

# A “revival of cycling” in China?

*A case study on the rise of shared cycling in Shanghai  
through a practice theory lens*

Yue Song



Centre for Development and Environment

UNIVERSITY OF OSLO

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‘Without sustainable transport, there will be no lasting progress on climate action.’

- *Wu Hongbo*

(United Nations Global Sustainable Transport Conference, 2016)







# Abstract

Globally, the urban transport sector is facing a diversity of problems such as pollution, congestion, high energy dependency, and parking space shortage. Cycling is considered as a desirable means of transportation, which may contribute to a more sustainable urban mobility future, as it is broadly accepted as a low-carbon, inclusive, and healthy mode of transport. In the past decades, bike sharing emerged around the globe, but for a long time there was no significant effect when it came to stimulating the cycling rate in China. However, after the introduction of the dockless bike-sharing systems in 2016 in many of China's cities, the growth of cycling is unparalleled. This thesis focuses on China's urban mobility and takes Shanghai as a case, exploring the *cycling revival* in the past three years through a practice theory lens. Based on participant observations and interviews, this thesis found that the rise in shared cycling was triggered by the vast amount of a new and vital material element—the dockless shared bikes, which benefitted from technological advances, the emerging collaborative consumption form, and the bottom-up developmental model of bike sharing system. The cycling rise is also powered by China's recent economic transition, which provides great capital assistance and the governmental support for rapid scale-up. Besides, the modern lifestyle, including the prevailing usage of smartphone applications, on-line payment, and fast-speed urban life, has provided a solid base for the rise of (shared) cycling. Based on my empirical data, I also found that shared cycling is mostly practiced for first/last-mile problems and other occasionally urban short-distance trips. I concluded that these trips mostly substituted walking and public transports taking, so it is necessary to be critical when talking about how green this cycling rise is.

**Keywords:** shared cycling in China, urban mobility, sustainable mobility, social practice theory, dockless bike sharing







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# Acronyms

APEC: Asia-Pacific Economic Cooperation

GPS: Global Positioning System

IEA: International Energy Agency

IPCC: Intergovernmental Panel on Climate Change

BBS: bike sharing system

WCED: World Commission on Environment and Development

DBS: Dockless bike sharing

OECD: The Organisation for Economic Co-operation and Development

OICA: International Organization of Motor Vehicle Manufacturer

GHG: Greenhouse Gas

NBS: National Bureau of Statistics

PKU: Peking University

NPC: National People's Congress

CPPCC: Chinese Political Consultative Conference

CPC: Communist Party of China

HDI: Human Development Index

MDG: Millennium Development Goal

UNDP: United Nations Development Programme



# Chinese Words

共享单车(gongxiang danche) –Bikeshare, Bike/Bicycle Sharing; Shared Bikes/Bicycles

无桩单车(wuzhuang danche) – Dockless Bike/ Station-less Bike/ Free-floating Bike

有桩单车(youzhuang danche) – Station-based Bike

公共单车 (gonggong danche) – Public Bike

改革开放(gaige kaifang) – The Reform and Opening-up

新常态(xin chang Tai) – The New Normal

大众创新、万众创业 (dazhong chuangxin, wanzhong chuangye)

– mass entrepreneurship and innovation

供给侧改革 (gongjice gaige) – the structure-side reform

人口红利 (renkou hongli) – demographic dividend







# 1 Introduction

Beginning in 2016, a vast number of *dockless shared bikes*<sup>1</sup> poured into the streets of many of China's cities. Bike sharing is far from a new concept. Since *Witte Fietsen*<sup>2</sup> (the White Bikes) were launched in Amsterdam in the 1960s, this form of bike sharing has evolved across various generations over time, and the bike sharing industry has proliferated and spread rapidly around the globe (Fishman 2016). At the start of 2015, China was already a world leader in the station-based bike-sharing industry with 237 bike-sharing systems and an estimated 750,500 shared bikes out of 946,000 shared bikes in the world (Meddin and DeMaio 2015).

What differs in China's recent bike-sharing wave is the *dockless* operating system, which means that with an embedded GPS sensor, Bluetooth controlled wheel lock and a convenient mobile payment system. Users can pick up and return the bikes at any time near their destinations instead of spending time seeking for a limited number of stations which may not be close to their destinations. Citizens can merely use their smartphone to position the nearest bike and unlock it by tapping a specific code on the bike or just clicking the 'start' button on their phones after scanning the QR code attached on the bike. This innovation brings a door-to-door traffic service and has provided a solution to the accessibility barriers of the conventional bike-sharing system. The introduction of this new dockless scheme into Chinese cities was an instant hit and brought the bike sharing industry to a new level of scale. According to the 2017 Sharing Bicycle Economic and Social Impact Report<sup>3</sup> (2018), dockless bike sharing systems were in place in more than 200 Chinese cities, and in total there were over 25 million shared bikes put into service. Statistical Report on Internet Development in China (China Internet Network Information Centre 2018) stated that the number of bikeshare users exceeded 200 million in 2017. The shared bike cycling mileage reached 29.947 billion kilometres within 2017 (China Bike Sharing Industry Development Report 2018).

After the introduction of dockless bike sharing scheme, the bicycle usage share has doubled from 5.5% to 11.6% of all transport modes in 2017, and the cycling frequency has doubled

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<sup>1</sup> This thesis mainly studies 'station-less' or *dockless bike sharing*, which is also referred to as *free-floating bike sharing* in much of the literature. I adopt the term *dockless bike sharing*, and use the acronym DBS interchangeably in the rest of this thesis. The term *dockless shared bikes* refers to shared bikes launched in DBS schemes.

<sup>2</sup> The *Witte Fietsenplan* (the 'white bicycle plan'), launched in 1965, is the earliest bike-sharing scheme initiated by Luud Schimmelpenninck and the group *Provo*. Ordinary bikes were painted in white and placed without lock for free usage. However, the scheme soon collapsed because of theft and vandalism (DeMaio, 2009; Fishman, 2015).

<sup>3</sup> This report was released by the joint cooperation between Sharing Economic Research Center of Guanghua School of Management at Peking University and ofo Xiaohuangche (of 小黄车) Bike Sharing Company, and the China Academy of Information and Communications Technology (CAICT).



(Bike-sharing and the City, 2017 White Paper<sup>4</sup>). The growth of cycling is unparalleled in both scale and scope in this dockless bike sharing wave. However, this shared bike craze is also facing many serious troubles like riding safety and user misbehaviours such as theft, vandalism, freeloading, and parking chaos. Meanwhile, the fierce business competition and operating difficulty of bike-sharing companies have accelerated a series of problems, including a huge number of broken and abandoned bikes piling up in cities across China (the most notorious example is the growth of *bicycle graveyards*<sup>5</sup> in many cities).

Although China's cycling has increased significantly because of dockless bike sharing (DBS), it is still necessary to put quotation marks on recent *cycling revival* because of the ongoing problems mentioned above. The DBS crisis has received a great amount of social attention, and many media outlets have called it *the Fall of China's bike sharing*. Obviously, there are still various challenges in reviving cycling and a long way to bring bicycles back to urban life to achieve a more sustainable urban mobility future.

## 1.1 Rationale

When it comes to why China's recent bike sharing is worth studying, and why stimulating cycling (reviving cycling) has been regarded as a potential and valuable approach in a sustainable urban mobility system, it is necessary to put these issues in a broader context.

### **Urgent action required to achieve low-carbon development**

Development and modernity are closely connected with energy use, since energy is essential for industrialization, promoting economic growth, and providing support and services for everyday activities (Wilhite 2012a). By far, fossil fuel remains the most essential energy resource. According to the open data compiled by the International Energy Agency (IEA 2019), the demand for coal, oil, and gas separately account for 26%, 31% and 23% of the total energy demand in 2018. Over the past century, development has already resulted in massive non-renewable energy (mainly fossil fuel) consumption.

Although energy plays an important role during the course of a country's development, there are many challenges closely connected to energy use. Serious concern about the earth's energy

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<sup>4</sup> The White paper is guided by Institute for China Sustainable Urbanization of Tsinghua University, and jointly released by Beijing Tsinghua Tongheng Planning and Design Institute and Mobike Bike Sharing Company.

<sup>5</sup> *Bicycle graveyard* is a term, used frequently in the press, refers to the vast storage areas where local authorities are storing detained, abandoned or illegally parked shared bikes. For more visualized information, see pictures on the internet.



resources started with the oil crisis in the 1970s<sup>6</sup>. The unstable energy market and the limited fossil fuel reserve have greatly lifted the concerns on energy usage. Along with the global population increase and a growing number of the middle class in the global south, the overall demand for energy is expected to continue to grow (Wilhite 2012a) and the energy issue is increasingly severe. In addition, energy usage processes also involved negative environmental externalities. The usage of fossil fuel emits pollutants like sulphur and nitrogen compounds resulting in acid rain. Moreover, energy usage results in large quantities of emission of CO<sub>2</sub> which significantly contributes to climate change. Multiple convincing studies and reports (for example, see Oreskes 2004; Doran and Zimmerman 2009; Anderegg et al. 2010; IPCC 2014; Cook et al. 2016, 6) have already provided evidence showing that the earth's climate is warming, and CO<sub>2</sub> is the strongest driver (Goldemberg and Lucon 2010). Global warming has further adverse effects such as disordering the whole ecosystem, raising sea levels and influencing food harvest (IPCC 2014). The gradual deterioration of the environment and global warming make it imperative to rethink the relation between energy usage and human beings. The limited reserves and negative environmental impacts of fossil fuel are urgent challenges human beings are facing, and draws great attention in the contemporary development agenda changing the view from ignoring the environment to integrating it in the development process.

China has a population of 1.3 billion and has become the World's second largest economy since 2010 (The World Bank 2019). The review of the development history of China after the Reform and Opening-up (ibid), shows that China has undergone constant and rapid economic growth since 1978, on the average around 10% GDP growth per year. This economic growth has heavily depended on energy-intensive industrialization. Meanwhile, the rapid urbanization process has also been fuelled by massive carbon-based energy consumption (Wang 2016). Coal is China's major energy source due to the nature of its energy reserves (Song and Woo 2008). In China, coal industry (coal extraction and combustion) is considered as the one of the major contributors to *air pollution*<sup>7</sup>, CO<sub>2</sub> emissions as well as the main contributor to global human-made climate change (Jeffreys and Xu 2018). China's oil consumption has also seen a continually rapid increase trend and China has become the world's largest oil importer since 2017. The net oil import volume of the year was 440 million tons, with year-on-year growth of 11%. The external dependence increased to 69.8% (China Petroleum News Centre 2019). To power future development, China is still in need of a lot of energy. China has overtaken the US

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<sup>6</sup> The 1970s oil crisis refers to a period when major industrial countries were facing substantial petroleum shortages due to the oil embargo in Saudi Arabian and the interruption of oil exports triggered by the Yom Kippur War and the Iranian Revolution.

<sup>7</sup> China is facing serious challenge in fighting against air pollution. According to Environment Ministry survey, in first two months of 2019, there are only 83 of 337 cities monitored meet national standard (South China Morning Post 2019).



and become the biggest CO<sub>2</sub> emitter (The World Bank 2014). In the face of the growing challenges of global climate change, environmental degradation and its own development transition, the People's Republic of China (PRC) has already taken active response to these threats and committed to the Paris Agreement and started pursue a *green* path of development (Jeffreys and Xu 2018). It is vital for China to take more decisive actions on energy issue to move towards a low-carbon path.

### **The necessity of moving towards a sustainable urban mobility**

Transport enables trade, the tourism industry, people's everyday commuting and other travelling activities, and plays an essential role in the economic and social development in the present day. The modern transport system is undoubtedly unsustainable and is damaging the environment and society (Banister 2011). Firstly, the modern transport sector is among the highest energy consumption sectors, and its share of global energy-related CO<sub>2</sub> emissions is around 23% and will continue to grow (International Energy Agency 2017, 44). The high energy consumption and high greenhouse gas (GHG) emissions of contemporary car-dependent cities significantly contribute to the process of climate change (ibid, 44).

Secondly, the transport system in rich OECD countries is greatly based on private car ownership, and the rest of the world has also been witnessing a gradual surge in vehicle consumption over the past several decades. In the last century, more than one billion cars were manufactured (Urry 2004). The number of private cars has increased by 400 million from 1985 to 2005 worldwide, and will expectedly achieve 1.5 billion by 2020 (Davis et al. 2012). In addition, from the national and local level, car dominance on urban roads causes many problems, including increasing *social exclusion*<sup>8</sup>, transport burden, traffic congestion, car accidents, air and noise pollution, shortage of parking space, etc. These problems have direct impacts on the health and everyday lives of city residents.

When it comes to the situation in China, transport is among one of the highest energy consumption sectors, accounting for 60.1% of total oil consumption earlier in 2007 (Hu 2013). In the last decade, cars have been listed as one of the major household consumption items in urban China, and China is globally becoming their biggest consumer. The consumption of new

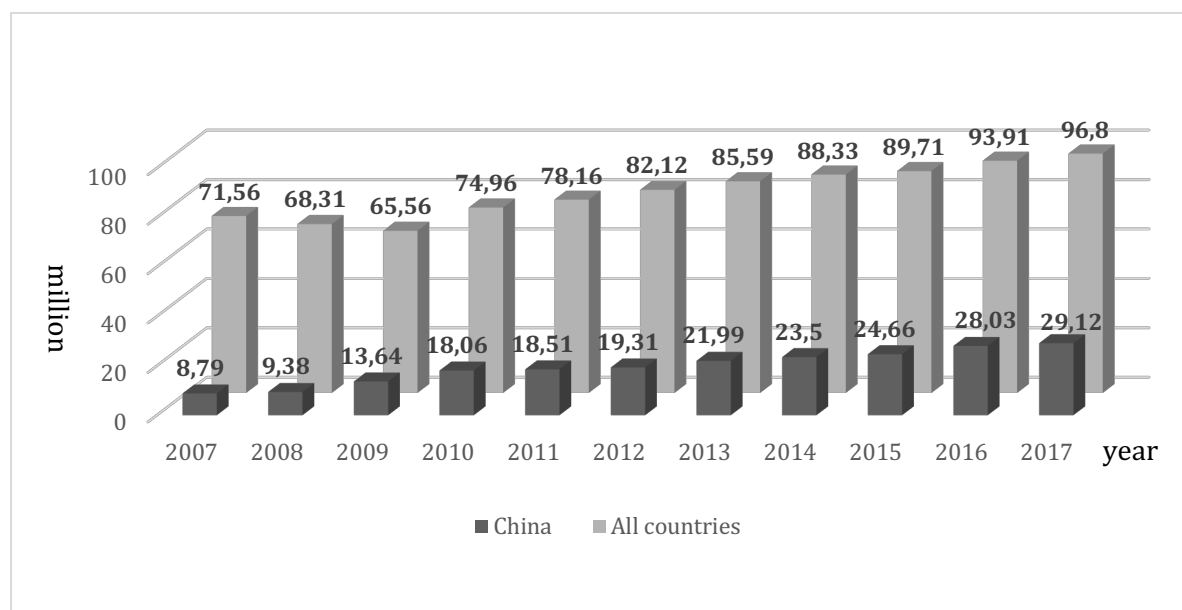
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<sup>8</sup> It is worth noting that disadvantaged groups (low income, elderly and disabled groups) have low transport accessibility and tend to experience greater troubles in car-dominated societies (Kenyon 2011; Cass et al. 2005).



vehicles<sup>9</sup> has increased threefold in ten years, from 8.79 million in 2007 to 29.12 million in 2017 (Figure 1-1).

Figure 1-1 Provisional Registrations of Sales of New Vehicles



Source: OICA (International Organization of Motor Vehicle Manufacturers) Statistics 2018

According to NBS (National Bureau of Statistics of China 2019), the possession of private vehicles in 2018 was over 207 million. Although China has already been one of the biggest consumers in vehicles, China is still in the early stage of motorisation and the private car ownership rate was 17% in 2015. Its motorization rate is much lower than OECD countries (Pew Research 2015). If we look at the numbers for cars per 1000 inhabitants, according to OICA, it is 118 veh./1,000inh in China while it is 821 veh./1,000inh in the US (OICA 2011). Economic growth and improved income will stimulate Chinese citizens' travel demand, and a parallel growth in private vehicle possession is likely to be seen in China in the coming decades.

In the present day, many cities in China are facing serious traffic problems (traffic congestion, air pollution, noise, and so on) brought about by private cars, and citizens of major cities like Shanghai has greatly suffered from these negative impacts. The government has correspondingly implemented measures to limit private automobile usage and ownership (for example, see, odd-even license plate system<sup>10</sup>; the vehicle quota system<sup>11</sup>), while promoting the

<sup>9</sup> Vehicle type definitions: According to OICA, the term "vehicle" here refers to two main types: passenger cars and commercial vehicles. Therefore, it covers taxis and hired passenger cars, may also include pick-ups or microcars (no permission needed to drive), light commercial vehicles, heavy trucks, coaches and buses (some countries where the buses or heavy trucks data are not available).

<sup>10</sup> The odd-even license plate system refers to the traffic control system which allows cars to drive on alternating days based on odd or even license plate numbers.

<sup>11</sup> The vehicle quota system is a system controlling the number of new vehicles allowed for registration.



usage of electric vehicles and encouraging trips through public transit. However, citizens are still having to endure serious traffic problems in their daily lives. In contemporary China, a sustainable mobility system is necessarily required to minimize negative environmental and social effects while satisfying residents' everyday travel needs.

## **1.2 Background for the study**

Cycling was the predominant transport mode in China in the late nineteen centuries. In the 1980s, cycling accounted for 62.7% of total traffic (Hu, Yin and Hu 2018). The bicycles dominated the central position of urban mobility three decades ago. However, urban mobility has changed significantly in present-day China. With the rapid construction of transportation infrastructures and the popularisation of public transport, the present-day urban transport system in China offers a variety of transportation options, including bus, metro (in major cities), boats (in some cities), train and high speed rail (inter-city transportation), and so on. The contemporary urban public transport system, which provides convenience and extends travel distances enriched urban traveling choices, while the private car was growing popular nationally and increasingly dominates China's major cities. Simultaneously, the bicycle gradually faded away from the Chinese history stage of urban transport.

I also get the strong feeling that cycling is gradually fade away from urban lives based on my personal experiences. I was born and raised in Kunming, the capital city of Yunnan province in southwest China. It is a city with clear skies and a year-round temperate climate, which has made it famous as the *Spring City* and an ideal cycling city. I learned cycling at the age of four when almost every child of similar age did the same.

When I was a kid, cycling still played an important role in the transport sector in my hometown. I remember my mother rode a bike to drop off and pick up her little girl to and from elementary school every day. I enjoyed sharing interesting things which had happened at school while I was sitting on the back of the bicycle. I also enjoyed looking around and observing other cyclists passing by. The distance between my home and school is not far so that I became very familiar with the street views we rode through on these daily journeys. Even today, I can vividly recall the breakfast shops, stationery stores, and repair shops we passed each day. When I got to middle school, I started to take the bus to school because it was too far to get there by bike. My middle school was located in the busiest district in the city centre, and private cars had already become prevalent in the city. I had to get up very early to catch an early bus, so as to avoid getting stuck in traffic jams and being late for school. After school, I still had to endure terrible traffic gridlocks and crowded public transit. The bus was always full of people, and I always



had to wait a long time before a bus with enough room for me to get on drove by. Even after I succeeded getting on a bus, it was still densely crowded and the experience of taking the bus was usually an unpleasant one. Commuting was both tiring and time-consuming. Kunming had undergone rapid urban construction during those years, and the roads were always under construction, which made the traffic congestion even worse.

Later I moved to Guangdong province for my bachelor studies. The university campus was large, and the distance from its various buildings and my dormitory was far, so I rode my bike within the campus but took public transit off campus. Bus and metro were the two primary transport modes I chose. Although the metro was quick and always on time compared to the bus, it was equivalent to the bus in terms of crowd density during rush hours and in certain urban districts. One metro line even has been named ‘the dead line’ because of its high crowd density level. Overall, the travel experience with bus and metro were not pleasant. In stark contrast, I enjoyed cycling on campus, which provided me with daily pleasure.

Based on my personal experience, I have noted that public transits are closely associated with the feeling of tiredness, crowding and uncomfortableness, while cycling is always connected to good memories. I became excited about the launching and rising popularity of dockless shared cycling in China. The recent surge in bike sharing provides an alternative travel mode for its citizens. Even though there are many challenges and problems associated with shared bikes, their presence on the urban landscape is actually bringing the bike back to peoples’ imaginations and this may contribute to the creating of greener and more liveable cities in China.

### **1.3 Research purpose and questions**

In this section, firstly, I will briefly introduce the existing research, and point out the fields insufficiently studied. Then I will illustrate my research purpose and my research questions, and state how it could provide a new perspective and new knowledge on research gaps.

After the appearance of the bike sharing system (BSS), an increasing number of the studies started to delve into this area. As summarized by Elliot Fishman (2015) in his review of bike sharing literature, earlier research on bike sharing mainly focuses on the following topics: history and status quo of its development, BSS customer usage patterns, BSS user preferences, BSS user motivations and barriers, the evaluation and analysis of BSS impacts on domains of the environment, safety and health, and the potential better solutions of bicycle redistribution among stations. The new *dockless* bike sharing system has changed traditional usage pattern



and the interrelationship between different stakeholders. It therefore became a new research field requiring new inputs.

When it comes to the areas where the research originates from, although China is the world's fastest growing country in the bike sharing industry, as well as being the leader of this market, there is a relative paucity of English language literatures that focus on China's bicycle sharing (ibid). The recent years have witnessed a global emergence of the new *dockless* bike sharing (DBS) system. Although the scale and the scope, as well as the impact, of the DBS is largest in China, China's DBS has received relatively limited academic attention. Most of the current discussions on China's DBS originate from media discourse. There are many Chinese language reports conducted by DBS leading companies, third-party institutes and the cooperation among them. Based on companies' internal data, open data, market investigations and user investigations, these studies mainly summarize DBS user characteristics, usage pattern, DBS social impacts (e.g. Bike-sharing and the City 2017 White Paper, 2017), the development situation and future development trend of the DBS industry (e.g. Bicycle Industry Development Index Report 2017; China Shared Bicycle Industry Report 2018). The Chinese language research on dockless bike sharing continues to grow, along with this study. For example, there are some studies on DBS traveling characteristics (e.g. see Zhang et al. 2017; Du and Cheng 2018), DBS usage influencing factors, DBS user satisfaction, and the impacts of DBS (e.g. see Sun 2018; Li et al. 2019), and DBS operation strategies (e.g. see Zhang and Meng 2019).

Most of the research associated with DBS mainly focuses on the DBS operational system or scheme itself, and studies concerning the building of a better DBS scheme. There are some studies that explore the social and environmental impacts of the DBS system. There are some studies that emphasise shared cycling behaviour where the research mainly focuses on individual perspective barriers and motivations behind their DBS cycling choices, which highly depend on an individualist *attitude-behaviour* approach emphasizing personal rational choices and giving too much *agency*<sup>12</sup> to individuals' subjective motivations and psychological processes. However, travel and consumption are constitutive of residents' everyday lives and are closely related to the historical and cultural context of specific places. There are few research studies on DBS cycling behaviour that either pay attention to residents' mundane lives or take macro-scale national development processes into account. Based on the research gaps mentioned above, this thesis takes a more integrated and comprehensive approach to understand shared cycling in China. The practice theory provides valuable insights into my study.

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<sup>12</sup> The meaning of *agency* here adopts the definition from Ortner (1997), which refers to '*the capacity to influence acts*'.



According to it, I set my study object as shared cycling itself rather than the DBS users to decentralize human's agency, and with the intent to provide new knowledge in this under-investigated field.

This thesis focuses on recent changes in urban mobility consumption, aims to increase our understanding of the rise of shared cycling within China's development context and of shared cycling in general, as well as provide knowledge relevant to policy makers regarding how (shared) cycling could be increased in the future.

My research questions are formulated as below:

**RQ1: Why and how has shared cycling increased rapidly in China in the past few years?**

We understand too little of why and how shared cycling increased so rapidly in China, so my first research question is to explore this issue.

