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Development of the Sharing Economy in China: The Interaction between Bike-Sharing and Urban Governance

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ABSTRACT:"Solving the last three kilometers of travel" is the slogan of the shared bike. The shared bike has already become a profound influence on our daily travel. Compared to Didi Chuxing, a popular online application for booking vehicles with a driver in Mainland China, the presence of shared bike is more remarkable than ever. Nowadays shared bikes have already changed the images and the landscapes of cities and metropolises. There are more and more city dwellers in Guangzhou who choose shared bikes as their favorite means of locomotion. However, there are some shortcomings exposed by the users of these shared bikes, it involves the occurrence of the condemned behaviors in terms of the use of these shared properties. After use, these shared bicycles are, most frequently, deserted elsewhere and poorly parked. The urban planners did not realize and provide adequate parking spaces for shared bikes because they seemed to underestimate the construction of bicycle lanes and parking facilities. As a result, there is a conflict between the companies managing these shared-bikes and urban governance, and these discords are increasingly conspicuous and inevitable. Since it has become a predominant problem for local governance, the service of bike-sharing is not only a challenge for the local authorities, but also indicates an important phenomenon for the global reorganization and diversification of the means of travel in urban areas. Therefore, the main objective of this study is to explore new approaches and strategies to improve this transportation sector. Concerning the method of collecting data, we reviewed numerous noticeable literatures and periodicals, interviewed cyclists and bike-sharing employees in order to reach the hidden facts underlying in the problems of shared-bike service. On the one hand, we attempt to better understand these conflicts and the trend of bike-sharing as well as urban governance system. On the other hand, we would also develop certain speculations and analysis on the establishment of shared bikes based on our assessment of the experience we have acquired and the impacts towards urban governance. This research would also provide substantial suggestions on reducing the unavoidable collision with urban governance caused by shared bikes.

KEYWORDS:*Bike-sharing, Challenges, China, City planning,Urban governance*

I. INTRODUCTION

Bike-sharing, or public bicycle programs (DeMaio, 2009) is referred to the companies that provide shared-bikes service on campuses, subway stations, bus stops, residential areas, commercial areas and public service areas. In fact, it is a mode of renting for a few hours representing at the same time a new shared and ecological economy. Unlike on time parking, shared bikes are more efficient, flexible and convenient, they do not depend on fixed parking, that means shared bikes can be parked anywhere after users finish using them. For users, they only pay some deposit (generally, the deposit is 99 RMB or 299 RMB), either by WeChat, Alipay or any other specific applications on mobile phone, they can then use the shared bikes. When they reach their targeted destination, i.e., finish using the shared bikes, the users usually park them on site and finish the settlement on the spot.

In the 1960s, a Dutchman named LuudSchimmelpennink (2009) proposed ''White Bikes'' plan called «Witte Fietsen». Launched in 1965 in Netherlands, Witte Fietsen is considered as the first shared bikes system in the world. He suggests that residents can paint their bikes white and place them in a public service area or park every Saturday. The bicycles are free of charge and accessible at the service of the population. This is the story of the city's first bike-sharing program. However, the plan soon proved to be unsuccessful, because it costs nothing so basically all the bicycles were lost or damaged in a short time (Metro Bike, 2009).

However, this failure does not indicate directly the failure of the shared bike. Ten years later, a country which situated a hundred kilometers away from Netherlands had become a shining star in the field of shared bike, that was France. In 1976, La Rochelle, a city in France, created for the first time the bike-sharing plan that Amsterdam had not succeeded. At the time, Michel Crépeau, the mayor of La Rochelle, managed to generalize the ''Vélo-Yélo'' to the use of citizens. Today you can still see these little yellow bicycles in this beautiful port city of France. In 1998, Rouen cooperated with Clear Channel, an American advertising company, to launch the first computerized bicycle-sharing system called "bicycle à la carte". The year 2005 was an important year for bike-sharing in France: this year, under the impetus of Mayor Gérard Collomb, Lyon launched the first modern commercial bike: Vélo'v (Henley, 2005). In total, 4000 bikes were installed in Rouen and Villeurbanne and 300 stations were installed. This system was designed and built by JC Decaux, the world's leading outdoor media company, and now it remains as one of the most important and famous bike-sharing systems in France.

Vélib, the public bike rental system in Paris, begun in 2007. Vélib has become the largest self-service public bike rental system globally besides China (Nadal, 2008), with the highest record in the world of 130 million uses per year. Unlike shared bike in China, Vélib needs pilotis to be able to dock. Fortunately, the establishment of numerous intensive bicycle stations and the price concessions have made it convenient and accessible to the citizens of Paris (Faye, 2008).

However, the situation is different in China, the shared bike industry has gone through three stages of development. The first stage was from 2007 to 2010. The foreign model of public bicycle system started to capture the attention of China and the government have orchestrated and managed it in various cities where the public bicycles were mostly stacked bicycles. It was very annoying because the users had to go to a fixed place to mount and store the bicycles. From 2010 to 2014, the second phase, the companies specializing in the bike-sharing market began to appear, but public bicycles users still relied mainly on stacked bicycles. The third phase was from 2014 to 2018 (Sootooinstitute, 2017). With the rapid development of mobile phones and the connection of Internet, the Internet-based shared-bikes industry led by MOBIKE has emerged. The more convenient battery-free bikes have begun to displace the annoying and troublesome stacked bikes (Hou, 2017).

In their study, Zhang, Shaheen and Chen (2013) discussed four major phases referring from Wang (2006)'s opinion in the bicycle evolution in China from initial entry and slow growth (1900s to 1978), to rapid growth (1978 to 1995), bicycle use reduction (1995 to 2002), and policy diversification (2002 to present) as exhibited in Table 1.

