

Study on Development and Parking Management of Dockless Bike Share (DBS) and in Tianjin

Li Wei, Liu Shaokun, Deng Han @ ITDP Institute for

Transportation and Development Policy

Tianjin, one of the four municipalities directly under the administration of the central government in China, is adjacent to the capital Beijing. It is the largest port city in the northern China and the key to the sea. In 2016, its permanent population has reached 15.62 million with a total built area of 11.946 thousand square kilometers. Tianjin witnessed the first bicycle in China and now becomes the largest production base for bicycles in China, even the world. Many famous brands like FLYING PIGEON and BATTLE are produced here.

In the late 1970s when China launched the reform and opening up policy, bicycle together with sewing machine and wrist watch were considered as three most important pieces for Chinese families. The bicycles, like local brand FLYING PIGEON, were quite popular among the Tianjin people who used them as the most convenient transportation mode. Nowadays, with the rapid development of motorization, the travel environment of bicycles is deteriorating day by day. The bicycle kingdom has gradually gone away, and bicycle culture has been gradually forgotten.



Bicycle flows on a main road in Tianjin on October 19, 1998 (Source: NetEase China)

In recent years, Tianjin municipal government has spent great efforts in improving the supply side of the public transportation and the infrastructure. Start from 2010, Tianjin has piloted some small scale traditional public bikes in the outskirt of Binhai New District, Wuqing District, Xiqing District and Beichen District to serve the needs of the short distance travel and connection to the public transport stations for local communities, but the service in the main city area was still blank.

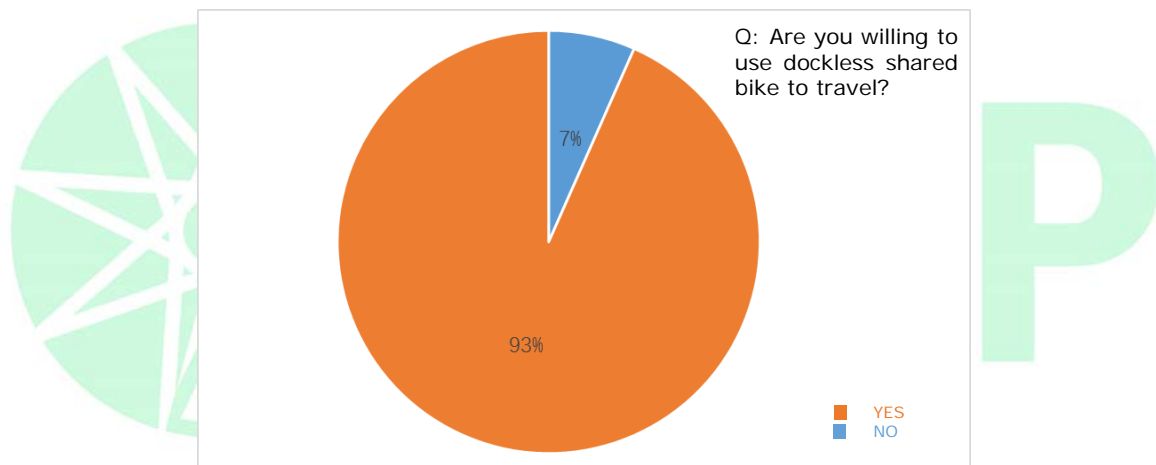


Traditional Public Bikes in Binhai New District
(Source: enorth.com)



Traditional Public Bikes in Xiqing District
(Source: enorth.com)

From 2016, with its flexibility and low price, the new born dockless bike share business has boomed under the growing interest of the shared economy, the Internet+ and smart phone payment technology. It has provided a brand new and green way of travelling. The metro/bus + dockless shared-bike commuter solution has been well accepted by more and more people and become an optimized way to replace driving.



10,723 samples have been surveyed by ITDP in January 2017, 93% of the surveyed people are willing to use the dockless shared bikes to travel.

In January 2017, the Coolqi Bike and Quickto Bike began their official operation in Tianjin, thereafter, Ofo, Mobike, Youon, Modena and Deer Bike followed with large scale operation, which broke the war for dockless bike share market. Until April 2017, there are 7 market players in Tianjin with more than 300 thousand bikes covering the whole city area.