Cycling gradually fades away in automobile-dominated Chinese big cities. Municipal governments had introduced station-based bike-sharing schemes to promote cycling before the appearance of dockless bike sharing systems, but the effort failed to thrive. Conversely, the current *bottom-up* wave of DBS led by the private sectors has greatly stimulated shared cycling. The rise of shared cycling is not only the result of the aggregation of individuals' personal mobility consumption choices. The national development context, social changes, cycling history and culture also contribute to recent DBS heat. With realizing that cycling is a social issue rather than merely the choice of individuals, I am looking for a more comprehensive understanding (based on socio-cultural, nation-developmental perspectives as well as individual mundane lives), rather than adapting an individualist approach to analyse choice change of mobility consumption. Through a social practice theory lens, my analysis of the growth of shared cycling will focus on shared cycling behaviour itself.

In order to better understand shared cycling behaviour, I thereby formulated my second research question:

**RQ2: Why and how do people practice shared cycling in their daily life in the city of Shanghai? What are the challenges *shared cycling* is facing when it comes to being a stable mobility practice?**



To answer these questions, first and foremost, a thorough knowledge of how people practice shared cycling in their daily life is essential. I chose Shanghai as my case study with the intent of providing new knowledge on shared cycling. Due to time limitations, I could not do field work in several cities to bring about a more comprehensive picture about China's shared cycling practice in general. However, Shanghai is an important and interesting place to conduct this research, and I will explain my rationale for selecting Shanghai as my case in detail in the following section.

I have explored the elements that constitutes shared cycling practice through interviews and participant observations during my field work in Shanghai. Furthermore, I have explored competing practices in order to better understand urban mobility consumption. In the end, I further discuss the potentials and challenges for shaping shared cycling as a stable mobility practice.

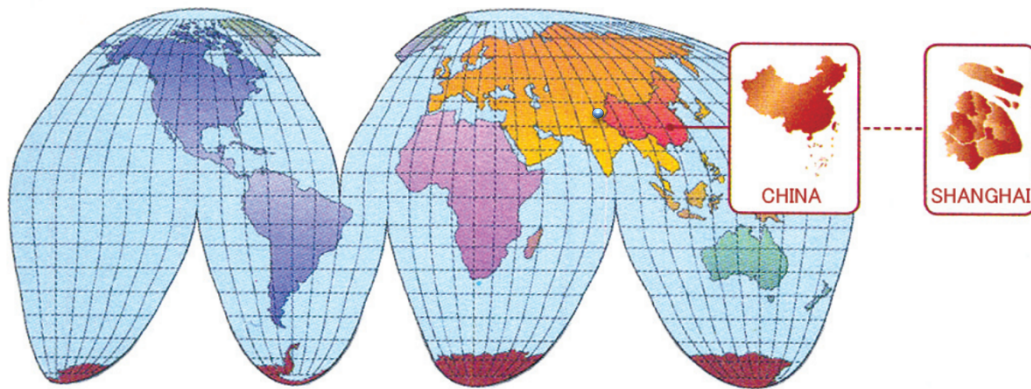
## **1.4 Selection of case: Why Shanghai?**

According to John Gerring (2007), the case study can be considered as an intensive study of a single case which (at least partly) sheds light on a larger class of cases. Although natural geography, climate, rainfall, urban development, land use pattern and transportation conditions are different in various cities, Shanghai is still an important and interesting case to focus on. I will briefly introduce Shanghai for readers who are not familiar with this city, and then state why Shanghai is a good case and place to study shared cycling.

Shanghai is located in eastern China (Figure 1-2) and covers 6,340.5 square kilometres (Information Office of Shanghai Municipality, Shanghai Municipal Statistics Bureau 2018). Shanghai lies on the alluvial plain of Yangtze River Delta.



Figure 1-2 Shanghai's location



Source: Information Office of Shanghai Municipality, Shanghai Municipal Statistics Bureau, 2018

The average sea-level elevation is around 4 meters. The vast majority of the land is flat with only a few hills lying in the southwest part of the city. Hence, the topographic feature is excellent for cycling. In terms of its climate conditions, the climate in Shanghai is classified as northern subtropical maritime monsoon climate. The average monthly temperature was 17.7 degrees Celsius in 2017 (Shanghai Municipal Statistics Bureau 2018). The pleasant climate is suitable for bike riding.

Shanghai is China's biggest economic centre and one of the most economic viable areas in the world, and at the forefront of national reform policy. It is leading the national technological development and innovation sector. The great economic opportunities attract plenty of investments and the constant inflow of immigration from other places of the country. The city has experienced a rapid construction boom and a swelling population.

According to the latest statistics, the population of Shanghai was around 24.197 million at the end of 2017 (Shanghai Municipal Statistics Bureau 2018). The city centre has an extremely high population density and is one of the largest cities in the world. According to statistics published in 2015, the population density in central areas (Figure 1-3) like Xuhui district, Jin'an district, Huangpu district and Hongkou district is 20,176 inhabitants/km<sup>2</sup>, 28,131 inhabitants/km<sup>2</sup>, 34,100 inhabitants/km<sup>2</sup> and 36,443 inhabitants/km<sup>2</sup>, respectively (Shanghai Statistics Bureau 2015).



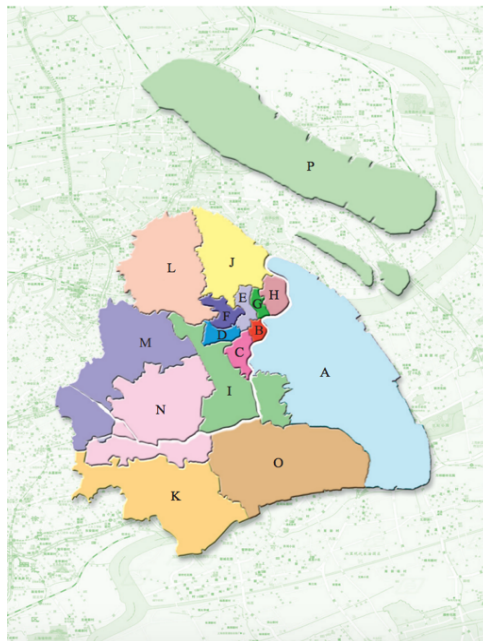


Figure 1-3 Map of Shanghai Administrative Areas

- |                     |                      |
|---------------------|----------------------|
| Ⓐ Pudong New Area   | Ⓑ Huangpu District   |
| Ⓒ Xuhui District    | Ⓓ Changning District |
| Ⓔ Jing'an District  | Ⓕ Putuo District     |
| Ⓖ Hongkou District  | Ⓗ Yangpu District    |
| Ⓘ Minhang District  | Ⓙ Baoshan District   |
| Ⓚ Jinshan District  | Ⓛ Jiading District   |
| Ⓜ Qingpu District   | Ⓝ Songjiang District |
| Ⓞ Fengxian District | Ⓟ Chongming District |

Source: Information Office of Shanghai Municipality, Shanghai Municipal Statistics Bureau, 2018

The traffic congestion and exhaust from vehicles are serious challenges that the citizens of Shanghai are facing, which has a bad impact on their health and well-being. People in Shanghai are also suffering from an overcrowded public transport system. According to the survey *Public views about Shanghai's future development goals*, Eco-city, sound environment and low-carbon transport got the highest support. In addition, liveable city with convenient transportation and complete supporting infrastructure also gained high support (Shanghai urban planning and resource administration bureau 2018). The urgent need for an improved urban mobility system drives diverse potential attempts to solve this challenge. Promoting cycling has a relatively good mass support and political base in Shanghai. From a political perspective, there also a favourable policy environment for promoting cycling. As Shanghai's latest urban master plan *Shanghai Master Plan 2035* states, a more sustainable eco-city is one of the sub-aims for future development, which means Shanghai will prioritize eco-city development and set an example for low-carbon development.

The DBS is mainly launched in the first- and second-tier<sup>13</sup> (一、二线城市) cities in China (2018 Development Report on Sharing Bicycle Industry in China<sup>14</sup>). Shanghai as first-tier city can represent or magnify the traffic tension and characteristics of most first- and second-tier

<sup>13</sup> The first-, second-, third- tier city classification system is a hierarchical classification of Chinese cities. Experts and scholars usually divide cities into first-, second-, third- tier cities when analyzing the real estate market, but there is no strict definition and classification from the Chinese government.

<sup>14</sup> This report is released by the mobile big data platform Trustdata, accessed by 4<sup>th</sup> March.  
<http://wemedia.ifeng.com/66272056/wemedia.shtml>



cities. In April of 2016, Shanghai was the first city to launch the large-scale dockless shared bikes, so it has relative long-time operating experience, including more user experience and more problems.

In summary, Shanghai presented as a good case for the conducting of my research. Firstly, Shanghai is a suitable city for promoting cycling, geographically and climatically. It has great potential for stimulating cycling, and studying this site has practical meaning. Secondly, Shanghai as a metropolis is suffering serious traffic problems and its urgent need to transform towards a more sustainable city make this case highly relevant. Thirdly, Shanghai plays an important national role in developing new sustainable mobility systems; many initiatives from the national government and companies are implemented in Shanghai from their outset.

## **1.5 Outline**

This thesis consists of nine chapters. Following this introductory chapter, the second chapter introduces relevant theoretical concepts within consumption and practice studies, aiming to briefly introduce social practice theory to readers. It further presents practice theory in contemporary consumption studies, illustrating the theoretical basis for this study. The third chapter discusses the methods adopted in this study. The methods used in this thesis include documents and literature reviews, participant observation, and semi-structured interviews. I also introduce my fieldwork experiences in Shanghai in this chapter. In this chapter, I talk about the ethical considerations and limitations of this study. At the end of this chapter, I also discuss the theoretical limitations and challenges regarding applying social practice theory in China's context. The fourth chapter is aiming to introduce a changing China for the readers. It consists of a brief introduction on China's national development trajectory in the past forty years. In chapter five, I present China's cycling history and culture, as well as present changes in cycling culture. Then I focus on illustrating the development trajectory of bike sharing in China, and emphasising the development of bike sharing in Shanghai. At the end of this chapter, I present the basic situation of shared cycling in Shanghaiers' daily lives, based on my empirical data. In chapter six, I conduct an analysis on shared cycling through a social practice theory lens in order to better understand the recent rise of shared cycling in China. I analyse the elements which comprise shared cycling, and it is based on the interview data and my participant observation during my field trips. In chapter seven, I analyse other competing practices of shared cycling in Shanghai, to describe the competing relations among different urban mobility modes. The competing practices includes walking, other types of cycling,



driving cars, taking taxis, and public transport. In chapter eight, I discuss why shared cycling increased quickly in China, the promises and challenges of shared cycling, as well as how *green* it is. In chapter nine I provide conclusions, state limitation and future research.



## 2 Theorizing consumption and practice theory

In order to better conduct my research, I found it relevant to examine key concepts within consumption and social practice theory. The emergence of sharing cycling is closely related to the development of sharing economy (a new consumption form in the 21<sup>st</sup> century), it also closely related to residents' daily mobility practice. The practice approach, especially the practice approach in consumption study is thus relevant and valuable in my study. The recent consumption change in mobility (a rise in shared cycling) in China is under the context of Chinese economic and social development, and is closely related to the everyday lives of Chinese residents. Rather than from an individualist psychological or economical perspectives, practice theory as a valuable addition, providing a holistic perspective to better understand changes in urban mobility consumption.

### 2.1 General consumption patterns in the 21<sup>st</sup> century

There is an increasing recognition that the meaning of consumption has moved beyond the traditional definition of holding exclusive possession of goods. In the past, the right to use a product was greatly based on its ownership, but an increasing number of goods and services are no longer exclusively owned (accessed) by one single consumer. In the 21<sup>st</sup> century, 'consumption' involves purchasing temporary access rights to products as well as purchasing services and performances. Increasingly, people consume goods, services and information collaboratively. This type of consumption is ubiquitous in the contemporary world. We listen to music via Spotify, watch TV series and movies via Netflix, commute by public transport, request rides via Uber (ride-sharing company), book accommodations via Airbnb (accommodation-sharing), etc. All of these consumption behaviours are not attached to private ownership but based on accessing specific services for the sake of gaining experience.

According to Warde, the definition of consumption is even broader, consumption could be described as

*a process whereby agents engage in appropriation and appreciation, whether for utilitarian, expressive or contemplative purposes, of goods, services, performances, information or ambience, whether purchased or not, over which the agent has some degree of discretion.* (Warde 2005, 137)



Historically, such consumption patterns with access model have not only appeared in the public sphere such as museum visits or public libraries, but also increasingly flourished in the for-profit sectors, which is a remarkable turn towards access-based and experience-oriented consumption around the world (Bardhi and Eckhardt 2012, 883). This shift has been facilitated by the prevalence of the internet. Rapid technological and commercial advances in the contemporary world are the main drivers that have made it possible to have different consumers sharing user rights of the same things (John 2013; Belk 2014). This greatly resolves trust problems among strangers and makes trade more efficient. Therefore, an increasing number of commercial businesses have started to organize this form of consumption by means of the internet medium. This has resulted in the emerging economic form of the ‘shared economy’. In effect, the shared economy has become widespread.

## **2.2 Collaborative consumption and sharing economy**

Several terms are associated with consumption with collaborative efforts: *collaborative consumption*, *sharing economy*, *access-based consumption*, *product-services system*, and *collaborative economy*. They partly overlap one another and share some similar characteristics but also emphasize different aspects, and therefore have subtle differences in meaning. In this section I mainly focus on two terms – *collaborative consumption* and *sharing economy* – and conceptualize them in the following section.

The term collaborative consumption has its root in the pre-internet era. The phenomenon of sharing, which can be defined as the integration and joint use of resources, is an ancient behaviour having a long history. Sharing is a non-reciprocal behaviour, different from reciprocal exchanges of goods and gift giving (Price 1975; Belk 2010; Benkler 2012). Traditional sharing behaviours mostly are internal sharing based on strong ties, for instance sharing food and daily necessities among household members; sharing beers with friends and colleagues. These sharing behaviours are either for functional reasons like survival needs or altruistic actions of courtesy and kindness. Felson and Spaeth (1978) were the first to classify this kind of interpersonal help and co-consumption behaviour as collaborative consumption, and further defined ‘collaborative consumption’ as *one or more persons consume economic goods and services in the process of engaging in joint activities* (Felson and Spaeth 1978, 614). It extended the meaning of consumption from solely an economic aspect to daily life, and suggests that consumption is not only a way to express personal preference, but also an important way in which people support each other in daily life. This definition was criticized for being too broad, and Belk (2014) put forward another more economically oriented one. His



perception of collaborative consumption involved *people coordinating the acquisition and distribution of a resource for a fee or other compensation*. Belk's definition of collaborative consumption is more suitable for the definition of the present-day *sharing economy* phenomenon, because sharing economy as a business phenomenon is economically based and a fee or other types of compensation is charged in the sharing processes.

The rapid development of technology greatly expanded traditional internal sharing to an external scope, facilitating sharing behaviours among strangers. Besides, the internet, online payment systems and mobile technologies provided virtual platforms that enabled both online and offline sharing of products and services. For example, Spotify and Netflix are platforms sharing online resources, while Airbnb and Uber are platforms sharing offline stuff. Through these platforms, customers can access music and movies gaining experience, and obtain access to a house or a car for a certain amount of time without ownership requirements.

There are different classifications in terms of different types of sharing economies. Firstly, the light-asset sharing model, which is represented by Airbnb and Uber, is peer-to-peer sharing. It is providing support platforms for customers and asset owners. It is connecting customers to customers (C2C), emphasizing the sharing of idle capacity,<sup>15</sup> and promoting resource utilization rates. Another sharing model is ownership of products and the provision of their services to different customers. Namely, companies hold the ownership of products, and they sell the usage right of products rather than the products themselves. It is broadly perceived as a business to customer (B2C) model. A variant of the latter form is the *product services system*. Compared to ownership of the products, it removes some responsibilities like repair and maintenance from the customers and brings convenience (Botsman and Rogers 2010). China's recent DBS is the best example of this second sharing form.

In the modern era, economic and social development brings material abundance and the prevalence of a consumer culture. The dematerialized feature of the sharing economy has received positive responses and is being considered as a potential way to achieve sustainable consumption. Time Magazine claimed that the sharing economy is one of ten ideas that will change the world (Time Magazine 2011). The *sharing economy* is broadly accepted as a solution towards changing consumption into a more efficient and convenient manner, and towards a more environmentally-friendly direction.

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<sup>15</sup> *Idle capacity* refers to under-utilized physical assets.



## 2.3 Defining consumption in this thesis

Precisely defining consumption is the starting point for my research, because my first research question is associated with the change in mobility consumption, mainly the rise of shared cycling. My definition of consumption emphasizes consumption as accessing shared bikes for their travel services. Although there are many different definitions of ‘consumption’, *collaborative consumption* and *sharing economy*, as discussed above, I ultimately take Warde’s definition of consumption (2005) as my foundation. Because his definition is a comprehensive one, one that is understood through a lens of the theory of practice, it better suits my analysis of shared cycling.

## 2.4 Traditional consumption theory

Consumption research is a multi-disciplinary field (Hansen 2016a) and diverse approaches have been applied to studying this field. Relevant consumption theories emphasise different aspects but easily neglect others or devalue them. A substantive overlap across disciplines is another problem. Fine and Leopold (1993) argued, more than twenty years ago, that the theory of consumer behaviour was in disarray.

Above all, the economical perspective has dominated conventional consumption research. Influenced by neoclassical economic ideology, consumer behaviours are closely related to choices of the rational economic man, who shares the same characteristics (self-interest, utility maximizing, being well-informed and autonomous) and makes decisions by evaluating benefits and costs. Economists believe income, the price of goods, the price of supplementary goods and substitutable goods have a decisive impact on consumer behaviours; they attempt using pure mathematical formulas to simulate and forecast consumption behaviours. Financial instruments and pricing systems are common methods economists use to change consumption demands. Individual tastes and preferences have been ignored during this process because they are hardly quantifiable. The economic perspective oversimplifies consumer behaviour and only pays attention to individual consciousness. It also simplifies the world to simple market or retail interactions and pays little attention to social and cultural meanings of consumption (Hansen 2016a). Asocial individuals are the sole agents in consumer activities. This methodological individualism simply aggregates asocial individuals together without considering dynamic interactions among them and without putting them in a broad social-cultural context, as well as ignoring structures’ unconscious influence.



*Yet despite the central role that consumption plays in economic theory, economics has been one of the least important contributors to the new wave of research* (Ackerman 1997, 651).

Sociologists place consumer behaviour in the social world and emphasize the complexity of society. The sociological perspective provides additional inputs in understanding consumption; economic theory is unable to provide explanation, for example, regarding the issue whether consumption behaviours are motivated by achieving group conformity or rather for enhancing self-identity and differentiation from others. Marx Weber's social stratification theory (1978) is a good example. Weber proposed a hypothesis of consumption hierarchy according to which social class one belongs to. He claims people in the same group tend to share a similar lifestyle and similar consumption patterns.

Since the 1970s, long-term economic growth and material wealth has brought a large surplus of commodities and services. The abundant commodities and services have not only brought comfort and pleasure, but also boosted consumption. As some claimed, 'consumer society' is coming, commodities are no longer purchased for their instrumental values but for other purposes like self-expression and self-identification (Campbell and Colin 1998, 235). The *cultural turn* in consumption research emphasizes culture (the *consumer culture*) and the values of signs, especially the social meanings of signs. The concept *conspicuous consumption*, introduced by Thorstein Veblen (1899) explains certain luxury goods consumption is as a way for consumers to show their social status. The consumption is not marital goods themselves but the sign (the luxury brand). However, there is also plentiful critique of cultural perspectives to understanding consumption. Critics argue that the cultural perspective holds a one-side understanding of consumer purpose, overemphasizing the value of symbol and forgetting the vital utility value of the goods. Moreover, they maintain that it exaggerates discursive consciousness and lacks analyses on tacit knowledge and unconsciousness.

In contrast to the limitation of the dominating economical approach and the traditional non-economical approach, social practice theory provides a new perspective to understanding consumption. According to this approach, neither consumer owns supreme power nor the structure produced huge impact in consumption behaviour.



## 2.5 Practice theory

Anthony Giddens, Pierre Bourdieu, and Michel Foucault among others, have published a series of theoretical statements and directly contributed to introducing social practice theory. Giddens (1984) proposed the seminal *structuration theory* (in his book *The Constitution of Society*) where he challenged the long existing agency-structure dualism and made a significant contribution to the social sciences. According to *structuration theory*, ‘the basic domain of study of social science is neither the experience of the individual actor, nor the existence of any form of social totality, but social practices ordered across space and time’ (Giddens 1984, 2). In other words, neither individual agency nor social structures are the focus of the study; rather, social practice is the basic study unit in social practice theory.

In the 1980s, the postmodernist ideology changed the emphasis in social science to explore the value of symbols and discourses. Social practice theory, therefore, experienced a silent period. Afterwards, Schatzki (1996), Reckwitz (2002), Shove (1998), Warde (2005) among others, further developed and revived this theory. Nowadays, practice theory has been applied to many research fields and achieved fruitful outcomes (for example, see Warde 2016, Nicolini 2012).

### What is practice?

The definition of ‘practice’ was elaborated by Reckwitz (2002) as a routinized behaviour. More specifically, practice is:

*A routinized type of behavior which consists of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, “things” and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge. (Reckwitz 2002, 249)*

Individuals’ practices are influenced by a series of elements, their body and their mind, as well as the socio-cultural context and the material world in which they are situated. In the view of practice theory, the individual (or agent) is the performer (or carrier) of social practice, and social structure governs practices while at the same time being consistently reproduced via practices. When people practice, not all elements Reckwitz described above work at the same time, but some elements always interact with one another, and together they influence the whole practice. It breaks down dualist divisions and treats all these elements as co-determined (Christensen et al., 2011). It is a horizontal theory framework which combines various disciplines together. Through the study of practices, individuals are no longer passive dupes

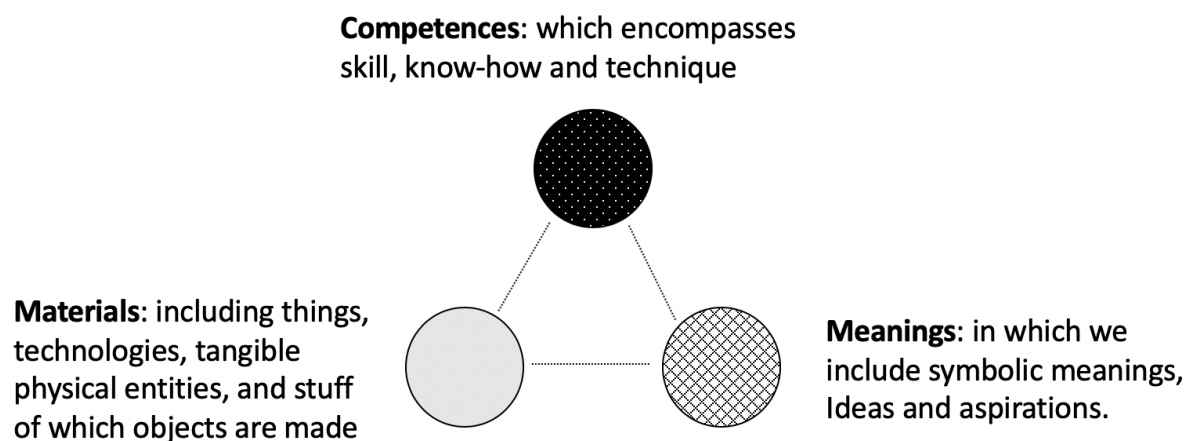


controlled by social structure or sovereign agents who rationally make consumer choices based on their own preferences (Seyfang et al. 2002). Hence, the characteristic of this theory shows that, exactly as Schatzki's argued (1996), it is not enough to understand behaviour only through individualist or holist aspect.

### Distributing agency: three elements

Practice theory implies a focus shift from agent to agency, which Ortner (1997) defines as *the capacity to influence acts*. These capacities are from an array of elements interacting with the individual. Reckwitz's definition (2002) of practice encompasses a set of interconnected elements: cognition, body, materiality, emotion, motivation, know-how. Shove, Pantzar and Watson (2012) further put forward a simpler scheme classifying Reckwitz's various elements into three groups, namely, *materials, meanings and competences* (Figure 2-1). It is believed that the integrated elements and interdependent links among them are the premise on which practices take place (Shove, Pantzar and Watson 2012).

Figure 2-1 Three elements of the practice



Source: Shove, Pantzar and Watson, 2012, p.29

In the three elements scheme, materials are considered to be a requisite for practices (Shove, Pantzar and Watson 2012; Reckwitz 2002; Wilhite 2016). Materials (things) directly impact on and are involved in practices. For example, when it comes to urban mobility practices, without a bike, *cycling* as a practice cannot be achieved; without a car, *driving a car* as a practice cannot be achieved. Social practice theory gives agency to materials, and recognizes the important role that materials play (Wilhite 2016). The objects existing around human beings have the power to shape behaviours. Humans create or change things, and things, in turn, impact on individuals.



