



Research on the co-governance of shared bicycles: taking Shenzhen's legislative consultation as an example

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ABSTRACT

The shared bicycles, which spread diffusely, has become an important part of urban public transportation system. Benefiting from the shared-economy and growth of Internet, the shared bicycles makes up for the shortcomings of traditional public transportation and facilitates urban residents. However, it could not be avoided that a lot of problems such as disorderly expansion and competition, waste of resources, traffic safety, and deposit risks occur posing problems and challenges for urban governance in many cities, including Shenzhen. The shared bicycles is both public and market-oriented, which means if there is no long-term and sustainable standard, it will not be able to fundamentally solve the dilemmas and problems the shared bicycles met. For this situation, Shenzhen has chosen to promote the collaborative governance through legislation. The law establishes the government's authority and responsibility as the main character of governance in regulating the management of shared bicycles, urging the shared bicycles enterprises transform their development strategy to focus more on service optimization and technology innovation. Only by creating a governance model of construction, co-governance and sharing, can shared bicycles get out of or transcend the predicament, develop into a normal means of transportation in the urban transportation system.

1. Introduction

Shared bicycles have carried the hallmark of the sharing economy since their inception. They have driven the reform of bicycle transportation supply through the utilization of the Internet and big data, offering a fresh, green solution for urban transportation infrastructure and residents' mobility. This, in turn, has paved the way for the development of a green and low-carbon economy. While major cities in China have essentially achieved full coverage of rail transit and buses, providing a convenient transportation system, the problem of incomplete coverage in certain areas poses a hindrance to urban residents, a critical challenge for building sustainable green cities and promoting low-carbon urban environments. Shared bicycles address this issue by offering services in densely populated areas with relatively complex traffic situations, thereby expanding the coverage area of public transportation to some extent. They provide a new direction for completing the "puzzle" of the transportation system and promoting eco-friendly travel for city dwellers. Shenzhen, as a major market for shared bicycles in China, has seen significant growth. According to statistics from the Shenzhen Municipal Transportation Bureau as of March 2022, there were over 29 million registered shared bicycle users in Shenzhen, with a daily usage exceeding 1.3 million people.

However, the rapid development of shared bicycles has also presented challenges for urban space management, traffic regulation, and industry development in Shenzhen. To ensure that shared bicycles can

thrive and continue to serve the city's residents sustainably, it is crucial to conduct in-depth research on the obstacles encountered during their development and the multiple challenges they pose to urban governance.

2. Literature Review

Currently, there is a wealth of research in China regarding the use of collaborative governance to address the issues related to shared bicycles. Various scholars have presented their viewpoints from different perspectives on the roles different stakeholders play in collaborative governance.

Sun Jin and Yuan Ye suggest that the government should set regulatory boundaries for the development and competition of shared bicycle companies, with a focus on strengthening fair competition review.[1]

Chen Shuquan and Wang Kaiyuan propose that legislation should be introduced to fill the regulatory gaps in the management of shared bicycles. [2]This legislation would provide a legal basis and fundamental support for the operation and management of shared bicycles. Shen Guoqi and Zhang Keke recommend that shared bicycle operators establish a user integrity mechanism to enhance product quality.[3]

Gao Xihan argues that companies should develop strategic plans and use innovative management techniques to address the chaotic competition in the market. Qin Jianguo and others suggest the cultivation of user group awareness to create a self-governing community. [4]This includes helping users develop internal incentives, ensuring mutual supervision by opening up information channels, and achieving autonomous governance of shared bicycles. [5]

Xiao Qian, Lin Kongtuan, and others propose that, in addition to government regulation, there should be efforts to educate users about proper bicycle usage. Shared bicycle companies should establish a user credit system and reduce the costs associated with responsible bicycle usage.[6]

This article, after summarizing the development of shared bicycles in major Chinese cities, examines the multiple challenges and their underlying causes that shared bicycles have faced during their development in Shenzhen. It also analyzes Shenzhen's approach to collaborative governance, as reflected in the legislation enacted in 2021, the first of its kind in the country, known as the "Shenzhen Economic Zone Internet Rental Bicycle Management Regulations." This legislation uses a collaborative governance approach, involving multiple stakeholders in the process, to shape a shared bicycle co-construction and co-governance model.

