

# History of Greenway network planning in China and their megacities

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## Abstract

With the spread of the sustainable development concept and the construction of ecological cities, many Chinese megacities have formed their Greenway network system. This study analyses the history of urban Greenways in China through an abundant literature review. It summarizes four aspects of Greenway development: The Greenway concept changing process, Greenway route selection methods, Greenway construction in four megacities, and post-occupancy evaluation research about Greenway. Firstly, we summarize the changing process of the Greenway concept in China in different periods. Analysis shows that the Greenway concept change process is closely related to the implementation policies in China. Research also reveals the relevant leading policies during China's Greenways development history. Secondly, it introduces the changes in Greenway route selection methods from the Olmsted period to recent years in China and other countries with corresponding cases. To view how they influence each other as knowledge spreads. In the third part of this study, we choose four typical megacities as examples, visualize the distribution of greenways, present the construction status of greenway networks now, and summarize the development of their current situation. In addition, the study collected 2098 comments on Ctrip from 2024 to 2017 to analyze visitors' opinions about these greenways. Finally, the study reviews the development process of the POE of Greenway in China, summarizes the popular research methods, and shares the unique perspective researchers are now using. The development of Greenway network is of great significance to improving the quality of human settlements and alleviating megacities common problems. With the application and research of big data, China's Greenway construction is developing toward human-oriented perception while keeping the detailed study of natural factors.

## Keywords

greenway, megacities, development history, central-district

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## INTRODUCTION

With the rapid development of China's urbanization and the expansion of cities, China has formed 10 megacities with a permanent urban population of more than 10 million. In these high-density megacities, the central urban area is often the most densely populated, with the most severe air pollution and lacking urban public activity space. Urban Greenways, as essential urban functional spaces integrating recreation, ecology, transportation, and culture, are of great significance in alleviating the "big city diseases" such as traffic congestion, living environment problems, and ecological environment deterioration in these megacities. A widely recognized concept of the Greenway is that the 'green-' in 'Greenway' came from 'greenbelt' and the '-way' from 'parkway.' This supports the use of 'Greenway' to describe linear public open space in rural or urban areas (Little,1995). Greenways are also recognized as networks of land containing linear elements that are planned, designed, and managed for multiple purposes including ecological, recreational, cultural, aesthetic, or other purposes compatible with the concept of sustainable land use (Ahern, 1995) In the mid-19th century, the famous landscape architect F. Olmsted planned the first Greenway, "Emerald Necklace" in Boston, and the Greenway system planning was loved by the surrounding residents and widely concerned by researchers.

At the beginning of the 21st century, the concept of Greenways was officially introduced in China. Since then, China has conducted planning research and construction practices in Zhejiang, Guangdong, and other regions. With the development of cities, the construction of Greenway systems in China has achieved fruitful results. Many cities and areas have formed their own Greenway network system. However, few studies have sorted out the change and development process of Greenway concepts and route selection methods in China. Therefore, from the development history perspective, this study sorted out the changes in the Greenway construction concept, Greenway routes selection method, typical Greenway construction cas occupancy evaluation (POE) of Greenways. Also, the study selected the central urban areas of four typical Chinese megacities, Beijing, Wuhan, Chongqing, and Shenzhen, as research samples for comparative study. Try to summarize the development process of Greenways in China, the influence of foreign Greenway route selection concepts on China's Greenway construction, and the current situation of Greenway network construction in high- density megacities.

## THE CHANGE PROCESS OF GREENWAY DEVELOPMENT CONCEPT IN CHINA

### 1949-1998 THE PERIOD OF SHELTER FOREST SYSTEM CONSTRUCTION

During this period, the Shelter Forest System construction project greatly improved the regional ecological environment. Still, the construction purpose was mainly to prevent wind, flood, soil erosion, and other natural disasters, and the Greenway planning was mainly top-down, with less public participation and less attention to recreational functions. In the 1950s, China carried out large-scale Shelter Forest System practice. This practice starts with constructing green

forest belts for farmland protection. In 1978, the construction of the Three-North Shelter Forest Program(三北防护林工程)started. In the early 1990s, the Shelter Forest system around Beijing and Tianjin, the shelterbelt system in the middle and upper reaches of the Yangtze River, and the coastal Shelter Forest System were initially planned. In 1998, the 'National Ecological Environment Construction Plan(全国生态环境建设规划)set off a nationwide greening movement, and so far, ten ecological protection forest systems have been launched.

#### 1998-2015 THE EXPLORATORY PERIOD OF GREENWAY PLANNING PRACTICE

During this period, the specific policy of Greenway construction was not formed nationwide. Still, some areas have begun to actively explore the planning and practice of Greenways and gradually realize the transformation from "conceptual Greenways" to "actual construction Greenways." Scholars gradually spread the ecological and social benefits of Greenway network development in this period. In January 2010, the Guangdong Provincial Department of Housing and Urban-Rural Development issued the master plan for the Pearl River Delta Greenway network. This is the first systematic greenway network system planning in China. From that time, Guangdong took the lead in building a regional greenway totaling about 1690km in the Pearl River Delta region in about three years. In 2012, "Built Beautiful China"(建设美丽中国) was proposed. In the same year, The 18th National Congress of the CPC included ecological civilization in the "Five-in-one overall plan"(五位一体)which refers to the five-sphere integration of economic, political, cultural, social, and ecological progress. In 2013, The State Council proposed"Opinions on Strengthening Urban Infrastructure Construction" to strengthen the planning and construction of Greenways and green corridors in combination with urban and rural environmental improvement, urban village transformation, and ecological restoration of abandoned sites. With the development of times, national policies are paying more and more attention to Greenway planning and ecological development.

#### 2015-2020 THE RISE OF GREENWAY PLANNING GUIDANCE BY POLICY AND STANDARDS

In this period, the status and importance of Greenway construction increased significantly, and the construction concept of ecological priority, systematism, and connectivity was established through policy guidance. In 2016, the Ministry of Housing and Urban-Rural Development issued the "Guidelines for Greenway Planning and Design" to clarify the construction standards of Greenways at the national level and guide the planning and design of Greenways across the country. In 2017, the 19th National Congress of the Communist Party of China(十九大) proposed establishing and practicing that "Lucid waters and lush mountains are invaluable assets."(绿水青山就是金山银山)This concept provides theoretical guidance for the construction of China's ecological civilization. Subsequently, "Urban repair and ecological restoration work"(城市双修) has been carried out in Hainan. In May of the same year, the "13th Five-Year Plan"(全国城市市政基础设施建修十三五规划)for the construction of National Urban Municipal Infrastructure took the construction of Greenways as a key project. It proposed the goal of adding 20,000 kilometers of Greenways by 2020.

## 2020-2023 SCIENTIFIC AND SYSTEMATIC GREENWAY PLANNING PERIOD

After nearly 20 years of exploration, China has issued specific Greenway spatial planning and construction standards. Greenway construction has risen from the short-term practice of local governments to extensive practice. It has been formally incorporated into the institutional framework of China's planning system. June 2021 According to the "Community Living Circle Planning Technical Guideline Standard(社区生活圈规划技术指南)" the Greenway will be used as a component of a high-density slow traffic network and green open space network<sup>12</sup>. In June 2021, The State Council proposed in the "Guiding Opinions on Scientific Greening"(关于科学绿化的指导意见) to enhance the systematic and collaborative nature of urban and rural green Spaces, build a Greenway network, and realize the connection of urban and rural green Spaces. In October of the same year, the CPC Central Committee and The State Council pointed out at the regional level that we need to promote Greenway development in urban and rural areas and cooperate to build regional ecological networks. As for Greenway systems in urban areas, we need to scientifically formulate urban slow travel system planning and build bicycle lanes and Greenways . The release of this policy indicates that China's Greenway construction policy is developing toward regional link networking.