Table 1. Four Phases of Bicycle Evolution in China (Sources: China Statistic yearbook (1981 – 2009) (Wang 2006)

Phase One: Initial Entry and Slow Growth (1900 to 1978)
. Bicycle entered China as a luxury good for rich people; . Number of bicycles grew slowly; . Bicycle ownership was 103 bikes/hundred households in Chinese in 1978*; and . Government encouraged bicycle for fuel savings.
Phase Two: Rapid Growth (1978 to 1995)
. The ''economic reformation of China '' in 1978 is the beginning of phase two; . Bicycle was available for low-income families . Number of bicycles increased rapidly due to tremendous economic development; . Bicycle ownership was 197 bikes/hundred households in Chinese cities in 1996*; . Average bicycle modal share in ten selected Chinese cities was 46% in 1980s, and 44% in 1990s*; . Government built bicycle infrastructure (e.g., bicycle paths . Bicycle become the main transport mode for people's daily mobility; and . China was characterized as a "Bicycle Kingdom.''
Phase Three: Bicycle Use Reduction (1995 to 20002)
. The release of *Standard of Urban Road Traffic* by the Central Government in 1993 is the key point separating phases two and three; . Bicycle possession and bicycle modal share decreased quickly; . Bicycle ownership was 143 bikes / hundred households in Chinese cities in the 2002s*; . Average bicycle modal share in ten selected Chinese cities was 35% in the 2000s*; . Bicycle was treated as a source of traffic conflict; . Some local governments developed strategies to discourage bicycle use; . Some cities were identified as "non-bicycle cities", and . Electric bikes emerged as an innovation from the traditional bicycle and spread quickly since 1998.
Phase Four: Attitude and Policies Diversification (2002 to Present)
. The release of the White Paper of Shanghai Urban Transport Development in 2002 marks the beginning of phase four; it defined the bicycle as a complement to publish transportation rather than a competitive mode for the first time;

. Bicycle possession and bicycle modal share continued to decrease;
. Bicycle ownership was 113 bikes/hundred households in Chinese cities in 2008*;
. Bicycle began to be treated as a complement to public transportation rather than a competitive mode (i.e., public bike-sharing);
. Government attitudes towards bicycle diversified;
. Some cities adopted special bicycle plans; and
. Public bike sharing emerged in some cities as a new form of mobility and spread quickly since 2008.

The shared bike concept has begun to develop among the communities in China since 2008 (CityLab, 2017). The new economic model allowed the capitalists to see the added value in their decision to launch the bike-sharing program. In 2016, at least 25 shared bike brands were created, of which MOBIKE (or Meituanbike) and OFO were the main market leaders. However, there are some downturns happened in some companies, for instance, in 2017, Wukong became the first bike-sharing company in China to go bankrupt. Only 2 days later, 3VBIKE became the second bike-sharing company to go bankrupt, its running time was only 4 months. In November 2017, China's third largest shared-bike company, BLUE GO GO, ceased operations and became the first major shared-bike company to go bankrupt in this booming and rather unpredictable industry. At this point, the configuration of shared bikes in China was mainly composed of MOBIKE and OFO, the two giants of shared bikes in China. The share of the two bike-sharing companies in the Chinese market exceeds 90%.

Driven by theory and practice requirements, the purpose of this study is to discuss how to better coordinate and harmonize the development of bike-sharing in Mainland China with urban governance in order to make bike-sharing a service that can elevates the lives of citizens positively. In addition, within the framework of this research, it is reasonable to go beyond the current vision, combine the Chinese economic market situation and the practical experiences of the main users for obtaining an in-depth analysis and a reliable prediction of the shared-bike industry development especially on how the shared bike industry adapts quickly to the governance of different cities, strengthen the operational capacity for an efficient and effective use of this service.

In order to coordinate and collaborate with the urban governance, how should bike-sharing be adapted in China? This research discusses important issues about how to balance the harmonies between three parties such as shared bike industry, the local people and the local authorities while simultaneously reducing the conflicts in the implementation of shared bike service. Furthermore, it also focuses on shared bikes' adaptation to the different policies formulated by the local governments and the influence on the relevant communities.

The main components of the study are organized as follows. After the introduction, the next section analyzes the research methodology. The third section presents the SWOT analysis. The fourth section discusses the challenges of shared bikes. The fifth section discusses the coordination and harmonization between development and governance. The sixth section examines the prediction concerning the situation of the shared bike and urban governance. Finally, the last section concludes our study and certain limitations and future recommendations for inquiry are presented.

II. METHODOLOGY

In order to collect reliable data and develop an impartial and equitable analysis, we apply two main research methods: the field surveys and the document analysis method. With the execution of these two methods, it would enable us to achieve the objectives that had been identified in the study.

2.1 Document Analysis

The document analysis method is the methodology of this study. Given that the research has a limited budget to conduct this bike-sharing project in China, an analysis of documents relevant to bike-sharing companies, their operation and ecology of the bike sharing industry could possibly provide certain revelation about the reality of the industry. The document analysis is more practical and feasible to analyze the strategy of the companies studied in this paper.

Document analysis is one of the qualitative methods that was practiced frequently today by many researchers in various fields of research. According to Australian National University (2009), document analysis is a key competency in historical interpretation. In addition, the literature review is not merely a simple summary or description of what happened, but rather an analysis of the motivation, intent and purpose of a document in a particular historical context. Winget (2005) argues that documents analyzed in qualitative research include all research-related documents, such as interview transcripts, questionnaire-based open-ended questions, journals, and various forms of documentation.