3.The development of the bike-sharing industry

The concept of sharing, in conjunction with the rise of "Internet+" and the push for "green and low-carbon" initiatives, has rapidly expanded and permeated various industries. Bicycles, as one of the primary means of short-distance transportation for residents in China, due to their extensive presence, garnered significant attention when the concept of "sharing" was integrated with them. Consequently, numerous companies emerged in the shared bicycle industry, and although it initially received substantial social acceptance and recognition, many issues began to accumulate and spread as soon as shared bicycles entered urban areas. While the "development hides a multitude of flaws," temporarily masking these problems, they began to surface as the number of shared bicycles continued to grow, along with the user base. The development of the domestic shared bicycle industry can be broadly divided into stages: the parallel phase of problem accumulation and bike deployment growth, the contradictory phase of problem emergence and sustained development, and the phase of government regulation and guidance.

3.1 Rapid Deployment and the accumulation of issues

The rapid growth of the sharing economy has made the public realize that although shared bicycles are a relatively new concept, their high acceptability and cost-effectiveness have led to explosive growth in user registration and usage as these bicycles are deployed. Simultaneously, the pursuit of scale expansion for greater benefits by shared bicycle companies, coupled with the increasing demand from residents, has driven these companies to adopt even "panic-inducing" deployment strategies to capture the market, resulting in a rapid increase in the number of shared bicycles in cities. Each shared bicycle company has chosen its own competitive strategy and primary target areas. Mobike, for example, has focused on utilizing smart technology to enhance the riding experience. [7] On the other hand, Ofo has emphasized large-scale deployment to increase convenience. Ofo expanded its shared bicycles to major cities, while Mobike focused on the Beijing, Shanghai, and Guangzhou markets. Youon Bike primarily deployed its bicycles in the Yangtze River Delta and Pearl River Delta regions, while xiao-ming bicycles operated primarily in the Shanghai area. As of the end of 2016, the total number of shared bicycle users in China had reached nearly 20 million. In Shenzhen, there were seven companies deploying internet bicycles, with over ten million registered users, more than 500,000 deployed bicycles, and an average daily turnover rate of 5.4 times per bicycle. [8]

Upon the entry of shared bicycles into urban environments, various governance issues have continued to accumulate. Initially, users would park these bicycles haphazardly, causing blockages in urban spaces and provoking dissatisfaction among citizens and public opinion. Subsequently, some shared bicycles were subject to vandalism, unauthorized use, and damage by certain users. This led to an increasing number of shared bicycles being abandoned and left to deteriorate due to a lack of timely recovery and repairs, ultimately turning them into "urban litter." This not only inconvenienced users but also resulted in significant losses for the companies operating the bicycles. Furthermore, the timeliness and fairness of deposit and refund arrangements by some shared bicycle companies soon garnered widespread social attention. Even amidst the public discourse and controversies surrounding these issues, shared bicycle companies, without fully addressing these problems, continued to adopt aggressive market expansion strategies, continually increasing the scale of bicycle deployment and user acquisition.

3.2 The conflicting between emergence of shared bicycles and sustained development

As both the number of shared bicycle companies and the volume of deployed bicycles continued to increase, preexisting issues remained unresolved and were increasingly pronounced. Some shared bicycle companies lacked long-term planning and crisis management capabilities, and their capital backers were unable to provide sufficient support. Faced with the compounding challenges, some companies opted to transform their business models or exit the market altogether. Many cities, including Beijing, Shanghai, and Shenzhen, recognized that the excessive expansion of shared bicycles was causing various governance problems. To mitigate the negative impacts of shared bicycle development on their cities, these cities began to limit the number of shared bicycles through special enforcement actions and similar measures. In September 2017, the Shenzhen Municipal Transportation Commission issued the "Implementation Plan for Standardized Management and Rectification of Internet Rental Bicycles in Shenzhen." This plan called for a suspension of additional bicycle deployments in public urban spaces during the period of regulation and rectification. [9] It also required that improperly parked bicycles be handled through a unified platform. Violations involving bicycles parked in public areas without timely removal could result in fines and vehicle confiscation for the companies responsible. Furthermore, within just a year after two major rounds of substantial financing, Little Yellow Bike (Xiao Ming), which had accumulated over 4 million registered users

and collected over 800 million yuan in deposits, faced bankruptcy and legal actions. It became the first shared bicycle company in the nation to declare bankruptcy. [10] Meanwhile, the industry giants Ofo and Mobike also confronted significant challenges in their continued development. In December 2018, Ofo faced a financial crisis, involving several billion yuan. The inability to refund user deposits sparked a major controversy. Some media outlets obtained Ofo's balance sheet from around six months prior, which showed debts exceeding 6 billion yuan, with user deposits exceeding 3.5 billion yuan. Mobike, despite being acquired by Meituan and receiving new capital injection, maintained its fundamental business strategy and continued to experience losses. [11] Shared bicycle companies facing significant developmental crises attempted to salvage their operations by adjusting business strategies, dealing with the aftermath, or choosing to exit or transition. However, those that continued to operate shared bicycles still lacked new business strategies and remained trapped in the cycle of "fundraising—deploying more bicycles—capturing more customers—expanding fundraising." They had not yet found a sustainable and profitable development path that could coexist with urban order.

