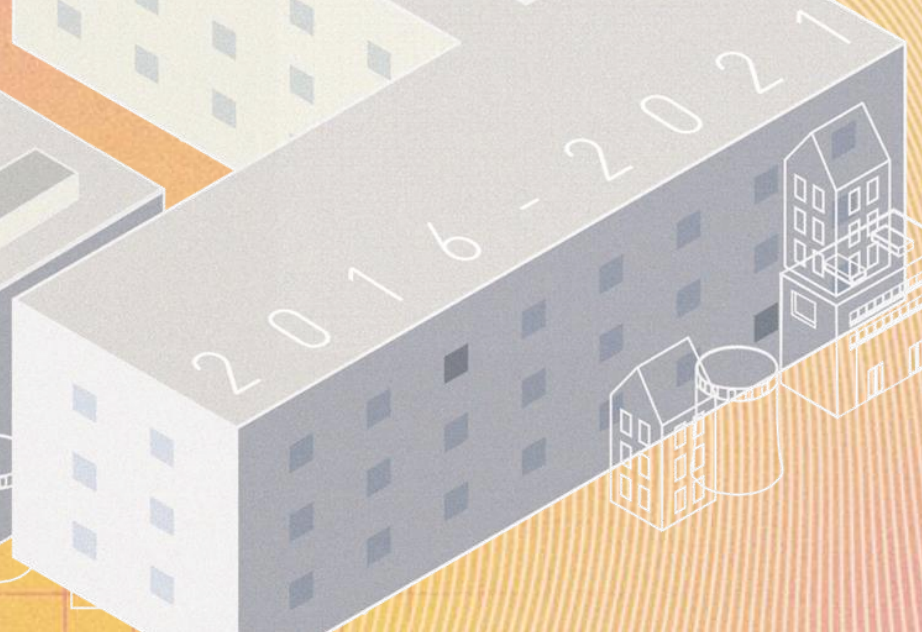
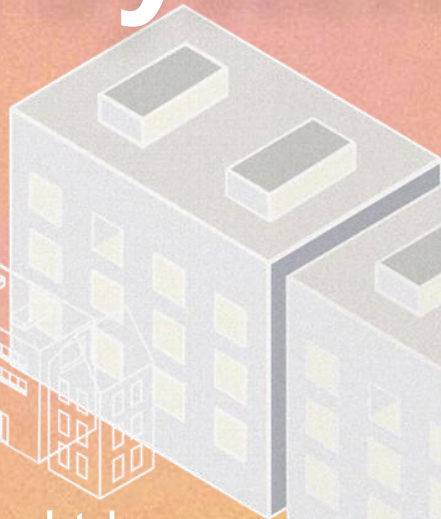
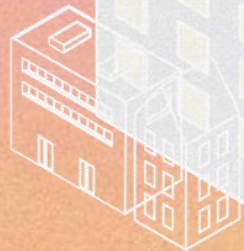
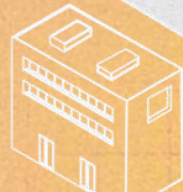
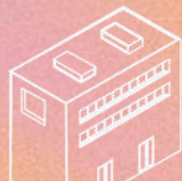


Bike Sharing Management by Means of a Smart Technology/System

Beijing City Quadrant Technology Co., Ltd.
Wang Yuanhan



Our Company

Beijing City Quadrant Technology Co., Ltd (UrbanXYZ). was incubated from Beijing Urban Planning and Design Institute in 2016. The company is committed to innovative scientific research, urban planning and governance practices of cities. Our company conducted and participated in many major planning and governance projects, including Beijing city health assessment, Beijing human settlement big data monitoring, Beijing core area control plan, Research on the big data platform for Beijing core area, Xiong'an standard work camp, "HuiTian"-a big data platform for urban governance in a super large community, etc.



Team members

Our team has multidisciplinary backgrounds of urban planning, computer, mathematics, geographic information systems and other. The founder of the company, Mingrui Mao, has served as the deputy director of the Planning Information Center of the Beijing Urban Planning and Design Institute for many years, the secretary-general of the Innovation Center, and he is responsible for the technological innovation and digital transformation of the Beijing Urban Planning Institute.

Roles



Urban governance

Urban governance consulting and urban brain system solutions & implementation



Community regeneration

Community research, community placemaking and community regeneration



Urban big data consulting

Smart city planning, technical services for digital planning, city examination and big data analysis platform construction



Project Background

As the main way to solve the "last mile" of public transportation travel, shared bicycles have become an indispensable part of citizens' daily travel. While bringing convenience, it also brings a lot of burdens to the city governance.