Data collection is highly dependable on what the researchers' question and the aim of their study. Researchers may apply various knowledge from books, journals, essays, newspapers, images, government reports, websites, business reports and other documents that would be considered suitable for the data analysis.

2.2 Field Surveys

According to Statistics Canada (2010), a survey is an organized and methodical data collection activity on characteristics of interest of some or all units of a population using well-defined concepts, methods and procedures. It is followed by a compilation exercise to present the data collected in a useful summary form. The survey assumes that the authors are confronted with a need for information or the data at their disposal are not sufficient for the development of their research.

The conduct of the survey may take several phases, including the definition of objectives, the selection of a sampling frame, the choice of the sampling plan, the design of the questionnaire, data collection and processing, data analysis and dissemination, and documentation of the investigation. Each step plays a key role in the investigation process.

Based on social practices in different bike-sharing companies, we surveyed different bike-sharing users to gather various opinions on the issue of bike-sharing in China. We also conducted interviews with the employees and officials of the bike-sharing companies established mainly in Guangzhou and Shenzhen. The companies are shown in Table 2.

Table 2. Top Shared Bicycles in China and their Companies

LOGO	Enterprise Name	Name of Shared-Bike
mobike 摩拜单车	北京摩拜科技有限公司 Beijing Mobike Technology Co., Ltd.	Mobike (Meituanbike)
ofo小黄车	东峡大通(北京)管理咨询有限公司 Dongxia Chase (Beijing) Management Consulting Co., Ltd.	OFO
Hellobike 哈罗单车	上海钧正网络科技有限公司 Shanghai Jun Zheng Network Technology Co., Ltd.	Hello Bike
youon 永安	常州永安公共自行车系统股份有限公司 Youôn Technology Co., Ltd	永安行 Youôn
U-bicycle 优拜单车	上海轺辂信息技术有限公司 Shanghai Yaolu Information Technology Co., Ltd.	优拜单车 U-bicycle

III. SWOT ANALYSIS

The development of cities always comes with opportunities and challenges. To a certain extent, the development of bicycle-sharing certainly accompanies the development of the city because bicycle-sharing is like a means of urban transportation, they are always linked to conflicts and to the original urban planning.

Understanding the characteristics of bike sharing can help better understand the interplay between bike sharing and urban governance.

3.1 Strengths

3.1.1 Easy to Use at Low Cost

At present, the cost of shared bikes is around 1 Yuan. Bike sharing not only solves the problem of traveling in a short distance but is also more economical compared to walking or taking a taxi (Wu &Xue, 2018). At the same time, compared to the free half-hour public bicycles that the government has introduced, shared bicycles are registered in the mobile app., they are very efficient and convenient (Karki & Tao, 2016).

3.1.2 Traffic Relief and Contribution to Green City Construction

During rush hours or traffic congestion, shared bike may serve as an alternative means of transportation. As the number of shared bike users increases, the cars on the road may gradually decreases, the amount of exhaust emissions would possibly decrease as predicted, air pollution problem can be reduced. This coincides with the national strategy for the development of low-carbon cities (Kayal, Singh, & Kumar, 2014). Moreover, since shared bikes has a relatively small size, they are handy with an easy manageable security system, it is considered as a better auxiliary mode of urban transport to improve urban traffic and combat congestion in urban areas (China Daily, 2014).

3.2 Weaknesses

3.2.1 Simplicity of the Profit Model and Inability to Make a Profit

In general, most of the funds of the bike-sharing companies are mainly coming from early investments (Wang, 2018). The main source of funds of the companies are bonds deposited by the users of shared bikes. When these companies put shared bikes on the market, the bonds finance the project and maintain their operations (Shui & Szeto, 2020). However, the cost of maintaining shared bikes is high, which further hinders the profitability of the businesses.

3.2.2 Rise of Social Problems Creating more Obstacles in the Development of Shared Bikes

The lack of facilities like bicycle parking spaces and the imbalance distribution of the shared bikes are conspicuous problems in urban area. Due to the limitation of the parking space, the bikes are scattered and unorganized in many places. This had caused blockage and some inconvenience in the sidewalk. Another thing is, the shared bikes are unevenly distributed in certain areas. The situation becomes worse when the number of bike-sharing launches is unreasonably high in certain fixed destinations. The companies launch a remarkable bike-sharing at some favorable sites such as metro station entrances and bus stops. The users have no access to the bicycles if they are far away from these mentioned places. Therefore, these problems have caused considerable difficulties for the shared bike users. (Bi, 2017; Shui & Szeto, 2020).

Besides, there is another serious problem. Many users choose to keep the shared bikes by themselves. The shared bikes become their exclusive transport vehicle. Their actions have caused the other users to increase their cost of time to search for a shared bike. In order to secure them, these users even scratch the QR-code and the number tag from the shared-bikes and then put the private locks on the bikes or move them to their living and working areas. Their aim is to keep the shared bikes under their control and prevent others from using them (Albiński, Fontaine, &Minner, 2018). Without a doubt, these behaviors and actions have reduced the opportunities of using shared bikes for other users and have most certainly contradicted the nature and philosophy of 'sharing' the shared bikes.

3.3 Opportunities

3.3.1 Favorable Scientific and Technological Environment

The internet and digital technology have revolutionized a new lifestyle for the public. With the rapid development of wireless network, the popularization of shared bikes gets a wide coverage. The innovation of science and technology has opened up new market opportunities to bike-sharing companies. The emergence of smartphones which can provide practical and efficient online payments has improved people's life experience and lifestyles (Dutzik, Madsen, & Baxandall, 2013). Due to a nation-wide coverage of internet, it is easier to overcome certain technical problems of QR-identification code, anti-theft and positioning in the context of urban traffic modernization. It is faster and more efficient to connect more people with new technologies. New information and communication technologies have made shared bikes more stable than traditional bikes and creating a better experience for users (Hallock & Inglis, 2015). From a marketing perspective, shared bikes have fundamentally revolutionized the concept of the bicycle supply chain from the traditional sales of bicycles to the sales of services in a technological environment.