The material also has agency and works in cooperation with other elements. In order to better understand behaviour, the study about materials is indispensable.

Skills and competences are also indispensable for the taking place of certain practices. Multiple types of understanding, background knowledge, know-how, and techniques are crucial components constituting practices (Shove, Pantzar and Watson 2012). For example, knowing how to navigate and ride a bike, how to recognize different traffic signs and how to make corresponding decisions, such as how to behave under different traffic signs, are important to the practice of cycling.

Meanings are another important part that affect the practice. *Meaning* usually refers to the social and symbolic significance, which related to what Reckwitz (2002) mentioned as mental activities, emotions and motivational knowledge. Some meanings impact behaviour in an obvious manner, while some in a relative or tacit way. In certain social-cultural contexts, there are a series of meanings like norms and customs shared within social groups, and which differentiate certain group from many other groups. These shared meanings within the group are sometimes shaped by tacit and unconscious knowledge and may attach an unreflective sense about what kinds of behaviour are *right* or *suitable* (Rettie, Burchell and Riley 2012; Fiona et al. 2013). They have an inarticulate power to influence acts, which do not belong to the mind's conscious and reflexive part; i.e., they can still impact significantly on any practice.

Shove, Pantzar and Watson (2012) state that the three groups of elements (meaning, materials and competences) co-exist and link with each other to form a certain practice. For example, goods have their symbolic meanings and communication meanings for individuals to achieve self-identification or to show an individual's status position, while it also has basically and fundamentally an instrumental function. According to Shove, Pantzar and Watson (2012), these elements have their dynamic lives. New elements are recruited, part of existing elements defect, while new elements are being reproduced over time. The existence of a stable social practice depends on faithful and continuous reproduction and a statue of dynamic balance. A breakage of the links among the three elements may result in the variation and the disappearance of the practice, and potential changes can even result in a brand-new practice (Shove, Pantzar and Watson 2012).



## 2.6 Practice theory in consumption research

When it comes to understanding the relation between practice and consumption, *from the point of view of a theory on practice, consumption occurs within and for the sake of practices* (Warde 2005, 145). Warde proposed that ‘consumption is not a practice itself but is rather a moment in almost every practice’ (ibid., 137). Putting consumption behaviour in a practice framework, the consumer is no longer a sovereign agent making their independent choices nor a dupe cheated by structure forces. Consumers are carriers and performers of consumption. Individuals as bodily and mental agents embody a set of established knowledges (know-how, tacit knowledge) that govern practice and gradually form behaviour disposition. This often happens without an individual’s active reflection and this is also why theories of practice pay attention to routinized behaviour.

In everyday life, there are many moments in a vast arena of routinized behaviours that produce consumption. For example, driving a car to work every day will produce oil consumption; watching TV in the evening will produce electricity consumption. Practice theory is a potential framework to understand consumer behaviours producing consumptions embodied in daily routines, without being noticed by individuals.

## 2.7 Practice theory, mobility and shared cycling

The term *transportation* generally refers to the physical movement between two spots while the term *mobility* involves embedded meanings in the process of geographical movement. The difference between *transportation* and *mobility* is somehow similar to the difference between *space* and *place* in the discipline of human geography. According to Yi-Fu Tuan (1977), *space* is a location without social connections with human beings, there are no meanings, and no values have been embedded in space. In contrast, *place* is much more than a geographical location. It has been created by humans and closely connected with humans’ experiences and memories. Similarly, *mobility* denotes more social connection and interaction with human beings. Mobility includes transport, which represents a movement within a physical location. Moreover, as Hansen (2016b) states, individuals use transport not for the sake of movement itself, but for achieving other purposes and for linking to other practices. However, mobility itself is also a tangible practice filled with meanings created by humans rather than just an in-between space movement. In my study, I will not only focus on the new transport mode of bike sharing and the physical movement brought about by it, but also emphasize urban mobility and



its integrated meanings and interactions that develop during the whole process. I will also explore the emerging mode in China's urban mobility — namely, the shared cycling.

In terms of the relation between consumption and mobility, taking a specific transport mode to travel, no matter whether at a cost or not, is a type of consumption behaviour in the 21<sup>st</sup> century. Mobility consumption is not just an individual's personal choice, but also greatly influenced by social-historical and cultural elements. Mobility consumers are not sovereign agents making their conscious mobility choices in isolation nor dupes who have to follow a certain mobility because of external and structural forces (Hansen 2016a). Fiona et al. (2015) have analysed cycling as a social practice and considered cycling as a social issue instead of solely as individual behaviour, and their study provided many insights to the conducting of my research and analysis on shared cycling. The practice theory lens provides a valuable addition showing that mobility consumption frequently happens without too much psychological reflection on behalf of individuals involved in such practices; individuals mostly carry out (or are engaged in) these mobility practices in the mode of routinized behaviour.

My research focuses on recent changes to mobility consumption in China, namely the rise of shared cycling. Hence, it is important to first look at shared cycling, and how people practice shared cycling in their everyday lives. According to Shove et al. (2012), practices exist both as performances taking place when an individual engages in the practice, and as abstract entities presenting certain practice generally. Ever since cycling made its appearance on the urban landscape, it has become a practice successfully undertaken by a large number of carriers, and over time, it has become a stable practice entity. Over time, some elements that have comprised cycling have disappeared or changed, and new elements are being produced. In the urban mobility practices, with increased competition from other mobility practices (e.g. from the rise of car ownership in China), the performances of cycling practice have decreased. Despite this decline, cycling is still today being widely practiced and sustained.

Shared cycling itself cannot be considered as a new practice entity replacing the cycling practice, but as a type of new performance influencing the original cycling practice through certain elements, such as participant patterns of different elements, and links between the different elements. According to practice theory, shared cycling can be considered as a collection of each cycling performance (each shared cycling behaviour). These shared cycling performances have the potential to be successfully routinized, and become a stable practice through faithful and continuous reproductions.



In short, this thesis treats shared cycling as a collection of a certain type of cycling performances. Through practice theory lens, I explore this specific type of cycling practice in this thesis, and mainly focus on the elements that comprise shared cycling and their dynamic linkages to explore the rise of shared cycling and the challenges it faces.



## 3 Methodology

In this chapter, I will illustrate the methodology adopted in this study. The method I chose is based on my research questions. The aims of this thesis are to better understand the consumption rise of shared biking in China, and how people practice shared cycling in their daily life to further explore the potential and challenges of sustainable mobility transition. The changes in urban mobility consumption is contextualized in the process of China's development and economic transition. In addition, mobility consumption behaviour changes are closely connected to everyday life. To answer the research questions, I employed qualitative approaches to explore the national development context and to understand changes in everyday life.

Firstly, I will describe the document and literature review approach. Secondly, I will detail my mobility activities during the two fieldwork trips in Shanghai. Thirdly, I will present how I did participant observations through riding shared bikes during my field work. Then I will state how I recruited interviewees and how I conducted the semi-structured interviews for collecting the data and detailed information. The rationale for choosing these methods will also be stated as well. Afterwards, I will discuss the related ethical considerations. Lastly, I will reflect upon the data collection and interpretation process, and the limitations of the process.

### 3.1 Document and literature review

This approach is used to form an overall picture of my study. First and foremost, existing literature is important in terms of understanding related theories, forming my theoretical framework (which is already stated in Chapter 2) and guiding the data analysis process. Furthermore, this approach was used to examine the rationality and validity of the data and information obtained from the semi-structured interviews and participant observation. In addition, existing academic literature, governmental reports, business reports and media discourses in both Chinese and English have been used as the main source for understanding China's macro socio-economic development and its cycling history. This data material was also used to study the historical trajectories of bike sharing in China. Moreover, this approach was used to provide a general knowledge of the case of this study—Shanghai, including basic information about the city (geography, climate and population), urban development history, cycling development history, and bike sharing development history. Therefore, this approach provides a general knowledge to better understand the context of this study.



## 3.2 Fieldwork in Shanghai

I began paying attention to China's dockless bike sharing in 2017 when one of my friends posted a story on Weibo (Twitter-like app, popular in China) about his cycling experience with dockless shared bikes. Afterwards, he began riding the bikes more frequently, and later more and more of my friends in China started using these bikes. The dockless shared bikes all of the sudden become so popular that almost all of my Chinese friends rode them, and there were suddenly thousands of discussions on Chinese social media on this topic. I left China in 2016 while DSB got in to popular in 2017, so I only had heard about it from friends and the media. After I decided to study DSB as my master's thesis topic, I started to select my case sites to see how prevailing this bike sharing had become and how it worked. Because of the time limitation I decided to choose only one site and conduct an intensive investigation at this site. At the same time, I got an internship offer from a real-estate consultancy company to assist them in publishing a report regarding the latest Shanghai Master Plan 2035. Fortunately, the working time was flexible (I only need to be on-site three or four days per week) and it helped me to get a general knowledge about Shanghai and its urban development. As I mentioned before in the introduction chapter, Shanghai is a good and interesting site to study dockless bike sharing, and also considering the practical factors mentioned above, I made the final decision to conduct my field study in Shanghai. In total I conducted two periods of fieldwork, I will illustrate it below.

The first field trip was from 14<sup>th</sup> of January 2018 to 10<sup>th</sup> of May 2018 and I stayed in Shanghai for 8 weeks. Detailed participant observation and interviews during this period will be stated in following two sections. At that time, brightly coloured shared bikes could be seen everywhere in the city. A huge number of bikes were parked next to metro stations (Figure3-1) and along the sidewalks (Figure3-2), Many shared bikes (and shared E-bikes) were parked randomly, and blocking streets and pathways (Figure3-3, Figure3-4, Figure 3-5, Figure3-6)



Figure 3-1



Figure 3-2



Photograph taken by the author.

Figure 3-3



Figure 3-4



Photograph taken by the author.



Figure 3-5

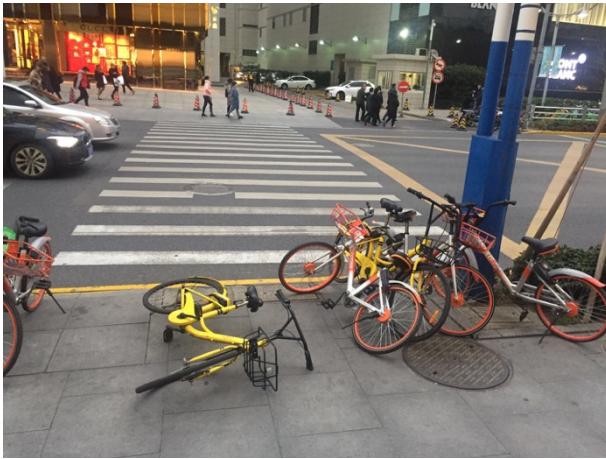


Figure 3-6



Photograph taken by author.

The streetscape changed significantly after the appearance of shared bikes. Rapid development of DBS brought millions of bikes back to Shanghai's streetscape. After my first field trip, seeing these bikes made it clear why millions of people were talking about DBS. Nobody in the city could ignore their existence as they either enjoyed the convenient service that DBS offered or experienced the negative aspects of bikes blocking their way.

However, there were many changes that happened after my first field trip and made me decided to conduct the second field trip. The Shanghai government implemented control on the total number of shared bikes, and suspended the launch of new shared bikes in August 2017, which caused the scaling-up process to slow down. However, no significant decrease in shared bikes has been witnessed during my first trip (at the beginning of the 2018). As time went by, many shared bike companies went bankrupt due to fierce competition (more than 70 companies got engaged in DBS market in 2018), immature profit model and cheap ride fare (a half-hour ride costs just 1 yuan, or 0.14 dollar). As a result, abandoned bikes were left on the streets by the bankrupt companies. In addition, a great number of broken bikes occupied the streets without being repaired, because of the operational troubles and inefficiency of the surviving DBS companies. The abandoned and illegally parked bikes had been taken over by local authorities and has gradually been collected and taken away to certain areas, and the number of shared bikes in the street decreased quickly as time went by. At the same time, I got to know that shared cycling was not as popular as it used to be several months earlier.

As Scott et al (2006, 38) stated: *fieldwork requires a negotiated, adaptive and flexible approach*. The rapid changes in the DBS industry and the potential changes of citizen's travel



behaviour made me decide to conduct a second field trip to collate information on the changing elements of shared cycling behaviour.

The second Shanghai field trip was from 2<sup>nd</sup> of November 2018 to 14<sup>th</sup> of November 2018. It had been 8 months since my first Shanghai field trip. As showed below, the streetscape changed significantly. These two pictures below (Figure 3-7 and Figure 3-8)<sup>16</sup> were taken outside the same metro station (Daduhe road station 大渡河路站) on 15<sup>th</sup> of January and 13<sup>th</sup> of November separately. There used to be a large amount of share bikes parking along the street outside this station and these bikes also parked on the separation areas which divided bike lane and motorway. The second time I went to this site, there were no bikes parked on the separation area and very few along the street. The change was significant.

Figure 3-7



Photograph taken by the author.

Figure 3-8



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<sup>16</sup> Note: even the pictures were not taken at the same time in a day, the significant difference of bicycle number may be considered as a result of delayed rebalancing. However, I lived around this station in both trips. According my own observations in different time of the day, the number of bike reduced significantly and less than 1/10 in first fieldwork. Thurs, I chose these two picture to show this significant change.



There were also a large number of newly printed bike parking areas (Figure 3-9~3-12) on the sidewalk, which I had not seen in my first field trip. However, few shared bikes were actually parking there (Figure 3-9, Figure 3-11, Figure 3-12). The positive point is that they were parked more orderly then before (Figure 3-10).

In short, the second field trip in Shanghai was conducted when DBS had already become a serious problem and the DBS situation was quite different compared to how it was at the beginning of 2018. Hence, in order to provide a more updated and comprehensive knowledge about China's bike sharing wave and to better understand shared cycling behaviour in a dynamic process, I did an additional field trip in the end of 2018.

Figure 3-9



Figure 3-10



Figure 3-11



Figure 3-12





### 3.3 Participant observation

In order to better understand practices, it is important to go beyond talking to carriers or performers of practices, and to further join them in carrying out or performing their practices (Hansen 2016a, 47; also see Halkier and Jensen 2011; Watson and Till 2010). Inspired by Hansen (2016a) and his field work in Vietnam, I chose to participate in shared cycling during my field trips.

I rode shared bikes as much as possible for different trip purposes during my fieldwork and interchanged bikes from two different major shared bike companies (Ofo and Mobike), so that I could experience shared cycling myself and observe other cyclists at the same time. Through this approach, I generated my own perception and gained empirical knowledge of shared bike user experience. In addition, became more empathetic with my interviewees when it came to understand their description and narration such as road conditions and cycling infrastructures.

As mentioned before, I was doing the internship when I did my first field trip in Shanghai, so I was able to experience the daily commutes. I lived in Putuo district and my company was located at a central location in Jinan district. It was difficult to cycle from my accommodation to the workplace for daily commuting, because it was quite far (around 10 km). However, to get a long-distance cycling commuting experience, I cycled once when I was off work back to home, and it took me around fifty minutes. This trip also helped me to acquire information on road conditions, cycling lane conditions, and further observation data about other shared bike cyclists, private bike cyclists and scooter users along my way. In general, I commuted using the metro, but I often used shared bikes as the *last-mile* traveling tool between metro station and home or workplace.



In order to get to my workplace, I needed to get up at seven and leave the apartment/house around half past seven. I walked very fast to the closest metro station and it took me approximately 15 minutes. If I happened to find shared bikes near the entrance of my residential community, I would ride the shared bike to the metro station (it took me 4 to 5 minutes). The metro did not directly bring me to my destination, so I needed to change to another metro line on the way. The metro was severely crowded during the rush hour. Figure 3-13 shows the situation of subway carriages and Figure 3-14 shows the stairs when I finally got off the metro and went out of the station.

Figure 3-13



Figure 3-14



Photograph taken by the author.

The metro station near my workplace was in the city centre, and I was usually not able to find a shared bike there to ride to my office, so I walked another 10 minutes to my destination. When I finished work I always chose the same route back home. After leaving the metro station, I would walk home slowly and get some groceries along the way, and only when it was late I chose to ride the shared bike as the *last-mile* solution. Sometimes I chose to take bus home, and the bus station was as far away as the metro station, but the destined bus station was only 3 minutes away from my accommodation, and I could often get a seat. The only reason I did not take the bus home is because it never came on time, and I needed to wait for a long time. That was one reason I did not choose to take the bus to work, and another reason was that I was afraid of the traffic jam. The metro was crowded but always on time.

As stated above as an example, the participant observation approach provides me practical knowledge to better understand people's traveling behaviour in this city. I participated in other



competing practices of shared bikes and observed how people carried out these practices, which was valuable in my research process as well.

## **3.4 Semi-structured interview**

### **3.4.1 Rationale**

It has been pointed out that interviews may not be a proper method in studying practices, because the study units should be the practices itself rather than the individuals (Bourdieu 1990, 28). Nonetheless, interviewing people can still help the researchers to understand practices. People are carriers or performers of practices, and it is them employing the background knowledge of the skills, know-hows, motivational elements, and the understandings of meanings like values, symbols, and norms. Through talking to them, researchers may acquire meaningful insights towards the embodied knowledge which carriers have.

The opposite opinion of interviews as a method of studying practices claim that the practices contain the unspeakable aspects including embodied disposition and tacit knowledge, which interviewees may not realize themselves (Hitchings 2012). Hence, they suggest using videos, photo diaries and other ethnographic methods to study practice, and there are some studies which employed such approaches (for example, see Latham 2013). These methods are certainly good ways to investigate practice, but I agree with Hitching's (2012) opinion that *we cannot discount interviews on studying routine practice*. There are many tacit knowledge behind mundane and routinized practices, but certain kinds of everyday practices are easier than others to talk about. According to Hitching (2012), people can be entirely able in talking about their mundane actions, which are typically performed without too much thinking, and this conclusion has been supported by his own two interview projects. He mentioned there are several limitations when applying interview approaches in everyday practices: some practices are easier than others, and different respondent groups may have different capacities to speak about their practices in a fruitful manner. Macpherson (2010) argues that we should not reject interviews completely.

Understanding the potential valuable information that interviews can provide, I chose to employ interviews in my study. In terms of the potential limitations mentioned above, I stayed mindful about these issues. Firstly, I argue that dockless shared cycling is a recently emerging behaviour that can be considered as a relatively easy case to discuss in contrast to many of the more unconscious practices. Respondents are more aware about the meanings they perceive related to it. Secondly, I employed other approaches alongside the interviews in my fieldwork (like



participant observation) to supplement important information that might have been ignored. Although I did not take videos or use a photo diaries, I actively participated in observations and took some photos as supplemental materials to reveal practices. Thirdly, I designed the semi-structured interview guide<sup>17</sup> as the basic guideline, but I expanded it with in-depth conversations with interviewees depending on their responses. Through in-depth interviews, which were supported by my own observations and mobility practices, I formulated various questions to encourage them to speak out and to expand on their answers. Moreover, I also conducted many informal interviews with local people, which helped me gain more background knowledge in understanding the shared bike cycling.

In summary, it is important to realize the merits and limitations of interview as a method to study social practice to increase the validity in study process.

### **3.4.2 Recruitment**

I mainly applied a snowball technique in recruiting my informants, as I used my own network, my friends, and acquaintances in Shanghai to during this process. Aside from their help, I also actively attended local activities and events to expand my network looking for informants. As mentioned before, I did two field trips and there were some changes in the project design in between, and the final informants' list were quite different from my initial thoughts. During the first trip, I recruited 14 informants and kept another ten-people's contact for on-line interviews. However, after coming back to Norway, I decided to do the second field trip. The online interviews were not all conducted before the second trip and the qualities of those were not as good as I expected. The informants accepted my interviews but with relatively low trust and the answers were not as comprehensive as I expected, mainly due to the defects of the online approach (remote connection hard to build trust, and limited and not flexible interview time as I told them it will be done in around 30 minutes ahead). In the end, I decided to give up all on-line interviews I had done, and to focus on face-to-face interviews. There were 4 informants during the first trips that have been deleted from the final version for better sampling consideration. During the second fieldtrip, I recruited 13 informants to expand my data. In addition, I could reconnect with the 6 informants from my first field trip, so I did the updated interviews with them in November 2018.

The final informant list is shown in Appendix. Some general information about the informants is listed in Appendix B. The age of informants ranged from 21 to 40. Eight of them were male

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<sup>17</sup> Appendix A



and fifteen were women. Their residential areas included Baoshan district, Changning district, Jiading district, Jinan district, Minhang district, Pudong district, Putuo district, Xuhui district, Yangpu district. Fourteen of them did not have vehicles, five of them owned private car (two among them held non-local license plate from another province<sup>18</sup>), one owns a bike, one owns a scooter, one informant owner a private car, a scooter and 2 bikes. The questions that were asked were based on an interview guide<sup>19</sup>, but were flexible and free with some additional in-depth conversations depending on characteristics of deferent informants and their responses. The interviews took place in the participants' offices, company hall, parks or restaurants near their office/home. The duration of interviews ranged from 30 minutes to 90 minutes. During all the interviews, I took detailed notes.

### **3.4.3 Sampling**

To gain an in-depth understanding shared cycling behaviour, it was important to interview people who use this transport mode as the main mode of travel. However, I also wanted to explore the challenges that shared cycling, as a potential urban sustainable mobility behaviour, is facing. Thus, I applied snowball technique recruiting informants who travelled with various modes of transport and used shared bike with different frequencies. The full informants' travel information is listed in Appendix C.

Informant No. 11 rode shared bike every day for commuting. Informant No. 22 rode shared bike almost every day, but used it (as the last-mile solution) in combination with metro for daily commuting. Informants No.2, 14, 15, 20, 21 often used shared bike (1-3 times per week in good weather, but situation varied depending on weather). Informants No. 4, 5, 8, 17 often used shared bikes before, but now decreased the usage. Among them, Informant No. 17 no longer use shared bikes. Informants No.6, 7, 9, 16, 19, 23 were occasionally shared bike users. Informants No. 10, 12, 13 used shared biked only occasionally. Informant No.1 had only used it a handful of times in total. Informants No. 3 and 18 had never used shared bikes. Informant No. 6 was an electric shared bike user. Their travel purpose of shared bikes also varied, some used it as (part of) for daily commuting (2,4,8,11,14,15,16,17,20,21,22). On the other hand, some used it for exercise (14, 15) or weekend entertainment trips (2,5,7,9,13,15,19,).

In summary, the informants' shared bike usage frequency varied depending on weather and other elements (even the same informants varied the usage frequency over time). The

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<sup>18</sup> These cars are not allowed to drive on the overhead highways in rush hours.

<sup>19</sup> Appendix A



informants' trip purposes with shared bikes also varied. There was also great variation in how they practiced other urban mobility modes such as driving cars, riding scooters, riding their own bikes, riding electric-shared bikes, taking public transport, and taking electric shared bikes. Thus, the informants' urban travel mobility covered most common urban motilities, which helped me to collect enough data to analyse shared cycling and competing and connecting urban motilities in Shanghai.

### **3.5 Ethical consideration**

The interviews all started with a brief introduction of the project and I informed all informants where their information would be used while showing my student ID to prove my identity. They also had been given informed consent form which informed interviewees that notes would be taken during the interviews and that all the information they provided would be kept anonymous. Although my research involved their personal information and their daily traveling behaviours, there were no direct information that would reveal their identities. I did not let them sign the consent form because it may let them feel too formal and would increase their suspicion, but all of them gave me the oral permission. In terms of recording the conversations, even if it would increase the accuracy when analysing the data, it may not be a good strategy in China. Although the interview would not involve sensitive topics, most people would feel unsafe and keep sceptical about my research, especially since I was doing a postgraduate study in a foreign country and was holding an English student ID from a foreign university which they have not heard about. In order to keep them comfortable, I chose not to record their talk. I wrote detailed notes as fast as I can while conducting the interviews. After they left, I added more detailed notes as soon as possible when my memory was still fresh.

Throughout the interviews, I did my best to let them talk freely. I kept my manner of speaking neutral and did my best to not let them feel judged. For example, one informant was uncomfortable to mention that he does not own a private car and subtly expressed his embarrassment, so I spent a bit more time to build trust and a relaxed atmosphere with this person, encouraging him to express his real feelings. This made him feel more comfortable. I also did my best to avoid the interruption of the interviews. For example, some interviews were first meant to be conducted in shared offices where there were other people present in the office space. In these cases, I suggested to change the location of the interview to a meeting room/ bench in the first floor of their work building/ restaurants nearby. Through this approach, I tried to give them a more comfortable environment to let them talk freely about themselves.