## HISTORY OF GREENWAY ROUTE SELECTION METHOD

### 1869-1998 INITIAL DEVELOPMENT PERIOD OF ROUTE SELECTION METHOD

Greenway route selection method analyses are designed to identify and measure the suitability of potential sites for Greenway development. In the early stage of route selection, Landscape architects made choices by overlaying hand-drawn maps with different reference factors. Then, on this basis, Ian Lennox Mc Harg proposed the "layer cake phenomenon," which reveals the interaction pattern of the landscape and develops the process analysis map, ordering the stratified map in chronological order, with the original part containing rocks and then superimposing water, soil, vegetation, etc. The method opened up the classical method of Greenway route selection research. This method later influenced China's Greenway route selection method and was widely cited by relevant scholars. Later on, the advent of GIS technology greatly improved this method.

### 1998-2012 ROUTE SELECTION METHOD IS GRADUALLY ENRICHED

After 1997, the growth rate of Greenway-related papers increased rapidly. In 2004, Fábos J G summarized the five-step method of Greenway planning, proposed a comprehensive Greenway vision planning method for Greenways with different construction purposes, and proposed linking all types of Greenways at the regional level. This method provides a theoretical basis for the subsequent Greenway network planning. In 2004, Ashley Conine and others expanded the evaluation factors of Greenway route selection, including potential demand range and accessibility of service facilities from the perspective of demand-supply. During this period, foreign route selection methods began to be introduced into China, impacting China's Greenway development theory. The selection method mainly focuses on land suitability assessment. In 2005, Yu Kongjian proposed the concept of landscape Security Pattern (景观安全格局)and analyzed landscape Security Patterns in China on a large scale.

Time	Guiding policies	Construction content	Research and construction focus
1950s	Farmland protection forest	Farmers themselves build protective forest belts around their farmland	
1978	The "Three North" shelter forest	Building protective forests in the northwest, northeast, and north of China	Soil and water conservation, wind and sand prevention, regulation of agricultural climate, etc
After 1990	Protection forest system	Construct 10 major protective forest systems, including the protective forest system around Beijing and Tianjin, the protective forest system in the middle and upper reaches of the Yangtze River, and the coastal protective forest system.	
1998	Notice on Issuing the National Ecological Environment Construction Plan	Vigorously carry out tree planting and grass planting	Planting trees and grass on land suitable for greening
2000	Notice on Further Promoting the Construction of National Green Channels	Greening and beautification along highways, railways, rivers, and embankments	The main function should be to prevent wind consolidate soil, and beautify the environment.
2013	Opinions on Strengthening Urban Infrastructure Construction	Intensify planning and construction efforts for Greenways, Greenways, and other green corridors.	Improve the ecological landscape indicator system and promote the construction of ecological landscape cities.
2016	Several Opinions on Further Strengthening the Management of Urban Planning and Construction	Optimize the layout of urban green spaces, build a Greenway system, connect green spaces inside and outside the city, and introduce ecological elements into the urban area.	Restore the natural ecology of the city.
2016	Greenway Planning and Design Guidelines	Clarify Greenway construction standards nationally and guide Greenway planning and design in various regions.	Leisure and fitness, green travel, ecological protection, society and culture, tourism and economy
2017	The 13th Five-Year Plan for National Urban Municipal Infrastructure Construction <sup>7</sup>	Strengthen greening around cities and urban agglomerations, promote Greenway construction, and build a network system of urban and rural Greenways.	Make Greenway construction a key project and propose the goal of adding 20000 kilometers of Greenways by 2020
2020	Guidelines for the Compilation of Urban Land and Space Master Plan	Build a slow traffic system with system security, combined with streets and blue-green networks, to build a Greenway system connecting the city and suburbs	Incorporate urban and rural Greenways into other planning documents.
2021	Guiding Opinions on Scientific Greening	Building a Greenway network to achieve connectivity between urban and rural green spaces	Enhance the systematicity and synergy of urban and rural green spaces.
2021	Technical Guidelines for Community Life Circle Planning	Building a high-density slow traffic network consisting of urban roads, Greenways, streets and alleys, public passages, etc., relying on a 15-minute community living circle; Building a green open space network with balanced coverage and a combination of points, lines, and surfaces, relying on various types of park green spaces, affiliated green spaces, Greenways, small and micro public spaces, etc	The chronic system and open space system connectivity network between Greenways and the 15-minute community living circle
2021	Opinions on Promoting Green Development in Urban and Rural Construction	"Collaborative construction of regional ecological networks and Greenway systems" at the regional level, and "tailored construction of bicycle lanes and Greenways" within urban areas	Improving the regional ecological environment and scientifically formulating urban slow traffic system planning

Table 1. Table of Changes in the Construction Concept of Urban Greenways

In 2011, Zhuang Rong introduced the route selection method of the greenway network based on ecological conservation in the Pearl River Delta region. During this period, Greenway network theories were also being spread across China.

#### 2012-2020 FURTHER EXPANSION OF INFLUENCING FACTORS OF GREENWAY ROUTE SELECTION

After 2012, the research on route selection related to Greenways began to be gradually enriched. According to the statistics on CNKI from 2012 to 2020, research in this field shows a fluctuating upward trend. The number of articles published in 2020 reached its peak. The factors that researchers consider are also starting to diversify. In 2013, scholars Hu Jianshuang and Dai Fei summarized a set of planning procedures and methods for constructing urban Greenway networks in China, which provided a theoretical basis for planning green island networks in typical cities. 2015, Li Fangzheng et al. studied the travel rules of the urban population based on bus card data. They introduced relevant travel distribution density, travel destination, and other indicators into the analysis and evaluation of Greenway route selection in a pioneering way.

The route selection of greenway construction in central urban areas faces different land use diversity from that in nature. Its planning layout is related to the land use pattern, road network system, population density, and other factors. In 2016, Zhou Conghui evaluated the route selection potential of the central urban area through three indicators: intensity of recreation demand, recreation attraction, and suitability of Greenway construction, and customized the route selection layout plan of the central urban area of Dongying(东营) City with the evaluation results, alternatives are also provided for different aiming. In 2020, Chen Xixi et al. used the use data from shared bicycles and the entropy method to establish an evaluation system for the utilization potential of green space nodes and tried to use this method to search key green space link nodes within the city, obtain the road heat of bicycle use through the track data of shared bicycles, and extract the current linear green space corridor. This method includes data on the shared bicycle business that has arisen in China in recent years, further enriching the route selection ideas of Greenways in central urban areas.

#### 2020-2024 ROUTE SELECTION METHOD COMBINED BIG DATA ANALYSIS

With the development of Internet services and information technology, the application of big data enables researchers to use crowd activity trajectory data such as public bicycle use data and urban public service facilityPOI. Dai Fei et al. planned and analyzed Greenway route selection in Wuhan based on urban POI point data and the service range of service facilities combined with visual sensitivity analysis. They introduced visual sensitivity and POI interest points into the study of Greenway route selection in a pioneering way.

In general, the route selection methods of Greenways in central urban areas show diversified development, and scholars have begun to study the route selection of Greenways from the aspects of residents' behavior and perception of the city. Instead of only focusing on the interaction of environmental factors in the past, the research object has gradually shifted to human behavior and needs. Big data is widely used for analysis and research to provide data support for route selection.