Mobike



ofo

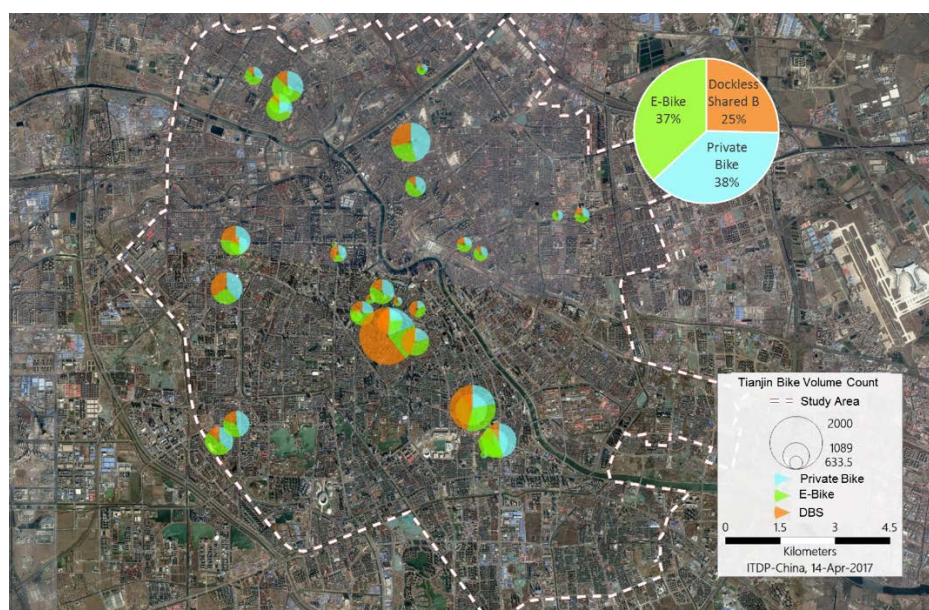


Coolqi and Quickto



Youon

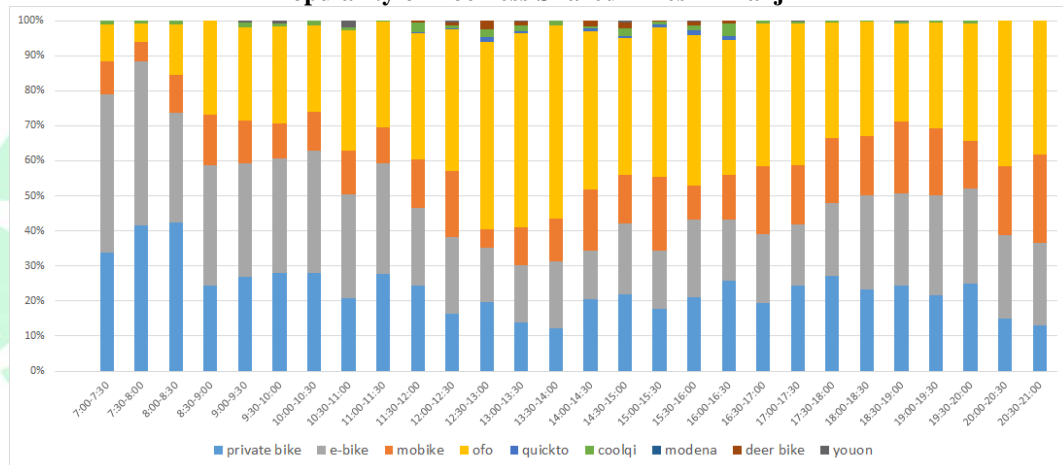
According to the ITDP survey in April 2017, the use of dockless shared bikes account for 25.4% of all the bike users while 37.7% use their private bikes and 36.9% use private e-bikes, which are quite balanced among these three. The private bikes and e-bikes are mostly used by commuters in the morning and evening peaks while the dockless shared bikes are mostly used in off peak hours.