3.3.2 Monitoring of the Capital Market

Before MOBIKE became popular, there was a bike rental company with a similar business model existed in China. These shared bikes also have the basic functions of paying and unlocking system by scanning the QR-code. However, it was not popularized because the company failed to secure the required capital to develop their business. The consumers hardly knew that the bicycles could be rented (Bork, 2019). However, MOBIKE has a different strategy, when it gained the required capital, the brand had established a public attention with the help of the increasing news coverage. These had helped the bike-sharing industry remarkably

to set up an operation on the internet platform to further increase their popularity. They applied many new strategies to promote the concept of bike-sharing and create an unremitting marketing atmosphere (Lin, 2017).

3.4 Threats

3.4.1 Fierce Competition in the Shared Bike Market

Although the shared bike industry is budding in China's soil only for several years, considering itself a prospective force, the shared bike industry has been growing rapidly, and the size of the market has expanded in a short time (Little, 2016). According to the data obtained, until March 2017, the amount of financing the bike-sharing industry in China had reached RMB 7 billion with more than 30 brands of bike-sharing companies. Competition in the sector has become increasingly fierce (Huang, 2018). In terms of user size, bike-sharing apps had become the most applicable internet app in the second half of 2017. According to statistics, until December 2017, the number of domestic users of shared bikes reached 221 million, which represents 28.6% of the total of internet users in China. The size of users increased by 115 million in six months, with a growth rate of 108.1%. At present, according to the statistics of mobile app downloads, MOBIKE and OFO occupy a significant market share, with market shares of 44.6% and 43.5% respectively, and they are the most powerful competitors in the bike-sharing market (Wei, 2017).

3.4.2 Lack of Shared Bike Policies, Laws, and Regulations

As a new mode of economic growth, the development of bike-sharing requires relevant supervision of laws and regulations and also the execution of related policies (NACTO Policy, 2018). But the relevant laws and regulations are still in the process of formulation and not fully implemented. Therefore, the shared bike industry is not protected and supervised by the required laws and regulations. For example, the law on the prevention of the shared bikes vandalism is not implemented effectively and there is no legal protection for the safety of minor users. Moreover, if an accident happened, the limited legal resources and the absence of regulatory system would cause a lot of problems and this needs more attentions and improvements (Fishman, Washington, & Haworth, 2013). There are more problems and situations that need the immediate involvements and prompt legal engagements to intervene. For instance, the illegal possessions of shared bikes by the users who neglect public interests and treat the shared bikes as their private property, illegal shared bikes parking at random places that causes sidewalk passage problems, the violation of road traffic rules by the shared bike users, these problems imposed negative impacts on the city's bike sharing programs, and also affected the urban development and definitely it would shatter the development of the sharing economy. Besides, the abovementioned problems, there are other issues like the security problems that involve the protection of user's personal data and personal bank account information in the online registration system, the effectiveness of the refunding of the balance online, and most importantly the enforcement of the government policies to oversee, maintain and require the provincial state to announce and implement relevant laws and regulations.

IV. THE CHALLENGESOF SHARED BIKES

Nowadays, the shared bike has gradually and completely integrated in our daily life. It is undeniable that we can no longer consider it as a futuristic innovation but rather it is an immediate necessity at presence. The shared bike's development is parallel with urban development. If it is not properly managed, it would not only affect our daily routine but correspondingly slow down the management of the city.

4.1 Traffic Demand Management Challenges

According to the "Employment Research Report in the Bike-Sharing Industry'', until July 2017, the number of bike-sharing launches had reached approximately 16 million in total in China. When the market initially triggered the launch of bike-sharing, the companies didn't do more analysis and haven't considered much about the maximum of the capacity of bike-sharing on urban roads (Liu, Shen, & Zhu, 2018), and they kept launching a large number of shared bikes in order to occupy the bike-sharing market. Thus, they continued creating unprecedented disorder in urban traffic and chaotic occupation in some public places. Bike-sharing companies should have serious considerations on these problems to have a better development in the near future. (Zhao, 2017).

4.2 Challenges and Guarantee of Road Rights for Bicyclists

Due to the lack of urban road infrastructures for bicycles, car drivers are generally the only ones to have privileges to use the roads. Therefore, the space and the accessibility of the roads and lanes for shared bikes are limited. The shared bike users are forced to use the non-conforming narrow lanes and even share the sidewalks with the pedestrians. The spaces for bike-sharing are not guaranteed and organized. With the gradual return of cycling as a popular means of transportation, it is essential to realize that the guarantee of bicycle users' rights has become an unavoidable issue which requires an urgent attention and immediate action to tackle the above-mentioned problems (Zhao, 2017).

4.3 Road Planning and Parking Challenges

As most cities lack of the parking stations and required facilities for shared bikes, and moreover, with absence of parking rules and regulations, disordered parking for shared bikes is an omnipresent phenomenon (Lin & Yu, 2013). Furthermore, there is no rules and regulations to control and restrict bike-sharing users'

behaviors on where they can park the shared bikes, this had caused many chaotic parking problems. In order to improve the parking problems, it is necessary to consider the three aspects such as the shared bike parking management system (Jiang, Ou, & Wei, 2019), the allocation of parking space, and the establishment of parking restrictions.