Year	Author	Route selection method	Important Evaluation Factor	Application case
1869	Frederick Law Olmsted Charles Eliot	Link city parks and coastal views	soil, revetment ecological benefits, urban landscape elements, coastal landscape etc	Boston Park System/ Emerald Necklace
1987	Ian Lennox McHarg	L ayer Cake Representation of Phenomena	Natural geographical factors, social value factors, etc	Bronx River Parkway, New York
1998	J.G. Fábos	Five-step route selection method	ecological/nature protection, recreational, and historic/cultural values.	Greenway Plan for New England
1998	William Miller, Michael G. Collins, Frederick R. Steiner, Edward Cook	Expert interviews, public surveys, Suitability analysis	Ecological environment type, slope, water body, distance from humans (wildlife habitat), land use, development pressure, landscape elements, green space coverage, population density, water quality, surface water, erosion control, etc	Prescott Valley, AZ, USA
2001	Yu kongjian Li Dihua Chao Luomeng	Urban ecological infrastructure construction	Native habitat system natural form of the coast combination of shelterbelt forest system and green space system, etc	/
2004	Ashley Conine, Wei-Ning Xiang b, Jeff Y oung c, David Whitley	Seven-step route selection method	Evaluation of potential demand scope, evaluation of potential connection supply, greenway land suitability assessment, accessibility assessment, greenway scope demarcation, and alignment of multiple options, etc	Concord, North Carolina
2006	Alessandro toccolini, Natalia Fumagalli, Giulio Senes	Four-step route selection method	Current landscape resources, existing greenway network, linear historical landscape elements, etc	The Lambro River Valley Greenways System
2013	Hu jianshuang Dai fei	Greenway planning procedures and methods based on Chinese cities	Natural elements, artificial elements, historical and cultural elements, urban construction materials, etc	/
2015	Li fangzheng Li wanyi Lixiong	Bus card route selection method	Bus travel distribution density, travel destination, urban land. etc	Beijing Center District
2015	Wang min Jia jianling Zhang junlei	Suitability evaluation method	Ecological location, ecological sensitivity, land use type, landscape resource distribution, boundary characteristics, accessibility, etc	Xiamen City Haicang District Greenway
2016	Zhou conghui	Greenway route selection potential in central city based on quantitative evaluation	Green ecological type, historical and cultural facilities, road section type, road and green belt width, population density	Dongying City Central City Greenway Network Plan
2018	luo kun	Cost Distance Model based on the "Source- Sink" theory	Park green space, river system, historical culture, cultural and sports facilities, commercial facilities, rail transit, etc., landscape style roads, boulevards, etc	Greenway, Xuhui District, Shanghai
2019	Chen xixi, Li Liang	Route Selection Method based on Shared Bicycles	Park green space distribution map, protected green space distribution, etc. shared bike track data, urban shared bike road use, shared bike space heat, etc	Haidian District, Beijing City Cycling Greenway
2020	Dai Fei Yang Chao Xu ya Chen Ming Pei Ziyi	Route Selection method based on POI data	POI points service range; road network cost weighted distance, visual sensitivity	Wuhan Hanyang District green way

Table 1. Greenway route selection method chronological table

## CONSTRUCTION PROCESS OF HIGH-DENSITY URBAN GREENWAY NETWORK IN FOUR MEGACITIES

Megacity greenways are often made up of multiple projects built at different times and by different implementing agencies. However, few studies have yet to sort out the distribution of the overall greenway system in different megacity cities in China, especially in their central-district. According to the existing official data, this study visualized the distribution of greenways in four Chinese megacities to present the construction status of Greenway network now. Data sources include: “Beijing Greenway Construction Overall Plan (2013-2017)”,” Wuhan Greenway System Plan 2012”, “Special Planning Plan for Mountain City Trail in Chongqing’s Main Urban Area 2011”, “Shenzhen Greenway Network Special Plan (2010-2020)” and another supplementary database.

### SHENZHEN

In 2009, the publishing of “General Planning Outline of the Pearl River Delta Greenway Network in Guangdong Province”(珠江三角洲绿道网总体规划纲要)opened the prelude to the large-scale, legalized, and normalized planning and construction of Greenways in China. According to “Shenzhen Greenway Network Special Plan 2010-2020” (深圳市绿道网专项规划) in 2011, The urban greenway is divided into three types: coastal style greenway, mountain greenway, and urban vitality greenway, with a total length of about 500km. At present, the total length of greenways has reached 2843 km. Among them, the coastal style greenway takes the 15km coastline of Shenzhen Bay as the line, connecting Sea World, Shekou Area, Shenzhen Bay-Houhai Headquarters Economic Zone, Overseas Chinese Town Inner Lake, Mangrove Park and Futian Mangrove National Nature Reserve, etc., forming a continuous coastal urban living and leisure function place.

From the view of the development process, Shenzhen’s Greenway construction has experienced two stages. The first stage (2010-2020) focuses on the construction of The three-scale Greenway network system, which focuses on “quantitative growth”; the second stage (2021-2035) focuses on detailed guidelines for Greenway construction and pays more attention to the “quality improvement” of the Greenway system. Shenzhen’s leading role in constructing and managing high-density urban Greenways has become a good practice example for other cities.

As for Greenway management, the Shenzhen Municipal Government issued the “Shenzhen Greenway Management Measures” (深圳市绿道管理办法)in 2012, which clarified the responsibilities of various departments in the process of Greenway planning and construction, management, including maintenance and supervision of Shenzhen Greenway . Shenzhen’s green network system has formed continuously improved operation management systems. During the construction period, the construction leading group office takes the lead in the construction process. After the construction is completed, Greenway management combines territorial construction management, park organization management, tourism company management, and real estate developer management in different segments for later management and operation. In 2022, the Shenzhen Municipal Bureau of Urban Management issued the “Shenzhen Greenway Network Special Plan (2021-2035) ” , which aims to improve the quality of Greenway construction from the perspective of the whole area and all elements and play.



Since 2011, under the influence of the construction of the Pearl River Delta Greenway network, China's Beijing, Shanghai, Fujian, Zhejiang, Sichuan, Hubei, Hunan, and other provinces have learned from the experience of Guangdong to carry out Greenway construction, and the trend of Greenway construction has begun nationwide.

## BEIJING

In 2013, the Beijing Municipal Development and Reform Commission (NDRC) issued the "Overall Plan for the Construction of Beijing Greenway 2013-2017" (北京市级绿道建设总体方案). The overall distribution presents "three rings, three wings, and multiple corridors type" (三环、三翼、多廊) layout. Including 28 major greenway lines with a total length of more than 1,200 km. Among them, the central urban greenway includes the Second Ring Greenway(二环路绿道), the Three Mountains and Five Gardens Greenway (三山五园), and the Yuanbo Greenway (园博绿道). Greenways are closely distributed along water systems, green spaces, and links to popular Public Spaces inside the city. In the following two years, the Beijing Municipal Department issued the "Measures for the Management of Beijing Greenway 2015 北京市绿道管理办法" and a series of policies also. These policies not only promoted the process of Greenway construction but also provided an institutional guarantee for the management and supervision of Greenways in the later stage.