## **3.6 Limitations and positionality**

### **3.6.1 Limitations**

#### **Rapid changes in China's urban mobility**

The speed of changes on China's urban mobility is much faster than my study and writing process. Even though I conducted two field trips in 2018 to capture an updated information on DBS, it was still hard at the time to provide an up-to-date and comprehensive analysis of DBS and DBS cycling. For example, there are some recent changes in aspects of DBS which may have impacted on cycling practice in Shanghai. As one example, the descriptions in this thesis on how to register, use and pay for shared bikes may be different from the current system, since the companies always update, optimize and change their operations (specifically, DBS companies previously asked for a deposit when a user registered, but later on some companies no longer asked for deposit, which might have influenced the cycling practice for some users). In addition, although some aspects of DBS have changed since I conducted my field work, the impact of those changes on cycling practice may be postponed. As mentioned before, the regulation on controlling the number of shared bikes in Shanghai directly resulted in difficulties in finding available bikes and reduced the frequency of cycling, but a more orderly parking environment, reasonable allocation and a gradually healthier DBS market competing environment may need some time to get realized. When it comes to the performers (DBS users) of DBS cycling, the changes happened in the material world, and the meanings and competences also need some time to become embodied knowledge.

#### **Second hand data**

Second hand data has been largely used in this study to better understand China's development and recent transition, as well as the history of cycling and bike sharing development trajectories. When using secondary data, it is important to consider the reliability, validity and sensitivity issues. Most of the statistics about DBS have been published by companies in the private sectors, including the operational companies and third-party consultant institutions (separately or in joint cooperation). The accuracy and reliability of these statistics are hard to evaluate. Accurate statistics such as the number of the dockless shared bikes (or the number of the registered DBS users) is hard to calculate in any report because one report cannot include all engaged companies' participation. Thus, the statistics are most likely based on the leading companies' user data combined with some rough estimation. In addition, the rapid changing industry make the numbers more inaccurate. Moreover, reports have different themes and emphasize different



aspects, so it is hard to find comprehensive statistical information from a single report. Nevertheless, when I adopted statistics from different reports, the basis of these statistics may have originated from different databases which have used different methods. The accuracy decreased when I put these statistics together.

The situation mentioned above has been put me in a difficult situation, since when I wanted to illustrate the development of DSB, I could not give a comprehensive statement on this. (For example, how many bikes were launched, how many people have been registered as users, how many people were active users among the registered, the riding distance, and the usage frequency (per day) of dockless shared bikes).

I have been forced to use statistics (in chapter one, introduction part) from various reports conducted at different time-points, which lacks accuracy. Luckily, I am not using statistics to conduct quantitative research and make calculations based on them. My aim by presenting these statistics is to provide an overall picture about the DSB and how *hot* it has been, so extreme accuracy was not necessary in this context.

### **3.6.2 Positionality**

Being a Chinese student who investigates bike sharing in China presented both merits and challenges during the research process. All the interviews were conducted in Chinese, and as a native researcher it was easy for me to communicate with my Chinese informants, build trust and get information. Moreover, I read both Chinese and English literature and documents, which to a great extent expanded my resources while studying bike sharing. In addition, I was born and raised in China, so it was easier for me to understand the socio-cultural background, and to analyse the data I collected while placing them in this context. However, as an insider, there existed some challenges. Firstly, it was a big challenge to convert the data I got from interviews into English because it was hard to precisely translate this data and present them properly to Western readers, and accuracy might sometimes have been lost during the translation process. Secondly, I am so familiar with China's socio-economical context that I may sometimes have taken social norms and other embodied knowledge for granted, and may not have noticed that some analyses or statements could be difficult to comprehend for non-Chinese readers.



### 3.7 Theoretical limitations and challenges

Said (1984) states in his *Traveling Theory* that when applying a theory in a new situation, the original meanings embedded within theory will change. The social practice theory is built based on European social scenarios and built by European scholars, so some potential problems may arise when it has been applied in China's case. Yechao Fan (2017) argues that China's national conditions are different from Western countries. The political regime, development condition, economic level, urbanization and industrialization rates, historical and cultural context and so on are different from western and other Asian countries. Fan (2017) also mentioned the concepts like *civil society*, *privatization*, and *decentralization* are potential premises when building social practice theory, and these concepts are not totally fitting in China's situation. I side with Fan on his argument, since China's political regime, and historical and cultural context are different from western situations, so it is necessary to be critical when applying the social practice theory in China's case. The civil society in China is not that active as western countries and there is not that many spontaneous activities to push social changes, instead most social changes are led by central government.

No one has claimed that this theory is built based on western practices, and there is no one who tested it to discover whether it suits for China or the global. I agree that some practices may be the same everywhere around the globe, but I believe that some may not, because the strong power China's government has. I, hereby, argue that in China's context, there is one element (the central government) with significant power that could rapidly impact other elements and further change/shape practices, and a modified social practice theory may need to be developed for better understanding China's social practices.



## 4 Research context: a changing China

Transport and consumption are important parts of peoples' daily lives, and are closely related to the development of countries and regions. Economic growth and gradually increased household income are important to understanding everyday consumption changes (Hansen 2016a, 32). China's burgeoning economic development and urbanization has greatly affected urban mobility. The recent economic transformation in China has stimulated entrepreneurship and driven the emergence of the sharing economy, and is important to understanding the recent emergence of shared mobility including shared cycling.

In this chapter, I will first introduce China's development over the past four decades as a background to understanding the consumption and urban mobility changes over time. For better understanding, the development over the past four decades has been divided into two parts. It is also marked by two significant reforms, namely, the Reform and Opening-up from 1978, which stimulated rapid national economic growth and major social change, and the recent supply-side structural reform, which aimed at fostering new growth drivers. I will subsequently focus on urban mobility, illustrating China's cycling history and the most recent changes in urban mobility brought about by the sharing economy. The aim of this section is to show a changing urban mobility in China during the past decades. It also aims to provide a background picture about how people perceive cycling over time from a socio-cultural perspective.

### 4.1 Reform and opening-up

#### 4.1.1 Economic and social changes

China's reform and opening up started in 1979 at the Third Plenary Session of the 11th Central Committee of the Communist Party of China (CPC)<sup>20</sup> (十一届三中全会). Reform and opening up was a series of policies aimed at a comprehensive national reform: 'opening the door' to the outside world and carrying out reforms at home. The People's Republic of China established *opening up* as a basic national policy of China. The internal reform first began with the *household responsibility system*<sup>21</sup> in the rural areas, which enabled people to accumulate wealth and develop a new spending power (Latham 2006). From 1978 to 1985, the remarkable achievements of this reform could already be seen: both the rural income and rural consumption

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<sup>20</sup> It is the founding and ruling party of the People's Republic of China.

<sup>21</sup> This system supplanted the egalitarian distribution method, which was common in the planned-economy era.



doubled during this period. The urban income also showed a 61% growth in the 1980s (ibid, p. 27).

Since the economic reform started in 1978, China has made impressive progress in economic development (Banik and Hansen 2016; Li and Banik 2013). Alongside achievements in the economic sector, China also achieved significant progress in poverty reduction. If one were to apply a poverty line of \$2 per day, poverty in China saw a decrease from 972 million people to 474 million people during the period 1981–2005 (Chen and Ravallion 2008, 45). Social protection programmes in areas such as healthcare and education have functioned as an important safety net for the poor (Li and Banik 2013). Remarkable progress has been achieved as a result of these reforms. China's score in the UNDP's Human Development Index<sup>22</sup> (HDI) improved from 0.407 in 1980 to 0.699 in 2012. The country has already achieved four specific Millennium Development Goal (MDG) targets: it has halved the population below the poverty line of \$1.25 per day, halved the number of people living in conditions of food scarcity, ensured that all children can complete secondary education, and reduced by two-thirds the mortality rate for children below five years of age (Way and Catharine 2015).

Along with economic growth and poverty reduction, there has also been a growth in household consumption of goods and leisure activities (Chao and Myers 1998). By the beginning of the 2000s, consumerism had become a regular feature of everyday life in urban areas (Latham 2006). By 2005, it was estimated that 200 million middle-income consumers in China could afford a private car and a house, and spend money on leisure travels (Croll 2006). However, the number of middle-class people within the whole Chinese population was still small; around 15% of the population was regarded as being middle class in China in 2002, while the statistics for the United States was 60% (Sun 2002; cited by Croll 2006). The outcomes of reform and opening up also resulted in the appearance of a super-rich class. In 2001, it was reckoned that China had more than one thousand *yuan*<sup>23</sup> *billionaires* and more than three million *yuan millionaires* (The Economist 2001; Croll 2006). In 2017, China became the country with the highest number of dollar billionaires in the world, surpassing the United States (Forbes, 2017). China has also become the major market for luxury goods and has seen an increasing number of conspicuous consumption (Latham 2006). The rapid economic growth has greatly changed Chinese daily consumption, and it has resulted in huge gaps and differences among different social groups.

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<sup>22</sup> The Human Development Index (HDI) is a statistic composite index. A higher HDI score for a country indicates that the lifespan is higher, the education level is higher, and the gross national income GNI (PPP) per capita is higher.

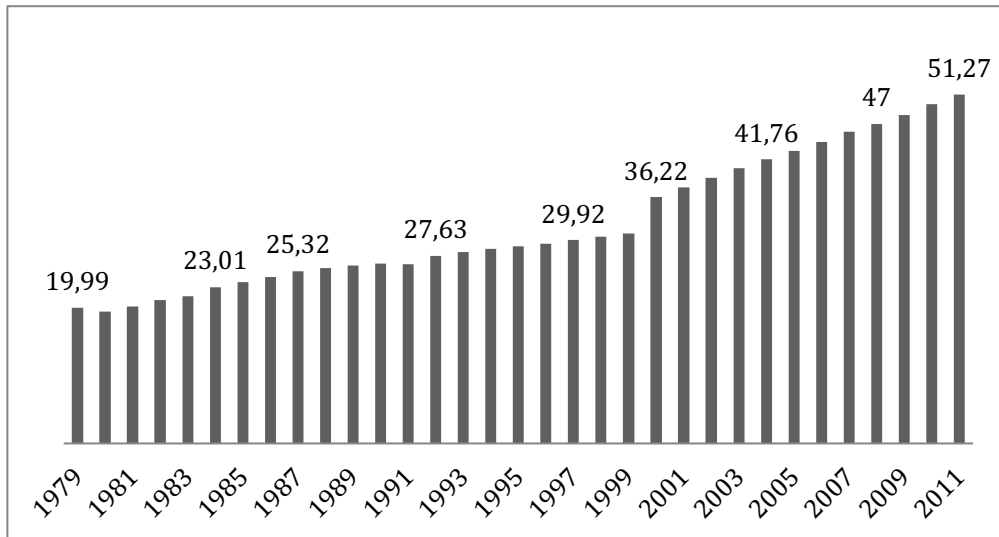
<sup>23</sup> *Yuan* is the basic unit of RMB (renminbi), which is the official currency of the People's Republic of China).



### 4.1.2 Rapid urbanisation

The economic growth also lead to significant changes in China's cities. China has gone through an urbanisation<sup>24</sup> process and it has seen a rapid development momentum in the past decades (Figure 4-1).

Figure 4-1 Urbanisation rate in China (%)



Source: China Economic and Social Development Statistics Database, 2015

Urbanisation reflects a complex process during which the countryside transforms into cities. There are various definitions and different understandings of urbanisation (Xu and Zhou, 2009). In general, urbanisation is a process where the population migrates to the city along with a range of significant transformations in social, economic, demographic, geographical and lifestyle domains (ibid.).

Cities exist because of the agglomeration effect. Centralized exchange activities and centralized production processes contribute to higher production efficiency and higher yields. The convenience and efficiency of urban mobility are both a cause of agglomeration and a result of agglomeration. The rural population flowed into the city on a larger scale during the Chinese urbanisation process. The city size also changed to accommodate its new residents. Changes in urban land use pattern occurred along with the urbanisation process. The enlargement of cities and changed lifestyles have brought about changed urban travel that have facilitated car usage and led to a decrease in cycling practices.

<sup>24</sup> It is worth noting that there is a significant regional imbalance in China's urbanisation process. The urbanisation level in the eastern region is relatively high, while it is relatively low in the western region.



## 4.2 The *New Normal* of China's economy

### 4.2.1 China's new economic reform

The statistics shows that China's GDP growth rate decreased to 7.4% in 2014, which was the lowest growth rate in the past 24 years. In 2015, the GDP growth rate was 6.9%, the lowest growth rate in 25 years (NBS 2019). It means that China's economy has entered a new era and is facing a downward trend. In November 2014, the Chinese General Secretary Xi Jinping systematically elaborated the term *New Normal of China's economy* (in Chinese: 中国经济的新常态) at the APEC CEO Summit to describe this new era. From Xi Jinping's view, the *New Normal* has a main feature that the Chinese economic development speed has changed, from a high-speed growth to a medium-high-speed growth.

The traditional driving powers of economic growth in China heavily depended on energy-intensive heavy industries including iron, steel, chemicals and cement (Wei 2016). It also heavily depended on labour-intensive manufacturing industries and export business. In the past decades, *Made in China* has become one of China's icons, and China has also developed an image as a product country (Han and Wang 2012). Truly, the high-speed development of Chinese economy cannot be decoupled from the contribution of the population's *renkou hongli* (人口红利 *demographic dividend*<sup>25</sup>) and cheap labour. However, the rapid economic growth of the past decades has also resulted in a gradual increase in *unit labour cost*<sup>26</sup>, which in turn decreased profits within labour-intensive industries. In addition, the recent *trade war* with the United States has also had a significant negative impact on China's export business. Moreover, the environmental concerns have also made China's government rethink the traditional development mode which relied on energy-intransitive industries requiring huge natural resources input and having negative environmental impacts and diminishing returns. Hence, there has been an urgent need to adjust the economic structure and to improve the quality of the economic development.

China is undergoing a new economic transition in order to deal with the new development challenges in this slow-down developmental period. At the 2015 World Economic Forum Annual Meeting, Chinese Premier Li Keqiang stated that, *For the Chinese economy to*

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<sup>25</sup> *Demographic dividend* is a term that refers to the economic growth potential resulting from shifts in a population's age structure, mainly when the share of the working-age population (15 to 64) is larger than the non-working-age share (defined by the United Nations Population Fund).

<sup>26</sup> Unit labour costs (ULC) refers to 'the average cost of labour per unit of output and are calculated as the ratio of total labour costs to real output'. (OECD System of Unit Labour Cost Indicators 2017). Source: <https://www.ft.com/content/760621a8-9fcf-11e4-aa89-00144feab7de>



*withstand the downward pressure ... we need to say no to traditional mindset, we must encourage innovative institutions, and press ahead with structural reforms*<sup>27</sup>. In 2015, General Secretary Xi Jinping proposed a *supply-side structural reform* (in Chinese: 供给侧改革), which has been further emphasised by Li Keqiang:

*while moderately expanding aggregate demand, efforts were made to strengthen supply-side structural reforms, focus on improving the quality and efficiency of the supply system, and increase the momentum of sustained economic growth.*

(Li Keqiang, 2015 World Economic Forum Annual Meeting)

The government realised that the old economic model is not sustainable and no longer suitable for the nation's continued development, and now the supply-side reform has become China's new national strategy for providing a growth impetus for a sustainable economic development.

#### **4.2.2 Mass entrepreneurship and innovation**

Before 1988, the legitimacy of private enterprises had not been recognized by China's authority. However, the economic revolution (from 1978) unleashed the growth of the private business sector and wealth, with the private business sector surpassing state-owned enterprises from 1992 onwards (He, Lu and Qian 2017).

In 2015, the 13<sup>th</sup> Five-Year Plan<sup>28</sup> (五年计划) emphasized that China's development should be *innovative, green, opening-up and inclusive* (Wei 2016). In the 13<sup>th</sup> Five Year Plan, one of the main goals is to obtain *innovation-driven development*<sup>29</sup>. It is the first-time *innovation* has been put forward as a new development driver, and it clearly pointed out the importance of innovation and entrepreneurship (Xinhua News 2015). In the same year, the development of entrepreneurship has entered the golden era (He, Lu and Qian 2017). Chinese Premier Li Keqiang stressed that under the wave of reform and innovation, it is time to set off *shuangchuang* (in Chinese: 双创, which is the abbreviation of wan''zhong'chuang'xing 万众创新 da'zhong'chang'ye 大众创业, refers to: *mass entrepreneurship and innovation*). The

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<sup>27</sup> The full text of Chinese Premier Li Keqiang's speech at the World Economic Forum's Annual Meeting 2015 can be found here: <https://www.weforum.org/agenda/2015/01/chinese-premier-li-keqiangs-speech-at-davos-2015/>.

<sup>28</sup> The Five-Year Plans (五年计划) are a series of social and economic development initiatives issued since 1953 in the People's Republic of China. The plans are the blueprint for national social, economic and political reforms, as well as underlining focused developing areas in the coming five years.

<sup>29</sup> *Innovation-driven development* (创新驱动发展) is the main goal put forward in the 13<sup>th</sup> Five Year Plan, under the 'Guiding ideology, main goals and development principle' part.



State Council issued an opinion<sup>30</sup> to further boost mass entrepreneurship and innovation on June 2015. Later in September, The State Council further released guiding opinions on accelerating the building of supporting platforms for mass entrepreneurship and innovation<sup>31</sup>. Afterwards, rapid growing local policies and measures started prioritizing entrepreneurship and innovation activities, especially encouraging scientific and technological individuals and college students/graduates to start their own enterprises (The New York Times 2015). By 2016, the government had spent more than 56 billion dollars to stimulate *shuangchuang* (Reshetnikova 2018). The supporting services and infrastructures for entrepreneurship and market environment have also been greatly improved.

Under the strong advocacy and promotion from the government, a large number of new business incubators have been established. At the same time, there has been a rapid development of investment which has provided strong capital resources. In addition, a new culture of entrepreneurship and innovation has been growing in China. A large number of young professionals and talents have engaged in this innovative development process (The New York Times 2015). China's entrepreneurial entities have moved from *minority* to *mass*. More and more grassroots groups have joined in entrepreneurial teams. It has also been criticized that there exist risks and crises behind the flourishing of entrepreneurship in China, and huge waste on financial investments and social resources (The Wall Street Journal 2016).

In summary, innovation and entrepreneurship have become a new orientation in present-day China. With the continuing development in the technology sector, the entrepreneurial activities will likely be more prosperous. In general, the good environment for entrepreneurship and innovation in China's economic *New Normal* has provided good material and cultural foundations for the new business activities. The rise of the sharing economy and shared bikes is embedded in this new process of economic and social development.

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<sup>30</sup> The state council of the People's Republic of China issued *Guidelines on Measures to Boost Mass Entrepreneurship and Innovation*, which can be found on this government webpage:

[http://english.www.gov.cn/policies/latest\\_releases/2015/06/16/content\\_281475128473681.htm](http://english.www.gov.cn/policies/latest_releases/2015/06/16/content_281475128473681.htm)

<sup>31</sup> The English version of the reference can be found at: <http://en.pkulaw.cn/display.aspx?cgid=257582&lib=law>.



# 5 Cycling in China: history, culture and changes

The study of China's development and economic transformations over the past four decades discussed in the previous chapter provides background knowledge to understanding the changes of cycling practice in China. In this section, I will first introduce China's cycling history and culture to show how cycling gradually faded away from the centre stage in China. Then, I will emphasize the development trajectory of the sharing bike industry, illustrated by the development trajectory of public bike sharing and dockless bike sharing in China. I will further focus on my case — Shanghai, illustrating the development trajectory of bike sharing in Shanghai and presenting shared cycling in Shanghaiers' daily lives based on my empirical data.

## 5.1 Cycling history and culture

The bicycle was introduced to China in the 1900s, and gradually became an important transport mode. Looking back at the one-hundred-year-long history of cycling in China, the penetrations of cycling have changed over time, and the attitudes towards bikes have also changed a lot over time. Cycling development in China can be classified into four phases according to different characteristics of those phases (Zhang, Shaheen and Chen 2014). The first phase was from 1900s to 1978, in which bike use grew slowly during that time. The second phase was from 1978 to 1995 when cycling experienced a rapid growth. The third phase was from 1995 until 2002, when the rate of cycling declined rapidly. The last phase was from 2002 until the present-day, where the development of cycling has become diversified (ibid.). Several innovations appeared in the traditional bike industry during the last phase, for example, the appearance of electric bikes, public bikes and recent dockless bikes. In the following section, the detailed development situations of cycling in each phase will be illustrated.

The bike was initially introduced as a luxury good by the royalty of China. Its use in the early 1990s grew very slowly for a long time given that only wealthy people could afford it. During the 1950s and 1970s, China experienced a politically turbulent time and economic stagnation. People were still living in the age of planned economy; the supplies for people's everyday living were scarce and they obtained daily necessities through tickets. A bike was seen as one of *The*



*Four Big Things* (四大件)<sup>32</sup> (Doland, 2015) which households, especially newlyweds, yearned for. Bicycle possession (or generally speaking, The Four Big Things) was one of the symbols of the Chinese notion of *Good Life*. Since the late 1970s, cycling experienced a rapid growth until 1995. Since the reform and opening up in 1978, cycling was no longer a transport mode which only belonged to rich people. The bike was introduced and encouraged by government as a sign of equality and universalism, and was linked to modernity when Deng Xiaoping promoted *A Flying Pigeon* (飞鸽) in every household as a symbol of Chinese prosperity at that time (Christensen, 2017). By the end of the 1980s, bike possession had reached 400 million in the whole of China (Zhang et al. 2013). Most cities were in the early stage of urbanisation, cities were relatively compact, and daily commuting and trips involved relatively short distances. The economic reform improved household income so that ordinary people or even low-income households could afford a bike. Hence, cycling was a suitable as well as an affordable transport mode and became prevalent in China. Bike ownership in urban China had reached 197 bikes per hundred households in 1993. Cycling in rural China also became a very popular transport mode with 147 bike ownership per hundred households in 1995 (Zhang, Shaheen and Chen 2014).

After 1995, the conditions of cycling development in China changed a lot. There are several drivers which are important for understanding this change. Firstly, China's rapid urbanisation process, mentioned earlier in Chapter 3, resulted in changes in urban population size and land use pattern. The roads in modern city were mainly designed for vehicles and public transport, making the city unsuitable for cycling. Also, cycling was difficult to use for urban long-distance trips. Secondly, the continual growth of household income and improvement of living standards were constantly changing people's lifestyles and life philosophies. The old *Four Big Things* were replaced in the 1980s and now included a colour TV set, a stereo cassette player, a washing machine and a fridge (Latham 2006). They changed again at the turn of the millennium, and the new *Four Big Things* now referred to a smartphone, private car, apartment and bank savings (BBC News 2018). The private car has totally replaced bikes in people's wish list (Gerth 2016). The private car is an urban mobility mode, but it is also considered a status symbol. Thirdly, in China, the policy strategies have also played an important role in the process of cycling development through direct strategies on cycling or indirectly through strategies on the motor industry. The release of the *Standard of Urban Road Traffic* in 1995 was a turning point when

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<sup>32</sup> *The Four Big Things* is a phrase used frequently in China earlier, and referred to the four materials household (which newlyweds especially hoped to obtain). From the 1950s to 1970s, *The Four Big Things* included a bike, a sewing machine, a radio, and wristwatch. Since then, the term has come to refer to four goods which are the most fashionable at the time and could be listed in a wish list for most ordinary households. *The Four Big Things* have changed over time.



the central government first outlined an explicit direction for cycling development. The State Bureau of Technical Supervision and Ministry of Construction proposed several strategies in this document, including putting the priority of urban transportation on public transit; controlling the volume of bikes on the roads in big cities and controlling the cycling trips (*Standard of urban road traffic*, 1995; Zhang, Shaheen and Chen 2014). Overall, from a policy perspective, cycling was to some extent discouraged in the big cities after 1995. All these changes in everyday urban life caused an increasing number of people to rely more on public transportation, motorcycles and private cars, while bikes were gradually marginalized. According to a study on the change in the prevalence of cycling in China, the share of cycling as main mode of transportation was reduced from 46 % in the 1980s, to 44 % in the 1990s, and to 35 % in the 2000s. The prevalence of cycling decreased over time (Zhang, Shaheen and Chen 2014), while motorized vehicles (which includes both private cars and motorbikes as well as public buses) became the primary urban mobility mode.