Bike Volume Count at Different Road Sections in Tianjin



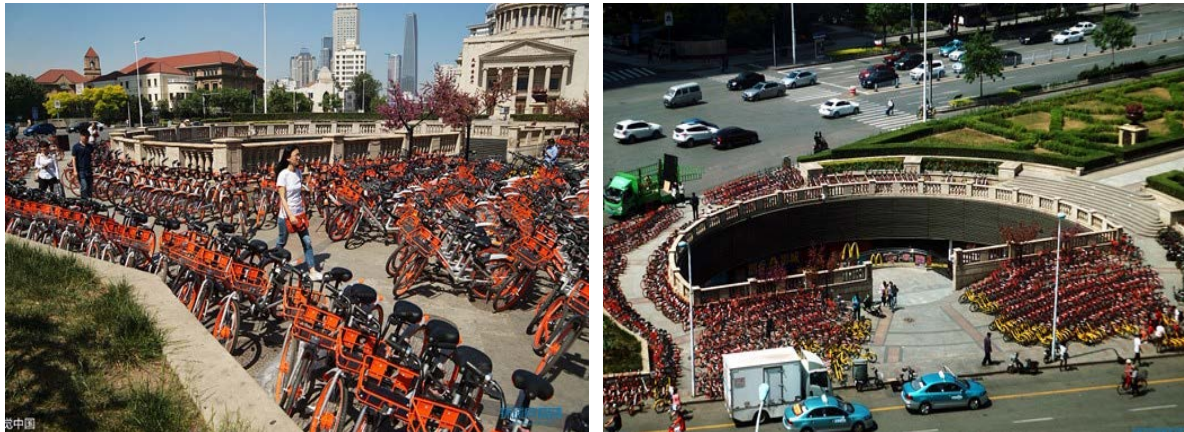
Popularity of Dockless Shared Bikes in Tianjin



Long Time Cross section Bike Volume Count at Nanjing Rd. (At South Isetan Department Store of Nanjing Rd-Yingkou Rd intersection)

The growing number of dockless shared bikes also pose great challenges to the city management. The insufficient regulations, infrastructure and guidelines have led to disorderly public management issues. The biggest problem could be the parking issue for hundreds of thousands of dockless shared bikes.

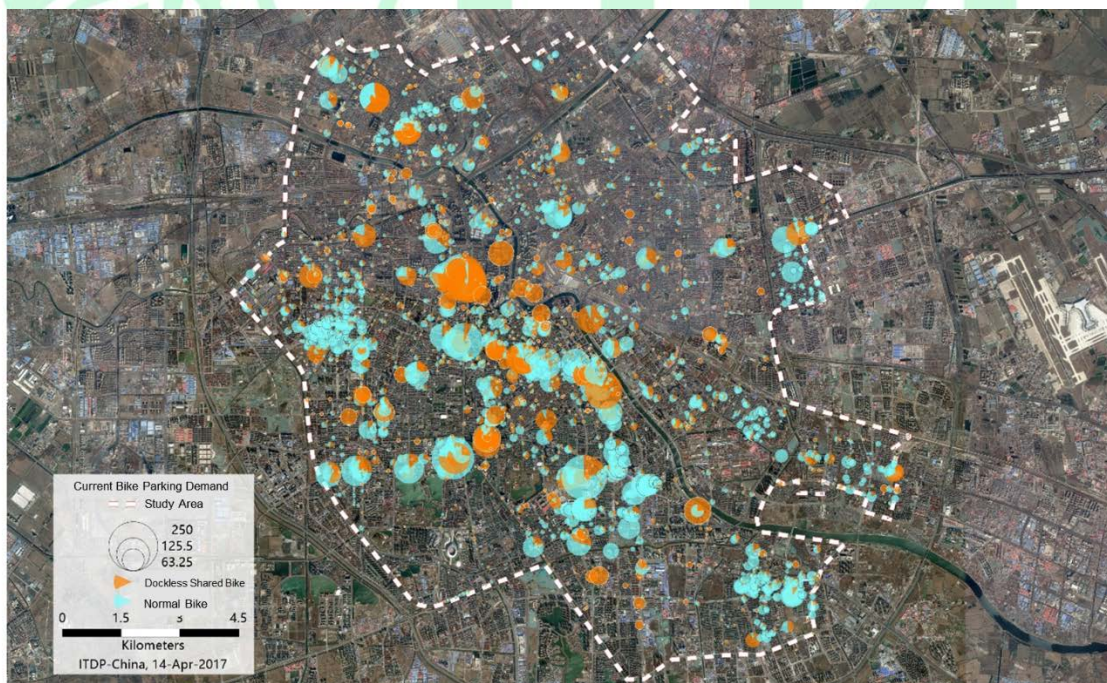




The disorderly parking issues of dockless shared bikes in Tianjin (Souce: ITDP & Visual China)

The limited urban space cannot accommodate the barbarian growth of the dockless shared bikes while a proper supply would be a key for the sustainable development of the dockless bike sharing market. Based on the ITDP surveys conducted before dockless shared bikes entry and after dockless shared bikes entry and considering the population and transportation mode sharing rate, 17% of the private bike travel has been shifted to the dockless shared bikes, and the number of bikes needed in Tianjin city proper is around 133.4 thousand.