4.4 Offence and Adopted Laws Challenges

Traffic violations are pervasive among shared bike users including reverse-cycling, traffic light violations, illegal entry to the motor vehicle lane, and the use of shared bicycles under the age of 12. Consequently, from the emergence of bike sharing until now, especially in 2016, the number of non-motorized traffic violations across the country was 817,000 cases, an enormous increase of 50.4% over the same period (Alpert, 2019). The investigation of the illegal traffic of shared bikes often faces difficulties in law enforcement. The shared bike users who involved with breaking the rules and regulations, committing vandalism, refusal to pay fines are not cooperating in the investigation. Therefore, the local authorities and the shared bike managements need to implement coercive measures to ensure the effectiveness of law enforcement (Zhao, 2017).

V. COORDINATIONAND HARMONIZATIONBETWEENDEVELOPMENTAND GOVERNANCE

In this section, the research focuses on the experiences of shared bike employees because their experiences and descriptions would reflect the realities of the bike sharing situations since they are responsible for the management of shared bikes. Their experiences can be a reliable source of evidences and records of this research. Therefore, with the description of the details provided by the employees, it is helpful to relate the discussion about the development and management of shared-bikes industry and economy. Simultaneously, the research could be able to explain further about the balance between the development of shared bikes and the coordination of urban management and also to present concrete suggestions about the initiatives that shared bike companies and local authorities could bear in order to ensure the coordination between the development of shared-bike and urban management.

5.1 Development and Governance from the Employees' Perspective of Shared-Bike Companies

In charge of an area of about 3 kilometers in diameter, the 2 or 3 shared bike employees have to supervise and manage consistently whether the shared bikes are parked correctly, keep monitoring whether they are properly parked in the area provided for parking. The employees are also responsible for transporting the bicycles that are parked outside the parking zones to the nearest parking lot (NYC Department of Transportation, 2020). They sometimes need to cooperate with the city inspectors, who regularly provide them with information about irregular bike parking. Shared-bike employees in charge of the area should immediately go to the required site and park the shared bike in the precise location. For shared bikes parked in the indicated area, they have to check if each shared bike can be unlocked normally. If a shared bike that cannot be unlocked is found, its number tag should be immediately reported to the data center. After the data center confirms and repairs them, employees must reconfirm if the shared bike can be used normally. At the end of the workday, they will be informed that the number of shared bikes as such has exceeded the demand in the area and that the use of public space is hampered, then they will go with the truck driver to the area where too many shared bikes are placed, and the excess shared-bikes will be loaded to be brought back to an area where they can be parked. Finally, they finish their workday. The next day they can be assigned to different areas, but the content of the work is consistent.

Therefore, these employees are the most direct participants and players in the management of shared bikes. Without them, data could not be transformed in real time, and there would be absence of coordination between bike-sharing and urban governance. Consequently, it would be less likely to achieve a better urban development. If bike-sharing data are critical to business development, these employees are the crucial front liners of bike sharing companies' development and undoubtable the main pillars of the development of bike-sharing program.

5.2 Development from the Business Perspective

In order to manage the bike-sharing project efficiently, technological innovations in the management must be promoted. It involves many aspects. Firstly, the establishment of the correspondence across government and the construction of business management platforms need to be installed. Secondly, a technology that involves the combination of the road traffic status data and the bike-sharing positioning data should be developed to provide an accurate and reasonable distribution and able to respond effectively to travel demand. Thirdly, the program should integrate the traffic video surveillance system with the shared-bike geolocation system in order to detect any illegal parking on the road and avoid it in time.

The bike sharing companies need to provide a more user-friendly experience to gain recognition among shared bike users. Users' choice and trust are the basis for the survival and development of shared bikes. The companies should provide more shared-bikes to reduce the users' anxiety about the shared bike shortage and this may directly prevent the users' illegal possession of shared-bikes to some extent. Moreover, the companies

should develop the required technology apt to distribute and allocate the shared bikes reasonably and rationally. It will improve the problems in over or unevenly distribution of shared bikes in certain regions. Besides, the companies need to optimize the tracking shared bike systems in order to increase the efficiency of the service. The maintenance of the conditions of shared bikes should be given priority to boost up the confidence of the users to use the service simultaneously providing more supplement services such as adding rear seats or baskets. These will certainly attract more users to use shared bikes.

From the perspective of management, flexibility in management must be promoted. The companies can encourage more enterprises and general public to participate actively in the management of shared bikes. It can greatly leverage their labor advantages and improve the uncivilized parking behaviors efficiently. For example, OFO establishes a patrol team with 300 men in Guangzhou who supervise the shared bike networks. There are more than 30 city hunters hired and they were given the benefits of discount prices on the discovery of the non-regulatory parking in certain places (Wei, 2017).

5.3 Governance from Government Perspective

From the government perspective, a systematic planning must be optimized to ensure the development of shared-bike policies. In terms of access to shared bikes, the government should ensure the standardization of the production of shared bikes. Quality controls of the shared bikes must be maintained and reinforced before the bicycles running on the road, and bicycles with obvious defects should be retrieved to avoid accidents. For example, the Nanjing Traffic Control Department implements centralized registration of bicycles based on regular bicycles to safeguard the bikers' security and to prevent casualties and accidents. It is effective in reality because the quantitative management of bicycles facilitates the implementation of a long-term total control of the vehicle distribution and the traffic condition on the road (Cohen &Kietzmann, 2014; Manzi&Saibene, 2018; Ma, Lan, Thornton, Mangalagiu, & Zhu, 2018).

The supervision of the management must be enhanced and upgraded constantly (Wosskow, 2014). It can be established through the integration of the credit system and the personal social credit system. This strategy will help the supervision system to collect reports of illegal traffic information. As a result, the users' behaviors could be regulated through this coupling of credit systems and social integrity systems.