After 2002, along with the rapid development of urban automobile in China's big cities, severe traffic congestion has caused huge negative impacts on the daily lives of urban residents. Moreover, environmental concerns have also been an important reason for policy makers to reconsider cycling as a potential solution. The innovations in cycling that emerged in the last decade have been characterized by a more convenient and faster service compared to the traditional cycling practice. Among the new forms of cycling, electric bikes and shared bikes have demonstrated the largest impact on cycling.

In the late 1990s the electric bike<sup>33</sup> emerged in China and grew rapidly (Weinert, Ma and Cherry 2007). In 2007, the electric bike possession reached 17 bikes per hundred households (Wang 2008, cited by Zhang, Shaheen and Chen 2014). The government's attitude towards E-bikes has been complex. At the beginning, it encouraged the use of electric bikes through giving energy efficiency discounts. However, the manufacturing of the E-bike has not been regulated, and some products have exceeded safety criteria for weight and speed limitation, which are the cause of potential cycling risks (Zhang, Shaheen and Chen 2014). The State Traffic Control Bureau have granted local governments the right to regulate of e-bike usage in 2014 (ibid.). The attitudes of local governments towards e-bikes have varied. The development of e-bikes has been allowed in some cities and these cities also have had comprehensive license systems for the registration of private e-bikes. Shanghai is one of these pro-electric bike cities. Some cities

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<sup>33</sup> Here the term electric bike includes two different types of E-bike, the first type is bike-style and requires a human pedal to propel it while it also has an electric battery installed as a supplementary power source to propel the bike. The second type is scooter-style, which is propelled by electricity.



have held a neutral attitude towards e-bikes, neither banning its usage nor encouraging it. In other cities e-bikes have been banned. The safety consideration of riding speedy electric bike and possible conflicts with other vehicles are the main reasons why many local governments have banned electric bikes.

Except for the development of electric bikes, the technical advances and innovations in the cycling industry have also brought other diverse cycling forms. In the past decades, the emerging of the sharing economy has also impacted on the cycling sector, and bike sharing (including e-bikes) made their appearance. In the next section, the main focus will be on illustrating the development trajectory of China's bike sharing industry.

## **5.2 Bike sharing in China**

### **5.2.1 Public bike sharing in China**

The first attempt of bike sharing started in the 1960s in Amsterdam (Demaio 2009; Fishman 2016), and technological advances and economic efficiency have gradually optimized operation systems. Public bike sharing is a form of bike service which offers short-time bike access, allowing users to pick up and return bikes in different stations (Shaheen, Guzman, and Zhang 2010; Zhang, Shaheen and Chen 2014).

The first bike sharing scheme in China was launched in Beijing by a private bike company (The Fangzhou Bicycle) in 2005. This scheme was led by the private sector with the purpose of profit. The Chinese government had learnt several lessons from overseas' experiences of bike sharing, and actively promoted public bike projects in many cities as early as in the beginning of the 2000s, aiming to keep and improve slow traffic in the city. In 2008, Hangzhou launched a non-profit public bike sharing scheme led by the local government. Local authorities provided necessary land for facilities (e.g. bike stations), and the public transit agency established a company in charge of bike sharing operations. The operations company received governmental subsidies, revenue via advertisements on bikes or station billboards and charged a small fee from the users if they used a shared bike for more than one hour. In 2012, 2,674 stations had already been built in Hangzhou and 65,000 shared bikes had been launched (Zhang, Shaheen and Chen 2014). This government-led and non-profit bike sharing form (public bike sharing) gradually surged in China. In 2012, there were 12 cities which had launched public bike sharing (PBS) schemes and 9 cities which employed pilot PBS programs. By May 2014, 162 PBS programs had been launched covering 29 provinces (Zheng 2017). When it came to the development situation of bike sharing (all types including government-led and private sector-



led) in China generally, in 2014 there were already 750,500 shared bikes put into service in 237 bike sharing systems (Fishman 2016).

### 5.2.2 Dockless bike sharing in China

In May 2015, ofo (小黄车)<sup>34</sup> integrated idle bicycle resources and launched 2,000 shared bicycles at the campus of Peking University (PKU). This was the first *Campus Bike Sharing Project* in China. Seeing a huge number of bikes lying idle on the campus and seldom used, five PKU graduates had an idea: making idle bikes handy for all and cycling anytime and anywhere as a potential mobility mode (Peking University 2015). Later they turned the idea into reality. Their business was subsequently extended to other universities and went out of the campus to a broader stage. ofo's former main market target (the campus) has been transformed, and presently it covers most large and medium-sized cities across the country and has even expanded to overseas markets, providing services in more than 250 cities in 20 countries around the world (4<sup>th</sup> Quarter 2017 China's Major Cities Cycling Report 2017). Mobike (摩拜单车) was another industry giant which was established in January 2015. At present, Mobike has launched its market in more than 200 cities all over the world (Mobike 2019). The ofo and Mobike have basically achieved a similar coverage in large and medium-sized cities in China, and there is not much difference in market distribution.

A low copying threshold of DBS mode resulted in a huge number of entrepreneurial firms becoming engaged in this area. As mentioned in the introduction chapter, it is estimated that more than 70 firms are engaged in the bike sharing industry. Dockless bike sharing systems were in place in more than 200 Chinese cities, and in total there were over 25 million shared bikes put into service in 2017 (*2017 Sharing Bicycle Economic and Social Impact Report* 2018). However, the challenges have been plenty along with the rapid development of DBS. Fierce business competition resulted in over-supply of shared bikes as each firm wanted to expand their market share. The number of shared bicycles has far exceeded the social demand, causing great pressure and troubles to urban space and social order.

The turmoil of the bike-sharing industry has resulted in a series of problems, including a huge number of broken and abandoned bikes piling up in cities across China; the most notorious examples are the *bicycle graveyards* that many cities have acquired. Meanwhile, other problems

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<sup>34</sup> Ofo is a Beijing-based bicycle sharing company founded in 2014. In China, ofo-brand bike has been given the nickname 'little yellow bike', predominantly by Beijing citizens and Chinese media. Ofo and Mobike are two bike sharing giant companies in China's recent dockless bike sharing industry.



associated with riding safety and user misdemeanour and/or misconduct, such as theft, vandalism, freeloading and parking chaos, also endanger this emerging mobility scheme.

## **5.3 Bike sharing in Shanghai**

### **5.3.1 Public bike sharing in Shanghai**

In 2009, Shanghai officially launched a public bike sharing system in Minhang District. It was a non-profit scheme offering completely free cycling services to residents in Minhang District (Minghang News 2019). The project adopted a cooperation mode between the local government and the company. Local government integrated land use, facilities resources and provided regulations to guarantee a good service for the public, while the Shanghai Permanent Bicycle Company conducted everyday management tasks. Local government used municipality funding and advertisement revenues to purchase services from the enterprise. In the early stage, the pilot project in Minhang district only constructed 20 stations along a metro transit with a low degree of scale and provided a limited number of services, but soon received favourable responses (Shanghai News 2013).

The project later started scaling-up, and by the end of 2013 the number of the stations reached 564 sites and the number of bikes was more than 19,000 (Zhu et al. 2012). The stations were mainly distributed around metro stations, bus stations, shopping centres, residential communities, government institutions and industrial areas. As with other bike sharing programs, public bike schemes also provide multiple-site bike access services, providing relatively flexible and convenient travel options.

In the first four years, Minhang PBS did not charge for any deposit fee and rental fee, as long as users resided in Minhang district. However, many problems came about under this access system. Nearly half of PBS cards were in the dormant state, and there were also serious problems associated with user misbehaviours such as theft and vandalism (Shanghai News, 2013). By 2013, in order to make sure the registered users were frequent utility users and used bikes accordingly with good manners, Minhang district cancelled the original service mode and started to charge a deposit fee (200-300 yuan) when issuing bicycle cards, which would bind with users' personal bank cards (Tencent News Morning Edition 2013). The cycling trip with public bikes within one hour was free of charge, and charging from 5 yuan to 10 yuan depended on time duration (Minhang News 2013). In the last few years, the prevalence of dockless bike sharing has brought lots of problems (a detailed description on DBS will be stated in the next section). Because many bike-sharing companies are in a difficult financial situation and facing



bankruptcy or are already bankrupt, it is hard to get back deposit refunds, and this is one significant problem which has damaged the trust between the bike sharing industry and ordinary users. This has also had a negative impact on PBS usage. In order to attract users to continue cycling with public bikes, Minhang Public Bicycle IC Card has officially opened a deposit-free service, cancelled the deposit (200 yuan), and only retained the saved money (for future deduction) in the account (100 yuan) since December 2018 (Minhang Urban Construction and Communications Commission 2019).

### **5.3.2 Challenges of traditional bike sharing system**

Some of the challenges of traditional bike sharing in Shanghai are similar to the problems that bike sharing programs in other cities (or other countries) are facing, namely a limited number of bike stations, inefficiency of bike rebalancing services, troublesome card binding process, and complex access operations. In China, traditional bike sharing systems are mostly led by government (some are operated under the public-private partnership mode), but the process of registering as a user is normally cumbersome. In Minhang district, Shanghai, residents need to bring their ID card and other relevant identity materials to a specific office to apply for the bike card. After paying a deposit (and/or saving some money on the card) and registering themselves, they may need to wait a few days to get the card (Dongfang News 2013). In addition, the layout of PBS station locations is fixed and not convenient enough, which greatly affects the users' willingness to actually use the service. Furthermore, users sometimes encounter an empty station when they need a bike or find a full station when they want to return the bike. Moreover, the shared bike has small profit margins, with most rides being within 1 hour and it is either free of charge or costs only a few yuans. Therefore, traditional public shared cycling greatly relies on a large number of governmental subsidies and funding for daily operation and maintenance. In Shanghai, PBS is facing yet another challenge: it is impossible to use public bikes across different districts (Shanghai Observer 2015). This has had a negative impact on the PBS cycling rate and the popularity of the PBS scheme. The above problems have all led to the low efficiency of the operation of public bicycles systems.

### **5.3.3 Dockless bike sharing in Shanghai**

Shanghai is among the earliest cities where launched dockless bike sharing scheme. In April 2016, Mobike was the first company launched DBS scheme in Shanghai, soon more than 12 companies have put their dockless shared bikes in the market. In August 2017, the number of shared bikes in Shanghai has exceeded 1.7 million (according to the China Bicycle Association,



cited by Xinmin Evening Newspaper 2017). According to one estimate, the bike demand in Shanghai is around 500,000, and the number of shared bicycles is far larger than the actual needs of the city.

On 18<sup>th</sup> of August 2017, the Shanghai Transportation Commission announced that Shanghai would control the number of shared bikes in the city and has enforced a ban on new shared bikes (CCTV<sup>35</sup> News, 2017). This was a turning point in that the number of shared bikes started to decrease in Shanghai. In the following year, other major cities in China, including as Beijing and Shenzhen, also enforced bans on new shared bikes.

Figure 5-1 Local authorities storing detained, abandoned or illegally parked shared bikes.



Photograph taken by author.

#### **5.3.4 Shared cycling in Shanghaiers' daily lives**

After launched dockless bike sharing in 2016, the shared cycling has become popular in Shanghai. Based on my fieldwork trips and interviews, I will briefly introduce how Shanghaiers practice shared cycling in their daily long-distance or short-distance trips.

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<sup>35</sup>CCTV is the acronym for China Central Television. It is the predominant state television broadcaster in Mainland China.



### **Urban long-distance trips**

Only a few of my informants practiced shared cycling on long-distance trips. For those trips, they mainly ride for the purpose of exercise. However, shared bike riding is not solely for the sake of doing exercise; it differs in this manner from riding the mountain bike or other specialist bikes. Long-distance users mostly ride shared bikes for space movement while doing exercise at the same time. For example, they ride shared bikes on their way home after they have finished their workday. Those trips are sometimes impromptu. For those who get used to riding shared bikes for long-distance trips, they always prepare various components to support their trips in various weather conditions. The paraphernalia includes gloves, scarves and other items that help keep them warm during cycling.

### **Urban short-distance trips**

Most of my informants practice shared cycling for short-distance urban trips. Only a few of them are frequent shared bike users. The frequent users ride shared bikes as a daily routinized commuting mode.

For the most part, it is occasional users that ride shared bikes for short-distance trips. They usually ride shared bikes for shopping-leisure purposes during the weekends. When they have abundant time, and are more flexible, they prefer cycling to their destinations with shared bikes. These short-distance shared bike trips take place occasionally and are always impromptu.

Many of my informants use shared bikes as part of their single trips, connected with other mobility practices. Shared bike riding always connects to public transportation as a *last-mile* solution. Their shared cycling behaviours are not fixed daily routines, greatly depend on weather conditions, the accessibility of the shared bikes, their own time schedules and many other factors.



## 6 Analysing shared cycling through a practice theory lens

Sahaklan and Wilhite (2014) argue that change of a certain practice might occur through understanding within the practice or the agentic aspects of the practice, then identifying the opportunities and spaces. In this chapter, I will explore and uncover shared cycling practice through a thorough analysis of the elements that constitute shared cycling based on the empirical data accessed during fieldwork in Shanghai.

A practice theory lens is applied to the data analysis. Shove et al. (2012) lump elements of practice into three categories (materials, meanings and competences), and I adopt their framework as my analytical structure when I explore China's recent shared cycling practice. Two master's theses using practice theory – one, a study founded on *a practice theory analysis on car sharing in Oslo* conducted by Cyriac George (2017) and two, a study on *bicycle commuting in Oslo* carried out by Liv Jorun Andenes (2014) – provided insight into the framing of my own study and analytical framework. My empirical work also helps me to structure my own study. The empirical data of my study was collected through 23 semi-structured interviews, and many informal conversations with local residents as well as the data from my own participant observations. All of the interviews were translated from Chinese by the author. It is worth mentioning here that *shared cycling* in this and following chapters refers solely to shared cycling with dockless bikes; i.e., it does not refer to other types of cycling, such as cycling with private bikes or cycling with public shared bikes.

### 6.1 Materials

Materials and/or objects fundamentally serve an instrumental function: they are involved in practices and directly impact on them (Shove et al. 2012). The materials existing around human beings have the power to shape their behaviour. The materials also have agency, and work in cooperation with other elements. In order to better understand behaviour, a study about materials is indispensable.

In this part of the chapter, I will analyse the material elements of shared cycling. There are several elements that overlap with conventional bike sharing and have not changed over time, other elements that have been transformed, while some elements no longer exist in shared



cycling. My analysis will involve all of these elements to explore the important material elements that shared cycling consists of.

### **6.1.1 The bicycle**

The most vital material for the cycling practice is undoubtedly the bicycle itself, and without it there would be no *cycling*. One premise of cycling is a simple but well-functioning bike (not a broken, problematic bike). The importance of the bike is the same as that of the body, which as a physical object for the existence of the cycling practice itself (riding a bike). Both the bike and the body should be taken into the consideration of the cycling practice at all times. Unlike some other materials which are required for only a short period of time in the cycling process, the bike is present at all times.

#### **The bicycle and its occupation of space**

The bike as a physical entity occupies space. It needs space to achieve movement and space in which to park when cycling practices have not yet started or have finished. There is a link between the bike and its accommodated space. I will analyse the role of space for supporting cycling movement later, (under section 6.1.2 Cycling infrastructure). Here, I focus on the role of space for the non-active bike. This type of space co-exists with the bike; it has agency and influences cycling.

Informant No. 15 used to be a bike owner, but sold her bike 5 years ago. She stated:

*After I moved to my new residence, I no longer commuted by bike. Since I was not using my bike that frequently, it was in my home almost all of the time. One day, I realized I had only used my bike several times over the past few months. Why not just sell it? Storing a bike at home occupies much space, so I sold it.*

After having changed her commuting mode, and before she sold her bike, she had actually ridden it on several occasions on the weekends and holidays. However, the extra space that storing the bike required made her eventually sell it. Afterwards, she did not practice cycling for years. She resumed it only after the dockless shared bikes hit Shanghai, with millions of shared bikes appearing in the streets and providing abundant materials.

*Nowadays, the dockless shared bike is very convenient. I can ride bikes and I don't need to own one, which would have to be stored in my home when I don't use it. If the weather is lovely, I prefer cycling to my workplace. (Informant No. 5)*



Except for Informant No. 5, who resumed occasional cycling with the reappearance of bikes in her everyday life, most of my informants mentioned that their cycling practices increased after DBS came to Shanghai. This illustrates the importance of bikes as central materials in the cycling practice.

Compared to the private bike, the bike for shared cycling does not elicit the same attachment from its rider. Hence, the mechanism of how parking space impacts shared cycling practice is different. Different to private bikes, the performers play different roles; they are not owners but users. The owner of the private bike has both the right to use the bike as well as some responsibilities, including the preparation of a parking space and its safekeeping. The user of a shared bike does not have this responsibility after its use.

The loose relationship between space and the shared bike brings both positive and negative impacts on the continuous reproduction of shared cycling. After the introduction of the DBS schemes in Shanghai, there are an increasing number of spaces used by shared bikes. The growth of shared cycling practice is significantly affected by the increasing number of shared bikes. During my second field trip, after the Shanghai government controlled the number of shared bikes, the number of spaces for shared bikes has decreased. After that, my informants told me they found it difficult to find a bike when they wanted to cycle. It seems that the greater the space made available for storing shared bikes, the higher the probability that shared cycling practice would take place. Many of the DBS companies were apparently pursuing the same logic, and placed as many bikes as they could before the bike control. Such behaviour by the DBS companies is problematic. They did not consider (or ignored) a major negative aspect of this loose relation, which is that it eliminates the responsibility of users to park the bikes in proper spaces. This was reflected in the huge number of serious parking misbehaviours taking place in Shanghai. The huge number of physical shared bikes and their chaotic spatial distribution had negative impacts on other practices (such as walking, with pedestrian paths being occupied by bikes), it also negatively affected how shared bikes were perceived by the public (from being seen in a positive light to be seeing as a troublemaker). These negative impacts in turn weakened the positives impacts that abundant material existence had brought.

During my interviews, I asked my informants where they parked their shared biked when their trips ended. Most people appreciated that the shared bike could be parked close to their destination, but did not fully assume responsibility for properly parking the bikes.



*I cycle to work most of the time. It is so convenient (with DBS). I park the bike outside my office building. There are a lot of firms nearby, there are always a lot of bikes already parked, and I do not always get enough time to park my bike in order. And sometimes I just find a very narrow gap where I can set my bike in, so it inevitably exceeds the limits of the parking zone. (Informant No. 11)*

*I cycle to malls and hang out with friends during the weekend with a DBS shared bike. After I've arrived, I always park my shared bike where other people park their bikes. I don't pay attention to whether it is in a parking zone or not. (Informant No. 11).*

Several informants had similar answers that they parked their bike where other people parked theirs. This was especially the situation outside the metro stations (e.g, see Figure 6-1).



Figure 6-1 Shared bike's inappropriate parking



Figure 6-2 Broken shared bike on the street.

Photograph taken by the author.

As illustrated in the photograph in Figure 6-1, the shared bikes have been parked at an inappropriate place. Even though there is a bike parking zone one minute away, it appears much easier to just stop and park the bike when other shared bikes are already there. Rather than blaming the performers for having low *suzhi* (素质)<sup>36</sup> when park the shared bike, it is important to focus on the core of this inappropriate parking problem—the loose relation among the

<sup>36</sup> *Suzhi* refers to the 'quality' of an individual or 'human quality', and is a term frequently used in China. It is related to the concepts of *breeding*, *personal cultivation* and *refinement*. (Australian centre on China in the world, 2013)



shared bike, space for non-active bikes and the performers. A potential method of reducing the negative impacts of this issue is to build or create linkages and change the loose relations.

### **The bicycle and its maintenance**

Another feature of the bike worth noting is that it needs constant maintenance to make sure it functions well until its usage next time. Shared bike transferred this responsibility from performers to DBS operational companies. DBS ensured performers were no longer in charge of taking care of the maintenance of the bike. Accordingly, this greatly encouraged more performers to participate in practicing shared cycling.

However, it must to be noted that the responsibility is transformed rather than being totally eliminated. In order to provide high-functioning bikes for shared cycling, ensuring the good quality of this most important *material* is vital. In Shanghai, compared to my first trip, there were many more broken bikes on the street during my second trip. Sometimes I could find a bunch of broken bikes banded together which means they had already been recognized by the operational companies (Figure 6-2). However, the maintenance and repairs were not always undertaken on time. Except for the acknowledged broken shared bikes, the number of broken or malfunctioning shared bikes was growing in the bike fleet.

*It was much easier to find a (shared) bike before, nowadays the number of bikes has decreased. I think ... maybe nine out of ten ofo<sup>37</sup> bikes are broken! Every time when I want to use a bike, I find many are broken. Sometimes after I have gotten on a bike, I have had some bad experience with non-functioning bikes.*

(Informant No. 4).

*Roughly estimated, 30% of the shared bikes I accessed were broken, some bikes cannot count as broken but still made me feel uncomfortable when I was riding them. (Informant No. 19).*

*I could not always find a bike that made me feel comfortable while cycling. For example, the seat sometimes was either too high or very low, the pedals sometimes needed big efforts to make them work. (Informant No. 12).*

As pointed out by Informant No. 12, unlike riding a private bike, performers rode a different shared bike each time, and one could never be certain that there would always be a comfortable

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<sup>37</sup> ofo, is one of several giant Chinese shared bike companies.



and suitable bike for its rider. Putting specific requirements from different riders aside, a well-functioning bike is unquestionably a shared premise of shared cycling. This point should always be taken into consideration if shared cycling wants to be continuously reproduced and achieve a stable practice.

### **The bicycle and its cost**

The cost of (using) a bike significantly affects individuals' cycling practice. One has to pay from several hundred to tens of thousands to purchase a bike. Unless the individual frequently uses a bike, he or she would most probably not be willing to buy one. However, the appearance of the (dockless) shared bike changed the cycling costs. For occasional bike users, they did not need to buy a bike before using it. Instead, they only had to spend a small entering fee for using it under the bike sharing scheme.

The price of dockless shared cycling service has changed over time. The operational companies frequently changed their pricing strategies. Informant 5 stated:

*When dockless shared bikes just launched in Shanghai, there were a lot of free single riding coupons. I even got a free monthly ticket. I paid almost nothing riding shared bikes back then.*

During my first trip in Shanghai at the beginning of 2018, the operational companies still had many promotion activities. I used shared bikes from both ofo and Mobike company, and at that time I always got free-riding coupons (as showed in Figure 6-3 and Figure 6-4). The pricing system were different among the bike sharing companies. Ofo charged 1 yuan for its first one-hour ride, while Mobike charged 1 yuan<sup>38</sup> for its 30-minutes ride and charged 2 yuan for the next half an hour. However, I always paid nothing because of a lot of coupons. My informants told me that they also always got *red pockets* (红包 the coupons). Many of them admitted that the cheap price and the free coupons increased their cycling frequency. In contrast, during my second trip in Shanghai, there were almost no coupons available, and the monthly ticket price had also increased.

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<sup>38</sup> Yuan is the official currency of the People's Republic of China. One Chinese yuan = 0.14 U.S. dollars (in 2019).



Figure 6-3 ofo trip information (based on author's own trip)

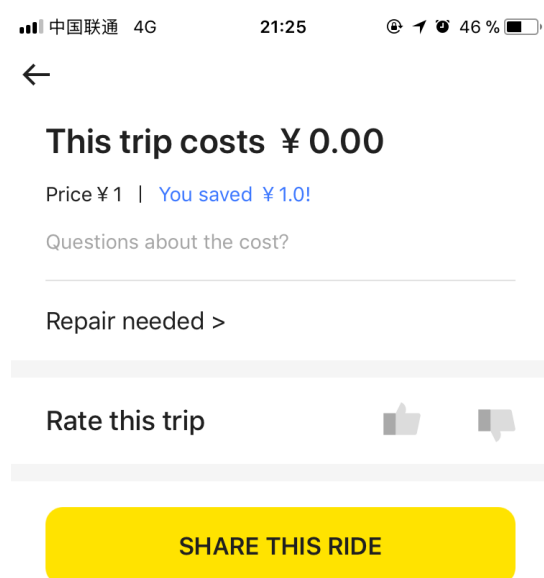
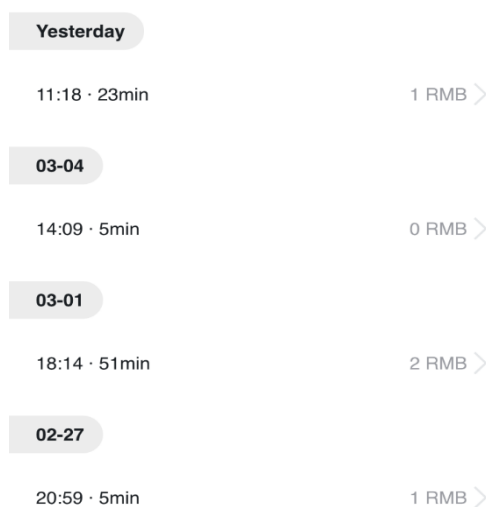


Figure 6-4 Mobike trips information (based on author's own trips)



source: screenshots from author's own phone

Informant 8 states:

*I used to have monthly tickets, which only cost several yuan, but now it costs 20 yuan. I no longer purchase it.*

She also told me that the raised riding price and a higher monthly ticket fee somehow decreased her cycling frequency. Some of my other informants also said the higher costs was one of the reasons that made them use shared bike less. Although the price of shared bike riding was already very low and affordable for the public, many would instead choose to walk for some short-distance trips if they had to pay for shared cycling<sup>39</sup>. The low price of shared bike also implies that it could be easily substituted by public transport or walking once its price increased.