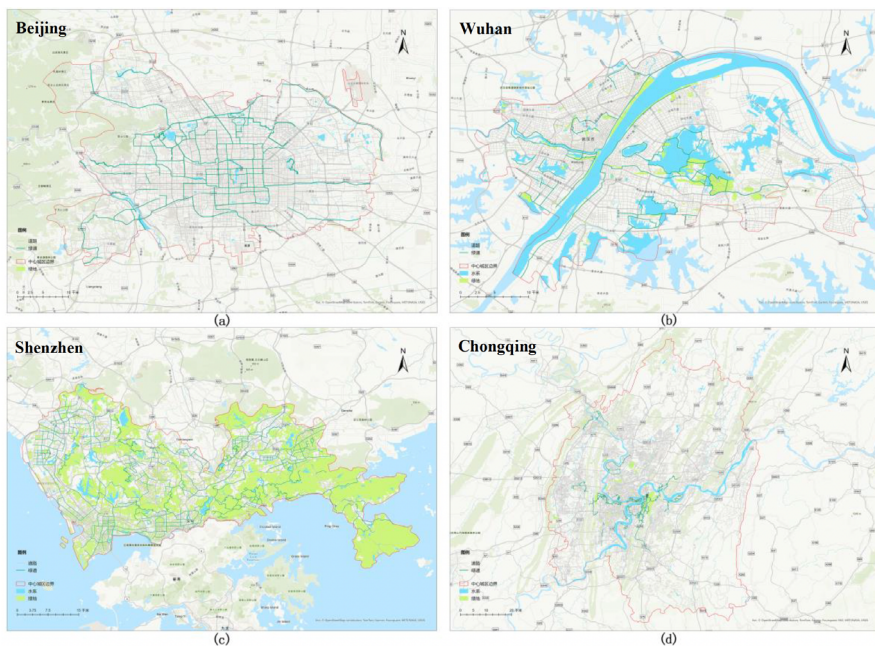


Fig. 2. Layout of four megacities greenways



Fig. 3. 100 key comments words of four megacities greenways

The period from 2013 to 2015 was the peak of Greenway construction in the central urban area of Beijing. In 2014, a Greenway in the central district of Beijing started to connect many parks and historic sites. By 2017, Beijing had built 710 kilometers of Greenways, of which 500 km are within the scope of the central urban area. One of the most famous is the construction of the “Three Mountains and Five Gardens” (三山五园) greenway, which is located in the west of Beijing and also the first demonstration project of the Beijing Greenway. the “Three Mountains” refer to the Xiangshan Mountain (香山), the Yuquan Mountain (玉泉山), and the Longevity Mountain (万寿山), and the “Five Gardens” refer to the Jingming Garden (静明园), the Jingyi Garden (静宜园), the Qingyi Garden (清漪园) (the Summer Palace), and the nearby Changchun Garden (畅春园) and the Old Summer Palace (圆明园). This greenway’s total length is 36.09 km. The line was completed in October 2014, connecting 13 parks and green spaces west of Beijing. In 2023, the Special Plan for Beijing’s Greenway System (2023-2035) will further guide Beijing to build a connected, comfortable, modern, and convenient Greenway system.

## WUHAN

Wuhan Municipal Commission of Planning and Natural Resources organized the “Wuhan Greenway System Planning in 2012” (武汉市绿道系统规划). The overall structure of the Greenway network is “one center, six wedges, and ten belts. 一心、六楔、十带” The planned total length of the Greenway is 2200 kilometers, which includes 450 kilometers of urban Greenway located in the center-district of the city. The distribution of Greenways in downtown Wuhan echoes the ecological pattern of “two rivers confluence, lakes and wetlands dense” in Wuhan. A continuous and perfect Greenway distribution pattern forms on the Yangtze and Han rivers.

A good connection is formed with the green space on both sides of the river, creating a good walking or cycling environment for the users of the Greenway. In addition, Greenways are built around lakes and parks in the city, and together with the Greenway along the river, they form a relatively Greenway framework.

Under the guidance of this plan, the Lion Mountain Greenway(狮子山绿道) was completed in 2015. the construction of 30km Zhanggongdi Greenway (张公堤绿道) and the first phase of the East Lake Greenway(东湖绿道) was completed in 2016, and the second phase of the East Lake Greenway(东湖绿道) was completed in 2017. The East Lake Greenway is an important part of the Wuhan Greenway system, connecting popular Public Spaces such as universities, cultural centers, lakes, hills, and suburbs. The construction of the third phase will be completed in 2024, and the connection with the first and second phases will be realized.

## CHONGQING

The planning and construction of the Chongqing Greenway began in 2018. Greenway's systematic development and construction in Chongqing is challenging because Chongqing is a mountainous city with great terrain changes. The plan divides Greenways into three types: street, riverside, and mountain forest, and it constructs a network of 60 Greenways with a length of about 1207km. Among them, the City Wall Trail (环城墙步道), Shaxi Trail(沙磁步道), Panxi River Trail(盘溪河步道), and Gele Mountain Trail(歌乐山步道) have been completed and put into use now. Gele Mountain hiking trail is mainly distributed in Gele Mountain Forest Park, Shapingba, Chongqing, a hot spot for citizens to relax.

## COMPARISON SUMMARY OF TYPICAL CITIES

These megacity Greenways share some commonalities: Firstly, Greenways in central urban areas link various types of open public Spaces. The planning goal is often to integrate overall landscape resources in the region. Secondly, from the perspective of ecosystem protection, Greenways connects the surrounding rivers, animals, plants, and other ecological resources to a certain extent. In addition, the construction of Greenways in central urban areas considers the connectivity of Non-motorized Traffic and, more importantly, the impact on the flow of people and natural organisms. Each city's Greenway construction has its own characteristics.

## ONLINE COMMENTS ABOUT GREENWAY NETWORK IN FOUR MEGACITIES

This study collected 2098 comments about greenways and related scenic spots in four megacities on Ctrip (携程旅行网) from 2017 to 2024. The study aimed to analyze the opinions of visitors by using the TF-IDF and lexical network analysis methods. The majority of comments expressed users' love for the greenways, with only a few complaints. Some disgruntled comments mentioned "holidays" and "overcrowding."

## SHENZHEN

A total number of 848 comments have been collected, including Shenzhen Bay Park (深圳湾公园) and Shenzhen Mangrove Reserve (深圳红树林保护区) in Shenzhen. In the reviews of Shenzhen Greenway, “pretty good” is the critical comment word, and the relevant evaluation words also include “satisfactory,” “great,” “superior,” and so on, expressing the user’s high recognition of the relevant scenic spots. Time-related words include “autumn,” “after dinner,” “daily,” and “holiday.” Indicate that these places are also hot holiday visiting spots. Words related to crowd types, including “children” and “friends and relatives,” mean that visitors include children and family groups. From the lexical association network map, there is a strong correlation between “park,” “mangrove,” “Shenzhen Bay,” “walk,” “bicycle,” and “nature reserve.” It could be inferred that the cycling and walking activities of the coastal greenway in Shenzhen are the activities that participants often carry out in this scene.

## BEIJING

Comments about Beijing’s greenway network including San Shan Wu Yuan (三山五园), Yingcheng Jiandu waterfront Greenway (营城建都滨水绿道), Second Ring Road Greenway (二环城市绿道), Liangshui River Park Greenway (凉水河公园绿道), and Olympic Forest Park greenway (奥林匹克森林公园绿道) were analyzed, totaling 126 reviews. The TF-IDF analysis revealed that “Recreational walking” is an important activity in Beijing’s greenways, with related words such as “physical exercise,” “walking,” and “gathering” also being significant. This suggests that many visitors prefer to walk and exercise in these green spaces. In terms of timing, the analysis showed that “noon,” “At nightfall,” and “evening” are the peak hours for visitors to the greenways.

## WUHAN

Wuhan East Lake Greenway(东湖绿道), Houguanhu Wetland Park (后官湖湿地公园), Jiangtan Sports Park (江滩体育公园), a total of 170 comments was collected. In the comments on Wuhan Greenway, “camp” is a crucial word, and its related environmental adjectives also include water-related words such as “mountains and water,” “sparkling,” and “beautiful,” which also reflects the characteristics of the bonding of Wuhan Greenway and water. From the perspective of time-related words, “early morning,” “festival period,” “sunset,” and other words appear more frequently. As for the possible activities, “leisure activities,” “swimming,” “morning exercise,” and “walking” appear more frequent than other words. From the lexical association network map, East Lake “and “greenway” riding “produced a strong correlation. It shows that more users of the greenway in Wuhan use it for cycling, exercise, and leisure walking.

## CHONGQING

A total of 954 comments were collected about the Chongqing Greenway network, which includes Chongqing Bijin Park (重庆碧津公园), Nanshan Scenic Area, and Mountain (南山步道) City Walk (山城步道). In the comments of Chongqing Greenway, “morning and evening” is a more important word, and its related time words also include “morning,” “after

dinner,” and “often go,” indicating that Greenway has become one of the common choices for people to relax and after dinner walk. From the perspective of activity type, words such as “climbing up and down,” “walking,” and “exercise” appear more frequently. Indicate Chongqing’s exceptional topographic condition. As the lexical network analysis result shows, “Nanshan,” “walking path,” “night view,” “boardwalk,” “scenic spot,” “scenery,” and other words are highly correlated, which means that the night scene here has become one of the choices of the city night tour, which many users love.

