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# Chinese dock-less bike-sharing model

The market situation and  
underlying implications

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## 前言

目前，中国的经济发展速度迅猛，给人们生活中带来了很大变化。尤其是近几年互联网的普及化，人们对智能手机的依赖性逐渐增加。如今，人们只需要打开手机就能做到很多事情，包括购物、支付、打车、定外卖、定车票、订酒店、订电影票、等都可以在手机上完成。科技的发展推动了信息化和智能化，这就是共享经济发展机会的地基。

共享经济业界首先诞生于西方国家，然后才在中国落地。但是，中国在创新方面力争上游，要创优自己的品牌、产品以及服务。在达到此目标的过程中，中国首先向其他国家学习科技技术，其次再把中国特征结合在产物里。例如，美国旧金山的 Uber（优步 *Youbu*）首先进入中国提供租车平台服务，于 2016 年 8 月，两年就被中国滴滴出行（*Didi Chuxing*）打败<sup>1</sup>。

本论文的研究话题是中国式的无桩共享单车，也就是中国独特的共享经济行业之一。共享单车是“共享”于“自行车”汇合的产物，首次运用于公共自行车（*public bike-sharing PBS*）上。公共自行车是欧洲的发明，目的是给人们提供一种交通补充，并且缓解城市的废气排放，以及交通拥堵。自从中国的快速经济发展产生了严重污染现象，近几年，中国中央政府为改善城市化的负面影响复兴了自行车的使用。21 世纪初，中国大大小小的城市行政部门都推出了公共自行车系统。公共自行车是官方给百姓提供的交通服务，此项目的普及化给私营企业的无桩共享单车打开发展道路。

公共自行车系统和滴滴公司的诞生是中国研究先进国家的创新技术实例的成果。超越美国公司 Uber，使中国公共自行车进一步改善，是中国走向创新和先进国家的第一步，无桩共享单车的发明更加标志着中国的进一步重大成就。中国已经达到其它发展中国家的科技水平，目前正在推出海量的优质品牌，而无桩共享单车也包括在内。

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<sup>1</sup> 滴滴出行是如何将 Uber 挤出中国的？ <<http://tech.qq.com/a/20161007/003290.htm>>

2014年 ofo 小黄车的成立使百家品牌开业，其中还有 2015 年初成立的小黄车的主要竞争对手——摩拜单车（Mobike）。共享单车被称为“新四大发明”之一，是一种绿色出行方式，为百姓解决“最后一公里”的问题。同时，共享单车也为城市降低了排放污染，并且缓解了拥堵和过分城市化所产生的弊端。但是，由于共享单车火爆发展，百家品牌在主要城市竞争产生了一系列的新难题<sup>2</sup>。

首先，共享经济行业本身就有难题，由于依靠着互联网来运营，信息保护和用户安全成为主要问题。关于自行车行业，除了点对点模式的用户安全问题和平台信用问题，也包括用户在骑行中所遭遇的事故。道路拥堵或不完善的设施都降低用户使用自行车的安全性。其次，除了人身安全，共享经济还有很多关于平台租赁的弊端。用户的信息和支付的押金是最关键的两点。另外，共享单车的过量投放已成为中国许多城市的严重现象。

其次，一、二线城市是共享单车的主要市场，这些城市的大街小巷堆满了各种颜色的自行车，已造出“围城”的现象。由于共享单车行业一推出就得到大众的关注以及欢呼，几个月之内就有几十家五颜六色的无桩自行车出现在街头上。共享单车行业的竞争十分激烈，使企业为了争夺市场份额积极投放车辆。推出仅一两年，就已经达到无法控制的程度：单车的乱停拥堵了街道，用户不良行为不断地增加企业的成本，凶猛的竞争让许多企业破产，大量的用户退押金的现象暴露了企业缺钱的真相。

如果共享单车是非常“烧钱”得行业，为何还会有众多的投资者支持它的发展呢？共享单车行业获得了数亿启动资金，投资者中有优秀的高科技企业，包括腾讯（Tencent）、阿里巴巴（Alibaba）。阿里的蚂蚁金融（Ant Financial）、滴滴出行、腾讯帮助的美团电瓶（Meituan-dianping）以及许多海外的投资者都参与了七彩双轮的

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<sup>2</sup> “新四大发明”，literally “the new four great inventions” in modern China are the high-speed rail, Alipay, online shopping and the new dock-less bike-sharing model. These are compared to the Chinese four-great invention of the ancient times, which are the paper, the printing, the compass and the gunpowder. 入选中国“新四大发明”共享单车凭啥征服世界？<[http://www.xinhuanet.com/fortune/2017-07/24/c\\_1121368658.htm](http://www.xinhuanet.com/fortune/2017-07/24/c_1121368658.htm)>

“烧钱大战”。两年营业的持续，却未达到可持续性发展模式是本论文的出发点：共享单车企业真正的生存目的和优秀的高科技企业资助它们的原因是本论文研究的提问。本论文一共由四部分构成：第一章总结了全球公共自行车的来历、每一代的特点，以及共享经济的特征；第二章讲解了中国自行车的发展过程、国家对自行车发展的政策影响，以及共享单车的发展趋势和主要阶段；第三章收集了一些主要共享单车企业的资料；第四章是研究后做出的结论。论文的中心位于第二章的第二部分。此部分是笔者通过研究汇编的共享单车发展趋势以及主要事件的分析，包括无桩共享单车在国外发展的阐述，以及在各方面产生的影响评估。

由于共享单车的发展是从4年前开始的，论文的核心部分以及结论都是笔者通过大量网络新闻分析的成果。研究的时间段从2014，ofo小黄车最早成立的一年，至2018年9月底的情形。绝大多数信息的来源是中国新华网（Xinhua net）、和其它网络报纸，例如南华早报（South China Morning Post）、财新（Caixin global）、中金投X（China Money Network）等，以及百度百科（Baidu baike）和其他热门头条新闻。研究的难度在于结合大量碎片、重复的信息来判断共享单车行业的发展阶段及趋势。此外，不同的信息来源给予的视角也不同，从而造成难以表述完整、全面的结论。

从此研究，笔者认为共享单车从共享经济的一个热门行业，从而得到了很大的关注和投资，现如今已变成其他企业的战争。共享单车市场竞争的激烈不只是单车企业的战役，也有国家、地方财政，以及雄厚的投资机构的缘故。一方面，官方需要完善这个新行业的管理制度及标准，在另一方面，共享单车企业无法挖掘可持续发展模式，必须依靠大量投资而运营，使势力留到后台投资的玩家手里。关于第一个方面，共享单车行业的出现也为中国编制规定及标准化的过程带来了创新，使当地行政部门以及独立机构有了更大的表达及参与权。关于第二个方面，可以说单车企业们争夺市场的战斗目前成了几家高科技大企业的竞争。共享单车企业已经成为了腾讯、阿里、滴滴之类的大企业的木偶。

总的来说，从此研究能判断的是中国模式的无桩共享单车不只是一种交通工具、绿色出行服务，其中还包含着大企业的相互竞争。再加上某些中国独特的状况，在中国七、八十年代自行车在人们生活中有较大影响。过去拥有一辆自行车意味着家庭状况良好，反而目前人们都不再买自行车了。这是因为中国经济发展让社会更重视汽车，也是因为公共自行车及共享单车让城市有过量的单车。就是因为共享单车的数量大，2017年下半年仅在国内的用户规模就达到了2.21亿，并在国外21个国家运营<sup>3</sup>。如此大的渗透率，给营业商带来海量关于用户慢行出行的大数据。大数据也就是共享经济以及网上商业的基础，而对腾讯、阿里、滴滴类似的高科技企业来说，这些数据有很大的重要性。共享单车行业已经进入了这些大公司的平台上，例如通过微信小程序（WeChat miniprogram）、支付宝（Alipay）、蚂蚁金融的芝麻信用（Sesame Credit）平台免押金使用单车活动等，都已经透露了共享单车行业对大平台增加竞争力的关键性。这些大公司的利益对社会有所影响，关涉人们的生活各方面。尤其是在中国上涨的信息化、依靠信用分数提供更多的产品和服务的趋势发展，人们连最简单骑一辆自行车也要被监控。

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<sup>3</sup> 共享单车国内用户达 2.21 亿 已渗透 21 个海外国家  
<<https://baijiahao.baidu.com/s?id=1591187386770715831&wfr=spider&for=pc>>

## INTRODUCTION

The bicycle is a brilliant human invention. The bike intended as a vehicle for human transportation that stays in equilibrium on two wheels has 200 years old<sup>4</sup>. Nowadays we can see bikes everywhere in the streets, and for people, they are ordinary objects, conventional means of transportation or an attractive way to do some physical activity. However, in the past, bicycles were a more precious object, even becoming indispensable in people's life. Evoking the movie "Bicycle Thieves<sup>5</sup>," the bike is a whole family's fortune. In an era of post-war misery, bikes have more than a mere instrument, they have been the hope and the despair of an entire society, of a whole nation.

This thesis has under the spotlight the bicycles, but in another era, in another country. Bikes exited the black and white period of poverty when it was a precious good, passed through a period in which it was widespread and now entered in a new era of excess. Since 2014, China has started a new chapter in the bicycle evolution with its dock-less bike-sharing start-ups. These companies have their foundation in another essential concept, which is the "bike-sharing." With the economic development and world's progress, the urban environment has become more hostile for human-living. Pollution and traffic are the urbanization's side-effects, which led to the creation of the bike-sharing, that is the "shared used of a bicycles fleet."

The bike-sharing is the union of the bicycle as a zero-emission mean of transportation and the concept of sharing. The original purpose was to promote cycling in the cities, to reduce car-trips and alleviate traffic and environmental problems. The result is the birth of the "public bike-sharing," that is the establishment of a fleet of bikes in the city which can be used by the citizens, who do not need to buy and possess them. The development of the public bike-sharing programs (PBSPs) has a long history which goes back to 1965 when this kind of programs developed in Europe and since then has spread worldwide.

With the rapid economic development, China has been facing severe environmental and urbanization issues. As in the rest of the world, the Chinese government embraced the bicycles

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<sup>4</sup> The first bicycle that has been effectively used is the "draisine", invented by the German-man Baron Karl von Drais, in 1817. <<http://www.cyclinside.com/Storia-della-Bicicletta.html>>

<sup>5</sup> Original title in Italian: "Ladri di biciclette". Is an Italian movie released in 1948 and directed by Vittorio De Sica <<https://www.mymovies.it/film/1948/ladridibiciclette/>>

as a savior for the cities. Thus, in the early 2000s, China has re-evaluated the role of the bikes, starting to launch many PBS programs in different cities.

While the bicycle and the “public bike-sharing” are both western's invention, the free-floating bikes, and the “dock-less bike-sharing” are Chinese innovations. This research aims at explaining how the Chinese dock-less bike-sharing start-ups have started and developed, who are the main players in this new market and how is the dock-less bike-sharing industry's situation worldwide.

The first part of this work describes the birth and the evolution of the bike-sharing worldwide. The research to construct a complete picture of worldwide PBSPs development has been conducted through the analysis of the previous literature on this topic. The first part of Chapter 1 is a review of PBS programs types and their evolution in the world, the reason why they have started and how they operate. The second part of the chapter explains the kind of market in which bike-sharing is running, that is the sharing economy. After a general introduction on what is the sharing economy, the study gives a more in-depth focus on the shared mobility, which is the cluster that encompasses the bike-sharing, and the relationship between bike-sharing and the sharing economy.

Chapter 2 is the core of this thesis, which examines the Chinese dock-less bike-sharing phenomenon. After a complete overview of the bicycle and bike-sharing evolution in China, the central part of the chapter presents the birth and the development of the Chinese dock-less bike-sharing model. Being a very recent and still evolving phenomenon this part of the research is mainly relying on the online research and analysis of the news published on the most prominent online newspapers which follow the events regarding the dock-less bike-sharing. Among the newspaper the main one consulted to conduct this research is Xinhuanet.com (新华网 *Xinhuanet.com*), while other key newspapers are the South China Morning Post (南华早报 *Nanhua zaobao*), Caixin global (财新 *Caixin*), the China Money Network (中金投 X *Zhongjintou X*), which have been integrated with the information available on Baidu baike (百度百科 *Baidu baike*) and other popular news headlines which can be find online. The period investigated is from 2014, when ofo was the first company to establish, to September 2018, which is the conclusion time of this research. Form the analysis of these four years, with particular attention to the two-years period 2016-2017, when there was the most

intense flow of events, we observe that the Chinese style bike-sharing is different from the previous bike-sharing models because of the introduction of an innovative feature to the bikes: being "dock-less." While the public bike-sharing schemes in China are governmentally supported initiatives, the dock-less model is an innovation made by private companies. In 2014, ofo was the first start-up launching the new dock-less bike-sharing model in mainland China but was followed by a flood of competitors. This chapter explains the reasons for the rainbow-colored fight between the two-wheels of different bike-sharing start-ups, in particular, the battle between the two major companies (ofo and Mobike) and the fate of the smaller competitors. Since these companies are also taking global expansion steps, there is also the analysis of some foreign markets' situation.

The last chapter is a collection of profiles on some main dock-less bike-sharing companies, giving more detailed and aggregated information on corporates' evolution and situation.

In conclusion, the thesis gives a complete overview of the reason why the Chinese dock-less bike-sharing start-ups have grown so many in numbers and few of them also so much in size, even outside China. The sharing economy is undoubtedly developing fast, with a considerable number of investors willing to finance the sharing industries. In particular, the Chinese economy is still pointing at the tech-innovation to create further domestic products and services of excellence, and the dock-less bike-sharing companies are surely riding this wave of opportunities to seize capitals. However, the current situation is that all these companies have been swept by the same wave that previously brought them high. This is not only the case for the first-fallen small bike-sharing start-ups, but also for the two leading companies, ofo and Mobike. The battle that has been fought by the young two-wheels in the past two years is now passing in the hands of the tech giant firms that financed them, such as Alibaba, Tencent and Didi chuxing. The dock-less bike-sharing companies seem to be the puppets of the more significant battle that has been existing between these old rivals. The underlying impacts of the dock-less bike-sharing industry are not insignificant in a country where few vast tech companies are ruling, and the protection of the consumers' interests is threatened by trends such as the excessive reliance on smart-services (i.e., e-commerce, mobile payments, food-delivery) and the advent of the social credit system, the IoT (Internet of Things), and the Smart Cities, which relies on the use of big data.

# CHAPTER 1 – BIKE-SHARING: HISTORY AND THE MARKET

## 1.1 Bike-sharing: definition and terminology

The shared use of bicycles is a phenomenon with a long history worldwide to received various names and definitions, varying from country to country, where the adoption purpose is different. The reason why it is called "bike-sharing" or "public bicycle program" (PBP) (DeMaio, et al., 2009) (Shaheen, et al., 2010) is because the bicycles are publicly available like other public transportation means, such as buses, subway, and trains. This definition is even clearer under the North American general approach towards the concept of public bike-sharing, which can be defined as "the shared use of a bicycle fleet," an innovative transportation (Shaheen, et al., 2012), open to the public, to which it serves as a form of public transportation (Fishman, et al., 2013).

In the context of public transportation, bicycle-sharing is implemented as "schemes" or "programs", with a high involvement of the government. Considering this characteristic, researchers gave a range of names to the bike-sharing phenomenon: "public bicycle sharing program" (PBSP) (Mateo-Babiano, 2015), "bike-share program" (BSP) (Fishman, 2015) and "bike-sharing scheme" (BSS) (Midgley, 2011) (Ricci, 2015). Despite the fragmented denominations, these programs/schemes consist in the short-term urban bicycle rental at specific self-service stations, enabling users to make point-to-point trips (Institute for Transportation & Development Policy (ITDP), 2013). Specifically, the bicycles are at disposition in designated docking-stations, where they can be picked up to make the trip and returned to another station (Midgley, 2011). It must be highlighted that this is a more "contemporary" definition of the rental schemes (Fishman, et al., 2013) because initially there were no specific stations (i.e., the first generation bike-sharing program called "White Bikes"), while other schemes later introduced the requirement to return the bicycles to the original station (i.e., some second generation and "residential use" bike-sharing programs).

Furthermore, "bike-sharing" is different from "bike rental" which is more focused on leisure purpose and must be returned to the original renting station (Shaheen, et al., 2010). More specifically, bike rental services provide bicycles mainly for private use within a given amount of time (Ricci, 2015). Bike-sharing is somehow like a bicycle rental service, but also have the following characteristics (Midgley, 2009):

- The possibility to rent a bicycle at one location and either return it to the original station or another designated location;
- Have fast and easy access;
- Have diverse business models;
- The most recent programs/systems apply technologies, such as smart cards and mobile phones;
- Often designed as part of the public transportation system.

The principle of bike-sharing is to have a short-time access to a bicycle, permitting to ride from a point to another (Shaheen, et al., 2010), it is aimed to increase the number of rides, often by giving free of charge service (most of the schemes gives 30 minutes free of charge usage), eventually followed by a time-related fee. Each program can have commonalities as well as differences in the operating model, for this reason we can distinguish a “bike-sharing program” (BSP) or “bike-sharing scheme” (BSS) (Shaheen & Guzman, 2011) (Ricci, 2015), form a “bike-sharing system” (Fishman, et al., 2013). The authors who contributed to the literature on bike-sharing do not explicitly distinguish these terms. However, from an analysis of their definitions, we might conclude that “program” and “scheme” refer to the bike-sharing service provided in the city, whereas a “system” refers to the generation or the type of a “program” or “scheme” which can be offered by different operators. One operator can be the provider of the bike-sharing program/scheme in one or more cities and countries. When talking about a bike-sharing system, the meaning is more related to how a program/scheme is operated. The definition of a system depends on the characteristics of the operations adopted by an operator. For example, we can define as a public bike-sharing program or scheme the entire bike rental service of an operator in a city, but the same service can be operated in another city too. These two cities are said to possess their own public bike-sharing programs, but since they are identical from the operational point of view, they have one bike-sharing system.

Other terms referring to shared bicycles are “public-use bicycles” (PUBs), “bicycle transit” or “smart bikes” and this latter refers to the most diffused and advanced bike-sharing schemes, of which the expansion lead to more research on the phenomenon. In general, some common denominations are “cycle hire” in the UK, “public bicycle” in China and “bicycle-sharing” in North America (Institute for Transportation & Development Policy (ITDP), 2013).

In this study, the various programs operating in different cities are identified as “bike-sharing schemes or programs,” whereas the entire service provided from the entity running the program (the operator) or more programs with same operational or business model as “bike-sharing system.” Thus, the term “system” can be used when talking about different generations of bike-sharing programs, since every generation have some general differences, which characterize their way to operate.

### 1.1.1 BIKE-SHARING: FOUR GENERATIONS HISTORY AND CHARACTERISTICS

We talk about “generations” in bike-sharing because it has been an evolving phenomenon over the decades. According to the different characteristics of the bike-sharing systems over time, the literature distinguished the following generations.

#### *First generation: “White Bikes” or “Free Bike Systems”*

Bike-sharing started in July 1965 in Amsterdam, the Netherlands, where the Witte Fietsen or White Bikes, have been introduced in the city for free usage. Fifty bicycles were painted white and provided by Provos, an environmental organization, to provide a sustainable form of transportation. The bikes were left unlocked, and everybody could use them to reach the destination and leave them to the next user (DeMaio, et al., 2009). However, the “White Bike Plan” stopped almost immediately its birth, after suffering massive damage, thefts of bicycles and confiscations from the police, who believed the service was increasing the criminality (DeMaio & Gifford, 2004) (Shaheen, et al., 2010).

Despite the failure of the program, it marked the beginning of the first-generation bike-sharing systems, called “White Bikes” or “Free Bikes Systems.” Systems of this generation is characterized by:

- Ordinary bicycles painted in white (or other bright colors);
- Bicycles are left unlocked;
- Free use;
- No docking ports.

Some programs do lock the bicycles, but users can have free access to them by participating to local businesses and provide a deposit, while the service is still free of charge (Shaheen, et al., 2012).

A successful example is a scheme called Vélos Jaunes or Yellow Bikes provided in La Rochelle, France, in 1974 (Shaheen, et al., 2010) (Midgley, 2011), and only a few others are still operating as a community-based initiative (Shaheen, et al., 2012).

Bike-sharing soon expanded to North America, where the first program was the Yellow Bike. The scheme possessed sixty bicycles available for everyone in Portland, OR, from 1994 and it was free of charge. It operated until 2001 when it evolved into Create-A-Commuter and since 2007 it has been trying to create a new bike-sharing program. This program has been followed by Boulder, Colorado, which launched the Green Bike Program in 1995, a free of charge program of 130 bikes run by the City Transportation Management department and maintained by high-school students, but ended because of thefts, and there was an intention to install a new system of 250 bike and 10 stations (Shaheen, et al., 2010).

In general, the main problem of the first-generation is theft (DeMaio & Gifford, 2004). The lack of incentives for returning the bicycles in original conditions was the main reason for closure of the programs (Midgley, 2011), such as the Green Bike Scheme, launched in 1993 in Cambridge, the UK, which lost 300 bikes.

#### *Second-generation: "coin-deposit systems"*

The second-generation follows the first one with improvements, mainly tackling with the theft problem. The new programs are known as "coin-deposit systems," with some other new characteristics (DeMaio & Gifford, 2004):

- Bicycles are manufactured for sharing purpose and prevent theft, with distinguished colors and distinctive design (Shaheen & Guzman, 2011);
- Bicycles can be picked up at specific stations with a coin deposit (DeMaio, et al., 2009) (Shaheen & Guzman, 2011), which usually is less than \$4US (Shaheen, et al., 2012);
- Bicycles are docked at designated stations/parking locations, where they can be returned (Shaheen & Guzman, 2011) (Shaheen, et al., 2012).

While the first-generation bicycles were left free, this new generation designated specific stations where bicycles are locked to prevent theft. DeMaio (2004) noted that two different models could be distinguished, one for "residential use" and one for "community use." The former type must be returned to the original station, which is normally an apartment building and the latter one can be returned to any of the available stations. Generally, when referring

to bike-sharing programs, we intend the “community use” model, and in this study, we do not consider the “residential use” model, which are more specific in some countries and contexts, such as Japan.

Most of the second-generation bike-sharing schemes are operated by non-profit organizations with the governments’ support. Deposit is usually cheap, while the absence of time limit for bike usage resulted in high rates of non-returning (Shaheen, et al., 2010). However, they seem to incur very high costs for operating and required more funds.

The first program, of this type, was launched in 1991 in Farsø and Grenå, Denmark, and in 1993 in Nakskov, Denmark. These were tiny programs of 26 bicycles and four stations (DeMaio, et al., 2009).

The first large-scale second-generation scheme is Bycyklen or City Bikes, launched in 1995 in Copenhagen, Denmark (DeMaio & Gifford, 2004). It counted on more than 1,000 bikes and closed in 2012 but has been replaced in 2013 with a modern system (Larsen, 2013). Copenhagen’s Bycyklen inspired the launch of a series of programs across Europe, such as Bycykler in Sandnes, Norway in 1996, City Bikes in Helsinki, Finland in 2000 and Bycykler in Aarhus, Denmark in 2005.

Developments of second-generation programs followed in North America, where the first bike-sharing scheme of this type started in the cities of Minneapolis and St. Paul with the Yellow Bike Project created by a local health club’s law firm. One hundred-fifty bikes were available with a US\$ 10 refundable deposit for a card which enables their usage. Minnesota Office of Environmental Assistance provided the program with short-term funding. The original program has been canceled due to theft and replaced by the Public Bike System Company (PBSC), maker of Montreal’s BIXI, providing 1,000 bikes in 80 stations by June 2010 (Shaheen, et al., 2010). This program was followed by a series of coin-deposit bike-sharing programs in the U.S., such as:

- “Olympia Bike Library” in Olympia, Washington, 1996;
- “Yellow Bike” in Austin, Texas, 1997;
- “Red Bikes” in Madison, Wisconsin, 1995, which was a “free bike-sharing program” evolved a few years later;
- “Freewheels” in Princeton, New Jersey, 1998;

- “Decatur Yellow Bikes” in Decatur, Georgia, 2002.

Some community-based first and second-generation bike-sharing systems are still operating in the United States (Shaheen, et al., 2012).

*Third-generation: “Smart Bikes Programs” or “IT-Based Systems”*

Third-generation bike-sharing systems are those employing smart technologies in the bicycles, and they are known as “Smart Bikes Programs” (DeMaio & Gifford, 2004) or “IT-Based System” (Shaheen, et al., 2010). These technological improvements target to reduce theft, which still was the main shortcoming in the coin-deposit generation due to users’ anonymity (DeMaio, et al., 2009) (Shaheen, et al., 2010). However, the beginning of a newer generation does not necessarily imply the end of the older one, in fact, many second-generation systems are still operating (Shaheen, et al., 2012).

Four key components can be identified in this new generation (Shaheen & Guzman, 2011):

- Unique designs or advertising displays distinguish bicycles;
- Each program employs docking stations, which can be fixed (designated stations with dock and kiosks) or flex (adopting mobile phone technology and street furniture for bike pick-up and drop-off). In the latter type, bikes are unlocked by receiving the code on the phone, minimizing the infrastructures needed for docking and making bikes available everywhere in the city;
- A user interface is necessary for check-ins and check-outs;
- Employment of advanced technology (such as mobile phones, magnetic stripe cards, smart cards)

More specifically, third-generation systems use electronic racks at the stations, and the bicycle can be picked up with a magnetic stripe card or a smart card, which requires users’ registration. The association to the proper identity gives the users the responsibility to return the bikes at the designated locations, and a monetary sanction is to be applied to tackle misuse and theft (DeMaio & Gifford, 2004). The majority of systems in America improved the accountability with the use of credit or debit cards (Shaheen, et al., 2012), which act both as a deposit, as well as payment for registration and usage fees (Fishman, et al., 2013) (Ricci, 2015). Additional features could be the possibility to access the system through the mobile phone, the telecommunication system and the onboard computers (DeMaio, et al., 2009). The integration

of information tracking, along with the possibility of bicycle reservations are other crucial supplements (Shaheen, et al., 2010). Thanks to technologies like the integrated global positioning (GPS), the movements can be tracked from one station to another (Larsen, 2013). Equally technological kiosks can accompany bicycles technology improvements, functioning as the interface through which users can check-in and check-out the bicycles, generally with the use of a smart card (Shaheen, et al., 2012). At these terminals, users can also get information on the scheme, consult the map and access to customer service and sometimes it is also possible to pay for hiring a bike (Ricci, 2015). Near the kiosks, there are the sophisticated docking stations which can communicate with the central system by employing Radio Frequency Identification (RFID) and GPS technologies. There are two main racking technologies: one is the automated bike rack with the use of a smart card (i.e., Clear Channel Adshel, JCDecaux, and Gewista), the other one is the automated lock relying on the entry code sent via mobile phone to the user (i.e., Deutsche Bahn) (DeMaio & Gifford, 2004). Another add-on is websites, where customers can get more information about the scheme. All these improvements created “custom-built, heavy-duty” bicycles, which also had a non-standard design to reduce theft (Midgley, 2011). The possibility to track the bikes and access to users’ information can help system management and reduce theft, but technology requires higher costs for operators (Shaheen, et al., 2012). Despite this, BSP operators are encouraged to install these technologies across their bike-share fleet since benefits outweigh the costs (Fishman, 2015).

The first time a third-generation bike-sharing program made its appearance was in England, where students at the Portsmouth University used a magnetic stripe card to rent bikes in 1996. The program stopped due to lack of funds but opened the way for many others small and large scales schemes (DeMaio, et al., 2009).

The first remarkable program is SmartBike, better known as Vélo à la Carte (DeMaio, et al., 2009), which name is inspired to the use of a smart card to use the service. Launched in 1998 in Rennes, France, the scheme started with 200 bicycles and it was operated by Clear Channel Communications, Inc., one of the largest advertising companies. The system provides three hours free of charge service for those who applied for a smartcard. The scheme ended in 2009

but has been replaced by LE Vélo STAR, operated by Kelios, the largest private sector French transport group, which provided 900 bicycles in 81 stations (Shaheen, et al., 2012).

Velo'v is a successful program launched in 2005 in Lyon, France, by JCDecaux, with 1,500 bicycles and 100 automated self-service docking stations (Larsen, 2013). The high success is confirmed by the high usage numbers, accounting for 15,000 members and 65.5 times average daily rides (DeMaio, et al., 2009).

In the meanwhile, the Vélos Jaunes program launched in 1974 in La Rochelle, has evolved into a second-generation system and replaced in 2006 by Yélo, an automated IT-based system (Shaheen, et al., 2012). The original scheme has expanded and developed from a technological perspective, using smart cards for 110 bikes in 26 stations, fully integrated into the public transport network until 2009 (Midgley, 2009) (Shaheen, et al., 2010) .

Remaining in France, Paris's Vélib is the biggest success in Europe, which started on 15 July 2007 with 10,000 bicycles at 750 stations. The name stands for "vélo libre" or "vélo liberté," which means "free bicycle" or "bicycle freedom" (Midgley, 2009). The scheme operated by JCDecaux is the result of a 10-year contract aimed at reducing air pollution in the city (Larsen, 2013). Vélib was the most extensive bike-sharing scheme in the world before the Chinese uptake and remains the largest in Europe with its fleet reaching 20,000 bicycles by 2009 (Shaheen, et al., 2010). It is free of charge for the first 30 minutes, to encourage bike turnover and avoid competition with private bike rental companies (Midgley, 2009). Users can also subscribe to the one-day pass for €1, week-pass for €5, or the one-year subscription for €29 (Shaheen, et al., 2010). Being very cheap and convenient, due to a high bike coverage (every 300m), the service resulted in a significant success among the dense Parisian population, which accounts to more than 2 million inhabitants (Midgley, 2009).

In the early 2000s, there are a series of programs launches across Europe (DeMaio & Gifford, 2004):

- In Austria, Vienna's Citybike, launched by Gewista in 2003, with 120 bicycles and 13 stations;
- In Germany, Berlin in 2002, Frankfurt in 2003 and Munich in 2001 have the Call a Bike system, operated by the Deutsche Bahn;

- In the Netherlands, following the closure of the White Bike Plan in Amsterdam, in 1999 Depo was launched, but stopped due to lack of funds. The same ending for Rotterdam's City Bike, launched in 1997, which ceased due to poor performance. In 2001, OV-Fiets has been launched by a quasi-governmental organization, with 650 bicycles and 52 stations.
- In Norway, Sandnes Bysykkel started in 2000, operated by the non-profit City Bike Foundation of Sandnes. A series of programs operated by the private companies JCDecaux (Porsgrunn Bysykkel in 2003) and Clear Channel Adshel (Drammen Bysykkel in 2001, Bergen Bysykkel and Oslo Bysykkel in 2002) followed.

In 2010, London partnered with BIXI to start a big bike-sharing scheme with 6,000 bicycles and 400 stations (Shaheen, et al., 2010).

Barcelona is a very populated city (1.5 million people), and has a scheme named Bycing. Started in May 2007 with 750 bikes and 50 stations, it expanded to 6,000 bikes and 400 stations by the end of 2008. Like Vélib, it is free for the first half an hour and every additional 30 minutes are charged € 0.30, up to 2 hours and, it is accessible every 300m. Furthermore, the city already had 128km cycling lanes, implemented with other 22km. However, only residents can use the scheme, paying an annual subscription of € 24. Bycing as a smart bike-sharing program provides real-time information on the bikes through the internet. B:SM (Barcelona de Serveis Municipals, a municipal service company) operates it, and it is funded with revenues from on-street parking (Midgley, 2009).

We can observe that most of the third-generation programs are the result of public-private partnerships, developed and operated by major advertising companies, such as Clear Channel Adshel and JCDecaux (Shaheen, et al., 2010) (Midgley, 2011). Smart bike-sharing systems are often provided by city administrations or a public transport operator, but increasingly, city administrations are contacting private operators to provide these schemes. The three principal operators are Bicincittà by Comunicare (Italy), Cyclocity by JCDecaux (France) and SmartBike by Clear Channel Outdoor (USA) (Midgley, 2009).

Bicincittà system started in 2004 and installed in 21 cities in Italy and Spain. It provides the system in partnership with City councils, to which the service is differently provided (free stations, hourly fee, monthly subscription or annual subscription).

Cyclocity has been developed by the most prominent global outdoor advertising company, JCDecaux, the leader in street furniture advertising. In 1999, this self-service bike system started as a first-generation program in June 2003 in Vienna, (Austria), Gijon and Cordoba (Spain). A newer generation has been developed in 2004 and introduced in 2005 with 1,00 bikes in Lyon and Villeurbanne. The system is present also in Aix-en-Provence, Besançon, Brussels, Marseilles, Mulhouse, and Seville, while the most extensive program is in Paris (20,000 bikes).

SmartBike is operated by Clear Channel Outdoor, the world's largest outdoor advertising company. In 1999, the first smart-bike program started in Rennes, France, and spread to other countries too. Apart from France (Caen, Dijon, Perpignan Rennes), it is also in Italy (Milan), Norway (Drammen, Oslo, Trondheim), Spain (Barcelona, Zaragoza), Sweden (Gothenburg, Stockholm), and the U.S. (Washington, D.C.).

In America, bike-sharing has arrived a few years later, and the oldest third-generation program started in 2007 with Tulsa Townie in Tulsa, Oklahoma. The scheme is the first solar-powered, fully automated docking-based system in the world and it provides a free of charge service (Shaheen, et al., 2012).

SmartBike D.C. pilot program was launched in 2008 in Washington D.C., with 120 bikes at ten stations. The scheme charges an annual subscription of US\$40, which allows up to three hours ride each time (Shaheen, et al., 2010). The system is part of a twenty-years bus shelter contract and, it is owned and maintained by Clear Channel Communications, Inc., and stopped in January 2011, leaving the room for the Capital Bikeshare. The latter is a broader, citywide program started in September 2010 and operated by BIXI's American partner organization, Alta Bicycle Share, Inc., with 1,200 bikes and 130 stations in the District of Columbia and Northern Virginia.

The biggest scheme in North America was BIXI (Bicycle-TaXI) in Montreal, Canada, launched in 2009, with 5,000 bicycles in 400 stations and 11,000 members. The system was developed by the parking authority of the city of Montreal, operated by PBSC Urban Solutions. In January 2012, BIXI Montreal grew to 5,120 bikes at 411 stations and nearly 40,000 members (Shaheen, et al., 2012). BIXI Montreal expanded into Toronto and, the Ottawa-Gatineau area (Shaheen

& Guzman, 2011), Toronto in 2011 had 1,000 bicycles in 80 stations, while Capital BIXI in the Ottawa-Gatineau region had 100 bicycles in 10 stations (Shaheen, et al., 2012).

Alta Bicycle Share, Inc. of Portland, OR, made a partnership with BIXI in Canada to be the provider of Capital Bikeshare, New Balance Hubway, and Nice Ride Minnesota in the United States, while PBSC Urban Solutions provides the equipment for all BIXI systems (Shaheen, et al., 2012).

Boston's planned bike-sharing program, the New Balance Hubway bike-sharing system, whose name comes from its corporate sponsor, New Balance, was launched in July 2011. It aimed at reaching half size of the Montreal's one by 2010 (Shaheen, et al., 2010). Operated by Alta Bicycle Share, Inc., the program had a fleet of 600 bicycles at 61 stations in January 2012 (Shaheen, et al., 2012).

A trendy scheme is the one launched in 2010 is Nice Ride Minnesota which could count 960 bicycles and 116 stations in the Twin Cities by January 2012. In 2011, 217,000 trips were made with the system, which had about 3,800 annual and thirty-day subscribers with an overall user population of 33,900 (including the daily users) (Shaheen, et al., 2012).

In 2010, B-cycle started in Denver, Colorado, and in 2012 it could count 520 bicycles, 51 stations, and 79,701 members. As of May 2012, B-cycle system expanded to: Boulder, CO; Broward County, FL; Chicago, IL; Houston, TX; Madison, WI; Omaha, NE; San Antonio, TX; and Spartanburg, SC. Furthermore, Des Moines B-cycle and Hawaii B-cycle are two pilot programs launched in 2010 and 2011, respectively (Shaheen, et al., 2012).

Another Canadian system is the Golden Community Bikeshare, launched in British Columbia in 2011, in January 2012 had 15 bikes in 2 stations (Shaheen, et al., 2012).

As of January 2012, there were 15 IT-based public bike-sharing systems in the United States with 172,070 users and 5,238 bicycles. By January 2012, Canada had four IT-based bike-sharing organizations with more than 44,352 members and 6,235 bicycles and plans to start other schemes. In general, in 2011, there were many programs launched, and more to be implemented, like Citi Bike in New York, in collaboration with the City bank (Shaheen, et al., 2012). Since May 2013, Citi Bike in New York City, has become North America's largest IT-base system, operating with 6,000 bicycles in 330 stations (Shaheen, et al., 2014).

In South America, and the rest of the world, 2008 is the significant year for many locations, such as Brazil, Chile, Argentina, Colombia (Shaheen, et al., 2010).

Brazil launched in 2008 UseBike in São Paulo, and in 2009 Samba in Rio de Janeiro. UseBike operates with 202 bicycles and 23 bike stations, free for the first hour and charging US\$0.85 for each additional hour. Samba is a pilot program which started with 80 bicycles in 8 stations but planning to expand immediately up to 500 bikes in one year. It requires mobile phone activation, and users must subscribe online (Shaheen, et al., 2010). In November 2011 it relaunched as BikeRio, with 600 bicycles and 60 stations and used mobile-phone technology to access the bikes (Shaheen, et al., 2012)

Chile followed with its program with 50 bicycles in 10 stations (Shaheen, et al., 2010), launching B'easy in Santiago, in December 2008. With the initial 150 bicycles and 15 stations, the city was thinking to expand (Shaheen, et al., 2012).

In Argentina, Santa Fe launched Subite a la Bici in December 2010. As in March 2012, the program has 135 bikes in 8 stations (Shaheen, et al., 2012).

In February 2010, Mexico City launched EcoBici with 1,200 bicycles at 90 stations for a yearly membership of US\$25. The system received very high demand (Shaheen, et al., 2012) and it expanded to 3,530 bikes in 261 stations by 2014 (Shaheen, et al., 2014).

In Australia, bike-sharing started in February 2010, in the City of Melbourne. BIXI has been designated to provide to Melbourne Bike Share 1,000 bicycles in 52 stations by summer 2010 (Shaheen, et al., 2010). PBSC Urban Solutions is the equipment provider for successful programs, but the program must face the central issue of Australian helmet law (Shaheen, et al., 2012).

In Asia, bike-sharing started directly with third-generation programs, but with a very high growth market (Shaheen, et al., 2010) since they could follow the western examples.

The first bike-sharing program is Singapore's TownBike (Larsen, 2013), which started in 1999, it is known with the name of Smart Bike from 1999 to 2004 and ended in 2007 (DeMaio & Gifford, 2004). Three SmartBike programs operated by Clear Channel Adshel, which have started in the early 2000s, suspended in Singapore (DeMaio & Gifford, 2004). Two programs

running in Singapore, one conventional and one run by a carsharing company offering electric bikes (Larsen, 2013) (Mateo-Babiano, 2015).

The second program in Asia followed in Japan, where the Taito Bicycle Sharing Experiment kicked off in Taito as a pilot program in November 2002 and ended in January 2003. Funded by the national government's Social Experiment grants, the program comprised 130 bicycles in 12 locations. Bikes could be used with a magnetic striped membership card and gained high usage rates, so much that the citizens believed more bikes were necessary (Shaheen, et al., 2010).

Another program in Japan is Kitakyushu's PBSP, a small-scale scheme, managed by a non-profit organization and operating with a unique model, providing docking points for private and public bikes, while other schemes generally focused on bike-share users. The program originated from growing green activity which led to a variety of policies aimed at improving sustainable technologies for the community. The program was implemented in March 2010, when the local government signed the contract with the non-profit organization (NPO), which receives its support while being fully responsible for the operation. This scheme of 116 electric assisted bicycles at ten stations, is a successful example of small-scale NPO model. It is one of the nine bike-sharing programs in Japan launched between 2009 and 2012 and ranging from small-scale pilot schemes to large-scale dense systems, with the purpose to provide means for tourists and change the city's transportation modes (Mateo-Babiano, 2015).

In South Korea, the city's government promoted policies for compulsory installation of bike-sharing schemes to improve the low level of cycling. Ten model cities were designated to implement public bike-sharing programs in 2008 (Mateo-Babiano, 2015), among these Nubija in Changwon, a public-private model scheme, started with 430 bicycles in 20 stations and free of charge for the first hour (Shaheen, et al., 2010). To use the program, users must register and pay US\$ 8 for membership. It is, therefore, an affordable public transport alternative, but not very integrated with the rest of the transport network. A total of twelve programs have been kicked off in the country, being mostly small-size schemes, except for the one in Changwon, which expanded to 4.600 bikes, while the Goyang PBSP has around 3,000 bikes (Mateo-Babiano, 2015).

In Taiwan, there are two schemes. The first program is C-Bike launched in 2009 in Kaohsiung City, followed by YouBike originated in the same year from the partnership between the government and the producer of bicycles Giant. The program is completely automated permitting to pick up and return 500 bicycles at any of the ten stations (Shaheen, et al., 2010). C-bike has been implemented by the government to reduce private vehicles ownership (Wei and Kao, 2010), it started with 1,500 bicycles and enlarged up to 4,500 bicycles located at major activities points (Mateo-Babiano, 2015).

The most surprising country in bike-sharing development is China, where bike-sharing started to develop in 2008, a remarkable year for many launches in America too. China possesses eight of ten largest bike-sharing programs, reaching 79 programs in 2013 (Tang et al. 2013) and 358,000 bicycles (Mateo-Babiano, 2015).

Hangzhou Public Bicycle system launched in 2008 was China Mainland's first IT-based program (Shaheen, et al., 2012). Hangzhou city high population (3.73 million) density makes it a good location for the development of the bike-sharing scheme, which comprises 40,000 bicycles and 1,600 stations. The program soon expanded to 50,000 bikes and 2,000 stations by the end of 2009, making a bike accessible every 200m. In 2011, it reached 61,000 bikes and more than 2,400 stations (Shaheen & Guzman, 2011). It has been a very successful case, with a 6 times average ride per bike and no losses in the first year (Shaheen, et al., 2010) and one of the densest scheme with an monthly average use of 9.75 million (International Business Times, 2013) (Shaheen et al. 2011) (Mateo-Babiano, 2015). The program must be very proud of the success in integrating docking stations with bus and subway networks, allowing the same transit card to be used across all modes and granting extra free bike riding time when combined with a bus transfer (Mateo-Babiano, 2015). A large pool of studies concentrates on the factors of success of this bike-sharing program\*. As of March 2010, a survey to Hangzhou Public Bicycle members and non-members finds that car ownership does not reduce the likelihood of bike-sharing use, because users use the bikes simultaneously with other transportation modes (buses, walking, autos, taxis), incorporating cycling in daily commute (Shaheen & Guzman, 2011). This finding may be strictly related to China, where early adopters of bike-sharing were also more likely to purchase and own a motor vehicle (Fishman, et al., 2013). The scheme was so successful that users suggested the provision of more parking spaces, more bike availability, longer service hours, real-time information regarding bike and

parking availability. More improvements on the locking mechanism, member enrollment processes are suggested by non-members too (Midgley, 2011). The scheme, with its 65,000 bicycles fleet, surpassed the Vélib's 20,000 bikes fleet in 2012, but a larger scheme of 70,000 bicycles has been launched in Wuhan (Shaheen, et al., 2012) (Fishman, et al., 2013). This program is called Xinfeda Public Bicycle and reached 90,000 bicycles in 2015 but has been discontinued (Mateo-Babiano, 2015).

Many other cities started their bike-sharing programs, such as Beijing's municipal bike-share program opened in 2012, with 2,000 bikes to be expanding to 50,000 in 2015 (Mateo-Babiano, 2015).

Among other countries in Asia trying to implement bike-sharing systems, there is India, where the city of New Delhi government, to reduce private vehicles ownership, launched GreenBike in 2009. The system has been integrated into the Delhi Integrated Multimodal Transport Vision 2021, aimed at extending the transport network, among which new bicycle lines. GreeBike is operated by a private advertising company, commissioned to run 50 bicycles at five stations for US\$ 450 every month for each station. However, to use the service, users must give a valid Indian ID card, forcing the ride to be round-trip. Even though the scheme is very cheap (US\$ 0.15 for 4 hours and additional US\$ 0.07 for every hour), it has many other shortcomings, primarily due to the lack of governmental support, poor bicycle infrastructure and lack of a clear goal. Furthermore, in Indian culture, non-motorized means (such as bicycles and rickshaws) are considered lower classes' transportation methods (Mateo-Babiano, 2015).

In South Asia, Pasig City, Philippines, launched a pilot program in 2009. The Asian Development Bank started the scheme of 10 bikes and only one station, funded by the Japanese Fund for Poverty Reduction and managed by Clean Air Asia, in the attempt to develop a sustainable system in a developing country (Mateo-Babiano, 2015).

In Bangkok, Thailand, Pun Pun Bike has been introduced to alleviate traffic and better the high death rate in urban areas. The 50 bicycles and 12 stations scheme must face many particular issues, such as monsoonal weather, high humidity and treacherous roads (Mateo-Babiano, 2015).

The city of Bandung, Indonesia, implemented in 2012 Bike.Bdg, which has been initiated by local citizens and by the Bandung Creative City Forum, to reduce traffic congestion and

increase cycling. Thanks to the successful marketing campaign on social media, the scheme was a success and spurred the adoption in Jakarta and Solo (Mateo-Babiano, 2015).

We can undoubtedly state that the third-generation bike-sharing programs can rely on extensive literature as many studies have been conducted after the successful implementation of the first schemes in Europe, which revealed the potential role of smart bike-sharing systems in urban mobility (Midgley, 2011). The bike-sharing cases followed in North America, where the studies walk along with a period of many implementations (Shaheen, et al., 2012) (Shaheen, et al., 2014). During third-generation up taking years, studies were so focused on bike-sharing phenomenon, to the point that these “smart bikes schemes” have been identified with the concept of “bike-sharing” (Fishman, et al., 2013).

Third-generation systems could resolve previous generations’ weaknesses, which are mainly related to damage and theft, by introducing new technologies, such as GPS, therefore improving users’ reliability. However, these new improvements resulted in much higher costs (Shaheen, et al., 2010). Even though the technology has been more and more accessible and affordable, and third-generation could further improve to face its new challenges, evolving into a system with new characteristics, to a point where Midgley (2011) identified a “third-generation +.” New elements within the third generation are the further integration to GPS-embedded fleets, such as Wi-Fi hotspot functionality, more services from real-time tracking, including information on bicycle availability at the docking stations, information, and data analysis to help decision-making (Midgley, 2011). However, the advancing of issues and correlated improvements, lead us to the next and last generation of bike-sharing.

#### *Fourth generation: “Demand-Responsive, Multi-Modal System” and “Dock-less Bicycles”*

Since during the years of the expansion of many third-generation bike-sharing systems there were many studies on the improvements of one generation upon another, the experts in the field also started to speculate on the characteristics of the fourth-generation bike-sharing model. The new generation was expected to be the solution for the previous generation bike-sharing programs’ shortcomings, by providing improved distribution, installation, powering station, tracking, pedal assistance and new business models in general (DeMaio, et al., 2009). To summarize, improvements from the previous generation that must be enhanced are in the following areas:

- Improved distribution
- Ease of installation
- Powering station
- Tracking: improved data collection of favorite bike routes and quantification of vehicle miles traveled (but this scope is minimal)
- Pedal assistance
- New business models

Before the rise of the fourth-generation, it was predicted to be a “demand-responsive, multi-modal system” (Shaheen, et al., 2010) with the following characteristics:

- flexible, with clean docking stations;
- innovative in the redistribution system, like the use of value pricing to encourage self-rebalancing;
- have a smart card integrated with other transportation modes (i.e., public transit and carsharing);
- employing technology, such as GPS and touchscreen kiosks;
- higher security.

Furthermore, it should provide multi-modal access alternatives, real-time transit integration, and system data dashboard (Midgley, 2011).

Electric bikes are a crucial integration of the newest generation of bike-sharing (Shaheen, et al., 2010). They can resolve previous generations’ barriers, such as hilly topography and help people with physical difficulties.

With the development of the new generation’s bicycles, other innovations turned out to be:

- movable docking stations;
- solar-powered docking stations;
- mobile phone real-time availability applications (Midgley, 2011);
- integration with public transit by locating the bikes according to transit stations and transportation schedules (Shaheen, et al., 2012);
- cleaner technology (Shaheen, et al., 2012);
- dock-less systems (Parkes, et al., 2013);
- real-time tracking and automated data collection (Midgley, 2011);

- better rebalancing (Fishman, 2015).

The fourth-generation schemes are not very different from the more advanced third-generation ones because many have already enhanced some of the newer characteristics. For example, the already GPS-embedded Copenhagen's new bike-sharing program started in 2014, has an onboard table and Wi-Fi hotspot function (Midgley, 2011). More advanced GPS usage can help operator to track the bicycles with a geo-fence, which signals whether a bicycle is out of the designated area (Parkes, et al., 2013), as well as the rebalancing problem by providing bicycle availability information to both users and operators, permitting the latter to provide incentives to enhance more sustainable rebalancing systems. A common problem with docking stations is the availability of bikes for users who want to pick a bike and free docking spaces for those who want to return the bike, as it is evident that in hilly cities, higher stations are empty while lower stations are full (Fishman, 2015). Vélib, for instance, was already providing price and credit incentives for users who return the bikes to high-demand stations, reducing the need to use polluting trucks to manually rebalance the system (Shaheen, et al., 2010). Also, BIXI Canada took the first step toward solar-powered, mobile stations, advancing in both cleaner technologies' employment and dock-less features (Shaheen & Guzman, 2011). Given that the third-generation has varying advanced features across different schemes, the dock-less and electric assistance feature in the e-bikes are seen to be the most significant characteristics of the fourth-generation systems. With the dock-less feature, bicycles can be returned everywhere resolving the stations' availability issue. E-bikes can make the bike-sharing programs more accessible in case of hilly topography and to people who have difficulty riding a bike and also relieving the rebalancing issue (Mateo-Babiano, 2015).