Except for single trip costs, most of the shared cycling service providers charge for the deposit fee ranging from 99 yuan to 299 yuan. Most of my informants said they do not like the deposit system:

*299 yuan is enough to purchase a basic bicycle. (Informant 19)*

<sup>39</sup> It is worth noting that the price of a single shared bike riding raised again in 2019. It costs 1 yuan for the first 15 minutes, and 0.5 yuan more every following 15 minutes. For a one-hour trip, it costs 2.5 yuan, which is higher than taking a bus. For details, see <https://www.huxiu.com/article/293086.html>



There was the scandal that many DBS companies appropriated users' deposits to develop their business, but once they got bankrupt, they no longer repaid their users.

Some bankrupt companies already had defaulted in giving back deposit fees, which had a terrible effect on all DBS users. During my second field trip in Shanghai, some firms cancelled the mandatory requirements of deposit fee (such as ofo, users can exempt paying deposit as long as they have enough sesame credit 芝麻信用<sup>40</sup>), but not all (former) users knew this change.

Informant 17 frequently used shared bike before she took parental leave. While she was at home waiting for the birth of her baby, she heard about the DBS scandal, so she withdrew the deposit fee, and no longer used shared bikes since then. After knew her concern on DBS deposit, I told her that ofo already applied zero deposit fee if she has enough sesame credit. However, she would not willing to reregister as the user again.

The frequent changes in the companies' pricing systems makes it difficult for users to stay up to date. The renewed strategies may not reverse the decline of DBS usage.

Compared to owned bicycles, dockless shared bikes provide a low entering fee for using bikes. It is affordable for the public. However, since users do not have ownership of the bicycles, it also brings some drawbacks, such as inadequate maintenance of the bikes and parking chaos.

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<sup>40</sup> Sesame Credit (芝麻信用) is a private credit scoring and loyalty program system developed by Ant Financial Services Group, an affiliate of the Chinese Alibaba Group.



### 6.1.2 Cycling infrastructure

As mentioned in the last section, the bike as a physical substance occupies space regardless of whether it is in movement or not. When humans practice cycling, the road for its movement has impact on shared cycling.

In Shanghai, according to my own observation and interviews, although cycling lines have not covered all areas, the network of basic cycling roads are quite extensive. The material existence of cycling roads provides space for the practice of cycling. Although they do not always function perfectly, they have provided good support for shared cycling (or generally, all kinds of cycling).

However, the condition of cycling lines varies, which means certain areas may facilitate cycling practice while others may lag behind.

*In general, the bike lane covered the areas I cycled, but some bike roads are very narrow, which causes inconvenience. (Informant No. 11)*

*I enjoy cycling commuting, on my way to work, most of the cycling road I went through was separated from vehicle lane, and there were trees between cycling lanes and vehicle lanes. It is safer than those roads which are not separated from vehicles or those that only paint white lines for separation. Moreover, cycling under the trees on hot summer days has a cooling effect.*

(Informant No. 11)

*I think the cycling conditions are good. As you can see, no matter young or old, no matter female or male, they all cycle in Shanghai. (Informant No 14)*

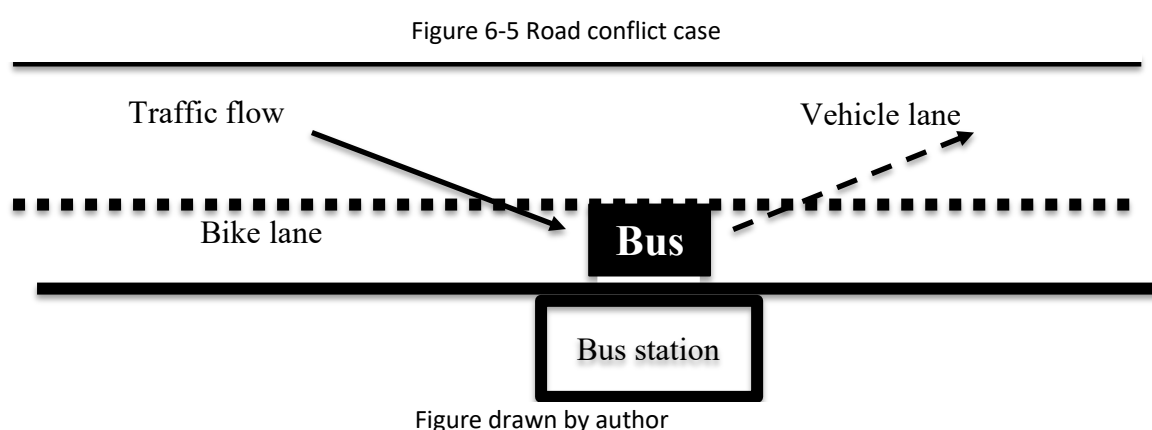
Almost all my interviewees held a positive attitude towards Shanghai's cycling roads. However, how individuals perceive the cycling roads varies, depending on their embodied knowledge. After I visited Copenhagen in May 2018, certain aspects of the urban design impressed me. Compared with Copenhagen, the cycling conditions in Shanghai are more disorderly and less biker- friendly.

When I look at Shanghai's cycling conditions, I do not find it that satisfying. This is mainly because of the high expectations linked to my own embodied knowledge. For example, when



mentioning that the conditions of many of Shanghai's cycling roads annoyed me (see below), my interviewees did not think it was a big problem.

From my own perspective, there were several aspects of the design of cycling roads in Shanghai that were unsatisfactory, and I have illustrated the one that annoyed me the most below. On my way forward, the bus would stop in the bike lane, preventing me from moving forward. Then the passengers would get off the bus, which would slow my riding down, and it is actually an unsafe situation for the cyclist as well as the passengers who are getting off.



In summary, the basic bike lane is necessary material for cycling. Ideally speaking, the better the conditions and more reasonable the bike lanes are, the more positive the effect on the (shared) cycling being practiced. However, this element has links with other elements (for example, the competence of cycling, embodied knowledges), the precise impact is difficult to assess. Shanghai's cycling lanes have provided sufficient support for the recent rise in shared cycling.

Another important cycling infrastructure is the parking zone. I already discussed this in the bike section. The loose relation between the parking zone and the bike weakens the importance of parking zones. As I stated in the methodology chapter, when I conducted my second fieldwork in Shanghai, the number of parking zones had increased. However, the core problem was not the parking zone itself, but the linkage between the performers, the bikes and the parking space.

### 6.1.3 Components and supplementary components of shared bikes

#### Components of shared bikes

The basket, the bike bell, the smart locker, the GPS device and the smart phone (with interface connected with shared bike usage and payment system) are all components of a shared bike. They are *things* which have agency and influence shared cycling (Wilhite 2016). Some



components (the basket, bike bell, locker) are part of the bike, some (digital interface and payment system embedded in a smart phone) are extra components of a bike.

The basket and bell provide assisting functions for (shared) cycling, they are not active all the time, just for a period or some moments. In this section, I will mainly focus on the smart locker, GPS device, and a digital interface and payment system embedded in a smart phone. These three components differentiate shared bikes from conventional bikes. Regarding the locker and GPS device embedded in the bike, their qualities and functions are implemented by the operational companies, but their usage is linked to users. The smartphone with the bikeshare application and the mobile payment system is linked to the cyclists while the design and operation are linked to DBS companies. Therefore, these components co-exist on both sides, and both of them have the potential of agency regarding shared cycling.

Generally speaking, the new smart locker combined with its operation system on smartphones makes the locking process achieved by remote control, and no longer depends on physical force. The advanced technological innovation is key in the transformation of the traditional bike to a shared bike. All my informants apart from Informant No. 3 had shared bike user experiences. The statistics show that in China, the total users of mobile payment in 2018 had reached 890 million (36 Kr 2018). The prevalence of mobile payment and smartphone applications provided strong support for shared cycling. Most urban residents had experience using multifunctional smartphones with regard to positioning, mobile payment and other functions.

In the past, the main function of the lock was to prevent theft; once it is broken, the bike would disappear for its owner. The user is not the owner of a shared bike, and once the bike had been stolen, there was no impact on users. This fact made more performers willing to practice shared biking. However, the operational companies also needed to pay for stolen and free-loading shared bikes, which may have negative impact on their future operations. Thus, apart from the core technology that makes shared bikes possible, the fundamental and utilized function of the smart lock is to prevent the bikes from being stolen.

### **Supplementary components of shared bike**

The scarves, mittens, helmets and so on are supplementary components of shared biking. In China, there is no regulation asking cyclists to wear a helmet. Very few ordinary cyclists wear them. The wearing of gloves, masks and scarves, the additional physical stuff in the cycling practice, are a more common sight among cyclists. But their existence is not necessary for all cyclists, at least not all of the time, and mostly during windy and cold weather conditions.



*When the weather is getting cold, I will wear a mask, a scarf and gloves while cycling. (Informant No. 15)*

Informant No. 15 often rides a shared bike. She told me more than 30 per cent of her daily commuting involves shared cycling. On her way to work, she takes the bus, but on her way back home, she always rides a shared bike. She explained *except on very cold days or rainy days, I prefer cycling home. The mask, scarf and mittens keep me warm if it's getting cold.*

*If it is cold or rainy, I will take a taxi or public transport. (Informant No. 8)*

Informant No. 8 often uses shared bikes, but she clearly stated she would use other transport modes when the weather is not good. When I asked her if she would consider biking on cold days if she had some supplementary accessories to keep her warm? She answered:

*Maybe no. Why bother preparing these accessories? And, I think that even if I wear these accessories, I would probably still get cold. If sick, I will not cycle!*

Through her answer, it is clear that these supplementary accessories are not necessary for stimulating (shared) cycling. However, their existence can have a positive impact on shared cycling.

Informant No. 11 rode shared bike for commuting, and as a daily commuter explained:

*In winter, I do not cycle. This winter it was snowing a lot in Shanghai. It is too cold. ... During other seasons, I still choose to cycle to work. It takes me only 15 minutes to get to the office. I will wear scarf and gloves to keep warm if it is cold.*

While Informant No. 12 states,

*I wear a scarf and gloves in winter or on light rainy days while cycling.*

Informant No. 12 is private bike user. Her daily commuting involves relying on a bike. Even in winter, except during extreme weather conditions, she will ride her bike.

According to the above statements, these accessories play more important roles for daily or frequent bike users, but have little impact on occasional users. For continuous (shared) cycling performance, they are important, but they are not necessary for all.



#### 6.1.4 Material environment

Compared with other popular mobility practices such as public transit and car driving, the material environment like geography, topography and weather greatly impact on (shared) cycling. Cycling performance is more exposed to, and influenced by the external environment. Thus, these elements have greater impact on cycling.

In the last section, the statements provided by my informants suggest that cold, windy and rainy weather negatively impacts on (shared) cycling. The geography and topography also greatly impact on cycling, since cycling needs continuous pedalling to make the bike move forward.

*I like biking along the Huangpu River. It is enjoyable. (Informant No. 13)*

Informant No. 13 is a car owner. He rarely used a shared bike. However, he used shared biking along the Huangpu River. The roads along the Huangpu River are well constructed and flat, and the sightseeing is also good. This geography produces certain *meaning* and makes a highly car dependent user practice shared cycling.

*I use a shared bike as last mile solution, sometimes riding it from metro station to home, I never ride bikes from home to the metro station because it is uphill, but on my way back home, it is downhill and that makes the cycling experience cooler.*

(Informant No. 20)

*After I get off the metro, I often take a taxi for a 10-minute-long drive home. On my way home, there is an overline bridge. It hard to cycle there. I don't use a shared bike on this part because it requires lots of energy. I choose taxis most of time. It costs no more than 20 yuan, not expensive. (Informant No. 17)*

Their answers reflect on the importance of topography as an existing material impact on (shared) cycling. These material environmental elements vary in different cities. In Shanghai, according to documentation and my own participant observation as well as my interviews, it can be concluded that, generally speaking, environmental elements are suitable for (shared) cycling.

## 6.2 Competences

Skills or competences are indispensable for shared cycling practice taking place. These types of embodied knowledge include multiple types of understanding, know-how, and techniques.



For example, knowing how to ride a bike, how to recognize different traffic signs and making corresponding decisions, how to behave in different traffic lights, constitutes important embodied knowledge in the practice cycling.

### 6.2.1 Riding a shared bike

Bike riding is the most vital skill, without which (shared) cycling would not be achieved. The ability to operate a bike and successfully pedal it to move around is based on a type of embodied knowledge (Bourdieu 1990, 1993). This kind of knowledge cannot be verbalized or represented; humans develop this know-how (knowledge) through their own bodies. When a rider starts cycling, there is not too much subjective deliberation on how to keep their balance and move forward.

Among all my informants, there was only one who had never ridden a shared bike after the DBS hit China. Among all the others, even though their main travel mode was not shared cycling and some of them were a car, a scooter or private bikes, they have all had shared cycling experiences at least a few times.

I asked the informant who had not tried shared biking why she had not tried it even once, and she said:

*Yes, shared bike is convenient for sure. Almost all my classmates and friends around ride it. From my campus to the nearest metro station, it takes around thirty minutes walking. They all cycle to the metro station if they want go downtown. The thing is I do not know how to ride a bike, that is why I haven't tried once.*

(Informant No. 3)

The barrier that hindered her from shared cycling was the riding competence. When asked why she did not learn cycling before, she said,

*When I was young, my parents drove me, later, when I grew up, I mainly took public transport. My residential locations were always nearby the public hub. For her, there was no cycling demand earlier. Now, with a bike it will be faster to go to the metro station, but I don't want to learn to cycle. I'm not that young, my body is not that flexible. It's easier to get hurt. If I do need to hurry to go to the metro station, I will take a taxi.*



The reason why she did not know cycling is related to her own socio-historical experiences. The bike riding skill is a significant skill for shared cycling. That a huge number of residents in Shanghai knew how to ride a bike was a precondition for why shared cycling increased as fast as it did.

However, shared cycling would not necessarily directly encourage more people to learn cycling.

The abilities and competences for riding a shared bike is not too different from riding a conventional private bike. If any differences exist, that must be that for each trip there is most probably a new bike that is used (this issue is connected with materials which I already discussed in the former section). For this feature of shared bike, the adaptability of operating different bikes is also needed to some extent.

The other capability that also plays a vital impact on (shared) cycling is how to reach the destination. That includes navigating ability as well as the basic knowledge about local traffic rules, traffic signs and so on. These knowledges provide assistance for riding a bike around on the urban roads.

### **6.2.2 Using shared bike appliance**

Unlike conventional cycling, shared cycling in Shanghai's context asks for operative skills on DBS appliances including using a digital interface to find a bike, unlock and use a bike. All of these operations are embedded in the smartphone.

In order to successfully get a shared bike, in general, the users are required to be familiar with smartphone operations, at least in specific areas. First, it is necessary to build a connection between one's own smart phone and the bike sharing service; this involves searching, downloading and installing the shared bike appliance through the smart phone or finding out the shared bike interface from mobile payment applications. Second, users have to register themselves through DBS applications: input basic individual information, link and empower the bike sharing application to a mobile payment system, and make sure that automatic payments will be created after shared cycling trips. Third, the operative skills on shared bike usage are required each time when shared cycling is practiced, and include identifying the position of the DBS bike nearby through the digital interface, unlocking it, and when the trip is finished, locking the bike and completing the payment.



Some skills like search, download and registration of personal information have been performed in other practices, which means the user may already be familiar with them. The operational interface of DBS and the usage of shared bikes can also be similar with other existing on-line mobility practices (for example, on-line taxi services, car sharing). Thus, the competence of DBS application can be transformed from competences carried out by other similar practices, and the user can mimic how they have been complimented before (Shove et al. 2012).

Nowadays, mobile phones have already become an indispensable part of Shanghaiers' everyday life. Figure 6-4 shows what I observed when I was in Shanghai, that almost everyone is playing with their phones on the metro. Even the broadcasting at the metro stations kept saying, 'Please hold on to the armrest while taking the elevator. Do not play with your phones'. As crowded as Shanghai's metro stations are, the fact that people are still playing with their phones all the time shows how addicted Chinese urban residents are to their phones.

*Nowadays with a smartphone I do not even need to bring my wallet outside. I often hang out with friends and only bring my cell phone with me. I could use my phone to call the taxi service, ride DBS bikes, buy fruits, snacks and clothes in shops, pay for food at restaurants, and order groceries (Informant No. 5)*

As my informant mentioned, in the past years, online shopping and off-line mobile payments have been prevalent<sup>41</sup>. It is convenient to achieve almost all of daily life's monetary transactions through different applications embedded in the mobile phone.

In cities, especially in a metropolis like Shanghai, most off-line shops accept mobile payment, and there is no need to bring a bank card or cash. Gradually, other types of services all started to become online-oriented. Shanghai metro started to use online payment (with its own application software) replacing the old metro card since the start of 2018. After several years of development of online services, most people have improved their skills of operating various online payment application software. Thus, it has been quick and easy for users to enter the new shared bike services.

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<sup>41</sup> China is now the world leader in e-commerce and digital payments. According to the McKinsey report, in mobile payments, penetration among China's internet users has grown to 68 percent in 2016. Online source: <https://www.mckinsey.com/~media/mckinsey/featured%20insights/China/Chinas%20digital%20economy%20A%20leading%20global%20force/MGI-Chinas-digital-economy-A-leading-global-force.ashx>



Figure 6-6 Mobile phone is vital for residents' everyday life in Shanghai



Photograph taken by the author.

Specifically speaking, in terms of DBS application, even though the user already has enough competence to operate it, there are also some distinctive factors in using the shared cycling application.

One of my informants complained about the rapid and frequent changing operation systems on DBS. She used to be a frequent DBS user riding shared bikes frequently when commuting between her home and the metro station, but now she does not use it anymore.

*After several months of pregnancy leave, I found out there are many changes on the DBS operation systems. I have downloaded two DBS companies' applications for riding two brands of bikes, but later on, I found out there were always some changes in these applications, for example, one stopped asking for a deposit fee, but needed extra operations for confirming real-name identity. And sometimes I got confused between the two DBS applications. After I got my deposit refund, I just deleted both of them. Don't want to spend time for confirming real-name identity and do any other extra operations for them. (Informant No. 17)*

Her experience illustrates that a routinized operation on these applications is actually important for shared cycling. Frequently changing digital interfaces, payment modes and operation systems requires high competence in adapting to those operative changes, and this ability differs among individuals.



### 6.2.3 Planning trips

Shared cycling is a mobility practice closely related with the ordinary day travel behaviours of residents. Time and route planning prior to the travel is required. When it comes to whether to use a shared bike or not, it greatly depends on the trip distance, the user's trip purpose, schedule, weather, alternative transport modes, and so on.

The users require competence in estimating the travel time with different transport modes. They also need a comprehensive ability to compare differences of various mobility practices for certain trip purposes. In addition, they require basic analysis skills of the weather and other external environmental factors. In the end, they make a basic judgement about whether the conditions are suitable for cycling, and whether they would like to do shared cycling. Once they have decided to travel via shared cycling, they need a clear plan about where to find the bike, how long it may take, which route they will follow toward their destination, and what kind of speed they should aim at.

All my informants had many considerations to tackle in their trip planning process. The most important one was the trip distance. Obviously, (shared) cycling is not suitable for long distance trips. However, there are still exceptions.

*I cycle home sometimes. It takes around 40 minutes, it is a kind of exercise for me.*

(Informant No. 15)

*I take the bus when going to the company in the morning, but I choose to ride a shared bike home around 2 or 3 times per week. It takes around one hour. I think this long-distance cycling is a good way to exercise. If it is too hot or too cold I will not ride the bike.* (Informant No. 14)

Informant No. 14 told me the distance between his home and his workplace is around 15 kilometres. He accepted long-distance shared cycling because he wanted to do exercise in this way. There were still some other considerations when he planned a trip with the shared bike. The weather conditions were a significant factor that impacted on his shared cycling. He continued to tell me that he did not want to cycle to his workplace in the morning, because he was always in a hurry during morning commuting, and he always got sweaty, which made him uncomfortable the whole day. By contrast, biking home did not raise these issues, his time was more flexible and he could take his time; and after long-distance biking, he did not need to



worry about getting sweaty since he could take a shower right after he arrived back home. In summary, his final travel plans also combined other considerations such as time scheduling and comfort considerations.

Although cycling is not suitable for long-distance trips, there are still some (e.g. Informants No. 14 and No. 15) who do long-distance shared cycling for exercise purposes. It reveals the significant impact of the trip purpose on the trip planning process.

When it comes to daily commuting as a trip purpose, time and efficiency will, especially in the mornings, be prioritized in different mobility practices. Many of my informants mentioned that they did shared cycling from their homes to the metro because it was quicker. It helped them get to the metro station faster than they otherwise would.

However, the situation was different when they finished work and planned going home. The occasional shared cyclists do not consider time and efficiency that important at the end of their working day. Instead, they want to experience the freedom the bike brings and enjoy the free time after working the whole day. (This will be illustrated in detail in the next section, when I analysis meanings.)

For most shared cyclists, riding a shared bike as a last-mile solution is usually an instant plan rather than a fixed original plan. The appearance of many shared bikes in the city streets has rendered bike accessibility relatively high. It is easy and efficient to replace the walking practice. Shared cycling has become an alternative to walking and other short-distance public transit. Except from substituting other short-term mobility practices, shared cycling also plays an important role in entertainment-purpose trips. This could be witnessed in my interviews and my own participant observation.

*During the weekend, when I go shopping, to the cinema or the restaurant, I will ride a shared bike if the distance is within 5 km. (Informant No. 14)*

*As a car owner, most of my trips are done by car. But sometimes, after work, when a group of my colleagues want to have dinner together somewhere near our company, we would ride shared bikes together to find a place. (Informant No. 1)*

*I use shared bikes during the weekend if I go to the shopping mall nearby. (Informant No. 19)*

Some informants also mentioned other considerations in their trip planning process.



*If I wear high-heel shoes that day, or if I am in a hurry, I will choose shared cycling to get to my workplace. Otherwise I will take a walk.*

(Informant No. 2)

For Informant No. 2, her home is close to the company she works at (walking quickly takes her around 15 minutes, shared cycling takes her about ten minutes). When she plans her trips, shared bikes would be a prioritized choice only when time was limited, or she wanted to save energy. Her mobility decisions come out of planning skills she has developed as embodied experiences, ones that she may not even notice or be conscious of herself.

This is another example that she made her trip plan with her own preferences.

*After work to home, I sometimes ride the shared bike from the metro station to my home, but if I wear a dress, I will definitely not cycle.*

(Informant No. 20)

In summary, the basic trip planning skill is a set of skills based on an individual's embodied knowledge and other elements. Individuals plan their mobility trips with a shared bike using multiple considerations, including trip purpose, trip distance, material environments, time efficiency and their own embodied knowledge.

## **6.3 Meanings**

Meanings are another important element group that affect practice, including a series of norms and customs shared within social groups. The meanings shared within the group sometimes are shaped by tacit and unconscious knowledge. They have an inarticulate agency to influence acts, which does not belong to the mind's conscious and reflexive part, but is significant.

The meanings are co-existing and linking with materials and competences of shared cycling.

Compared to the traditional private bike or traditional public shared bike, the meanings of biking have changed a lot with the appearance of dockless shared bikes. In this section I will explore this change in the meaning of cycling. The data is partly from interviews and partly from documentary literature.