Although shared bicycles fundamentally entail a rental process and establish contractual relationships based on the rental of a vehicle, the rental procedure for shared bicycles is more straightforward, cost-effective, and convenient compared to renting traditional modes of transportation. It offers a short-distance transportation solution that targets the "pain points" of many residents, which has garnered significant user recognition. The low barriers to usage and convenient conditions have attracted a massive user base. User demand, grounded in practicality, has provided continuous impetus for the expansion of shared bicycles. This has also driven companies to compete with a "quantity-first" approach, to some extent, overlooking the issues and risks that accumulated during development. Shared bicycle companies have persistently sought to expand their coverage, intending to survive by covering up problems, and this approach has led to the exacerbation of issues rather than their resolution. As shared bicycles continued to grow, these problems spread and eventually led to a critical point where the development of shared bicycles faced significant challenges and entered a vortex of controversy.

3.3 The government's regulatory and guidance

The development of the shared bicycle industry has not only profoundly altered the urban transportation landscape but has also attracted significant capital investment, driven by profit motives. Under the influence of capital-driven growth, shared bicycle companies often overlooked the optimization of bicycle management and development strategies. This led to the accumulation of challenges related to deposit collection and refunds, space occupation, and other issues. The negative consequences of these challenges directly impacted urban transportation governance and the maintenance of social order, gradually distancing the shared bicycle industry from its original goal of optimizing urban transportation. The shared bicycle industry opened up a new realm of development, and local government regulations for urban transportation were not prepared to address this emerging sector. Therefore, the management of shared bicycles became an unavoidable and pressing issue that governments needed to address.

The shared bicycle industry, from its inception and rapid expansion to the challenges it faced, demonstrates that a nascent sector cannot achieve sustainable development solely through self-regulation and industry self-norms. Local governments, as the leaders of governance, must not only play the role of managers but also create a favorable market regulatory environment. They should continuously adjust their strategies in managing the industry while providing moderate guidance for its development based on the interests of the city and the maintenance of social order. Taking Shenzhen as an example, the government's approach to regulating and guiding the shared bicycle industry is characterized by a top-down and rapid re-

sponse. On one hand, the government can promptly issue targeted governance policies. On the other hand, management practices are gradually moving towards "baseline thinking," emphasizing guidance for the development of shared bicycle companies without excessive direct administrative intervention. For instance, in February 2017, Shenzhen's traffic police bureau, education bureau, and other entities jointly issued a "Joint Statement on Regulating the Use of Shared Bicycles by Minors." This statement targeted shared bicycle companies and their user information screening processes, prohibiting the use of shared bicycles by children under 12 years of age. In September of the same year, the Shenzhen municipal government issued the "Implementation Plan for the Standardized Management and Rectification of Internet Rental Bicycles in Shenzhen," requiring strict rectification of shared bicycles within six months. This plan covered areas such as the scale of shared bicycles and the establishment of new parking areas. If shared bicycles were improperly parked and not promptly addressed, companies would face fines and the confiscation of their shared bicycles. Subsequently, Shenzhen continued to optimize its approach to shared bicycle management. After thoroughly considering input from relevant companies, the public, and experts, the city transitioned from action-oriented governance to normative governance. In 2019, Shenzhen introduced interim measures and standards for the management of internet rental bicycles, specifying detailed infrastructure and technical requirements for deploying bicycles and setting service standards for shared bicycle companies. These measures also defined the scope of government management and responsibility relationships across different government levels and departments.

4.The multiple challenges in shared bicycle governance in Shenzhen

Shenzhen, as a large and densely populated metropolis, faces a multitude of challenges in governing shared bicycles. These challenges primarily revolve around three key areas.