The first type of dock-less system has been provided by Call-a-Bike and NextBike, mainly operating in Europe, while in America there was Social Bike or SoBi, a dock-less, solar-powered and GPS-enabled lockbox, which can be used to lock the bike on available public spaces. This latter system has been provided only in small communities (Parkes, et al., 2013).



- need special tools for disassembly and employ unique components that cannot be used on other bicycles;
- have a unique design and stand out from ordinary bicycles.

Smart-bikes also have other components (Midgley, 2009):

- GPS (Global Positioning System) tracking system or RFID tag (Radio Frequency Identification). These technologies can be integrated with mobile apps or websites to provide further information, such as the availability, distance traveled, and calories burned (Shaheen, et al., 2012);
- Anti-theft system;
- Require credit card information;
- Incentives for users to return and redistribute the bicycles;

Due to long operation experiences, some companies have become the provider of bike-sharing systems to more jurisdictions. Furthermore, considering the localities' needs, providers may offer differentiated services and products (Shaheen, et al., 2012).

Smart bikes have peculiar access system and eventually users' registration procedures (Midgley, 2011) (Shaheen, et al., 2012):

- There are two dominant technologies to unlock the bicycles from the stands: 1. The bicycles are checked out from an automated rack using a smart card or a magnetic stripe card; 2. The technology provides an automated lock on the bicycle itself and relies on the users to communicate or pay via mobile phone for an entry code;
- Most systems require users to register with multiple options also for paying. For encouraging casual tourists to use the bikes, the registration is usually quick and can be done at the docking station. The registration may be a barrier to using shared bikes but can reduce theft and vandalism;
- Some systems can offer electric pedal assisted bicycles.

### *Off-bike features*

Most of the bike-sharing system comprises the designated docking stations (Midgley, 2011), which can be:

- Fixed-permanent: designed racks where the bicycles are stationed with a coupling system;

- Fixed-portable: like Montreal's BIXI system portable modular stations, which does not require wiring installation because of solar power and wireless networking;
- Flexible: bikes do not have to be locked at designated rack or stations, bikes have a general-purpose locking device (a chain or a cable) which allows the bike to be locked to any stationary object when not in use or locks blocking the bicycle's drive train and steering.

Docking stations can be supported with kiosks (Midgley, 2011) with the function of:

- Registering to the system;
- Paying for renting a bike;
- Getting real-time information and accessing the map and bicycle availability information.

As mentioned before for the bicycle provision, the provider of the systems can also offer different types of stations and kiosks. For example, three main vendors are the providers of docks and kiosks types in North America (Shaheen, et al., 2012). The majority of the operators uses:

- mobile docking stations that can be relocated and solar-powered kiosks;
- an interface to check-out which usually requires preregistration to increase users' accountability, even though this could be perceived as a barrier for using the scheme;
- Kiosks that may employ the use of smart cards, smart keys or access codes via mobile phones, and that accept payments through credit cards; fewer systems also accept debit cards;
- Maintenance buttons, LCD touch screens at the docking stations.

Form an operational point of view, bike-share systems must have:

- mobile repair stations for damaged bicycles (DeMaio & Gifford, 2004);
- a general maintenance system;
- a redistribution program, by providing conveniently enough located stations, anticipating the asymmetric travel demand and give incentive to users to check-out at high-demand stations (Midgley, 2011).

### 1.1.3 BUSINESS MODELS

Bike-sharing systems can have very different business models which also depend on the purpose of adoption. From the analysis of the public bike-sharing literature, we can observe some correlations between the geographical area and tendencies of business models.

#### *Governmental models*

When the government provides the bike-sharing scheme, it is called “governmental model.”

In this case, the scheme is usually provided as a public transportation service to integrate those already existing (DeMaio & Gifford, 2004). Government-Supported schemes have the main objective to serve the locality, enhancing public transport modes. The high level of integration with the rest of the public transport network is the main strength for governments, which are fully responsible for the program's operations and should have all the interest to make it successful. However, governments may not have enough knowledge and experiences compared to other operators, which could be more suitable and have more competences in the sector (DeMaio, et al., 2009). Examples of schemes provided by the government are:

- “City Bikes” in Denmark;
- “OV-fiets” in the Netherlands;
- “Nubija” in South Korea;
- “YouBike” in Taiwan;
- “Shanghai Public Bicycle” in China (Shaheen, et al., 2010)

#### *Quasi-governmental models or transport-agency models*

When a quasi-governmental organization, such as a transport agency, is the provider of the service, bike-sharing schemes are called “quasi-governmental models” or “transport-agency models.” In this case, the organization provides the service and a jurisdiction, region or nation is benefitting from it (DeMaio, et al., 2009). The implementation of the bike-sharing scheme is considered an extension to the other transport modes, the jurisdiction benefitting from it does not need to develop and operate the program, since this task is delegated to the organization, which is fully responsible for it. The organizations do not aim at generating revenues, because they are only providing an additional service for the citizens. They have the support of the government also regarding subsidies, though some other private operators might be better than transport agencies in providing such a service (DeMaio, et al., 2009). Examples are:

- Call-a-Bike operated by Deutsche Bahn of Germany, which is the German railroad company. It operates a car-sharing service too;
- BIXI operated by Stationnement of Montreal, which is the parking authority;
- Hangzhou Public Bicycle in China (Shaheen, et al., 2010).

#### *University models*

In a “university model,” the bike-sharing service is provided by an educational institution, and it is usually operating within a campus. Programs of this type do not depend on other jurisdictions, but at the same time are limited to campus borders, preventing other potential users to benefit from the service. Thus, there is a compatibility issue when integrating with external systems (DeMaio, et al., 2009). Examples are:

- Portsmouth University program;
- St. Xavier University program, Chicago.

#### *Non-profit models*

“Non-profit model” bike-sharing programs are backed by a non-profit organization, which provides the service and operates with the funds from the benefitting jurisdiction, the revenues from membership/fees and sponsorships. The locality where the program is active does not have any liability because all the burden is on the non-profit organization. These kinds of organizations are less likely to incur in operational liabilities and to be sued, but they heavily depend on the public-sector funding (DeMaio, et al., 2009). This model relies on Public-private partnership funding, fees, bank loans and local funding (Shaheen, et al., 2010). Examples are:

- The program launched by the City Bike Foundation of Copenhagen;
- BIXI, Canada;
- Hourbike, UK;
- Bicincittà, Italy;
- Wuhan Public Bicycle, China.

#### *Private company models or advertising company models*

In an “advertising company model” there is a private company, usually an advertising company (such as JCDecaux, Clear Channel Outdoor, Cemusa) operating the bike-sharing program for a jurisdiction to have the public space to make advertisings and generate revenues. Local governments can have the service without providing funds, but the revenues

usually go to the jurisdiction rather than the advertising company, which must bear the cost with little revenues and might not be able to provide an outstanding service (DeMaio, et al., 2009). Some examples are:

- SmartBike, the U.S. and Cyclocity, France (Shaheen, et al., 2010);
- In Barcelona, B:SM (Barcelona de Serveis Municipals) is a public advertising company which provides the service for a fee and not for an advertising contract, being more similar to the “transport provider model” (DeMaio, et al., 2009).

#### *For-profit model*

The “for-profit model” expect a private company to provide the bike-sharing program. There is a little or no governmental involvement, and the company keeps all the revenues. Thus, it can benefit from independent funds generated from fees and ads (Shaheen, et al., 2010). However, it might be relying only on its private resources and does not have access to public help, such as funds but also parking spaces, which are needed unless they have private properties (DeMaio, et al., 2009) and they appear to be a big expense for the operator. An example is Next bike in Germany (Shaheen, et al., 2010).

#### *Developments in business models*

With the advent of IT-based systems, business models have been evolving too. There can be overlaps among these models’ definitions depending on the variations in ownership, system administration, and operations (Shaheen, et al., 2012):

- non-profit: with the goal of covering operational costs and expanding service; start-up and operational funding typically are supported by grants, sponsorships, and loans (i.e., Denver B-cycle);
- both privately owned and operated: owned and operated by a private entity; operator provides all funding for equipment and operations; may have a limited contractual agreement with public entities for rights-of-way (i.e., DecoBike);
- both publicly owned and operated: owned and operated by a public agency or local government; agency subsidizes bike-sharing with system revenue (i.e., Golden Community Bike Share);
- public owned and contractor operated: owned by a public agency or local government, responsible for funding and administering the system, whereas operations are contracted to a private operator (i.e., Capital Bikeshare; Capital BIXI);

- street-furniture contract: operator permitted to operate in a jurisdiction in exchange for advertising rights, generally with street furniture; system funded through advertising revenue (i.e., SmartBike D.C.)
- third-party operated: operated in partnership with local businesses in exchange for a percentage of the profit, hybrid operation scheme that can be paired with another business model (i.e., Chicago B-cycle);
- vendor operated (emerging): operated by the same company that designs or manufactures the system equipment (the vendor) (i.e., Bike Nation Anaheim).

### *Business models in the world*

In different countries it is possible to observe differences in the business models' trend:

- In Europe: bike-sharing programs are generally large-scale, operating through public-private partnerships and advertising models, featuring advanced technologies. Thus, it is widespread to have an external operator, such as an advertising firm, working alongside with city authorities at the implementation of bike-sharing schemes. The operator has his system which is sold to the city. The two most important operators are the largest advertising companies, JCDecaux, and Clear Channel, which run the systems for the right to advertise on the cities' street furniture. There is a process of differentiation in the provision of the bike-sharing according to cities' needs, and local governments can benefit from the service without having any burden (Parkes, et al., 2013).
- In North America: most of the schemes in the U.S. and Canada are non-profit models (Shaheen, et al., 2012). The most common type of support for the operators is sponsorship, through which they can get start-up and operational support from corporate sponsors, station sponsors, and government sponsors. Public and private entities can either sponsor the bike-sharing system or specific kiosks and locations, generally in exchange for the right to advertise on the bicycles and bike stations, or rather than selling advertising, the revenues can be used for capital purchases (Parkes, et al., 2013). The predominant business models are "publicly-owned/contractor operated" models, such as the cases of Capital Bikeshare and Capital BIXI. In the second place, there are for-profit models, like DecoBike, Bike Nation, SoBi (Shaheen, et al., 2012).

- In Asia, there are several businesses and governance models like the European ones. Most of the countries adopted a business model of partnership between local government and advertising agencies. Other models include public agency funding (i.e., the Hangzhou system, which provides the service under the guidance of a public authority to enhance the public transportation system), non-profit models (which provide services under the support of public agencies or local councils), business-operating model (like the Wuhan system, China, and the Kyushu system, Japan) (Mateo-Babiano, 2015).

#### 1.1.4 BIKE-SHARING SCHEMES OPERATIONS

##### *The economic perspective: costs*

Running a bike-sharing service requires operators to meet a series of costs, which can be categorized into capital costs and operational costs (DeMaio, et al., 2009).

**Table 1: Bike-sharing scheme costs**

Capital costs:	Operational costs:
<ul style="list-style-type: none"> <li>- production of bicycle and stations</li> <li>- license or purchase of the system</li> <li>- purchase or rental of maintenance and redistribution for the bicycle fleet installation of the system</li> </ul>	<ul style="list-style-type: none"> <li>- Periodical maintenance and distribution</li> <li>- staff</li> <li>- insurance</li> <li>- office space</li> <li>- storage facilities</li> <li>- electricity</li> <li>- website, mobile app</li> <li>- marketing</li> <li>- professional services</li> <li>- others, such as expansion costs</li> </ul>

Sources: (DeMaio, et al., 2009) (Shaheen, et al., 2014)

##### *The economic perspective: funding*

For their operations, bike-sharing programs can rely on a variety of sources, such as advertising, user fees, grants, loans, sponsorship, health-care/tobacco settlement funds, governmental funds. In general, they rely on a combination of these sources for both operational and capital costs (Shaheen, et al., 2012).

Significant sources of funding have been identified to be (Midgley, 2011):

- public-private partnerships account for 48% of all the schemes;
- advertising companies (such as Cemusa, Clear Channel and JCDecaux) accounts for 20% of the schemes;

- non-advertising companies-suppliers account for 28%;
- public sector (such as municipalities, public transport agencies and, municipal parking agencies), accounting for 30%;
- for-profit company NextBike accounts for 7%
- new Chinese companies, like Forever Bicycle Company, account for 4% of Chinese 14 systems, including the Hangzhou Public Bicycle.

The access to substantial funding is rare. In Europe, the European Commission has the CIVITAS program providing support to the selected cities in developing bike-sharing schemes. The most important program is in Spain, where the Institute for Diversification and Saving of Energy (IDAE) provided € 2.5 million in 2008 to support the development of 56 schemes with more than 8,000 bicycles (Midgley, 2011).

Many start-ups in North America receive start-up funds from local, state and federal government. Operational costs usually are funded through a combination of user fees, advertising, and sponsorships. In Europe, advertising-based business models and funding are more common, while in North America sponsorship is the primary systems. The only difference might be whether an advertising firm runs the program, or the program sells advertising (Shaheen, et al., 2012).

Users fees can be in various forms but are usually low (Midgley, 2011): subscription for daily, weekly, monthly memberships and rental fees collected by all the major bicycle-sharing systems. For example, many schemes offer 30 minutes free of charge service and then apply a low fee (Shaheen, et al., 2012).

Depending on the business model revenues can also derive from advertising (but in many cases, such as Vélib, this revenue goes to the city and not the operator), other subsidies, or parking revenues, government grants and sponsorships (Midgley, 2011).

#### *Bike-sharing schemes' profitability*

The profitability can be very different from scheme to scheme, primarily depending on their purpose and business model. A bike-sharing system is financially sustainable when the revenues (for example from the users) cover the costs, but this is not the case for most of the schemes (Shaheen, et al., 2012). Factors impacting the profitability are (Shaheen, et al., 2014):

- Bike-sharing stations' location: in North America, stations located in "High-density Mixed-use locations" generates the greatest ridership but not the highest revenues. "Tourist locations" generate the highest revenues; thus, casual users account for the highest revenue and members account for the greatest ridership. "Park-and-ride" phenomenon is the biggest success of the stations located close to an automobile parking, which is an important factor to consider when locating the kiosks;
- Membership retention: how many annual or seasonal members renew their subscriptions after the expiration;
- Discount: whether membership is sold at a discounted price;
- New revenues sources: like an occasional user package, new sponsor revenues, selling of advertising spaces, online store.

*The importance of partnerships for funding and operations*

The establishment of partnerships is fundamental not only for the availability of capitals but also for the policy support, playing a critical role in the success of the bike-sharing scheme from an operational perspective. There are different types of partnerships (Shaheen, et al., 2012):

- Revenue-enhancing partnerships are among the government, the private sector, and the bike-sharing operators, like station sponsors, corporate sponsors, corporate memberships, federal/General Services Administration (GSA) memberships, or also with carsharing organizations. Examples are agreements with local bike shops to provide helmets discount, in particular, those with carsharing organizations and public transit agencies (for discounts and combined public transit cards) and with health insurance providers (for free or discounted membership), which are believed to be among the most beneficial for public bike-sharing users. The collaboration with governmental agencies is a crucial factor because they can amend local ordinances to enable bike-sharing programs.
- Partnerships to enhance equity and system access have the function to allow the use of debit cards as an alternative to credit cards since this requirement is a barrier to bike-sharing use. Partnerships with banks (like Washington D.C., Capital Bikeshare) permit to have discounted memberships, in this way they can obtain an increase of membership and an easy way to obtain the required debit or credit card for the users.

- Public transit partnerships' role is encouraging modal connectivity by collocating bicycles at public transit stations. Public transit authorities can provide bike parking areas and bike racks on buses and allow bicycles on trains. The support can include technological integration, by providing information on transit routes, station maps, and bicycle availability and the development of a universal public transit/bike-sharing card. Digital linking, such as integrating real-time data, apps, websites and online maps, with public transit is also critical. Public transit discounts and collaboration with carsharing operators are other partnerships that could encourage public bike-sharing schemes expansion and modal connectivity.

#### *Operational perspective: rebalancing issues*

Containing the costs for operations is critical for the success of the bike-sharing schemes. More massive schemes must face more difficult rebalancing problems. Rebalancing means to move bicycles across the network to maintain a reasonable distribution across docking stations (Fishman, 2014). Operationally speaking, there is the distinction between pre-rebalancing (re-locating bicycles before the start of the commute) and re-balancing (re-balance the system in response to commute patterns) (Shaheen, et al., 2014).

#### 1.1.5 BIKE-SHARING ADOPTION

##### *Adopters' objectives*

Motivations for adopting a bicycle-sharing program are different from jurisdiction to jurisdiction. However, the generation of revenues is not the primary purpose (DeMaio & Gifford, 2004), while the main adoption purposes are correlated with environmental, social and transportation-related benefits. For example, bicycle-sharing schemes can help to reduce global climate change, urban traffic congestion and, oil dependency. Therefore, for decision-makers, bike-sharing schemes are a new innovative sustainable transportation strategy (Shaheen, et al., 2012), which is especially the case for the later adopters, such as Asian countries, where there is an increasing interest among public authorities and the community. For example, the Asian Development Bank was planning to implement pilot schemes in South Asia (Mateo-Babiano, 2015). Bike-sharing schemes have some advantages in the adoption process compared to other transport modes (i.e., shuttles, buses), such as lower costs of implementation (Shaheen, et al., 2012) and are also a zero-emission mode of transport (Fishman, et al., 2013).

Synthesizing the purpose for adoption of public bicycles programs:

- Reduce traffic congestion (DeMaio & Gifford, 2004) (Shaheen, et al., 2012);
- Enhance mobility by providing more options, faster transits and, connections between different modes (Shaheen, et al., 2012) (Larsen, 2013). In particular, bike-sharing systems have been seen as an innovative instrument to solve the “first/last mile problem”, which is the short distance trip between home and public transits and the working place or the destination, that are too far to reach by walking (DeMaio & Gifford, 2004) (Shaheen, et al., 2010) (Ricci, 2015). By reducing the gap in the existing transportation network, bike-sharing schemes encourages individuals to use multiple transportation modes and rely less on private and motor vehicles (Shaheen, et al., 2014);
- Improve the environmental quality and reduce the oil dependency, by decreasing fuel use and emissions through transport mode shifts from polluting means (Shaheen, et al., 2012) (Ricci, 2015) (Fishman, et al., 2013) and strengthen sustainable transports (Larsen, 2013);
- Increase health, since bicycles are a zero-emissions transport mode, which can improve urban livability (Fishman, et al., 2013), and a way to exercise, decreasing stress and losing weight (Shaheen, et al., 2014) (Ricci, 2015);
- Attract more young people (Larsen, 2013) and establish a cycling culture (Ricci, 2015), especially in Asia, where the bike-sharing schemes implementation is aimed at creating a “smarter society” with a new culture and changing the travel behavior (Mateo-Babiano, et al., 2017);
- Support local businesses (Larsen, 2013) and economic development, increasing spending on economic activities which would not have occurred without the bike-sharing system (Shaheen, et al., 2014) and touristic activities (Ricci, 2015);
- Improve road safety, in particular for cyclists (Ricci, 2015);
- Enhance the image and livability of cities (Ricci, 2015).

### *Obstacles to adoption and challenges for users*

Though bike-sharing schemes can achieve multiple benefits, there are also obstacles for the cities in adopting one for different reasons.

For bike-sharing programs operators, significant concerns are the difficulties and costs for operating (Shaheen, et al., 2010) (Midgley, 2011), especially in Asian countries (Mateo-Babiano, et al., 2017). Although the introduction of advanced technologies has reduced theft and vandalism, costs are still very high if not even higher than previously (Shaheen, et al., 2010). Overall, benefits seem to outweigh the costs related. The redistribution of the bicycles fleet is still one of the most significant cost, especially in vast cities where the bike-sharing scheme is large (Shaheen, et al., 2014) and where hilly suburbs reduce willingness to ride a bike from a lower point to a higher point. Manual redistribution usually employs trucks, like in BIXI and Hangzhou Public Bicycle (Shaheen & Guzman, 2011), but price incentives can be used to make users to park the bikes where demand is high. Users may be less satisfied due to lack of availability of bicycles at the stations, but real-time information systems generated from data elaboration may help the redistribution and creation of incentives for users (Fishman, 2015). To rebalance the fleet, operators usually employ motor vehicles which are not only a consistent cost but can also reduce the environmental image of the system.

Safety and liabilities are significant concerns for both bike-sharing schemes adopters and users, along with the lack of bicycle facilities (DeMaio & Gifford, 2004) (Fishman, et al., 2013). Crashes and collisions risks are the main concerns for users and even more for unskilled riders (Midgley, 2011). However, when riding public bicycles, the safety is perceived as higher because drivers and motorcyclists pay more attention to the roads and perhaps this is also because public bicycles are slower and more visible (Fishman, 2015). Furthermore, the level of accidents occurred with public bikes is lower compared to the level of personal bikes' accidents (Shaheen & Guzman, 2011). The presence of bicycles lanes has helped the implementation of bike-sharing schemes, bicycle priority and safety and creating a bicycle culture (Midgley, 2011).

A factor varying much across countries is the mandatory helmet legislation (DeMaio & Gifford, 2004) and insurance liabilities and conflicts (Shaheen & Guzman, 2011). Some jurisdictions have mandatory helmet legislation, and where it is not mandatory, such as in most of the U.S. states, many cyclists do not wear one. The helmets usage percentage is lower among public-bicycle schemes users compared to private riders, and the main reason is that helmets are not provided or not easily accessible (Fishman, et al., 2013), and because casual users do not know in advance whether they will ride a bicycle during the day or not (Shaheen, et al., 2012).

Countries and cities requiring mandatory helmets, such as Australia, Seattle, Vancouver reported significant reductions in bike-sharing usage (Shaheen & Guzman, 2011) (Fishman, 2015). There have been some attempts to provide helmets, such as in Seattle and Vancouver (Shaheen, et al., 2014), with helmet distribution points and sanitizing machines. Seattle launched the bike-sharing program called Pronto in 2014, and despite the scheme announced that users could access free helmets available at the docking stations, it reported a 30% reduction in usage because users must comply with the law (Fishman, 2015). Some jurisdictions even arrived to modify the legislation, making exemptions for public bicycles schemes. For example, the low usage of CityCycle due to helmets requirement, lead to a 24 months trial issued by Parliamentary Committee to exempt cyclists aged 16 years and over from using a helmet when riding in parks, on footpaths and cycle paths and roads with a speed limit of 60km/h (Fishman, 2015). Also, the city of Dallas, Texas, has revoked the compulsory helmet law when considering the implementation of a bicycle-sharing scheme (Shaheen, et al., 2014).

Geographical issues may impact bike-sharing schemes, such as topography and climate (Midgley, 2009), which make some schemes to operate only seasonally, or slopes more than 4%, which are a high limit for cyclists who are not willing to return the bikes to upper locations (i.e. in Barcelona) (Midgley, 2011). In Asian countries, there are other types of urban challenges compared to Europe and North America, such as dense urban centers, differences in the interaction between the formal and informal transportation (buses vs. rickshaws, paratransit), a higher share of active travel (walking and cycling). All these differences require a diversified supplement of the transport system (Mateo-Babiano, 2015).

Apart from the differences in the land use mix, which in Asian countries is impacted by the rapid urbanization (Mateo-Babiano, 2015), local people and culture also play a role in determining users' willingness to ride public bicycles. Different mobility culture, travel behavior, and practices might impact the success of a bike-sharing system, for example, in India, non-motorized transportation means are considered as lower classes' transport modes. In conclusion, apart from all the barriers discussed above, the most critical factors of a public bike-sharing scheme's success are the government's and citizens' support (Mateo-Babiano, et al., 2017).

### *Users: opinions, characteristics of ridership and purposes*

Different types of users seem to have different trip purposes, elements varying from user to user are residential location, age, gender, ethnicity, ownership of cars. For example, in Japan, many pilot schemes received little participation due to a high amount of old people.

Across Europe and North America, the most common trip purpose is commuting to work and to school (Shaheen, et al., 2014) or being combined with other modes for these purposes (Fishman, et al., 2013). Another popular trip purpose is leisure and sightseeing, but it depends on the type of user. For example, a long-term subscriber of CityCycle in Brisbane, Australia, uses the bicycle to commute to work, while a short-time subscriber tends to use the bikes for leisure. Another scheme reporting high entertainment purposes, such as everyday errands and personal appointments, is Capital Bikeshare, Washington D.C. (Fishman, et al., 2013). Thus, it is impossible to distinguish by countries the primary purpose for using bike-sharing schemes, the reports from users clearly show a mixture of reasons within a country. In China, a study across the country shows that the principal purpose for establishing a shared bicycle scheme is commuting to work in Beijing, while users in Shanghai stated it is to go back from work. In Hangzhou, purposes are more various, including more leisure and sightseeing (Yang, et al., 2018).

Overall, the main reason for users to adopt bike-sharing is convenience (Shaheen, et al., 2012) (Ricci, 2015). Where bike-sharing schemes are the most convenient transport mode, they are successful in attracting users and switching their choices, for example, from private bicycles like in China (Yang, et al., 2018). Also, for other BSPs convenience is the main reason for users to ride a bike, such as in Washington D.C., Minneapolis/St. Paul and Melbourne (Fishman, et al., 2013).

Saving money appears to be motivating users in some PBS schemes, such as for the low-income Capital Bikeshare's users in Washington D.C. and London, while in Australia, this is not a very motivating reason since members are mainly high-income population (Fishman, 2015). Generally, bike-sharing programs' users are highly educated and have higher income compared to average levels (Shaheen, et al., 2014) (Ricci, 2015). Also, users usually have an employment (Fishman, et al., 2013), for example, in North America, many users live close to their workplace and use the bikes for commuting (Shaheen, et al., 2012). However, it seems that compared to regular cyclists, the users of bike-sharing schemes have lower income, at

least in North American, Washington D.C. (Fishman, 2015). Users in London are mainly wealthy, but with the spread of the scheme, the proportion of users of deprived areas increased (Fishman, 2015). Policy concerns must be considered to solve the equity issue because the bike-share has the potential to help the low-income population, but the schemes must be accessible to deprived areas and low-income population. An attempt to help low-income people to get access to bike-sharing was made by Capital Bikeshare, which partnered with the Bank to help those who do not possess a credit card to access with debit cards and discounts on membership. Both Capital Bikeshare and Nice Ride Minnesota did not require a deposit for low-income communities, and many other schemes adopted such strategies to alleviate the equity issue (Shaheen, et al., 2014) (Ricci, 2015).

While users are generally young people over worldwide schemes, gender is very different (Shaheen, et al., 2014) (Fishman, et al., 2013) (Ricci, 2015). Most of the schemes appear to have higher male participation, such as Capital Bikeshare scheme's users, and in London (Fishman, et al., 2013). It seems that in countries with a generally low level of cycling (such as the UK, the U.S., and Australia) bike-sharing trips are mainly made by, while in higher cycling level countries, women cycle more than men. Other schemes have both sexes participation, such as BIXI in North America and Australia (Fishman, et al., 2013). A study conducted on Capital Bikeshare, Washington D.C., shows that compared to regular cyclists, the number of females is higher in the bike-sharing scheme, mostly young and not owning a car. Usage purposes are different for men and women. For example, in China, it emerged that women are more likely to make multiple trips and multiple-circle trip chains perhaps to carry out household jobs and take care of the children and make group trips (Shaheen, et al., 2014). In London, a similar tendency has been observed because women are more likely to take slower traffic routes than large and multi-lane roads (Ricci, 2015). Women seem to report more trips for errand purpose, while men tend to report more commutes trips by bike-sharing (Fishman, 2015), in fact, very often the trips end in parks or are made on low-traffic routes, confirming other types of purposes rather than commute to work.

The ownership of a personal bike may impact users' tendency to use bike-sharing. It emerged that who owns a bicycle is more interested in bike-sharing schemes, and this confirms that users of public bicycles are generally more likely to cycle independently from the existence of

the scheme. However, sometimes who owns a bike can be less likely to use a public bike, such as in Montreal, Canada (Fishman, 2015).

Car ownership has a high impact on the participation in bike-sharing. Where cars are still the most convenient mean of transportation, people are not willing to use a bicycle, challenging the purpose to reduce car ownership and usage.

### *Bike-sharing schemes impacts*

While adopters' objectives are evident, the bike-sharing schemes' real impacts might not always reflect the goals. Impacts are difficult to quantify due to the lack of data and benefits are usually exaggerated (Midgley, 2011). In line with the purposes for adoption, impacts of bike-sharing include changes in the travel behavior, social, environmental, financial and health benefits (Shaheen, et al., 2010) and involve both the individual user and the community (Shaheen & Guzman, 2011).

Switching choices from motor vehicles, such as cars, towards bike-sharing is an important goal to reduce emissions, help the environment and improve the air quality (Shaheen, et al., 2012) (Ricci, 2015). While the impact on mode substitution is evident, there is no clear evidence on the fact that the bike-sharing programs are helping to reduce the emissions. The replacement of trips, otherwise made by car for short connectivity trips, is not always met, because the switch rate from motor vehicles to bicycle could be low, or bicycle trips might be substituting other eco-friendly ways, such as walking or private bike trips (Midgley, 2011) (Ricci, 2015). For example, a UN report found little impact on reducing car use in Barcelona, Lyon, Montreal and Paris, as well as in Dublin, London and Washington D.C. (Fishman, et al., 2013). In China, there is a low proportion of private vehicles ownership, which is the reason for low level of switches towards bike-sharing in cities like Beijing, Shanghai and Hangzhou, and in most of the cases people would have walked or used their personal bicycles in the absence of the bike-sharing schemes (Shaheen & Guzman, 2011). Users of higher income seem to switch more from car to bike or from rail to bike, while lower-income users switch more from bus or walking to bike. Thus, only a little proportion of users switches from car to bicycle due to bike-sharing implementation. Some examples show that car trips substituted by bike-sharing schemes are low: only 2% for London BCH (the UK), 7% for Vélo'v (Lyon, France), 9.6% for Bicing (Barcelona, Spain). Outside Europe, is 2% for BIXI (Montreal, Canada), 7% for Capital Bikeshare (Washington D.C.), 19.3% for Nice Minnesota in the twin cities of Minneapolis and

Saint Paul, 19% for Melbourne Bike Share (Australia), and 21% for CityCycle (Brisbane, Australia) (Fishman, et al., 2013). Furthermore, car trips substituted by bicycles could vanish when using trucks to rebalance the system (Ricci, 2015). A study conducted in London indicates that bike-sharing can increase motor vehicle usage due to the rebalancing problem, resulting in a negative environmental impact. Bike-sharing can be a substitute mode when there is low access to other forms of public transportation, such as in Melbourne (Fishman, 2015).

On the contrary, where other public transportation modes are accessible, bike-sharing plays more a connecting role, such as in London, Washington D.C., and Paris (Shaheen, et al., 2014), but also in Nanjing, China, where bicycles flow is tendentially from residential areas towards subway and bus stations. For example, in Dublin, where public transport is not easy to access, most of the users use the bicycles to connect with the rail stations and secondly with the bus stations, or in Montreal, where BIXI is heavily used in combination with metro, while lesser to connect with buses (Shaheen, et al., 2012). Overall, impacts on the increase or decrease of other public transport usages due to bike-sharing schemes are not consistent, but, bike-sharing is very contributing in solving the first/last mile problem (Parkes, et al., 2013). In some cities, bike-sharing increases the trips made by other modes, such as subway, railway, buses, because it creates better accesses to them. It seems that in larger cities, bike-sharing can decrease other public transit use because bicycles are faster and cheaper, also reducing car usage. Also, the impact on walking is not clear, in some cases, bike-sharing increased walking and in other cases, it decreased walking.

Health impacts mainly refer to public health in term of physical activities. Also, in this case, the increase in cycling does not mean a higher level of exercises, because bike trips may substitute other active modes, such as walking (Ricci, 2015). Health impacts involve different aspects, including physical activity, crashes and, exposure to air pollution. Benefits resulted to be different by gender and age, for example men seems to benefit from reduction in ischemic heart disease and women from reduction of depression (Fishman, 2015). Generally, bike-sharing schemes have the potential to increase physical activity and reduce stress (Ricci, 2015), it is then particularly beneficial for middle-aged and older users (Fishman, 2015).

Changes in travel behavior towards cycling increased the general level of cycling with both private and public bike (Ricci, 2015). Thus, there is an increase of awareness and acceptance of cyclists, leading to higher road safety, because bike-sharing users may also possess a car and bike-sharing cyclists receive higher attention from motorcyclist compared to private cyclists (Fishman, 2012) (Ricci, 2015).

There are economic impacts both on the cyclists and local businesses, such as higher employment possibilities and local businesses enhancements (Ricci, 2015). Individuals using CaBi in Washington D.C. reported to spend more due to trips made by bicycle in the neighborhood and the economic activities increased in locations close to bike-sharing stations in Minnesota.

## 1.2 The market characteristics

### 1.2.1 THE SHARING ECONOMY

The sharing economy has brought innovation to activities which were widespread and commonly occurring in everyday life. Imagine activities such as calling a taxi or staying in a hotel, and nowadays we can call an Uber or book a stay through Airbnb, instead. These platforms let us achieve the same objectives of making a car trip and renting a place to stay, but with the difference that these services are provided through an entirely new system.

Under the new background of the sharing economy, we can also distinguish bike-sharing from the bike rental. In this section, there is the explanation of bike-sharing as a new activity in the sharing economy. The difference between bike-sharing and bike rental is the same difference between calling a taxi vs. Uber and staying in a hotel vs. Airbnb.

#### *Definition and drivers*

The “sharing economy” is a Twenty-first century’s new phenomenon which has an unclear definition. The term became very popular around 2011-2012 in newspapers and articles. It is also known as “collaborative consumption” (introduced in 2010), “peer-to-peer consumption,” “gig economy,” “collaborative economy,” “mesh,” and others; many of these terms overlap in their meaning (Martin, 2016). From these expressions, the concept of sharing emerges to be the central point. The definition is complicated because starting from the term “sharing,” it should indicate a transaction which does not involve monetary benefits. However, monetary exchanges do occur (Martin, 2016). Thus, there have been critics on the fact that there is no

sharing, but on the contrary, there is the selling of goods and products with a money transfer like in a normal market transaction (Marquis & Yang, 2014). So, what is actually “sharing” in these new businesses? Sharing means “access without ownership” (Arun, 2016), that is to say, while in normal markets, the transaction ends with the ownership of a product, in the sharing economy, there is no purchase of goods (which then become private) because the transaction is based on the use of the goods among others (Puschmann & Rainer, 2016). From this perspective, the collaborative aspect emerges to be relevant for the definition of the sharing economy, since there is a short-term “collaborative utilization” (Nica & Potcovaru, 2015) or “consumption” (Dyal-Chand, 2015) of assets without possessing it.

While the sharing economy is a very recent phenomenon, the sharing is not a new concept at all. There were already forms of sharing in business-to-business (B2B) domains, such as the sharing of machinery for production, and in business-to-consumer (B2C) domains, such as the car rental, self-laundry services, video rental, ski rental (Puschmann & Rainer, 2016). Lessing (2008), has defined the sharing economy as the “collaborative consumption made by the activities of sharing, exchanging and rental of resources without owning the goods,” and from a macroeconomic perspective it can be seen as a hybrid market model (Puschmann & Rainer, 2016). The sharing economy is a “hybrid” model between the “gift economy” and “commercial economies” (Arun, 2016).

The gift economy had started in the 1990s when the development of the Internet enabled the creation of global digital networks, and an anti-capitalist movement started a new marketplace of free goods (Marquis & Yang, 2014). In this context, the sharing of various things is an exchange without the involvement of money and expectations of returns (Arun, 2016). For instance, Wikipedia is an online platform, where citizens are free to share knowledge in collaboration with others (Martin, 2016). Thus, what makes the sharing economy’s business models different from previous sharing models is the dependence on the Internet, which provides the platform for the new type of transactions (Nica & Potcovaru, 2015). Technological advancements include the digitalization of information, the growing power of hardware and digital devices and the programmability of advanced machines which permit the complex elaboration of data (Arun, 2016) and the development of mobile phone applications (Bond, 2015).

There are two primary motivations for sharing economy to exist: economic and ecological interests. The lack of good/services of good quality and low prices, the growing crowd in urban spaces have pushed the local economy toward more attention to sustainability (Nica & Potcovaru, 2015) (Puschmann & Rainer, 2016). The sharing economy can promote sustainable consumption practices by shifting away from the culture of consumers' ownership of assets toward a culture of consumers' access to assets (Martin, 2016). This is possible on peer-to-peer platforms on the Internet by connecting consumers and efficiently exploiting the underutilized assets, such as houses (i.e., Airbnb) and cars (i.e., Uber). For example, Uber's motivation to start the business was to reduce waste of space in cars. Shifting away from private accumulation, redress imbalances and helping the world's environmental degradation challenge are among sharing economy's foundations (Arun, 2016).

From an economic point of view, benefits derive from the access rather than ownership of assets for both the provider of the good or service, who can benefit from lower costs of transactions, and the consumers, who enjoy more variety and higher quality goods and services at a more competitive price and more immediate access without paying the whole price to own them. In fact, from a micro-economic perspective, the sharing economy is a collaborative economic model which employs underutilized resources in contrast to the traditional buying/selling of goods and human resources (Bond, 2015). Thus, the sharing economy's activities comprehend the selling of the use, not of the ownership or the selling of goods and services which support the re-ownership, and the exploitation of unused resources, targeting new customers and developing new business models (Puschmann & Rainer, 2016).

#### *Sharing economy's business models*

The sharing economy derives from pre-existent B2B and B2C models, which have changed with the advent of Information Technology (IT) industry's development. The new technological advancement, lead to a new type of consumer-to-consumer (C2C) business model, based on peer-to-peer (P2P) exchanges on an online platform. The digitally mediated relationship between the two peers has been made possible by the Internet (Martin, 2016). The crowd on the Internet becomes the base for the creation of a network for sharing (the platform), like the case of Napster, an MP3 files download service (Arun, 2016). Moreover, like in this case, there are no monetary benefits, leading the sharing economy to be a gift economy (i.e., Wikipedia). Nevertheless, the for-profit models are still the majority, and they

are distinguishable into C2C and B2B models (Parente, et al., 2018). In C2C model, there is a collaborative consumption of the good or service on the network coordinated by a community-based online service, while in B2C the platform is not provided by the crowd, but by intermediaries providing the good or service (Puschmann & Rainer, 2016).

*The sharing economy’s impacts: benefits and challenges*

The sharing economy’s benefits derive from unlocking the underutilized resources, creating new sources of wealth, especially among those with low status-quo (Bond, 2015). Both the supply and demand sides have advantages (Dyal-Chand, 2015), as mentioned before the benefits are mainly economic and ecological.

**Table 2: Sharing economy’s benefits**

Supply side	Demand side
<ul style="list-style-type: none"> <li>- Lower transaction costs through sharing (especially in C2C models);</li> <li>- Redistribution and democratic participation;</li> <li>- Ecological benefits due to waste reduction and higher efficiency in utilization of resources;</li> <li>- Positive brand image, due to ecological vision;</li> <li>- Increase local and international competitiveness.</li> </ul>	<ul style="list-style-type: none"> <li>- Competitive pricing compared to non-sharing economies;</li> <li>- Greater products and service variety;</li> <li>- Speed, customization and other gains;</li> <li>- Convenience from access instead of ownership;</li> <li>- Economic benefits due to low capital investments;</li> <li>- A more sustainable way of consumption;</li> <li>- More equitable access to good/services;</li> </ul>

Sources: (Nica & Potcovaru, 2015) (Puschmann & Rainer, 2016) (Arun, 2016) (Martin, 2016) (Parente, et al., 2018)

The fact that the sharing economy’s models are different from traditional forms of capitalism, as observed above, challenge both the localities and the consumer with regulatory and safety issues (Dyal-Chand, 2015) (Parente, et al., 2018). Local governments have to face legal problems, such as taxes payment and industries’ regulations (Puschmann & Rainer, 2016), as well as the unfair competition and the following complaints from interests’ groups (Nica & Potcovaru, 2015). For example, Uber drivers are competing with traditional taxicabs, and whether these peers should get a license like traditional drivers is a new challenge for pre-existing regulations (Arun, 2016). Apart from anti-competitive issues related to price-fixing and permits requirements to run the businesses, there are even more challenges, such as

workers protection and financial monitoring issues due to the unclear definition of these peers providing goods/services as employees or independent entrepreneurs (Dyal-Chand, 2015).

On the other side, the consumers are facing safety issues deriving from the collaborative utilization of goods/services, which might rise moral haphazard and privacy issues (Nica & Potcovaru, 2015). Sharing economy is based on online platforms, where consumers and providers are connected without knowing to what extent they are trustworthy. Even though the information sharing lead to the creation of monitoring systems, with sanctions for bad behavior, permitting the creation of trust and standards (Dyal-Chand, 2015), still there might remain privacy issues. The fact that trust is digitized, and the transaction are based on new digital social capital, issues concerning privacy are evident for these data-driven platforms (Arun, 2016).

### 1.2.2 BIKE-SHARING AND OTHER SHARED MOBILITY MODELS

There are four main sectors in which the sharing economy brought innovation, which are accommodation, transportation, peer-to-peer employment markets, peer-to-peer platforms for sharing and circulating resources (Martin, 2016). Bike-sharing falls under the shared mobility category, together with car and ride sharing.

The shared mobility can be further classified into carsharing, ridesharing (or carpooling) and bike-sharing (Boyd & Jan, 2014) (Shaheen, 2016).

#### *Carsharing business models*

With carsharing, individuals can have access to a car without owning one. Carsharing's primary objective is to reduce individual ownership of vehicles, bringing benefits for cities' traffic and flexibility for users. The different business models are (Boyd & Jan, 2014):

- Business-to-consumer (B2C), in which a company buys and provides vehicles for renting to consumers for round trips (like Zipcar) or point-to-point trips (like Car2Go). This model requires significant investments;
- Non-profit or cooperative carsharing is community-based for the operations and without financial gains;
- Peer-to-peer (P2P) carsharing heavily relies on the Internet, mobile phones, and web technologies, permitting private peers to rent their cars on an online marketplace (like Relay Rides and Flight Car).

### *Ride-sourcing and ridesharing (or carpooling) business models*

Carpooling is different from carsharing since an individual can share the ride with other people who are going to the same destination or have similar routes, reducing empty seats (Boyd & Jan, 2014). The models are:

- Non-profit or cooperative carpooling: is the dominant model for ridesharing as the primary objective is to contribute in the reduction of traffic congestion;
- Vanpooling: is the sharing of a van with more passengers and it is mainly corporate-sponsored or privately operated;
- P2P ride-sourcing: is the newest model enabled by the technological achievements. Examples are Uber and Lyft, which are gaining increasing market shares and are motivated to make profits.

### *Bike-sharing business models*

Bike-sharing is a service for the provision of bicycles to individuals who can ride them without owning one. There are different ways to operate a bike-sharing service:

- Street furniture bike-sharing: such as those provided by the global advertising companies, like JCDecaux, which collaborate with cities to promote cycling and enhance mobility;
- Publicly owned bike-sharing: bicycles are provided by the city, which has full responsibility for the operations;
- Sponsorship-based bike-sharing: can be publicly owned and run by a third-party operator to promote the public image rather than generate advertising revenues, or operated by a private company which obtained a sponsorship;
- Non-profit bike-sharing: are programs which aim at being self-sustainable or are supported by funds from government or non-profit organizations.

### *Sharing economy's characteristics relevant to bike-sharing*

We could not have the sharing economy platforms ranging from housing (i.e., Airbnb) to finance (i.e., Kiva), from education (i.e., Trade School) to transportation (i.e., Uber) without the widespread use of the Internet and technological advancements such as the GPS, mobile phones, applications and software, digitalization, which are all at the base of the sharing economy (Arun, 2016). Regarding bike-sharing, at the very beginning, it was closer to the gift economy because it meant to be a transportation solution to reduce urban problems, such as

lack of connections, traffic and, pollution. The first bike-sharing program, Amsterdam's White Bikes, is the perfect example to understand the principle of gift economy as people could benefit from a shared good or service without having to pay.

There is a middle stage in bike-sharing evolution before arriving at the latest and closest to the Chinese dock-less bike-sharing model, which can be fully considered a sharing economy industry. This intermediate phase sees different public and private, or mixed, business model, in which the bicycles are provided as part of public bike-sharing programs, the majority of which apply a fee for the service. The objective of the public bike-sharing program is to provide additional transportation service in the city and reduce traffic and motor vehicles usage. Profit making is not the primary goal of these schemes, despite it is crucial because their success depends on the capacity to cover the costs with the revenues.

With the third-generation bike-sharing systems, we can say that bike-sharing can be fully considered as a sharing economy's industry, because of some key factors, including technology advancements and the consequent development of new marketplaces (Shaheen, et al., 2016). Third-generation generation bike-sharing schemes apply advanced technology and, most of them have an online platform (kiosks, mobile app, website). However, the fact that most of the public-bike sharing programs service's purpose is different from those offered by platforms such as Uber or Airbnb, the Chinese style dock-less bike-sharing model is the closest one to the other industries' in the sharing economy. Despite the Chinese companies' claim to provide a green transportation mode as the public bike-sharing schemes, they are *de facto* private companies providing a service to make a profit and grow.

In conclusion, both public bike-sharing and dock-less bike-sharing model are part of the sharing economy, but not with the meaning of the gift economy (except for few cases of free services). The type of bike-sharing investigated in this research is a form of capitalism, in which there are monetary transactions and a platform connecting peers to peers, or businesses to peers. The sharing economy as crowd-based capitalism is an economic system with some peculiar characteristics (Arun, 2016). In Table 3, there are the sharing economy's characteristics as crowd-based capitalism, integrated with considerations on the peculiarities of the bike-sharing industry as a sharing economy's industry. As the shared mobility is the sharing of vehicles without owning them, its subcategory, the bike-sharing, is the shared use

of bicycles, (Shaheen, 2012). The modern interpretation of bike-sharing, especially of the Chinese dock-less bike-sharing, is to be a type sharing economy, that is the “shared mobility” (Boyd & Jan, 2014). This categorization is more suitable for bike-sharing systems starting from the third generation because they employ improved information and communication technologies (Boyd & Jan, 2014), which are also the basic characteristics of the sharing economy (Arun, 2016). Thus, concerning the shared use of bicycles fleets, only the third and the fourth generations of bike-sharing systems can be collocated in this new market.

**Table 3: Characteristics of bike-sharing as a sharing economy business model**

<b>Crowd-based capitalism</b>	<b>Bike-sharing</b>
Largely market-based: sharing economy creates new markets for goods and services	The share of bicycles is the new service
High-impact capital: refers mainly to the new opportunities gained through the full exploitation of goods capacity	The mobility enhancement and the higher access of bicycles can reduce waste of resources, such as using private or public motor vehicles to connect for first/last mile distances or owning a bicycle that might be rarely used
Crowd-based “networks” rather than centralized institutions or “hierarchies”: the supply of goods is decentralized. Peer-to-peer model is the base of crowd-based capitalism and it is very clear in shared mobility platforms, such as Uber, where someone who owns a private car can rent it as taxi to another peer.	However, in bike-sharing systems, the bicycles are not generally offered by an individual private peer (someone’s personal bicycle), but mostly offered by an operator. The operator can be a government (public) or a private company. The “decentralization” happens to the extent in which the bike-sharing systems, such as many third-generation public bike-sharing programs and the Chinese style dock-less bikes, are not provided by government or started and supported by governments.
Blurring lines between “personal” and “professional” as private peers can provide the goods and the services, which were previously provided only by specific professionals	In bike-sharing, the distinction between “personal” and “professional” is different as the bicycles are not generally provided by private individuals, but by an operator. The level of expertise is close to the bike rental services’ level
Blurring lines between fully employed and casual labor and between dependent and independent employment	It is not fully relevant to bike-sharing, because most systems do not involve a private person offering his own bicycle

Source: (Arun, 2016) and personal analysis

### *Shared mobility: different challenges*

From the definitions described above, we can conclude that bike-sharing has fewer complications compared to other shared mobility models, such as P2P car-sharing and ride-sharing business models, in which a private peer is involved. In these cases, more concerns are in the following aspects (Arun, 2016):

- Moral haphazard, related to the fact that an unknown person is providing the good or the service (i.e., Uber drivers, Airbnb hosts), while in the bike-sharing systems, there are no contacts with private individuals. The need to build “trust” is a smaller concern in bike-sharing, where the only problem is related to users’ accountability and conduct in theft and vandalism issues.
- Regulatory challenges, such as taxes payment, expertise, and qualification required to provide goods and services, concerning models such as Uber, are not relevant in bike-sharing because the peer providing the bicycles are not private citizens. For bike-sharing, the types of regulatory challenges are, for example, local helmet requirement and road safety rules, as well as insurance and liabilities issues<sup>6</sup>.
- Employment definition and workforce protection, like wages low wages, elimination of benefits, high level of job insecurity as opposed to increased flexibility, fluidity, innovation and creativity are not very relevant for bike-sharing.<sup>7</sup>

### *Shared mobility: different impacts compared to bike-sharing*

Despite the differences between bike-sharing and other shared mobility models, common innovative characteristics with the broader sharing economy are that sharing bikes, cars or rides on an on-demand basis can help issues like traffic increasing urban density, congestion, and sustainability (Boyd & Jan, 2014).