### 6.3.1 Newness

No one can neglect those colourful dockless shared bikes scattered all over the city.

Informant No.1 stated: *I like to try new things. When dockless shared bike was introduced in town, I tried it for fun.* While informant No.11 also mentioned that: *I'm glad that we have this new travelling mode.* Many other informants had also talked about the newness of shared cycling during their interviews.

According to media discourse and my empirical interview data, the dockless bike sharing system was perceived as a new urban mobility mode, and the shared cycling was perceived as new urban phenomenon.

From the 1950s and until the 1980s, a bike was seen as one of *The Four Big Things* (bike, sewing machine, radio and wristwatch), which were the four material household commodities that people (especially newlyweds) hoped to have. The bike was also seen as one of the symbols of the Chinese notion of *Good Life*. After the reform and opening up, the bike gradually became an ordinary thing and cycling even became considered a *cheap* and *low-grade* transport mode after the millennium. In contrast, the car gradually became a symbol of the modern transport mode. However, after the appearance of dockless shared bikes, the meaning of bike was transformed to the symbol of newness and biking became fashionable.

### 6.3.2 Innovation

Once shared cycling appeared, it has been closely connected to the meaning of innovation. Dockless bike sharing systems relate to the meaning of innovation in two important ways. First, it is a representative of the *sharing economy*. Secondly, compared to conventional bike sharing schemes, it is under the new *dockless* system. I will illustrate these two aspects of innovation as a significant meaning of shared bike below.

In China, by the beginning of 2012, mobile-based traveling services had already appeared, including in the car rental, carpooling, and taxi domains, and had received good market response. DBS bicycle appeared in the context of this broader sharing economy growth. All kinds of *sharing* services have made the *sharing* concept a hot topic in media and daily life discourses. The DBS has become the new representative product of the sharing economy and has been implemented at an impressive scale in China. The innovation meaning derives from the *sharing* concept. *Sharing* makes the original ownership-based bike transform into an access-



based bike. The user right has been distributed to multiple individuals. This innovation of ‘sharing’ the user right has been considered a more sustainable mode of consumption. Hence, shared cycling with its *sharing* feature is closely connected to the meaning of innovation.

Another feature of DBS shared cycling is that users can pick up and return bikes at anytime and anywhere with the innovative *dockless* system. This technology has made shared cycling even more flexible and convenient.

The phrase *Four New Inventions* has become popular since 2017. This is a new saying which represents China’s recent four new innovative products, namely, high-speed rail, Alipay<sup>42</sup>, E-commerce and dockless shared bicycles (Xinhua News 2017). In other words, the dockless shared bike is considered to be at the forefront of innovation in China. Thereby, shared bike not only connected to innovation but also the national pride. For public, there is a strong wish on the transformation from *made in China* to *invented in China*. The shared bike represents the production invented in China, thereby closely connected to national pride.

In summary, in media and everyday life discourses, shared cycling is closely connected to innovation, since it consists of innovative ideas from the *sharing* concept, the *dockless* idea and recently developed advanced technology.

### 6.3.1 Flexibility and convenience

The meaning of flexibility of shared cycling derives from several aspects. First, compared to the traditional shared bike, the *dockless* system made bike sharing much more flexible. The experience of my informants and my own shared cycling experience all illustrate how flexible the shared bike rental could be.

*I live in Minhang district. In our district, the public bike used to be quite popular. I did not apply to become a user of the public bike share scheme, because I don’t think it is convenient. There was a station near the metro station, but there was no station near my home. If I want riding with that bike, I have to plan in advance where I can get the bike and which spot would be convenient to return it. It is inconvenient. Now DBS is much more flexible and convenient! (Informant No. 7)*

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<sup>42</sup> Alipay was established in 2004 by China’s e-commerce giant Alibaba Group, and it is a leading mobile and online payment service in China. According to its official website, it has more than 1,000,000,000 users. Source: <https://intl.alipay.com>. Accessed on 19<sup>th</sup> June, 2019.



The convenience of *dockless* system makes shared cycling practice more flexible.

Secondly, the (shared) cycling itself is a flexible transport mode. It is not like the metro or the bus, which has specific stops. With DBS cyclists can stop anywhere they want. When I was cycling in Shanghai, there are always some grocery stores or shops along my way. I sometimes stopped and did some shopping before arriving at my destination. If one was taking a bus and saw some interesting shops along the way, it would probably be inconvenient to get off at the nearest stop and have a look.

*Shared cycling makes you feel more freedom. You will not come across traffic jams.*

*You can do more sightseeing while biking.* (Informant No. 2)

Many of my informants also mentioned that their entertainment-purpose weekend trips with a DBS bike were always along flexible routes that could not be achieved with public transit.

The meaning (or the feeling perceived by my informants) of convenience comes from the flexibility (which brings the spatial and temporal free) of shared cycling. It also comes from the simple and friendly manipulating and payment process of the shared cycling. As mention in competence section, the process of using a shared bike and mobile payment is easy, which enrich the meaning of convenience.

### **6.3.2     Going Green**

Cycling is broadly accepted as a desirable means of transportation, and believed to be a transport mode that contributes to a sustainable urban mobility future.

When talking about shared cycling, some of my informants mentioned that they associate biking with being environmentally friendly, low in carbon emissions, inclusive and health promoting.

*Shared bike is a low-carbon mode, I think promoting it is good for city.*

(Informant No. 20)

*I appreciate the appearance of the shared bike, it is convenient, cheap and environmental friendly.* (Informant No. 19)

*Cycling is a good way to exercise. It is convenient, low carbon and provides quicker short-distance assistance.* (Informant No. 4)



The interview data showing that *green* as an abstract meaning is associated with shared cycling, but not as strong as the media and policy discourse does. When enquiring their concerns and motivations, my informants mentioned other meanings of shared cycling more than the green one. Most of time, they talk about the environmental perspective when I listed these words in my question (or when I went further and asked them about it)<sup>43</sup>. However, after several problematic issues got attention such as reports about bike graveyards, the green meaning of the shared bike decreased both from the evidence of my empirical data and media discourse.

### 6.3.3 Chaos

#### Chaos on the streetscape

According to the China Bicycle Association (cited by Chen and Chen, 2018), before the launch of DBS, the total bicycle production in China in 2014 was 83 million. Among them, 62 million were exported to overseas market, and only 21 million were for the domestic market. In 2017, after DBS rose in popularity, the annual production of shared bicycles reached 23 million, which far exceeded the demand of former years. The *dockless* system has brought convenience, but at the same time, it has also brought problems. As mentioned in the introduction chapter, riding safety and user misbehaviour such as theft, vandalism, freeloading, and parking chaos are serious problems.

Shanghai has witnessed an oversupply of shared bikes. In August 2017, the number of shared bicycles in Shanghai exceeded 1.7 million (the China Bicycle Association, cited by Xinmin Evening Newspaper, 2017), which is far above an estimated demand of 50,000.

As Informant No. 12 stated,

*The bikes are hiding the sides walks. It is very annoying and negatively impact the appearance of a city.*

During my field trips in China, I saw a lot of shared bicycle parking problems. Shared bikes are being parked everywhere; they are occupying the blind roads, sidewalks and vehicle lanes, and hiding doors of shops along the streets.

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<sup>43</sup> See Appendix A. Interview Guide. One of my guiding questions is *What is your consideration when you choose to use shared bike? (time saving, money saving, environmental consideration...?)*. Sometimes I went further by asking them do you have environmental consideration when you choose to ride a shared bike.



## **Chaos in the bike sharing industry**

As mentioned in the introduction to this thesis in Chapter 1, many companies in the DBS industry entered into a fierce business battle from 2017. Their rapid scaling-up process and low (zero)-profit operational mode quickly burnt through their capital and resulted in bankruptcy for many of them. More than 20 out of 77 bike-sharing companies had already closed down or stopped daily operations in the beginning of 2018. The turmoil of the bike-sharing industry has resulted in a huge number of broken and abandoned bikes piling up in cities across China, which further increased the shared-bike induced chaos in the streetscape.

The DBS companies that went bankrupt were unable to pay back the deposit fee. This had negative impacts on other DBS companies.

The chaos in the bike sharing industry also changed the meaning perceived by my informants. Many of them worried about whether they would get back their deposit refund and decided to quit the DBS scheme and this reduced the number of shared cyclists to some extent. The ongoing chaos from the shared bike misbehaviours and the various problems in the DBS industry have attached negative connotations to shared cycling.



## 7 Competing practices of shared cycling

Mobility practices have complex relations with one another. (1) Individuals engage in various urban mobility practices during the span of their everyday routines. Some of these mobility practices compete with a number of other mobility practices. (2) Some mobility practices are connected to others in one single trip, because most trips are multimodal mobility practices. For example, the daily commuting of informant No. 4 is a trip which consists of two kinds of mobility practices (walking and taking the metro) and three different stages: First, she walks for around eight minutes to the metro station. Then she transfers to metro mode, taking a ten-minute metro ride. In the end, she walks to her office building for around 3 minutes. (3) Some mobility practices are competing practices. For one single trip, carriers could carry either this trip (chain) mode or another trip (chain) mode. To take informant No. 4 as an example again: She told me that she sometimes rides a shared bike to her workplace. In this situation, shared cycling practice is the competing practice to taking the metro in her daily commute. Hence, in order to figure out the challenges shared cycling is facing, it is important to look at other urban mobility practices, especially those that compete the most with shared cycling. In this chapter, I focus on the following potential competing practices of shared cycling:

Walking, various types of cycling (including private bike cycling and electric-powered cycling), riding scooters, car driving, taking taxis, and taking public transport (mainly the metro and bus in Shanghai).

### 7.1 Walking

Most of my informants recalled their experience of shared cycling and found out their shared cycling trips mostly substituted walking. Especially the spatial movement that was between home (other destinations) and public transport hubs. In urban short-distance trips, walking and cycling are the main mobility practice choices. Here I bring the discussion on why and when people choose walking rather than shared cycling. According to some informants interviewed, walking is one of the most significant competing practices.

*Walking is a better way of exercising than cycling, because if you walk quickly, it is a kind of exercise. After I finish work, I prefer to walk home instead of riding shared bikes. If I feel like it I can take my time, walk slowly and do some fruit shopping along the way. (Informant No. 2)*



It takes Informant No. 2 15 minutes to walk to her workplace. Trips of a duration of 15 minutes are suitable for both walking and shared cycling. She said that in specific situations (such as when wearing high-heel shoes or having limited time) she would prefer to ride a bike. Her case shows that the shorter the duration of the trip, the more advantages walking has. In this situation, shared cycling is somehow un-routinized practiced behaviour.

*I ride a shared bike to work almost every day. Sometimes, when the weather is lovely,  
I will walk to my workplace, I will also stop to buy breakfast on my way.*

(Informant No. 11)

Informant No. 11 either used shared cycling for 15 minutes or walked for 40 minutes. Her trip distance was much longer than Informant No. 2. The substitute effect is better in her situation, and shared cycling had already become a routinized mobility practice for her.

Generally speaking, for shorter trip distances, walking is more flexible than shared cycling and walking can easily become a routinized mobility practice. For longer short-distance trips, shared cycling is more competitive. However, mobility practices should also be considered together with their connected practices. The trip purposes could be considered as a series of connected practices. When mobility practices are connected with working practices, there is often tight time planning involved and shared cycling will be more competitive in this situation.

## **7.2 Other types of cycling**

### **7.2.1 Private bike cycling**

For private bike cyclists, I mainly focus on two issues: (1) Why and how do they use their own bike? (2) Have they used a shared bike, and if so, why and how?

Two informants of mine (Informants No. 12 and No.16) were private bike owners. In terms of the first question, informant No. 12 said:

*I use my own bike mostly for leisure purposes. My bike is a mountain bike, and  
compared to a shared bike, it is much more comfortable for long-distance cycling.*

Informant No. 16 said:



*I have a child and I bought a bike for her because I want to teach her how to ride a bike. I also have my own bike and during weekends, my child and I sometimes bike together for leisure purposes.*

Their statements show two purposes of cycling with a private bike: for educational purposes and for long-distance leisure cycling. As stated in the walking section, mobility practices should also be considered together with their connected practices. Trip purpose as a connected practice has impact on their mobility practices.

Regarding shared bike user experiences, both were occasional users.

*I take the metro to work, and sometimes I will use a shared bike from my home to the metro station, if time is tight. The merit of shared bikes is that you can just leave them anywhere, but with my own bike I can't just leave it anywhere.*

(Informant No. 12)

Informant No. 16 is a car owner as well, and on some occasions, he did use shared cycling.

*There were several times that I used a shared bike with friends. We met at a transport hub and decided just to ride a shared bike to find a place to eat. Except for spontaneous cycling with friends or colleagues, I do not use shared bikes. I have my own bike, why spend money on a shared one?* (Informant No. 16)

Based on their statements, the shared cycling practice for private bike owners are mostly spontaneous and without any plan, mainly because of the convenience of accessing a shared bike.

For private biking, the link between the bike, the trip purpose and their bodies are stronger than in shared cycling. In addition, shared cycling cannot compete with a certain number of practices (such as teaching cycling, shared bike is too big for kids) while private bike cycling can.

## **7.2.2 Electric-powered cycling**

### **Shared electric bike cycling**

An electric-bike refers to an electric powered bike, but it still has a pedal that can be used for cycling. Shanghai has also launched a shared electric bike scheme (Xiang Qi Dian Dan Che 享骑电单车) led by a private company. Its scale and popularity is less than the DSB. Although it



is also under the *dockless* system, their parking is not as random as DBS bikes. There is a specific *electric fence* (电子围栏) area around the city for the storing and parking of electric shared bikes. These fences are invisible, and can only be recognized by mobile application software of Xiang Qi. The users can only park their shared e-bike within the range of these areas to end the trip. Otherwise, the trip will not count as ended and a fine will be charged when parking the shared e-bike outside regulated areas.

One of my informants used to be a daily electric bike user (Informant No. 6). From the middle of 2017 until May 2018, he rode a shared e-bike almost every day for daily commuting. He stopped riding e-bikes after he moved to another area of the city and his new residence was located very far from his workplace. Now he takes the metro to work, and occasionally uses a shared bike between his home and the metro station.

*Before I moved, I used a shared e-bike every day. It took 20 minutes from my home to my workplace. Both sites had an electric fence where I could find a bike. If I got up early, I could find an available one. Even on winter days I rode the e-bike, but I would then of course wear a scarf and gloves. It was super convenient and a cheap transport mode (2 yuan each trip). It's faster than a shared bike, and you would never get sweaty while cycling.*

Compared to shared cycling, according to his description, shared e-bike cycling had two advantages. First, it was faster which could be convenient for middle-distance trips. Second, it was somehow more comfortable than a shared bike (e.g., would not get sweaty, save energy).

However, speed was not a merit for all carriers. Informant No. 23 stated:

*I don't like the e-bike. When the speed is high, it is easier to get into a traffic conflict.*

(Informant No. 23)

This practice is similar to shared bike cycling, but with potential benefits for longer distance travels. However, the accessibility of shared e-bikes is not that high compared to shared bikes (with around 60,000 shared E-bikes put into service in Shanghai) (China National Radio 2017). Moreover, an important change in the shared e-bike industry would decrease e-bike cycling. Shanghai government does not encourage developing shared electric vehicles for safety reasons. First, cycling with e-bikes is more prone to cause traffic accidents because of the higher speed. Moreover, e-bikes have a hidden risk of fire, because the embedded batteries easily catch



fire in open air. The shared e-bikes already in service will be kept. However, electric vehicles have a limited life-span and local authorities have claimed they will not replace the existing ones once they are scrapped (China National Radio 2017). Although e-bike shared cycling has many merits compared to shared bikes, government regulations have decreased their accessibility.

In summary, shared e-bike cycling is more competitive in comparison to the shared bike for middles-distance trips, but the vital material – the e-bike – is not sufficient in Shanghai.

### **Driving a scooter**

Most electric powered vehicles in Shanghai are scooters. Although scooters do not have the paddle, and riding them cannot be considered cycling, it is still one of the most common transport modes in Shanghai. I decided to put scooters under electric-powered cycling because this mobility practice carriers are exactly like other e-bike/bike users (which are different from other public transport and car users), and their running speed is also similar (a bit quicker than) to the e-bike.

Informants No. 16 and No. 18 were electric scooter owners. No. 16 was also a car and private bike owner, and he did not use a scooter as often as his wife. In reality, the scooter's owner was his wife. His wife was a daily scooter user and mainly drove a scooter for daily commuting, so I mainly asked about the wife's scooter usage situation. Both seldom used shared bikes.

Informant No. 18 used a scooter frequently both for daily commuting and leisure purposes. His home was more than 20 km away from his workplace. He rode a scooter to the metro station for a distance of 3 km, before transferring to the metro to reach his workplace. When I asked him why he didn't use a shared bike from his home to the metro station, he stated:

*There is a bicycle shed near the metro station where I can park my scooter. I drive the scooter from my home to the metro station and when I finish work I drive the scooter from the metro station back home. It is quite convenient. The most important thing is that the scooter is fast! I like speed. Shared bike is too slow. (Informant No. 18)*

The speed is the most important factor affecting his usage of the scooter. In addition, the convenient daily routine also helped him get accustomed to using to this scooter-metro commuting method.



Both of my informants who drove the scooter mentioned that because of the higher speed, driving a scooter is colder than driving a bike, so in cold days they wear masks, scarves and gloves. Figure 7-1 is a photograph I took during my field trip. The scooter consists of two special components: both rain-proof equipment and cloth-like equipment for retaining warmth and for reducing the impact of the wind.

Similar to e-bike riding, scooter driving is more competitive in middle-distance trips. The routinized scooter driving likely has strong links to complementary accessories for dealing with different environmental conditions (such as rainy and cold weather).

Figure 7-1 Scooter and its complementary components



Photograph taken by author.

## 7.3 Driving a car and taking a taxi

### 7.3.1 Driving a car

Six of my informants were car owners (No. 1, No. 13, No. 14, No. 16, No. 17, and No. 22). Among them, No. 17 and No. 22 held non-local license plates (individuals who hold these license plates are not allowed to drive their cars on the overhead highways in rush hours), which limited their car driving. Most probably they could not drive their cars for daily commuting purposes because of this limitation. Both of my informants lived far from the city centre and needed to go through the overhead highways in order to reach downtown. Under this limitation, they had to choose other mobility practices for their daily commuting. They drive their cars only when doing leisure activities on weekends and when running errands,

The private car is an advantage for long-distance trips. It is more flexible than taking public transport, but also has some shortcomings that hinder car owners in driving their car.

*I take the bus to go to work and back home, mainly because of the car parking issue.*

*It costs 40 yuan per day nearby my office building. It's too expensive. Moreover,*



*taking the bus to my workplace takes around one hour, the same amount of time as driving to my workplace. (Informant No. 14)*

*I drive car to work two or three times per week. Other times I take the metro, especially if I need to go downtown to do errands, I will take the metro. The parking issue is annoying. It is sometimes hard to find an available parking space in the city centre. The cost of parking is also expensive. (Informant No. 16)*

The parking issue in Shanghai is another factor which impacts car driving practices. However, the substitute mobility practices are mainly provided by public transport.

*I drive my car every day. My work also requires me go to the surrounding cities/villages to do investigations, so the car is convenient in that way. Were my car in need of repairs, I would have to take a taxi. I have gotten used to travelling by car. (Informant No. 13)*

According to the informants, there were also other highly car-dependent users like informant No. 13.

When asking car drivers about their shared cycling experience, most of them had only tried it a few times and could be defined as occasional shared bike users.

*I only used shared bike a few times. (Informant No. 13); few times shared cycling (Informant No. 1); only several times. (Informant No. 16)*

Cars can reach much further than bikes. According to the discussion above, public transit is the main practice competing with car driving.

In summary, car driving has competitive advantage over cycling for urban long-distance trips, where shared cycling can almost not even be considered a competing practice. However, the relation between parking practices and car driving has decreased the performance of car driving and made public transport more competitive for urban long-distance trips. Shared cycling, as one connected practice of public transport practices, may therefore also be performed more frequently.

### **7.3.2 Taking a taxi**

Taking a taxi is one common urban mobility practice. After the online taxi service DiDi, with its smartphone application, was introduced, taxi ordering and payment processes have become more convenient and taking the taxi has increased in popularity.

*After I get off the metro, I often take a 10-minute taxi ride home. (Informant No. 17)*



One of my informants (No. 17) took taxis frequently as part of her daily commuting. A ten-minutes distance is suitable for shared cycling, but the main factor stopping her to cycle home was the topography of this route, which was not friendly for cycling. Her experience is an example showing that taking a taxi has certain merits that the bike does not have. These merits include offering comfort and convenience for longer distance trips, and taking a taxi is usually faster, and has fewer negative impacts under rainy and cold weather conditions.

## 7.4 Taking public transport

Shared cycling with dockless shared bike has always been considered as the *last-mile* solution for urban trips. Many of my informants rode bikes traveling between their home/office and transport hubs, and they practiced shared cycling as the supplementary of public transport trips. However, there also exists a competitive relationship between these two transport modes, especially in urban short-distance trips. I asked my informants which transport mode they would take for their last trip if there were no shared bike in the town, . Many of them told me they would take public transport.

Informant No.19 used shared bike during weekends when she went to the shopping mall or supermarket. She stated:

*If without shared bikes, I would take the bus for those trips. I had experiences that I had to wait a long time before I could get on a bus. Besides, the bus route is not directly towards the shopping mall and supermarket, where I usually go... So I would like to thank shared bikes for making those trips much easier.*

Her statement shows that shared bikes provide a convenient mode in short-distance trips because it is more flexible when it comes to spatial movement and time planning. It is also an affordable urban travel mode. The single trip via bus charges 2 yuan while the metro fare charges from 3 yuan<sup>44</sup>. The shared bikes only cost 1 yuan (or 1.5 yuan depend on different operators' bikes) for a one-hour ride. Hence, for short-distance trips, shared cycling is more favourable price wise.

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<sup>44</sup> According to the official website of Shanghai Metro, when one travels between 0-6 kilometers, the ticket price will be 3 yuan; if one's traveling mileage exceeds 6 kilometers, they shall pay 1 yuan for every 10 kilometers thereafter.



However, public transport still has some features that the shared bike does not have. I went to Shanghai in November in 2018 for my second field visit, and it wasn't a pleasant time for cycling then. Informant No. 8 told me:

*I can either take the metro or ride the shared bike for some trips, but I prefer subway nowadays.*

As she mentioned, public transport could provide comfort for travellers, especially when the weather is not good. Besides, taking public transportation does not ask for much physical effort, while cycling always requires efforts in pedalling. Although taking public transport is not as comfortable as taking the car, it has the same function when it comes to preventing travellers from exposing them to outdoor elements, including protecting them from rainy and cold conditions.



# 8 Discussion

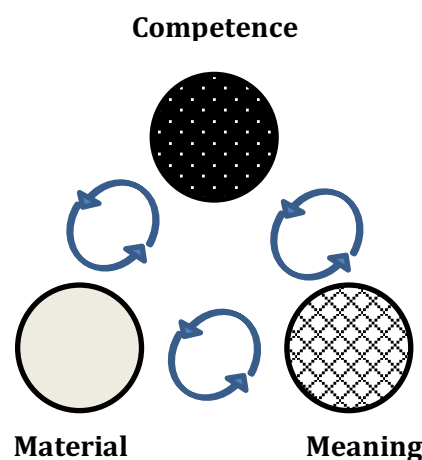
## 8.1 The rapid increase of shared cycling in China

Since the bicycle was introduced in the late 19<sup>th</sup> century, cycling has been a constant mode of transport in China. While China experienced a huge decline in cycling (the social practice of cycling) from the 1980s until 2015, as introduced earlier in Chapter 1, the emergence of shared cycling as a new form of cycling practice has revived cycling in many of China's cities. To better understand why and how shared cycling has escalated in urban China over only the past couple of years, I disaggregated shared cycling into elements and discussed the central components of shared cycling through a practice theory lens (see Chapter 6). In this section, I will further discuss how changes of elements and links between them changed cycling practice per se.

The introduction of the dockless bike sharing system in 2016 triggered the increase of (shared) cycling in Shanghai. The dockless shared bike as the new material element is vital. However, when it comes to answering why (shared) cycling is rising in urban China, dockless shared bikes alone, isolated from other important elements, cannot be considered as the sole influencing factor. Therefore, a comprehensive understanding of shared cycling needs to be emphasised.