4.1 The competition for spatial usage rights in the shared bicycle

The spatial usage rights in the shared bicycle industry can be broadly categorized into two main aspects: the right-of-way required for riding on roads and the right to park shared bicycles in urban public spaces. The right-of-way pertains to the specific space and time allocated for traffic participants, including motor vehicles, pedestrians, and bicycles, to conduct transportation activities on roads. In the context of urban traffic, this right-of-way is defined by traffic regulations and pertains to the space and time allocated for various traffic participants to operate on roads. [12]Over the past few decades, urban development in China has seen a significant increase in the number of motor vehicles, which has gradually led to the erosion of dedicated cycling lanes. For instance, in the case of Shenzhen, during its early development, bicycles had relatively well-defined rights-of-way. However, as the city rapidly expanded and the number of motor vehicles surged, bicycles lost their dedicated rights-of-way, and motor vehicles established dominance in terms of road usage rights. The increasing popularity of shared bicycles has resulted in debates and disputes over the redistribution of road usage rights. The question of whether bicycles can reclaim a significant share of existing road usage rights has become a crucial factor in determining the growth of shared bicycles. In densely populated metropolises like Shenzhen, where road and land resources are extremely scarce, resolving conflicts related to the allocation of road usage rights presents a challenging issue for the government, which serves as the road administrator. [13]The competition for road usage rights is a fundamental issue that directly impacts the successful integration of shared bicycles into urban transportation systems and requires careful consideration and resolution.

Since the inception of shared bicycles, their inherent public transportation value and innovation have been acknowledged by both the government and society. However, during the rapid expansion of shared bicycles, the issue of parking rights was sometimes neglected. The government relied solely on voluntary actions by shared bicycle companies to establish parking zones and urged users to park their bicycles in a regulated manner through recommendations. Shenzhen, as a densely populated metropolis with a complex transportation system, relies heavily on public transportation for most of its residents. Shared bicycles conveniently cover short distances between transportation hubs, residential areas, and workplaces, providing a convenient mode of mobility. However, during rush hours, many shared bicycles are haphazardly parked around subway and bus stations, occupying limited space with a large number of bicycles. Furthermore, due to the uneven distribution of shared bicycles and user density, shared bicycles often experience temporal clustering and dispersion in densely populated areas. Users sometimes lack a sense of public ethics, resulting in the disorderly parking of shared bicycles and impacting urban order. Two main issues contribute to the problem.

First, Lack of User Awareness and Public Ethics: Many users, in their pursuit of convenience and time savings, often park shared bicycles arbitrarily, contributing to urban disorder. The low cost of punishing those who damage shared bicycles has led to phenomena such as vandalizing shared bicycles with paint or modifying their components for personal use, turning shared bicycle resources into a "tragedy of the commons."

Second, Failure to Implement Electronic Fencing: Despite government encouragement to shared bicycle companies to use GPS to designate permitted and prohibited parking areas and set up electronic fences to regulate bicycle parking, many companies have not fully implemented these measures. This reluctance is due to various factors. Firstly, relying on user self-awareness is nearly impossible. Therefore, enforcing electronic fence parking rules must be associated with punitive measures. This implies that companies need to define boundaries for user behavior, and the severity of these punitive measures can influence user willingness to continue using the service, potentially leading to customer attrition. Secondly, setting up electronic fences introduces a new layer of competition. From a profitability standpoint, parking space represents profit potential for shared bicycle companies, and each company will strive to secure space through various means, which could create additional negative impacts.

The parking rights conundrum in Shenzhen's shared bicycle ecosystem reflects a complex interplay of user behavior, market competition, and the need for effective governance to maintain urban order and facilitate the continued growth of shared bicycles.

4.2 The lack of long-term and unified regulatory standards

The economic nature of shared bicycles underscores their highly market-oriented characteristics. Yet, it also carries an implicit implication that government regulation, as the "visible hand," must intervene to ensure the proper development of the bike-sharing industry. Without such intervention, there is a risk of capital expansion and investment becoming chaotic, ultimately undermining the effective functioning of bike-sharing systems. In recognition of this, in 2017, the Ministry of Transport and other relevant authorities issued guiding opinions requiring internet-based bicycle rental companies to enhance awareness among their staff responsible for bicycle parking management. This involved the implementation of measures such as monitoring credit records to effectively regulate user parking behavior. While these recommendations were well-timed and aimed at addressing the issues arising from the rapid growth of bike-sharing, the actual governance challenges are far from simple. Each city presents unique disparities in terms of geographic areas, bike-sharing operators, and user demographics. As a result, the guidance provided may not