Sharing economy's positive impacts derive from the principle of sharing. By sharing, it is possible to increase the access to goods and services and at the same time to reduce waste of resources by exploiting the “value of spare capacity.” For example, by renting out the empty house or the underused car, there is less necessity to build new houses or produce cars, and there are more spaces and less congestion in urban areas due to the reduced number of total buildings and vehicles (Arun, 2016). With the same objectives, shared mobility offers better

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<sup>6</sup> Chinese dock-less bike-sharing model’s regulatory challenges are discussed in Chapter 2.

<sup>7</sup> For the Chinese dock-less bike-sharing model, the topic is discussed in Chapter 2, in the section 2.3.

services, more variety and flexibility, while also reducing congestion, commute times and single occupancy of vehicles.

More specifically in bike-sharing, there are other benefits related to cycling, which can also increase health due to exercise and reduced emissions. Shared mobility business models are sustainable transportation strategies because they achieve important objectives such as (Boyd & Jan, 2014):

- Fewer trips;
- Modal shift;
- Distance reduction;
- Increased efficiency.

However, there are some different results between different type of shared mobility ((SUMC), Shared-Use Mobility Center, 2017):

- While bike-sharing is highly used for commute purposes, ride-sourcing is mainly used for recreational purposes with low use to commute;
- Bike-sharing impact on the reduction of car trips is low and, it may create a shift from other public transit modes, on the opposite, ride-sourcing appears to reduce more the car trips rather than public transit trips.
- Public transit such as buses and trains are the most used modes for every level of incomes, but lower income people seem more likely to adopt car-sharing rather than bike-sharing.

## CHAPTER 2 – BIKE-SHARING IN CHINA

### 2.1 Chinese bicycle history and the public bike-sharing

Since its first introduction in China, the bicycle has been an essential instrument for people's transportation. After the first stage of limited possession of this western-imported good, China has transformed to become the "Kingdom of Bicycles" in the 1970s (Shaheen, 2011). By this time, the bicycle has become an affordable good for most of the low-income families and a traditional good in people's life.

At the end of the 20th century, motorized vehicles and electric bikes (e-bikes) steadily replaced the bicycles. The economic growth increased Chinese people's income, allowing an

increasing number of families to buy cars. The urban environment has been changing according to the economic development policies and the diffusion of the car culture. Despite the era of rapid motorization and urbanization, which are the result of the economic development advocated by the Central Government, cycling and walking are still the Chinese people's main trip modes (Pan, 2011).

After the emergence of environmental concerns and traffic congestions issues caused by excessive urbanization, the bicycle has been revised as a sustainable means of transportation capable of solving the ongoing traffic and emission problems. The Central Government led the first steps in favor of bicycles' return, with the elaboration of new guidelines on environmental matters which must be followed by the local governments. Consequently, many localities launched public bike-sharing programs to tackle urbanization and pollution problems. Because of the decentralized structure of the Chinese State's structure, the localities must take full responsibilities of PBS projects' implementation.

Before entering the core of this research in the second part of this chapter, there is a brief overview of the evolution of bicycles in China. Next, the chapter analyses the literature on the Chinese transportation policies changes relevant to bicycles development and the public bike-sharing programs implementations. Lastly, there will be the review of some localities' cases of public bike-sharing schemes implementation before going into the further evolution of bike-sharing: the dock-less bike-sharing model.

### 2.1.1 BICYCLES DEVELOPMENT IN CHINA

#### *The introduction of the bicycle in China*

The first appearance of the bicycle in China was in the Sixties of the 19th century<sup>8</sup>. The Chinese Empire has introduced bicycles in the 1900s as a luxury good, and since then the number of bicycles has been growing until the end of the century (Zhang, et al., 2014). From its first introduction to 1978, the number of bikes grew slowly because only wealthy families could afford wester-imported goods. Besides, the first bicycles in China were low-quality, uncomfortable and unstable to ride, and too expensive. Shanghai was the city with the highest number of bicycles<sup>9</sup>. In 1950, the Chinese bicycle brand Feige (飞鸽 *Feige*), which started since

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<sup>8</sup> 自行车王国的重生：共享单车成中国新名片！ <[http://www.xinhuanet.com/world/2017-11/25/c\\_129749125.htm](http://www.xinhuanet.com/world/2017-11/25/c_129749125.htm)>

<sup>9</sup> Ibid.

1939 in Tianjin, first developed the entirely Chinese-manufactured and high-quality bikes, which were so fast that they gave the name of the brand. Many other brands established, such as the most famous Yongjiu (永久 *Yongjiu*) and Phoenix (凤凰 *Fenghuang*). Under these three most important names, the bicycle became China's first widespread manufactured good.

#### *China becomes the “bicycle kingdom”*

The second phase of growth arrived with the economic reform in 1978. With the opening to the western countries, the bicycles became affordable also for lower-income households, despite the fact it was still a precious good. In fact, for a developing country like China during that time, bicycles were not only a transportation solution but also a symbol of economic growth. Thus, bicycles got the policy support, with the construction of bike facilities. Bicycle ownership reached the peak in 1993 in urban areas and 1995 in rural areas and strongly depended on the income. In 1988, the lower income households' bicycle ownership surpassed, the higher income households' ownership as a consequence of the fact that the wealthiest shifted towards motor vehicles (Zhang, et al., 2014).

In 1981, the State Council (中国国务院 *Zhongguo guowuyuan*) announced great support for the development of bicycles, sewing machines, and other daily use electromechanical goods. By 1986, China reached a total production amount of 32.29 million bikes in all colors and sizes. In the 1980s China reached 500 million bikes, becoming the “bicycle kingdom”: at that time Beijing's population was 10 million people and had 8 million bikes, this means that, excluding the children and the elderly, everyone possessed one.

Despite the great diffusion, bicycles were still a precious good, in fact, even for getting married, it was essential to possess at least a watch, a sewing machine, and a bicycle. For example, a Yongjiu bike costed CNY 170, while an average salary was about CNY 20. Possessing a bike equaled to have transportation mean for people and objects, it was a sign of wellness for the families<sup>10</sup>.

#### *Urbanization and motorization: the decrease of bicycles*

The following phase is the reduction of bicycles starting from 1995 (Zhang, et al., 2014). The growth in numbers of motorized vehicles resulted in a conflict with the bicycle use. Central and local governments started to regulate bicycles flows in the cities and these actions

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<sup>10</sup> Supra, note 8

drastically reduced the use of bicycles, which are considered a danger for the traffic flow. Despite the reduction of bicycles, there was a growing number of electric bikes starting in 1998. The government supported the electric bikes until 2002 because they were considered a cleaner vehicle compared to motorized vehicles. Additionally, e-bikes are more convenient for longer distance trips compared to bicycles, and their price is also very accessible. Electric bikes increased roads unsafety mainly because of the National Electric Bike Standards, which set the weight limit to 40kg and speed limit to 20km/h and applies to both the scooter-style electric bikes (SSBEs) and the bicycle-style electric bikes (BSEBs). This resulted in the constant violation of the limits by the SSBEs, even leading the Central Government to declare the ban of electric bikes in 2006 but soon after repealed (Zhang, et al., 2014). The non-compliance with safety rules is also determined by the fact that electric bikes are considered non-motorized vehicles, which do not require a license, the registration of the vehicle and the requirement to wear helmets. Also, their regulation falls under the local jurisdictions, which have their policies supporting or non-supporting e-bikes (Zhang, et al., 2014).

#### *Rejuvenation of cycling: a solution for the urban illness*

Cycling gradually became more difficult in the cities but, since the beginning of the 21<sup>st</sup> century, it also became the symbol of a new lifestyle: exercise, health, and leisure<sup>11</sup>. From 2002 there is the inception of a new phase supporting the rebirth of bicycles to fight against the environmental problems, traffic congestion issues, and the car culture. Soon after, public bike-sharing programs emerged in many cities as a complementary, and not a competitive, public transport mode (Zhang, et al., 2014). Bicycles are considered green, convenient, fast, and advantageous, consequently, in the last years, more than 100 cities have developed public bike-sharing schemes, starting from the most important examples of Hangzhou and Beijing<sup>12</sup>. Bike-sharing has been designated as the solution for the “last-mile problem” (Liu, et al., 2012).

#### 2.1.2 INSTITUTIONAL FRAMEWORK AND POLICIES

China has a peculiar state structure, which is denominated as “regionally decentralized authoritarian (RDA) regime”<sup>13</sup> (Xu, 2010). The transportation sector responds to the same structure, in which the Central Government provides policies and guidelines, while the

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<sup>11</sup> Supra, note 8

<sup>12</sup> Ibid.

<sup>13</sup> China is recognized to be an authoritarian regime, but with a decentralized structure. The definition as “regionally decentralized authoritarian regime” (Xu, 2010) is given because the political power is in the central government’s hand, while the economic development’s burdens are on the regional governments.

implantation is carried out by the cities. The decentralization of governmental functions is necessary for a large country such as China, where each province has its peculiarities. As a result, essential public services are said to be provided by the government, but the major responsibilities and all the burdens are on municipal governments, which carries the duties of providing education, healthcare, as well as urban transport services (Pan, 2011).

The State Bureau of Quality and Technical Supervision (国家质量技术监督局 *Guojia zhiliang jishu jian du ju*) and the Ministry of Construction (建设部 *Jianshe bu*), which released the Standard of Urban Road Traffic (城市道路交通标准 *Chengshi daolu jiaotong biao zhun*) in 1995, are at the central level of the transportation sector. Under this law, for the first time, bicycles were regulated with the aim to give priority to the growth of motorized vehicles by defining the ratio of bicycles and public transport trips and separating the lanes for the circulation of bicycles and motor vehicles (Zhang, et al., 2014).

Under the policies supporting the economic development and the promulgation of the automotive and industrial policy in 1994, bicycles immediately started to diminish, while also substituted by cars, which increased from 1 million in 1884 to 32.7 million in 2008 (Pan, 2011). The rapid urbanization and motorization, which resulted from economic growth, drastically changed cities aspects and lead to severe environmental problems and traffic congestion. In addition to the health problems related to the pollution, there are also social equity issues. The growth of private cars created unbalanced resources allocation, which were mainly going to the construction of motorways and highways, while households without a car cannot benefit from the public infrastructures as higher income households which possess cars (Jiang, et al., 2017).

Mainly to meet the new environmental restriction established by the central government, such as the Air Pollution Control Act (大气污染防治法 *Daqi wuran kongzhi fa*, passed in 1987 and revised in 1995 and 2000) there have been many actions to reduce vehicles' emissions, such as the establishment of the vehicle emission standards of 2000, followed by many phases of implementation (Pan, 2011). The White Paper of Shanghai Urban Transport Development issued by Shanghai in 2002 marked the inception of the new phase for bicycles (Zhang, et al., 2014). For the first time, there was a document defining bicycles as a green transport mode and a solution for pollution and traffic congestion and not as a competitor for other public

transportation modes. Finally, the Chinese national government gave more importance to road safety with the Road Traffic Safety Law (道路交通安全法 *Daolu jiaotong anquan fa*) of 2003, which went into effect in May 2004. The Article 19 of this Law gives the definitions of motor, and non-motor vehicles and states that both bicycles and electric bikes are in the latter group, while in Section 3 there are the rules to which non-motor vehicle must comply (npc.gov.cn, s.d.).

The Ministry of Construction issued the guideline on public transport development in April 2004, and urban infrastructures became fundamental to the cities after the “Advice on Economic Policy for Priority Development and Reform Commission” (关于优先发展和改革委员会经济政策的建议 *Guanyu youxian fazhan he gaige weiyuan jingji zhengce de jianyi*) issued by the Ministry of Construction, the National Development and Reform Commission (NDRC, 国家发展和改革委员会 *Guojia fazhan he gaige weiyuan*), the Ministry of Finance (财政部 *Caizheng bu*) and the Ministry of Labor and Social Security (劳动和社会保障部 *Laodong he shehui baozhang bu*). In May 2004, the Premier Wen Jiabao declared his support to the strategy of giving priority to the urban public transports’ development. The State Council issued a document approving the opinion of the Ministry of Construction regarding the prioritized development of urban public transport in 2005, which is the beginning year of the “Transit Priority” (公交优先 *Gongjiao youxian*) policy that has spread from the State Council and the Ministry of Construction to all the governmental levels below (Pan, 2011).

In 2006, the call of total energy reduction planned by the Eleventh Five-Year plan (“十一五”规划 *“Shi yi wu” jihua*) (2006-2010), and the growing environmental concerns gave birth to new guidelines. In December, the “Advice on Economic Policy for Priority Development of Urban Public Transport” has been issued by the State Council, the NDRC, the Ministry of Finance and the Ministry of Labor and Social Security, which entirely gave the responsibility for public transportation development to cities’ governments.

In 2007, the Priority for public transport development policy was one of the main points listed by the State Council, which mentioned for the first time in its official document – the Comprehensive Energy Reduction Work program (综合节能工作计划 *Zonghe jieneng gongzuo jihua*) – the development of transport. With this document, cities should build faster

the public transport and metro to reduce energy consumption, while from 2008 the function of urban public transport management shifted to the Ministry of Transportation (交通部 *Jiaotong bu*) (Pan, 2011). The state code of Urban Road Transportation Plan and Design Criterion (GB 50220-95, 《城市道路交通规划与设计准则》国家代码 《*Chengshi daolu jiaotong guihua yu sheji*》zhunze) defines the spaces for public transport, bicycles and pedestrians in urban planning. For bicycles, it requires separate bike lanes for major urban roads or at least side pavements on main and subsidiary roads (Pan, 2011).

In conclusion, the cities, which have the responsibility to provide affordable, convenient, comfortable and efficient transport service, are helped by the technical standards and guidelines<sup>14</sup>. Local governments face an increasing political pressure to improve their mobility service and to reduce the governments' financial burden, the enterprises which provide the transportation services must follow the market-driven principle (Pan, 2011). Furthermore, with the establishment of the new concepts of low-carbon cities and green transportation, in 2006, the central government issued transport policy guidelines sustaining local governments to develop bicycle transport by improving bike facilities. For example, Shanghai has planned a non-motorized transport network, Beijing has planned two bicycle demonstration zones and Hangzhou invested hundreds of million RMB in the public bike-sharing scheme (Pan, 2011).

#### *Beijing: the fragmented beginning of public bike-sharing*

As the capital, Beijing was the first city responding to the new directions with the implementation of low fare public transport services and a bus rapid transit service (Pan, 2011). It was also the first city to introduce public bike-sharing programs, which were operated by private companies, the first of which has been launched in 2005. The size of the fleet varied between 5,000 and 10,000 during the time between the launch and the Olympics games, when Beijing reformed the transportation sector. However, bike-sharing programs did not get enough support by the users and government, which only provided policies supporting advertising right to operators (Zhang, et al., 2015). Besides, the system was not IT-based, and by 2010, it ceased the operations due to poor maintenance and performances (Campbell, et al., 2016). In 2008, Beijing gave itself a new image of the city for the Olympics by being the first Chinese city to launch a public bike-sharing program. At the same time, the Beijing

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<sup>14</sup> For further explanation on the decentralization of functions, such as economic development, healthcare and transportation, consult (Xu, 2010)

government established recommendations for encouraging bicycle transport and as a solution to traffic congestion. However, the bikes which could be found every 300m-400m were not all accessible because provided by different companies. Also, the lack of bike facilities made users feeling unsafe riding on the streets (Liu, et al., 2012). Despite the government's positive attitude towards bike-sharing, the companies were left alone to carry all the burdens and ceased the operations between 2009 and 2011. The Action Plan of Beijing Municipality (北京市行动计划 *Beijing shi xingdong jihua*) for a People-Oriented, High-Tech Urban Commission System of 2009 supported the public bike-sharing scheme, signaling new efforts to increase public bicycles numbers. In 2012 it was scheduled the launch of a new PBS scheme, which is operated by private rental companies and funded by a state-owned enterprise with the governmental supervision. The fleet of 20,000 bicycles in 500 stations on its launch in 2012, is planned to reach 50,000 bikes in 2,000 stations in 2015, as the public bike-sharing has been defined as a component of public transit by the authorities of Beijing (Liu, et al., 2012).

#### *Shanghai: a change of policy*

In 2002, the Shanghai government issued the White Paper of Shanghai Urban Transport Development (上海城市交通发展白皮书 *Shanghai chengshi jiaotong fazhan baipi shu*). This document first introduced the two principles of promoting long-distance bicycle trips to public transport, as well as short bicycle trips and integration of bicycle trips with other public transport modes. It marked the beginning of policy turnover on bicycle transport in China, opening the fourth phase of bicycle evolution, which sees bicycles as integration and not a competitor of the public transportation (Zhang, et al., 2014).

Shanghai introduced a bike-sharing system in September 2008, with the government purchasing the service from the private company Forever Bicycle Co. LTD (Zhang, et al., 2014). The scheme Yongjiu gongxiang zixingche (永久公共自行车 *Yongjiu gongxiang zixingche*) reached more than 10,000 bicycles in 2009, supported by government subsidies and advertising revenues (Zhang, et al., 2015). It is a third-generation bike-sharing system which employs technology such as Internet for online communication and management, smart and automated docking stations with IC card and RFID technology for identity certification (CHEN, 2013). However, the government did not provide the program with reserved public space, and in fact, the operator could not afford the high cost for the land near the railway and the bus stations (Zhang, et al., 2014). Still, the famous brand of Forever Bicycle actively promotes

bike-sharing culture, striving for establishing a set of standards for national public bike-sharing and further develop the system. Thus, Shanghai got the title of “City of Design” (设计之都 *Sheji zhi du*) in February 2010, while bike-sharing became a business card for the city (CHEN, 2013).

*Hangzhou and Wuhan: successful national public bike-sharing schemes examples*  
Despite the relevance of the above cities for bike-sharing uptake in China, the most remarkable public bike-sharing programs are those in Hangzhou and Wuhan.

Hangzhou is the first city in China which has introduced a public bike-sharing scheme as part of its implementation of the Public Transit Priority policy (公交优先政策 *Gongjiao youxia zhengce*) of 2004 (Shaheen, 2011). Hangzhou Public Bike-sharing (杭州公共自行车 *Hangzhou gonggong zixingche*) started on 1st May 2008, being the first third-generation bike-sharing system launched in mainland China. The scheme's first location was the city center, which is a major touristic spot for its West Lake and soon reached a fleet of 50,000 bicycles, surpassing Vélib in Paris and becoming the biggest bike-sharing scheme in the world (Zhang, et al., 2015).

Hangzhou's flat topography, good bike facilities, and suitable temperature contribute to creating a good cycling environment (Shaheen, 2011). Besides, the main success of this scheme is the strong support of the government, which built the scheme with an investment of CNY 150 million. In fact, the owner and the operator of the Hangzhou Public Transportation Development Co, Ltd (杭州市公共交通发展有限公司 *Hangzhou shi gonggong jiaotong fazhan youxian gongsi*) is a state-owned company affiliated to the Hangzhou Public Transportation Group Corporation (杭州公交集团公司 *Hangzhou gongjiao jituan gongsi*), which granted the locations for the bicycles service points, including those close to other transports' stations and the right to advertise at the bicycle points, allowing a revenue source (Zhang, et al., 2015). Combined with the fact that the system employs low-cost bicycles (Shaheen, 2011), the service is free of charge for the first 30 minutes, with very low charges if this limit is exceeded, supporting the flows of bikes through the stations. The low cost of the service attracted plenty of users (90% of the trips are made free of charge), and residents are the primary users for commuting, while tourists can enjoy the service for sightseen (Shaheen, 2011).

Apart from the strong governmental intervention, another critical factor is the technology employed. Being an IT-based third-generation system, users must register with their real identity, impeding theft and vandalism. Furthermore, the bike-sharing system employs a smart-card which is connected to the other public transport modes, giving discounts for buses and subway to the bikers and resolving the “last mile problem” (Yao & Zhou, 2009). In combination with a small fee and the fact that the bicycles are not expensive, the system could cover the whole city center, becoming very convenient compared to other transport modes.

Following this successful example, many Chinese cities have been implementing similar programs, under the Chinese trend of the model cities which represent good examples to be followed, such as Dongguan, Foshan, and Jiangyin (Zhang, et al., 2015).

The system in Wuhan, is remarkable for being both the most extensive public bike-sharing scheme, even surpassing the one in Hangzhou and the first completely free of charge scheme. It is owned by two private companies Wuhan Xinfeda Group (武汉鑫飞达集团 *Wuhan Xinfeda jituan*) and Wuhan Longqi bicycle (武汉龙骑单车 *Wuhan Longqi danche*), which are backed by the robust governmental support in business operation with provision of the land, investments in bicycle facilities and advertising rights. However, problems with this system are the fact that the two companies operate their systems separately in different urban areas. Furthermore, the system is not supported by a reliable tracking system, leading to high rates of damages and loss of bicycles (Zhang, et al., 2015).

In summary, from big metropolis to smaller cities, between 2008 and the 2014 many public bike-sharing schemes have been developing, until the outbreak of the dock-less bike-sharing system, which opened a new era of bike-sharing in China.

## 2.2 The dock-less bike-sharing system

As discussed in the previous section, the rise and the sustainability of bike-sharing in China are strictly related to the policy. Despite the type of business model of the Chinese public bike-sharing systems, all the successful programs depended on the strong governmental support due to high costs for operating. Thus, the governments are very helpful by providing the use of public lands for bicycles and right to advertise.

Nonetheless, the aim to provide a new mean of transportation for short distances has been replaced by a new type of bike-sharing starting from 2014, that is the dock-less bike-sharing

model. The dock-less bikes reflect the characteristics of the newest generation of shared bicycles since their main characteristic is to be “dock-less.” Free-floating bicycles can finally resolve the main shortcoming of the third-generation bike-sharing systems, that is the need to be returned to a fixed station. The need to return the bicycles in determined spots is often an inconvenience for the users, who might not find a bicycle at the station or might not have the possibility to park at the destination, and for the operator, which must bear high costs for managing the fleet. Last but not least, dock-less bike-sharing can really solve the “last-mile problem,” because it can potentially eliminate the need to reach a station.

After the birth of the two larger startups, ofo and Mobike, tens of other startups popped out soon after, and the fierce competition gave rise to an intricate battle both in China and abroad. The research will focus on the central scene of mainland China and following there will be a more in-depth insight about the birth of the Chinese dock-less bike-sharing startups their development trends, the rules to which they respond, and the players involved. General insight into some foreign dock-less bike-sharing companies and an overview of the markets' situation outside mainland China completes the picture on the Chinese style dock-less bike-sharing situation and implications.

Being a very recent and ongoing phenomenon, this part of the research mainly consists in the description of the dock-less bike-sharing evolution and personal analysis based on the personal elaboration of hundreds of news headlines on the Xinhua.com website, by searching the string “共享单车” (bike-sharing). The research output is a series of news headlines from all over China relevant to the domestic and foreign bike-sharing market situation. Though the elaboration of all the headlines available until the 500<sup>th</sup> page, which reaches the year 2016, this section of the research can display the evolution of the dock-less bike-sharing both in China and abroad and about Chinese bike-sharing companies, as well as few foreign dock-less bike-sharing companies. Another main source is the South China Morning Post website, on which similar research has been conducted by digiting “bike-sharing” in the research tool of the page. Besides, when the primary sources' information is not complete, separate researches complete are made to make the complete overview of the subject. From these researches, particular attention has been given to the major Chinese companies, such as ofo, Mobike, and Hellobike, and to some foreign companies, such as Singapore's oBike and Hong Kong's GoBee.Bike. While screening all the headlines, the content on the meaningful evolution

steps relevant to the dock-less bike-sharing has been read and analyzed, arriving to discover the rules to which the companies respond to and the major players involved in the bike-sharing market.

### 2.2.1 TERMINOLOGY AND DEFINITION: PUBLIC BIKE-SHARING VS. DOCK-LESS BIKE-SHARING

The concept of “bike-sharing” (自行车共享 *zixingche gongxiang*) can be distinguished into “public bike-sharing (systems)” - 公共自行车(系统) *gonggong zixingche (xitong)*- and the “shared bicycle” (共享单车 *gongxiang danche*), even though this latter is interchangeably called as “public bicycle” due to the definition of “bike-sharing” as “the shared use of a bicycle fleet.”

Public bike-sharing systems (公共自行车系统 *gonggong zixingche xitong*) are normally provided by the cities and have docking stations, and smart-locks which prevent bicycles from theft and the fleet is electronically supervised by a central data collector that monitors the operations. These programs are integration and part of the public transport system, providing a green transportation solution, helping with the traffic congestion and solving the “last mile problem” for short commutes. Bicycles are docked at fixed or movable stations and can be borrowed and returned by using a smart card. Public bike-sharing in China is a lesson from European countries’ bike-sharing system, in particular, learning from the successful cases of Paris and Lyon, and have some problems mainly related to high costs for the implementation and operations.

The object of this research is the other type of bike-sharing, which is related to the newest generation of dock-less bicycles and referred to a phenomenon which originated in China and which reached out the rest of the world later. Nowadays, when we refer to the “Chinese bike-sharing,” it is to be intended the complicated situation in which a certain number of Chinese private companies operates in China and abroad, providing the bike-sharing service. One of the main peculiarities of the dock-less bike-sharing model is that it follows the market principle of competition. While the public bike-sharing systems in China are a result of an up-down process, in which the local government implements the schemes to meet the central government policies’ directions as part of the public transportation system of which they are entirely responsible, the dock-less bike-sharing is a service provided by private companies.

These start-ups were able to attract massive investments and are struggling to reach the highest quote of the market under a fierce competition between them.

### 2.2.2 THE CHINESE DOCK-LESS BIKE-SHARING MODEL

#### *Online application*

Firstly, in the dock-less bike-sharing model, the online application (app) is the essential feature apart from the bicycle. The mobile app offers the platform on which the bicycles can be rent and is the core of sharing economies' industries. Thus, the app can be downloaded on the smartphone, which must also have an Internet connection and the Bluetooth.

Secondly, after the download, the user must register on the bike-sharing platform by providing real information to confirm the identity, and in most of the cases, there is a need to pay a deposit. Especially in China, there is the possibility to pay through the most common mobile payment methods, which are Alipay (支付宝 *Zhifubao*) and WeChat (微信 *Weixin*). Also, users can access through their Alipay and WeChat accounts to complete the registration on the bike-sharing app.

Next, after the registration and the eventual payment of the deposit, it is possible to scan the QR code on the bicycle's body by using the smartphone's camera and Bluetooth, to open the smart-lock. In some versions, it might be necessary to receive a code sent to the mobile phone and digit the code on the lock.

Finally, the users can ride the bike until the destination, where they can park the bike on the sidewalks or in designated spaces and physically close the smart-lock of the bike. The mobile app will automatically stop and calculate the time and distance of the trip, as well as apply the fee. Fees are generally low and calculated on thirty minutes or hourly basis.

Moreover, there are some additional functions because of the integration of the bike-sharing app with some bigger platforms. For example, the integration with Alipay allowed ofo and Hellobike to provide free-deposit service if the Sesame credit score is higher than 650 points, as well as the possibility to unlock the bikes without downloading the dedicated app, but through the bigger platforms' app. Mobike and other brands are available in the WeChat miniprograms function, on which it is possible to rent the bikes without downloading the bike-sharing app (as for Alipay) but it is sufficient accessing WeChat, from which the payment will be made after the ride.

The online application relies on technologies such as the GPS for the location of the bicycles on a map, and the Bluetooth to open the smart-lock. The bike-sharing companies mainly rely on third parties to run the online application system and the smart-lock technology; this is especially the case for smaller companies.

A point worth to mention is that, as for all the other sharing economy's industries, the heavy reliance on personal data to operate the service gives rise to privacy and personal data protection concerns. Although the third-generation public bike-sharing systems first started to collect and analyze user's data for better management and urban planning purposes, the sensitivity of the location data is even higher in the dock-less bike-sharing model which relies much more on the online platform. Location data are considered personal data and must receive much attention (OECD/ITF, 2015). Data protection is even a more significant issue when dealing with the Chinese dock-less bike-sharing companies since they do not only operate in mainland China, but also in many foreign markets, where data protection degree and rules are different. Chinese bike-sharing companies with overseas market comply with both local road safety legislation and data protection legislation. However, it seems that users must agree to the transfer of their data for purposes specified in the agreement. In this way, the users can choose whether to have their data at risk or not, but if they do not agree to all the clauses in the agreement they cannot use the bike-sharing service, showing the more significant power of the company over the consumers, who have to agree to the terms or renounce to use the service.

### *Offline operations*

The free-floating bike-sharing model should have less offline operations problems compared to PBS systems which have fixed docking stations, firstly because the online application has become more important in the total operations and there is not the necessity to rebalance the fleet immediately to have available bikes or free docks. Secondly, the online application can rely on additional tools, such as the location of the bikes on the map or price incentives to rebalance the fleet without displacing workers.

However, there is still a need for personnel to adjust bicycles in case of damages or in case of haphazard parking or when the bikes are returned to remote areas. In these cases, the costs might be even higher compared to the PBS systems which leave less room for illegal parking.

In many cases, the offline operations, which concerns bicycles physical presence on the streets, must comply with the local jurisdictions' regulation. This is not only the case for foreign markets, where there might be completely different rules, such as the helmet requirement but also within the Chinese market. The unregulated industry brought chaos in the streets due to excess of bicycles and high damage rates, as well as sidewalks overcrowding and inappropriate use of the bikes. Moreover, as already observed, Chinese transportation management is delegated to the local governments' jurisdiction, resulting in different reactions towards the bike-sharing companies. In particular, because of the excess of free-floating bicycles supply, many cities started to limit the introduction of more bikes and to regulate companies' management. Furthermore, the national attempt to regulate the industry has been made with the Guiding Opinions on Encouraging and Regulating the Development of Internet Bicycle Rental (关于鼓励和规范互联网租赁自行车发展的指导意见 *Guanyu guli he guifan hulianwang zulin zixingche fazhan de zhidao yijian*), which established new rules for operations of the dock-less bike-sharing companies<sup>15</sup>.

### 2.2.3 PHASE 1: THE BIRTH OF THE BIKE-SHARING STARTUPS AND RAPID GROWTH *The great era of sharing*

According to the China Internet Network Information Center (CNNIC, 中国互联网络信息中心 *Zhongguo hulianwangluo xinxi zhongxin*), by the first half of 2017, Chinese Internet users are 751 million, accounting for one-fifth of the globe, while Internet connection presence is 54.3%, that is 4.6% higher than the world's average. Under such numbers, China reached 100 million dock-less bike-sharing registrations by the same period<sup>16</sup>.

The first company providing this new type of bicycles was ofo, which was founded in 2014 by a group a student of the Peking University. In January 2015, ofo managed to provide 2,000 bicycles in the Peking University's campus and obtained a pre-financing round in October 2015 to extend the service in the city<sup>17</sup>. At the same time, 2015 is the foundation year of the yellow

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<sup>15</sup> See section 2.3.4

<sup>16</sup> 我国共享单车用户过亿 技术与资本推动行业发展 <[http://www.xinhuanet.com/tech/2017-08/04/c\\_1121432854.htm](http://www.xinhuanet.com/tech/2017-08/04/c_1121432854.htm)>

<sup>17</sup> ofo 小黄车 <<https://baike.baidu.com/item/ofo%E5%B0%8F%E9%BB%84%E8%BD%A6>>

colored ofo bicycles main rival, Mobike<sup>18</sup>. These orange bikes concluded the first financing round of several millions of dollars when ofo concluded its pre-financing round in October.

The dock-less bike-sharing market attracted both new entrepreneurs and investors. While ofo and Mobike were concluding the first financing rounds, the Chinese cities were soon to be covered by other tens of colors. In 2016, Chinese cities have been painted by the most differently colored bicycles, with around 20 firms as in March 2017 covering 30 cities until becoming almost 70 companies and reaching out in few hundred cities with a fleet of more than 16 million bicycles by fall 2017, and more than 130 million registered users<sup>19</sup>.

How is possible to have all these bicycles in just one year? The first phase of rapid growth has been possible due to the enthusiasm towards the bike-sharing market of both entrepreneurs and investors. The fact that tens of start-ups emerged in a few months is a clear sign of the development opportunities of the sharing-economy sectors. This is the reason for investors poured their resources to back the bike-sharing companies. In an era in which the sharing concept in China is emerging in the most various sectors, ranging from the cars and rides sharing to the umbrellas and power-banks sharing, it is evident that the bicycle industry would not be neglected. Chinese sharing industry has been receiving “a torrent of venture capital,” in which it is stated the craziness of the Chinese sharing-economy. In China, it is possible to share not only cars and car rides, but also BMWs, not only an apartment but also a napping capsule, as well as karaoke booths, umbrellas, luxury bags, and even treadmills boxes. It is an era of huge potentiality for businesses to attract investments from “investors looking for the Next Big Thing<sup>20</sup>.” The period of 2014-2015 is with highest numbers of start-ups getting funds, whereas, in 2017, the number of start-ups established has diminished as investors have become choosier. Investors are getting more prudent for funding deals over CNY 100 million and only 192 projects compared to 390 in the first half of 2014 have been developed<sup>21</sup>. Despite

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<sup>18</sup> 摩拜单车

<<https://baike.baidu.com/item/%E6%91%A9%E6%8B%9C%E5%8D%95%E8%BD%A6?fromtitle=mobike&fromid=19943837#7>>

<sup>19</sup> 理智与情感共享单车决战在三月 <[http://www.xinhuanet.com/info/2017-03/13/c\\_136124016.htm](http://www.xinhuanet.com/info/2017-03/13/c_136124016.htm)>

<sup>20</sup> Unicorn fever seizes China as start-ups and investors seek the next big thing

<<https://www.scmp.com/tech/start-ups/article/2125953/unicorn-fever-seizes-china-start-ups-and-investors-look-next-big>>

<sup>21</sup> More start-ups in China succeed in getting funding, but investors are becoming choosy

<<https://www.scmp.com/business/companies/article/2112026/more-start-ups-china-succeed-getting-funding-investors-are>>

the gold rush era has passed, ofo and Mobike could get the biggest slices in the funding battle in bike-sharing industry. They managed to seize huge investments, and since their inception, they poured in the first-tier cities and the most important second-tier cities<sup>22</sup> many bicycles. Thus, their fleet captured more users before the other companies could enter, and they could soon get 90% of the total market share.

### *Race to cover the cities' street: an investment rounds battle*

The success of ofo and Mobike, is the enormous financial support they have gotten from giant companies. The main cities targeted by the companies are the first and second-tier cities, where the high density of population results in high demand for bicycles. The main first-tier cities targeted by the companies are Shanghai, Beijing, Guangzhou, and Shenzhen, where there were 1.08 million bikes concentrated by March 2017. By this time, the city of Shanghai alone concentrates more than 30 companies, which compete against each other with their 450,000 bikes and 4.5 million registered users<sup>23</sup>.

While Mobike was launching its bicycles in Shanghai on 22<sup>nd</sup> April 2016 after the financing round A of October 2010 made by Joy Capital (愉悦资本 *Yuyue ziben*)<sup>24</sup>, ofo was already producing 2 million bikes after the conclusion of the financing round A of January 2016. The yellow bikes fleet raised soon up to 5 million by June 2016 and after a period of trial in the University's campus, it extended with its large fleet into the main cities. Ofo continued to get

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<sup>22</sup> Chinese cities are classified from the administrative view (Long, 2016). In this research, the distinction of the cities into tiers refers to the cities' level under the area administered by the PRC:

1. the first-tier cities are the four **Municipalities** (直辖市 *zhixiashi*), Beijing, Shanghai, Tianjin, Chongqing and the **sub-provincial cities** (副省级行政区 *fushengji xingzhengqu*), which are unofficially called cities and are at the prefecture-level but administered by a province, examples are Chengdu, Xi'an, Wuhan, Hangzhou, Guangzhou, Shenzhen, Xiamen, Nanjing, Suzhou;
2. second-tier cities are **prefectural-level cities** (地级市 *dijishi*), such as Shijiazhuang, Zhengzhou, Changsha, Changzhou, Nanchang, Taizhou and the **sub-prefectural cities** (副地级市 *fudijishi*), which should be county-level cities, but are at the prefecture-level, such as Yiwu;
3. third-tier cities are **county-level cities** (县级市 *xianjishi*), usually translated as "districts" or "prefectures";
4. four-tier cities include **towns** (镇 *zhen*) and **townships** (乡 *xiang*);
5. fifth-tier cities include **communities** (社区 *shequ*) and **administrative villages** (行政村 *xingzhengcun*), but are not in the official classification;
6. sixth-tier cities include neighborhood/community groups (居民小组 *juminxiaozu*) and village groups (村民小组 *cunminxiaozu*)

<[https://en.wikipedia.org/wiki/Administrative\\_divisions\\_of\\_China#Ambiguity\\_of\\_the\\_word\\_%22city%22\\_in\\_China](https://en.wikipedia.org/wiki/Administrative_divisions_of_China#Ambiguity_of_the_word_%22city%22_in_China)>

<sup>23</sup> 共享单车进入城市攻防战 ofo 上海试点“免押金” <[http://www.xinhuanet.com/city/2017-03/17/c\\_129511489.htm](http://www.xinhuanet.com/city/2017-03/17/c_129511489.htm)>

<sup>24</sup> Supra, note 18

funds, with a financing round A+, while coloring of yellow the streets of Beijing, Shanghai, Chengdu, Xiamen between November and December 2016, reaching 33 cities by January 2017 and planning to extend in Hefei, Wuhan, Changsha, Nanjing, Chongqing, Foshan, Tianjin, Xi'an, Shijiazhuang, Zhengzhou, Jinan, Nanchang, Suzhou, Ningbo, Nanning and Fuzhou by 22<sup>nd</sup> January<sup>25</sup>. In the meanwhile, Mobike was raising tens of millions of dollars in B and B+ financing rounds by August 2016 from Panda Capital (熊猫资本 *Xionghao ziben*), Joy Capital, Sinovation Venture (创新工场 *Chuangxin gongchang*) and Vertex Venture Capital (祥峰投资 *Xiangfeng touzi*) and reached the amount of US\$ 100 million in the single financing round C of September 2016 led by Hillhouse Capital Group (高瓴资本 *Gaoling ziben*) and Warburg Pincus (华平投资集团 *Huaping touzi jituan*), and followed by many others, including Sequoia Capital (红杉资本 *Hongshen ziben*) and earlier investors. Mobike's C round was in concomitance with ofo's financing round B, which raised ten million from Jingwei Venture Capital (经纬中国领投 *Jingwei zhongguo touzi*) and GSR Ventures (金沙江创业投资 *Jinshajiang chuangye touzi*) leading, and Will Hunting Capital (唯猎资本跟投 *Weilie ziben*) following the investment<sup>26</sup>. It was inevitable that these bike-sharing start-ups would get the attention of giant tech companies, such as Didi chuxing (滴滴出行 *Didi chuxing*), which made a strategic investment on ofo's platform on 29th September 2016, and participated into the financing round C1 of October 10<sup>th</sup>, when US\$ 130 million of funds have been raised with also Coatue and Xiaomi, which lead the C2 round<sup>27</sup>.

It can be observed that the two companies' strategies are different since ofo's funds were mainly employed in the production of bikes, while Mobike declared to focus its investment on research and innovation development. In fact, while ofo was concentrating on the expansion, Mobike was developing technologies (of which it made patents) and new products, such as "mobike lite," a new bicycle model launched in October 2016<sup>28</sup>. Also, ofo knew the importance of the technology and developed a first generation of smart-locks in January 2016 and on

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<sup>25</sup> Supra, note 17

<sup>26</sup> Supra, note 18

<sup>27</sup> Supra, note 17

<sup>28</sup> Supra, note 18

February 22<sup>nd</sup> started the collaboration with China Telecom (中国电信 *Zhongguo dianxin*) and Huawei (华为 *Huawei*) to develop NB-IoT technology for its operation<sup>29</sup>.

In the meanwhile, many other start-ups started to raise funds and launch their services in the cities, such as UniBike<sup>30</sup> (founded in early 2016), Hellobike<sup>31</sup>, Kuqi Bicycle<sup>32</sup>, Bluegogo<sup>33</sup>, YOUON<sup>34</sup> (these founded in fall 2016) and many others in early 2017, such as 99bicycle (赳赳单车 *Jiujiu danche*)<sup>35</sup>. We can observe that the many start-ups which aroused in late 2017 and raised capitals to operate before ofo and Mobike could go further along with the fund-raising battle. However, the small competitors were struggling to battle with the two leading companies, ofo and Mobike in the first-tier cities.

The entrance of many different competitors in the bike-sharing business clearly shows the market's actual value to the investors. To catch their intention to invest, firms try all the possible strategies to become more attractive and competitive, including free-rides events, red-pockets (in China is money for gift), deposit-free benefit, collaboration with different types of partners. For instance, there are many partnerships with high tech companies to develop new products and integrate their platforms (ofo for the smart-locks, aerospace, credit system) and with bicycle producers (especially with those with a long-history brand), such as the collaboration between ofo and the famous Tianjin-based bicycle producer Flying pigeon (飞鸽自行车 *Feihe Feihe zixingche*) in 2016, the collaboration between U-bicycle (优拜单车 *Youbai danche*) and the Shanghai-based Forever bicycle (永久自行车 *Yongjiu zixingche*) in July of the same year, and the new collaboration between ofo and the Shanghai-based Phoenix bicycle (凤凰自行车 *Fenghuang zixingche*) in May 2017<sup>36</sup>.

Among other strategies, there is the collaboration with governments to establish standards for the new business-model and cooperation in the management of the service, since the

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<sup>29</sup> Supra, note 17

<sup>30</sup> 由你单车 <<https://baike.baidu.com/item/%E7%94%B1%E4%BD%A0%E5%8D%95%E8%BD%A6>>

<sup>31</sup> 哈罗单车

<<https://baike.baidu.com/item/%E5%93%88%E5%95%B0%E5%87%BA%E8%A1%8C/22879308?fromtitle=%E5%93%88%E7%BD%97%E5%8D%95%E8%BD%A6&fromid=20496948>>

<sup>32</sup> 酷骑单车 <<https://baike.baidu.com/item/%E9%85%B7%E9%AA%91%E5%8D%95%E8%BD%A6>>

<sup>33</sup> 小蓝单车 <<https://baike.baidu.com/item/%E5%B0%8F%E8%93%9D%E5%8D%95%E8%BD%A6>>

<sup>34</sup> 永安行 <<https://baike.baidu.com/item/%E6%B0%B8%E5%AE%89%E8%A1%8C>>

<sup>35</sup> 赳赳单车 <<https://baike.baidu.com/item/%E8%B5%B3%E8%B5%B3%E5%8D%95%E8%BD%A6>>

<sup>36</sup> Supra, note 17

bikes occupy public spaces and are in all effects non-motorized vehicles. Special events, such as free rides are used to get more new users and retain the old ones. For example, ofo and Mobike were launching many free rides events in the first month of 2017. Mobike announced the free ride period from 6<sup>th</sup> to 12<sup>th</sup> March 2017 (the period of the National People Congress) as a strategy to retain its users and integrate the transportation restrictions of those days, while soon after ofo launched the same strategy also to gain the status of an advocate for green transportation modes<sup>37</sup>. Even, the expansion abroad has been for bike-sharing start-ups one of the earliest strategies to distinguish themselves (ofo was the first, followed by Mobike, but in fall 2017, also smaller firms started to target abroad, such as Bluegogo)<sup>38</sup>.

Thus, on the one hand, big giants poured higher and higher amounts of money in the two leading brands, while on the other hand, also the second entrants' start-ups could get billions of CNY. In fact, while towards the end of 2016 Unibike conducted the pre-A investment round of CNY 5 million<sup>39</sup> and Hellobike concluded the series A financing round including GGV as investor<sup>40</sup>, Mobike immediately announced in January 2017 a new D round of US\$ 215 million which includes Tencent (腾讯 *Tengxun*) among the investors, soon after followed by Singapore's Temasek, arriving up to US\$ 300 million total investments in a single round. The expansion strategy has been kept up by Mobike, which launched in Singapore in March 2017, and in Manchester and Salford (the UK) in June 2017, arriving to operate in 9 countries and more than 180, with 7 million bikes and 200 million users by October 2017, while continuing its expansion in the domestic market launching a new ultra-light model of bicycle on 22<sup>nd</sup> April<sup>41</sup>. The financial battlefield became even hotter in March 2017, with ofo's new financing round D of US\$ 450 million, with leading investors such as DST, Didi chuxing, CITICPE (中信产业基金 *Zhongguo chanye jijin*), Jingwei Venture Capital (经纬中国领投 *Jingwei zhongguo touzi*), Coatue, Atomico, Macrolink Group (新华联集团 *Xinhualian jituan*), followed by many others domestic and foreign well-known organizations<sup>42</sup>.

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<sup>37</sup> Supra, note 19

<sup>38</sup> See section 2.2.5

<sup>39</sup> Supra, note 30

<sup>40</sup> Supra, note 18

<sup>41</sup> Ibid.

<sup>42</sup> Supra, note 17

In conclusion to the first phase of the Chinese dock-less bike-sharing start-ups development process, we can say that in only one year, the bike-sharing market attracted money from bigger and bigger investors. Further cases are Hellobike, which conducted another A+ round in 2017 January 12th still with GGV leading the investment<sup>43</sup>, YOUON, which concluded its investment round A, which includes Ant Financial (蚂蚁金融 *Mayi jinrong*), IDG, Shenzhen Capital Group (深创投 *Shenchuangtou*)<sup>44</sup>, and many others and Unibike, which started to operate in Beijing after its A round of CNY 100 million in April 2017<sup>45</sup>.

#### 2.2.4 PHASE 2: CHINESE BIKE-SHARING MARKET SATURATION AND DIFFICULTIES

##### *A “cash-burning” industry*

As of the first quarter of 2017, bike-sharing turned out to be a high cash-burning activity, in which money is needed not only to produce bicycles but also to operate in the cities. As a matter of fact, when the bike-sharing start-ups enter in new cities, their burdens increase as well. Apart from bicycle production costs, all the offline management of bicycles in the cities requires personnel to place the fleet in the streets and repairers to fix the broken bicycles. Notwithstanding the ideally lower rebalancing costs required for the dock-less bike-sharing business models compared to fixed station bike-sharing models, free-floating bicycles face new problems which drain the companies' resources.

First, the bicycles themselves worn out for heavy usage or can be damaged because of users' misconducts, such as vandalism and privatization. The physical presence on the streets makes the bicycles a target for malicious acts, for example, Mobike filed a lawsuit because its bicycles have been used to stick advertisements<sup>46</sup>.

Second, due to the fierce competition to reach out the most relevant locations where there are more users, the most mixed colored bicycles are concentrated in the city center or subway and bus stations creating sidewalks congestion. Consequently, the bike-sharing operators must face local governments' complaints and bicycles removal measures. Many different bike-sharing companies poured bicycles on the street with increasing speed and quantities. The saturation of the bike-sharing market is the result of the fierce competition among the start-

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<sup>43</sup> Supra, note 31

<sup>44</sup> Supra, note 34

<sup>45</sup> Supra, note 30

<sup>46</sup> 20万辆共享单车被套上车座广告 摩拜单车索赔100万元 <[http://m.xinhuanet.com/2017-12/27/c\\_1122176406.htm](http://m.xinhuanet.com/2017-12/27/c_1122176406.htm)>

ups, which only care about placing their bicycles in the most strategic spots of the principal cities. The importance of getting into the main markets is strictly related to the success of getting further funds from investors. As for the Chinese start-ups' investment style, the investors, especially those from smaller venture capitals, mainly pay attention to the operating numbers and the peculiarities of the start-ups to differentiate themselves in the market<sup>47</sup>. The production of bicycles is backed by the strong financial support of the investors, making bike-sharing a very cash-burn industry to reach out the main markets and get further investments.

As a result, the scenario evolved rapidly, from an initial enthusiasm for this convenient new transportation service to a battle between rainbow-colored two-wheels. The second entrants' companies are indeed smaller in size compared to the fast-growing ofo and Mobike. Thus, these smaller players were the first to start the retreat from the market or to shift toward second-tier or even third and fourth-tier cities<sup>48</sup>, where there is less competition. Even, other new entrants have started their business to target small localities directly. On the opposite, start-ups which could stand out got more investments, having the possibility to produce more bicycles and develop new technologies and strategies to further distinguish themselves. This positive cycle led ofo to be the first bike-sharing start-up to become an "unicorn" – a status given to a start-up of US\$ 1 billion in valuation – by June 2017, after only one year of operation<sup>49</sup>.

Economically speaking, the gold rush concentrates on the few bigger and more promising companies. The biggest investors pour money into those start-ups which stand out while the less relevant brands must face increasing difficulties to operate. For example, in the beginning, ofo, Mobike and Bluegogo were the most important brands in the market and all the three engaged in overseas expansion. However, as of March 2017, Bluegogo's investment chain interrupted. Bluegogo soon lost its third position, which has been taken later by Hellobike (merged with YOUON)<sup>50</sup>.

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<sup>47</sup> Supra, note 20

<sup>48</sup> Supra, note 22

<sup>49</sup> Supra, notes 17 and 20

<sup>50</sup> These cases are described with more details in the next two paragraphs.

Going back on the financial perspective, while Bluegogo obtained an investment of CNY 1 billion in January 2017<sup>51</sup>, Mobike concluded its financing round D of US\$ 215 million on 4<sup>th</sup> January 2017, backed by Tencent and Warburg Pincus as leader of the financing round and the new strategic and financial investors, such as Ctrip (携程 *Xiecheng*), Huazhu Hotels Group (华住 *Huazhu*), Transport Publics Genevois (TPG), Sequoia Capital, Hill House Capital (高瓴资本 *Gaoling ziben*). This financing round is to be increased up to US\$ 300 million with Singapore's Temasek participation<sup>52</sup>. Hellobike concluded the A+ round with GGV as the leading investor in January 2017, while YOUON announced in March 2017 its round A, including Ant Financial's participation. Nevertheless, as of March 2017, they have been greatly surpassed by ofo's D round of US\$ 450 million, with DST leading the investment and Didi, CITICPE, Matrix Partners China (经纬中国 *Jingwei zhongguo*), Coatue, Atomic, Macrolink Group, and many others domestic and foreign well-known organizations supporting the investment<sup>53</sup>.