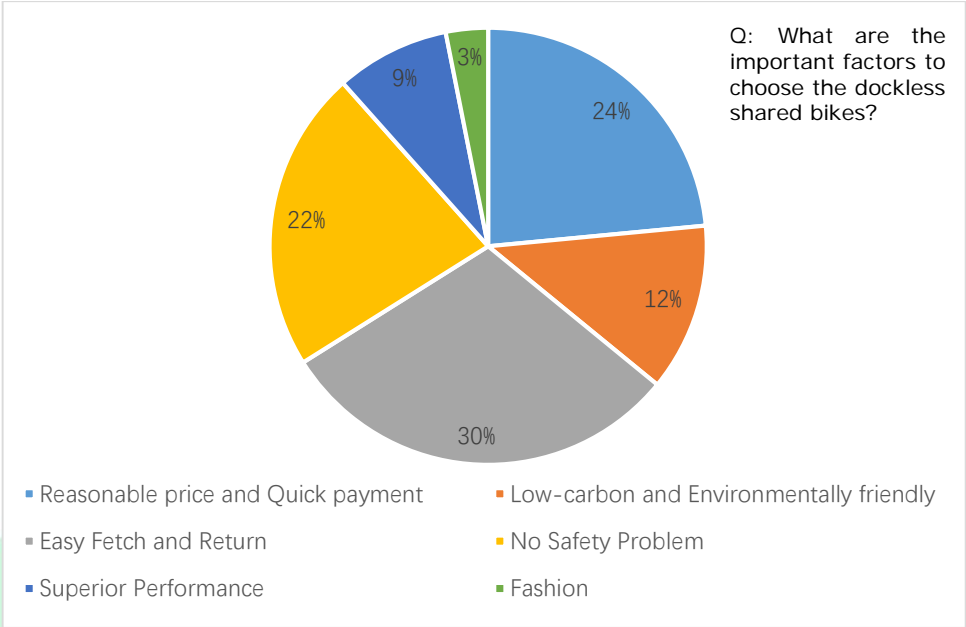
According to ITDP survey on bike parking demand in the city center, the main parking demand points are those near the metro stations, important public facilities, commercial centers and large hospitals. The parking of dockless shared bikes is very much concentrated in the commercial and business area while relatively scattered in the residential areas. For private bikes, they almost park inside the residential communities and public buildings due to the safety and maintenance needs.



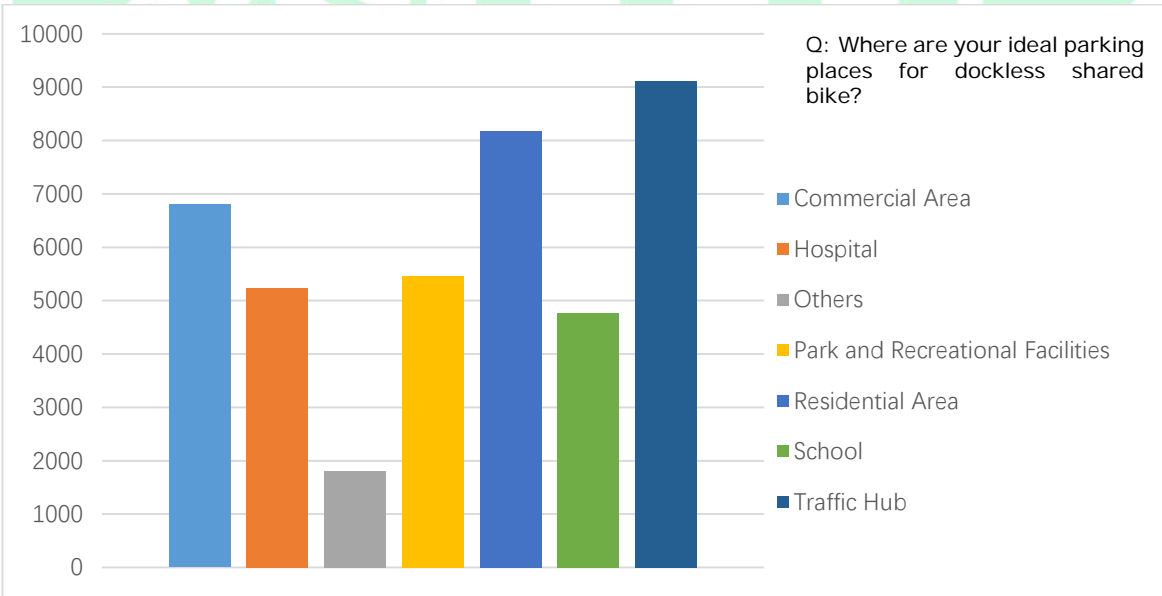
Curent Bike Parking Demand Distributions in Tianjin City Center (Private Bike and Dockless Shared Bike)