In order to better understand this emerging mobility practice, I relied on Shove et al.'s (2012) work who argue that the materials, meanings and competences that make up a practice are not independent of one another, but rather mutually shape one another (Figure 8-1).

Figure 8-1 Elements of the practice are shaping one another



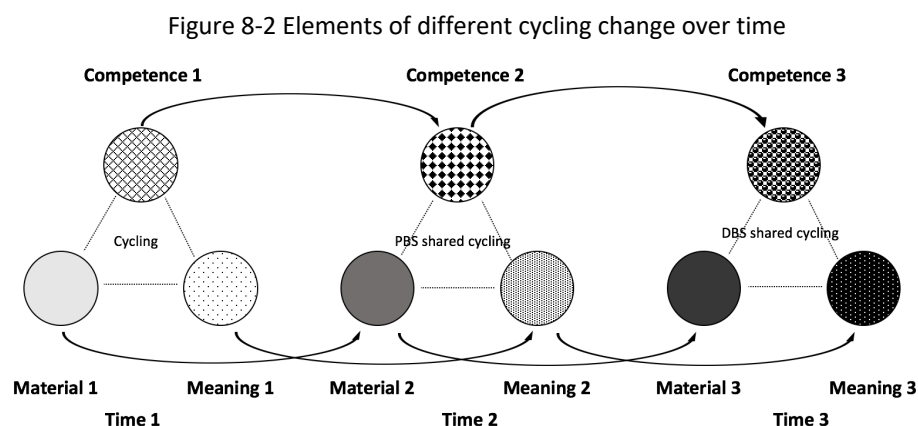
Source: Shove et al., 2012, p. 32.



The new material element – the dockless shared bike – results in a new round of dynamic combination, changing the involved materials, meanings, competences and their interconnections, and further shifting the conventional cycling practice. The entrance of dockless shared bikes in Shanghai discarded the personal bike as the core object of the cycling practice. Bike riding has been decoupled from bike ownership under the DBS system, which provided the primary material resources (the bikes) for urban residents. The appearance of a large number of dockless shared bikes significantly improved their accessibility. In addition, the low price of shared cycling offered a cheap urban mobility alternative for Shanghaiers. In effect, the affordability of dockless shared bikes significantly increased the access competence of bike riding, especially during the early period. The smartphone is another material element that has been recruited because of the dockless shared bike. It has a strong link with the newly entered competence of using the smartphone and mobile payment.

When it comes to the meaning changes, the dockless shared bike has been closely connected to an object perceived as a representative of advanced technology and innovation, and broadly accepted. After it launched and got popular, the perceived meaning of riding the bike has been updated from a low-grade and obsolete travel mode to a new and trendy one. Moreover, DBS riding also connected to the meaning of flexibility and convenience, mainly due to the high accessibility and low price of the dockless shared bike. The recent combination of new and old materials, competences and meanings and the newly created links among them resulted in a new type of cycling performances — shared cycling.

The flourishing of shared cycling in the past three years also needs to be understood from a historical perspective, rather than from a specific point in time. Shove et al. (2012) state the elements that comprise practices are not static. Instead, they are interconnected and part of a dynamic process that changes over time.



Source: Shove et al. 2012, p. 33; Figure drawn by the author.



As Figure 8-2 illustrates, at three different points in time, the three groups of elements have changed and new types of cycling performances have emerged.

As a collection of a certain type of cycling performances, dockless shared cycling has built on the transformation of the conventional cycling practice and/or of public shared cycling. It keeps part of the old elements, discards others and involves some new elements. The weather and topography are vital for cycling. Shanghai is a pleasant city for cycling, and the vast majority of the land in Shanghai is flat. In addition, the climate there is generally mild, which is suitable for cycling. When it comes to cycling infrastructures, even after the rapid urban development and construction of the past four decades, Shanghai's basic infrastructure from earlier times still provides sufficient support for the recent rise of shared cycling in its streetscapes. Competences like riding skills and trip planning skills have also been kept from conventional cycling practices. The meaning and representation of cycling as a low-carbon transportation mode is not totally new, as it has been increasingly promoted under the contemporary environmental discourses. In short, many existing elements have been recruited smoothly, thus offering a solid fundament for the rapid increase of shared cycling.

Cycling is closely connected to the daily lives of urban residents, as are other types of mobility consumption. After four decades of rapid economic development, China's citizens accumulated wealth and gradually adopted a modern urban lifestyle. Nowadays, on-line shopping and other digital businesses are highly prevalent in Shanghai as well as in China's other major cities, and most urban residents (especially the younger generation) have access to an abundance of on-line services. They have quickly gotten used to them as normal aspects of their everyday lives. In other words, the intelligent bike sharing scheme was easily and immediately embraced. The required competences of shared cycling, such as knowledge of smart phone usage and mobile payment, have already grown through other similar practices. The appearance of a new mobility alternative quickly catered to citizens' mobility needs in their busy urban lives.

The rapid increase of (shared) cycling in Shanghai also needs to be understood within China's rapidly changing socio-cultural context. Mobility consumption changes have been greatly influenced by the country's national economic and social development. The rise of shared cycling has also been powered by China's recent economic transition. After China entered in the New Normal, the supply-sided reform and promotion in innovation and green industries became the government's new priorities. Dockless shared bikes as a product representing technological advances, innovative collaborative consumption, and low-carbon travelling



greatly catered to the requirements of China's new economic transformation. During the New Normal period, when products like the dockless shared bike first appeared, they received intensive capital support within political favoured fields, and were quickly scaled-up.

## **8.2 Shared cycling: promises and challenges**

In contemporary urban China, especially in major cities, citizens are suffering from the overcrowding and congestion of public transport. The private car can provide comfort and fast mobility solutions, but it is not affordable for all. In addition, the congestion and parking problems closely connected to cars do not always make it a perfect transport mode, especially for urban short-distance trips. The dockless shared bike provides an alternative choice for urban short-distance travel. It is widely welcomed by the public and has a good support base for further development. What's more, dockless shared bikes greatly contribute to solving the last mile' problem, which is quite annoying in fast-speed urban lives. Furthermore, nowadays, as part of China's green discourse, great opportunities exist for the further development of the dockless share bike.

However, the challenges the dockless shared bike is facing is endangering its benign development. As a public good it occupies public space, and this requires the fixing of the serious problem of disorderly parking and better cooperation between local government and private operators. The timely maintenance and rebalance of bikes also play a central role if DBS wants go further. The low entering threshold of this industry already allows for the involvement of too many unqualified companies and enables dysfunctional competition, which endangers not only the private companies themselves but also the whole DBS industry. Better regulation policies are necessary. In short, the future of shared bike cycling is promising but still a huge challenge, and greatly depends on better corporation between private operators and government.

In addition, in the *New Normal* period, national policy on encouraging *mass entrepreneurship and innovation* should also be more elaborate, to avoid the investment capital and heat pouring into industries which under the banner of innovation and green technology.



### 8.3 How green is shared cycling?

The dockless shared bike is broadly advertised as a green transport mode. Ideally speaking, cycling has many merits and it is a low-carbon mobility choice, but shared cycling in recent China may not actually be that green when one looks at how shared cycling has been practiced and developed in Shanghai, and on the basis of my empirical data.

A quantitative analysis on the environmental impact of bike sharing in Shanghai conducted by Yongping Zhang and Zhifu Mi (2018) found that bike sharing in Shanghai saved 8358 tonnes of petrol, decreased CO<sub>2</sub> by 25,240 tonnes and decreased NO<sub>x</sub> emissions by 64 tonnes. However, when they calculated the petrol saving and CO<sub>2</sub>, NO<sub>x</sub> emission decrease, they transferred all cycling trips into vehicle trips. They assumed all shared cycling mileage had been travelled by car, and calculated how much environmental impact it would have. The result was their outcome of petrol saving and CO<sub>2</sub>, NO<sub>x</sub> emission decrease.

However, based on my empirical interviews, (the *truth* of) the results are not that simple and positive. When it comes to which transport mode has been substituted by shared bike riding, long-distance shared cycling mainly substitutes public transport modes like metro- and bus-taking. The urban long-distance trips are difficult to be substituted by cycling, so the appearance of shared bikes has minor impact on long-distance urban trips. Public transit and automobiles still play an important role in urban long-distance trips in China's major cities like Shanghai. In terms of a small group of people, those who are or may be willing to ride a shared bike for longer distance travel, the provision of good quality, well-functioning and rideable bikes can be a way of stimulating the volume of the exercise-purpose longer trips. Or alternatively, the dockless shared bike company can provide different kinds of shared bikes for different trip proposes.

For the frequent users who ride shared bikes as a routinized daily commuting mode, my empirical interview data shows that they mostly substitute walking and public transport, and that the substitute effect for the car and the metro is weak. As for occasional users, their shared cycling trips mainly substitute walking, taxi rides, and public transits. When the cost of taxi hailing and car sharing services in urban China decreased over the past years, many residents started to choose these services for their urban short-distance trips. The appearance of dockless shared bikes brings an even cheaper alternative. On the basis of my empirical interview data, some taxi rides and car sharing short-distance trips had been substituted by dockless shared bikes, but some people still choose taxis and car sharing because of the comfort and speed the



cars offer. Most of the short-distance shared cycling trips have not become routinized daily mobility practices, and they are easily substituted by other competing practices. At present, the number of the shared bikes available has decreased considerably due to the regulations and bankrupt bike sharing operators, and it has directly resulted in a decline in shared cycling. A growing number of broken bikes on the street (and the inadequacy of the repairs of broken bikes) accelerates the decline of shared cycling.

Except for the weak substitute effect of shared cycling, the chaos in China's bike sharing industry also contributes to the production of enormous waste: the abandoned, broken, and unpaired bikes are to be seen everywhere, piled up along the streets as well as in *bike graveyards*. The waste problem is a highly significant problem that requires serious attention. It underlines the importance of taking into account the entire life cycle of shared bikes when assessing the shared bike economy, which should include a comprehensive analysis of the production, maintenance, repair and recycling of shared bikes. Accordingly, it shines a critical light on talks about how green shared cycling actually is.



## 9 Conclusions

Globally, cities are facing various severe challenges as we find ourselves moving further into the 21<sup>st</sup> century. All over the world, the urban transport sector is facing a diversity of problems such as pollution, congestion, high-energy dependency, and parking space shortage. The contemporary dominating motor vehicle plays a significant role in most of these problems. Cycling has been considered as a desirable means of transportation, which may contribute to combat these problems and move cities towards a more sustainable urban mobility future.

In China, cycling was the predominant transport mode through much of the 20<sup>th</sup> century. However, with the rapid economic development and urban construction in the past four decades, urban mobility has changed a lot, and cycling gradually faded away from urban streetscapes. Since 2016 dockless bike sharing schemes have been introduced, and the growth of cycling in China has been unparalleled as shown in this thesis. My first research question set out to explore this *rise*. Rather than applying a mainstream *attitude - behaviour* approach to explore the motivations and rationales behind shared cycling users, I adopted a social practice approach for my enquiry. There are several insights provided by practice theory. Firstly, I realize that the transport mode decisions that individuals take often are not driven simply by their subjective motivations and psychological processes, but are influenced by a number of elements, such as the material settings around them as well as social norms, which individuals may not subjectively perceive. A practice approach has been valuable in my study as it decentralizes the human's agency and provides a holistic understanding of (shared) cycling. Secondly, from a social practice perspective, individuals should not simply be treated as victims for consuming high-carbon transport modes or be blamed if they did not choose a more sustainable mobility mode. Lastly, mobility practices are closely associated with residents' everyday life. Shared cycling does not exist in isolation, but is closely connected and competing with other social practices. There are complex relationships within and beyond mobility practices.

Based on my empirical data, I analysed shared cycling under Shove et.al (2012) three elements' group model and disaggregated these into multiple sub-elements. In chapter 6, I listed and analysed important components of shared cycling, and pointed out some unstable elements and the vulnerable linkages, which may become disincentive factors for shared cycling practices becoming more stable. I further discussed how the components and their links function together and create shared cycling in chapter 8.1.



I found out that the dockless bike-sharing (DBS) system launched in 2016, providing a new and vital material element (the dockless shared bike), triggered a rapid growth in (shared) cycling in Shanghai. Firstly, the dockless operational and tracking technology, as well as online payment method enabled by technological advances, have greatly changed the accessibility, flexibility and payment method of conventional bike rental/public bike sharing modes and provided convenience to cyclists. Secondly, the emerging form of collective consumption decoupled the bike ownership and the cycling practice, lowering the thresholds for cycling (e.g., eliminating the following related responsibilities of cyclists: having the bike ownership, preparing the parking space for the bike, maintaining and repairing the bike). Thirdly, the button-up development path and fierce competition among different dockless bike sharing companies brought a huge number of shared bikes to the streetscape in Shanghai at a low cost (a couple of yuans for a single trip). It provided abundant material resources and greatly increased the accessibility and affordability (even for free during their promotional periods) of shared cycling practice. However, the rise of (shared) cycling is not simply the result of the aggregation of individuals' personal choices of riding dockless shared bikes, but rather a complex social phenomenon. The national development context, social changes, cycling history and culture have also contributed to the recent explosive growth in shared cycling. In this thesis, I found that several social, cultural elements and national context closely stimulated the rise of shared cycling. First, in recent years, the sharing economy as an appealing consumption form has entered into many areas in China. Car sharing and ride-hailing services as the trailblazers in the shared mobility field, were already prevailing in Shanghai before DBS was launched. Together with the other popular smartphone applications and a convenient online payment system, citizens have already got use to the digital modern urban lifestyle, so that it is quick and easy for most of them to accept and use dockless bike sharing. Second, China's recent economic transition context (the supply-sided reform and innovation and green notions) and the wave of *mass entrepreneurship and innovation* has been an important contextual factor. The innovative consumption pattern and embedded *Invented-by-China* technology had three promotional drivers: (1) the capital assistance from private venture capital and (2) the governmental support for the rapid scale-up of the DBS industry, (3) as well as the change in the meaning of cycling from being old-fashioned and low-class to being a new and trendy transport mode. Third, China used to be a *bicycle kingdom*. Even after the rapid urban development and construction, Shanghai's basic infrastructures from earlier times still provided sufficient support for the recent (shared) cycling rise. The riding skills have also been kept from earlier times; meanwhile, the rapid urbanisation resulted in greater traffic congestion and worse environmental conditions, and shared cycling as a representative of green mobility



initiatives have quickly received massive support from local governments and also been widely welcomed by urban residents.

The rise of shared cycling is closely connected to the technological advances and the emerging collaborative consumption form, but China's recent economic transition, and digital and modern urban lifestyles are also important in understanding the *cycling revival* in the past three years.

To better understand *shared cycling as a social practice*, I put forward my second research questions, taking Shanghai as my case to explore: How and why do Shanghaiers practice shared cycling in their everyday life? What are the promises and challenges when it comes to shaping shared cycling as a stable urban mobility mode for a more sustainable future?

My second research question is closely connected to Shanghaiers' daily lives, more specifically, how they practice shared cycling in their everyday lives. The analytical chapters (chapter 6 and chapter 7) described and presented how Shanghaiers practice shared cycling in their daily lives. The unstable elements and linkages between them (stated in chapter 6), as well as the competing mobility practices (stated in chapter 7) showed the challenges shared cycling are facing. I also discussed the promises and challenges shared cycling is facing in chapter 8.2.

The Shanghai residents I interviewed mainly practiced shared cycling in urban short-distance trips. As the first- or last-mile solution, shared cycling provides a flexible, faster and convenient alternative for walking. It is also cheap in short-distance riding, charging only around one yuan for each first- or last mile ride. In modern busy lives, shared cycling has been practiced as a quick, convenient and affordable mobility mode. Only a few of my informants' practice shared cycling as their routinized, daily travel mode. It is mainly because Shanghai is a big city, and the average commuting distance is too long to make it suitable for riding the bike in most cases. Thus, occasional shared cycling users still represents the majority. A few of my informants practiced shared cycling in urban long-distance trip only for the sake of the exercise.

In Shanghai, the public transport system is overcrowded, and the private car is not affordable for all, which also has its problems like parking, congestion etc. The conditional private (electric) bike is not necessary for most residents. Hence, shared cycling can still play a role as an alternative urban mobility choice, which is cheap, flexible, and convenient, especially in urban short-distance trips, so it still shows promise for further development.

However, the challenges like disorderly parking, not timely maintenance and rebalancing of bikes, and the deposit scandal, also endanger shared cycling. Social practice approach provides



a set of insights into changing elements and their links for shaping a more stable future for shared cycling. I listed some insights throughout the analytical parts, for example, (1) build or create linkages on the loose relations among the shared bike, space for non-active bikes and the performers. It requires better cooperation between DBS companies and local authorities, and a better operational and usage plan for bonding cyclists' responsibilities on shared bikes usage; (2) differentiate various trip purposes and provide several types of shared bikes for them; (3) avoid frequent pricing and operational changes, and develop a better and more transparent notification system. However, in order to make shared cycling more routinized and fruitfully practiced, there is a complex web of such potential political interventions and business strategies to consider. In my study, they are hard to be answered systematically and completely. In future research, how social practice theory could bring about implications for shaping shared cycling as a more stable urban mobility modes are interested to be explored further.

This thesis focused on Shanghai residents' daily urban trips, also taking changes in national development strategies and changes in the society and culture at large into account to bring out a comprehensive understanding on the rise of shared cycling in recent China.

There is one word which could perfectly describe how many residents perceive shared cycling in Shanghai—*bittersweet*. On the one hand, it provides an alternative mobility option and can contribute greatly towards making urban life easier and more convenient. On the other hand, shared cycling is a burden through parking chaos, residents' misbehaviour and the DBS industry chaos. However, the dockless shared bikes have brought cycling back to Shanghai's streetscapes and is thus leading to a cycling revival. Despite the system's many flaws and wastefulness, this could prove a very important development.



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# Appendix

## A. Interview guide

### 1. general information

- Age, gender, education?
- Work?
- Family situation?
- Vehicle/bike ownership?
- Location of residence (which district)?
- What is your average commute time?
- What is your distance to work (study)?
- Can you describe your ordinary commute day?
- Can you describe your trip trajectory for entertainment and leisure activities?
- Can you describe your trip trajectory for doing errands?
- Why you choose these transport modes for commute/ leisure activities/ doing errands?

### 3. Cycling in Shanghai

- Do you cycle? Why?
- Do you use the car? Why?
- Using a car or cycling, which one will make you feel mentally happier? Explain why.
- What is your dream bike? Can you describe it?
- How do you think bike/ car influence your work quality/ family relationship/ healthy?
- Do you think it is normal to cycle in Shanghai?
- Do you think it is easy to cycle in your residential/ working area?
- How do you think the cycling conditions will improve in Shanghai?



-Could you describe your former cycling experience? (eg. during your childhood or college time.) How does it changed?

-What is your attitude about cycle in this car-dominate society?

#### **4. bike sharing in Shanghai**

-Have you ever use a shared bike in Shanghai? Could you describe your experience?

-Do you think shared bike changed or influenced your daily life? In which way?

-Do you think it is easy to access to shared bikes?

(1) For people who do not use shared bike

- The reasons why you do not use the shared bike?

- What would encourage you to use it?

(2) For people who use shared bike

-What are your travel purposes, what is the time lasting?

-Imagine without shared bike, how you complete your last trip which conclude shred bike riding?

- Could you imagine for the trips, which you used shared bike, how you complete those trips if there is no shared bike system?

-If you are frequently user, could you tell me shared bike substitutes which transport modes that you used before bike sharing launched?

-What is your consideration when you choose to use shared bike? (time saving, money saving, environmental consideration...?). Why you use shared bike?

-What would encourage you to use it more frequently?

-Do you follow the ethical rules when using shared bikes? (eg. parking it at wrong place...)



## B. Informant List

No. *	Gender	Age	Occupation	Residential location	Vehicle ownership	Interview time
<i>1</i>	Male	36	Manager	Yangpu district	Private car	Jan. 2018
<b>2</b>	Female	27	Clerk	Putuo district	No	Jan. 2018 Nov. 2018
<i>3</i>	Female	26	Student	Yangpu district	No	Feb. 2018
<b>4</b>	Female	24	Clerk	Putuo district	No	Jan. 2018 Nov. 2018
<b>5</b>	Female	28	Clerk	Putuo district	No	Mar. 2018 Nov. 2018
<b>6</b>	Male	27	IT	Pudong district	No	Mar. 2018 Nov. 2018
<b>7</b>	Female	30	Clerk	Minhang district	No	Feb. 2018 Nov. 2018
<b>8</b>	Female	26	Consultant	Xuhui district	No	Jan. 2018 Nov. 2018
<i>9</i>	Female	21	Student	Yangpu district	No	Jan. 2018
<i>10</i>	Male	26	Clerk	Jingan district	No	Jan. 2018
<i>11</i>	Female	36	Researcher	Xuhui district	No	Nov. 2018
<i>12</i>	Female	31	Receptionist	Putuo district	Bike	Nov. 2018
<i>13</i>	Male	33	Manager	Jiading district	Private car	Nov. 2018
<i>14</i>	Male	30	IT	Baoshan district	Private car	Nov. 2018
<i>15</i>	Female	34	Clerk	Changning district	No	Nov. 2018
<i>16</i>	Male	36	Researcher	Yangpu district	Private car, Scooter 2bikes	Nov. 2018
<i>17</i>	female	32	Clerk	Jiading district	Private car (with non-local license)	Nov. 2018
<i>18</i>	Male	39	IT	Baoshan district	Scooter	Nov. 2018
<i>19</i>	Female	40	Manager	Xuhui district	No	Nov. 2018
<i>20</i>	Female	22	Clerk	Putuo district	No	Nov. 2018
<i>21</i>	Female	28	Finance	Pudong district	No	Nov. 2018
<i>22</i>	Female	30	Clerk	Jiading district	Private car (with non-local license)	Nov. 2018
<i>23</i>	Male	28	Clerk	Pudong district	No	Nov. 2018
*italic numbers refer that the interview conducted in first trip; bold number refer that the interview conducted in both trips; the normal number refer that it has been conducted in the second field trip.						



## C. Informants' travel information

No. *	Gender	Dockless shared bike use frequency	Main mobility mode 1. commuting 2. other trip purposes
1	Male	Only used few times	Private car Private car
2	Female	Often	Walk/shared bike Metro/taxi
3	Female	Never	walk Walk/ taxi + metro
4	Female	Often (before) Occasionally(now)	Metro/shared bike Metro
5	Female	Often (before) Occasionally(now)	Shared bike/walk + metro Metro
6	Male	Occasionally	Before: shared e-bike or bus Now: walk (shared bike) + metro Metro, shared bike (short-distance < 10km)
7	Female	Occasionally	Bus+ metro Bus+ metro
8	Female	Often (before) Occasionally(now)	Metro, shared bike, taxi Metro
9	Female	Occasionally	Walk Metro+ shared bike
10	Male	Very few	Walk Metro/taxi
11	Female	Daily commuting by shared bike	Shared bike Metro
12	Female	Very few	Own bike Metro, own bike
13	Male	Very few	Private car Private car
14	Male	Often	Metro/shared bike Bus, metro, Private car for holiday self-driving trips (use quite few)
15	Female	Often	Bus or shared bike Shared bike, bus, metro
16	Male	Occasionally	Metro+ shared bike (when it is hurry), Private car Metro, taxi, private car, shared bike
17	Female	Often (before) doesnot use (now)	Bus+ metro/shared bike Private car
18	Male	Never	Electric bike (or bus) +metro



			Electric bike (or bus) +metro, Taxi
19	Female	Occasionally	Metro
			Metro, shared bike (go to shopping centre or market)
20	Female	Often	Metro+ bus/shared bike/taxi/walk
			Metro+ bus/shared bike/taxi/walk
21	Female	Often	Walk/shared bike+ metro, shared bike
			Walk/shared bike+ metro, shared bike (go to market or shopping mall)
22	Female	Almost everyday	Shared bike+ metro
			Shared bike +metro
23	Male	Occasionally	Walk+ metro
			Walk+ metro Taxi Shared bike (to gym or other closer destinations)
<p><i>*often</i> and <i>occasionally</i> are vague statements<sup>45</sup>. It is hard to quantify the exact usage frequency, so I adopt a brief classification and inform the difference between ‘often’ and ‘occasionally’ to my informants:</p> <ul style="list-style-type: none"><li>● often refers to 1-3 time per week</li><li>● occasionally refers to 1-3 time per month</li></ul>			

<sup>45</sup> It is worth to note that the statements of ‘often’ and ‘occasionally’ are in general cases, it does not include extreme situation like rainy, winter cold days, uncomfortable sick periods)