effectively resolve the root problems. In the case of Shenzhen, shortly after the issuance of the "guiding opinions," the city quickly released specific guidelines for curbside bike parking. However, these measures fell short of fundamentally resolving the issue of disorderly bike parking within the city. On one hand, due to the limited scope of the documents, the lack of comprehensive management directives from the government left room for uncertainty and negotiation between businesses and the authorities, giving rise to deeper governance challenges. This complexity makes the governance process significantly intricate. Furthermore, even as the responsibilities of government departments have become more defined, the existing administrative system in China, characterized by multi-agency cross-management, often leads to blurred responsibility boundaries, a culture of shifting responsibility, and low efficiency in executing actions. These challenges have undoubtedly exacerbated the complexities of comprehensive governance for bike-sharing. In the case of Shenzhen, despite the issuance of several targeted documents aimed at addressing the challenges faced by the city's bike-sharing sector, a lack of unified management standards and clear directives among different departments remains a notable issue. Various agencies, including the Transportation Commission, Municipal Urban Management, and Municipal Traffic Police, have all played roles in the regulatory framework, creating a somewhat fragmented approach. For instance, the planning and construction of urban bicycle transportation networks and the provision of guidance for bike parking facilities have been under the purview of different departments. [14] In contrast, the direct regulation of bike parking requires collaboration among the Municipal Traffic Police, the Municipal Urban Management Department, and local neighborhood offices.

Bike-sharing companies not only function as industry operators but also hold vast reservoirs of data. They have access to information such as the number of registered users, user activity, fleet size, distribution patterns, deployment strategies, maintenance standards, technology deployment plans, and user reward and penalty rules. Recognizing the importance of governing the behavior of these companies, governments have sought to establish regulations that compel bike-sharing companies to assume the role of key stakeholders in managing vehicle parking and maintenance. However, the bike-sharing industry is relatively new, and both companies and regulators are still in the process of navigating uncharted waters. This lack of mature experience and empirical data can make it challenging for the industry and government to formulate scientifically grounded regulations and standards for specific technologies, thereby undermining the rationality and scientific basis of industry norms.

4.3 The conflict between the public nature and market orientation of bike-sharing services

The development of the bike-sharing industry exhibits a dual nature. As part of the transportation system, it offers a high degree of accessibility, making it a form of public transport. In this sense, bike-sharing services possess a public character, and bike-sharing companies can be seen as providers of public services. One of the key characteristics of public bike-sharing systems is their strong public welfare aspect, often operating as a nonprofit endeavor with a significant one-way cost incurred by the government. These systems are marked by limited capital reinvestment and recycling. While some areas, including parts of Shenzhen, have attempted to introduce market-oriented operation to public bike-sharing, they still carry a substantial public welfare aspect, necessitating long-term and sustained financial support to maintain system operation. [15] Traditional city public bike-sharing systems entail various expenses, including vehicle selection and deployment, infrastructure construction, vehicle maintenance, recovery, and replenishment, all of which are covered by the government. This approach represents a means by which the government executes its social functions. However, in the case of bike-sharing, it operates as a profit-generating tool provided by private enterprises. In the bike-sharing industry, the market takes precedence over the government

as the main operator, delivering both bicycles and services. Bike-sharing systems emphasize operational efficiency and have a high degree of market orientation, operating as profit-driven tools for businesses. They aim to generate revenue by quickly establishing leasing relationships with users and prioritize cost recovery and financial returns on the initial investment. This approach offers significant operational flexibility compared to traditional public bike-sharing systems.

From this perspective, an inevitable conflict arises between profitability and the common good. Enterprises, in order to sustain the operation of bike-sharing services, inevitably seek to maximize their returns.

[16] However, bike-sharing services, as a form of social public service, must consider the balance between profit and the common good. Firstly, bike-sharing, while operated by private enterprises, still relies on public resources, making it unrealistic to be completely detached from the public sphere. In essence, bike-sharing services generate revenue by utilizing public spaces. While these services contribute to the improvement of urban transportation, the profit-maximizing nature of bike-sharing companies means that they cannot independently and thoroughly resolve the various public issues arising from bike-sharing. These problems remain unresolved and recurrent, leading to the inefficient waste of public resources and increased urban governance costs. Secondly, the unregulated expansion driven by "land-grabbing" and "user acquisition" practices by bike-sharing companies. The number of users and the land area occupied by each station are the foundation for the expansion of bike-sharing companies. To ensure stable flow and income, many companies opt for early "expansion" based on quantity rather than actual demand. According to a report by the Shenzhen Municipal Transportation Commission, Shenzhen witnessed a surge in the number of bike-sharing bicycles from over 400,000 to nearly 800,000 between 2016 and 2018. [17]

Moreover, due to the flexibility of business operations and competitive needs, companies hold certain proprietary information that cannot be disclosed in a timely manner, resulting in information asymmetry in society. This leads to a lag in the oversight role of politics and society, resulting in market failure and strong negative externalities. Thirdly, conflicts arise from the misalignment of interests among bike-sharing companies, the government, and users. Bike-sharing companies are concerned with maintaining revenue levels. They must weigh the impact on profit maximization when formulating penalty mechanisms for violators and recovering damaged bicycles. This lack of enthusiasm on the part of companies to actively implement stricter bicycle management measures can be attributed to this consideration. [18] The government, as the main body of urban governance and manager of social resources, seeks to improve governance efficiency and reduce governance costs. It requires companies to cooperate in assuming corresponding social responsibilities to prevent the wanton waste of social resources, thereby indirectly increasing the operating burden and expenses of businesses. Users, driven by personal interests and the convenience of use, often find it difficult to fully adhere to various parking management rules.