There is a need to establish rules and regulations for shared-bike parking on the streets and simultaneously improve the construction of transportation infrastructure. Recently, major Chinese cities are announcing guidelines on shared-bike parking areas, specifying parking areas and parking requirements, providing strong institutional support to strengthen shared-bike parking management. The authorities should also cooperate with companies in terms of bike-sharing investigations and accident handling (Reddick, Zheng, &Liu, 2020). For example, the Shenzhen Traffic Control Department cooperates with MOBIKE to conduct a joint investigation and implements a mechanism for managing traffic accidents in order to protect the legitimate rights and interests of users.

The safety precaution and educational activities about bikers' security should be promoted and organized regularly. Public awareness of abiding the traffic rules should be nurtured and traffic safety should be highlighted among users. The targeted provisions are needed to be circulated and amended in order to be able to tackle the recent problems in various situations (Katz, 2015) for the efficiency of these non-motorized vehicles management.

VI. FORECASTS CONCERNINGTHESITUATIONOF THE SHARED BIKEAND URBAN GOVERNANCE

Generally, there exists a small number of companies that have become oligopolies in a certain industry and it dominates more than 80% of the market. According to experts in urban planning and management, they suggested that bike-sharing problems should be shifted to the planning stage. They proposed the application of big data and the bicycle flow should be considered as indicators. It can be served as a supporting system for cities in planning and evaluating different development strategies according to different combinations of space occupation, economic activities and public transport services (Ganapati & Reddick, 2018). In the case of bike sharing service, it is important to consider the planning of parking stations for shared bikes, traffic routes, and the construction of bus stops.

6.1 Merger between Different Companies

Market structure theory primarily concerns with the measurement of the distribution scale of a product and a manufacturer. It focuses at the market level which is an important indicator of the degree of competition in a market (Nickolas, 2020). In a competitive monopoly market, there are quality differences in the products, such as geographic differences, service differences, product differences, etc. Therefore, it is obvious that there are monopoly phenomena. Although there is a monopoly status and excessive profits exist in the short-term, but with the entry and exit of other manufacturers, normal profits can only be obtained in the long term.

Shared bike companies are currently in a monopoly competition market. There is a tendency that the development of shared bike will go through the process of market elimination, companies merging and market acquisitions and then pave their way to the development of oligopoly (Pawlicza,2019). At present, there are

numerous competitors in the market. The profits made by MOBIKE and OFO have attracted a large number of manufacturers who continue to gain market share. Not to mention that the revenues and expenses of each company are similar, the fees are about 1 RMB per hour and they all adopt the similar application method. Thus, there is hardly any difference in how they operate. Beside this, the car-sharing has been developing, it is considered as a substitute for bike-sharing. They substituted each other. The car-sharing existence has created problems to the bike-sharing system and threatened the development of bike-sharing program.

In order to analyze the problem, we would like to introduce the concept of an economic model called the "prisoner's dilemma". It assumes that all parties involved in the game are reasonable and they must pursue the maximization of their own interests. Therefore, the behavior of simply pursuing the interests will inevitably cause the loss of the collective interest. There will be different companies of shared bikes appeared in this situation. At the beginning of the game, the most obvious means of competition for all companies are low-cost subsidies, which are mainly focused on strategies such as price reduction and red envelope bonuses. Once this war of price begins, companies have to continue to issue more subsidies, otherwise the users will prefer the opponent companies with a more competitive price. Those companies who continue to provide more subsidies will survive or else they will be eliminated from the game. Consequently, the companies are forced to continue to increase their subsidies until the price comes to a standstill. It is very similar to the previous case of DIDI Chuxing and Uber. Both parties continued to increase their subsidies and ultimately both are lost in the game, then the two companies have to merge in order to break the "prisoner's dilemma" situation. When the "prisoner's dilemma'' happens, mergers and acquisitions are the only solution and the inevitable result. Only by merging capital and gaining a monopoly advantage can they overcome the dilemma of continued subsidies and achieve long-term development. Competition in the sharing economy is mainly about the competition of the number of users, operating capacity, promotion and the business model. The unreasonable allocation of resources leads directly to waste. Besides, there is a problem of excessive competition in shared-bike companies. In order to get a better profit, the companies have to put their effort in improving the performance of products and they must upgrade their service for customers (Ganapati & Reddick, 2018). Thus, improving the product performance to attract more customers is their foremost priority. During this competition, the businesses that cannot keep up will be eliminated from the market, they either merged or withdrawn. As a result, shared bikes will inevitably enter an oligopoly market (Xu, 2017).

6.2 Building Big Data and Creating a Smart City

Smart cities are the recent and future trends of the informative age and the development of urban civilization. They determine the future urban development. The construction of smart cities in China has three main objectives, namely the installment of a smart city information system, the creation of intensive and efficient economic environment, and the development of a scientific and reasonable mechanism for decision-makers and government (Hu & Tanaka, 2019). One of the key solutions is using Big Data to build and manage a smart city. With the application of Big Data on traveling, it may facilitate public transport and monitor city traffic situations. The problems and difficulties may possibly be resolved. Big Data could sort out the problems of tracking the shared-bikes used in the Smart cities. It can estimate and adjust the number of shared-bike launches accurately. It also supervises the frequency of bicycle use and enhances the operational efficiency of urban transport, and thus increase the synthetic competitiveness of cities (Xinhua News Agency, 2004).