By spring 2017, the bike-sharing business has attracted the peak of attention from entrepreneurs and investors with increasing quantity of money entering in the sector and still many new entrants establishing their businesses. However, it was clear that the leaders in the bike-sharing market were ofo and Mobike, on which all the spotlights went for the next investments. The year 2017 is not lacking unexpected turns of events. In fact, with surprise, Ant Financial turned out to sustain ofo's financing round D+. This support for ofo was more significant strategically rather than economically<sup>54</sup>. After the shift of attention of the giant Ant Financial towards ofo platform, it was the time for Mobike's rematch, which concluded an investment round of US\$ 600 million on June 16<sup>th</sup>, the highest investment in one single round so far. The investment's leader was Tencent, followed by ICBC International Holdings Limited 工银国际 *Gongyin guoji*), BOCOM International Holdings Co. Ltd. (交银国际 *Jiaoyin guoji*), Farallon Capital, TPG, Sequoia Capital, Hill House Capital and others<sup>55</sup>. Nevertheless, it was not yet the hottest moment of this cash-burning battle, which arrived with the response from ofo on 6<sup>th</sup> July, when it announced the conclusion of a financing round of US\$ 700 million.

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<sup>51</sup> Supra, note 33

<sup>52</sup> Supra, note 18

<sup>53</sup> Supra, note 31

<sup>54</sup> Supra, note 17

<sup>55</sup> Supra, note 18

The round was backed by the leading investors' coalition of Alibaba (阿里巴巴 *Alibaba*), Hony Capital (弘毅投资 *Hongyi capital*) and CITICPE, and the following investors Didi chuxing and DST<sup>56</sup>.

Inevitable to say that it was the time of melting in such fever for many smaller and seconds entrants' firms, including the third-placed bike-sharing start-up, Bluegogo. After these breaking records, Hellobike (now the third bike-sharing company in China) gained an investment round B+ of several hundred million CNY. However, it was evident that it could not bear the competition from its yellow and orange competitors and it mainly targeted second and third-tier cities. Hellobike merged with YOUON on 25th October 2017 and before the conclusion of the year, it gained a D2 financing round of CNY 1 billion<sup>57</sup>.

*Call for "emergency brake" to stop the surge of bicycles in the "besieged cities"*<sup>58</sup>  
Notwithstanding the promising possibility of expansion abroad, the domestic market is still the headquarter of bike-sharing battle. The Chinese bike-sharing market reached its highest heat with the vast investments of the first half of 2017 when the market started to reveal its first signs of crisis. Market saturation was already a concern when ofo and Mobike alone placed their orders to produce 30 million bicycles. According to a research conducted by Tencent, the four municipalities, Beijing, Shanghai, Guangzhou, and Shenzhen have a population of 71.32 million people, while ofo and Mobike have already displaced 1.08 million of bikes by March 2017, even though they arrive to displace 1.81 million bikes, they will not be able to employ all the 30 million bikes<sup>59</sup>. The main cities targeted by several bike-sharing operators started to take measures to handle the problems created for the urban transportation and parking order. The earliest cities to take measures are Beijing and Shanghai, followed by many others. By February 2017, Beijing's started to work on standards to regulate dock-less bike-sharing development and also Shanghai's few areas started to research measures to tackle the disordered parking and users' misconduct. Beijing, Shanghai, Chengdu,

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<sup>56</sup> Supra, note 17

<sup>57</sup> Supra, notes 31 and 34

<sup>58</sup> "急刹车" (*ji shache*), literally "emergency brake", is the term used by the Chinese medias to refer to the phase of market saturation in the major cities. "围城" (*wei cheng*), literally "besieged city", is the term used by the Chinese media to refer to the major cities where the excess of bicycles from different dock-less bike-sharing companies have created problems, such as sidewalks congestion, illegal parking, deposit concerns and others. 共享单车投放"急刹车" <[www.xinhuanet.com/info/2017-08/26/c\\_136556552.htm](http://www.xinhuanet.com/info/2017-08/26/c_136556552.htm)>

<sup>59</sup> Supra, note 19

Tianjin, Shenzhen, Guangzhou, Xi'an, Wuhan, Hangzhou, and Nanjing have been reported to be the most cyclable cities, according to the Report on 1<sup>st</sup> October 2017 holidays<sup>60</sup>. As described hereafter, these are the main markets targeted by the dock-less bike-sharing companies, and all had big problems with the dock-less bike-sharing companies, opening the phase of the “order to stop introducing [bicycles]”<sup>61</sup>.

According to Mobike's data, since its beginning of operation in Shanghai in April 2016, there were already 100,000 orange bicycles. Shanghai's data for the first half of 2017, states that there are already 500,000 bicycles in the city. In Shanghai, by the end of February 2017, there were already more than 30 different companies operating with a fleet of 450,000 bicycles for a total of 4.5 million users<sup>62</sup>. By August 2017, in Shanghai, there were 1.5 million bikes, whereas the city could bear a maximum of 600,000. Thus, on 18<sup>th</sup> August, the Shanghai Municipal Transportation Commission (上海市交通委 *Shanghai shi jiaotong wei*) announced that the dock-less bike-sharing operators must stop introducing new bikes and comply with four requirements: 1. Stop pouring bicycles in the city; 2. increase the management for irregular parking; 3. increase the number of personnel to manage the distribution of the bikes; 4. collect the broken and piled bicycles. Those not meeting the four points are subject to forced removal of the bikes by third parties, and they will be registered with a negative note<sup>63</sup>.

Beijing had 200,000 bicycles by the end of February 2017, and reached 700,000 bikes by April 2017, registering 7 million rides every day from almost 11 million users (almost half of the city population)<sup>64</sup>. The main problem is that 80% of the bicycles are in Beijing city center, where there is the concentration of 600,000 bikes<sup>65</sup>. Beijing declared the stop order on 23<sup>rd</sup> August<sup>66</sup>,

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<sup>60</sup> 天津上榜共享单车热门骑行十大城市 游海河成热门 <[http://www.tj.xinhuanet.com/2017-10/11/c\\_1121787370.htm](http://www.tj.xinhuanet.com/2017-10/11/c_1121787370.htm)>

<sup>61</sup> “禁投令” (*jin tou ling*), literally “order to stop introducing” [bicycles] is the term used by medias to describe the trend of the Chinese cities “besieged” by the excess of bicycles and that have started to prohibit bike-sharing companies to pour more bikes. 共享单车市场仍需竞争来激活 <[http://m.xinhuanet.com/comments/2018-05/04/c\\_1122780971.htm](http://m.xinhuanet.com/comments/2018-05/04/c_1122780971.htm)>

<sup>62</sup> 共享单车是城市慢行系统的模式创新 <[http://www.xinhuanet.com/info/2017-02/28/c\\_136089818.htm](http://www.xinhuanet.com/info/2017-02/28/c_136089818.htm)>

<sup>63</sup> 上海暂停共享单车新增投放 总量已超 150 万辆 <[http://www.xinhuanet.com/2017-08/20/c\\_1121512395.htm](http://www.xinhuanet.com/2017-08/20/c_1121512395.htm)>

<sup>64</sup> 北京将设定共享单车发展上限数量 停车区将统一标准 <[http://www.xinhuanet.com/local/2017-04/27/c\\_1120880519.htm](http://www.xinhuanet.com/local/2017-04/27/c_1120880519.htm)>

<sup>65</sup> 共享单车投放上限下月发布 <[http://www.xinhuanet.com/info/2017-04/27/c\\_136238911.htm](http://www.xinhuanet.com/info/2017-04/27/c_136238911.htm)>

<sup>66</sup> 如何更好地“共享”单车：全国 12 座城市暂停共享单车投放 <[http://www.xinhuanet.com/video/2017-09/12/c\\_129701884.htm](http://www.xinhuanet.com/video/2017-09/12/c_129701884.htm)>

while policy elaboration to establish the new regulation for the bike-sharing industry has started in April 2017, to be implemented in September<sup>67</sup>.

Guangzhou, by the end of July 2017, had six different companies which poured in the city 800,000 bicycles with 9 million registered users. The Communications Commission of Guangzhou Municipality (广州市交通委员会 *Guangzhou shi jiaotong weiyuanhui*) expressed that in the future there will be the possibility for the establishment of a stable communication system between the companies and the public administration, which will work together with the industry's self-regulation and the sharing of big data to provide a better service<sup>68</sup>. Guangzhou declared the stop on 28<sup>th</sup> August<sup>69</sup> and proceeded in the regulation of the industries like the other main cities targeted by dock-less bicycles<sup>70</sup>.

Towards the end of 2017, Nanjing could count about 450,000, of which 80% are disorderly parked and from twelve different companies (nine bike-sharing and three electric bike-sharing), with ofo leading the market with 160,000 bikes and more than 2 million total users. Now that the market is saturated, companies must improve their management. For example, most of the ofo bikes were without the smart-lock, and it is starting to work on changing the locks by October 2017. Nanjing also announced in August 2017 to stop the introduction of further bicycles until the end of the year, and to eliminate from the market the electric bikes without a plate by 10<sup>th</sup> August. On 24<sup>th</sup> November, Nanjing also announced to implement a registration system to put the license plate on the dock-less bikes and control their numbers<sup>71</sup>, while participating in the regulation process as the other first-tier cities<sup>72</sup>.

In Hangzhou, by November 2016, there were already 448,600 bikes from ten companies creating problems due to haphazard parking<sup>73</sup>. By April 2017 the Hangzhou City Urban Management Committee (杭州市城管委 *Hangzhou shicheng guan wei*) the Transportation

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<sup>67</sup> See section 2.3.4

<sup>68</sup> 12个城市暂停新增投放 共享单车何去何从? <[http://www.xinhuanet.com/2017-09/08/c\\_1121633276.htm](http://www.xinhuanet.com/2017-09/08/c_1121633276.htm)>

<sup>69</sup> Supra, note 66

<sup>70</sup> See section 2.3.4

<sup>71</sup> 南京共享单车有44.9万辆80%投诉是乱停乱放 <[http://www.js.xinhuanet.com/2017-11/25/c\\_1122008935.htm](http://www.js.xinhuanet.com/2017-11/25/c_1122008935.htm)>

<sup>72</sup> See section 2.3.4

<sup>73</sup> 杭州发布共享单车指导意见 年底前建成监管平台 <[http://www.xinhuanet.com/2017-09/30/c\\_1121753050.htm](http://www.xinhuanet.com/2017-09/30/c_1121753050.htm)>

Bureau (杭州市交通运输局 *Hangzhou shi jiaotong yunshu bu*) and Public Security Bureau (杭州市公安局 *Hangzhou shi gongan ju*) have already asked the companies, including ofo, Mobike and Hellobike, to stop introducing more bicycles and had to prohibit the entrance in the West lake area during the 1<sup>st</sup> May holiday<sup>74</sup>. The first call to stop the increase of bikes has been introduced in April 2017 but had to be remarked with the official stop on 22<sup>nd</sup> September<sup>75</sup>. In July 2017, the Hangzhou city Administration called the dock-less bike-sharing companies to sign an agreement on responsibilities toward the society and improve the management of the bicycles fleet, since the city has already lost CNY 220,000 to move the 23,000 irregular parked bikes<sup>76</sup>. In October 2017, Hangzhou City Urban Management Committee has launched the geofencing (or electronic fencing) technology to control the parking problem in collaboration with the bicycle's companies, ofo, Mobike and Hellobike, which implemented the function on their apps with an award/punishment system giving more/less points to the users' credit score according to their behavior<sup>77</sup>. Since November 2017, the Transportation Bureau has announced to "slim down" the bicycles fleet from 882,700 to 770,000. The downsizing plan has been retaken in April 2018, with the objective to reach the ideal number of bicycles which is 320,000-460,000. The downsizing method is to cut the numbers of bikes from different companies according to their evaluation as for the first quarter of 2018<sup>78</sup>.

Since the first introduction of dock-less bikes in October 2016 in Shenzhen, by the end of August 2017, the city could count ten different dock-less bike-sharing companies, 890,000 bikes, registering more than 5 million rides every day and 20 million users<sup>79</sup>. By the end of 2017, it has registered almost 130,000 illegal conducts and ten death accidents<sup>80</sup>. Shenzhen traffic circulation is profoundly affected by the high number of bikes, electric bikes and other

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<sup>74</sup> 杭州发布公告：“五一”期间西湖景区等地禁止投放“共享单车” <[http://www.xinhuanet.com//local/2017-04/25/c\\_1120873073.htm](http://www.xinhuanet.com//local/2017-04/25/c_1120873073.htm)>

<sup>75</sup> 杭州重申暂停新增共享单车企业和车辆 <[http://www.zj.xinhuanet.com/2017-09/23/c\\_1121712116.htm](http://www.zj.xinhuanet.com/2017-09/23/c_1121712116.htm)>

<sup>76</sup> 杭州市城管委约谈 9 家共享单车企业 要求依法有序经营 <[http://www.xinhuanet.com//local/2017-07/11/c\\_1121300078.htm](http://www.xinhuanet.com//local/2017-07/11/c_1121300078.htm)>

<sup>77</sup> 圈住乱停放的共享单车 杭州延安路启用“电子围栏” <[http://www.zj.xinhuanet.com/2017-12/11/c\\_1122090024.htm](http://www.zj.xinhuanet.com/2017-12/11/c_1122090024.htm)>

<sup>78</sup> 杭州要给共享单车“瘦身” 从 77 万降至 50 万辆 <[http://www.zj.xinhuanet.com/2018-03/22/c\\_1122573904.htm](http://www.zj.xinhuanet.com/2018-03/22/c_1122573904.htm)>

<sup>79</sup> 深圳拟出台共享单车管理办法 <[http://m.xinhuanet.com/qd/2017-10/26/c\\_1121857453.htm](http://m.xinhuanet.com/qd/2017-10/26/c_1121857453.htm)>

<sup>80</sup> 89 万共享单车有了“大总管” <[http://www.ha.xinhuanet.com/car/carnews/2017-12/01/c\\_1122042754.htm](http://www.ha.xinhuanet.com/car/carnews/2017-12/01/c_1122042754.htm)>

new commuters on the streets, such as the many food-delivery motorcycles and packages-delivery cars. Shenzhen city's Transportation Bureau has announced to stop further pouring of bikes on 7<sup>th</sup> September 2017 to manage those on the streets, some banks and companies have already started to tackle users' deposit and removal of bikes in some key areas<sup>81</sup>.

By September 2017, in Wuhan, there were almost 700,000 bikes, while its parking spaces for non-motorized vehicles are only 10,000, with the capacity for 400,000 bikes circulation. In Wuhan, there are five companies, Mobike, ofo, Hellobike, Kuqi Bike and Newbike (牛拜 *Niubai*<sup>82</sup>), and on 4<sup>th</sup> September Wuhan announced the stop of bikes introduction<sup>83</sup>. Bicycles were concentrating in the main areas, because costs for operation in the new area is much higher. Already in May, Wuhan has pulled out the Guiding Opinions<sup>84</sup>. In particular, Wuhan is an early adopter of the geofencing technology (began with ofo's collaboration)<sup>85</sup> and the "blacklist" method to prevent users from accessing bike-sharing services if they registered negative behaviors<sup>86</sup>, in both cases the strategies have been enhanced in collaboration with the bike-sharing companies.

The dock-less bike-sharing companies entered Chengdu in November 2016, and by February 2017 it had 320,000 bicycles which were creating chaos on the streets. Chengdu is one of the first cities to promote the bike-sharing industry standards establishment and regulation<sup>87</sup> and first treating the stealing and damaging of bikes as a crime to be punished with detention and monetary fines<sup>88</sup>. One year later, Chengdu could count 1.3 million bicycles from seven companies, with ofo's 700,000 bikes and Mobike's 500,000 holding 92% of the market, pushing the city to stop the companies to pour further bikes in November 2017. Chengdu also established an evaluation system for the bike-sharing companies to push them hiring more personnel to manage the bikes and defined the most crowded areas where the parking of

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<sup>81</sup> Supra, note 68

<sup>82</sup> <http://www.newbike.com.cn/>

<sup>83</sup> 武汉共享单车已达 70 万辆 企业表示支持暂停新增投放 <[http://m.xinhuanet.com/2017-09/05/c\\_1121604798.htm](http://m.xinhuanet.com/2017-09/05/c_1121604798.htm)>

<sup>84</sup> See section 2.3.4

<sup>85</sup> 武汉将设“电子围栏”规范共享单车停放 <[http://www.xinhuanet.com/2017-07/06/c\\_1121277697.htm](http://www.xinhuanet.com/2017-07/06/c_1121277697.htm)>

<sup>86</sup> 武汉出台共享单车“黑名单”机制细则 首批 216 人入列 <[http://www.xinhuanet.com/2017-07/25/c\\_1121376733.htm](http://www.xinhuanet.com/2017-07/25/c_1121376733.htm)>

<sup>87</sup> See section 2.3.4

<sup>88</sup> 成都发布“规范”鼓励共享单车有序发展 <[http://m.xinhuanet.com/2017-03/04/c\\_1120568312.htm](http://m.xinhuanet.com/2017-03/04/c_1120568312.htm)>

bikes is prohibited<sup>89</sup>. Moreover, Chengdu is adopting the geofencing technology to control illegal parking with the collaboration between companies and the local administration<sup>90</sup>.

Xiamen is a “dock-less bicycles cemetery” with 80,000 bikes piled in square 7,000km. Since November 2017, Xiamen City Urban Management Department (厦门市城管部门 *Xianmen shi cheng guan bumen*) started a disposing work in the city and cleared up 10,000 bikes in a month. The government was forced to take actions against the 350,000 bikes introduced by the companies. The number of bikes has considerably surpassed the demand, which would be around 100,000 for the city’s 3.9 million inhabitants. Now it is to build a mutual collaboration between companies and the government to manage the situation. The fierce competition was the main obstacle for the government’s request to stop the further increase of bikes because none of the companies would leave the space to the rivals<sup>91</sup>. In February 2018, in Xiamen, there is the opening of electronic parking areas, implemented in some trial spots by ofo. The parking in the suggested areas increase users credit score and positively influence their deposit and renting fees benefits, for example by giving free rides. At the same time, Mobike adopted a similar system, but it seems that it does not affect users’ credit score, while Hellobike has not started yet. Although the implementation of an electronic parking system helped in gaining more ordered parking of the bikes, there is still need of a broader application by the bike-sharing companies to truly better the situation<sup>92</sup>.

Xi’an is an ideal city for cycling. Ofo and Mobike besieged the city’s 80% market, with 280,000 and 260,000 bikes respectively by the end of 2017<sup>93</sup>. Starting from 14<sup>th</sup> September 2017, Xi’an published the “shared bicycles parking and management standards and measures” (共享单车停放管理标准及措施 *Gongxiang danche tingfang guanli biao zhun ji cuoshi*), which prohibits to park within 50m in 8 types of areas: subway stations, bus stations, schools, information points, crossroads, and touristic attractions. Furthermore, the companies have 2 hours to

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<sup>89</sup> 成都共享单车停放秩序排名 重点区域将设“禁停区” <[http://m.xinhuanet.com/sc/2017-12/20/c\\_1122140316.htm](http://m.xinhuanet.com/sc/2017-12/20/c_1122140316.htm)>

<sup>90</sup> 成都共享单车启用“电子围栏” 违停或被“封杀” <[http://www.xinhuanet.com/video/2017-12/26/c\\_129775672.htm](http://www.xinhuanet.com/video/2017-12/26/c_129775672.htm)>

<sup>91</sup> 厦门“共享单车坟场”背后的博弈 <[http://www.xinhuanet.com/2017-11/29/c\\_1122032048.htm](http://www.xinhuanet.com/2017-11/29/c_1122032048.htm)>

<sup>92</sup> 厦门：共享单车电子围栏来了！ <[http://www.fj.xinhuanet.com/shidian/2018-02/14/c\\_1122417635.htm](http://www.fj.xinhuanet.com/shidian/2018-02/14/c_1122417635.htm)>

<sup>93</sup> 西安试点共享单车电子围栏 违规停放将扣信用分 <[http://www.sn.xinhuanet.com/2017-12/20/c\\_1122140028.htm](http://www.sn.xinhuanet.com/2017-12/20/c_1122140028.htm)>

remove the illegally parked bikes and 4 hours to clean piled bicycles<sup>94</sup>. On 1<sup>st</sup> November, the Comprehensive urban management and law enforcement Bureau (西安市城市管理综合执法局 *Xi'an shi cheng guanli zonghe zhifa ju*) opened a dialogue with the bike-sharing companies' local managers and it will temporarily seize the irregular bikes and remarked the promise to manage the bicycles fleet<sup>95</sup>. In December Xi'an also enhanced a trial of the geofencing system with ofo and Mobike, to impede parking in the restricted areas<sup>96</sup>.

Between August and September 2017, cities like Shanghai, Hangzhou, Nanjing, Guangzhou, Shenzhen, and few others, for a total of 12 cities, announced to stop the introduction of more bicycles<sup>97</sup>. With these cities pressing the "temporary stop button,"<sup>98</sup> the bike-sharing firms exited the phase of expansion and cash-burning and entered a management improvement phase. With the new requirements to improve the service quality in the cities and resolve the illegal parking and diminish the number of damaged bikes, the companies must operate under new rules established by the governments<sup>99</sup>. By this time, the two leaders, ofo and Mobike, both declared that they have reached the number in the major cities and that they are starting the management work in those cities with all their commitment.

However, the saturation is not only a problem of first-tier cities but also of the major second and third-tier cities. For example, in December 2017, the prefecture-level city of Fuzhou, enacted the local regulation, the Opinions for the implementation of the rules for the management of the shared bicycles of the Fuzhou city Government General Office (trial) (福州市人民政府办公厅关于规范共享单车管理的实施意见 (试行) *Fuzhou shi renmin zhengfu bangongting guanyu guifan gongxiang danche guanli de shishi yijian (shixing)*) to establish a ceiling to the number of bicycles<sup>100</sup>.

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<sup>94</sup> 西安规范共享单车停放: 地铁口及公交站 50 米范围内禁停 <[http://www.xinhuanet.com/local/2017-09/15/c\\_1121670663.htm](http://www.xinhuanet.com/local/2017-09/15/c_1121670663.htm)>

<sup>95</sup> 西安启动新规 共享单车违规停放将被依法暂扣 <[http://www.sn.xinhuanet.com/2017-11/04/c\\_1121905675.htm](http://www.sn.xinhuanet.com/2017-11/04/c_1121905675.htm)>

<sup>96</sup> Supra, note 93

<sup>97</sup> Supra, note 66

<sup>98</sup> “暂停键” (*zan ting jian*), literally “temporary stop button”, is a metaphor used by the Chinese media to indicate the action of stopping the increase of bicycles numbers as part of the “order to stop introducing” bicycles. Supra, note 58

<sup>99</sup> See section 2.3.4

<sup>100</sup> 福州发布共享单车停放新规 共享单车企业将被限额投放 <[http://www.xinhuanet.com/photo/2017-12/02/c\\_1122046140.htm](http://www.xinhuanet.com/photo/2017-12/02/c_1122046140.htm)>

Another second-tier city besieged by the excess of bikes is Shijiazhuang, where the city government announced to stop new bike introduction on 14<sup>th</sup> December and to dispose of the bikes in some central areas. By the end of 2017, in the city there were about 400,000 bikes, which are far more than the demand. Notwithstanding the companies' work to improve the bicycles fleet management according to self-regulation, there are still some areas with excess and disorder<sup>101</sup>.

In the prefecture-level city of Kunming, on 9<sup>th</sup> December 2016, YOUON was the first bike-sharing company to enter with its free-floating blue bikes. Ofo was the next to enter on 29<sup>th</sup> December, immediately followed by Mobike, which arrived on 7<sup>th</sup> January 2017. Kunming turned out to be a very active city due to high ride rates and soon became saturated with more than 3.8 million bikes. There was even a local bike-sharing company introducing its bike on Kunming's streets in May 2017<sup>102</sup>.

Also, in the prefecture-level city of Taiyuan there were already 143,000 bikes according to the report of July 2017. Taiyuan published the Opinions on the regulation for the development of the Internet rental bicycles (关于规范互联网租赁自行车发展的意见 *Guanyu guifan hulianwang zulin zixingche fazhan de yijian*) on 25<sup>th</sup> December 2017, establishing the ceiling of 160,000 bikes and not supporting the electric bike-sharing development. Furthermore, the bike-sharing companies must operate under the road safety law, the city's transportation department will handle breaches to traffic rules. However, bike-sharing companies are the foremost accountable for operations management and must follow the proportion of at least 50 workers for every 10,000 bikes, implement geo-fencing and bicycles' maintenance<sup>103</sup> as established in the national Guiding Opinions.

Zhengzhou prefecture-level city pushed the "emergency brake" in August 2017, but on 13<sup>th</sup> September, the local Transportation Bureau, the City Government, and the Public Security Bureau jointly opened a dialogue with the five companies, Mobike, ofo, Kuqi bicycle, Qingli bicycle (轻力单车 *Qingli danche*)<sup>104</sup> and Yigoubao bicycle (易购宝单车 *Yigoubao danche*) to

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<sup>101</sup> 石家庄清理近万辆违规停放共享单车 <[http://m.xinhuanet.com/he/2017-12/17/c\\_1122123569.htm](http://m.xinhuanet.com/he/2017-12/17/c_1122123569.htm)>

<sup>102</sup> 昆明共享单车用户超380万 <[http://www.yn.xinhuanet.com/hot/2018-01/08/c\\_136879355.htm](http://www.yn.xinhuanet.com/hot/2018-01/08/c_136879355.htm)>

<sup>103</sup> 太原: 共享单车将不超16万辆 电动自行车不会共享 <[http://www.sx.xinhuanet.com/2017-12/26/c\\_1122165374.htm](http://www.sx.xinhuanet.com/2017-12/26/c_1122165374.htm)>. See also section 2.3.4

<sup>104</sup> 轻力单车 <<https://baike.baidu.com/item/%E8%BD%BB%E5%8A%9B%E5%8D%95%E8%BD%A6/20453734>>

further improve the bicycles fleet management and control the quantity, which must be maintained under 400,000 bikes. The companies have been asked to stop introducing more bikes, to reinforce the collaboration with the governmental department by strengthening the information sharing, to develop the geo-fencing technology for limiting the illegal parking and to create a credit system to assess the users<sup>105</sup>.

One last example is the county-level city Yiwu , where an oversized fleet of 110,000 bicycles has slowly become a problem after their first appearance in August 2017, forcing the local government to establish a credit system to evaluate the bike-sharing companies. The standards are defined in the Method for the assessment of the ordered parking management of the Internet rental bicycles (互联网租赁自行车停放秩序管理考核办法 *Hulianwang zulin zixingche tingfang zhixu guanli kaohe banfa*), according to which the companies with a score below 60 points must stop the operations<sup>106</sup>.

In conclusion, all the above examples show the changing situation of the bike-sharing market, which switched from a very promising market in which tens of companies poured their two-wheels to a saturation and blockage situation, in which localities are pushing back the surge of bicycles. With the beginning of the new phase, companies cannot continue the cash-burning strategy for producing and introducing the highest number of bikes possible but must undertake a reorganization process, by focusing on the management of the bicycles according to the new regulations established in the localities<sup>107</sup>.

#### *Bike-sharing companies in smaller localities: the bike-sharing union model*

As explained above, smaller companies target smaller localities because of the fierce competition and the saturation of the first and second-tier cities. The presence of minor companies in smaller cities is not only a retreat strategy, switching from bigger to smaller cities, but also a first move strategy by being the first to operate in localities not yet targeted by the bigger companies. In smaller, but still essential cities, there is the opposite trend, with smaller companies first entering the market, followed by the bigger ones. As discussed in the previous section, many second and third-tier cities reached the saturation as the first-tier ones.

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<sup>105</sup> 饱和度达到全国第一 共享单车, 郑州踩了急刹车 <[http://m.xinhuanet.com/ha/2017-09/14/c\\_1121659517.htm](http://m.xinhuanet.com/ha/2017-09/14/c_1121659517.htm)>

<sup>106</sup> 浙江义乌设共享单车“红黑榜” 将清退不合格企业 <[http://www.xinhuanet.com/auto/2018-01/08/c\\_1122223587.htm](http://www.xinhuanet.com/auto/2018-01/08/c_1122223587.htm)>

<sup>107</sup> *Supra*, note 66

While the situation is still very competitive in smaller cities, where the second entrants' companies must face the arrival of the bigger ofo and Mobike, there is still space for growing in four and five-tier cities<sup>108</sup>. In these very small localities, the dock-less bike-sharing has a new model: the bike-sharing unions<sup>109</sup>. Even 3Vbike, announced to change its strategy on 18<sup>th</sup> August 2017, turning to fifth and sixth-tier localities by joining local bike-sharing unions. 3VBike failed because of the bigger competitors but has launched a new model to exploit its resources in small localities with the help of new ventures, who are gathered to cooperate in venture capital.

The enthusiasm for the dock-less bike-sharing business in the small town is given by the fact that the big and successful companies operating in the main cities would never go so far to reach out fourth, fifth or sixth-tier localities. At the same time, these localities are potential prosperous market without competitors, since they might need the bike-sharing service, while the entrepreneurial initiative would be driven by the possibility to establish a profitable business based on high profits from the ride's fees. An example is Xiaoqiang Bicycle (小强单车 *Xiaoqiang danche*), a dock-less bike-sharing company which established with the union model in Dongguan prefecture-level city in Guangdong. Mr. Wu went to first, and second-tier cities and the dock-less bike-sharing fast uptake attracted him. He has been thinking of the fact that these companies would never go to small cities such as Dongguan. Despite the fact Dongguan has already its governmental supported public bike-sharing program, he was sure that it would not influence the dock-less bike-sharing business. In May 2017, he introduced 500 bikes in Dongguan, at the cost of CNY 780 per each, for a total cost of CNY 500,000 including transport, employees and other costs. In his mind, there was a need of at least 2,000-3,000 bikes and CNY 1.5 million were necessary to reach the scale. However, the bikes were rarely used and did not reach the expected ride rates.

Many other companies established in small towns with the union model, such as DDbike. This company announced to reach profitability in 3-4 month and to recover all the costs in 8-9 months because of low investments needed. The members of the union must buy bikes from

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<sup>108</sup> Supra, note 22

<sup>109</sup> “加盟”, literally “to join an union,” is the term used by the Chinese medias to describe the bike-sharing model which developed in the small localities. This section entirely based on the webpage: 共享单车后半场: 小品牌转向四五线小城 加盟乱象凸显 <[http://www.xinhuanet.com/fortune/2017-08/25/c\\_1121539387.htm](http://www.xinhuanet.com/fortune/2017-08/25/c_1121539387.htm)>

the union's platform at the price of CNY 500-900, with a more considerable part of return going to the members of the union. As an alternative, members can invest on the platform CNY 500,000 as the fee to enter the union and must operate together with the union and receive profit according to the shares. In both cases, the offline operations are all on the union's members, who will mainly receive profits from the high rates of rides' fees. The expectations from 1,000 bike in a city with 200,000 inhabitants would be costs for bikes of CNY 860,000 (CNY 860 each), CNY 10,000 for every month's operations, while monthly profits should be CNY 150,000-240,000 deriving from 5 to 8 average rides at CNY 1. In less than half a year the initial costs are fully recovered. Furthermore, there is the possibility to earn from advertising on the bikes and the app.

Despite the confident predictions, these small bike-sharing unions could not reach the expected average rides. For example, Xiaoqiang bikes expected to make four rides on average and to recover the costs in 8-9 months, but, it only reached 1.2-1.5 rides. The truth is that even in the first and second tier cities, companies hardly make five rides on average. Also, small towns do not have good bikes facilities, with people privileging the use of electric scooters. Members had to worry about the bicycle's quality too. Still taking Xiaoqiang's case, the bikes started to have quality problems after only one month, resulting not complying with the quality standards. Furthermore, the bikes' GPS location system was utterly imprecise, making users and workers unable to find the bikes.

These bike-sharing unions models started in 2017 and are all small-scale businesses. They initially were bicycles producers or mostly software developers. For entrepreneurs, is not difficult to establish a bike-sharing company, since specialized companies are providing bike-sharing platform's software at the cost of CNY 100,000 including mobile APP and the operation assistance. The alternative is the possibility to buy the entire system for CNY 200,000. There are other companies specialized in smart-locks, which sells bikes with the entire system for CNY 620. Most smart-locks are produced in Shenzhen and have an average price of CNY 270. This means that it is possible to open a bike-sharing business for less than 100,000 CNY, including the bicycles with smart-locks, management system, and the mobile app. The union model is not as efficient as the direct management model, such as those of ofo and Mobike, because of less control on the business from the members, but can help to reduce costs and risks. In fact, the previous operators in second-tier cities such as Kuqi and 100bike (百拜单车

*Baibai danche*)<sup>110</sup> have already switched to the union model. However, this model is still facing bigger companies' competition and are operating only in small towns, where the management costs are generally higher and it is more difficult to operate.

*Companies short on cash: first retreats in the Chinese market and the "deposit crisis"*

The increase of bicycle numbers is a clear sign of the fierce competition going on in the bike-sharing market. Some smaller companies could not hold ofo and Mobike's growth speed, because they started to be short on cash. The difficulty in getting more funds for the smaller players is a consequence of the shift of the leading investor's attention towards the few best start-ups. Many second and third entrants' companies turned away from first and second-tier cities in order to survive. For example, Ming bike announced its change of strategy by leaving the first and second-tier cities to enter third and fourth-tier cities; 3Vbike, which stopped in June, tried to start in fifth and sixth-tier localities for exploiting its resource<sup>111</sup>.

With the concentration of the money in few brands' hands, on 13<sup>th</sup> June 2017, the first company declaring bankruptcy was Wukong. A few days later, on 21<sup>st</sup>, it was the time for 3Vbike's closure. These companies' failure demonstrated that the companies which cannot reach a large scale or do not have other competitive characteristics are destined to be overwhelmed by the ofo and Mobike. also, Ding Ding Bike has entered a cash interruption crisis, and the company headquarters disappeared by August 2017. A big case was Bluegogo's failure, announced on 20<sup>th</sup> November 2017, exactly after one year since its establishment. Bluegogo was the third company after ofo and Mobike, but entered in a financial crisis, when it could not get the B financing round of US\$ 400 million it hoped. After that, it entered a deposit crisis because it used part of the deposit to produce the bikes and was not able to reimburse it to the increasing number of users requiring it. Ding Ding's users had problems in getting back their deposit since March 2017, leaving 10,000 users without their money after it closed in summer 2017. Bluegogo had to face a surge of requests since the deposit has become a national growing concern and failed in returning the amounts due to illicit use of the deposit for bikes production when it entered in difficulty. Kuqi has also been a case of

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<sup>110</sup> 100bike <<http://www.100-bike.com/>>

<sup>111</sup> 共享单车巨头放缓 弱势品牌转战四五线城市 <[http://www.he.xinhuanet.com/jujiao/2017-08/27/c\\_1121549390.htm](http://www.he.xinhuanet.com/jujiao/2017-08/27/c_1121549390.htm)>

deposit crisis, which started since August 2017, immediately after the first big deposit cases<sup>112</sup>. On 12<sup>th</sup> December, Kuqi Bike received the warning from the China Consumers Association (中国消费者协会 *Zhongguo xiaofeizhe xiehui*) to return the deposit, but it has never responded to the problem, and the company's office turned out to be empty on 19<sup>th</sup> November. On 18<sup>th</sup> December, the Guangdong province Consumers Association sued Ming bike, which became the first civil case accepted by the second level court concerning the bike-sharing companies. Ming bike receive more than 30.000 complaints from its users, mostly on deposit issue. These cases show how consumers are not incentivized to sue the bike-sharing companies because of high costs to make the lawsuit. However, the main instrument they can rely on is to shift their right to get back the deposit to the Consumers Association, which can make a comprehensive public lawsuit for the consumers. The self-regulation of the companies operating in the bike-sharing industry made the use of the deposit a secret. However, the employment of deposit for any purpose by the bike-sharing companies is a breach in the Law on the Protection of Consumers' Right and Interests (消费者权益保护法 *Xiaofeizhe quanyi baohu fa*), and consumers are now becoming more aware of the possibility to make public lawsuits<sup>113</sup>. According to Sesame Credit's report, since September 2017, six companies' closure (Wukong, Ding Ding, Kuqi, Ming bike, Bluegogo) created a loss of more than CNY 1 billion for the consumers<sup>114</sup>. In March 2018, among the 70 bike-sharing companies, 34 closed and the China Consumer Association is calling the government to enact laws to solve the deposit issue<sup>115</sup>.

As of January 2017, ofo and Mobike reached 10 million users, calculating from their deposit policies of CNY 99 and CNY 299, they should have collected CNY 4 billion. Because of the presence of so many brands on the streets and new battles to steal users from each other, many users started to retrieve the deposit. When many episodes of difficulties in returning the money aroused, the deposit became one of the main issues when looking at the bike-

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<sup>112</sup> 财发现：共享单车洗牌季 这些公司的“死因”有这几种 <[http://www.xinhuanet.com/fortune/2017-11/03/c\\_129731730.htm](http://www.xinhuanet.com/fortune/2017-11/03/c_129731730.htm)>

<sup>113</sup> 公益诉讼将助百万共享单车用户讨要押金 <[http://www.xinhuanet.com/gongyi/2017-12/27/c\\_129775420.htm](http://www.xinhuanet.com/gongyi/2017-12/27/c_129775420.htm)>

<sup>114</sup> 企业接连倒闭 多部门调研酝酿共享单车配套政策 <[http://www.xinhuanet.com/yuqing/2017-11/24/c\\_129748392.htm](http://www.xinhuanet.com/yuqing/2017-11/24/c_129748392.htm)>

<sup>115</sup> 70 多家共享单车 34 家倒闭 中消协提请推进押金立法 <[http://www.xinhuanet.com/auto/2018-03/19/c\\_1122556296.htm](http://www.xinhuanet.com/auto/2018-03/19/c_1122556296.htm)>

sharing market in China<sup>116</sup>. In fact, after the suspension of operations of the above mentioned six companies which had cash shortage crisis, the China Consumer Association has been pushing Kuqi to give explanations to the consumers, and it also supported a general complaint against all these companies. However, what it must be understood is how ofo and Mobike are managing consumers' deposit since media are already talking about the possible illegitimate use of deposit for further implementing their expansion strategy. The difficulty in understanding the real situation behind the deposit is given by the fact that the deposit management is left to industry's self-regulation, but more people from inside the banks and the industry are disclosing information about the improper utilization of deposit by the companies<sup>117</sup>.

*Survive the flames of the cash-burning industry: is merging a solution?*

Despite retreats from first and second-tier cities and bankruptcy of the smaller companies, another outcome of the fierce competition could be M&As.

After the peak of the financing round battles, when Mobike and ofo got US\$ 600 million and US\$ 700 million between June and July 2017<sup>118</sup>, many smaller competitors have failed as described above. However, for the survivors, the competition continues in lower-tier cities. On 25<sup>th</sup> October 2017, YOUON and Hellobike merged, continuing to operate under Hellobike's name but it has become a YOUON subsidiary. With this merger, the brand Hellobike became the third top dock-less bike-sharing brand after ofo and Mobike, though it concentrates its operation mostly in second and third-tier cities because it has lost the first entrants' advantages. However, this merge resulted successful, with Hellobike getting CNY 1 billion funds from Ant Financial and other big investors starting from 2018<sup>119</sup>.

The hopeless cash-burning business seems not to have a solution to reach a sustainable model. After the conclusion of the substantial financing rounds between ofo and Mobike, in December 2017, it was time for discussing a possible merger between ofo and Mobike. The talks were pushed by the investors but failed due to ofo's firm refusal to intercede for the merge. The two companies occupy the 90% of the dock-less bike-sharing market, which means

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<sup>116</sup> Supra, note 19

<sup>117</sup> 中消协 15 天三度发声:共享单车企业不得挪用押金 <[http://www.xinhuanet.com/yuqing/2017-12/21/c\\_129771470.htm](http://www.xinhuanet.com/yuqing/2017-12/21/c_129771470.htm)>

<sup>118</sup> Supra, notes 17 and 18

<sup>119</sup> Supra, notes 21 and 34

that the current situation is already an oligarchy of two. A possible merger would mean entering a monopoly which would have detrimental consequences for the society. The bike company would have more power over the users, who must pay higher costs. However, the operators already have enormous costs for production and management; a merger would not be the solution to cover an even more significant expense. Although they could have unified the effort, also all the burdens would sum up. Also, the internal conflicts after the merger would be a relevant issue. The final result would be probably higher costs for a lower quality service for the users. A merger between the two major companies seems not the solution for a winning model in dock-less bike-sharing business, and there is still the need to find a way to curb the high costs, decrease the rate of damage to the bikes and reach a healthy competitive order<sup>120</sup>.

#### 2.2.5 CHINESE STYLE BIKE-SHARING OUTSIDE MAINLAND CHINA

##### *Chinese bike-sharing start-ups going international*

For start-ups which are in a full domestic scenario of disputed investments between tens of start-ups, a common strategy is to look abroad. On 23<sup>rd</sup> December 2016, ofo declared its overseas strategy, ready to enter in San Francisco in the U.S. and London in the UK; on 27<sup>th</sup> it declared the start in Singapore as well<sup>121</sup>. The beginning of 2017 has been a period of overseas expansion for ofo and Mobike, and since September, also many second entered firms announced abroad operations<sup>122</sup>. The main reason for going abroad is the seeking of funds in a crowded domestic market, with this strategy, ofo and, Mobike point to get the attention of more prominent investors.

Since the domestic market is getting crowded, as the year 2017 was going on, and with the beginning of the summer, a sort of race towards foreign markets started. By fall 2017, there were five companies with overseas operations, including the smaller companies, U-Bicycle in Canada, Bluegogo in San Francisco and Baicycle in Japan. However, as for the domestic market, the two leaders struggling for the foreign markets are still ofo and Mobike<sup>123</sup>.

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<sup>120</sup> 合并不是共享单车的唯一出路 <[http://www.ah.xinhuanet.com/2017-12/12/c\\_1122097201.htm](http://www.ah.xinhuanet.com/2017-12/12/c_1122097201.htm)>

<sup>121</sup> Supra, note 17

<sup>122</sup> Supra, note 19

<sup>123</sup> 中国共享单车“出国潮”背后的机遇和隐忧 <[http://www.xinhuanet.com/silkroad/2017-09/05/c\\_129695978.htm](http://www.xinhuanet.com/silkroad/2017-09/05/c_129695978.htm)>

Many overseas cities are enthusiastic about the new dock-less bike-sharing service provided by the Chinese companies. With the peak of the financial numbers, the year 2017 has been a period of rapid expansion overseas, especially for ofo and Mobike. After ofo's launch in foreign markets, a very rapid rush towards foreign markets started with its main competitor Mobike and other smaller companies. Also, Bluegogo expanded to San Francisco on 25<sup>th</sup> January 2017<sup>124</sup>, while Mobike's first battle with ofo in Singapore on 21<sup>st</sup> March 2017<sup>125</sup>. In January 2017, ofo was also the first dock-less bike-sharing company in India, where it could develop in gated communities and universities with the collaboration of the local digital wallet Paytm, which is backed by Alibaba<sup>126</sup>. By June, Mobike entered Manchester and Salford (the UK), later in July it also arrived in Florence (Italy) and in London (the UK) in August 2017, when ofo landed in its fifth overseas market, Thailand, where Mobike arrived (in Bangkok) at the end of the same month. In the meanwhile, ofo started in Vienna (Austria) and Oxford (the UK) on 27<sup>th</sup> August 2017 and Mobike officially started in Washington (the US) on 20<sup>th</sup> September 2017. It was again ofo's turn to conquer new markets, landing in Tokyo and Osaka (Japan) in the middle of September, entering Prague (Czech Republic) on 16<sup>th</sup> and Spain and Portugal on 17<sup>th</sup> October. In the meanwhile, the smaller companies, U-bicycle announced to enter Canada. On 9<sup>th</sup> August Bluegogo started to set up its overseas strategy in cooperation with ZTE Corporation (中兴通讯 *Zhongxing tongxun*) to enter San Francisco (California, the U.S.), aiming to cover 30 cities in ten different countries. Furthermore, the Chinese electronics company, Xiaomi, was promoting Baicycle (小白单车 *Xiaobai danche*) to enter Japan's Universities' campus in July 2017. Thus, there were a total of five Chinese dock-less bikes-sharing companies going abroad<sup>127</sup>. By fall 2017, the rush towards foreign markets has reached the peak of the battle, with ofo and Mobike as the leading fighters. By October 2017, ofo has entered the UK, the U.S., Australia, Austria, Czech Republic, Italy, Japan, Kazakhstan, Malaysia, the Netherlands, Russia, Singapore, Spain, Portugal, and Thailand, for a total of sixteen countries, and more than 180 cities. Mobike has reached Singapore, Japan, the UK, Italy, Malaysia, Thailand, the U.S., for a total of eight countries, hitting cities such as Washington, London, Manchester (in

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<sup>124</sup> Supra, note 33

<sup>125</sup> Supra, note 18

<sup>126</sup> Supra, note 123

<sup>127</sup> 共享单车“骑”向海外，跑得还顺利吗？ <[http://www.xinhuanet.com/tech/2017-09/13/c\\_1121652916.htm](http://www.xinhuanet.com/tech/2017-09/13/c_1121652916.htm)>. Supra, notes 17, 18, 19 and 33

whole thirteen cities). On 14<sup>th</sup> November 2017, Mobike also entered Sydney (Australia) and Berlin (Germany) on 21<sup>st</sup> November<sup>128</sup>.

Among the most enthusiastic countries, we have Italy and the UK. Both ofo and Mobike arrived in Italy, where main cities such as Milan and Florence can count more than 10,000 bikes by September 2017<sup>129</sup>. In the U.S. there is also the provision of additional services supporting Chinese dock-less bike-sharing companies, such as free riding classes, free management of the fleet. The European markets have many years of experience with the public bike-sharing programs, and the cycling culture is well established in these markets. Also, cycling in the U.S. received much attention in recent years, for example, Citi Bike is the most significant American bike-sharing system, and in Washington is growing in scale, showing the growing demand for bike-sharing, registering an increase of bike trips of 25% in 2016. However, compared to the bike-sharing in China, these old established bike-sharing schemes have no comparison: the American most important bike-sharing system, Citi Bike, has a total of 10,000 bikes and 236,000 users, while Beijing alone has 700,000 bikes and 11 million users<sup>130</sup>. Furthermore, going abroad is not without difficulties, as discussed hereafter.

When approaching a foreign market, the initial operation is tiny in scale. For example, ofo in the U.S. arrived only with 2,000 bikes, in Cambridge and Oxford (the UK) only with 500 and 1,000 bikes respectively, in town and state Malacca (Malaysia) 2,000 bikes, only Singapore is surpassing these numbers. Mobike entered Singapore with only 500 bicycles and in Washington with only 200 bikes, in Manchester (the UK) with 1,000 and London (the UK) only 750<sup>131</sup>. When ofo entered Prague (16<sup>th</sup> October) it started with 300 bikes, users could ride for free until the end of the year, and bikes were to be increased if the trial is positive<sup>132</sup>. U-bicycle in Canada must comply with the numbers planned by the city, but no more than a thousand<sup>133</sup>.

The reason for the cautious moves by Chinese bike-sharing companies abroad is the different market environment and needs, such as different domestic legislation (such as helmet requirement) and stricter rules for the management, which increases the cost for operating

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<sup>128</sup> Supra, notes 17 and 18

<sup>129</sup> 中国共享单车模式布局欧洲 <[http://www.xinhuanet.com/video/2017-09/21/c\\_129709896.htm](http://www.xinhuanet.com/video/2017-09/21/c_129709896.htm)>

<sup>130</sup> Supra, note 123

<sup>131</sup> 中国共享单车战火烧至新加坡 <[http://www.jckb.cn/2017-03/23/c\\_136149930.htm](http://www.jckb.cn/2017-03/23/c_136149930.htm)>. Supra, note 123

<sup>132</sup> 中国共享单车登陆布拉格受欢迎 <[http://m.xinhuanet.com/2017-10/17/c\\_1121814429.htm](http://m.xinhuanet.com/2017-10/17/c_1121814429.htm)>

<sup>133</sup> Supra, note 123

abroad. Chinese bike-sharing companies' strategy for going abroad is to adapt to the foreign market requirement. Thus, they usually establish a special team for foreign operations and also produce different bikes for non-Chinese users. Ofo has established a foreign markets team and has the ofo bikes overseas version, different from the bikes in mainland China<sup>134</sup>. In Singapore, ofo replaced by October 2017 all the bikes with a new version equipped with a smart-lock unlockable worldwide and a more resistant material for the Singaporean wet climate and hilly roads; in Washington, Mobike's bicycles have three speeds, automatic light on the front and a larger basket, while in Australia the helmets are also inserted; U-bicycle provides bikes of different size and characteristics according to the local people characteristics and habits, such as the requirements to use helmets<sup>135</sup>. Even though the city environment is good for cycling, there are generally stricter rules to comply with. Especially after the chaos in the Chinese cities have emerged in 2017, the foreign markets are very cautious towards the Chinese dock-less business model. For example, in the UK, ofo and Mobike must respect the designed parking areas<sup>136</sup>. Singapore requires to park the bikes inside the parking spaces drew on the floor, or the company must incur in fines. Now in Singapore, there are more than 4,000 bikes' parking<sup>137</sup>. Mobike in Singapore operates differently, cooperating with the locality to provide specific parking spaces for the bikes<sup>138</sup>. The approach of foreign markets towards bike-sharing is that bicycles are a mean of transportation that must meet safety standards and roads rules, and there are government's competences. The reason why foreign markets look cautiously to the Chinese bike-sharing model is that the lack of regulation led to many problems in the cities, where the governments are running after the bike-sharing companies to solve their management shortcomings.