5. A Collaborative Governance model for Bike Sharing

The bike-sharing industry combines the openness of the sharing economy with the convenience of the internet. It is provided by market-oriented private enterprises and offers a public service. Traditional approaches of either "restrictive" or "laissez-faire" governance, where issues are addressed in a piece-meal fashion, are not conducive to the healthy development of the industry. Therefore, legislation is necessary to establish a sustainable and uniform set of management standards. The governance of bike-sharing is a multi-stakeholder collaborative process. Collaborative governance emphasizes the voluntary, equal, and cooperative participation of all stakeholders. This is essential due to the complexity, dynamics, and diversity inherent in the social system. In the process of promoting legislative governance of bike-sharing, it is essential to prioritize collaborative governance. Leveraging the unique function of collaborative legislation, it

allows the government, enterprises, citizens, and other stakeholders to engage in discussions. This ensures the clarification of responsibilities for all parties involved, enabling legislation to strike a balance among the various interests and gain broader acceptance. It becomes the "greatest common denominator" for bike-sharing governance. The concept of legislative negotiation is both universal and distinctive. Through negotiation, consultation, and argumentation, it facilitates constructive interactions among the nation, the ruling party, and various segments of society. [19] This connects the realm of public discourse with the institutionalized legislative process, allowing the opinions of various segments of society to exert a substantial influence on legislative decisions. As a result, it expands the depth and breadth of democracy. In the process of promoting legislative negotiation, the government, as the principal entity responsible for urban governance and social resources, plays an irreplaceable role in establishing the rules of conduct for members of society. It guides other stakeholders to collectively achieve management objectives. [20] However, this does not imply that other stakeholders are superfluous or incapable of contributing to governance. On the contrary, given the critical importance of "negotiation," if undue focus is placed on a particular stakeholder's role while neglecting the participation of others and obscuring their responsibilities, the process of governance, even with legislation in place, will be fraught with challenges.

5.1 The legislative negotiations led by governing bodies

In Shenzhen, since the inception of the bike-sharing industry in the city, various management measures have been introduced at different times to address specific issues. While these measures have proven effective in the short term and provided timely solutions to certain problems, they have been lacking a more robust and sustainable set of management standards. This changed in 2021 with the introduction of the "Regulations on the Management of Internet Rental Bicycles in the Shenzhen Special Economic Zone," which took the form of legislation and played a pivotal role in guiding the collaborative governance of bike-sharing. From the perspective of the period before and after the enactment of this legislation, the government, as the primary governing entity, demonstrated proactive leadership. Taking legislative negotiation as an opportunity, the government guided bike-sharing companies to standardize their operations. The government assisted these companies in reshaping public trust as a core objective in their industry development. This entailed integrating the diverse social resources controlled by different stakeholders to enhance the effectiveness of social governance and create a legal basis for governance. This proactive guidance from the government can be primarily observed in the following three areas.

Firstly, it is essential to engage in multi-party negotiations. The term "multi-party" primarily signifies the richness of negotiation levels and the diversity of the system. In contrast to the "directed consultation" employed in the formulation and execution of laws and regulations, "multi-party negotiations" emphasize the involvement of multiple stakeholders at different levels. To effectively address the multifaceted issues arising from the development of bike-sharing, the government cannot simply rely on a command-and-control approach. Instead, it should adopt a service-oriented mindset and work towards issue resolution by creating platforms, enhancing institutional frameworks, strengthening oversight, and providing information. Through collaboration with market entities and social forces, the government can engage in institutional, financial, and information provision, allowing various stakeholders to participate in collaborative governance. The growth of the bike-sharing industry presents novel governance challenges, necessitating the introduction of new laws and regulations to address existing gaps and optimize governance efficiency. At this juncture, multi-party legislative negotiations become a crucial opportunity for consensus building. The government's involvement in legislative negotiations within the political consultative conference aids in strengthening connections between its members, market entities, and the general public. This process ena-

bles the authentic and objective collection of relevant opinions, facilitating the fulfillment of its duties. It also harnesses the strengths of political consultative conference members and democratic parties in political consultation and participation in governance. These efforts revolve around the challenges presented by bike-sharing policies, using legislation as a foundation and governance effectiveness as the goal, and involve the receipt of valuable decision-making advice and recommendations.