## DEVELOPMENT OF GREENWAY NETWORK POE RESEARCH

### 2009-2015 SURVEY AS THE MAIN POE RESEARCH METHOD

Under the Guangdong Zhujiang Delta Greenway network construction background, scholars have begun researching the Greenway after its completion. Research and evaluation of the Greenway system started to be carried out during this period. In this stage, the questionnaire investigation was considered an important method in POE research. For example, Wu Junyuan studies the users’ behavior and usage needs of the Greenway system by questionnaire in Zengcheng(增城)City, Guangzhou, obtains the post-occupancy evaluation(POE) of the Greenway in the research section, research proposes strategies and optimization suggestions based on the evaluation result. Lu Feihong et al. conducted a quantitative analysis of the evaluation of Greenway users’ use satisfaction through a questionnaire. Greenway user’s experiences and behavior are the focus of researchers in this field.

### 2015-2020 POE RESEARCH METHODS DIVERSIFIED DURING DEVELOPMENT

In this period, research on Greenway assessment was widely carried out, and there was more diversity in research objects and methods. Research objects are no longer limited to a single city but expanded from a specific area to multiple scales and cities. For example, Zhang Haiye extracted a total of 2,721 effective evaluation records of ten Greenways in Guangdong, Sichuan, Jiangsu, Zhejiang, and other provinces, analyzed the characteristics and demand of Greenway users, and summarized three kinds of user portraits, and put forward targeted suggestions on the quality improvement of Greenways. At this stage, researchers began to pay attention to Greenways at various levels. For example, Chi Wenxiu and Lin Guangsi et al. took a representative community Greenway in Guangzhou as an example. They investigated the user’s usage patterns and their evaluation of the importance of different built environment elements through questionnaires. The factors of the built environment studied in this period are more comprehensive. As for research methods, some studies began to explore more diversified investigation methods. For example, He Hui et al., based on the SD method, conducted a study on the perception and evaluation of the riding environment on the East Lake Greenway in Wuhan. Instead of using a survey, some studies take the environmental dimension as the entry point to evaluate the impact of environmental factors and their influences on users’ feelings and behaviors through direct observation. The aspects of Greenway research are gradually enriched, and the research Angle is more diversified than before.

## 2020-2023 MULTI-SOURCE DATA AND INTELLIGENT TECHNIQUES IMPROVE RESEARCH ACCURACY

With the support of new technologies, Greenway evaluation is no longer limited to single questionnaire survey data, multi-source data, and various analysis models for more scientific, accurate evaluation are now available. These studies promote the progress of Greenway evaluation technology and provide a more powerful scientific basis for Greenway construction and management. Some studies evaluated the Greenway through the impact of built environmental factors and the intensity of Greenway use. Taking the central urban area of Beijing as an example, Qiu Cailin et al. conducted regression analysis using trajectory data to reveal the spatial effects of built environment factors on Greenway use intensity through a spatial metrology model. Other studies start from users' perceptions and evaluate the Greenway environment's effect on users. Xie Bo et al. investigated the residents around the East Lake Greenway in Wuhan to explore the impact of urban Greenway intervention on the mental health of residents in the surrounding communities. More detailed research continues to emerge. Researchers began to analyze and decompose human perception in detail to make more accurate assessments. Greenway research gradually transformed into a comprehensive system involving multi-scale research objects and diversified assessment methods.

## 6. CONCLUSION

It can be seen that the change process of the Greenway concept is closely related to the implementation policies in China. Early Greenway construction is closely related to natural disasters such as wind, floods, desertification, etc. Greenways are an important way to protect farmland and fields. During this period, fewer factors were considered for recreational activities. With the development of modern landscape ecology and the introduction of foreign Greenway research and route selection methods, scholars began to realize the importance of ecological infrastructure. With the advocacy of ecological development, China began to build the urban Greenway system and carried out pilot construction in the Pearl River Delta region. In recent years, with the continuous improvement of Greenway construction status and the promotion of the degree of construction, national policy has gradually advocated the coordinated development of urban and rural ecological networks and Greenway systems. Promote the improvement of urban and rural ecological environments and plan low-carbon systems in big cities simultaneously.

The Greenway route selection research development process shows that Mc Harg's "layer cake Phenomenon" has played a guiding role in China's Greenway route selection. Chinese scholars have carried out continuous innovation and exploration of this method in combination with the current situation of Chinese cities. In recent years, more and more scholars have begun to pay more attention to human behaviors in megacities. Relevant studies use data on human activity, such as bicycle travel and POI interest point data, to research Greenway route selection. Greenway route selection has gradually developed from focusing on environmental factors and their interaction to integrating human activities and perceptions.



China's Greenway has great potential, and many aspects still need to be improved. Each city has its own development pace. Among them, Shenzhen's Greenway network system has formed a relatively complete three-level Greenway system and a unique management system. Wuhan City Greenway, combined with its own pattern of natural resources, the construction of high-quality urban tourist attractions. Beijing's urban Greenway system has launched 20 characteristic cycling routes, promoting low-carbon travel in the city and easing the problem of regional traffic congestion. Chongqing Urban Greenway provides a digital publicity guide, which offers a good interactive system for urban cultural publicity and citizen leisure.

China's researchers have already carried out different POE research from various perspectives, especially in megacities. As for research methods, the research on the evaluation of Greenways no longer relies only on questionnaires or single survey data. Researchers try to use more scientific and comprehensive evaluation methods through multi-source data and multiple analysis models. As for user activities and perception evaluation, there is also a trend of accurate evaluation in specific aspects. With the application and research of big data, China's Greenway construction is developing toward fine human-oriented perception while retaining a detailed study of natural factors. In general, the construction of Greenway networks in China's megacities has made some achievements. However, green network system research still has a long way to go, and further research and exploration are needed in construction and management.

## REFERENCES

- Ashley Conine et al., "Planning for Multi-Purpose Greenways in Concord, North Carolina," *Landscape and Urban Planning* 68, no. 2-3 (May 2004): 271, [https://doi.org/10.1016/S0169-2046\(03\)00159-2](https://doi.org/10.1016/S0169-2046(03)00159-2).
- Alessandro Toccolini, Natalia Fumagalli, and Giulio Senes, "Greenways planning in Italy: the Lambro River Valley Greenways System," *Landscape and Urban Planning* 76, no. 1-4 (April 2006):98, <https://doi.org/10.1016/j.landurbplan.2004.09.038>.
- Bo Xie, Yi Lu, and Yi-Ling Zheng, "Casual Evaluation of the Effects of a Large-Scale Greenway Intervention on Physical and Mental Health: A Natural Experimental Study in China," *Urban Forestry & Urban Greening* 67, (January 2022): 127419, <https://doi.org/10.1016/j.ufug.2021.127419>
- Cai-Lin Qiu, Ning Qiu, and Tian-Jie Zhang, "The Spatial Patterns and Effect of Built Environment on Greenway Use Intensity Based on Active Travel-Evidence from the Central Urban Area of Beijing," *Chinese Landscape Architecture* 39, no. 11 (November 2023): 83, <https://doi.org/10.19775/j.cla.2023.11.0083>.
- Charles E. Little, *Greenways for America* (Baltimore: Johns Hopkins University Press, 1990). 7.
- Chun-Chun Wang, Yun-Feng Jin, and Sen Xu, "Greenway Planning and Construction in China: From Campaign Style to Institutionalization," *Chinese Landscape Architecture* 29, no. 1 (January 2022): 82-87, <https://doi.org/10.14085/j.fjyl.2022.01.0082.06>.
- Cong-Hui Zhou, "Layout Planning Method of Greenways in Central Urban Area Based on Route Selection Potential Quantitative Evaluation," *Chinese Landscape Architecture* 32, no. 10 (October 2016):104.
- Fábos, J.G., "Introduction and overview: the greenway movement, uses and potentials of greenways," *Landscape Urban Plann.* (October 1995). 33 (1-3), 3.
- Fang-Zheng Li, Wan-Yi Li, and Xiong Li, "Research on Urban Greenway Planning Based on Big Data of Bus Smart Card," *Urban Study* 22, no. 8 (August 2015): 27, <https://doi.org/10.3969/j.issn.1006-3862.2015.08.005>.
- Fei Dai et al., "Route Selection of Greenway in Hanyang District of Wuhan Based on POI Point Data," *China Urban Forestry* 18, no. 6 (December 2020):26, <https://doi.org/10.12169/zgcsly.2019.05.23.0001>.
- Fei-Hong Lu, Hai-Wei Yin, and Fan-Hua Kong, "The Using Characteristics and Satisfaction of Urban Greenway—A Case Study of the Purple Mountain Greenway in Nanjing," *Chinese Landscape Architecture* 31, no. 9 (September 2015):50, <https://doi.org/10.3969/j.issn.1000-6664.2015.09.012>
- "General Planning Outline of the Pearl River Delta Greenway Network," Guangdong Institute of Urban and Rural Planning and Design, last modified December 31, 2010, [https://www.gdupi.com/Project/detail/goods\\_id/269.html](https://www.gdupi.com/Project/detail/goods_id/269.html).
- "中共中央办公厅国务院办公厅印发《关于推动城乡建设绿色发展的意见》," The State Council of the