Many times, before entering, the Chinese start-ups first explore and agree with the locality. For instance, Mobike before entering Washington's Columbia District on 20<sup>th</sup> September 2017, has already started to promote the dock-less bike-sharing service in July 2017. Many foreign markets have a very cautious attitude towards Chinese dock-less bike-sharing model,

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<sup>134</sup> Supra, note 127

<sup>135</sup> 中国共享单车遭美国“山寨”能否骑乐融融-新华网 <[http://www.xinhuanet.com/world/2017-09/27/c\\_129712675.htm](http://www.xinhuanet.com/world/2017-09/27/c_129712675.htm)>

<sup>136</sup> Supra, note 129

<sup>137</sup> 共享单车在新加坡的管理模式 <[http://www.xinhuanet.com/photo/2017-10/17/c\\_1121812923.htm](http://www.xinhuanet.com/photo/2017-10/17/c_1121812923.htm)>

<sup>138</sup> “中国车”登陆新加坡,带火当地共享单车市场-市场上3家无桩共享单车平台正加快各自产品的推广速度,一场“大战”已经悄然打响 <[http://www.xinhuanet.com/mrdx/2017-06/23/c\\_136387990.htm](http://www.xinhuanet.com/mrdx/2017-06/23/c_136387990.htm)>

especially after the critics ongoing in the Chinese cities on the unregulated situation and chaos on the streets. Thus, especially some European countries and the American markets, are reluctant to let Chinese bike-sharing entering freely. Because safety is these countries' priority, many barriers are preventing Chinese bike-sharing companies to rapidly expand in the cities as they do in mainland China. For instance, the U.S. requires Chinese companies to ask the permission to operate in the cities, which set the number of bikes to be introduced. In fact, when Mobike entered Washington, it started only a six months trial period, after which Mobike was to be evaluated, and when ofo entered Spain and Portugal, it made an agreement with the local government to mutual manage the operation<sup>139</sup>.

Furthermore, the fierce competition follows the Chinese two-wheels abroad. This is especially the case for relevant markets, where the demand for bike-sharing is high. Singapore is an example of an important market, where the competition is between ofo, Mobike, and the local dock-less bike-sharing brand oBike. Singapore's market is essential due to the high demand for bike-sharing because of local car restriction policy. Thus, costs for transportations, as taxi fees, are high and bike-sharing is a convenient alternative, costing CNY 10 per ride. To seize the Singaporean market, ofo launched on 24<sup>th</sup> May a new type of bike with GPS and a smart-lock system which can be unlocked worldwide. Singapore is a hot market, with the fierce competition between the newly established oBike and the two Chinese brands ofo and Mobike. In facts, Mobike's price is lower than oBike's price, which is SGD 1 against Mobike's SGD 0.5. The deposit is the same amount of SGD 49 (US\$ 35). When Mobike entered Singapore in March 2017, ofo was launching free deposit and free rides events<sup>140</sup>.

The Chinese style bike-sharing does have not only other countries' brand as competitors but also the public bike-sharing schemes the public bike-sharing schemes which are already well-established in the localities. The reluctance of foreign markets to accept the Chinese style bike-sharing is mainly due to the high investments already poured in the PBS schemes and, especially in the most successful cases, the Chinese bike-sharing does not have a regulatory framework, whereas there is uncertainty on the quality and the management. Thus, especially for the cities which already have an eradicated cycling culture and a public PBS scheme, the

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<sup>139</sup> 美媒：中国共享单车拓展至美国 摩拜锁定华盛顿 <[http://www.xinhuanet.com/asia/2017-07/12/c\\_129653732.htm](http://www.xinhuanet.com/asia/2017-07/12/c_129653732.htm)>. Supra, note 135

<sup>140</sup> Supra, note 131

Chinese style bike-sharing is not always encouraged. For example, Paris (France) has a ten-years-old PBS scheme, Vélib, which is very successful. Paris is imposing taxes on Chinese bike-sharing companies while hoping to create a regulatory framework. While the government support strongly backs Vélib's operations, the Chinese bike-sharing is still an unknown model which has not yet reached profitability. On the contrary, Vélib is spending € 4 million to operate (renewing and fixing bicycles) but is making money from advertising. The USA is also a crowded market with its own brands, such as Neutron Holdings Inc.'s Limebike, which is a new company established in California. Limebike is present in California, North Carolina, Florida, and Seattle<sup>141</sup>. For example, in Seattle, there are already 2,000 bikes from Spin, Limebike, and ofo competing on the streets. Another competitor for the Chinese dock-less bikes are the already operating shared bikes with docking stations, for example, a popular public bike-sharing scheme in the U.S. is Citi Bikes. Local bike-sharing can improve their docked models into the dock-less model, becoming direct competitors to the Chinese brands. However, in the U.S., New York city has declared on 11<sup>th</sup> August, that domestic brands should not evolve into the dock-less model. For instance, Spin in New York has been prohibited from becoming dock-less<sup>142</sup>. The competition abroad is seen not only in the bike-sharing market but also as affecting the other industries, such as the taxi or if the presence of the bikes on the streets might create costs for the tourism because ruining cities' environment<sup>143</sup>. However, there is also the case of London (the UK) where the local bike-sharing scheme with fixed docks, Boris Bike, at the end of March 2018 it was planning to stop the service in favor of ofo and Mobike. The old local bike-sharing scheme requires high costs for operations, and with the constant need of management and technology development which requires high costs, ofo and Mobike can help gradually substitute the old service and release the city from this burden<sup>144</sup>. Despite the great success in the UK, there is no lack of doubts about dock-less bike-sharing model's quality, security, and management issues.

In conclusion, going abroad is mainly a new strategy to get more investments, especially in a moment in which the domestic market is showing the first signs of crisis. With the saturation

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<sup>141</sup> 共享单车骑到了十字路口 <[http://www.jjckb.cn/2018-06/22/c\\_137272930.htm](http://www.jjckb.cn/2018-06/22/c_137272930.htm)>

<sup>142</sup> Supra, note 135

<sup>143</sup> Ibid.

<sup>144</sup> 英国版共享单车“鲍里斯单车”或将退出历史舞台 <[http://www.xinhuanet.com/video/2018-03/31/c\\_129841670.htm](http://www.xinhuanet.com/video/2018-03/31/c_129841670.htm)>

of the first-tier cities and the failure of many minor bike-sharing companies, the foreign markets are seen to have great potentiality for further growth. However, different market environment and different type of demand represent higher costs and difficulties to operate abroad. Furthermore, also in the most promising markets, there are both local companies and other Chinese competing, which increases the chaos and the unwillingness to accept Chinese dock-less bike-sharing model. The Chinese bike-sharing start-ups choice to focus on the domestic market is not only a consequence of the difficulties and restrictions in the foreign markets, but it is also their own attitude because having operations abroad is only a label to show to investors.

*The Singaporean oBike case: the local market, Taiwan and abroad*

Singapore is not only a country targeted by Chinese bike-sharing companies, but it has its local brand: oBike. This is the first Singaporean dock-less bike-sharing platform, which started in February 2017 with 1,000 bikes in its home country. oBike started a significant overseas penetration in twenty-four different countries, launching in many European countries, such as the Netherlands (June 2017), Germany and Switzerland (July 2017), Austria (August 2017), in Spain and Belgium (September 2017), France, Sweden Norway and Italy (November 2017). oBike was the first to enter Australian market: on 14th June 2017 it started in Melbourne (Australia) on 9th August it arrived in Sydney and got the permission to operate in Adelaide from October 2017, comprehensive of helmets as required by Australian legislation. The price per ride is AU\$ 1.99 (equivalent to CNY 10)<sup>145</sup>.

oBike is also in other Asia Pacific countries: Malaysia, Taiwan, South Korea, Thailand, Hong Kong, and Indonesia. oBike entered Taiwan in April 2017, being the only dock-less bike-sharing service. However, Taiwan's market is a tough place where to operate due to the high numbers of motorbikes (two motor-bike every three persons), and the competition with the local bike-sharing scheme YouBike. In Taiwan, oBike has been rejected by the local people and the local government because of the chaotic parking disturbing city's appearance and the traffic, the competition against local bike rentals and the lack of space for motor-bikes to park. Thus, oBike, which was planning to pour 50,000 bikes in three month and catching millions of users, had to face forced removal because pushed aside by motorbikes users. Also, Taiwan has good bike facilities, and local people were already used to ride the local bike-sharing scheme with

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<sup>145</sup> oBike <<https://www.o.bike/it/>>

fixed docks. Even, some cities have their specific bike-sharing schemes, such as Cbike in Kaohsiung city and Tbike in Tainan city, mainly targeting students and tourists. However, the lack of regulation on the new dock-less model left space to a high rate of loss and damaged of oBikes<sup>146</sup>.

As the Chinese bike-sharing companies, also oBike found difficulties in 2018. In June 2018 it pulled out Melbourne (Australia) due to bikes damages and strict regulation to prevent bikes littering. After this, oBike stopped the operations in its home country, Singapore, where very stringent regulation has been established after the surge of different companies' bikes<sup>147</sup>. Singapore has been targeted by the Chinese bike-sharing companies, ofo, and Mobike, which put much effort into complying with the local requirements. Singapore introduced a new licensing scheme for which bike-sharing companies must apply to have the permission to operate under strict conditions on fleet size and management, such as the use of geofencing technology and fines for the unfulfilling companies<sup>148</sup>. The deadline for application was 7<sup>th</sup> July 2018, and both ofo and Mobike rushed to apply. On the contrary, Singapore's brand GBikes stopped with the coming of this regulation, as well as oBike<sup>149</sup>.

#### *The Hong Kong-based Gobee.bike and its competitors*

With the new advocacy towards cycling in Hong Kong, in April 2017 the first Hong Kong-based dock-less bike-sharing company has established. The company Gobee.bike has been founded by a French entrepreneur, who saw the high potentiality of growth for bike-sharing. Gobee's founder, Raphael Cohen, did not only operate in Hong Kong but addressed the European markets too. However, very soon Gobee.bike started to have haphazard parking problems in Hong Kong, with many complaints from the citizens, who also encountered problems in renting process through the app<sup>150</sup> and safety issues on the transfer of users' credit card

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<sup>146</sup> 无桩共享单车进军台湾, 为何遭遇尴尬? <[http://m.xinhuanet.com/qanqao/2017-08/03/c\\_129672029.htm](http://m.xinhuanet.com/qanqao/2017-08/03/c_129672029.htm)>

<sup>147</sup> Bicycle hire company oBikes pulls out of Melbourne <<https://www.scmp.com/news/hong-kong/hong-kong-economy/article/2154877/gobeebike-packs-it-end-road-bike-sharing-services>>

<sup>148</sup> As Gobee.bike packs up, is it the end of the road for bike-sharing services in Hong Kong? <<https://www.scmp.com/news/hong-kong/hong-kong-economy/article/2154877/gobeebike-packs-it-end-road-bike-sharing-services>>

<sup>149</sup> Singapore's oBike gets on its bike: proof you can 'kill your innovators'? <<https://www.scmp.com/week-asia/business/article/2153151/singapores-obike-gets-its-bike-proof-you-can-kill-your-innovators>>

<sup>150</sup> 'Sheer number' of Hong Kong users stalls Gobee.bike app, with fix to take weeks <<https://www.scmp.com/news/hong-kong/community/article/2118675/sheer-number-hong-kong-users-stalls-gobeebike-app-fix-take>>

information. Besides, only after one week of operation Gobee has already suffered huge damages to its 400 bicycles fleet<sup>151</sup>. Despite government's willingness to increase cycling mode, Hong Kong lacks parking spaces and users' public sense<sup>152</sup>.

At the end of June 2017, HobaBike, another bike-sharing service with docking stations launched. HobaBike announced to focus more on healthy lifestyle and data collection to develop value-added services. In fact, it is not expecting to make profits from the bike rental service<sup>153</sup>, charging only HK\$ 3 per half hour, whereas Gobee charges HK\$ 5 per half an hour and a deposit of HK\$ 399<sup>154</sup>. On 15<sup>th</sup> September 2017, the first foreign company, the Singaporean dock-less oBike enters Hong Kong. oBike arrived with 1,000 bikes, which costs HK\$ 3 per 15 minutes and HK\$ 350 of deposit to pay through the app<sup>155</sup>.

With the increase in the number of bicycles and the ambitions to grow of all the companies, the number of bikes surged from a thousand to 15,000 in 2018<sup>156</sup>. The government is adding new parking spaces to deal with parking issues. In the New Territories, there are already 57,700 spaces, which are to be increased with 7,000 more<sup>157</sup>. The insufficient space ended with the forced removal of bikes by the authorities. To help the illegal parking, Gobee.bike established a credit system to encourage the parking into designated areas. Customers who park in these areas can earn riding credits and additional free 30 minutes. Hobabike has

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<sup>151</sup> Newly launched Hong Kong bike-sharing app has bumpy start with damaged rides and security fears  
<<https://www.scmp.com/news/hong-kong/education-community/article/2089835/newly-launched-hong-kong-bike-sharing-app-has>>

<sup>152</sup> Bike sharing would be great for Hong Kong commuters travelling short distances  
<<https://www.scmp.com/comment/letters/article/2119333/bike-sharing-would-be-great-hong-kong-commuters-travelling-short>>

<sup>153</sup> Hong Kong bike-sharing market accelerates with new players and business models  
<<https://www.scmp.com/news/hong-kong/economy/article/2099894/hong-kong-bike-sharing-market-accelerates-new-players-and>>

<sup>154</sup> New player to enter Hong Kong bike-sharing market, promising 'lower prices and better parking plan'  
<<https://www.scmp.com/news/hong-kong/education-community/article/2096831/new-player-enter-hong-kong-bike-sharing-market>>

<sup>155</sup> Singapore operator oBike rides into Hong Kong with 1,000 shared bicycles  
<<https://www.scmp.com/news/hong-kong/health-environment/article/2111463/singapore-operator-obike-rides-hong-kong-1000>>

<sup>156</sup> 香港这样规管共享单车 <[http://www.xinhuanet.com/qangao/2018-04/20/c\\_129855004.htm](http://www.xinhuanet.com/qangao/2018-04/20/c_129855004.htm)>

<sup>157</sup> Hong Kong government bows to pressure for more bicycle parking spaces  
<<https://www.scmp.com/news/hong-kong/economy/article/2102398/hong-kong-government-bows-pressure-more-bicycle-parking<zcxv>>

adopted a similar system and, as Ketch'up Bike, it also enhanced the geofencing technology to encourage the parking in the designated areas<sup>158</sup>.

Gobee.bike has also started overseas operations starting from November 2017 by entering the key European markets France (Paris, Lille, and Reims) Belgium (Bruxelles) and Italy as well<sup>159</sup>. However, due to the high rate of damages from vandal acts, it has been forced to pull out from the overseas markets at the beginning of the year 2018, after few months of operations. By the end of February, Gobee.bike registered a thousand stolen bikes only in France, which is the first battlefield that it left. The company arrived in Paris with 2,000 bikes, and seized 150,000 users across Europe, but has now to retreat not only from France, but also from Brussels (Belgium) and Florence (Italy). Gobee.bike's bicycles appeared not being reliable on the quality perspective, and the market preferred the other brands, ofo, Mobike and oBike, which together occupy 95% of the European dock-less bike-sharing market<sup>160</sup>.

In April 2018, after the difficulties in the foreign markets, there were rumors about ofo taking over Gobee's operations in Hong Kong. Among Gobee.bike's investors, there were Grishin Robotics and Alibaba Hong Kong Entrepreneurs Fund (raising US\$ 9 million), which gives the sense to unify two companies backed by the same big investor. Ofo has arrived in Hong Kong in December 2017, charging HK\$ 3-5 and HK\$ 99 deposit<sup>161</sup>. Just one year later its start, Gobee was facing other five companies' competition, which poured a total of 17,000 bikes in Hong Kong, with the two leading two controlling 10,000 bikes. LocoBike has started in October 2017 with 2,200 bikes, charging HK\$ 3 and deposit of HK\$ 99, it also applies penalties and awards for better parking. Ketch'Up Bike started with 1,000 bikes<sup>162</sup>, is the smaller among Gobee's competitors and is shifting towards the creation of electric motorcycles and vehicles rental platform. In fact, in July 2018, it sold the majority stake into cryptocurrency coins and looked

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<sup>158</sup> Supra, note 156

<sup>159</sup> *Arriva in Italia il bike sharing di Gobee.bike: la prima città è Torino* <<http://www.datamanager.it/2017/11/arriva-italia-bike-sharing-gobee-bike-la-citta-torino/>>

<sup>160</sup> *Theft, vandalism force Hong Kong bike sharing start-up Gobee to retreat from Europe* <<https://www.scmp.com/tech/start-ups/article/2134746/theft-vandalism-force-hong-kong-bike-sharing-start-gobee-retreat>>. *HK bike sharing startup Gobee halts operations in Paris* <<https://www.dealstreetasia.com/stories/dockless-bike-share-pioneer-gobee-quits-paris-93050/>>

<sup>161</sup> *Ofo rolls out bike-sharing service in Hong Kong* <<http://www.ejinsight.com/20171206-ofo-rolls-out-bike-sharing-service-in-hong-kong/>>

<sup>162</sup> *Hong Kong's bike-sharing industry due for a shake-out, with six start-ups burning money and public opposition mounting* <<https://www.scmp.com/lifestyle/article/2146192/hong-kongs-bike-sharing-industry-due-shake-out-six-start-ups-burning-money>>

at the development of blockchain technology to create an environmentally friendly vehicles rental platform.

After retreating from foreign markets, Gobe.e.bike ended its operations in Hong Kong on 17<sup>th</sup> July 2018 due to unsustainable maintenance costs and fierce competition after fifteen months of operations<sup>163</sup>. By May 2018, in Hong Kong, there were already six different companies, all facing difficulties in operating. Users could retrieve their deposit, but not the credit remaining on their accounts, that they could use before the actual stop of the bikes<sup>164</sup>.

To conclude, the Hong Kong market is still having difficulty in accepting the new sharing economy businesses compared to mainland China. In the bike-sharing industry, despite the government's enthusiasm towards the green transportation mode, there are still difficulties related to road safety, theft and vandalism, illegal parking, personal information protection, and fair competition issues. Above all, the failure of bike-sharing in Hong Kong is the lack of a good management system, and together with a general lack of cycling culture, the bike-sharing companies face high costs to provide an underused service. These costs are even higher with the government's discontent towards the chaos created by the haphazard parking and vandalism of the bikes. In fact, Hong Kong implemented a bicycle license plate system for the companies. Despite the challenges, and the attempts to regulate the bike-sharing market, there is still the need to improve both cycling culture and infrastructures further. It is not clear how profitable the bike-sharing industry can be in Hong Kong, and to what extent it can generate valuable data.<sup>165</sup>.

#### *Dock-less bike-sharing in Italy: a deeper insight into the Italian market*

In Italy, the cycling culture is well established with many public bike-sharing schemes as described in Chapter 1. Thus, it was predictable that Italy would be the new dock-less bike-sharing companies target.

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<sup>163</sup> Hong Kong's first bike-sharing brand Gobe.e to close down just over a year after launching <<https://www.scmp.com/tech/apps-gaming/article/2154555/hong-kongs-first-bike-sharing-brand-gobe-e-close-down-just-over-year>>

<sup>164</sup> Hong Kong bike-sharing start-up Gobe.e.bike goes bust from losses and high maintenance costs <<https://www.scmp.com/news/hong-kong/hong-kong-economy/article/2154547/hong-kong-bike-sharing-start-gobeebike-goes-bust>>

<sup>165</sup> 困难与机遇——共享单车落地香港周年记 [http://www.xinhuanet.com/ganqao/2018-05/07/c\\_129865810.htm](http://www.xinhuanet.com/ganqao/2018-05/07/c_129865810.htm)

The first company to launch in Italy was Mobike, which started on 24<sup>th</sup> July 2017 in Florence<sup>166</sup>, followed by Milan (August 2017), Turin, Bergamo (November 2017), Pesaro, Mantova, Reggio Emilia (March 2018), and Bologna (June 2018)<sup>167</sup>. The yellow competitor, ofo first arrived in Milan on 22<sup>nd</sup> September<sup>168</sup> and then in Varese on 8<sup>th</sup> November 2017<sup>169</sup>. The third company targeting the Italian market is the Hong Kong-based Gobee.bike, which launched in Turin on 2<sup>nd</sup> November 2017<sup>170</sup>, Florence on 4<sup>th</sup> December 2017<sup>171</sup> and Rome on 13<sup>th</sup> December 2017<sup>172</sup>. Another company targeting Rome is oBike, which arrived with 1,200 bikes towards the end of 2017<sup>173</sup>.

The fact that all these bike-sharing companies targeted Italy as an essential step for their overseas expansion shows the Italian enthusiasm for cycling. While in other countries, the moves have been very cautious (i.e., the UK), in Italy the dock-less model has been welcomed by the cities like Milan and Florence, which opened calls for the provision of bike-sharing services. This can also be observed by the numbers of bikes introduced, which are a more substantial quantity compared to other foreign markets, with an initial introduction of about 4,000 bikes (such as ofo in Milan, Mobike in Florence and Gobee.bike in Turin)<sup>174</sup>; only ofo and Mobike in Milan, and Florence surpassed 10,000 bikes<sup>175</sup>.

Notwithstanding the local enthusiasm towards the innovative service, the bike-sharing companies encountered the same difficulties also in Italy. Theft and vandalism strike the bicycles, while haphazard parking of the bike overcrowds the urban areas. For instance, Milan,

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<sup>166</sup> <<https://mobike.com/it/blog/post/lancio-mobike-firenze>>

<sup>167</sup> <<https://it.wikipedia.org/wiki/Mobike>>

<sup>168</sup> <<https://www.ofo.com/#/about>>

<sup>169</sup> *Bike sharing: Ofo sbarca a Varese, ecco le primi bici gialle 'free floating'*

<<https://www.ilgiorno.it/varese/cronaca/bike-sharing-ofo-1.3520732>>

<sup>170</sup> Supra, note 159

<sup>171</sup> *Firenze, arriva Gobee.bike, il secondo operatore di noleggio bici*

<<https://www.toscanaoggi.it/Toscana/Firenze-arriva-Gobee.bike-il-secondo-operatore-di-noleggio-bici>>

<sup>172</sup> VIDEO | *Il bike sharing fa il bis, al centro e all'Eur arrivano le bici verdi Gobee.bike*

<<https://www.romatoday.it/green/mobilita/video-bike-sharing-gobee-bike-roma.html>>

<sup>173</sup> <<https://www.corriere.it/tecnologia/economia-digitale/cards/addio-gobee-bike-ofo-mobike-servizi-bike-sharing-free-floating-italia/obike-bike-sharing-sbarca-roma.shtml>>

<sup>174</sup> *Ofo: da oggi 4000 bici colorano Milano di giallo*

<[https://www.milanofree.it/milano/trasporti/ofo\\_da\\_oggi\\_4000\\_bici\\_colorano\\_milano\\_di\\_giallo.html](https://www.milanofree.it/milano/trasporti/ofo_da_oggi_4000_bici_colorano_milano_di_giallo.html)>. Supra, note 171

<sup>175</sup> Supra, note 129

Turin, Bologna and Florence applies € 7 fines to users who park the bikes outside the designated areas<sup>176</sup>.

Gobee.bike opened the retreat from Italy in February 2018, due to the failure in the other European cities<sup>177</sup>. It was not until ofo's announcement to have difficulties in operating in Milan<sup>178</sup> and its silent retreat from Varese in June 2018<sup>179</sup> that the Italian failure is confirmed. By the first half of 2018, Mobike seems to be the leading company in Italy, with almost 10,000 bikes in Florence, Milan, Turin, Cremona and Bergamo, and 354,000 users at the time of Gobee.bike's retreat<sup>180</sup>.

### *The retreat from foreign markets*

As observed above, the foreign markets are very different from the Chinese market, with different regulation and cycling culture, not to say the competition both between other dock-less bike-sharing brands and local public bike-sharing programs. Overseas operations require both more diversification in the product and higher costs for managing the fleet under the regulation and requirement of the locality.

Under such circumstances and the financial crisis, which arrived also for the leading Chinese dock-less bike-sharing companies at the beginning of 2018, we can observe the first retreats from the foreign markets. All of them face the difficulties in operating due to huge management costs due to illegal and random parking, the need to retrieving bikes parked in remote areas, vandalism and theft.

When ofo was in its heyday, it extended its operation in twenty countries, with the arrival of the year 2018 and the financial problems, it started slimming its overseas operations. Just one month before the Singaporean oBike retreat from Melbourne (Australia)<sup>181</sup>, on 10<sup>th</sup> July 2018

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<sup>176</sup> Mobike: via alle multe contro la sosta selvaggia <<http://www.firenzetoday.it/cronaca/mobike-multe-sosta-selvaqgia.html>>

<sup>177</sup> <[https://www.corriere.it/tecnologia/economia-digitale/cards/addio-gobee-bike-ofo-mobike-servizi-bike-sharing-free-floating-italia/addio-gobee-bike\\_principale.shtml?refresh\\_ce-cp](https://www.corriere.it/tecnologia/economia-digitale/cards/addio-gobee-bike-ofo-mobike-servizi-bike-sharing-free-floating-italia/addio-gobee-bike_principale.shtml?refresh_ce-cp)>

<sup>178</sup> <[https://milano.corriere.it/notizie/cronaca/18\\_luglio\\_18/milano-bici-gialle-crisi-vandali-abusivi-conti-non-tornano-ofo-taglia-manager-d0552e58-89ee-11e8-8bbc-b107b233a106.shtml](https://milano.corriere.it/notizie/cronaca/18_luglio_18/milano-bici-gialle-crisi-vandali-abusivi-conti-non-tornano-ofo-taglia-manager-d0552e58-89ee-11e8-8bbc-b107b233a106.shtml)>

<sup>179</sup> <<https://www.varesenews.it/2018/06/le-ofo-andate-via-varese-silenzio/730669/>>

<sup>180</sup> Bike sharing: Gobee lascia, Mobike resta in Italia <<http://www.gonews.it/2018/02/16/bike-sharing-gobee-lascia-mobike-resta-in-italia/>>

<sup>181</sup> Bike share companies Ofo, oBike and Reddy Go set to depart Australian shores <<https://www.news.com.au/finance/business/retail/bike-share-companies-ofo-obike-and-reddy-go-set-to-depart-australian-shores/news-story/1c8bc28498acb4521c584252f46a539b>>

ofo announced to stop the Australian operations<sup>182</sup> (in Adelaide, where it entered in October 2017 and Sydney, where it entered soon after), after less than one year. At the same time, ofo pulled out from Israel, where it operated for only five months in the city of Ramat-Gan with 500 bikes and 100 on the university's campus<sup>183</sup>, and India, where it has started operations in seven cities less than six months before, in January 2017<sup>184</sup>. The first Indian city to experience the retreat is Coimbatore in June, followed by Chennai, Indore, Ahmedabad, Bangalore, Pune, and Delhi. In the UK, in July 2018, ofo left Norwich, where it started in October 2017<sup>185</sup>. On 17th July 2018, Ofo is also retreating from Berlin (Germany) where it tried to enter only three months earlier<sup>186</sup>, and from most of the U.S. markets. Ofo achieved to penetrate in more than thirty U.S. localities with more than 40,000 bicycles. However, it encountered difficulties in entering some U.S. markets, such as Boston and Manhattan, where there are bike-sharing agreements between the companies and the government to establish docking stations, whereas the dock-less bike-sharing companies are blocked<sup>187</sup>. Now, ofo is retreating from most of the cities, remaining only in those more viable, such as New York, Seattle and, San Diego<sup>188</sup>.

## 2.2.6 THE CURRENT SITUATION AND FUTURE PROSPECTS

### *Operating in a more regulated market: bike-sharing companies under assessment and bicycles under control*

Since the second-half of 2017, the call of the first-tier cities and most of the major second-tier cities, also the leading companies entered a difficult period to operate, while those who have adjusted their business are cut out from the main markets. With the order to the stop bicycles to further enter in the cities, Hellobike, after merging with YOUON, could only focus on lower tier cities, where the operation is more difficult due to the different economic conditions and

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<sup>182</sup> *Ofo closes its Australia operations, alongside its businesses in Israel and India* <<https://kr-asia.com/ofo-closes-its-australia-operations-alongside-its-businesses-in-israel-and-india>>.

<sup>183</sup> *Ofo Quits India, Announces Exit From Australia and Israel* <<https://thepassage.cc/ofo-quits-india-announces-exit-from-australia-and-israel/>>

<sup>184</sup> *Alibaba Group-backed bicycle-sharing company Ofo closes India operations* <[https://www.business-standard.com/article/companies/alibaba-group-backed-bicycle-sharing-company-of-closes-india-operations-118071100062\\_1.html](https://www.business-standard.com/article/companies/alibaba-group-backed-bicycle-sharing-company-of-closes-india-operations-118071100062_1.html)>

<sup>185</sup> *Bike sharing firm ofo quits Norwich* <<https://www.bbc.com/news/uk-england-norfolk-44780649>>

<sup>186</sup> <<https://www.caixinglobal.com/2018-07-18/wednesday-tech-briefing-of-xpeng-new-energy-vehicles-101305913.html>>

<sup>187</sup> *China Bike-Sharing Giant Ofo to Shut Most U.S. Operations* <<https://www.wsj.com/articles/china-bike-sharing-giant-of-to-shut-most-u-s-operations-1531959910?mod=searchresults&page=1&pos=1>>

<sup>188</sup> *Ofo pulls out of US after exiting Australia, Germany and India* <<https://kr-asia.com/ofo-pulls-out-of-us-after-exiting-australia-germany-and-india>>

users' habits. The same for Didi's Bluegogo bicycles, which are confined in fifth and sixth tier cities<sup>189</sup>, while its brand new Qingjie bikes find difficulties in entering the streets. For example, Didi introduced new bicycles in Shenzhen, but has been caught as a violation of the stop order. The 20,000 Qingjie bikes cost Didi a negative note in its records. This is not the only case of non-approved introduction of bicycles, violating behavior of the bike-sharing companies is common in the Chinese cities which have called the stop of bike. Difficulties to prevent bike-sharing companies to pour more bikes are also in Shanghai, where the stop started in August 2017, in Guangzhou, where ofo and Mobike have been clearly prohibited to increase the bikes number and Didi and Hellobike have been signaled to not bringing new bikes, and in Xiamen, where starting from 17<sup>th</sup> January 2017 has started a new set of rules to limit bicycles up to 150,000, while during the highest peak of 2017 there were more than 400,000 bikes. This means that in most of the cities, bike-sharing companies are not only violating the stop but were not cutting the bikes number<sup>190</sup>.

With the restriction in most of the most important cities, bike sharing-companies are struggling to advance in their expansion. Another example of the market saturation crisis is Shijiazhuang, which is an important second-tier city. Here, on 23<sup>rd</sup> March 2018, 2,000 new introduced Hellobike's bikes have been disposed because they have entered without permission and the company must undergo the punishment according to the rules that the city has established to control the bicycles. In this case, Hellobike declared that they have substitute the number of previous YOUON bicycles, appealing to this loophole to move the stuck situation<sup>191</sup>. Though the call for the stop from the cities, bike-sharing companies still tries strategies to expand. Consequently, the localities are establishing increasingly restrictive rules with beginning of the year 2018. Hereafter there are the description of some cases.

In Nanjing, despite the restrictions defined in August 2017, some areas of the cities saw a great number of new bikes from ofo and Hellobike in November 2017. Thus, Nanjing is implementing a registration system, for which only registered bikes can operate, and through this system it will find out the real numbers. According to Nanjing's new rules, the companies

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<sup>189</sup> Supra, note 17

<sup>190</sup> 多地共享单车呈饱和状态 有车辆无人骑落满灰尘 <[http://www.xinhuanet.com/yuqing/2018-03/21/c\\_129833260.htm](http://www.xinhuanet.com/yuqing/2018-03/21/c_129833260.htm)>

<sup>191</sup> 石家庄: 2000 余辆擅自投放共享单车被清理 <[http://m.xinhuanet.com/he/2018-03/24/c\\_1122584359.htm](http://m.xinhuanet.com/he/2018-03/24/c_1122584359.htm)>

will be assessed under a centralized evaluation system established by the Transport Department<sup>192</sup>. Starting from 2018, all the companies' operations will be evaluated with the index of the system, which is divided into three parts: companies' operation management, department's evaluation and society's evaluation. Companies are evaluated under 11 indexes with the highest score of 100, of which 6 indexes for the operations management (30 points), 4 for the department evaluation (30 points) and 1 for society's evaluation (40 points). If the company is not meeting the standards, it loses points and below a certain threshold, the competent section will take measures. Starting from 24<sup>th</sup> November 2017, the Transportation Department announced the implementation of the license plate system and only the registered bicycles can operate. The online management system started on December 8<sup>th</sup>, with the possibility for the management department inspectors to check the license by scanning the QR code on the approved bike<sup>193</sup>.

A similar system has been adopted in Chengdu, where the stop to introduce new bikes started on 31<sup>st</sup> January 2018. The new rules for the development of the bike-sharing industry have been established by the Chengdu Transportation Committee (成都市交委 *Chengdu shi jiaowei*), the Chengdu City Administrative Committee (成都市城管委 *Chengdu shi cheng guan wei*) and the Chengdu Public Security Office (成都市公安机关 *Chengdu shi gong'an jiguan*), aiming at cleaning the chaos on the streets by 16<sup>th</sup> March 2018. In Chengdu, there is only the possibility to place new bikes some areas where the supply is still low compared to the demand, but as the main areas, they all must comply within the approved numbers. Among the total of 800,000 bicycles, at least 500,000 must be optimized to serve the high demand key areas, while the excess of 300,000 can be displaced in the other areas. Ofo promised to fully collaborate to reach this objective, by increasing both online and offline management systems, while Didi is operating the acquired Bluegogo bikes together with its brand Qingjie, which are not clear if they are to be considered new bikes or replacements of the old blue bikes<sup>194</sup>. Towards the end of March 2018, Chengdu has declared that the companies not complying with the new standards and rules must leave the city. The Chengdu Transportation

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<sup>192</sup> Supra, note 71

<sup>193</sup> 南京给共享单车发警务识别号牌 <[http://csj.xinhuanet.com/2017-12/12/c\\_136819039.htm](http://csj.xinhuanet.com/2017-12/12/c_136819039.htm)>

<sup>194</sup> 成都限制共享单车新增投放 清理破损不活跃单车< [http://www.sc.xinhuanet.com/content/2018-02/01/c\\_1122351720.htm](http://www.sc.xinhuanet.com/content/2018-02/01/c_1122351720.htm)>

Committee, the Administrative Committee and the Public Security Office established the new bike-sharing companies' evaluation policy, under which the companies are classified into four levels, AAA (good), AA (fair), A (up to standard) and B (not up to standard) on which their operating conditions are based. AAA level companies can introduce more bicycles and are encouraged by the city, AA level companies cannot increase the number of bicycles, while A level companies must decrease bicycles numbers and increase regulation<sup>195</sup>. Lastly, B level companies must leave the city and recorded in the companies' data sharing platform. By the end of March, the limit of the bikes was 900,000 and on 18<sup>th</sup> of April Chengdu released the trials "Chengdu city bike-sharing companies' service management standards" and the "Chengdu city bike-sharing companies' service quality reputation assessment method", which are a score-based system. The assessment is yearly made with the maximum score of 1,000, the companies below 600 points must leave the city, while to get more points companies can adopt strategies, such as the free-deposit service. Companies above 850 point, which correspond to AAA level, can increase the number of bikes, AA level is 700 to 849 points, A level is 600 to 699 points and B level is below 600 points<sup>196</sup>. The commitment of the city government on the dock-less bike-sharing problems are tangible in its continuous effort in pressing the bike-sharing companies towards a better management. On 14<sup>th</sup> of May 2018, the City Management Committee together with the Transportation Bureau and the Public Security Committee has officially talked with eight bike-sharing companies, including, Mobike, ofo, Qingjie and Hellobike. The companies have been presented five big problems (1. Intensive and disorderly introduction of bicycles, 2. The excess of bicycles in some key areas and the extensive displacing in these areas, 3. Insufficient offline workers, 4. Delay when there is immediate need to put in order the bikes, 5. Not complying with repetitive notification) and five requirements (1. Within three working days, all the companies must establish completely new measures, 2. Companies must provide at least 5 offline workers for every 1,000 bikes, 3. Starting from 15<sup>th</sup>, 260 core areas in the city will establish parking limitations, 4. the bikes in excess which are not managed will be cleared up by the City Management Department, 5.

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<sup>195</sup> “不合格”就退出：成都出台共享单车企业考核政策 <[http://m.xinhuanet.com/video/2018-03/28/c\\_129839419.htm](http://m.xinhuanet.com/video/2018-03/28/c_129839419.htm)>

<sup>196</sup> 打分考核 共享单车 <[http://www.xinhuanet.com/local/2018-04/19/c\\_1122704681.htm](http://www.xinhuanet.com/local/2018-04/19/c_1122704681.htm)>

Rigorous enforcement of the management and the assessment method, according to with the companies below standards will have a note registered on it trustworthiness records)<sup>197</sup>.

Wuhan, where the stop to the increase of bicycles has been called in September 2017, is still facing high difficulties in preventing new bikes to appear on its streets and huge public costs for regulating the 700,000 bikes. In spring 2018, 1,400 Qingjie bicycles appeared on the streets, introduced during nighttime and the weekends. Since March 21<sup>st</sup>, this is Qingjie's third time violating the rules, thus, its 1,400 are now detained<sup>198</sup>. Like the two previous examples, Wuhan started the implementation of a bike-sharing companies' service quality assessment system, with a first round of assessment for the period from May 2017 and April 2018 through samples examinations, interviews and data analysis. The highest score is 100, below 60 point companies are classified as "one star", between 60 and 75 points are "two stars", between 75 and 90 points are "three starts," and above 90 points are "four starts." From the first examination, Mobike, ofo, and Hellobike received 77.31 points, 67,56 point and 66.50 points respectively, with Mobike being the only "three stars" company. The companies must proceed to reduce their number of bikes of 10% according the assessment's outcome proportion, which means that Mobike must cut 45,500 bikes, ofo 50,000, and Hellobike 54,500 bikes. In case they do not reach the numbers between 14<sup>th</sup> June and the end of July 2018, the authorities will take further measures by seizing the bicycles in excess<sup>199</sup>. Wuhan is the first city to implement an innovative management system on 20<sup>th</sup> June 2018, that is the "common management and control" of the bicycles fleet. Under this management model, a third-party is providing management agents for all the three companies in charge of the regulation of the bicycles parking, short-distance relocation, fixing and disposal, reducing the costs and increasing the efficiency at the same time<sup>200</sup>. The "union" between the local City Administration and the three companies to clean the disorder in the streets jointly reduced

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<sup>197</sup> 三部门约谈成都共享单车企业 今起中心城区 260 个节点设停放上限  
<[http://www.sc.xinhuanet.com/content/2018-05/15/c\\_1122833035.htm](http://www.sc.xinhuanet.com/content/2018-05/15/c_1122833035.htm)>

<sup>198</sup> 武汉:1400 多辆"青桔"共享单车违规"疯长"被清理暂扣 <[http://www.hb.xinhuanet.com/2018-04/06/c\\_1122643961.htm](http://www.hb.xinhuanet.com/2018-04/06/c_1122643961.htm)>

<sup>199</sup> 武汉首批调减共享单车 15 万辆 <[http://www.hb.xinhuanet.com/2018-06/15/c\\_1122988853.htm](http://www.hb.xinhuanet.com/2018-06/15/c_1122988853.htm)>

<sup>200</sup> 武汉探索共享单车"共管共治" 首批第三方"代管"上 <[http://www.xinhuanet.com/mrdx/2018-06/21/c\\_137270121.htm](http://www.xinhuanet.com/mrdx/2018-06/21/c_137270121.htm)>. Supra, note 199

the bikes of 15,000 by the beginning of July and seems to be an efficient way to manage the shared bikes<sup>201</sup>.

As the “slimming down” has become the new trend in the bike-sharing industry, Hangzhou started a new bicycle reduction strategy on 14<sup>th</sup> April 2018. Hangzhou has already 770,000 bicycles and plans to cut the numbers of 1/3, since city’s present demand is 320,000 to 460,000 bikes, which might increase to 500,000 in 2020. Under the companies’ service quality evaluation system, the five companies operating in Hangzhou must be assessed every semester, and the reduction of bikes will be in proportion to the examination results<sup>202</sup>.

Similarly, Kunming city’s Wuhua district enforced on 16<sup>th</sup> April 2018 a new system to regulate bicycles, which is based on different colors monthly classification. Green color bike-sharing companies are those operating well, yellow color classified companies have some problems, while red color companies will undergo some punishment measures. The assessment is done monthly and in addition the bike-sharing companies must entrust a third party which helps the bicycles management in the city according to the formed market regulation. Lastly, the three bike-sharing companies which violated the parking rules in March 2018 with their 33,000 bikes, have an infringement notice registered, and for the first time, the bike-sharing companies have been fined CNY 20,000 for the infringement<sup>203</sup>.

While the “union” between the bike-sharing companies resulted in a management solution, in Shenzhen the situation is to be solved by reviving the competitiveness between the companies. Shenzhen city asked the bike-sharing companies to increase their management in September 2017, and between 16<sup>th</sup> March and 23<sup>rd</sup> April 2018, Shenzhen evaluated the bike-sharing companies’ service quality. The companies generally registered low average scores (on a maximum of 110 points): the first-classified is Mobike with 67.72 points, followed by ofo with 60.22 points. The low scores are due to the ongoing violation of the new introduction of bicycles by the bike-sharing firms, which all have received low scores on management indexes, with an average score of only 28%. Shenzhen is one of the dozen bunch of cities which pulled

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<sup>201</sup> 共享单车“清淤”行动开启 本月武昌将减少 1.5 万辆 <[http://www.hb.xinhuanet.com/2018-07/05/c\\_1123083892.htm](http://www.hb.xinhuanet.com/2018-07/05/c_1123083892.htm)>

<sup>202</sup> 杭州将开始对共享单车“瘦身” 行业需找新模式 <[http://www.zj.xinhuanet.com/2018-04/14/c\\_1122681504.htm](http://www.zj.xinhuanet.com/2018-04/14/c_1122681504.htm)>

<sup>203</sup> 昆明市五华区将针对共享单车开展“分色管理” <[http://www.yn.xinhuanet.com/nets/2018-04/17/c\\_137117548.htm](http://www.yn.xinhuanet.com/nets/2018-04/17/c_137117548.htm)>

the “stop” to introduce bicycles and is trying to remark the restrictions to the bike-sharing companies, which are still violating the requests. Thus, as the other cities, Shenzhen is going to apply punishments for those not complying with the government’s order and not managing the bike fleets on the streets<sup>204</sup>.

For the first time in mainland China, on 6<sup>th</sup> May 2018, Nanchang City Management and Administration execution Bureau (南昌市执法局 *Nanchang shi zhifa ju*) monetarily fined a bike-sharing company for displacing bicycles which have blocked the circulation. Notwithstanding the attempt to regulate the bike-sharing industry starting from the second half of 2017, in the new year there are still violations of the rules. The illegal 260 bikes were fined a total of CNY 5,200, signing a milestone for next implementation of the monetary punishment toward bike-sharing companies in the Road Traffic Safety Law of the People’s Republic of China (中华人民共和国道路交通安全法 *Zhonghua renmin gongheguo daolu jiao tong anquan fa*). Starting from May 2018, according to the Art. 18, China will apply a monetary fine between CNY 5 and CNY 50 to haphazard parking<sup>205</sup>. The growing influence of the City Administration over bike-sharing regulation seems to be effective on the companies’ behavior. On the 15<sup>th</sup> of May, with big surprise, the streets were completely displaying ordered Qingjie bicycles. Now that the companies are punished by bicycles detention and monetary fine from the city, and their performance is evaluated every month, companies must comply with the rules to continue their operations. The maximum score is 100 and the companies which do not reach the base score for two months must leave the city. Furthermore, there is the Wechat enforcement platform to assess the low-performing bikes, as part of the “double codes system” since the users must scan the bicycle QR code to unlock the bike for use, while the Wechat code is used to register bike-sharing companies’ performance<sup>206</sup>.

In conclusion, we can say that, at the first half of the year 2018, the dock-less bike-sharing market has shifted from “fast grow and enthusiasm” to “efficiency first” operating method with the saturation of the cities and their call to stop the surge and the disorder of the bikes. According to the Report on the Chinese bike-sharing industry data (中国共享单车行业数据报告

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<sup>204</sup> 共享单车市场仍需竞争来激活 <[http://m.xinhuanet.com/comments/2018-05/04/c\\_1122780971.htm](http://m.xinhuanet.com/comments/2018-05/04/c_1122780971.htm)>

<sup>205</sup> 南昌对共享单车企业首开罚单 处罚总金额达 5200 元 <[http://www.jx.xinhuanet.com/2018-05/07/c\\_1122792532.htm](http://www.jx.xinhuanet.com/2018-05/07/c_1122792532.htm)>

<sup>206</sup> 南昌市东湖区实行“路长制”治理共享单车乱停放 <[http://www.jx.xinhuanet.com/2018-05/16/c\\_1122838425.htm](http://www.jx.xinhuanet.com/2018-05/16/c_1122838425.htm)>

*Zhongguo gongxiang danche hangye shuju baogao*), by February 2018, ofo, Mobike and Hellobike have 50.89%, 49.14% and 5.64% of the total Chinese bike-sharing market. This means that the first and the second-tier cities are completely saturated and that bike-sharing companies must focus on the quality of their service by complying with the more restrictive rules. Now that the bike-sharing industry have reached the turning point, in the second round of the battle the new competition will not be based on the fast growth, but on the high efficiency<sup>207</sup>, which means more offline management support and online technology development, such as the use of geofencing and credit system, as well as a deeper collaboration with local authorities.

*Users under pressure: the new operating model with the credit system and geofencing*

The bike-sharing companies are not the only ones accountable for the chaos in the cities; also the users' behavior is a critical point. In order to make the users more reliable when they use the bike-sharing service, the companies adopted the geofencing system to prevent the users to park in undesired spots and the credit system. Especially with the beginning of a new era of the bike-sharing industry focused on the efficiency and management, the use of geofencing and the credit system are essential aspects to make also the users participating in the new regulative wave.

The credit system has been first employed in the bike-sharing field with the collaboration between bike-sharing platforms and the Sesame Credit System. For example, through this collaboration, the bike-sharing platform is included in the Alipay platform, and it usually provides deposit-free service if the score is above 600 (of0) and 650 (i.e., Hellobike). After the break with Alibaba, ofo dropped out the Sesame Credit platform and is running its own credit system since May 2017. Under ofo's system, users can have a maximum of 100 points, and when the score reaches 0, they cannot use the service anymore. In February 2018, Mobike announced its new credit system, in which users with "so-so" conduct level incur in doubled tariffs and are unable to benefit from monthly cards and other offers, while users classified as "poor" conduct level may incur up to CNY 100 fee to rent a bike<sup>208</sup>.

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<sup>207</sup> 共享单车下半场：“速度与激情”过后 一场“方便与秩序”的运维标准化革命  
<[http://www.xinhuanet.com/tech/2018-05/21/c\\_1122860865.htm](http://www.xinhuanet.com/tech/2018-05/21/c_1122860865.htm)>

<sup>208</sup> 共享单车新信用系统上线 信用机制能否成治病良药? <[http://www.xinhuanet.com/tech/2018-02/27/c\\_1122459432.htm](http://www.xinhuanet.com/tech/2018-02/27/c_1122459432.htm)>

With the support to the implementation of the credit system to make users behave well when renting the bicycles in the Guiding Opinions<sup>209</sup>, the bike-sharing companies are almost all sticking to a credit system. However, whether the implementation of such a method is beneficial to reduce theft, vandalism, privatization and haphazard parking of the bicycles is not clear. Furthermore, the right of the company in punishing the users by prohibiting them from accessing the bike rental service is an issue of the protection of the consumers' right. For example, in Kunming, in January 2018, there was a debate on the power of the company to prevent users to access the rental service through such a system, complaining about the injustice to incur up to CNY 100 if the score on Mobike's platform is below 80 points, and the registration in a "blacklist" is the ofo score is 0. The discussion reveals that users are might be under excessive regulation after the stricter rules' establishment. Another question is whether the police have the right to punish the citizens who did not comply with the rules regarding the shared bikes which are beyond the jurisdiction of the Road Safety Law (i.e., children under 12 years old are not allowed to ride bicycles on the roads)<sup>210</sup>.

The concerns described above are even more significant under the newly pressure to regulate the industry. Another measure promoted by the Guiding Opinions at a national level is the adoption of the geofencing technology, to prevent users to park the bikes in remote and too crowded areas (i.e., city center, subway and bus stations). In February 2018, Mobike is testing the geofencing in some cities, such a Tianjin, by implementing the app. The users can visualize areas signaled with the letter "P," and if they park within these suggested areas they can earn credit points, on the contrary, if they park in prohibited areas, their credit score is reduced<sup>211</sup>. In March 2018, the China information and Communication Research Institute (中国信息通信研究院 *Zhongguo xinxi tongxin yanjiuyuan*) and the Mobile Internet of Things Alliance (移动互联网产业联盟 *Yidong wu lianwang chanye lianmeng*), jointly with ofo, launched the "Technical requirements for shared bicycle electronic fence" (共享单车电子围栏技术要求 *Gongxiang danche dianzi weilan jishu yaoqiu*), which establishes the end final parking positions, the fence delimitations, the bicycles parking management platform, the app and

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<sup>209</sup> See section 2.3.4

<sup>210</sup> 信用差禁骑共享单车 昆明市民有话说 <[http://www.yn.xinhuanet.com/yqhy/2018-01/22/c\\_136914455.htm](http://www.yn.xinhuanet.com/yqhy/2018-01/22/c_136914455.htm)>

<sup>211</sup> 上线电子围栏规范共享单车停放 <[http://www.tj.xinhuanet.com/qyzx/2018-02/11/c\\_1122401544.htm](http://www.tj.xinhuanet.com/qyzx/2018-02/11/c_1122401544.htm)>

other standards. The objective for using the electronic fencing systems is to promote the regular parking habit among the users, by establishing the prohibited areas and the suggested spots on the app and requires the companies to install the GPS on the bikes. The geofencing system is used in combination with the credit system to incentivize the users with an award and punishment system<sup>212</sup>. During the second edition of the World Intelligence Conference held in Tianjin in May 2018, the electronic fencing has been supported as a method to improve the bicycles management on the users' side<sup>213</sup>. After, many localities implemented the system in collaboration with the bike-sharing companies. Apart from the first-tier cities which started early trials and implementation of the electronic fencing technology, starting from the second half of 2018, also the smaller cities are requiring the use of geofencing in combination with the users' credit system, such as Zhengzhou<sup>214</sup> and Changsha<sup>215</sup>.