subway station

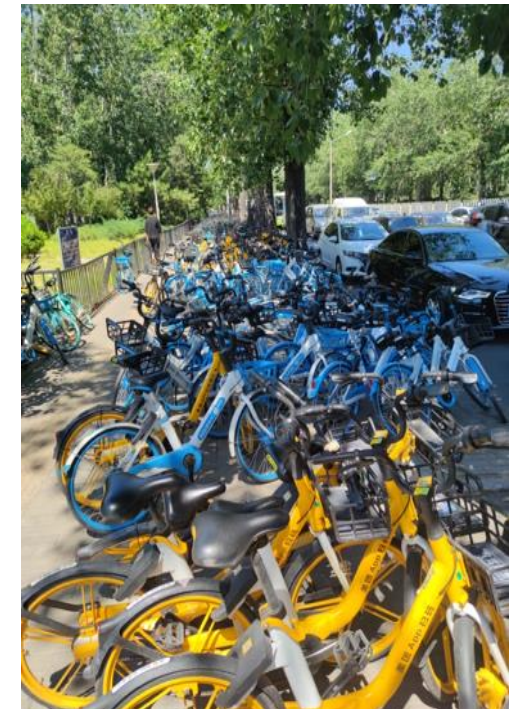
Bus Station

Office building

Large residence

.....

There are very serious problems in some areas, especially at locations such as bus stations and subway stations.



Our Project

A smart technology/ device is needed to solve these problems

The “pains” of shared bikes management

Excessive accumulation of bicycles

....

Parking at will

Obstruct normal traffic

Affect the city appearance and environment

....

Why traditional management methods failed

Dynamic circulation of shared bicycles

....

How many bicycles are there?

How many will be ridden?

How many to provide?

Is the planning reasonable?



A device sensing the number of bicycles in real time

Traditional device:



the equipment itself is expensive

high transmission cost

**High energy consumption and
harsh installation conditions**

**Not able to identify bicycles in
long-time idle**



Our device:

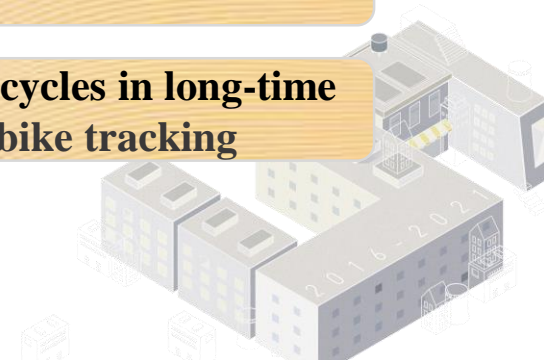


Low cost

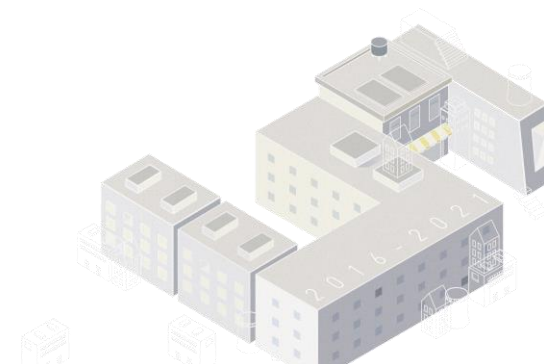
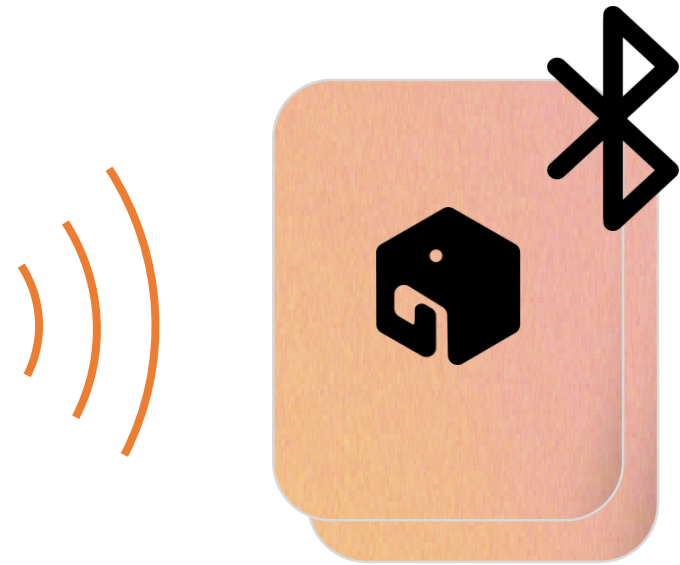
Sustainable, low-carbon

Easy to install

**Identify bicycles in long-time
idle, bike tracking**

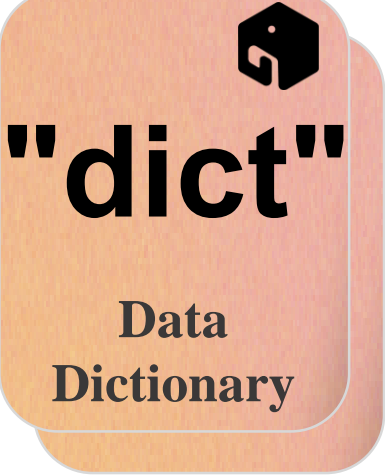


How to sense a bicycle?



How to parse the code?