People's Republic of China, last modified October 21, 2021, [https://www.gov.cn/zhengce/2021-10/21/content\\_5644083.htm](https://www.gov.cn/zhengce/2021-10/21/content_5644083.htm).

“住房和城乡建设部关于印发绿道规划设计导则的通知,” Ministry of Housing and Urban-Rural Development, last modified October 14, 2016, [https://www.mohurd.gov.cn/gongkai/zhengce/zhengcefilelib/201610/20161014\\_229168.html](https://www.mohurd.gov.cn/gongkai/zhengce/zhengcefilelib/201610/20161014_229168.html).

“国务院关于加强城市基础设施建设的意见,” The Central People's Government of the People's Republic of China, last modified September 16, 2013, [https://www.gov.cn/zwgk/2013-09/16/content\\_2489070.htm](https://www.gov.cn/zwgk/2013-09/16/content_2489070.htm).

“国务院关于印发全国生态环境保护纲要的通知,” The State Council of the People's Republic of China, last modified November 26, 2000, [https://www.gov.cn/gongbao/content/2001/content\\_61225.htm](https://www.gov.cn/gongbao/content/2001/content_61225.htm).

“国务院关于印发全国生态环境建设规划的通知,” Department of Ecology and Environment of Guangdong Province, last modified November 7, 1998, [https://gdee.gd.gov.cn/ghjh3128/content/post\\_2333773.html](https://gdee.gd.gov.cn/ghjh3128/content/post_2333773.html).

“国务院办公厅关于科学绿化的指导意见,” The State Council of the People's Republic of China, last modified June 2, 2021, [https://www.gov.cn/zhengce/zhengceku/2021-06/02/content\\_5614922.htm](https://www.gov.cn/zhengce/zhengceku/2021-06/02/content_5614922.htm).

Hai-Ye Zhang, “Greenway Optimization Strategy based on Post-Occupancy Evaluation and Persona Analysis,” *Transportation and Shipping* 6, no. 4 (August 2019):86, <https://doi.org/10.3969/j.issn.1001-599X.2019.04.015>.

Hui He, Xiao-Wu Lin, and Yan-Wei Yu, “Research on Greenway Riding Environment Perception Evaluation Based on Semantic Differential Method: The Case of the First Phase of East Lake Greenway in Wuhan,” *New Architecture*, no. 4 (August 2019):33, <https://doi.org/10.12069/j.na.201904033>.

Ian L. McHarg, *Design With Nature* (New York: John Wiley&Sons Inc., 1969). 127–152.

Jian-Shuang Hu and Fei Dai, “Study on the Urban Greenways Planning Methods in China,” *Chinese Landscape Architecture* 29, no. 4 (April 2013): 116.

Julius Gy. Fábos, “Greenway planning in the United States:its origins and recent case studies,” *Landscape and Urban Planning* 68, no. 1-3 (May 2004):332, <https://doi.org/10.1016/j.landurbplan.2003.07.003>

Jun-Yu Wu, “Post Occupancy Evaluation(POE) on the Zengcheng Greenway System in Guangdong Province,” *Chinese Landscape Architecture* 27, no. 4 (April 2011):39, <https://doi.org/10.3969/j.issn.1000-6664.2011.04.010>.

Jian Qin. “Research of Urban Disease in China:Origin,Present and Future,”*Mordern Urban Research* (May 2012),No.27:60.

Jun-wen Bai et al., “A Spatial Analysis Approach for Evaluating the Service Capability of Urban Greenways—A Case Study in Wuhan,” *ISPRS International Journal of Geo-Information* 6, no. 7 (July 2017): 208, <https://doi.org/10.3390/ijgi6070208>.

Kong-Jian Yu, “Landscape Ecological Security Patterns in Biological Conservation,” *Acta Ecologica Sinica*, no. 1 (January 1999): 8, <https://doi.org/10.3321/j.issn:1000-0933.1999.01.002>.

Kong-Jian Yu, Di-Hua Li, and Nu-Yu Li, “The Evolution of Greenways in China,” *Landscape & Urban Planning* 76, no. 1-4 (April 2006):223, <https://doi.org/10.1016/j.landurbplan.2004.09.034>.

Kong-Jian Yu, Di-Hua Li, and Tie-Wu Duan, “Landscape Approaches in Biodiversity Conservation,” *Biodiversity* 6, no. 3 (August 1998): 209, <https://doi.org/10.17520/biods.1998031>.

Kongjian Yu, Dihua Li, Luomeng Chao, “Ten landscape strategies for the construction of urban ecological infrastructure,” *Planners*,no.17(December 2001)12.

Kun Luo, “Green way planning and construction in Metropolitan Areas -Take Xu hui Greenway in Shanghai as an example,”*Urban Planning Forum*(March 2018),No.243,77

Kun Luo, “Greenway Planning and Construction Strategy in Metropolitan Areas--Take Xuhui Greenway in Shanghai as an Example,” *Urban Planning Forum*, no. 3 (August 2018): 77–85, <https://doi.org/10.16361/j.upf.201803009>.

Min Wang, Jian-Ling Jia, and Jun-Lei Zhang, “Greenway Site Selection in Haicang District of Xiamen Based on Suitability Assessment,” *Huazhong Architecture* 33, no. 10 (November 2015): 83, <https://doi.org/10.3969/j.issn.1003-739X.2015.10.020>.

Ministry of Housing and Urban-Rural Development of the People's Republic of China - Construction Statistical Yearbook,2022,01-1-2-2

Rong Zhuang, “Pearl Delta Regional Greenway Planning Based on Ecological Concept,” *Planners* 27, no. 9 (August 2011): 44, <https://doi.org/10.3969/j.issn.1006-0022.2011.09.008>.

Shao-hua Tan, Wan-nian Zhao, “Research progress and prospect of greenway planning,”*Chinese Landscape Architecture* (February2007), 85

Shenzhen Urban Management and Comprehensive Law Enforcement Bureau, “Shenzhen Greenway Network Special Plan (2021-2035),” Shenzhen Municipal People's Government, last modified May 30, 2022, <http://cgj.sz.gov.cn/attachment/0/980/980209/9835577.pdf?eqid=9bfc037001039e600000006643b601a>

Shenzhen Urban Management and Comprehensive Law Enforcement Bureau, “Shenzhen Greenway Network Special Plan (2021-2035).” “Shenzhen Greenway Management Measures,” Shenzhen Municipal Peo-



ple's Government, last modified June 4, 2012, <http://cgj.sz.gov.cn/attachment/1/1096/1096302/2076387.pdf>.