VII. CONCLUSION

The bike-sharing issue has been one of the most discussed topics in China for more than a decade. Unlike traditional scientific and technological innovation, its emergence and development has directly influenced and changed people's daily lives (Wang, Huang, & Dunford, 2019). The shared bike is considered as alternative of public transport. Although some individuals complained that bike-sharing has brought too many problems to urban governance, they still have some positive aspects (Shaheen& Elliot, 2015). Bike-sharing has made our life easier. It improves travel efficiency, reduces carbon dioxide emissions, and thus changes the city's environmental quality (US Department of Transportation, 2016). The emergence of bike-sharing has created many new job opportunities in the city, which has significantly improved the city's economy and raised the level of urban governance. However, the problems that bike-sharing has posed to urban governance cannot be ignored, we must take the initiative to deal with them. The shared bike companies and government should reduce the negative effects to a certain extend and discover the potential of shared bikes in order to improve urban governance.

It is important to recognize that our study is a case study of the bike sharing mainly in Guangzhou and Shenzhen. It is not appropriate to generalize the analysis and the result of the study to all the cities in China. However, it would be better and beneficial to conduct further studies in other cities and countryside in China. We found out that it is necessary to make adjustments and create new development plans according to the uniqueness of each city. With further investigation, accurate estimation and rational planning, improvements can be made and the problems of bike-sharing in China could be able to be resolved gradually. Therefore, in order to achieve this objective, we would suggest the application of different research methods to examine the findings.

It is obvious that urban governance is not just a matter for state or local authorities, but a matter for all.

REFERENCES

[1] Albiński, S., Fontaine, P., Minner, S.(2018). Performance analysis of a hybrid bike sharing system: A service level-based approach under censored demand observations. Transport. Res. E: Logist. Transport. Rev. 116, 59–69.

[2] Alpert, D. (April 30, 2019). Why "people biking need to follow the law more" is bad safety advice. https://ggwash.org/view/71937/why-people-biking-should-follow-the-law-more-is-bad-safety-advice

[3] Bi, T. (2017). Analysis of the problems in sharing economy - take sharing bicycles as an example. China International Business, 7, 13-14.

[4] Bork, H. (2019). The rise and fall of Chinese bike-sharing startups. https://www.rolandberger.com/nl/Point-of-View/The-rise-and-fall-of-Chinese-bike-sharing-startups.html

[5] Bogdan, R., & Taylor, S. (1975). Introduction to Qualitative Research Methods. New York: John Wiley & Sons.

[6] Cohen, B., &Kietzmann, J. (2014). Ride on! mobility business models for the sharing economy. Organ. Environ, 27(3), 279296.

[7] CityLab.(2017). The Real Story Behind the Global Bike-Share Boom. [online] Available at: http://www.citylab.com/city-makers-connections/bike-share/ [Accessed 26 October 2020].

[8] Chinadaily.com.cn. (2014). China scraps high-pollution vehicles in air cleanup. [online] Available at: http://www.chinadaily.com.cn/china/2014-05/26/content_17542019.htm [Accessed 25 October 2020].

[9] Dutzik, T., Madsen, T., & Baxandall, P.(Fall 2013). A New Way to Go - The Transportation Apps and Vehicle-Sharing Tools that Are Giving More Americans the Freedom toDriveLess.https://pennpirgedfund.org/sites/pirg/files/reports/A%20New%20Way%20to%20Go%20vPA.pdf

[10] Faye, V. (2008). French network of bike: Cities and bike-sharing systems in France. le Club des VillesCyclables, Paris.

[11] Fishman Elliot, Washington Simon, & Haworth Narelle (2013). Bike share: A synthesis of the literature. Transport Reviews, 33(2), pp. 148-165. https://doi.org/10.1080/01441647.2013.775612

[12] Ganapati, S., & Reddick, C. G. (2018). Prospects and challenges of sharing economy for the public sector. Government Information Quarterly, 35(1), 77–87. https://doi.org/10.1016/j.giq.2018.01.001

[13] Hallock L. and Jeff Inglis J. (February 2015). The Innovative Transportation Index - The Cities Where New Technologies and Tools Can Reduce Your Need to Own a Car (Frontier Group). https://nmpirg.org/sites/pirg/files/reports/Innovative_Transportation_Index_NMPIRG.pdf

[14] Huang Frankie (December 31, 2018). The Rise and Fall of China's Cycling Empires. China's bike-sharing firms were supposed to be the next big thing. What happened? https://foreignpolicy.com/2018/12/31/a-billion-bicyclists-can-be-wrong-china-business-bikeshare/

[15] Henley, J. 2005. Rentabike moves up a gear from curiosity to runaway success. The Guardian. August 12. http://www.guardian.co.uk/world/2005/aug/12/france.jonhenley/.

[16] Hu Jichen,& Tanaka Takehiro (2019). A Study on Smart Business Continuity Management for Near Future Cities "Differences between Chinese and Japanese Smart Cities as Regards Buildings/Facilities: A Case of Tokyo as the Representative of Japan", IOP Conf. Series: Earth and Environmental Science 330 (2019) 022069IOP. https://doi:10.1088/1755-1315/330/2/022069.

[17] Hou Changhai 侯长海.2016 年中国共享单车市场分析报告.《互联网天地》第 2 期 2017：35-3.

[18] Jiang Qianling, Ou Sheng-Jung and Wei Wei (2019). Why Shared Bikes of Free-Floating Systems Were Parked Out of Order? A Preliminary Study based on Factor Analysis. Sustainability 2019, 11, 3287; doi:10.3390/su11123287.

[19] Karki, T.K., & Tao, L. (2016). How accessible and convenient are the public bicycle sharing programs in China? Experiences from Suzhou city. Habitat International, 53, 188-194. doi: 10.1016/j.habitatint.2015.11.007.

[20] Katz, V. (2015). Regulating the sharing economy. Berkeley Technology Law Journal, 30(4), 1067-1126.