Secondly, it's important to establish standardized management. As urban populations continue to grow and approach saturation, the number of shared bicycles should not be unlimited. It needs to be maintained at a reasonable proportion to the city's population. Since the introduction of bike-sharing in Shenzhen, many bike-sharing companies have employed strategies like the "bicycle flood" and "territorial expansion" to expand their market presence. This has often led to an increasing ratio of bikes to residents, which places added strain on the city's transportation system, adversely affecting the daily commutes of its citizens. Through various targeted governance efforts, the Shenzhen government recognized the need for legal mechanisms to regulate the volume of shared bikes and to determine a total supply that better aligns with the city's needs. Building on the foundation of legislation, starting from 2017, Shenzhen has engaged in discussions and collaborative actions with bike-sharing companies to establish dynamic deployment ratios for shared bikes in different areas, addressing the problem of excessive concentration of bikes in specific times and locations. This effort seeks to rectify issues like shared bikes occupying pedestrian paths and motor vehicle lanes, creating new traffic congestion "black spots," and the phenomenon of excessive bike accumulation in specific areas.

Thirdly, there's a need to enhance urban transportation planning to protect the "road rights" of shared bicycles. Disputes over the right of way for shared bicycles have been long-standing in Shenzhen. As the governing authority, Shenzhen's relevant departments, prior to pushing for legislation, invited various stakeholders, including companies, residents, and community organizations, to participate in the governance process through negotiated discussions. This gradually shifted the previous focus on prioritizing motor vehicles in road allocation, improving the travel conditions for shared bicycles, and laying the groundwork for legal justification for "road rights." Starting from a collaborative governance approach, the legislative push officially affirms the status of shared bicycles, further integrating them into the city's public transportation system. With the introduction of legislation, shared bicycles are considered in the planning and development of transportation infrastructure and roads. Beyond 2022, the Shenzhen government, as a means of keeping the legal framework up-to-date, continues to engage in negotiations with various stakeholders to update regulations governing bicycle use and corresponding penalties, thereby providing legal protection for shared bicycle users. Simultaneously, this ensures the standardization of shared bicycle usage behaviors and enhances their integration with other public transportation modes.

5.2 Driving the repositioning of businesses for development logic

Shared bicycle companies must establish a solid operational logic as the foundation for long-term success in urban environments. A reasonable operational logic implies that companies should not only focus on profitability but also take on social responsibilities related to product management and maintenance. Businesses cannot sustainably operate while accumulating debt or constantly shifting resources to cover operational shortcomings. To operate successfully in the long run, they should have the necessary resources to address any negative social consequences their products may produce. Since the inception of the shared bicycle industry, collecting user deposits has been a common method for generating revenue. Relying on deposit fees for profit implies that the business model of shared bicycles is shifting closer to traditional bike rental services. However, considering that many shared bicycle companies have chosen to exit

the bicycle market and diversify their business models, there are significant doubts about whether this approach can sustain businesses in the long term. As the costs of deploying, maintaining, and reclaiming shared bicycles continue to rise, maintaining low usage fees may lead to insufficient revenue for the companies. If price adjustments are too steep, it could deter users, leading to a significant decline in the overall profitability of shared bicycles. Thus, it is important to strike a balance between generating revenue and ensuring user satisfaction. The indiscriminate pursuit of short-term profit can lead to a loss of users and hinder the development of the industry. After experiencing various controversies related to user deposits in the shared bicycle industry, regulatory frameworks were introduced through multi-stakeholder negotiations and legislation to address these issues. The shared bicycle deposit regulations, as outlined in the "Regulations," represent the consensus and spirit of collaboration achieved through these negotiations. They aimed to establish clear rules regarding the collection of user deposits, thus creating a more balanced and fairer environment. These regulations also clarify that user rental fees have become an essential source of profit for shared bicycle companies, shifting their revenue model away from relying solely on deposits.