"The 14th Five-Year Plan for National Economic and Social Development of the People's Republic of China and the Outline of the long-range goals for 2035," National Development and Reform Commission, last modified March 23, 2021, [https://www.ndrc.gov.cn/xxgk/zcfb/ghwb/202103/t20210323\\_1270124.html](https://www.ndrc.gov.cn/xxgk/zcfb/ghwb/202103/t20210323_1270124.html).

"The construction of the Beijing Greenway is advancing in a solid and orderly manner," Beijing Municipal Commission of Development and Reform, last modified March 30, 2017, [https://fgw.beijing.gov.cn/fgwzgwkg/zcjd/201912/t20191226\\_1505418.htm](https://fgw.beijing.gov.cn/fgwzgwkg/zcjd/201912/t20191226_1505418.htm)

The Ministry of Housing and Urban-Rural Development and the National Development and Reform Commission, "The 13th Five-Year Plan for National Urban Infrastructure Planning and Construction was Promulgated and Implemented," The State Council of the People's Republic of China, last modified May 26, 2017, [https://www.gov.cn/xinwen/2017-05/26/content\\_5197086.htm](https://www.gov.cn/xinwen/2017-05/26/content_5197086.htm).

The "Three North' Shelter Forest Project," Central Commission for Discipline Inspection and National Supervisory Commission, last modified September 25, 2019, [https://www.ccdi.gov.cn/yaowen/201909/t20190925\\_201205.html](https://www.ccdi.gov.cn/yaowen/201909/t20190925_201205.html).

Wen-Xiu Chi and Guang-Si Lin, "The Use of Community Greenways: A Case Study on A Linear Greenway Space in High Dense Residential Areas, Guangzhou," *Land* 8, no. 12 (December 2019): 188, <https://doi.org/10.3390/land8120188>.

William Miller et al., "An Approach for Greenway Suitability Analysis," *Landscape and Urban Planning* 42, no. 2-4 (December 1998):92, [https://doi.org/10.1016/S0169-2046\(98\)00080-2](https://doi.org/10.1016/S0169-2046(98)00080-2).

Xi-Xi Chen and Liang Li, "Study on Urban Bicycle Greenway Planning Based on Big Data Analysis of Shared Bicycle," *Chinese Landscape Architecture* 35, no. 6 (June 2019):109, <https://doi.org/10.19775/j.cla.2019.06.0109>.

Ya-Qi Zhou and Ming Sheng, "Analysis to the Planning of Shenzhen Greenway Network," *Landscape Architecture*, no. 5 (October 2010):042, <https://doi.org/10.14085/j.fjyl.2010.05.025>.

Wen-Xiu Chi and Guang-Si Lin, "The Use of Community Greenways: A Case Study on A Linear Greenway Space in High Dense Residential Areas, Guangzhou," *Land* 8, no. 12 (December 2019): 188, <https://doi.org/10.3390/land8120188>.

Hui He, Xiao-Wu Lin, and Yan-Wei Yu, "Research on Greenway Riding Environment Perception Evaluation Based on Semantic Differential Method: The Case of the First Phase of East Lake Greenway in Wuhan," *New Architecture*, no. 4 (August 2019):33, <https://doi.org/10.12069/j.na.201904033>.

Cai-Lin Qiu, Ning Qiu, and Tian-Jie Zhang, "The Spatial Patterns and Effect of Built Environment on Greenway Use Intensity Based on Active Travel-Evidence from the Central Urban Area of Beijing," *Chinese Landscape Architecture* 39, no. 11 (November 2023): 83, <https://doi.org/10.19775/j.cla.2023.11.0083>.

Bo Xie, Yi Lu, and Yi-Ling Zheng, "Casual Evaluation of the Effects of a Large-Scale Greenway Intervention on Physical and Mental Health: A Natural Experimental Study in China," *Urban Forestry & Urban Greening* 67, (January 2022): 127419, <https://doi.org/10.1016/j.ufug.2021.127419>.

## IMAGE SOURCES

**Table 1:** The table is made by the author

**Table 2:** The table is made by the author

**Figure 1:** Author drawing According to related statistics

**Figure 2:** Author drawing According to related statistics

## ENDNOTES

4. Ministry of Housing and Urban-Rural Development of the People's Republic of China - Construction Statistical Yearbook, 2022, 01-1-2-2
5. Shao-hua Tan, Wan-nian Zhao, "Research progress and prospect of greenway planning," *Chinese Landscape Architecture* (February 2007), 85
6. Jian Qin, "Research of Urban Disease in China: Origin, Present and Future," *Modern Urban Research* (May 2012), no. 27: 60.
7. Kun Luo, "Green way planning and construction in Metropolitan Areas -Take Xu hui Greenway in Shanghai as an example," *Urban Planning Forum* (March 2018), no. 243, 77
8. Kong-Jian Yu, Di-Hua Li, and Nu-Yu Li, "The Evolution of Greenways in China," *Landscape & Urban Planning* 76, no. 1-4 (April 2006): 223, <https://doi.org/10.1016/j.landurbplan.2004.09.034>.
9. "国务院关于印发全国生态环境建设规划的通知," Department of Ecology and Environment of Guangdong Province, last modified November 7, 1998, [https://gdee.gd.gov.cn/ghjh3128/content/post\\_2333773](https://gdee.gd.gov.cn/ghjh3128/content/post_2333773).

html.