Despite the national support towards these systems adoption, the different bike-sharing companies and the different localities might operate differently. For example, in Changsha, Mobike applies a fee of CNY 5 if on two consecutive occasions the bike is not parked in the designated areas. The app signals "P" suggested parking areas and grey areas where is not suggested to enter and in case of violations the users receive a warning message. In June 2018, ofo implemented a trial of the geofencing system in Changsha. If the user parks in a prohibited area, after the lock is closed, the system will send a message to the user, who suffers the loss of credit points. Hellobike is running the electronic fence system on its app or the Alipay's map. Hellobike's users receive a message if they parked in red areas, after two consecutive times they incur in CNY 2 and, their credit is reduces if repeated twice<sup>216</sup>.

With the implementation of the electronic fencing and the credit system, the users are under the pressure of the award and punishment regime applied by the bike-sharing companies and enforced by the local governments. The possibility to find a broken bike and paying and being sanctioned for the bike-sharing companies fault concerned the users. Thus, the bike-sharing companies, to solve the service quality problems, started to calculate the fee after a while and

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<sup>212</sup> 共享单车电子围栏技术要求发布 <[http://www.bj.xinhuanet.com/bjyw/2018-03/30/c\\_1122613741.htm](http://www.bj.xinhuanet.com/bjyw/2018-03/30/c_1122613741.htm)>

<sup>213</sup> 共享单车将设电子围栏 <[http://www.tj.xinhuanet.com/2018-05/19/c\\_1122857270.htm](http://www.tj.xinhuanet.com/2018-05/19/c_1122857270.htm)>

<sup>214</sup> 郑州：共享单车电子围栏明年全部建成投用 <[http://m.xinhuanet.com/hq/2018-06/23/c\\_1123024041.htm](http://m.xinhuanet.com/hq/2018-06/23/c_1123024041.htm)>

<sup>215</sup> 多家共享单车平台在长沙划定电子禁停区 违停或被扣费 <[http://www.hn.xinhuanet.com/Business/2018-08/09/c\\_1123245202.htm](http://www.hn.xinhuanet.com/Business/2018-08/09/c_1123245202.htm)>

<sup>216</sup> Supra, note 215

a certain distance to leave the possibility to the users to switch to another bike in case they jumped into a broken one without paying the fee twice. For example, on 11<sup>th</sup> April 2018, Xi'an announced that the fee must apply within 50m or 2 minutes. In Xi'an, Mobike does not calculate the first 3-5 minutes, and within 50m the fee is not applied if the user reports a broken bike. Also, ofo implemented the function for reporting the broken bikes before terminating the ride by locking the bike, allowing the workers to fix the fleet immediately<sup>217</sup>. In Taiyuan, Mobike does not apply fees within 2 minutes and 100m and on the parking spaces are not only signaled on the map but also drew on the streets<sup>218</sup>.

#### *A new era of free deposit strategy*

Most of the companies require a deposit fee to start using the bicycles, for example, ofo started with a deposit of RMB 99 (later switched to RMB 199), while Mobike's deposit is RMB 299<sup>219</sup>. By March 2017, the only firm which was offering deposit-free service was YOUON, which also started the integration with the Sesame Credit platform, after receiving the funds from Ant Financial, to provide the free deposit benefit to users with 600 points or above<sup>220</sup>. However, ofo soon after started its counter-attack, also in collaboration with the Sesame Credit system, providing the service without deposit to users with 650 points or above, starting in March 2017, launching in Shanghai as a trial before extending the benefit to 25 other important cities<sup>221</sup>. In fact, ofo soon after received the investment from Ant Financial in its D+ financing round<sup>222</sup>.

With the increase of the competition in the two years 2016-2017, the free-deposit strategy was a necessary move to differentiate the company among the myriad of the other competitors in the same sector. Apart from the companies which provide free-deposit as a promotion for the users, there are other companies which are "born-free," such as the case of 99bicycle, which is the unique bike-sharing start-up to provide free-deposit service "from

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<sup>217</sup> 骑行少于3分钟小于50米共享单车遇故障报修可退费 <[http://www.sn.xinhuanet.com/2018-04/14/c\\_1122681735.htm](http://www.sn.xinhuanet.com/2018-04/14/c_1122681735.htm)>

<sup>218</sup> 画地为锁 管得住共享单车吗? <[http://m.xinhuanet.com/sx/2018-07/27/c\\_1123183424.htm](http://m.xinhuanet.com/sx/2018-07/27/c_1123183424.htm)>

<sup>219</sup> Supra, note 17 and 18

<sup>220</sup> Supra, note 34

<sup>221</sup> 共享单车进入城市攻防战 ofo 上海试点“免押金” <[http://www.xinhuanet.com/city/2017-03/17/c\\_129511489.htm](http://www.xinhuanet.com/city/2017-03/17/c_129511489.htm)>

<sup>222</sup> Supra, note 17

the beginning to the end.” 99bicycle entered Shanghai in 2017 June 15<sup>th</sup>, making its road toward essential cities such as Shenzhen, Chengdu, Beijing, Xiamen and, Huzhou<sup>223</sup>.

After the surge of companies’ incapable to reimburse the deposit to its users and their failure, in December 2017 the China Consumers Association opened discussion involving the seven most prominent companies, Mobike, ofo, YOUON, U-Bicycle, Hellobike, Baike (拜客出行 *Baike chuxing*), and Bluegogo to suggest them to start deposit-free service as a solution to resolve consumers’ rights infringement problem. By April 2018, 34 companies have failed, and Kuqi Bicycle alone have registered 210,000 complaints about the deposit issue. According to the 41<sup>st</sup> Statistical Report on China's Internet Development (中国互联网络发展状况统计报告 *Zhongguo hulianwangluo fazhan zhuangkuang tongji baogao*) released by the China Internet Network Information Center (CNNIC), in January 2018 the Chinese bike-sharing users reached 221 million users by the end of 2017, and with an amount between CNY 99 and CNY 299 the deposit volume alone surpasses CNY 40 billion, which is a massive amount in danger if considering all the cases in which companies have improperly used the deposit for their operations<sup>224</sup>. Under such a situation, the free-deposit strategy could be a new battle weapon for bike-sharing companies.

There were already companies providing deposit-free service, but the majority relies on consumers’ trustworthiness evaluated by a third-party system and only above specific score users can have the deposit-free benefit. For example, Ant Financial is offering the possibility to avoid paying the deposit through its Sesame Credit score system, which is a useful tool to reduce the deposit violations by companies and at the same time to help them in attracting more users.

Apart from ofo and YOUON, which collaborate with Sesame Credit to provide free-deposit service, on 7<sup>th</sup> August 2017, Mobike announced the free-deposit service in more than 150 cities in China, using the WeChat’s miniprograms system<sup>225</sup>. Also, Hellobike, after merging with YOUON, kept the collaboration with its investor Ant Financial to free-deposit service in ten cities, including Chengdu, Hefei, and Qingdao, starting on 16<sup>th</sup> January 2018. Starting from 13<sup>th</sup> March 2018 Hellobike started to extend the free-deposit service in whole mainland China,

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<sup>223</sup> Supra, note 35

<sup>224</sup> Supra, note 202

<sup>225</sup> 中国“共享单车”试水免押金 <[http://www.xinhuanet.com/fortune/2017-08/07/c\\_129676572.htm](http://www.xinhuanet.com/fortune/2017-08/07/c_129676572.htm)>

already reaching 10 million bikes that can be rent without paying a deposit<sup>226</sup>. Didi's new bike-sharing platform (launched in January 2018) is operating without deposit through the Sesame Credit system, becoming a desirable alternative in smaller localities, such as Shenyang sub-provincial city, where the more prominent companies did not reach out<sup>227</sup>.

While at the beginning of 2017, free deposit was more a promotional offer for the users to make the companies more attractive and competitive in the view of the investors, after the Guiding Opinions' support to adopt the free-deposit strategy as a solution to the deposit crisis, in 2018, the deposit policy has become a crucial issue concerning companies' operating models and strategies. Most importantly, the deposit-free service mainly relies on user's creditworthiness assessment making the credit system playing an increasing role in the bike-sharing industry, bringing new issues to the consumers' privacy protection<sup>228</sup>.

Furthermore, with the new trend to operate under the deposit-free model, the battle of the bike-sharing companies is moving towards a new stage of pricing and strategies. For example, Didi's move to apply free-deposit might cause have impacts on the other companies' competitiveness, such as causing the users to ask back deposit from ofo. However, only in October 2016, Didi invested in ofo and got 25.32% of shares in ofo's D financing round, since then Didi's financial manager is responsible for ofo's financial section. In November 2017, the two parties' relations fell apart, while Didi is trying to push ofo to merge with Mobike. After failure to merge due to ofo's strong opposition, Mobike has been acquired by Meituan-dianping (美团电瓶 *Meituan dianping*) (on 3<sup>rd</sup> April 2018 and launched free deposit service in all the cities on 5<sup>th</sup> July 2018)<sup>229</sup>. On the contrary, ofo's new strategy is moving away from the free-deposit model. After resisting Alibaba's acquisition, ofo ceased the deposit-free service with Ant Financial's Sesame Credit system in June 2018, launching its own credit system, but not related to free-deposit privilege. This might probably affect users' retention rate, especially under the free-deposit game played by its main orange and blue competitors<sup>230</sup>.

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<sup>226</sup> Supra, note 31

<sup>227</sup> 共享单车“青桔”落户沈阳 强调一律免押金 <[http://m.xinhuanet.com/ln/2018-04/02/c\\_1122623352.htm](http://m.xinhuanet.com/ln/2018-04/02/c_1122623352.htm)>

<sup>228</sup> 共享单车用信用上“新锁” 更多行业或迈入信用消费时代 <[http://www.xinhuanet.com/2018-07/02/c\\_1123065629.htm](http://www.xinhuanet.com/2018-07/02/c_1123065629.htm)>

<sup>229</sup> 滴滴自有品牌“青桔”共享单车上线 支持免押金骑行 <[http://www.xinhuanet.com/2018-01/26/c\\_1122317672.htm](http://www.xinhuanet.com/2018-01/26/c_1122317672.htm)>

<sup>230</sup> ofo, 战斗到底的最后一刻 | 深氦 <<https://36kr.com/p/5140462.html>>.

*The end of the “free rides” era: ofo and Mobike ceased fire*

Summer 2017 was the hottest moment of the battle to gain market shares between bike-sharing companies. During that time, companies adopted pricing strategies, such as free rides and discounted price at RMB 1-3, to seize more users. Ofo and Mobike were competing with low prices, for example, Mobike offered the monthly card for RMB 2 and seasonal card for RMB 5, while ofo went straight with RMB 1 for the monthly card and various free rides events.

Towards the end of February 2018, the two big players, ofo and Mobike, softened in their price battle to reach out more market share. Users realized that ofo does not offer the possibility to buy the monthly card at the price of RMB 1 anymore, while in Beijing Mobike’s discount on the monthly card has stopped too. Both companies restored the original prices of RMB 20 for one month (including daily two hours free ride), the seasonal card at RMB 60, six months card at RMB 120 and one-year service at RMB 240<sup>231</sup>. Both ofo and Mobike stated that this is only a temporary change in pricing and that in the future there will be new advantages for the users. In the meanwhile, Hellobike, which is focusing on third and fourth-tier cities and had to adapt to the different economic development conditions and different users’ habits in these small localities, is continuing to operate under discounted pricing strategy. Hellobike’s pricing is RMB 2 for the monthly card (instead of RMB 30), and half price on the seasonal, half a year and yearly card<sup>232</sup>. Hellobike does not seem to be changing its pricing strategy in the immediate future, because it is confined in second, third and fourth-tier cities, where is difficult to increase the market share, whereas it cannot target the first-tier cities because they announced the order to stop the introduction of more bicycles.

With both ofo and Mobike changing the pricing strategy, the “cash-burn” era seems to have reached an end. However, on the one hand, the higher prices might be helpful for the companies’ financial situation, on the other hand, the users are paying higher prices for the worst service. The surge of bicycles in the cities has created difficulties in managing the fleets, which have been subject to higher damage rate. The new pricing strategy is very likely to lead to the loss of users, who are increasingly thinking that riding these bikes has become stressful instead of being a convenient transportation solution. In fact, the high probability of finding

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<sup>231</sup> 洗牌后恢复理性 共享单车“免费骑”时代结束 <[http://m.xinhuanet.com/jx/2018-03/02/c\\_1122475610.htm](http://m.xinhuanet.com/jx/2018-03/02/c_1122475610.htm)>

<sup>232</sup> 共享单车“免费”时代结束 <[http://www.bj.xinhuanet.com/bjyw/2018-02/28/c\\_1122464147.htm](http://www.bj.xinhuanet.com/bjyw/2018-02/28/c_1122464147.htm)>

broken bikes, the restrictions in parking and the evaluation of the behavior on the credit system, are increasing concerns for service's convenience. The opening low-price followed by the rise of the prices was a predictable move since the bike-sharing companies are expected to face higher damage and maintenance costs with the advancement in their operations. However, at this point of the market evolution, there is the concern on the fact that ofo and Mobike are occupying almost the entire market, and there is the danger of reaching unreasonably high costs for the users, as happened with Didi car hiring platform, which started to apply higher costs in high peak hours, raining days and holiday<sup>233</sup>.

Ceasing fire in the price battle is a clear sign of the financial difficulties which ofo and Mobike are facing. After the crisis and the failure of many companies in the second half of 2017, starting from the end of 2017 and the beginning of the new year, ofo and Mobike are revealing their weakness too. In fact, towards the end of 2017, media reported that Mobike was receiving financial support from Meituan, which was leading the financing round, while Alibaba in a new financing round backed ofo. Despite the incoming funds, the parallel change in pricing strategy is a sign of their unsustainable financial situation<sup>234</sup>. Despite they can resist the deposit crisis and receive significant investors' attention, these last investments are more a sign of their hard time in continuing operations.

*Bike-sharing companies becoming the new puppets of the big tech giants: acquisition of ofo and Mobike*

The evidence from the evolution of the dock-less bike-sharing companies suggests that there might be only two ways to reach a sustainable model: the conglomeration of the companies to increase their pricing power and revenues or continuing in the cash-burning battle against each other to gain market share and waiting for a future turn for the better<sup>235</sup>. So far, many companies have already chosen the first strategy, such as YOUON and Hellobike, which merged and reached the third position in the Chinese market. On the contrary, ofo, and Mobike, the two leading companies, are still trying to sustain the battle. The two companies were leading a competitive price battle, until January and February 2018, when they have started to reveal the growing unsustainability of their actions. The parallel retreat from foreign

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<sup>233</sup> Supra, note 232

<sup>234</sup> 共享单车价格战“停火”? 摩拜与 ofo 月卡恢复原价 <[http://www.jl.xinhuanet.com/2018-03/06/c\\_1122494043.htm](http://www.jl.xinhuanet.com/2018-03/06/c_1122494043.htm)>

<sup>235</sup> 共享单车未来: 盈利只有两条路 <[http://www.xinhuanet.com/tech/2018-03/06/c\\_1122492218.htm](http://www.xinhuanet.com/tech/2018-03/06/c_1122492218.htm)>

markets and the talks about the merger of ofo with Mobike in January 2018, show how uncertain is the turn of the market situation if choosing the independence path instead of conglomeration.

Nonetheless, the bike-sharing companies are backed by big financiers, which gradually concentrated on the few more promising companies, until their role shifted from financial supporters to controllers. Since the big investors, such as Alibaba-Ant Financial, Didi chuxing, and Tencent-Meituan started to invest more money in the bike-sharing companies, these latter ones became more integrated with their investors' platforms (i.e., credit system on Alipay, miniprograms on Wechat). The tech giants are significant supporters for the bike-sharing operators to reach out to more users. However, what was happening, is that their giant investors are gradually sucking the bike-sharing companies as we can conclude from the events described hereafter.

On 17<sup>th</sup> January 2018, Didi's bike-sharing platform launched in Beijing and Shenzhen, making possible to rent ofo and Bluegogo bicycles without deposit through its app and after registering with the Sesame Credit account<sup>236</sup>. After the Bluegogo's failure in November 2017, it is possible to use Bluegogo's bikes through Didi's platform, which obtained the right to operate the blue bikes on 9th January 2018<sup>237</sup>. Users can convert the unrecovered deposit paid to Bluegogo into credits for new rides on Didi's platform, which also includes ofo bikes and its own brand Qinjie. Didi plans to extend the brands variety, for example, it is discussing the inclusion of Mingbike in its platform too. Small companies such as Mingbike and Kuqi Bike, despite their money shortage problem, are covering a broad slice of the market in low tier cities, while Bluegogo is still confined in only six cities. By the end of January 2018, Didi has already introduced 6 million bikes in Beijing, Guangzhou, and Shenzhen, but thanks to the integration on its platform, users do not need to download too many different apps. However, with the restriction to introduce more bicycles in the cities, Didi is struggling to access new markets. At the same time, Didi is also developing electric bike-sharing business projects in Hangzhou and Beijing, aiming at covering the 1-10 km travel distances with sharing alternatives. Didi's APP already includes 11 different type of transport services, express cars, taxi, special cars, luxury cars, public transportation, ride-hailing, bike-sharing, substitute

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<sup>236</sup> 滴滴共享单车平台上线 <[http://www.bj.xinhuanet.com/2018-01/18/c\\_1122276779.htm](http://www.bj.xinhuanet.com/2018-01/18/c_1122276779.htm)>

<sup>237</sup> Supra, note 33

drivers, elderly transportation and second-hand cars<sup>238</sup>. In August 2017, the Ministry of Transportation Ministry stated that the electric bikes' development is not supported, making the bike-sharing industry even more crucial to Didi.

Reviewing 2017, Wukong, 3VBike, and Dingding failed one after another, soon after they have been followed by Xiaoming, Kuqi and Bluegogo deposit crisis, while YOUON and Hellobike merged together. In the meanwhile, ofo and Mobike were still growing with more and more fund from big investors. Didi took part in ofo's C and D financing rounds, where there was also the big giant Alibaba. On the opposite side, Tencent invested in Mobike through Meituan. Another giant, Alibaba's affiliate Ant Financial, first invested in YOUON in March 2017, to switch to invest in ofo's D+ financing round one month later. After the merger between YOUON and Hellobike, Ant Financial invested in Hellobike again<sup>239</sup>. It is clear that these tech giant companies are trying to take over the market through the bike-sharing firms, sustaining them in their expansion.

Didi's attempt to create a bike-sharing union on its platform is also a consequence of the failure to merge ofo and Mobike in January 2018. Didi's first participation in ofo can be traced back to 2016, and now it has revealed all its intention in developing in the bike-sharing market. The brand new Qingjie bikes, which are officially in production since December 2017, started to operate thanks to the lesson learned from ofo when Didi entered ofo's board in July 2017 and Didi's vice-chairman, Fu Qiang, became the chief executive in ofo, reporting directly to ofo's CEO Dai Wei<sup>240</sup>. Also, according to 36kr.com, many Didi's employees joined ofo to help it with the operations. The strict partnership between ofo and Didi started with the first participation by Didi in ofo's B+ financing round of September 2016, which increased with the E financing round valued US\$ 700 million of July 2017 and the integration of ofo in Didi's platform starting from April 2017. With the participation in multiple financing rounds, Didi has become ofo's principal shareholder, retaining more than 30% and occupying two of the eight seats in ofo's board. Despite the current situation, Didi's original intention was to help ofo in improving its operations, but after the failure to merge with Mobike, the friendly relationship ended. In the meanwhile, Didi managed to gain enough experience from ofo and the other

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<sup>238</sup> Supra, note 229

<sup>239</sup> Supra, note 229

<sup>240</sup> 36 氪独家 / 滴滴高管付强加入 ofo, 出任执行总裁 <<https://36kr.com/p/5085138.html>>

bike-sharing companies which it acquired, such as Bluegogo, to operate its new brand Qingjie<sup>241</sup>.

The talks on the merger between Mobike and ofo has already started in October 2017, when both companies reached the peak of the investment battle receiving in June 2017 US\$ 600 million (including Tencent) and in July US\$ 700 million (including Alibaba) respectively and were about to face a financing interruption with arrival of the winter. Didi wanted to manipulate the potential merger between ofo and Mobike by proposing Mobike's CEO, Wang Xiaofeng, as the new CEO after the merger, making Dai Wei to step down. Didi's plan did not meet any opposition from Tencent. However, according to the findings of 36kr.com, ofo would have only accepted a co-management with Mobike, limiting Didi to its role of an investor as previously agreed with Mobike. A sudden break arrived on 30<sup>th</sup> November 2017 with the revelation of a breaking news in which the media revealed that both ofo and Mobike have started to employ users' deposit to fuel their cash shortage, making the merger talks more difficult. At the end, Alibaba supported ofo in getting new funds, blocking the merger as wished by ofo's CEO, Dai Wei, because of the fear to lose voice in the battle against Didi, which was trying to lead the merger and to reduce the shares in ofo hold by Jingsha river's CEO, Zhu Xiaohu, who was a supporter of the merger. Didi also contributed with US\$ 27 million to Alibaba's US\$ 120 million investment to undermine Jinsha river's influence in December 2017. In February 2018, ofo raised US\$ 866 million led by Alibaba by bonding the assets<sup>242</sup>.

In the meanwhile, on 4<sup>th</sup> April 2018, Mobike has been acquired by Meituan and has been integrated into its platform. Mobike has already reached its borderline in two years, being acquired by Meituan at the meager price of US\$ 2.7 billion, which includes 65% cash and 35% Meituan's shares, with CNY 320 million liquidities and US\$ 1 billion debts. In reality, Mobike's value before the last financing round was US\$ 2.6 billion, whereas after the US\$ 100 million financing its value grew up to US\$ 3.67 billion. However, Meituan's CEO sustained that Mobike has not been sold at a low price since bike-sharing is different from food-delivery service and this new business has not found a profitable model yet<sup>243</sup>.

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<sup>241</sup> Supra, note 230

<sup>242</sup> Supra, note 230

<sup>243</sup> 摩拜被美团“低价”收购 共享单车并购背后有何玄机 <[http://www.xinhuanet.com/fortune/2018-04/16/c\\_129850906.htm](http://www.xinhuanet.com/fortune/2018-04/16/c_129850906.htm)>

Ofo's main competitors, Mobike and Hellobike, which have been acquired and merged respectively, are now playing the free-deposit strategy. Ofo's difficulties in operating are evident since it mortgaged its bicycles for Alibaba's funds and it is also retreating from some markets, such as Australia and other European cities. Notwithstanding, Alibaba is still looking after ofo by leading the E+ financing round of US\$ 866 million on 13<sup>th</sup> March 2018. This financing round included the central participation of Alibaba but also its affiliate Ant Financial, which in April 2018 became Hellobike's E+ financing round principal investor, and it further increased the investment on the blue bikes of CNY 2 billion and the shares up to 36% by May and June 2018. Ant Financial is Hellobike's major stakeholder, while YOUON's shares decreased from 10.2% to 8.9%<sup>244</sup>.

With Mobike's acquisition by Meituan-Dianping, ofo missed the opportunity of the merger, and it is in difficulty to choose between Didi and Alibaba-Ant Financial for the acquisition. On the same day, both proposed to ofo the acquisition soon after Mobike's acquisition by Meituan. In the case ofo chooses Alibaba-Ant Financial, it might have to bear Hellobike's influence because Ant Financial holds more than 45% of its shares starting from April 2018. In the case ofo chooses Didi, it might be in more influential position because compared to Didi's Qingjie and Bluegogo ofo would be more influential due to its broad presence in the primary markets. However, it must be noted that even if ofo would have better conditions if choosing to be acquired by Didi, but Didi itself is relying on Ant Financial's Sesame credit system to run free-deposit service. If Alibaba-Ant Financial decides to stop its cooperation, Didi could find itself to bear all the risk on deposit policy, either it decides to continue or stop free-deposit<sup>245</sup>.

All these moves show the real motivation for the giant investors' disputes to take over the bike-sharing companies: get their big data. Therefore, Meituan has been very fast in catching the opportunity to acquire Mobike, since its data on people lives background, and short-distance travel routes are crucial for Meituan's business. A similar motivation was pushing Didi to conclude the merger between ofo and Mobike, since it has been supporting ofo for a long time, it was holding enough influence to get both companies' data.

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<sup>244</sup> Supra, note 141

<sup>245</sup> Supra, note 230

Now that Mobike has fallen in Meituan-Tencent's hands, Alibaba and Didi are looking at ofo, which tries its best to keep the independence. At the same time, Alibaba and Ant Financial are also promoting Hellobike, while Didi is pouring into Qingjie. Thus, if they will not acquire ofo, it might find itself in a more difficult position compared to Mobike. At the end of April 2018, ofo was undergoing acquisition talks with Didi chuxing. Didi is pressuring to acquire ofo while its main rival, Uber, acquired the New York-based bike-sharing company, Jump, at the beginning of April. Uber was already cooperating with Jump in San Francisco and is now expanding more in the bike-sharing industry as it turned out to be a valuable service that must be integrated into Uber's platform to offer a complete transportation rental service<sup>246</sup>.

Notwithstanding ofo's reluctance to give up the independence, it will still need new capitals to sustain the business before making profits on its own<sup>247</sup> and Didi is trying to leverage on this crucial moment of stiff competition. Undoubtedly the financial crisis has also arrived for the leading Chinese bike-sharing companies. In fact, according to a report from Caixing, as of half of May 2018, ofo does not have more than CNY 500 million left from the E2-1 financing round of March and must face May's total cost of CNY 250 million<sup>248</sup>. Furthermore, on 26<sup>th</sup> July, a piece of news revealed that ofo is losing the connection with 3 million bikes because it did not pay the smart-locks communication service provider. Despite ofo's will in maintaining its independence, as it can be observed from ofo's CEO's words in an internal meeting held in May 2018, there have been many rounds of acquisition talks with Didi chuxing and Alibaba-Ant Financial starting from the end of June and the early July 2018 confirming ofo's cash difficulties. According to a report from 36kr.com, Didi's offer seems to be only the half amount of Mobike's acquisition amount (around US\$ 1.5 million), and after each round of talks, the offer seems to drop, while at the same time Alibaba and Ant Financial are also making even lower offers. Ofo is still reluctant to give up, denying the entire acquisition story<sup>249</sup>.

As for the prospects, ofo's fate is the only left unknown. Either being acquired by Didi or Alibaba, ofo is already subordinated to them since they hold 24% and 16% respectively, which

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<sup>246</sup> 用叫车软件租单车 优步收购共享单车企业 Jump <[http://us.xinhuanet.com/2018-04/11/c\\_129847647.htm](http://us.xinhuanet.com/2018-04/11/c_129847647.htm)>

<sup>247</sup> China bike-sharing firm Ofo's CEO rebuffs offer and rallies employees to 'fight till the end' <<https://www.scmp.com/tech/start-ups/article/2146142/china-bike-sharing-firm-ofos-ceo-rebuffs-offer-and-rallies-employees>>

<sup>248</sup> Supra, note 230

<sup>249</sup> 36 氪独家 | ofo 和滴滴谈判已经接近尾声, 收购价格一再降低 <<https://36kr.com/p/5145348.html>>

means that together they are exceeding ofo' founders' team shares<sup>250</sup>. Ofo is in the middle of the battle between giant tech companies, with Alibaba directly competing with Tencent and Didi still having to take a position. On the one hand, Didi is afraid that if Alibaba acquires ofo, it might learn from Meituan and becoming a direct competitor in the transportation sector, on the other hand, there is also the possibility for Didi to being with Alibaba against Meituan. After refusing the acquisition in May 2018, ofo is still delaying the moment: in June all the talks have reached a deadlock. Both Didi and Alibaba consider ofo's price still too high, having in mind only half of Mobike's acquisition amount, they are still waiting for ofo to end all its cash and seeking for a new solution<sup>251</sup>.

*When there will be a profitable model?*

The Chinese dock-less bike-sharing has passed through many phases of development, starting with an initial high enthusiasm towards this new industry, passing through a fast-grow and cash-burn phase during 2016 and early 2017 to end up in market saturation and crisis phase starting from the half of 2017. The industry has reached a turning point in 2018, characterized by the localities pushing the brake to stop the bicycles' surge and the establishment of many new standards and regulations. At this time, the bike-sharing companies must shift their old strategy toward a more careful management strategy, focusing on complying with the new rules, improving the offline management and developing new online technologies, such as geofencing and credit system.

With the end of 2017, we can also observe that after an early crisis of small companies, also the leading ofo, Mobike and, Hellobike are facing financial difficulties, passing from two financing round in one month to once in few months' time. Even though Hellobike went through an early merger with YOUON and made a revenue of CNY 128 million in 2017, it has not reached the profitability model yet, with a net loss of CNY 480 million. Also, the two leading companies, ofo and Mobike have not reached a profitable model yet<sup>252</sup>. After the cash-burning battle they have conducted and the market saturation which pushed the two companies to try a merger, the bike-sharing industry's objective seems to be more explicit after two years of operations. With the interest of tech giants such as Alibaba and its main

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<sup>250</sup> Supra, note 230

<sup>251</sup> Supra, note 230

<sup>252</sup> 单车精细化运营时代来临 <[http://m.xinhuanet.com/tech/2018-06/06/c\\_1122942559.htm](http://m.xinhuanet.com/tech/2018-06/06/c_1122942559.htm)>

competitor Tencent, Didi chuxing and Ant Financial, it is evident that what they are looking at are the big data on the users, and they are trying to get closer to these sources especially now that the companies are in need of cash.

With the failure of the merge between ofo and Mobike, now Mobike has been acquired by Meituan, which is backed by Tencent. Didi, which was supporting the merger to reach out both platforms resources by leveraging its shares in ofo, is now leading its own path in gathering bike-sharing brands on its platform. However, Didi is still looking at ofo's acquisition. The same interest in the bike-sharing market is shown by Ant Financial, which is already present in both Hellobike and ofo because of the collaboration with the Sesame Credit system.

Notwithstanding the mergers and acquisitions, bike-sharing companies seem to be far from reaching a profitable model, since all these moves are only a way to survive. As declared by Mobike's CEO, *"the company have been acquired because it has not reached a profitable model yet, there is a need to strengthen the operations with more support."* After the acquisition Mobike's internal situation has radically changed, starting with the bad news about firing workers<sup>253</sup>. Despite the promises of not reducing personnel made soon after the acquisition, media have reported job cuts every day. However, the firing was already a concern during winter 2017, when the number of bicycles displaced, and the production orders plummeted. Furthermore, media also reported that Mobike's situation is far from being reassuring, holding more than CNY 6 billion of users' deposit and CNY 1 billion of debts towards suppliers<sup>254</sup>.

In ofo's case, it is even less clear how it will face the financial crisis by holding an independent position. The medias reported that ofo was cutting the workers and thinking of making profits from advertisement. Ofo stated that the profit would come from its high number of users, through online and offline advertisement, but the Transportation Bureau of Beijing, Shanghai municipalities and other localities prohibited the advertising on bicycles. Ofo is claiming its independence from being acquired by Alibaba, even stopping the collaboration for free-deposit through the Sesame Credit System provided by Ant Financial. In fact, ofo has developed its own credit systems, but it is not providing the free deposit service free-deposit

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<sup>253</sup> Supra, note 252

<sup>254</sup> Supra, note 141

anymore. The only way to avoid paying RMB 199 of deposit with ofo is to buy the credits for riding the bikes at the price of RMB 95, which are not refundable. By half of 2018, ofo is launching its independent strategy to reach profitability, that is “ofoConsumer” strategy. In quality of the leading company in the bike-sharing industry, the strategy suggested by ofo is made up of three stages, the first is “bike-sharing companies as providers of a transportation service;” the second is “bike-sharing company as high-quality livelihood connector;” the third is “bike-sharing company as a smart-services provider.” During a strategy decision meeting, ofo revealed that during the first half of 2018 it achieved the expansion of business diversification and lowered the total operating costs of 80%, in the first quarter of the year its revenues surpassed the previous year’s total income and in the second quarter it doubled the first quarter’s revenues. By reaching the financial balance in all the cities, ofo is on the way to hold the leading position in the market, while aiming at the passage to the second stage and reach the third stage of the “ofoConsumer” strategy in the second half of 2018. While the other bike-sharing companies have become bigger players puppets, ofo is leading its own way to become more influencing instead of being influenced. For example, ofo concluded the integration with Sesame Credit system, but is helping the development of the American most significant credit system FICO. Also, ofo plans to become a high-quality livelihood promoter by collaborating with many other entities, such as McDonald’s. In ofo’s vision, the possibility to reach the profitability in the bike-sharing industry does not come from company’s value, but on its impact on people’s life, a sustainable model will be possible because bike-sharing has already become a radical part of citizens’ lives<sup>255</sup>. However, it is a fact that ofo has not reached the profitability yet, with the ongoing talks of acquisition by Alibaba and Didi and the mortgage of assets to receive funds. Another possible outcome for ofo to survive is to develop in other industries. For example, ofo is exploring in further development of the blockchain technology and ICO cryptocurrency, which is however illegal in China. In fact, ancillary businesses are mainly developed abroad, like ofo cooperation in developing electric skateboards in the U.S.<sup>256</sup>

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<sup>255</sup> 共享单车下半场开赛 ofo 蜂巢战略直指盈利 <[http://www.jx.xinhuanet.com/2018-06/28/c\\_1123051303.htm](http://www.jx.xinhuanet.com/2018-06/28/c_1123051303.htm)>

<sup>256</sup> Supra, note 230

According to Trustdata's "2018 Report on Chinese bike-sharing Industry development analysis", first and second-tier cities are still bike-sharing users' core areas, reaching 75% of the total users, while third and fourth-tier cities users- scale is only 25%<sup>257</sup>. Thus, despite the type of strategies the companies might take in the future, they still have to focus on first and second-tier cities on the way to find a profitable model.

## 2.3 Dock-less bike-sharing industry: impacts assessment

The advent of such a big wave of bicycles on the streets did not only have consequences in the cities' transportation modes and citizens' daily life. Also, the bike-sharing companies have impacted the whole bicycle industry, disrupting the previous supply and demand situation. From the bicycles manufacturers to the workers on the streets, the dock-less bike-sharing companies have brought changes in the traditional bicycles industry profitability and employment situation.

The dock-less bike-sharing companies impacted the cities' environment and raised safety and traffic issues. Consequences are evident on both users and cities' road situation which are not protected by adequate regulation. Thus, this new industry enhanced a new process of standards and regulation establishment, which mainly involves local initiatives to regulate the new markets that are then converted into national standards. This shows how in a decentralized authoritarian regime like China the innovation is widely accepted and impacting the country's legal processes.

### 2.3.1 THE CITIES

It is evident that the presence of such a colorful expanse of bicycles on the Chinese cities' street would leave not insignificant impacts. According to the "2017 Report on bike-sharing economic and social impact" (2017 年共享单车经济社会影响报告 *2017 nian gongxiang danche jingji shehui yingxiang baogao*), the dock-less bike-sharing industry had a total economic-social impact worth CNY 221.3 billion. The dock-less bike-sharing service complements cities' transportation system by providing a solution for the "last mile problem" and traffic congestion. According to the report mentioned above, in 2017, bike-sharing decreased burdens related to traffic congestions of CNY 16.1 billion and saved 400 million

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<sup>257</sup> Supra, note 255

hours of congestion<sup>258</sup>. Many localities reported positive data, for example, Guangzhou and Shenzhen reported that after the introduction of the dock-less bicycles, the traffic congestion situation reduced by 6.8% and 4.1% respectively<sup>259</sup>.

Another significant contribution to the cities is the quantity of emission avoided by traveling by bicycles. According to Mobike, 5.6 billion km made with its bikes correspond to 1.26 million tons of carbon dioxides curbed<sup>260</sup>. For example, according to Kunming city's data, in Kunming there are 3.8 million bicycles, which contributed to 6% of the total carbon emissions reduction<sup>261</sup>. The "2017 Report on bike-sharing economic and social impact" stated that in 2017, bike-sharing contributed to curbing 1.41 million tons of gasoline, which correspond to 1% of the total national production of gasoline, saving CNY 1.24 million of costs due to resource consumption reduction. Carbon dioxide emission decreased 4.22 million tons, while PM 2.5 emission lowered 3.22 million tons, which means that bike-sharing decreased atmospheric pollution management costs of CNY 1.6 billion<sup>262</sup>. For example, Wuhan announced in September 2017 that dock-less bike-sharing contributed to decreasing 3,000 tons of carbon emissions<sup>263</sup>.

In some cases, despite having the bicycles, there was a lack of bike facilities. Sometimes, the growth of the bikes led to the construction of new bike lanes, such as in Yunnan province, which announced to recover bike lanes as stated in the Implementation plan of promoting "Internet +" convenient transportation to promote intelligent transportation development (推进“互联网+”便捷交通促进智能交通发展的实施方案 *Tuijin "hulianwang+"bianjie jiaotong cujin zhineng jiaotong fazhan de shishi fan'an*)<sup>264</sup>.

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<sup>258</sup> 共享单车一天骑了七千万人次 创造经济社会影响 2213 亿 <[http://www.xinhuanet.com/fortune/2018-02/08/c\\_1122384126.htm](http://www.xinhuanet.com/fortune/2018-02/08/c_1122384126.htm)>

<sup>259</sup> 交通部数据: 广州有共享单车后, 拥堵下降 6.8% <[http://www.xinhuanet.com/local/2017-09/23/c\\_1121713001.htm](http://www.xinhuanet.com/local/2017-09/23/c_1121713001.htm)>

<sup>260</sup> 共享单车不经意间推动骑行文化, 背后是千亿元的庞大市场 <[http://www.xinhuanet.com/sports/2017-09/30/c\\_1121749000.htm](http://www.xinhuanet.com/sports/2017-09/30/c_1121749000.htm)>

<sup>261</sup> Supra, note 102

<sup>262</sup> Supra, note 258

<sup>263</sup> 武汉发布首部低碳白皮书 共享单车半年碳减排 3000 多吨 <[http://m.xinhuanet.com/hb/2017-09/13/c\\_1121652320.htm](http://m.xinhuanet.com/hb/2017-09/13/c_1121652320.htm)>

<sup>264</sup> 有了共享单车却没有骑行道 政协委员呼吁恢复和修建城市非机动车道 <[http://www.xinhuanet.com/politics/2018-01/24/c\\_1122310149.htm](http://www.xinhuanet.com/politics/2018-01/24/c_1122310149.htm)>

By the half of the year 2018, the cities are starting to reveal the negative impact of the dock-less bike-sharing companies. Under the restriction to distribute more bicycles in the primary markets and the stricter management rules, the dock-less bike-sharing companies, which caught the wave, must now face the wreckage left after it crashed.

With the excessive production of bikes and the measures to control the numbers in the cities created a new ordinary landscape: the bicycles "cemetery."<sup>265</sup> The masses of bikes has become a diffused problem in the cities which pushed the "brake" to stop the increase of bikes, such as Beijing, Shanghai, Xiamen, Hefei, Nanchang, and others described before. Now that the bicycles have been braked, the natural question is who must take care of the "zombie" bicycles left in the "cemeteries"?<sup>266</sup> For example, by June 2018, in Guangzhou there are 300,000 bicycles amassed waiting for a disposal solution and the question about whether the government should proceed in the cleaning has arisen since 2017. Among the difficulties there is the fact that the bicycles in the cemetery are from different companies, some of them failed, and others are producing new bikes to substitute the old ones (such as ofo and Mobike). According to the Property Law of the People's Republic of China (中华人民共和国物权法 *Zhonghua renmin gongheguo wu quan fa*) the companies should sustain the burdens to dispose the bicycles because otherwise they are breaching the public interest. Moreover, the old bicycles still have a property value and must follow the legal procedure to be cleaned, but in both cases of recycling and auctioning, the costs are very high<sup>267</sup>. Thus, the elaboration of a legal process for the disposal of the worn-out bicycles is still incomplete.

## Figure 2: A bicycles "cemetery" in Wuhan

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<sup>265</sup> 多地频现共享单车“坟场”，谁为浪费负责？<[http://www.hb.xinhuanet.com/2018-05/23/c\\_1122874508\\_2.htm](http://www.hb.xinhuanet.com/2018-05/23/c_1122874508_2.htm)>

<sup>266</sup> 旧“坟”未平新“坟”又起，“僵尸”共享单车谁来管<[http://m.xinhuanet.com/gd/2018-05/23/c\\_1122874540.htm](http://m.xinhuanet.com/gd/2018-05/23/c_1122874540.htm)>

<sup>267</sup> 广州废弃共享单车逾30万辆 清理回收问题较突出<[http://www.xinhuanet.com/2018-06/24/c\\_1123026328.htm](http://www.xinhuanet.com/2018-06/24/c_1123026328.htm)>



Source: [www.new.com](http://www.new.com). Note 265

### 2.3.2 THE BICYCLE INDUSTRY

As explained in the first part of this chapter, after the central government changed the policy, many cities have been starting to launch their own public bike-sharing schemes as an extension of the public transportation service. In China, public bike-sharing is only a ten-years-old phenomenon but has already been disrupted by the dock-less bike-sharing companies. However, the arrival of the dock-less two-wheels mainly affected the cities where cycling environment is already good, which usually are big cities with high population. These were also the first cities to implement public-bike sharing schemes, although even smaller localities established PBS schemes. Apparently, for prefecture and county level cities, the majority of which do not have enough resources to provide a sustainable PBS, the dock-less bicycles could provide a very valid solution for short distance trips (in fact Mobike, was actively sustained by the locality when entering in lower-tier cities). On the contrary, in big cities where there was already an eradicated public bike-sharing scheme, the introduction of the dock-less bikes would create an extra supply of the same service. A remarkable case is the Wuhan public bike-sharing scheme, the largest in China with its 40,000 bikes, which has declared to cease operations starting from 25th November 2017, after eight years since its establishment. The

main reason is that since the arrival of the dock-less bikes, the public bike-sharing became a waste of resources for a service which now is provided by the market<sup>268</sup>.

However, the dock-less new option is not always better than the already existing public bike-sharing schemes. The dock-less bike-sharing companies also created problems in the cities as described previously, and concerns among the citizens, who usually must pay a deposit and the ride fee according to the brands' policy. Thus, where the PBS was already a successful solution for short trips, there is a coexistence between the docked and the free-floating bikes. As said by a citizen living in a second-tier city: "I still use the public bike-sharing scheme instead of the dock-less bikes because it is free, and the station is right next to my house."<sup>269</sup>

An interesting episode is the Hangzhou public bike-sharing reaction to the new dock-less competitors. The Hangzhou public bike-sharing scheme, which is one of the most successful ones in China, enhanced the new dock-less option. In May 2018, the red bikes of the Hangzhou Public bike-sharing scheme have a new interesting function, which is the possibility to be parked even if there are not free docks at the stations. This function employs the geofencing technology as the dock-less bike-sharing companies started to do in the cities after the imposition of stricter rules for the operations. By the end of 2018, Hangzhou public bike-sharing will provide 10,000 bikes with the dock-less parking function in 1,000 spots in the city<sup>270</sup>.

It reasonably foreseeable that the new dock-less bike-sharing business would have shaken the entire bicycle industry and not only the public bike-sharing industry. It is enough to see a few numbers to realize how the production of bicycles must have changed due to all these start-ups which placed their orders. As the dock-less bike-sharing companies went on with their growth, the traditional bicycle manufactures struggled to be part of this new business. Media have reported that by the end of the year 2017, the dock-less bike-sharing market has impacted the supplier with CNY 200 million debts towards them, involving 70 suppliers<sup>271</sup>. For example, a bicycle factory in Wuxi (Jiangsu) has been shocked by the order placed by Mobike.

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<sup>268</sup> 共享单车取代公共自行车之后 <[http://www.xinhuanet.com/comments/2017-11/23/c\\_1122000176.htm](http://www.xinhuanet.com/comments/2017-11/23/c_1122000176.htm)>

<sup>269</sup> Personal interview

<sup>270</sup> 无桩也能还车! 杭州公共自行车新功能迎击共享单车 <[http://m.xinhuanet.com/photo/2018-05/04/c\\_1122784692.htm](http://m.xinhuanet.com/photo/2018-05/04/c_1122784692.htm)>

<sup>271</sup> 企业接连倒闭 多部门调研酝酿共享单车配套政策 <[http://www.xinhuanet.com/yuqing/2017-11/24/c\\_129748392.htm](http://www.xinhuanet.com/yuqing/2017-11/24/c_129748392.htm)>

The factory produced 14,000 bikes every day for Mobike, which suddenly put this young and small company on the edge of this revolutionary economic era. On the other camp, ofo has been producing 30,000 bikes per day, to arrive to displace 10 million bikes by the end of 2017. ofo and Mobike alone probably could have reached a production of 30 million bikes per day. These were the number as of March 2017, when in the dock-less bike-sharing market there were 15 to 20 start-ups in 30 cities, pouring millions of different colored bicycles<sup>272</sup>.

During the High level Forum on the “sharing economy” (“分享经济”高层论坛 “*Fenxiang jingji*”*gaoceng luntan*) the State Information Center (国家信息中心 *Guojia xinxi zhongxin*) released the Employment report on bike-sharing industry (共享单车行业就业研究报告 *Gongxiang danche hangye jiuye yanjiu baogao*), according to which the bike-sharing industry created 10,000 new jobs. In the first half of 2017, it created 70,000 new job positions, accounting for 1% of whole mainland China’s employment upsurge. The investigation included bicycle manufacturers such as ofo’s partners Phoenix, Flying Pigeon, Giant Manufacturing (富士达 *Fushida*), and others, which are long-history traditional bicycles brands with factories all over China and almost 20,000 total employees. These companies occupied more than 80% of the total increase in new job positions created by the dock-less bike-sharing market within the bicycles manufacturing industry. Also, NB-IoT and NFC smart-locks manufactures’ employment positions doubled according to the report, which researched the companies in Shanghai, Shenzhen, Hangzhou, Zhongshan and other locations. Last but not least, the numbers of workers for the bicycles’ offline management increased of 30,000 by the first half of 2017 because there is one worker assigned to every 300-500 bicycles<sup>273</sup>.

According to China Bicycle Association (中国自行车协会 *Zhongguo zixingche xiehui*), in 2017 China produced 88.30 million bikes (increased of 10.3%), of which 25 million are designated to the domestic market. Among these bikes, 20 million are for the bike-sharing companies, occupying 22.7% of the total production<sup>274</sup>. With the advent of the dock-less bike-sharing companies, by the end of 2017, there were already 16 million free-floating bikes on the streets. Given the importance of this new market, the Chinese bicycles manufacturers are striving to

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<sup>272</sup> Supra, note 19

<sup>273</sup> 共享单车新增就业 7 万人 <[http://www.xinhuanet.com/local/2017-09/15/c\\_1121666228.htm](http://www.xinhuanet.com/local/2017-09/15/c_1121666228.htm)>

<sup>274</sup> 共享单车订单热退去 自行车企业悄然变化<[http://m.xinhuanet.com/video/2018-05/07/c\\_129866468.htm](http://m.xinhuanet.com/video/2018-05/07/c_129866468.htm)>

acquire quick money-making opportunities. In 2017, Flying Pigeon Bicycle received ofo's order of 5 million bicycles, in May Phoenix also received an order of 5 million bikes from ofo. The order placed by ofo even surpassed Phoenix's production capacity in 2016. With the new dock-less bike-sharing market, bicycles' manufactures, and components suppliers' revenues increased of 70%; for example, in the first half of 2017, Phoenix made CNY 798 million with a growth of 1.79 times, and among the 3 million bicycles produced, 43% were for ofo's. However, those companies which did not achieve the same attention from dock-less bike-sharing companies, are damaged by the new situation. For example, the famous brand Giant Manufacturer's revenues decreased by 5.5%<sup>275</sup>.

While on the production side the dock-less bike-sharing market brought growth opportunities, on the opposite side, the traditional bicycles' sales have been affected negatively. With the surge of bicycles on the streets, citizens do not need to buy a personal bicycle, making many traditional shops closing. In Beijing, only in the first quarter of 2017, half of the shops failed because of the reduction in bicycles' sales of more than 50%, especially the most expensive bicycles which cost more than CNY 1,000 are affected<sup>276</sup>.

However, in late 2017, when cities such as Shanghai, Guangzhou, Nanjing, Hangzhou, Shenzhen, and many other saturated markets called the stop to the influx of bicycles, bicycle manufacturers faced sudden cancellations of the orders. These manufacturers, which met their luck with the huge orders placed by the dock-less bike-sharing companies, now must stop and readjust their production volumes, facing problems in their production cycle, which was prepared to produce high quantities of bikes. For example, the Tianjin Tian'ao Bicycle Limited Company (天津天奥自行车公司 *Tianjin Tian'ao zixingche gongsi*) and Aowei Bicycle (奥威自行车公司 *Aowei zixingche gongsi*), which are well-established traditional bicycles manufacturers, both reported a decrease of orders by for dock-less bikes<sup>277</sup>. On the bicycle expo, the medias discovered that the plummeting of the orders, which began in 2018, is due to the failure of many companies and the reduction of the quantity of those remained. For example, Phoenix received in May 2017 the order to produce 5 million bikes for a bike-sharing company in one year, but it only produced 1.86 million bikes, which is only 37.2% of the

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<sup>275</sup> 共享单车“急刹车”，生产厂商怎么办？ <[http://www.xinhuanet.com/info/2017-09/09/c\\_136595960.htm](http://www.xinhuanet.com/info/2017-09/09/c_136595960.htm)>

<sup>276</sup> Ibid.