[21] Kayal, P., Singh, R. and Kumar, M. (2014). Defining Sustainable Urban Mobility. TERI-NFA Working Paper No. (11). [online] The Energy and Resources Institute (TERI), 6-9. Available at: http://www.teriin.org/projects/nfa/pdf/working-paper-11-Defining-Sustainable-Urban-Mobility.pdf [Accessed 12 Jun. 2017].

[22] Lin Kunhao (2017) 李琨浩.基于共享经济视角下城市共享单车发展对策研究.《城市》第 3 期，2017：66-69.

[23] Lin, J.J., Yu, C.J.(2013). A bikeway network design model for urban areas. Transportation, 40 (1), 1–24.

[24] Liu Zhaoyang, Shen Yanyan, Zhu Yanmin (February 2018). WSDM '18: Proceedings of the Eleventh ACM International Conference on Web Search and Data Mining, 378–386. https://doi.org/10.1145/3159652.3159708

[25] Little Arthur D. (2016). The rapid growth of bike sharing in China – good news for city mobility? https://www.adlittle.com/sites/default/files/viewpoints/adl_bike_sharing.pdf

[26] MetroBike. 2009. The Bike-sharing world map. http://maps.google.com/maps/ms?ie=UTF8&hl=en&om=1&msa=0&msid=104227318304000014160.00043d80f9456b3416ced&ll=43.580391,-42.890625&spn=143.80149,154.6875&z=1&source=embed/.

[27] Ma, Y., Lan, J., Thornton, T., Mangalagiu, D., & Zhu, D. (2018). Challenges of collaborative governance in the sharing economy: The case of free-floating bike-sharing in Shanghai. Journal of Cleaner Production, 197, 356-365.

[28] Manzi, G., &Saibene, G. (2018). Are they telling the truth? Revealing hidden traits of satisfaction with public bike-sharing service. Int. J. Sustain. Transport, Vol.12, Issue 4. doi: 10.1080/15568318.2017.1353186.

[29] NACTO Policy: Guidelines for the Regulation and Management of Shared Active Transportation, July 2018. https://nacto.org/wp-content/uploads/2018/07/NACTO-Shared-Active-Transportation-Guidelines.pdf

[30] Nadal, L. (2008). Vélib one year later. Sustainable Transport, Winter 2008 Number 20. New York City Department of Transportation Traffic Rules (April 15, 2020). http://www.nyc.gov/html/dot/downloads/pdf/trafrule.pdf
[31] Nickolas, Steven (June 2020). Monopolistic Market vs. Perfect Competition: What's the Difference? https://www.investopedia.com/ask/answers/040915/what-difference-between-monopolistic-market-and-perfect-competition.asp
[32] Paul DeMaio. 2009. Bike-sharing: History, impacts, models of provision, and future. Journal of public transportation Vol. 12, 4 (2009), 3.
[33] Pawlicza, A. (2019). Pros and cons of sharing economy regulation. Implications for sustainable city logistics. Transportation Research Procedia, 39, 398-404.
[34] Reddick Christopher G., Zheng Yueping, & Liu Te (April 2020). Roles of government in regulating the sharing economy: A case study of bike sharing in China, Information Polity, 25(3):1-17. DOI: 10.3233/IP-190207.
[35] Shaheen, Susan and Martin, Elliott M. W (2015). Unraveling the Modal Impacts of Bikesharing, Issue Number: 47, pp. 8-15. University of California Transportation Center (UCTC).
[36] Schimmelpennick, L. 2009. Conversation with Paul DiMaio. March 5.
[37] Sootooinstitute.2017 年第一季度国内共享单车市场调研报告.《互联网天地》第 4 期，2017：21-24.
[38] Shui C.S. & Szeto W.Y. (2020). A review of bicycle-sharing service planning problems, Transportation Research Part C: Emerging Technologies, Vol. 117, 102-648. doi.org/10.1016/j.trc.2020.102648.
[39] Statistiques Canada. Méthode et Pratiques d'Enquêtes, no.12 - 587 - X au Catalogue, ISBN978 - 1 - 100 - 95206 - 2, Périodicité : hors-série, Ottawa, 2010.
[40] US Department of Transportation (April 2016). Shared Mobility: Current Practices and Guiding Principles. https://ops.fhwa.dot.gov/publications/fhwahop16022/fhwahop16022.pdf
[41] Wang J. 2006. Strategies for Urban Transport in China. Accessed August 2010. http://www.chinautc.com/
[42] Wang J., Huang J., & Dunford, M. (13 March 2019). Rethinking the Utility of Public Bicycles: The Development and Challenges of Station-Less Bike Sharing in China, Sustainability,11, 1539. DOI: 10.3390/su11061539
[43] Wang, T. (July 10, 2018). Financing Strategies of bicycle-sharing firms: a case study. 11thIBA Bachelor Thesis Conference, Enschede, The Netherlands.
[44] Wei, B. 魏彬 (2017). 基于 SWOT 分析的我国共享单车行业营销策略研究.《中国商论》第 27 期, 53-54.
[45] Winget, M. (2005). Qualitative Research: The Ethnography of Annotation Model. pp. 1-19
[46] Wu Feifei&Xue Ying of bike sharing industry in China - A case study of Mobike's station-less bike sharing system, Master Thesis, KTH Royal Institute of Technology in Stockholm, Sweden.
[47] Xinhua News Agency. (2004). The decision of CPC Central Committee on strengthening the party's governance ability construction. Available at: http://news.xinhuanet.com/zhengfu/2004-09/27/content_2027021.
[48] Zhao, L. (赵琳娜) (2017). 共享单车给城市管理带来了哪些挑战.《人民公安报·交通安全周刊》5 月 12 日, 2.