10. Kong-Jian Yu, Di-Hua Li, and Tie-Wu Duan, "Landscape Approaches in Biodiversity Conservation," *Biodiversity* 6, no. 3 (August 1998): 209, <https://doi.org/10.17520/biods.1998031>.
11. Ya-Qi Zhou and Ming Sheng, "Analysis to the Planning of Shenzhen Greenway Network," *Landscape Architecture*, no. 5 (October 2010):042, <https://doi.org/10.14085/j.fjyl.2010.05.025>.
12. "国务院关于加强城市基础设施建设的意见," The Central People's Government of the People's Republic of China, last modified September 16, 2013, [https://www.gov.cn/zwqk/2013-09/16/content\\_2489070.htm](https://www.gov.cn/zwqk/2013-09/16/content_2489070.htm).
13. "住房城乡建设部关于印发绿道规划设计导则的通知," Ministry of Housing and Urban-Rural Development, last modified October 14, 2016, [https://www.mohurd.gov.cn/gongkai/zhengce/zhengce-filelib/201610/20161014\\_229168.html](https://www.mohurd.gov.cn/gongkai/zhengce/zhengce-filelib/201610/20161014_229168.html).
14. Chun-Chun Wang, Yun-Feng Jin, and Sen Xu, "Greenway Planning and Construction in China: From Campaign Style to Institutionalization," *Chinese Landscape Architecture* 29, no. 1 (January 2022): 82–87, <https://doi.org/10.14085/j.fjyl.2022.01.0082.06>.
15. "The 14th Five-Year Plan for National Economic and Social Development of the People's Republic of China and the Outline of the long- range goals for 2035," National Development and Reform Commission, last modified March 23, 2021, [https://www.ndrc.gov.cn/xxgk/zcfb/ghwb/202103/t20210323\\_1270124.html](https://www.ndrc.gov.cn/xxgk/zcfb/ghwb/202103/t20210323_1270124.html).
16. "国务院办公厅关于科学绿化的指导意见," The State Council of the People's Republic of China, last modified June 2, 2021, [https://www.gov.cn/zhengce/zhengceku/2021-06/02/content\\_5614922.htm](https://www.gov.cn/zhengce/zhengceku/2021-06/02/content_5614922.htm).
17. "中共中央办公厅国务院办公厅印发《关于推动城乡建设绿色发展的意见》," The State Council of the People's Republic of China, last modified October 21, 2021, [https://www.gov.cn/zhengce/2021-10/21/content\\_5644083.htm](https://www.gov.cn/zhengce/2021-10/21/content_5644083.htm).
18. "The 'Three North' Shelter Forest Project," Central Commission for Discipline Inspection and National Supervisory Commission, last modified September 25, 2019, [https://www.ccdi.gov.cn/yaowen/201909/t20190925\\_201205.html](https://www.ccdi.gov.cn/yaowen/201909/t20190925_201205.html).
19. "国务院关于印发全国生态环境保护纲要的通知," The State Council of the People's Republic of China, last modified November 26, 2000, [https://www.gov.cn/gongbao/content/2001/content\\_61225.htm](https://www.gov.cn/gongbao/content/2001/content_61225.htm).
20. The Ministry of Housing and Urban-Rural Development and the National Development and Reform Commission, "The 13th Five-Year Plan for National Urban Infrastructure Planning and Construction was Promulgated and Implemented," The State Council of the People's Republic of China, last modified May 26, 2017, [https://www.gov.cn/xinwen/2017-05/26/content\\_5197086.htm](https://www.gov.cn/xinwen/2017-05/26/content_5197086.htm).
21. Ian L. McHarg, *Design With Nature* (New York: John Wiley & Sons Inc., 1969). 127–152.
22. Julius Gy. Fábos, "Greenway planning in the United States:its origins and recent case studies," *Landscape and Urban Planning* 68, no. 1-3 (May 2004):332, <https://doi.org/10.1016/j.landurbplan.2003.07.003>
23. Ashley Conine et al., "Planning for Multi-Purpose Greenways in Concord, North Carolina," *Landscape and Urban Planning* 68, no. 2-3 (May 2004): 271, [https://doi.org/10.1016/S0169-2046\(03\)00159-2](https://doi.org/10.1016/S0169-2046(03)00159-2).
24. Rong Zhuang, "Pearl Delta Regional Greenway Planning Based on Ecological Concept," *Planners* 27, no. 9 (August 2011): 44, <https://doi.org/10.3969/j.issn.1006-0022.2011.09.008>.
25. Kong-Jian Yu, "Landscape Ecological Security Patterns in Biological Conservation," *Acta Ecologica Sinica*, no. 1 (January 1999): 8, <https://doi.org/10.3321/j.issn:1000-0933.1999.01.002>.
26. Jian-Shuang Hu and Fei Dai, "Study on the Urban Greenways Planning Methods in China," *Chinese Landscape Architecture* 29, no. 4 (April 2013): 116.
27. Fang-Zheng Li, Wan-Yi Li, and Xiong Li, "Research on Urban Greenway Planning Based on Big Data of Bus Smart Card," *Urban Study* 22, no. 8 (August 2015): 27, <https://doi.org/10.3969/j.issn.1006-3862.2015.08.005>.
28. Cong-Hui Zhou, "Layout Planning Method of Greenways in Central Urban Area Based on Route Selection Potential Quantitative Evaluation," *Chinese Landscape Architecture* 32, no. 10 (October 2016):104.
29. Xi-Xi Chen and Liang Li, "Study on Urban Bicycle Greenway Planning Based on Big Data Analysis of Shared Bicycle," *Chinese Landscape Architecture* 35, no. 6 (June 2019):109, <https://doi.org/10.19775/j.cla.2019.06.0109>.
30. Fei Dai et al., "Route Selection of Greenway in Hanyang District of Wuhan Based on POI Point Data," *China Urban Forestry* 18, no. 6 (December 2020):26, <https://doi.org/10.12169/zgcsly.2019.05.23.0001>.
31. Charles E. Little, *Greenways for America* (Baltimore: Johns Hopkins University Press, 1990).7.
32. Fábos, J.G., "Introduction and overview: the greenway movement, uses and potentials of greenways," *Landscape Urban Plann.* (October 1995). 33 (1-3), 3.
33. William Miller et al., "An Approach for Greenway Suitability Analysis," *Landscape and Urban Planning* 42, no. 2-4 (December 1998):92, [https://doi.org/10.1016/S0169-2046\(98\)00080-2](https://doi.org/10.1016/S0169-2046(98)00080-2).
34. Kongjian Yu, Dihua Li, Luomeng Chao, "Ten landscape strategies for the construction of urban ecological infrastructure," *Planners*, no.17(December 2001)12.
35. Alessandro Toccolini, Natalia Fumagalli, and Giulio Senes, "Greenways planning in Italy: the Lambro

- River Valley Greenways System,” *Landscape and Urban Planning* 76, no. 1–4 (April 2006):98, <https://doi.org/10.1016/j.landurbplan.2004.09.038>.
36. Min Wang, Jian-Ling Jia, and Jun-Lei Zhang, “Greenway Site Selection in Haicang District of Xiamen Based on Suitability Assessment,” *Huazhong Architecture* 33, no. 10 (November 2015): 83, <https://doi.org/10.3969/j.issn.1003-739X.2015.10.020>.
37. Kun Luo, “Greenway Planning and Construction Strategy in Metropolitan Areas--Take Xuhui Greenway in Shanghai as an Example,” *Urban Planning Forum*, no. 3 (August 2018): 77–85, <https://doi.org/10.16361/j.upf.201803009>.
38. “General Planning Outline of the Pearl River Delta Greenway Network,” Guangdong Institute of Urban and Rural Planning and Design, last modified December 31, 2010, [https://www.gdupi.com/Project/detail/goods\\_id/269.html](https://www.gdupi.com/Project/detail/goods_id/269.html).
39. Shenzhen Urban Management and Comprehensive Law Enforcement Bureau, “Shenzhen Greenway Network Special Plan (2021-2035),” Shenzhen Municipal People’s Government, last modified May 30, 2022, <http://cgj.sz.gov.cn/attachment/0/980/980209/9835577.pdf?eqid=9bfc037001039e600000006643b601a>.
40. “Shenzhen Greenway Management Measures,” Shenzhen Municipal People’s Government, last modified June 4, 2012, <http://cgj.sz.gov.cn/attachment/1/1096/1096302/2076387.pdf>.
41. Shenzhen Urban Management and Comprehensive Law Enforcement Bureau, “Shenzhen Greenway Network Special Plan (2021-2035),” “The construction of the Beijing Greenway is advancing in a solid and orderly manner,” Beijing Municipal Commission of Development and Reform, last modified March 30, 2017, [https://fgw.beijing.gov.cn/fgwzgwkg/zcjd/201912/t20191226\\_1505418.htm](https://fgw.beijing.gov.cn/fgwzgwkg/zcjd/201912/t20191226_1505418.htm).
42. Jun-wen Bai et al., “A Spatial Analysis Approach for Evaluating the Service Capability of Urban Greenways—A Case Study in Wuhan,” *ISPRS International Journal of Geo-Information* 6, no. 7 (July 2017): 208, <https://doi.org/10.3390/ijgi6070208>.
43. Jun-Yu Wu, “Post Occupancy Evaluation(POE) on the Zengcheng Greenway System in Guangdong Province,” *Chinese Landscape Architecture* 27, no. 4 (April 2011):39, <https://doi.org/10.3969/j.issn.1000-6664.2011.04.010>.
44. Fei-Hong Lu, Hai-Wei Yin, and Fan-Hua Kong, “The Using Characteristics and Satisfaction of Urban Greenway—A Case Study of the Purple Mountain Greenway in Nanjing,” *Chinese Landscape Architecture* 31, no. 9 (September 2015):50, <https://doi.org/10.3969/j.issn.1000-6664.2015.09.012>.
45. Hai-Ye Zhang, “Greenway Optimization Strategy based on Post-Occupancy Evaluation and Persona Analysis,” *Transportation and Shipping* 6, no. 4 (August 2019):86, <https://doi.org/10.3969/j.issn.1001-599X.2019.04.015>.