<sup>277</sup> Supra, note 275

original order. The total production of bicycles drastically reduced from 2017 to 2018 and the manufacturers must readjust their production cycle and reconsider the original products' mix<sup>278</sup>.

### 2.3.3 THE USERS

The free-floating bikes aim to be a new transportation service in the cities to solve the first/last mile problem and connect for short distance trips, being at the same time an environmentally friendly alternative. Citizens can both enjoy the exercise benefits and the convenience of the possibility to find and leave the bicycles without looking for designated stations as for the public bike-sharing schemes. Thus, with the vast number of bicycles introduced by the dock-less bike-sharing start-ups, the bicycle is becoming part of people's lifestyle, being a zero-emission and healthy commute option in the cities. Apart from providing the "last mile" solution for daily commutes and a good alternative for leisure trips, the high penetration of these bikes, can provide a "ride + tourism" solution for the 400 million registered users<sup>279</sup>. However, the use of the bicycles also hides many concerns on multiple aspects.

First, users should be respectful of the road safety rules, and being in the age for riding the bikes, which is from 12 to 70 years old for dock-less bicycles as established by the Guiding Opinions<sup>280</sup>, as well as treating and parking the bikes consciously. Users' safety is always a concern on the roads, because of damaged bikes or because of misconducts. For instance, many users misuse the bikes by carrying children in the front basket<sup>281</sup>. Although the bike-sharing companies should provide insurance for their bicycles and users, the real borders of who must take care of the liabilities are still unclear due to the lack of regulations (which are now in elaboration and settlement)<sup>282</sup>.

Secondly, to access bike-sharing services users must register with their real identity and in most of the cases, they also must pay the deposit fee. Thus, another area of harm for users is their personal information protection and the deposit issues. Big data is a precious resource in the bike-sharing industry, which permits the collection of millions of people's travel habits

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<sup>278</sup> Supra, note 114

<sup>279</sup> Supra, note 258

<sup>280</sup> See section 2.3.4

<sup>281</sup> 不安全的车筐 多少监护"疏忽"让孩子行走生死边缘 <[http://www.xinhuanet.com/2017-10/12/c\\_1121789284.htm](http://www.xinhuanet.com/2017-10/12/c_1121789284.htm)>

<sup>282</sup> See section 2.3.4

but needs more protection. The use of technology may expose users to digital safety issues, for example in the use of the camera, the GPS and other feature. For example, there have been episodes of fake QR codes on the bicycles, and when users scan the code thinking to unlock the bike, while they are accessing or letting the access to harmful contents<sup>283</sup>. Concerning the deposit, as discussed in a previous section, the dock-less bike-sharing is a cash-burning industry which led to the inappropriate use of users' deposit by the companies in need of cash. Users who made complaints had their first victory with the help of the Chinese Consumers Association, which for the first time brought to the court's attention a bike-sharing case.

Lastly, a peculiar aspect of the dock-less bike-sharing industry in China is the connection with bigger platforms, which uses a social credit system based on users' online conducts. The existence and the willingness to apply an evaluation system have raised many debates<sup>284</sup>. In the bike-sharing scope, the social credit system is integrated into the calculation of the personal score to have access to the bike rental service. In the case of the Chinese most important bike-sharing companies, they might have their own credit system to encourage the users to limit reckless parking behavior or the integration with third parties. In the latter case, the most important integration between bike-sharing and social credit platforms is the collaboration with the Sesame Credit available on the Alipay app, which is a mobile payment service that tracks all the online transactions. Sesame Credit's score is calculated based on users' financial reliability and depending on the score, and users might receive some benefits in other scopes depending on their score<sup>285</sup>. In the bike-sharing case, the social credit score impacts all the aspects ranging from the deposit (ofo, Hellobike) and the fee applied to the Sesame Credit platform, which will impact life's multiple aspects<sup>286</sup>.

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<sup>283</sup> 铜陵市共享单车发现诈骗二维码? 假的! <[http://www.ah.xinhuanet.com/2018-04/11/c\\_1122666663.htm](http://www.ah.xinhuanet.com/2018-04/11/c_1122666663.htm)>

<sup>284</sup> 中国个人信用系统

<<https://baike.baidu.com/item/%E4%B8%AD%E5%9B%BD%E4%B8%AA%E4%BA%BA%E4%BF%A1%E7%94%A8%E7%B3%BB%E7%BB%9F/10947510>>

<sup>285</sup> Supra, note 284

<sup>286</sup> Ofo currently stopped the collaboration with Sesame Credit; Mobike is applying penalties and high fees for low scores users

### 2.3.4 THE LEGISLATION AND REGULATION

#### *The need for regulation*

The accidental death happened on 26<sup>th</sup> March 2017, of an 11 years old boy who was riding an ofo bike in Shanghai, has increased the urgency to regulate the new bike-sharing industry. The fact that the boy was under the age to ride a bicycle according to the Road Traffic Safety Law of the People's Republic of China (道路交通安全法实施条例 *Daolu jiaotong anquan fa shishi tiaoli*) is an example of how the bike-sharing phenomenon is not only a solution in urban transportation but also a source of problems which might also fall outside the bike-sharing companies' jurisdiction<sup>287</sup>. The establishment of standards to regulate the new industry highly involves the government's intervention.

#### *The Guiding opinions*

On 22<sup>nd</sup> May 2017, the Ministry of Transport announced to open an opinion seeking session to draft the Guiding Opinions on Encouraging and Regulating the Development of Internet Bicycle Rental (关于鼓励和规范互联网租赁自行车发展的指导意见 *Guanyu guli he guifan hulianwang zulin zixingche fazhan de zhidao yijian*)<sup>288</sup>. Given the issues which raised with the dock-less bike-sharing companies, the lack of regulation in this new industry is to be filled with the promulgation on 1<sup>st</sup> August 2017 with national effectiveness. Ten different departments joined the new policy: the Ministry of Transport (MOT, 交通运输部 *Jiaotong yunshu bu*), the Propaganda Department of the Central Committee of the Communist Party of China (中共中央宣传部 *Zhonggong zhongyang xuanchuan bu*); the Office of the Central Leading Group for Cyberspace Affairs (中共中央网络安全和信息化领导小组 *Zhong gong Zhongyang wangluo anquan he xinxihua lingdao xiaozu*); the National Development and Reform Commission (NDRC, 国家发展和改革委员会 *Guojia fazhan he gaige weiyuanhui*); the Ministry of Industry and Information Technology (工业和信息化部 *Gongye he xinxihua bu*); the Ministry of Public Security (公安部 *Gong'an bu*); the Ministry of Housing and Urban-rural Development (MOHURD, 住房和城乡建设部 *Zhufang he chengxiang jianshe bu*); People's Bank of China (中国人民银行 *Zhongguo renmin yinhang*); the State Administration of Quality Supervision, Inspection and Quarantine (AQSIQ, 国家质量监督检验检疫总局 *Guojia zhiliang jiandu*

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<sup>287</sup> 共享单车安全性受关注 <[http://www.xinhuanet.com/info/2017-09/23/c\\_136630922.htm](http://www.xinhuanet.com/info/2017-09/23/c_136630922.htm)>

<sup>288</sup> [http://www.mot.gov.cn/yijianzhenqij/201705/t20170521\\_2206671.html](http://www.mot.gov.cn/yijianzhenqij/201705/t20170521_2206671.html)

*jianyan jianyi zongju*); China National Tourism Administration (国家旅游局 *Zhongguo lüyou ju*)<sup>289</sup>. The Guiding Opinions are the result of joint work between these central departments and some other cities' governments' effort in seeking and applying the new rule to encourage and regulate the new bike-sharing industry. Among these cities, we have Beijing, Tianjin, Shanghai, Hangzhou, Shenzhen, Chengdu, and others, for a total of 36 core cities that have been consulted, as well as special local committee established for the purpose, bike-sharing companies, experts and scholars.

The Guiding Opinions express full support towards the dock-less bike-sharing industry, which needs regulation for a more harmonious development, whereas the development of the electric bikes. In fact, the principles to follow for the dock-less bike-sharing development are “encourage” (鼓励 *guli*) and “regulate” (规范 *guifan*). “Encourage” means to create a good environment for bike-sharing industry's sustainable development and letting the citizens benefit from such service; “regulate” means to comply with security and quality standards requirements in the service provision and respect the fair competition principle<sup>290</sup>.

The Guiding Opinions, made up of five sections and 16 articles, establishes the new standards for the bike-sharing industry, including all the aspects, such as the production of the bicycles, the online and offline operations requirements and financial management, and defines the role of the companies in the cities and regulates all the aspects of consumers' safety and personal information and capital protection. All the localities must promote the new rule according to their specific situations with the new rules according to the local situation. Hereafter there are the most relevant key points on the bike-sharing industry<sup>291</sup>.

Firstly, the Guiding Opinions encourages the bike-sharing companies to improve their offline and online management to prevent haphazard parking by establishing designated areas both in the streets and on the maps with the geofencing technology. Bike-sharing companies must adopt the relevant technologies, such as bicycles' localization and the electronic fencing function on the app, while the cities are encouraged to provide bike-facilities and designated

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<sup>289</sup> 关于鼓励和规范互联网租赁自行车发展的指导意见

<<https://www.globalchinalaw.com/zh/documents/c1a18bd7-5124-ed54-ab41-f02cd712702a/bilingual>>

<sup>290</sup> 《关于鼓励和规范互联网租赁自行车发展的指导意见（征求意见稿）》有关情况

<[http://www.mot.gov.cn/2017wangshangzhibo/2017fifth/zhibozhaiyao/201705/t20170523\\_2207849.html](http://www.mot.gov.cn/2017wangshangzhibo/2017fifth/zhibozhaiyao/201705/t20170523_2207849.html)>

<sup>291</sup> [http://www.gov.cn/xinwen/2017-08/04/content\\_5215971.htm](http://www.gov.cn/xinwen/2017-08/04/content_5215971.htm)

parking spaces. Furthermore, the co-use between the bike-sharing companies and the governments of big data and the adoption of a credit system to evaluate users' behavior to apply a reward-punishment policy are highly supported. Bike-sharing companies must comply with the offline management requirements, while the cities and companies must promote cycling culture to improve rider's awareness of safety and rational parking.

Secondly, complying with the Regulation on the Implementation of the Road Traffic Safety Law of the People's Republic of China, Art. 71 (《道路交通安全法实施条例》第七十二条规定, 《*Daolu jiaotong anquan fa shishi tiaoli*》 *di qishier tiao guiding*) children under twelve years old are not allowed to ride bicycles on the roads. Bike-sharing companies must require the users to register with real identity or through the mobile phone number. However, the registration with the real identity is strongly supported, also to contribute to the construction of the social credit system.

Next, due to the deposit issue, consumers' protection must be improved. Thus, bike-sharing companies are encouraged to provide free-deposit service. However, consumers' behavior reliability might be an issue for the bike-sharing companies; thus, the alternative to offer free-deposit service through a credit system could be a great solution. The need to ask for the deposit is understandable and, in this case, companies should create a special account for deposit payments and adopt quick response to return deposit fees and limit the formation of capital's pool. Moreover, companies must rely on third parties (bank or non-bank) to provide the financial situation. Finally, even in cases of closure, merges and acquisitions (M&As) and reorganization, the companies must adopt a rational plan and protect consumers' right and safety.

### *Local regulation*

The Guiding Opinions on Encouraging and Regulating the Development of Internet Bicycle Rental is the national framework for the new dock-less bike-sharing industry in China, which must be followed by the local governments as can be expected in a "regionally decentralized authoritarian (RDA) country like China (Xu, 2010). The regulations and standards that emerged in this new industry's management process is an example of the ongoing decentralization trend in the Chinese governance system, in which local governments do not only obey to the

center, but they actively make their own decision (Tan & Zhou, 2015)<sup>292</sup>. In fact, the need to regulate the bike-sharing industry has first emerged by the besieged cities, which brought the issue to the attention of the central government to establish national standards<sup>293</sup>.

In March 2017, the Shanghai Municipal Bureau of Quality and Technical Supervision (上海市质监局 *Shanghai shi zhi jian ju*) expressed that the process to set up the new Group standard of shared bicycles (《共享自行车》团体标准 《*Gongxiang zixingche*》 *tuanti biao zhun*) has been completed, being the first set of standards that have been delegated to and led by an organization, which is the Shanghai Bicycle Association (上海自行车行业协会 *Shanghai zixingche xiehui*), including the participation of third-party operators, the bike-sharing companies, the inspection and examination organizations<sup>294</sup>. The standards tackle different aspects of the new bike-sharing industry, including the shared bicycles' technological requirements (products' standards on the quality and safety requirements) and the shared bicycles' scope of service (bicycles' maintenance, deposit management, complaints process, credit system management and indemnity terms). Among the requirements established by the standards we have<sup>295</sup>:

- For every 10,000 bicycles, the provision of 50 workers to manage the fleet;
- GPS location technology on the app and the bikes;
- Development of the geofencing technology;
- Balanced and regulated bicycles' introduction;
- Bicycles operational lifetime is three years;
- Time limit to give back the deposit is 7 days;

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<sup>292</sup> The administrative decentralization process in China accelerated in 2013 with the new leadership. The bike-sharing regulations definition process reflects the new "project packaging approach" (PG approach), for which the central government design a project for the public interest (i.e. public infrastructures) and the local governments complete the projects within the pre-determined terms (i.e. deadline, criteria). The bike-sharing industry's regulation process is similar to the PG approach, which is described by Tan & Zhou (2015) as an organization mode with a "top-down" project allocation by the central government and a "bottom-up" integrated management of the project by the local government.

<sup>293</sup> 共享单车与城市治理 <[http://www.xinhuanet.com/globe/2018-04/09/c\\_137087561.htm](http://www.xinhuanet.com/globe/2018-04/09/c_137087561.htm)>

<sup>294</sup> 上海: 共享单车相关团体标准已完成编制-技术/标准/培训-标准-中国自行车协会网,中国自行车协会,自行车协会,中自协,中国自行车杂志 <<http://www.china-bicycle.com/News/View/303e8410-874c-4cde-82b4-9b254849b0e8>>

<sup>295</sup> 上海共享单车标准已编制: 满12岁才能骑、须装GPS定位-技术/标准/培训-标准-中国自行车协会网,中国自行车协会,自行车协会,中自协,中国自行车杂志 <<http://www.china-bicycle.com/News/View/f780d7d5-7b93-4bc2-bfda-72792ab4a64c>>

- Users' height must be between 1.45-1.95m;
- Users must be 12 years old;
- At least 95% of the bicycles must be in good conditions;
- The bike-sharing service operator can appeal to the court or ask arbitration in case of unsolved problems with the users after five complaints;
- In case of personal injury due to bicycles' quality problem, the bike-sharing service operator must compensate an amount to the user not below CNY 150,000 and within 7 days.

These standards are effective starting from 1<sup>st</sup> October 2017. Based on the Guiding Opinions, the localities have implemented their own guidelines, which all respects the basics requirements with some local adjustments. Hereafter there are some examples of local implementation of the standards established by the Guiding Opinions.

Shanghai implemented the its version of the Guiding Opinions (trial) (上海市鼓励和规范互联网租赁自行车发展的指导意见 (试行) *Shanghai shi guli he guifan hulianwang zulin zixingche fazhan de zhidao yijian (shixing)*) on 9<sup>th</sup> November<sup>296</sup>. Furthermore, Shanghai also implemented a registration system, for which the Public Security Bureau and the Transportation Department apply the license plates to the non-motorized vehicles, including the shared bikes. The requirements are complying with the Shanghai Municipality Rules for Management of Non-Motorized Conveyances (上海市道路交通管理条例 *Shanghai shi feijidongche guanli tiaoli*) and the Shanghai Municipality Non-Motorized Vehicles Management Plan (上海市非机动车管理办法 *Shanghai shi feijidongche guanli banfa*)<sup>297</sup>.

On January 11<sup>th</sup>, Beijing called a conference to reduce the traffic congestions by launching officially the Beijing Municipality Regulations on the management of non-motorized vehicles (北京市非机动车管理条例 *Beijing shi feijidongche guanli tiaoli*), to help resolving the dock-less bike-sharing disordered parking problem, deposit problem, regulation of the electric vehicles and the opening of new bike lanes. According to the management, the excessive number of bikes must be managed by the legislation, which is about to settle the exact number

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<sup>296</sup> 上海出台鼓励和规范互联网租赁自行车发展的指导意见

<<http://finance.irj.com.cn/2017/11/09152623362635.shtml>>

<sup>297</sup> 《上海市鼓励和规范互联网租赁自行车发展的指导意见 (试行) 》解读

<<http://www.shanghai.gov.cn/nw2/nw2314/nw2319/nw41893/nw42233/u21aw1266583.html>>

of bicycles and the companies' responsibilities in operating. Beijing called the establishment of standards on 21st April 2017 mainly to cope with the illegal parking problem<sup>298</sup> and the Beijing city's Guiding Opinions on Encouraging and Regulating the Development of Internet Bicycle Rental (trial) (北京市鼓励规范发展共享自行车的指导意见 (试行) *Beijing shi guli guifan fazhan gongxiang zixingche de zhidaao yijian (shixing)*) launched on 15<sup>th</sup> September 2017, with particular attention to the insurance for personal injuries<sup>299</sup>.

Hangzhou called the process to seek opinions on 26<sup>th</sup> April 2017, and the Hangzhou city's Hangzhou's Guiding Opinions on promoting the standardized development of Internet rental bicycles (trial) (杭州市促进互联网租赁自行车规范发展的指导意见 (试行) *Hangzhou shi cujin hulianwang zulin zixingche guifan fazhan de zhidaao yijian (shixing)*), which launched on 29<sup>th</sup> of September. The first measures implemented in November 2017, with the beginning of the Hangzhou Internet rental bicycle market regulation plan (杭州市互联网租赁自行车市场整治方案 *Hangzhou shi hulianwang zulin zixingche shichang zhengzhi fang'an*), which requires the collection of data to implement the geofencing technology. Furthermore, the companies must undergo service quality assessment conducted by a third-party<sup>300</sup>.

Nanjing proceeded with the implementation of the Opinions for Guiding and Regulating the Development of Internet Bicycle Rental (trial) (关于引导和规范互联网租赁自行车发展的意见 (试行) *Guanyu yindao he guifan hulianwang faazhan de yijian (shixing)*) on 20<sup>th</sup> July 2017, to which participated the Nanjing Communications Bureau (南京市交通部门 *Nanjing shi jiaotong bumen*), the Public Security Bureau and the City Administration, together with ten bike-sharing companies' representatives<sup>301</sup>. On 1<sup>st</sup> September, Nanjing Transportation Bureau held the discussion with the bike-sharing start-ups and established the creation of specific parking areas and announced to be implemented by the end of the year 2017 and the creation of a bicycles registration system. Each bike must have the license plate, a smart-lock with

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<sup>298</sup> 北京将设定共享单车发展上限数量 停车区将统一标准 <[http://www.xinhuanet.com/local/2017-04/27/c\\_1120880519.htm](http://www.xinhuanet.com/local/2017-04/27/c_1120880519.htm)>

<sup>299</sup> 共享单车企业应为用户买人身意外伤害险-新华网 <[http://www.xinhuanet.com/2017-09/16/c\\_1121672709.htm](http://www.xinhuanet.com/2017-09/16/c_1121672709.htm)>

<sup>300</sup> 88 万辆共享单车怎么管? 看杭州如何解新时代新难题 <[http://www.zj.xinhuanet.com/2017-12/24/c\\_1122158134.htm](http://www.zj.xinhuanet.com/2017-12/24/c_1122158134.htm)>

<sup>301</sup> 《关于引导和规范互联网租赁自行车发展的意见 (试行) 》的政策解读 <[http://www.nanjing.gov.cn/xxgk/szf/201801/t20180117\\_5243512.html](http://www.nanjing.gov.cn/xxgk/szf/201801/t20180117_5243512.html)>

position tracking system, and for every 10,000 bikes there must be 50 workers for the management. Also, users' deposit, companies' bank accounts are supervised by third parties. Nanjing follows the Art. 59 of the PRC Road Safety Law (中华人民共和国道路交通安全法 *Zhonghua renmin gongheguo daolu jiaotong anquan fa*), which establish designated parking areas for non-motorized bicycles, in case of violation it applies a fine between CNY 5 and CNY 50<sup>302</sup>.

Tianjin started the standards elaboration process in January 2017 and implemented the Tianjin's Guiding Opinions on encouraging and regulating the development of Internet rental bicycles (trial) (天津市关于鼓励规范发展互联网租赁自行车的指导意见 (试行) *Tianjin shi guanyu yindao he guifan hulianwang fazhan de yijian (shixing)*) on 7<sup>th</sup> November 2017<sup>303</sup>. Furthermore, Tianjin municipality established that the misconducts towards the bikes, such as damaging and privatizing the vehicles with personal locks, must be punished with detention and monetary fines. According to the Public Security Administration Punishment Law (治安管理处罚法 *Zhian guanli chufa fa*), the detention is from 5 to 10 days and the fines are below CNY 500, whereas for more serious cases, detention is from 10 to 15 days, fines are below CNY 1,000. Also, in collaboration with the Tianjin Police, citizens are encouraged to denounce misconducts and damages to the bikes by calling the police. If the case the violation is certified, the citizen will receive a prize through ofo's creditworthiness system (of which when the score is 0, it is not possible to use the bike) and related benefits<sup>304</sup>.

Among the first to launch their own regulations, there are also Xi'an and Chengdu. Xi'an officially launched the local Guiding Opinions, according to which the companies that are retreating the market must publicly announce the closure through the media 30 days in advance and regularly return the deposit. In March 2017, also Chengdu launched the Chengdu Trial Opinions on encouraging the development of shared bicycles (成都市关于鼓励共享单车发展的试行意见 *Chengdu shi guanyu guli gongxiangdanche fazhan de shixing yijian*), which gives importance to the bike-sharing companies' role in the market and for the

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<sup>302</sup> Supra, note 205

<sup>303</sup> 《天津市关于鼓励规范发展互联网租赁自行车的指导意见 (试行) 》政策解读  
<<http://jtys.tj.gov.cn/Page/ShowInfoPage.aspx?ID=b1fbd0ce-4365-4220-a0cc-fc3e65eb8b19>>

<sup>304</sup> 共享单车最大规模“公车私用”查处行动启动 <[http://www.tj.xinhuanet.com/news/2017-12/10/c\\_1122086181.htm](http://www.tj.xinhuanet.com/news/2017-12/10/c_1122086181.htm)>

regulation of the bike-sharing industry<sup>305</sup>. Apart from these main cities, starting from 2018, also the smaller localities launched their own version of the Guiding Opinions to regulate the bike-sharing industry.

One of the most prominent issues in the bike-sharing industry is the deposit. On 20<sup>th</sup> December, the China Consumers Association, talked about the deposit problem for the third time, to define how to manage the deposit clearly. The deposit issue falls under the e-commerce since the bike-sharing companies provide the rental service through the Internet. Thus, the deposit regulation is included in the E-commerce Law (电子商务法 *Dianzi shangwu fa*), which is under development. Under such Law, the deposit must be managed through the adoption of a pre-authorization system to block the deposit, preventing the amounts to flow into companies' capital account<sup>306</sup>.

## CHAPTER 3 – DOCK-LESS BIKE-SHARING COMPANIES: SOME PROFILES

### 3.1 Ofo<sup>307</sup>

**Table 4: ofo 小黄车**

	
Company name	北京拜克洛克科技有限公司 ( <i>Beijing baikeluoke keji youxian gongsi</i> )
Common name	ofo 共享单车 (ofo bike-sharing company)
Year of foundation	2014

<sup>305</sup> 共享单车竞争压力大 小蓝单车在成都“不见了”? <[http://www.xinhuanet.com/2017-11/01/c\\_1121889961.htm](http://www.xinhuanet.com/2017-11/01/c_1121889961.htm)>

<sup>306</sup> 中消协 15 天三度发声:共享单车企业不得挪用押金 <[http://www.xinhuanet.com/yuqing/2017-12/21/c\\_129771470.htm](http://www.xinhuanet.com/yuqing/2017-12/21/c_129771470.htm)>

<sup>307</sup> ofo 小黄车 <[https://baike.baidu.com/item/ofo%E5%B0%8F%E9%BB%84%E8%BD%A6#3\\_6](https://baike.baidu.com/item/ofo%E5%B0%8F%E9%BB%84%E8%BD%A6#3_6)>

Founder	戴威 (DAI Wei)
Headquarter	Beijing (China)
Website	<a href="https://www.ofo.com">https://www.ofo.com</a>

Sources: logo and image <<http://family.pconline.com.cn/933/9338626.html>>

### 3.1.1 ABOUT THE COMPANY

Ofo is a Beijing-based company which provides dock-less bike-sharing service, founded in 2014 by a group of masters' students of the Beijing University. The company's philosophy is to connect bicycle without producing them, giving the possibility to everyone to access a bicycle by unlocking the lock. The service is based on the sharing economy's concept of the internet innovation with the objective to better the cities' environment by saving space and providing a solution for the first and last mile problem. To achieve these goals, ofo is strictly collaborating with the local governments, also by providing personalized services.

Ofo is not merely a bike-sharing service provider, it also carries out research and development, consumers' protection and support in the operations, as well as the creation of a big data platform to help in the urban planning and public health sectors.

### 3.1.2 THE SERVICE AND PRODUCTS

Ofo's bike-sharing service is available through the mobile app (iOS/Android). After registering and paying the deposit (if necessary), the user can scan the QR code on the bicycles' body to open the smart-lock (in another version, the lock can be opened by inserting code on the lock which is sent to the mobile phone). The bike can be returned at the destination after parked in available spaces or designated areas, and it is enough to lock the bike.

Ofo has been launching different versions of bicycles as research and development advance. The first versions did not have smart-locks, but to unlock the bike it was necessary to insert a combination of numbers, first with rotating disks and later, in the improved version, with buttons. In March 2017, ofo launched the new version, ofoCurve, in collaboration with 700Bike. The new bicycles require less management by using solid tires, are more ergonomic in the design and with improved personalization possibilities, such as adjustable seats and the basket in the front. Another ofo version is the *gongzhu che* (ladies' bicycle), designed for ladies. This version is made in collaboration with the well-known brand, Phoenix (凤凰自行车). On the opposite, there is the *jirou che* (muscle bicycle) version, which has very thick tires and an eight-speed gearbox. One last ofo version is the *er ba che* (28 bicycle), which recalls the famous

Phoenix's model 28. This is a classical model on which ofo brought the yellow color and the smart-lock technology.

### 3.1.3 MAJOR EVENTS AND FINANCIAL SITUATION

2014	<ul style="list-style-type: none"> <li>•Foundation</li> </ul>
2015	<ul style="list-style-type: none"> <li>•June: introduction of 2,000 bikes in the Beijing University's campus</li> <li>•October: conclusion of the pre-A financing round</li> </ul>
2016	<ul style="list-style-type: none"> <li>•January: conclusion of the A financing round</li> <li>•August: conclusion of the A+ financing round</li> <li>•September: US\$ tens of millions B financing round. Leading investor: Matrix Partners China; followed by: Jinshajiang Venture Capital Co Ltd, Will Hunting Capital</li> <li>•26th September: Didi chuxing made a strategic investmnet of US\$ tens of million</li> <li>•10th October: C financing round of US\$130 million. C1 round with Didi chuxing. C2 round includes Coatue Management LLC (U.S.), Xiaomi Inc. (China)</li> <li>•17th November: starting service in the city with ofo3.0 and in collaboration with 700bike</li> <li>•16th December: starting service in Chengdu and Xiamen</li> <li>•23rd December: starting overseas service, in San Francisco (the U.S.) and London (the UK)</li> <li>•27th December: starting service in Singapore</li> </ul>
2017	<ul style="list-style-type: none"> <li>•11th January: operating in 33 cities (and further expansion by 22nd in Hefei, Wuhan, Changsha, Nanjing, Chongqing, Foshan, Tianjin, Xi'an, Shijiazhuang, Zhengzhou, Jinan, Nanchang, Suzhou, Ningbo, Nanning, Fuzhou)</li> <li>•16th January: first-generation smart-lock</li> <li>•22nd Febrary: collaboration with Huawei and China Telecom for joint developmnet of NB-IoT (Internet of Things) techologies to improve bicycles's smart management system</li> <li>•1st March: D financing round</li> <li>•16th March: collaboration with Ant Financial to provide free-deposit service with the Sesam Credit system</li> <li>•22nd April: D+ financing round with Ant Financial Services Group</li> <li>•27th April: ofo is available on Didi chuxing's platform</li> <li>•3rd May: ofo is operting in 100 cities and 4 countries</li> <li>•8th June: CBInsights declares ofo an "unicorn" company</li> <li>•20th June: the deposit fee changes from CNY 99 to CNY 199 (Shanghai, Guangzhou, Hangzhou's free-deposit service remains)</li> <li>•6th July: E financing round of US\$ 700 million, with the leading investors: Alibaba, Hony Capital and CITIC Private Equity. Following investors: Didi chuxing and DTS</li> <li>•25th July: establishemnt of the Peking University Brilliance-ofo bicycle economic research center</li> <li>•1st August: ofo enters Thailand with first 6,000 bikes</li> <li>•27th August: ofo enters Austria, with 2,000 bikes</li> <li>•5th September: ofo enters London (the UK)</li> </ul>
2018	<ul style="list-style-type: none"> <li>•17th January: ofo is operating in 200 cities and 20 countries</li> <li>•28th March: ofo enters Japan</li> <li>•March: E2-1 financing round of US\$ 866 million with the leading investor Alibaba and followed by Haofeng Group, Tianhe Capital, Ant Financial</li> <li>•July: stopping operations in Australia, Germany, Israel, India</li> <li>•24th July: change in price strategy</li> </ul>

## 3.2 Mobike<sup>308</sup>

**Table 5: Mobike**

	
Company name	北京摩拜科技有限公司 <i>Beijing mobai keji youxian gongsi</i>
Common name	摩拜单车 <i>Mobai danche (mobike)</i>
Foundation	27 <sup>th</sup> January 2017
Founder	胡玮炜 (HU Weiwei)
Headquarter	Beijing (China)
Website	<a href="https://mobike.com/it/">https://mobike.com/it/</a>

Sources: logo <[http://blog.sina.com.cn/s/blog\\_16f6d2efc0102wqwt.html](http://blog.sina.com.cn/s/blog_16f6d2efc0102wqwt.html)>, image <[http://blog.sina.com.cn/s/blog\\_ed7afa610102x48y.html](http://blog.sina.com.cn/s/blog_ed7afa610102x48y.html)>

### 3.2.1 ABOUT THE COMPANY

Mobike is a dock-less bike-sharing service provider to solve the first/last-mile problem and an advocate of the green mode transportation, in fact, Mobike has been awarded by the United Nations with the “Earth Defender Award.”

Mobike of gives much importance to the research and development of technologies and the development of an excellent smart management system, for which it opened many partnerships with third-parties.

**Table 6: Mobike's main partners**

Date	Partner and project
28 <sup>th</sup> February 2017	China Merchants Bank (招商银行 <i>Zhao shang yinhang</i> ), for the management of the deposit fees, payments, banking, service and marketing
26 <sup>th</sup> March 2017	Shimao Group (世茂集团 <i>Shimao jituan</i> ), for the development of designated parking areas, the establishment of smart bike-sharing quarters, and to enhance bicycles' fleet smart management

<sup>308</sup> 摩拜单车

<<https://baike.baidu.com/item/%E6%91%A9%E6%8B%9C%E5%8D%95%E8%BD%A6?fromtitle=mobike&fromid=19943837#6>>

March 2017	Baidu Cloud Engine (百度云 <i>Baiduyun</i> ), for the development of smart parking suggestion system (sMPL)
28 <sup>th</sup> March 2017	Lucky Air (祥鹏航空 <i>Xiangpeng hangkong</i> ), is an example of the collaboration and mutual application between the technologies of the aviation and the bicycle industries
19 <sup>th</sup> April 2017	Futian District of Shenzhen city, for the establishment of the first key parking areas through the analysis of big data
2 <sup>nd</sup> May 2017	Hanergy Holding Group Limited (汉能控股集团 <i>Hanneng konggu jituan</i> ) to develop mobile energy sources
15 <sup>th</sup> May 2017	Ericson, China Mobile (中国移动 <i>Zhongguo yidong</i> ) to further promote smart technologies and bike-sharing smart-technology standardization

Source: note 308

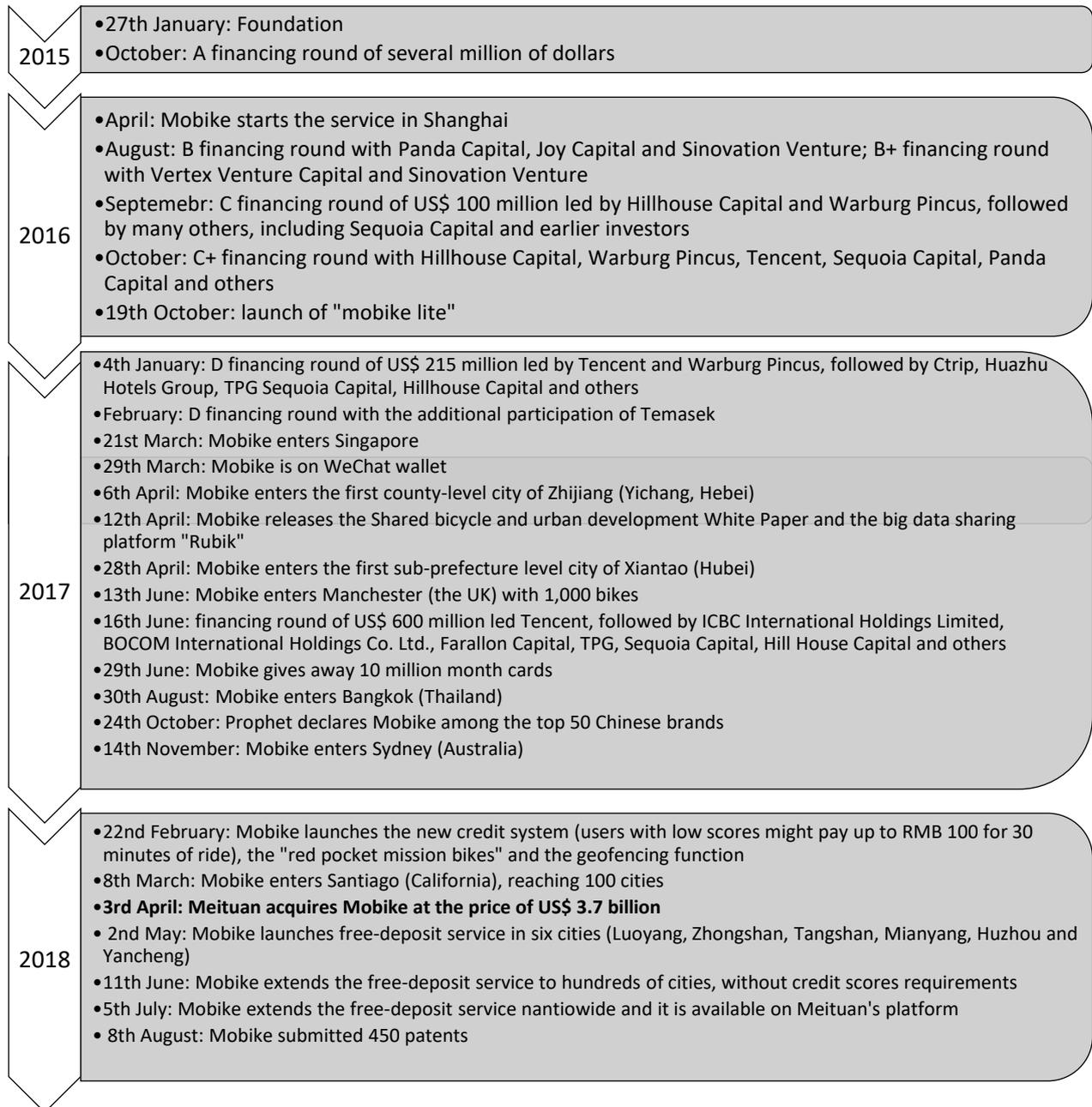
### 3.2.2 THE SERVICE AND PRODUCTS

Mobike's bicycles have a resistant aluminum body, with anti-burst tires and specialized design. The bicycles also have a microchip, GPS function, and a SIM card. On the Mobike app, it is possible to localize the bikes, and it allows the users to reserve and find a bicycle near to them. It is enough to scan the QR code on the body of the bikes to open the smart-lock, ride to the destination, park within regular spaces (white lines on the streets) and manually close the lock to end the ride. Starting from August 2018, Mobike is launching the free-deposit function, which is available on the updated version of its app or the WeChat miniprograms function. Mobike applies a fee of RMB 1 for half an hour ride and usually requires a deposit of RMB 299, which can be paid through the WeChat wallet of Alipay. The distinctive characteristics of the service provided are the dock-less feature which allows flexible parking; safe, resistant and easily recognizable bicycles; easy-to-use mobile app; protected patents; promotion of the cycling culture, decrease of the traffic congestion and environmental pollution.

In October 2016, Mobike launched a new model of bike, "mobike lite," which weighs only 17kg compared to 25kg of the older version. The price to produce the new bikes is around RMB 1,000, and the first fleets are displaced in Beijing and Shanghai, applying a fee of RMB 0.5 for half an hour. "mobike lite" benefits from a protected patent, as well as the smart-lock system. Moreover, the bikes have a dynamo and a solar panel in the basket to generate electricity.

On 22<sup>nd</sup> April 2017, Mobike launched a new version of the orange bikes, "light wind" (风轻扬 *Feng qing yang*), which further cut the weight but maintaining the classic characteristics at the same time. The new bikes require 30% less effort to cycles and employ the aerospace material to build the baskets.

### 3.2.3 MAJOR EVENTS AND FINANCIAL SITUATION



### 3.3 Hellobike / YOUON

#### 3.3.1 YOUON <sup>309</sup>

**Table 7: YOUON**

	
Company name	永安公共自行车系统股份有限公司 <i>Yong'an gonggong zixingche xitong gufen youxian gongsi</i>
Common name	永安行 <i>Yong'an xing (YOUON)</i>
Foundation	24 <sup>th</sup> November 2016
Chairman	孙继胜 (SUN Jisheng)
Headquarter	Changzhou (Jiangsu, China)
Website	<a href="http://www.youonbike.com/">http://www.youonbike.com/</a>

Sources: logo <<http://www.weexun.com/news/shangxun/13354.html>>; image <[http://www.sohu.com/a/128627424\\_468699](http://www.sohu.com/a/128627424_468699)>

Before launching on 24<sup>th</sup> November 2016, the app for the dock-less bike-sharing service, YOUON was already in the public-bike sharing business for six years, operating in 100 cities. However, YOUON faced many difficulties in the complete dock-less bike-sharing market, for example, in May 2017, it has been sued for patent infringement.

On 25<sup>th</sup> October 2017, YOUON merged with Hellobike.

#### 3.3.2 HELLOBIKE<sup>310</sup>

Founded in late 2016, Hellobike provides a dock-less bike-sharing service, which started its first operations in cities like Hangzhou, Ningbo, Fuzhou, Xiamen, and Tianjin. Starting from 13<sup>th</sup> March 2018, Hellobike collaborates with Ant Financial's Sesame Credit platform to

<sup>309</sup> 永安行 <<https://baike.baidu.com/item/%E6%B0%B8%E5%AE%89%E8%A1%8C>>

<sup>310</sup> 哈啰出行

<<https://baike.baidu.com/item/%E5%93%88%E5%95%B0%E5%87%BA%E8%A1%8C/22879308?fromtitle=%E5%93%88%E7%BD%97%E5%8D%95%E8%BD%A6&fromid=20496948>>

provide free-deposit service to the users with 650 points or above. Everyday Hellobike provides 15 minutes free-of-charge service and offers free-service at night time.

After merging with YOUON, Hellobike continues the operation with its name, but it is YOUON’s subsidiary. On 17<sup>th</sup> September, Hellobike officially changed the name from YOUON into Hellobike (哈啰出行 *Haluo chuxing*).

**Table 8: Hellobike**

	
Company name	上海钧正网络科技有限公司 <i>Shanghai junzheng wangluo keji youxian gongsi</i>
Common name	哈啰出行 <i>Haluo chuxing</i> (Hellobike) (starting from 17 <sup>th</sup> September 2018)
Foundation	2016
Founders	杨磊 (YANG Lei), 江伟 (JIANG Wei), 韩美 (HAN Mei)
Headquarter	Shanghai (China)
Website	<a href="http://www.hellobike.com/">http://www.hellobike.com/</a>

Sources: logo <<http://m.lagou.com/gongsi/164989.html>>; image <<http://www.ccidnet.com/2017/0421/10264731.shtml>>

**Table 9: Hellobike new logo and bikes**

	
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Sources: logo, note 310; image <<http://dy.163.com/v2/article/detail/D1KBL8M8051188EC.html>>

### 3.3.3 MAJOR EVENTS AND FINANCIAL SITUATION

2016

- Foundation
- November: A financing round, including GGV
- December: Hellobike starts operations in Xiamen
- 26th December: partnership with Ping an Insurance Group (中国平安 *Zhongguo ping'an*), providing the highest insurance in the bike-sharing market

2017

- 12th January: A+ financing round, led by GGV
- 11th March: Hellobike starts in Wuhan with 50,000 bikes
- 13th March: Hellobike starts in Nanchang
- April: B financing round
- 12th April: Hellobike launches in Tianjing
- July: B+ financing round
- **25th October: merger with YOUON, Hellobike continues to operate as YOUON's subsidiary and with a new CEO**
- 27th December: D2 financing round of RMB 1 billion, led by Fosun Group (复星 *Fuxing*), followed by GGV

2018

- February: Hellobike replaces part of the old and damaged YOUON bikes
- 13th March: Hellobike provides free-deposit service in collaboration with Sesame Credit (only for users with 650 points or above)
- April: E1 financing round of almost US\$ 700, including Ant Financial and Fosun Group
- 31st May: a subsidiary of Ant Financial increased the investment of RMB 2 billion, holding 36% of YOUON's shares

### 3.4 Bluegogo<sup>311</sup>

**Table 10: Bluegogo**

	
Company name	天津鹿鼎科技有限公司 <i>Tianjin luding keji youxian gongsi</i>
Common name	小蓝单车 <i>Xiaolan danche</i> (Bluegogo)
Foundation	23 <sup>rd</sup> November 2016
Founder	李刚 (LI Gang)
Headquarter	Tianjin (China)
Website	<a href="http://www.bluegogo.com/">http://www.bluegogo.com/</a>

Sources: logo, note 311; image <[http://www.sohu.com/a/125022680\\_502865](http://www.sohu.com/a/125022680_502865)>

#### 3.4.1 ABOUT THE COMPANY

Bluegogo established on 23<sup>rd</sup> November 2016, providing a dock-less bike-sharing service to solve 1-5km short distance trips problems. The company's principles are: to provide a green transportation alternative for short distances; provide a technological transport mean which does not have limits; promote a more active lifestyle.

In the beginning, Bluegogo was the third firm after ofo and Mobike. At the end of January 2017, it also launched overseas operations in San Francisco (California), but at the end March it had to withdraw the bikes because it did not obtain the permission to operate from the local government<sup>312</sup>.

The problems did not stop abroad but also raised in China. After only one year, Bluegogo entered in a phase of financial difficulties. In August 2017, Bluegogo started to reveal the first problems: the users were not able to get the deposit back from the app, and they started to send complaints, raising the deposit crisis in September. Moreover, Bluegogo launched on

<sup>311</sup> 小蓝单车<<https://baike.baidu.com/item/%E5%B0%8F%E8%93%9D%E5%8D%95%E8%BD%A6>>

<sup>312</sup> Supra, note 137

22<sup>nd</sup> March a half-year special card at the price of RMB 199, which can be reimbursed six days before the expiration of the six months, but Bluegogo automatically extended the period to one year without users' consent. After the surge of the complaints, the users started to go to Bluegogo's office to get back their deposit, but they find it closed.

On 20<sup>th</sup> November 2017, Bluegogo announced the closure due to the financial difficulties and Mobike's refusal to proceed with a merger or an acquisition.

From 9<sup>th</sup> January 2018, Bluegogo's bikes are available again with Didi chuxing operating the blue bikes, which can be rent on Didi's bike-sharing platform, together with ofo and Didi's Qingjie bikes.

#### 3.4.2 THE SERVICE AND THE PRODUCT

Bluegogo's bicycles are free-floating and embedded with GPS. Bluegogo focuses on the quality of its bikes, to provide the best riding experience to its users. The bicycles employ stabilizing and anti-shake solid wheels with aluminum rings, the brakes are quick-responding and high-performing both in dry and wet climates. When riding, it does not require much effort because of the very light and solid body. The most famous manufacturer (the Italian brand SelleRoyal) provides the seats, which are easy to adjust, wide and comfortable. On the front, there is a very robust basket, which can carry up to 25gk. Finally, the bikes have a smart-lock with a very accurate GPS positioning system, and fast unlocking process. The whole body is in aluminum and equipped with a smart-lock of the cost of RMB 600. One Bluegogo's bike costs around CNY 2,000 and due to its high quality, it received excellent evaluations from the users. The bike rental service employs the dock-less technology and the smart GPS location system which also works when in movement. Moreover, the bikes are very light, with a fashionable design and are very comfortable to ride. The bikes can be rent by scanning the QR code on the bike through the mobile app, and at the destination, it is enough to park the bike in the parking areas and manually close the smart-lock.

### 3.4.3 MAJOR EVENTS AND FINANCIAL SITUATION



## 3.5 Other Chinese dock-less bike-sharing brands

### 3.5.1 UNIBIKE<sup>313</sup>

**Table 11: UniBike**

	<ul style="list-style-type: none"> <li>- Company name: 由你单车 <i>Youni danche</i> (UniBike)</li> <li>- Foundation: 2016</li> </ul>
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Sources: Note 313

UniBike was founded by a group of students born after 1995, and it first started its operation in the Renmin University of China on 30<sup>th</sup> October 2016. In November it started in many other

<sup>313</sup> 由你单车 <<https://baike.baidu.com/item/由你单车>>

universities' campuses and raised an A financing round of RMB 100 to start the operations also in the cities in April 2017.

### 3.5.2 U-BICYCLE<sup>314</sup>

**Table 12: U-bicycle**

	<ul style="list-style-type: none"> <li>- Name: 优拜单车 <i>Youbai danche</i> (U-bicycle)</li> <li>- Foundation: 2016</li> </ul>
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Sources: Note 314

U-bicycle is a dock-less bike-sharing brand launched in collaboration with the traditional bicycles' manufacturer Forever Bicycle.

U-bicycle raised many financing rounds and produced many different types of bikes:

- July 2016: U-bicycle started to raise tens of million RMB;
- October 2017: U-bicycle launched the WeChat version, "Beat"
- November 2017: U-bicycle raised RMB 150 million in the A financing round
- 13<sup>th</sup> December 2017: U-bicycle raised RMB 10 million in the A+ financing round and manufactured the "Mars" model;
- January-March 2017: U-bicycle entered Dongguan, Foshan, Huizhou, Zhuhai, Shenzhen, Shantou, Wixi, Nanchang, Zhongshan, Changsha, Ningbo, Shanghai, Xiamen, Hangzhou;
- March 2017: U-bicycle launched the "Seeker" model;
- May 2017: U-bicycle enters Beijing;
- June 2016: U-bicycle launches the "H2" model.

U-bicycle is trying to compete with ofo and Mobike, following their example to extend nationwide. It plans to introduce 2.8 million bikes in 2017, also in collaboration with WeChat<sup>315</sup>.

<sup>314</sup> 优拜单车 <<https://baike.baidu.com/item/%E4%BC%98%E6%8B%9C%E5%8D%95%E8%BD%A6>>

<sup>315</sup> 这家共享单车据称融资超 2.5 亿 却未见产品落地 <[http://www.xinhuanet.com/info/2016-12/27/c\\_135934829.htm](http://www.xinhuanet.com/info/2016-12/27/c_135934829.htm)>

### 3.5.3 MING BIKE<sup>316</sup>

**Table 13: Ming Bike**

	<ul style="list-style-type: none"><li>- Name: 小鸣单车 <i>Xiaoming danche</i> (Ming Bike)</li><li>- Foundation: 2016</li><li>- Bankruptcy: 27<sup>th</sup> March 2017</li></ul>
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Source: Note 316

Ming Bike is a Guangzhou-based dock-less bike-sharing company, which started to raise funds in September 2016 and concluded an A financing round of RMB 100 million on 8<sup>th</sup> October 2016.

In July 2017, Ming Bike started to reveal problems in returning the deposit to the users and entered in the deposit crisis, with workers firing and the resignation of the CEO in November 2017. On 18<sup>th</sup> December 2017, the Guangdong Province Consumer Association brought to the people's court a lawsuit for the deposit issue, opening the deposit regulation issue nationwide. Ming Bike entered the bankruptcy process on 27<sup>th</sup> March 2018.