To achieve rapid growth and reverse operating deficits, shared bicycle companies have historically employed low-cost services and aggressive strategies to amass more customers, such as the "war of bicycles." However, the practice of offering massive subsidies to gain market share and generate profits has been proven to carry significant risks. It leaves companies without the necessary resources for bicycle maintenance, repairs, and regional adjustments. Furthermore, it hinders their ability to promptly address the negative consequences of shared bicycles on traffic order, city appearance, and other aspects of urban life, thereby preventing the effective management of these societal costs. In the process of participating in legislative negotiations, companies must recognize that the demands of other stakeholders should not be overlooked within the framework of collaborative governance. [21] If companies aim to sustain their operations by increasing profitability, they must cooperate with other governance stakeholders, especially while receiving guidance and support from the government, to reshape a sustainable development logic and create new profit models or avenues. From the perspective of assisting companies in redefining their development logic, the government plays a role that combines service and management. Legislative negotiations serve as a crucial means of achieving these objectives. Within the boundaries of applicable laws and regulations, shared bicycle companies can diversify their revenue streams, for example, by heavily developing supplementary income from advertising on top of rental income. This approach can enhance revenue capacity and stability, thus improving the operational capabilities of shared bicycle businesses and fostering sustainability. Collaborative efforts between the government and businesses can lead to the integration of shared bicycles and public bicycles, creating a new model in which the government and companies contribute their strengths, ensuring the long-term success of shared bicycles.

5.3 Facilitating data sharing and technological upgrades

Compared to other cities, Shenzhen stands as a pioneer in the realm of information-based governance. Both businesses and the government possess a wealth of data. Therefore, whether in terms of regulations or laws, each new enactment involves multi-party negotiations before it comes into effect and cannot bypass the application and management of data. Incorporating "negotiation" into legislation provides legal support for the joint construction of a credit mechanism by businesses and the government. This empowers shared bicycle companies to develop rational expansion and deployment plans based on the transportation data and user data provided by the government, preventing excessive deployment that could lead to resource wastage. It also makes it more convenient for users to access information about parking areas and traffic

conditions, thus promoting the proper parking of shared bicycles. It also allows the government to diversify its sources of information by gaining insights from user feedback and adjust public policies accordingly.

Embedding the concept of technology and sharing into management, and enabling the sharing, commonality, and negotiation of data among various stakeholders is a concrete manifestation of the sharing concept in the collaborative governance of shared bicycles. On one hand, in the process of governing shared bicycles, the government and businesses can legally aggregate their data into a unified database, accelerating the efficiency of collaborative governance among various parties. By making full use of the advantages of big data's interconnectivity, a data-sharing bridge is established, creating an environment for communication and fostering mechanisms of mutual trust among the government, businesses, and citizens. This ensures that all parties can take more timely actions using real-time data. On the other hand, data sharing is a crucial prerequisite for the collaborative governance of shared bicycles. To establish a trilateral collaborative governance framework, barriers in information sharing and differences in data acquisition channels must be broken down. This allows the government, businesses, and the public to communicate seamlessly and continuously within the context of information and data collection and sharing.

Moreover, the development of shared bicycle companies integrates the characteristics of Internet big data, including mobile payments, location services, and traffic route predictions. This provides an opportunity for technological innovation, the establishment of a collaborative development system among industry, academia, and research institutions. It allows for innovative approaches to address various aspects of shared bicycle development, promoting the integration and efficient utilization of production factors. For example, in the case of legislation resulting from negotiations, which establishes the responsibilities and obligations of companies, there is an emphasis on increasing data transparency. Through open, common, and shared data, companies collaborate with the government to develop a user credit system. Based on user usage patterns, they can create corresponding riding regulations to curb violations and encourage more meticulous management of shared bicycles. Companies can also improve their real-time tracking technology for shared bicycles, aligning with government traffic planning. They can adjust the number of shared bicycles deployed according to population density and space availability. This helps in redesigning parking areas based on demand, providing clearer usage guidance for citizens, and reducing the costs of urban governance.

6. Conclusions

The shared bicycle industry, from its inception to expansion, and facing development challenges, has now embarked on a strategy for transformation and growth. This journey presents new challenges and opportunities for optimizing and advancing urban governance in the new era. The enrichment and improvement of public services depend on the participation of diverse stakeholders. Under the framework of collaborative governance, it doesn't imply that the government is shifting its regulatory responsibilities to other entities. Instead, it raises the bar for how the government can become a more effective participant, enhancing urban governance efficiency. When dealing with a social commodity like shared bicycles, characterized by the Internet and the sharing economy, it's crucial to approach the issue from the perspective of collaborative governance. Through multi-stakeholder negotiations and full-process participation, legislation can be established that provides a long-term and unified standard. Legislation developed through negotiation gains higher acceptance, adaptability, and flexibility. It allows the government to govern with precision and a legal foundation. Within the collaborative governance framework, multiple stakeholders, including the government, market, and the general public, participate in governance. This approach ensures that shared bicycles become a transportation tool that harmoniously coexists with urban development and

is compatible with the urban transport system. It maximizes social benefits and promotes public transport services towards greater efficiency and rational supply.

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