Proper parking places shall be provided according to the travel needs to improve the accessibility of

the bikes and the management of the illegal parking. The parking places could be close to the demands like along the bus stations, the commercial centers, business areas and residential areas. Also, appropriate service intervals are also necessary to increase the bike utilization efficiency. Considering the features of “use and return on demand”, ITDP therefore recommend the service interval shall no further than 200m (100m service radius) and could be even shorter in the core areas.



10,723 Surveyed Citizens believe the feature of Easy Fetch and Return could be the most important factor for them to choose the dockless shared bikes



Ideal parking places for dockless shared bikes considered by 10,723 surveyed people

With its unique feature of fetch and return on demand, the dockless shared bikes do not need physical locking facilities (like docks, racks, and etc.). In the short run, the marked parking space could be used, while in the long term the value-added facilities like shelters, lightings, signs, and service stations could be brought in. The recommended parking place could be like:

Type 1: Integration of the bike parking with gaps of side trees and public facilities



Bike Parking Place in Jinan

Type 2: Integration of the bike parking with motorized cars parking



Public Bike Parking Integrated with Motorized Car Parking (Left: Barcelona; Right: Paris)

Type 3: Integration of the bike parking with surroundings



Public Bike Parking Integrated with bulb outs or greenery (Left: Austin-photo by Austin Transportation Department; Right: Shanghai)

To strengthen the management and enforcement on bike parking, the dockless bike share companies are also exploring some new technical solutions like the geo-fencing to improve the management efficiency. Geo-fencing technology uses the Internet-of-Things chips sending out signals to mark a fence for the dockless shared bikes and only allow the bikes to park inside the designated areas. Currently, the geo-fencing used on Mingbikes was jointly realized by GPS and Bluetooth, the GPS tells the area to park while the Bluetooth determines whether the bike is parked on place and locked.

This new technology can to some extent regulate the bike parking and reduce the operation cost.



Geo-fencing Demonstration Point in Shanghai (Source: Xiaomin)

Well planned parking place is only a part of the regulation for dockless shared bikes and the first step. In January 2017, Tianjin Transport Commission, together with Public Security Bureau, Development and Reform Commission, Market Supervision Bureau, Gardening Bureau, Legislative Affairs Office, Cyberspace Affairs Agency and People's Bank, drafted the Tianjin Internet Rental Bike Management Interim Measures (Exposure Draft) (hereinafter refer to Interim Measures) with intensive study and discussion. The Interim Measures were disclosed on the website of Transport Commission for comments. The 12 articles in the Interim Measures clearly stated the regulations for the roles and responsibilities of the government management, operation companies, users, the development principles, bike registration, corporate management, users' code, credibility, supervision and punishment etc.

For operation administration authorities, the Interim Measures require them to perform their duties according to the principle of "municipal level overall arrangement while the local level actual management": the police department shall be responsible for the bike registration of the bike companies, regulate the management and parking places, and also punish the illegal activities; the urban administration department shall be responsible for the guidance and supervising of the dockless shared bike parking; the market supervision department shall be responsible for the quality supervision of the shared bikes and regulate the market order; the development and reform authority, the People's Bank and cyberspace affairs authorities shall perform their own responsibilities to regulate the shared bike operation and supervision, and also strengthen the law enforcement for illegal activities.

For operators, the Interim Measures require at least 50 custom service staff for 10 thousand bikes; the database shall be linked to the industry supervision platform of the transport management department; the bikes shall be equipped with real-time positioning devices for locating and the smart locks with GPS and communication functions; the complaint mechanism shall also be established.

For users, the Interim Measures require the users to obey the laws and regulation for the city management, road management, traffic laws etc, use and park the bikes accordingly; users shall also take care of the dockless shared bikes and the parking facilities; children under 12 years old are not

allowed to use the dockless shared bikes.

As an innovation, the dockless shared bikes also bring the new challenges without any past solutions. The strengthened supervision on the operators and the whole industry is of vital importance. How to regulate the operators and market, how to improve the macro-guidance and regulation to ensure a sustainable development, and how to minimize the adverse impact on the city administrators, these are important questions for the city administrators to consider.