### 3.5.4 WUKONG BICYCLE<sup>317</sup>

**Table 14: Wukong Bicycle**

	<ul style="list-style-type: none"><li>- Name: 悟空单车 <i>Wukong danche</i> (Wukong Bicycle)</li><li>- Foundation: 2016</li><li>- Bankruptcy: 13<sup>th</sup> June 2017</li></ul>
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Source: <<http://news.zol.com.cn/650/6507186.html?via=index>>

<sup>316</sup> 小鸣单车 <<https://baike.baidu.com/item/%E5%B0%8F%E9%B8%A3%E5%8D%95%E8%BD%A6>>

<sup>317</sup> 悟空单车

<<https://baike.baidu.com/item/%E6%82%9F%E7%A9%BA%E5%8D%95%E8%BD%A6/20386306?fr=aladdin>>

Wukong Bicycle is a Chongqing-based dock-less bike-sharing company which established at the end of 2016. It reached 4.26 million users in China, but ceased operations on 13<sup>th</sup> June 2017, being the first company to fail in whole mainland China.

Wukong started to operate in Chongqing on 7<sup>th</sup> January 2017, planning to displace 100,000 bikes and enter in more than 300 other Chinese cities. Wukong uses a mobile app, on which it is possible to find a bike and digit the plate number to unlock the bike for the ride. At destination the user must lock the bike and the app will automatically calculate the fee.

However, after only 5 months of operations it failed. The young founder, born in the 1990s, declared that his dock-less bike-sharing company has faced fierce competition from the biggest rivals. There are more than 30 major dock-less bike-sharing companies in China and Wukong was not able to be competitive. The production cost for a bike was CNY 450-500, while many well-known brands could have a more advantageous cost of CNY 200-300 per bike. Thus, only the costs for the bicycles (not including bicycle fleet and users' management) were 180% higher compared to the other companies. Despite the high costs, Wukong bikes' quality was not as good as its competitors'. While Wukong introduced 1,200 bikes, ofo arrived with 100,000 bikes, plus free-rides. The 1,200 fleet has been soon lost due to the impossibility to install the smart-lock with GPS location. Wukong's founder concluded that small companies cannot compete with the major ones, because they must bear higher costs and cash difficulties because of the lack of big investments. Wukong was financed by small investors through a crowdfunding model, in which the investors buy the bikes at CNY 1,100 and receive back 70% of the earnings. However, the dock-less bike-sharing business has not find a sustainable model yet, and only few were willing to invest, creating a cash interruption situation. The founder was fast in retreating from the market, he was funding Wukong with his other company's money, before losing also the other business, her declared bankruptcy. Wukong gave back the deposits to its 10,000 users<sup>318</sup>.

### 3.5.5 3VBIKE<sup>319</sup>

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<sup>318</sup> Supra, note 112. “悟空”为何跌下共享风口？——重庆首家共享单车“退市”观察-新华网  
<[http://www.xinhuanet.com/local/2017-06/23/c\\_1121200151.htm](http://www.xinhuanet.com/local/2017-06/23/c_1121200151.htm)>

<sup>319</sup> 3Vbike <<https://baike.baidu.com/item/3Vbike>>

**Table 15: 3Vbike**

	<ul style="list-style-type: none"><li>- Name: 3Vbike</li><li>- Foundation: 26<sup>th</sup> February 2017</li><li>- Bankruptcy: 21<sup>st</sup> June 2017</li></ul>
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Source: Note 319

3Vbike is a dock-less bike-sharing platform which provides bike rental service in third-tier cities, such as Langfang and Qinghuangdao (prefecture-level city in Hebei), Putian (a prefecture-level cities in Fujian) and others. It reached out only 11,000 users with a maximum of 500 daily rides. It started in February 2017 with CNY 60,000-70,000 funds, which permitted the production of 1,000 bikes. 3Vbike chose to target third-tier cities to avoid ofo and Mobike's competition. However, in small localities, 3Vbike faced high rates of stealing episodes, while the local governments were not prepared for managing the new business. After losing almost all the bikes due to the lack of smart-locks with the geo-localization function the company closed just a few days later Wukong, on 21st June, after only four months of operatio. 3Vbike only relied on a WeChat group for the registration and the rental of the, using the WeChat's geo-localization function<sup>320</sup>.

### 3.5.6 DING DING BIKE<sup>321</sup>

**Table 16: Ding Ding Bike**

	<ul style="list-style-type: none"><li>- Name: 町町单车 <i>Dingding danche</i> (Ding Ding Bike)</li><li>- Foundation: 18<sup>th</sup> December 2016</li><li>- Bankruptcy: 2<sup>nd</sup> August 2017</li></ul>
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Source: Note 321

<sup>320</sup> 财发现：共享单车洗牌季 这些公司的“死因”有这几种 <[http://www.xinhuanet.com/fortune/2017-11/03/c\\_129731730.htm](http://www.xinhuanet.com/fortune/2017-11/03/c_129731730.htm)>

<sup>321</sup> 町町单车 <<https://baike.baidu.com/item/%E7%94%BA%E7%94%BA%E5%8D%95%E8%BD%A6>>

Ding Ding Bike is a Nanjing-based dock-less bike-sharing company, founded in 2016 by a wealthy family’s son, with a registered capital of CNY 100 million. It is necessary to download the mobile app to use the Ding Ding bikes, register and scan the QR code on the bike (which can be located through the online system), unlock it through the phone and ride for CNY 0.5 per half an hour.

By the end of 2016, Ding Ding introduced 5,000 bikes in Nanjing, planning to displace 80,000 bikes by the first half of 2017. Ding Ding was the first dock-less bike-sharing company to start in Jiangsu Province, and extended to Beijing, Shanghai, Shenzhen, and other strategic locations.

By the beginning of April 2017, Ding Ding reached 150,000 users. However, already in March, users were complaining about the impossibility to get back the deposit. The situation got worst until July, when a greater number of users could not get their money back. Ding Ding made up excuses for the business of the consumers’ assistance service, whereas the real motivation for delaying the deposit reimbursement was the interruption of the funds. The company went under inspection, and the headquarter turned out to be already empty, explaining why the customer service line was not working. Among the 150,000 users, there are still 10,000 who could not get the deposit back, while on the streets there are 10,000 abandoned bikes<sup>322</sup>.

3.5.7 KUQI BIKE<sup>323</sup>

**Table 17: Kuqi Bike**

	<ul style="list-style-type: none"> <li>- Company name: 酷骑单车 <i>Kuqi danche</i> (Kuqi Bike)</li> <li>- Foundation: 18<sup>th</sup> November 2016</li> <li>- Bankruptcy: 2<sup>nd</sup> August 2017</li> </ul>
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Source: <[http://www.freep.cn/zhuangxiu\\_6/News\\_165670.html](http://www.freep.cn/zhuangxiu_6/News_165670.html)>

<sup>322</sup> Supra, note 316

<sup>323</sup> 酷骑单车 <<https://baike.baidu.com/item/%E9%85%B7%E9%AA%91%E5%8D%95%E8%BD%A6>>

Kuqi Bike is a Beijing-based dock-less bike-sharing company founded on 18th November 2016. To use the Kuqi bikes, it is necessary to scan the QR code on the bikes by downloading the App, registering and pay the deposit fee. On the app, it is possible to locate a bike, which can be unlocked by turning on the Bluetooth. At the destination, it is necessary to lock the bike manually, while the app will automatically stop the ride and calculate the fee. Kuqi gives ten first free rides; afterward it charges CNY 0.3 per half an hour. Kuqi entered Beijing, Nanjing, Tianjin, Xi'an, Zhengzhou, Luoyang, Kaifeng, Shenyang, Taiyuan, Shijiazhuang, Hefei, Tangshan, Lanzhou, Xiaoyi, Shenzhen, and others. The bikes are displaced in cities' most strategic spots, such as subway and bus stations, residential areas, business districts, and universities' campuses. Kuqi has its own credit system, which starts from an initial 100 points. By registering regular rides, the points will increase, if the users violate the parking rules is -20 points, if the bike is not locked is -100 points, if the bike is lost the points go to 0, if escaping from traffic police is -50 points, if mounting a private lock, the points go to 0. If the points are below 80, the ride is charged CNY 100 CNY per half an hour. There is the customer service in charge of returning the deposit if the users are not out of the credit. Return time is 1-7 working days.

Kuqi reached 16 million users and 1.4 million bikes, but starting from the end of September, it started to retreat from some cities because it lost the contact with the commercial offices due to the deposit crisis. Since August 2017, Kuqi faced the "deposit crisis," and with an increasing number of customers complaining, the deposit problem has become a nationally relevant concern. By 11<sup>th</sup> December, Kuqi received 210,000 complaints because it was not able to return the deposit to the increasing number of customers asking for the reimbursement because it illegally employed the money in its operations. Kuqi ended to close all the channels for deposit's return. Kuqi violated the Law on the Protection of Consumers' Right and Interests, the Contract Law (合同法 *Hetong fa*) and other regulations established by the Guiding Opinions. On 12<sup>th</sup> December 2017, the China Consumer Association sent an open letter to Kuqi, stating that the company must face the legal responsibility for not returning the deposit fees. On 15<sup>th</sup> of March, the CCTV exposed its insolvency nationwide. By the time of Kuqi's failure, other 34 companies have already failed, but Kuqi deposit problem was the biggest, with 210,000 complaints and still CNY 1 billion of deposit not returned.

Kuqi admitted that at the beginning 30,000 to 40,000 users were asking their deposit, and for each transaction the company had to pay more than CNY 1, creating a huge cost every month. Thus, it was forced to change the deposit return policy from 1-7 days to 7 days (on 25<sup>th</sup> August). Due to the impossibility to get the money back from the online channel, users started to go to the physical office, but in September Kuqi was already preparing to close. On 22<sup>nd</sup> September, Kuqi declared to its workers that the company could not be able to pay the salaries due to cash problems and that they were free to remain or leave<sup>324</sup>.

3.5.8 QINGJIE BIKE<sup>325</sup>

**Table 18: Qingjie Bike**

	<ul style="list-style-type: none"> <li>- Company name: 青桔单车 <i>Qingjie danche</i> (Qingjie)</li> <li>- Foundation: 25<sup>th</sup> January 2018</li> </ul>
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Source: Note 323

Qingjie is a new dock-less bike-sharing brand operated by Didi chuxing, which officially launched it on its new bike-sharing platform on 25<sup>th</sup> January 2018, first available in Chengdu. Qingjie is one of the brands available on Didi’s platform, but also on WeChat’s miniprograms function, and together with Bluegogo and ofo, Didi is offering free-deposit service.

Qingjie also entered Tianjin, Foshan, Dongguan, Hefei, Shenyang and other cities, launching free-deposit and free monthly cards and discounted monthly card at CNY 2 to attract new users. With the monthly card, it is possible to ride the bikes 20 times every day for free within 5 hours per ride. The standard pricing is CNY 1 per one hour, after which is CNY 0.5 every 30 minutes. Qingjie’s bicycles introduction in the cities is challenging due to the saturation of the markets, but it has reported good evaluations from the cities<sup>326</sup>.

<sup>324</sup> Supra, note 317

<sup>325</sup> 青桔单车 <<https://baike.baidu.com/item/%E9%9D%92%E6%A1%94%E5%8D%95%E8%BD%A6>>

<sup>326</sup> 免押金滴滴共享单车来大同了——青桔单车大同上线 免押金还可领0元月卡 <<http://www.sxjib.cn/zz/rdjj/news172842.htm>>

### 3.6 Gobee.bike<sup>327</sup>

**Table 19: Gobee bike<sup>328</sup>**

	
Company name	Beebike Holdings Limited
Common name	Gobee.bike
Launched on	20 <sup>th</sup> April 2016
Ended on	10 <sup>th</sup> August 2018
Founder	Raphael Cohen
Headquarter	Hong Kong

Sources: logo <<http://www.2265.com/soft/74627.html>>; image: note 325

#### 3.6.1 ABOUT THE COMPANY

Gobee.bike is the first dock-less bike-sharing company to launch in Hong Kong, founded by the Frenchman Raphael Cohen in February 2016 and launched the bike rental service in Hong on 20<sup>th</sup> April. The founder strongly believed in the success of the dock-less bike-sharing development in Hong Kong, because the free-floating model is very convenient. Moreover, the service provided by Gobee.bike is cheaper than the traditional bike rental services, which generally apply a fee of HK\$ 40<sup>329</sup>

#### 3.6.2 THE PRODUCT AND THE SERVICE

Gobee's bikes can be rent through the mobile app, on which users must register and pay by credit card a deposit of HK\$ 399 to unlock the bikes. At the destination, the lock must be closed manually, and the fee is HK\$ 5 per half an hour. The bikes are also integrated with solar panels.

<sup>327</sup> GoBee.Bike <<https://zh.wikipedia.org/wiki/GoBee.Bike>>

<sup>328</sup> Gobee bike <<https://baike.baidu.com/item/Gobee%20bike/22402750?fr=aladdin>>

<sup>329</sup> Bike-sharing service offering rental anywhere through mobile app rides into Hong Kong <<https://www.scmp.com/news/hong-kong/economy/article/2088944/bike-sharing-service-offering-rental-anywhere-through-mobile>>

### 3.6.2 MAJOR EVENTS

Gobee.bike engaged in a large overseas expansion plan starting from November 2017, targeting some main European markets: France, (Paris, Lille, and Reims), Belgium (Bruxelles) and Italy (Florence, Turin, Rome)<sup>330</sup>.

However, Gobee.bike found difficulties in operating in Hong Kong because of the high rate of vandalism the lack of cycling culture, haphazard parking episodes and motorcycles and other local and foreign dock-less bike-sharing companies' competition, which led to the closure of its domestic service in July 2017. Gobee.bike was also the first dock-less bike-sharing company to retreat from the European markets in February 2017<sup>331</sup>.

## 3.7 oBike<sup>332</sup>

**Table 20: oBike<sup>333</sup>**

	
Company name	oBike
Foundation	November 2016
Founder	Shi Yi, Edward Chen
Headquarter	Singapore
Website	<a href="https://www.o.bike/it/">https://www.o.bike/it/</a>

Sources: note 330

### 3.7.1 ABOUT THE COMPANY

oBike is a Singaporean dock-less bike-sharing service provider. It started the service in Singapore in February 2017 but has stopped in June 2018 because of the new regulations in the home market.

<sup>330</sup> See section 2.2.5

<sup>331</sup> Ibid.

<sup>332</sup> oBike <<https://baike.baidu.com/item/oBike>>

<sup>333</sup> oBike <<https://en.wikipedia.org/wiki/OBike>>

### 3.7.2 THE PRODUCT AND THE SERVICE

The service provided by oBike is analogous to the other Chinese platforms, allowing the registered users to open the smart-locks through the scanning of the QR, using the Bluetooth and the Internet connection. The users must register on the platform and pay the deposit and the fees by credit/debit card.

### 3.7.3 MAJOR EVENTS

oBike is competing in many overseas markets like ofo and Mobike, launching the service in 24 different countries:

- Malaysia (Kuala Lumpur)
- Korea (Seoul)
- Thailand (Bangkok, July 2017)
- Hong Kong (15 September 2017)
- Taiwan (April 2017)
- Australia (Melbourne, June 2017; Sydney, August 2017; Adelaide, Brisbane, The Gold Coast)
- Germany (Munich, 24th August 2017; Hanover, 15th November 2017), but retreated from Munich. The fee is €1 for 30 minutes and € 79 of deposit
- The Netherlands (Rotterdam, June 2017; Amsterdam, July 2017), but has been banned from Amsterdam in October 2017. The fee is € 0.25 per 15 minutes and a deposit of € 79 (€ 49 for students)
- Spain (Madrid, September 2017)
- Switzerland (Zurich, July 2017), with a fee of CHF 1.5 per 30 minutes and deposit of CHF 129
- The UK (London, July 2017), but interrupted at the end of the year
- Belgium (Brussels, 22<sup>nd</sup> September 2017), with a fee of € 1 per 30 minutes
- Sweden (Stockholm, 15<sup>th</sup> November 2017), with a fee of SEK 10 per 30 minutes
- Italy (Turin, 17<sup>th</sup> November 2017; Rome, March 2018), with a fee of € 0.3 per 30 minutes in Turin and € 0.5 in Rome.

In June 2018, oBike stopped the service in the domestic market due to the insolvency with the new rules and the license required to operate in Singapore<sup>334</sup>.

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<sup>334</sup> See section 2.2.5

## CHAPTER 4 – CONCLUSIONS

The present research's objective is to give a complete picture of the birth and the evolution of the Chinese dock-less bike-sharing model. The research first examined the bike-sharing phenomenon, starting from the concept of "sharing" and the function and the role of the bicycles in people's lives through the decades. Bike-sharing started as a solution to solve the urban traffic and pollution problems and originated in Europe. After the fast spread of the adoption of the public bike-sharing schemes across Europe and America, bike-sharing landed in China too. During the 1970s, China was the "Kingdom of Bicycles," but with fast economic growth and the urbanization, the Chinese cities became unfriendly to the two-wheels. On the opposite, China saw the surge of cars and electric motorcycles, which are much more convenient in the urban environment. Such a transformation is the result of the Central Government's willingness to become a developed country. However, now that China has reached the top of the development, there is a need to solve the new challenges and consequences, such as the urban traffic and environmental pollution. Thus, the bicycles are restoring their "kingdom" in the Chinese streets, first with the governmental supported public bike-sharing schemes and now with the new dock-less bike-sharing companies.

In the last decades, China has been struggling to advance economically and to reach this objective it has been learning from the western countries. For instance, the public bike-sharing schemes are lessons from Europe and America. During the learning process, China always adapts the foreign innovation to its domestic needs and sometimes even surpasses the original countries. In the case of PBS schemes implementation, China has started to learn from the most advanced third-generation schemes, which were very successful in the Chinese cities such as Hangzhou and Wuhan, where the scale of the schemes largely surpassed those operating in Europe and America. With the invention of the dock-less bike-sharing model, China confirmed to have reached a very advanced level of economic development and innovation capacity. In the last decades, China used to be in the shadow of the most prominent countries in Europe and the U.S., but now it has left the dark and is dazzling the other countries with its own innovative products, services, and brands. An example of this turning point is the "sharing economy," which originated in the U.S. and Europe first, but in China it found the most fertile ground to grow. From the first sharing industries, such as cars and houses sharing, China has developed the most various sharing markets, from power-banks to umbrellas, from

luxury bags to BMWs and many others which cannot be found elsewhere. The dock-less bike-sharing is one of these original-Chinese innovations, which did not only revolutionize the Chinese market, but it is also stepping abroad to other countries. The bike-sharing industry has considerable importance in China not only because it is has reached out the entire Chinese market, but also because of the expansion in overseas markets, which is providing an innovative and advanced image of China. It is evident that Chinese economic development has reached incredible levels, which radically transformed the entire society and lifestyle. Innovative products and services, such as the dock-less bike-sharing, would not be possible if China had not reached a certain technological and Internet diffusion levels. According to the 41<sup>st</sup> Statistical Report on China's Internet Development released by the CNNIC in January 2018, China has already reached 772 million Internet users, which is 55.8% of the total population, and among these users, 97.5% are Mobile Internet users<sup>335</sup>. These numbers explain the Chinese society new trends, such as the mobile payment, the e-commerce, the food-delivering and the sharing economy's rapid development, including the dock-less bike-sharing industry. Hereafter there are further considerations on the Chinese style dock-less bike-sharing development.

Firstly, from the research, it emerged how the development of bike-sharing in China is a result of the Central Government's directions and policies. Without the central advocacy for the development of green transportations modes, such as the bicycles, there would not be any room for the two-wheels, since the construction and the designation of the bike facilities depend on the local governments' allocation of the resources. Despite the decentralization of the administration, which has been fundamental in the Chinese economic development and urbanization process, the local government must follow the central policy's direction, even though the implementation part is their business. The establishment of the public bike-sharing schemes has been possible only because of the revival of the bicycles at the central level, which led to the construction of more bike facilities by the localities. Although the dock-less bike-sharing model is a service provided by private companies, the governmental support is essential. Bicycles are a mean of transportation which circulates on the public streets; moreover, the shared bicycles are also parked in public spaces. Thus, the bike-sharing industry

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<sup>335</sup> 据统计国内互联网用户数达到 7.72 亿, 移动用户达到 90%  
<[https://www.sohu.com/a/226242565\\_100131591](https://www.sohu.com/a/226242565_100131591)>

needs the regulation to avoid users' safety issues and urban disorder situations. However, the lack of regulation for the dock-less bike-sharing industry shed light on a new Chinese regulative process, since the new standards establishment mainly involved the participation of the local governments, the bike-sharing companies, and independent organizations (i.e., the China Consumer Association and the China Bicycle Association). The dock-less bike-sharing regulation process is one example of the bottom-up regulative process which is becoming more important in China.

Secondly, the fact that none of the tens of the dock-less bike-sharing companies has reached the profitability yet should be a warning of their real value and role in the economy. Since the dock-less bike-sharing companies are privately run, they must be seeking profits in the market. Even if they are advocating the diffusion of the zero-emission transportation mode, they are not funded and sustained by the governments like in the case of the public bike-sharing schemes, of which they share the same objective to make the bicycles accessible to the citizens. From this research, it is evident that the dock-less bike-sharing industry requires enormous investments to operate, and these bike-sharing start-ups managed to get the funds even from the pockets of the most important players in the Chinese economy. As from the current situation and prospects, the dock-less bike-sharing companies still have to find a sustainable model. Neither the overseas expansion nor the merger and acquisitions permitted any company to make profits. In only two years, tens of companies established and closed, others merged or were acquired. For example, companies such as Kuqi bike, Ding Ding bike, Mingbike, 3Vbikes, and many others failed due to the cash shortage, while also raising many safety and deposit issues, while YOUON and Hellobike merged and became the third company in China. What the latest evolution in the bike-sharing market revealed is that these companies are valuable because of their high penetration in people's lives. Considering that the dock-less bike-sharing companies reached 400 million users, this means that they are collecting a vast quantity of big data. After the large investments from companies like Alibaba, Tencent and Didi chuxing, the bike-sharing companies, especially now that they are stuck in the market saturation and regulation stage, are becoming the new puppets of their supporters. The failure of the merger between ofo and Mobike, the acquisition of Mobike by Meituan, the creation of Didi's bike-sharing platform and the ongoing talks on ofo's acquisition by Alibaba and Didi, revealed the conflicts and interests of these giant tech companies. Especially Alibaba

and Tencent, which are the two digital economy leaders in China, are conducting the battle: the two companies are old rivals in China and abroad, holding 552 million online customers and 1 billion WeChat accounts respectively<sup>336</sup>. It is not accidental that after Mobike's acquisition by Meituan, which is backed by Tencent<sup>337</sup>, Alibaba helped ofo to raise the last financing round of US\$ 866 million. In the middle of this fight, Didi is struggling to expand its business in the bike-sharing market by creating the new platform, which currently includes ofo, Bluegogo, and its own brand, Qingjie bike. Didi is pushing to acquire ofo exploiting the difficult financial period for bike-sharing companies, but at the same time is looking for other brands to expand its platform. Although the bike-sharing industry is not profitable yet, Meituan acquired Mobike looking at the considerable quantity of big data, while the bike-sharing platform is even more essential for Didi after the two critical episodes which concerned the ride-hailing platform. In May 2018, Didi Hitch carpooling service stopped after the killing of a flight attendant, and in August, the rape and the murder of a 20 years old girl occurred with the ride-hailing platform in Wenzhou (Zhejiang)<sup>338</sup>.

Thirdly, the bike-sharing companies financially are sustained by the tech companies such as Alibaba, Tencent, and Didi, but are also integrated into their investors' platforms. In the beginning, the presence on the bigger platforms was helpful to the bike-sharing companies in seizing more users by making the bike rental service more accessible and convenient. For example, Mobike is available on WeChat's miniprograms, on which it is possible to rent a Mobike without downloading the app and paying with the WeChat wallet; ofo was available, like Hellobike, on Alipay's platform, and through the Sesame Credit system it is possible to rent the bikes without paying the deposit. Now, Didi's new bike-sharing platform is providing free-deposit service too. These kinds of collaboration were beneficial for the bike-sharing start-ups to be more competitive, but now their big supporters are sucking them into their business interests. In particular, the credit system is raising the major concerns. The increasing adoption of the users' creditworthiness system based on the award and punishment model is

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<sup>336</sup> *Alibaba v. Tencent: The Battle for Supremacy in China* <<http://fortune.com/longform/alibaba-tencent-china-internet/>>

<sup>337</sup> *Tencent-backed Chinese internet giant Meituan Dianping probes massive user-data leak* <<https://www.scmp.com/tech/start-ups/article/2144527/tencent-backed-chinese-internet-giant-meituan-dianping-probes-massive>>

<sup>338</sup> *Didi woman passenger killed amid China ride-hailing safety concerns* <<https://www.reuters.com/article/us-china-didi/didi-woman-passenger-killed-amid-china-ride-hailing-safety-concerns-idUSKCN1LA09K>>

creating many debated on whether the companies and the public authorities should have the power to implement such measures on the users. With the latest implementation of the credit systems (both the bike-sharing platforms' own systems and the integration with the Sesame Credit system), the users are undergoing an increasingly unfair assessment. The credit system has been introduced in the bike-sharing platforms to stop the haphazard parking, theft, vandalism, and privatization of the bikes by the users. However, with the latest regulations, the localities and the companies are applying more onerous sanctions on the users. For example, in some localities, the users can be fined by the public authorities in case of irregular parking, damage or privatization of the bikes, while at the same time the bike-sharing companies are applying higher fees or the prohibition to use the service if the users' score is too low. However, now the users must comply with all the new restrictions, such as parking into the designated areas, and are also awarded or punished according to what they do. The current situation is very different from the original one, in which the bike-sharing companies are a green and convenient transportation service to solve the last mile problem. In fact, the users have been facing many problems with the bike-sharing companies, such as the deposit crisis, data protection issues, a growing number of damaged bicycles. In general, the service is getting worse, while the prices and the restriction, along with the punishments, are increasing.

Lastly, the dock-less bike-sharing industry's evolution matches some Chinese characteristics, such as the rapid spread of the mobile technologies, the implementation of the social credit system and the promotion of the "Smart Cities." The Chinese dock-less bike-sharing companies also expanded in the other countries, where there are not these characteristics, but there are even more different circumstances. In general, when expanding abroad, the bike-sharing companies are complying with the local rules, such as the helmet legislation. However, given that the real value of these companies is not the revenues but the big data, the users' personal information is a big concern. The bike-sharing companies, such as ofo and Mobike, comply with the local data protection requirements. In the EU there is the Data Protection Directive (Directive 95/46/EC) on the protection of "personal data," which has been replaced by the General Data Protection Regulation (GDPR) of 2016 (active from 25th May 2018) (UNION, 2016). In the U.S. there are more fragmented "ad hoc" privacy laws with a "sectoral approach" and the data protection law is formed by many regulations and self-

regulation within the single companies, which are responsible for implementing their own policies (Cobb, 2016). In China, the individuals' data protection is regulated for the first time by the Cyber Security Law of 2016, which is based on the principle of notice and consent as in the new EU Regulation (Parasol, 2018). However, the Cyber Security Law is restricting the storage of the data within the Chinese territory, while on the other side, it is not clear if the data collected on the foreign users overseas are transferred to China. Despite the presence of data protection laws both in the EU and the U.S., the users must accept the terms and conditions offered by the bike-sharing operator. Thus, users are notified about the treatment of their information, but if they want to keep them safe from the Chinese bike-sharing companies, they must give up the bike rental service because they would not be able to unlock the bikes without the consent to the terms and conditions. However, it is nevertheless unknown whether these data are transferred to China or to other entities which can forward them to China.

In conclusion, whether the overseas users' data are relevant or not, because the bike-sharing penetration is much lower compared to China, it is evident that the dock-less bike-sharing industry is more relevant in domestic market. This is because China has already reached a high level of economic development and it is now continuing in being “innovative.” Innovation has become the “new economic development”, which is now based on “coordination,” “green development,” “opening-up,” and “sharing.” To achieve this new goal, China must develop the Internet of Things (IoT), which is the connection to the Internet of everyday things, and the Smart Cities, which are cities with a good management because they are digitally connected (Parasol, 2018). Thus, to achieve the next level of economic development, China heavily relies on big data analytics, and the new Cyber Security Law is providing the legal framework for reaching the new objectives settled by the central government. Notwithstanding the Chinese administrative decentralization, which occurred when pursuing the economic development, and the growing bottom-up initiatives, the central government still has the absolute decision power. China is now aiming at the Informatization and the creation of the “information society” for the development of the IoT, the Smart Cities, and the Internet Plus shared innovation platform, but at the same time it is maintaining the Network Sovereignty, which is the centralization of the Internet governance (Parasol, 2018). This is the reason why the bike-sharing companies are not merely market-driven profit-seekers, but they

have become an essential component of a much bigger national plan. In this big picture, the tech giants, such as Baidu, Alibaba, and Tencent (BAT) play a crucial role in maintaining the Network Sovereignty by helping the Central Government in the censorship work (Parasol, 2018). Now that these giant tech companies have reached out their tentacles on the bike-sharing companies, also the bicycles have become a new tool of the Central Government to reach its new objectives.

## GLOSSARY

2017 年共享单车经济社会影响报告 <i>2017 nian gongxiang danche jingji shehui yingxiang baogao</i>	2017 Report on bike-sharing economic and social impact
“十一五”规划 <i>“Shi yi wu” jihua</i>	Eleventh Five-Year plan
阿里巴巴 <i>Alibaba</i>	Alibaba
百拜单车 <i>Baibai danche</i>	100bike
百度百科 <i>Baidu baike</i>	Baidu baike
百度云 <i>Baiduyun</i>	Baidu Cloud Engine
拜客出行 <i>Baike chuxing</i>	Baike
北京市非机动车管理条例 <i>Beijing shi feijidongche guanli tiaoli</i>	Beijing Municipality Regulations on the management of non-motorized vehicles
北京市行动计划 <i>Beijing shi xingdong jihua</i>	Action Plan of Beijing Municipality
财新 <i>Caixin</i>	Caixin global
财政部 <i>Caizheng bu</i>	Ministry of Finance
成都市城管委 <i>Chengdu shi cheng guan wei</i>	Chengdu City Administrative Committee
成都市公安机关 <i>Chengdu shi gong'an jiguan</i>	Chengdu Public Security Office
成都市关于鼓励共享单车发展的试行意见 <i>Chengdu shi guanyu guli gongxiangdanche fazhan de shixing yijian</i>	Chengdu launched the Chengdu Trial Opinions on encouraging the development of shared bicycles
成都市交委 <i>Chengdu shi jiaowei</i>	Chengdu Transportation Committee
城市道路交通标准 <i>Chengshi daolu jiaotong biao zhun</i>	Standard of Urban Road Traffic
城市道路交通运输规划与设计准则 <i>Chengshi daolu jiaotong gui hua yu she ji zhun ze</i>	Urban Road Transportation Plan and Design Criterion
创新工场 <i>Chuangxin gongchang</i>	Sinovation Venture
大气污染防治法 <i>Daqi wuran kongzhi fa</i>	Air Pollution Control Act
道路交通安全法 <i>Daolu jiaotong anquan fa</i>	Road Traffic Safety Law
滴滴出行 <i>Didi chuxing</i>	Didi Chuxing
叮叮单车 <i>Dingding danche</i>	Ding Ding Bike
飞鸽自行车 <i>Feihe Feihe zixingche</i>	Flying pigeon bicycle
凤凰自行车 <i>Fenghuang zixingche</i>	Phoenix bicycle
福州市人民政府办公厅关于规范共享单车管理的实施意见（试行） <i>Fuzhou shi renmin zhengfu bangongting guanyu guifan gongxiang danche guanli de shishi yijian (shixing)</i>	Opinions for the implementation of the rules for the management of the shared bicycles of the Fuzhou city Government General Office (trial)
富士达 <i>Fushida</i>	Giant Manufacturing
复星 <i>Fosun Group</i>	Fosun Group
高瓴资本 <i>Gaoling ziben</i>	Hillhouse Capital Group

工银国际 <i>Gongyin guoji</i>	ICBC International Holdings Limited
公共自行车(系统) <i>gonggong zixingche (xitong)</i>	public bike-sharing (system)
公交优先政策 <i>Gongjiao youxia zhengce</i>	Transit Priority Policy
共享单车 <i>gongxiang danche</i>	bike-sharing
共享单车电子围栏技术要求 <i>Gongxiang danche dianzi weilan jishu yaoqiu</i>	Technical requirements for shared bicycle electronic fence
共享单车停放管理标准及措施 <i>Gongxiang danche tingfang guanli biao zhun ji cuoshi</i>	shared bicycles parking and management standards and measures
鼓励 <i>guli</i>	encourage
关于鼓励和规范互联网租赁自行车发展的指导意见 <i>Guanyu guli he guifan hulianwang zulin zixingche fazhan de zhidao yijian</i>	Guiding Opinions on Encouraging and Regulating the Development of Internet Bicycle Rental
关于优先发展和改革委员会经济政策的建议 <i>Guanyu youxian fazhan he gaige weiyuan jingji zhengce de jianyi</i>	Advice on Economic Policy for Priority Development and Reform Commission
广州市交通委员会 <i>Guangzhou shi jiaotong weiyuanhui</i>	Communications Commission of Guangzhou Municipality
规范 <i>guifan</i>	regulate
国家发展和改革委员会 <i>Guojia fazhan he gaige weiyuan</i>	National Development and Reform Commission (NDRC)
国家质量技术监督局 <i>Guojia zhiliang jishu jiandu ju</i>	The State Bureau of Quality and Technical Supervision
杭州公共自行车 <i>Hangzhou gonggong zixingche</i>	Hangzhou Public Bike-sharing
杭州公交集团公司 <i>Hangzhou gongjiao jituan gongsi</i>	Hangzhou Public Transportation Group Corporation
杭州市城管委 <i>Hangzhou shi cheng guan wei</i>	Hangzhou City Urban Management Committee
杭州市促进互联网租赁自行车规范发展的指导意见(试行) <i>Hangzhou shi cujin hulianwang zulin zixingche guifan fazhan de zhidao yijian (shixing)</i>	Hangzhou's Guiding Opinions on promoting the standardized development of Internet rental bicycles (trial)
杭州市公安局 <i>Hangzhou shi gongan ju</i>	Hangzhou City Public Security Bureau
杭州市公共交通发展有限公司 <i>Hangzhou shi gonggong jiaotong fazhan youxian gongsi</i>	Hangzhou Public Transportation Development Co, Ltd
杭州市互联网租赁自行车市场整治方案 <i>Hangzhou shi hulianwang zulin zixingche shichang zhengzhi fang'an</i>	Hangzhou Internet rental bicycle market regulation plan
杭州市交通运输局 <i>Hangzhou shi jiaotong yunshu bu</i>	Hangzhou City Transportation Bureau
哈啰出行 <i>Haluo chuxing</i>	Hellobike

汉能控股集团 <i>Hanneng konggu jituan</i>	Hanergy Holding Group Limited
合同法 <i>Hetong fa</i>	Contract Law
弘毅投资 <i>Hongyi capita</i>	Hony Capital
红杉资本 <i>Hongchen ziben</i>	Sequoia Capital
互联网租赁自行车停放秩序管理考核办法 <i>Hulianwang zulin zixingche tingfang zhixu guanli kaohe banfa</i>	Method for the assessment of the ordered parking management of the Internet rental bicycles
华平投资集团 <i>Huaping touzi jituan</i>	Warburg Pincus
华为 <i>Huawei</i>	Huawei
华住 <i>Huazhu</i>	Huazhu Hotels Group
建设部 <i>Jianshe bu</i>	Ministry of Construction
交通部 <i>Jiaotong bu</i>	Ministry of Transportation
交银国际 <i>Jiaoyin guoji</i>	BOCOM International Holdings Co. Ltd.
金沙江创业投资 <i>Jinshajiang chuangye touzi</i>	GSR Ventures
经纬中国 <i>Jingwei zhongguo</i>	Matrix Partners China
经纬中国领投 <i>Jingwei zhongguo touzi</i>	Jingwei Venture Capital
赳赳单车 <i>Jiujiu danche</i>	99bicycle
酷骑单车 <i>Kuqi danche</i>	Kuqi Bike
劳动和社会保障部 <i>Laodong he shehui baozhang bu</i>	Ministry of Labor and Social Security
蚂蚁金融 <i>Mayi jinrong</i>	Ant Financial
美团电瓶 <i>Meituan dianping</i>	Meituan-dianping
摩拜单车 <i>Mobai danche</i>	Mobike
南华早报 <i>Nanhua zaobao</i>	South China Morning Post
南京市交通部门 <i>Nanjing shi jiaotong bumen</i>	Nanjing Communications Bureau
牛拜 <i>Niubai</i>	Newbike
ofo 小黄车 <i>ofo xiao huang che</i>	ofo
上海城市交通发展白皮书 <i>Shanghai chengshi jiaotong fazhan baiqi shu</i>	White Paper of Shanghai Urban Transport Development
上海市道路交通管理条例 <i>Shanghai shi feijidongche guanli tiaoli</i>	Shanghai Municipality Rules for Management of Non-Motorized Conveyances
上海市非机动车管理办法 <i>Shanghai shi feijidongche guanli banfa</i>	Shanghai Municipality Non-Motorized Vehicles Management Plan
上海市交通委 <i>Shanghai shi jiaotong wei</i>	Shanghai Municipal Transportation Commission
上海自行车行业协会 <i>Shanghai zixingche xiehui</i>	Shanghai Bicycle Association
设计之都 <i>Sheji zhi du</i>	City of Design
深创投 <i>Shenchuangtou</i>	Shenzhen Capital Group

世茂集团 <i>Shimao jituan</i>	Shimao Group
天津市关于鼓励规范发展互联网租赁自行车的指导意见（试行） <i>Tianjin shi guanyu yindao he guifan hulianwang fazhan de yijian (shixing)</i>	Tianjin's Guiding Opinions on encouraging and regulating the development of Internet rental bicycles (trial)
推进“互联网+”便捷交通促进智能交通发展的实施方案 <i>Tuijin "hulianwang+"bianjie jiaotong cujin zhineng jiaotong fazhan de shishi fan'an</i>	Implementation plan of promoting "Internet +" convenient transportation to promote intelligent transportation development
微信 <i>Weixin</i>	Wechat
唯猎资本跟投 <i>Weilie ziben</i>	Will Hunting Capital
武汉龙骑单车 <i>Wuhan Longqi danche</i>	Wuhan Longqi bicycle
武汉鑫飞达集团 <i>Wuhan Xinfeida jituan</i>	Wuhan Xinfeida Group
悟空单车 <i>Wukong danche</i>	Wukong Bicycle
西安市城市管理综合执法局 <i>Xi'an shi cheng guanli zonghe zhifa ju</i>	Comprehensive urban management and law enforcement Bureau
祥峰投资 <i>Xiangfeng touzi</i>	Vertex Venture Capital
祥鹏航空 <i>Xiangpeng hangkong</i>	Lucky Air
厦门市城管部门 <i>Xiamen shi cheng guan bumen</i>	Xiamen City Urban Management Department
消费者权益保护法 <i>Xiaofeizhe quanyi baohu fa</i>	Law on the Protection of Consumers' Right and Interests
小白单车 <i>Xiaobai danche</i>	Baicycle
小鸣单车 <i>Xiaoming danche</i>	Ming Bike
携程 <i>Xiecheng</i>	Ctrip
消费者权益保护法 <i>Xiaofeizhe quanyi baohu fa</i>	Law on the Protection of Consumers' Right and Interests
新华联集团 <i>Xinhualian jituan</i>	Macrolink Group
新华网 <i>Xinhuawang</i>	Xinhuanet
熊猫资本 <i>Xiongmao ziben</i>	Panda Capital
移动物联网产业联盟 <i>Yidong wu lianwang chanye lianmeng</i>	Mobile Internet of Things Alliance
永安行 <i>Yong'an xing</i>	YOUON
永久自行车 <i>Yongjiu zixingche</i>	Forever bicycle
优拜单车 <i>Yubai danche</i>	U-bicycle
由你单车 <i>Youni danche</i>	UniBike
愉悦资本 <i>Yuyue ziben</i>	Joy Capital
招商银行 <i>Zhao shang yinhang</i>	China Merchants Bank
支付宝 <i>Zhifubao</i>	Alipay
治安管理处罚法 <i>Zhian guanli chufa fa</i>	Public Security Administration Punishment Law
中国电信 <i>Zhongguo dianxin</i>	China Telecom

中国共享单车行业数据报告 <i>Zhongguo gongxiang danche hangye shuju baogao</i>	Report on the Chinese bike-sharing industry data
中国互联网络发展状况统计报告 <i>Zhongguo hulianwangluo fazhan zhuangkuang tongji baogao</i>	Statistical report on China's Internet development
中国消费者协会 <i>Zhongguo xiaofeizhe xiehui</i>	China Consumers Association
中国信息通信研究院 <i>Zhongguo xinxi tongxin yanjiuyuan</i>	China information and Communication Research Institute
中华人民共和国道路交通安全法 <i>Zhonghua renmin gongheguo daolu jiaotong anquan fa</i>	Road Traffic Safety Law of the People's Republic of China
中金投 X <i>Zhongjintou X</i>	China Money Network
中信产业基金 <i>Zhongguo chanye jijin</i>	CITICPE
中国互联网络信息中心 <i>Zhongguo hulianwangluo xinxi zhongxin</i>	China Internet Network Information Center (CNNIC)
中国平安 <i>Zhongguo ping'an</i>	Ping an Insurance Group
中国移动 <i>Zhongguo yidong</i>	China Mobile
中兴通讯 <i>Zhongxing tongxun</i>	ZTE Corporation
自行车共享 <i>zixingche gongxiang</i>	bike-sharing
综合节能工作计划 <i>Zonghe jieneng gongzuo jihua</i>	Comprehensive Energy Reduction Work program

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哈罗单车

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摩拜单车

<<https://baike.baidu.com/item/%E6%91%A9%E6%8B%9C%E5%8D%95%E8%BD%A6?fromtitle=mobike&fromid=19943837#7>>

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杭州要给共享单车“瘦身” 从 77 万降至 50 万辆<[http://www.zj.xinhuanet.com/2018-03/22/c\\_1122573904.htm](http://www.zj.xinhuanet.com/2018-03/22/c_1122573904.htm)>

杭州重申暂停新增共享单车企业和车辆<[http://www.zj.xinhuanet.com/2017-09/23/c\\_1121712116.htm](http://www.zj.xinhuanet.com/2017-09/23/c_1121712116.htm)>

武汉:1400 多辆“青桔”共享单车违规“疯长”被清理暂扣<[http://www.hb.xinhuanet.com/2018-04/06/c\\_1122643961.htm](http://www.hb.xinhuanet.com/2018-04/06/c_1122643961.htm)>

武汉共享单车已达 70 万辆 企业表示支持暂停新增投放<[http://m.xinhuanet.com/2017-09/05/c\\_1121604798.htm](http://m.xinhuanet.com/2017-09/05/c_1121604798.htm)>

武汉出台共享单车“黑名单”机制细则 首批 216 人入列<[http://www.xinhuanet.com//2017-07/25/c\\_1121376733.htm](http://www.xinhuanet.com//2017-07/25/c_1121376733.htm)>

武汉发布首部低碳白皮书 共享单车半年碳减排 3000 多吨<[http://m.xinhuanet.com/hb/2017-09/13/c\\_1121652320.htm](http://m.xinhuanet.com/hb/2017-09/13/c_1121652320.htm)>

武汉将设“电子围栏”规范共享单车停放<[http://www.xinhuanet.com//2017-07/06/c\\_1121277697.htm](http://www.xinhuanet.com//2017-07/06/c_1121277697.htm)>

武汉探索共享单车“共管共治” 首批第三方“代管”上<[http://www.xinhuanet.com/mrdx/2018-06/21/c\\_137270121.htm](http://www.xinhuanet.com/mrdx/2018-06/21/c_137270121.htm)>

武汉首批调减共享单车 15 万辆<[http://www.hb.xinhuanet.com/2018-06/15/c\\_1122988853.htm](http://www.hb.xinhuanet.com/2018-06/15/c_1122988853.htm)>

永安行<<https://baike.baidu.com/item/%E6%B0%B8%E5%AE%89%E8%A1%8C>>

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洗牌后恢复理性 共享单车“免费骑”时代结束<[http://m.xinhuanet.com/jx/2018-03/02/c\\_1122475610.htm](http://m.xinhuanet.com/jx/2018-03/02/c_1122475610.htm)>

浙江义乌设共享单车“红黑榜” 将清退不合格企业<[http://www.xinhuanet.com/auto/2018-01/08/c\\_112223587.htm](http://www.xinhuanet.com/auto/2018-01/08/c_112223587.htm)>

滴滴共享单车平台上线<[http://www.bj.xinhuanet.com/2018-01/18/c\\_1122276779.htm](http://www.bj.xinhuanet.com/2018-01/18/c_1122276779.htm)>

滴滴出行是如何将 Uber 挤出中国的? <<http://tech.qq.com/a/20161007/003290.htm>>

滴滴自有品牌“青桔”共享单车上线 支持免押金骑行<[http://www.xinhuanet.com/2018-01/26/c\\_1122317672.htm](http://www.xinhuanet.com/2018-01/26/c_1122317672.htm)>

理智与情感共享单车决战在三月<[http://www.xinhuanet.com/info/2017-03/13/c\\_136124016.htm](http://www.xinhuanet.com/info/2017-03/13/c_136124016.htm)>

用叫车软件租单车 优步收购共享单车企业 Jump <[http://us.xinhuanet.com/2018-04/11/c\\_129847647.htm](http://us.xinhuanet.com/2018-04/11/c_129847647.htm)>

由你单车 <<https://baike.baidu.com/item/%E7%94%B1%E4%BD%A0%E5%8D%95%E8%BD%A6>>

由你单车 <<https://baike.baidu.com/item/由你单车>>

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画地为锁 管得住共享单车吗? <[http://m.xinhuanet.com/sx/2018-07/27/c\\_1123183424.htm](http://m.xinhuanet.com/sx/2018-07/27/c_1123183424.htm)>

石家庄: 2000 余辆擅自投放共享单车被清理 <[http://m.xinhuanet.com/he/2018-03/24/c\\_1122584359.htm](http://m.xinhuanet.com/he/2018-03/24/c_1122584359.htm)>

石家庄清理近万辆违规停放共享单车 <[http://m.xinhuanet.com/he/2017-12/17/c\\_1122123569.htm](http://m.xinhuanet.com/he/2017-12/17/c_1122123569.htm)>

福州发布共享单车停放新规 共享单车企业将被限额投放 <[http://www.xinhuanet.com/photo/2017-12/02/c\\_1122046140.htm](http://www.xinhuanet.com/photo/2017-12/02/c_1122046140.htm)>

美媒: 中国共享单车拓展至美国 摩拜锁定华盛顿 <[http://www.xinhuanet.com/asia/2017-07/12/c\\_129653732.htm](http://www.xinhuanet.com/asia/2017-07/12/c_129653732.htm)>

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英国版共享单车“鲍里斯单车”或将退出历史舞台 <[http://www.xinhuanet.com/video/2018-03/31/c\\_129841670.htm](http://www.xinhuanet.com/video/2018-03/31/c_129841670.htm)>

西安启动新规 共享单车违规停放将被依法暂扣 <[http://www.sn.xinhuanet.com/2017-11/04/c\\_1121905675.htm](http://www.sn.xinhuanet.com/2017-11/04/c_1121905675.htm)>

西安规范共享单车停放: 地铁口及公交站 50 米范围内禁停 <[http://www.xinhuanet.com//local/2017-09/15/c\\_1121670663.htm](http://www.xinhuanet.com//local/2017-09/15/c_1121670663.htm)>

西安试点共享单车电子围栏 违规停放将扣信用分 <[http://www.sn.xinhuanet.com/2017-12/20/c\\_1122140028.htm](http://www.sn.xinhuanet.com/2017-12/20/c_1122140028.htm)>

财发现: 共享单车洗牌季 这些公司的“死因”有这几种 <[http://www.xinhuanet.com/fortune/2017-11/03/c\\_129731730.htm](http://www.xinhuanet.com/fortune/2017-11/03/c_129731730.htm)>

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赳赳单车 <<https://baike.baidu.com/item/%E8%B5%B3%E8%B5%B3%E5%8D%95%E8%BD%A6>>

轻力单车 <<https://baike.baidu.com/item/%E8%BD%BB%E5%8A%9B%E5%8D%95%E8%BD%A6/20453734>>

这家共享单车据称融资超 2.5 亿 却未见产品落地 <[http://www.xinhuanet.com/info/2016-12/27/c\\_135934829.htm](http://www.xinhuanet.com/info/2016-12/27/c_135934829.htm)>

郑州: 共享单车电子围栏明年全部建成投用 <[http://m.xinhuanet.com/ha/2018-06/23/c\\_1123024041.htm](http://m.xinhuanet.com/ha/2018-06/23/c_1123024041.htm)>

酷骑单车 <<https://baike.baidu.com/item/%E9%85%B7%E9%AA%91%E5%8D%95%E8%BD%A6>>

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铜陵市共享单车发现诈骗二维码? 假的! <[http://www.ah.xinhuanet.com/2018-04/11/c\\_1122666663.htm](http://www.ah.xinhuanet.com/2018-04/11/c_1122666663.htm)>

青桔单车 <<https://baike.baidu.com/item/%E9%9D%92%E6%A1%94%E5%8D%95%E8%BD%A6>>

饱和度达到全国第一 共享单车, 郑州踩了急刹车 <[http://m.xinhuanet.com/ha/2017-09/14/c\\_1121659517.htm](http://m.xinhuanet.com/ha/2017-09/14/c_1121659517.htm)>

香港这样规管共享单车 <[http://www.xinhuanet.com/qiangao/2018-04/20/c\\_129855004.htm](http://www.xinhuanet.com/qiangao/2018-04/20/c_129855004.htm)>

骑行少于3分钟小于50米 共享单车遇故障报修可退费 <[http://www.sn.xinhuanet.com/2018-04/14/c\\_1122681735.htm](http://www.sn.xinhuanet.com/2018-04/14/c_1122681735.htm)>

中国个人信用系统

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