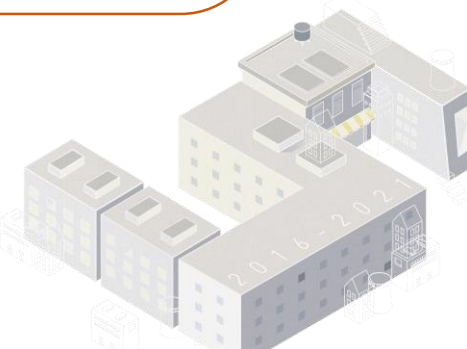
```
allMu_210128.txt
mobike e8b84d b2a52 79 2021-01-28T14:23:23
mobike ea211f bb15b 61 2021-01-28T14:23:23
mobike eb7758 898bf 71 2021-01-28T14:23:23
mobike ebcf6e 8d6ad 77 2021-01-28T14:23:23
mobike ec1a9d e7f21 82 2021-01-28T14:23:23
mobike ecbed1 90d38 64 2021-01-28T14:23:23
mobike ed33f8 f5a49 75 2021-01-28T14:23:23
IK>EGA ed46ae 3afa2 67 2021-01-28T14:23:23
HB9150602894 eda525988236 71 2021-01-28T14:23:23
HB9190935253 ee1213b4fb18 81 2021-01-28T14:23:23
mobike eeac9e 9a112 73 2021-01-28T14:23:23
mobike ef2117 52d11 76 2021-01-28T14:23:23
mobike efb936 d2740 72 2021-01-28T14:23:23
mobike f0a6b1 8a053 87 2021-01-28T14:23:23
mobike f0d5ad 3d348 75 2021-01-28T14:23:23
rtgnpj f11190 e6fa4 78 2021-01-28T14:23:23
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mobike f20047 ebb20 72 2021-01-28T14:23:24
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DJI RS 2-060R60 f673a5cf31e0 73 2021-01-28T14:23:24
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_ fa2270 ac3ec 75 2021-01-28T14:23:24
mobike fae201 5f29d 81 2021-01-28T14:23:24
mobike fb0e15 a67eb 75 2021-01-28T14:23:24
NLB15 fca47a 1d98b 78 2021-01-28T14:23:24
mobike fcd82e f7206 79 2021-01-28T14:23:24
HB9060061590 fd74ef87496f 73 2021-01-28T14:23:24
mobike fe750dc2e762 74 2021-01-28T14:23:24
HB9150762466 febddd1f3572 79 2021-01-28T14:23:24
#sw~!z fef420419e90 65 2021-01-28T14:23:24
mobike ff8e9098c3ba 85 2021-01-28T14:23:24
HB3120685600 0c300a7620c0 78 2021-01-28T14:24:30
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XTraB0 241510 0c793 75 2021-01-28T14:24:30
XTraB0 241510 11ccb 85 2021-01-28T14:24:30
XTraB0 241510 29e9e 72 2021-01-28T14:24:30
XTraB0 241510 3b2e4 85 2021-01-28T14:24:30
XTraB0 241510 45894 74 2021-01-28T14:24:30
XTraB0 241510 5dce2 67 2021-01-28T14:24:30
XTraB0 241510 603ae 84 2021-01-28T14:24:30
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XTraB0 241510 c5ec5 75 2021-01-28T14:24:30
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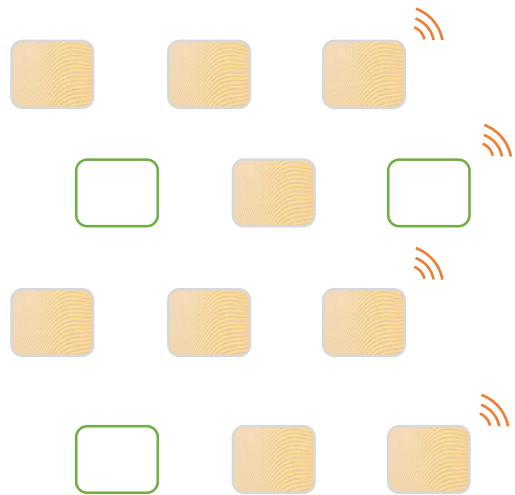
- lock a
- lock b
- lock w
- lock g
- lock f
- lock d
- lock s
- lock k

Identify

- Bicycle Company A
- Bicycle Company B
- Bicycle Company C
- Bicycle Company ...



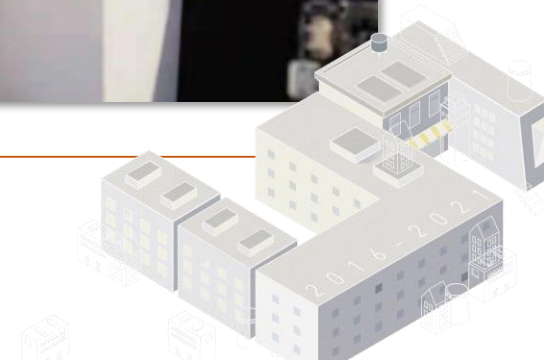
IoT perception tool



Power

Network

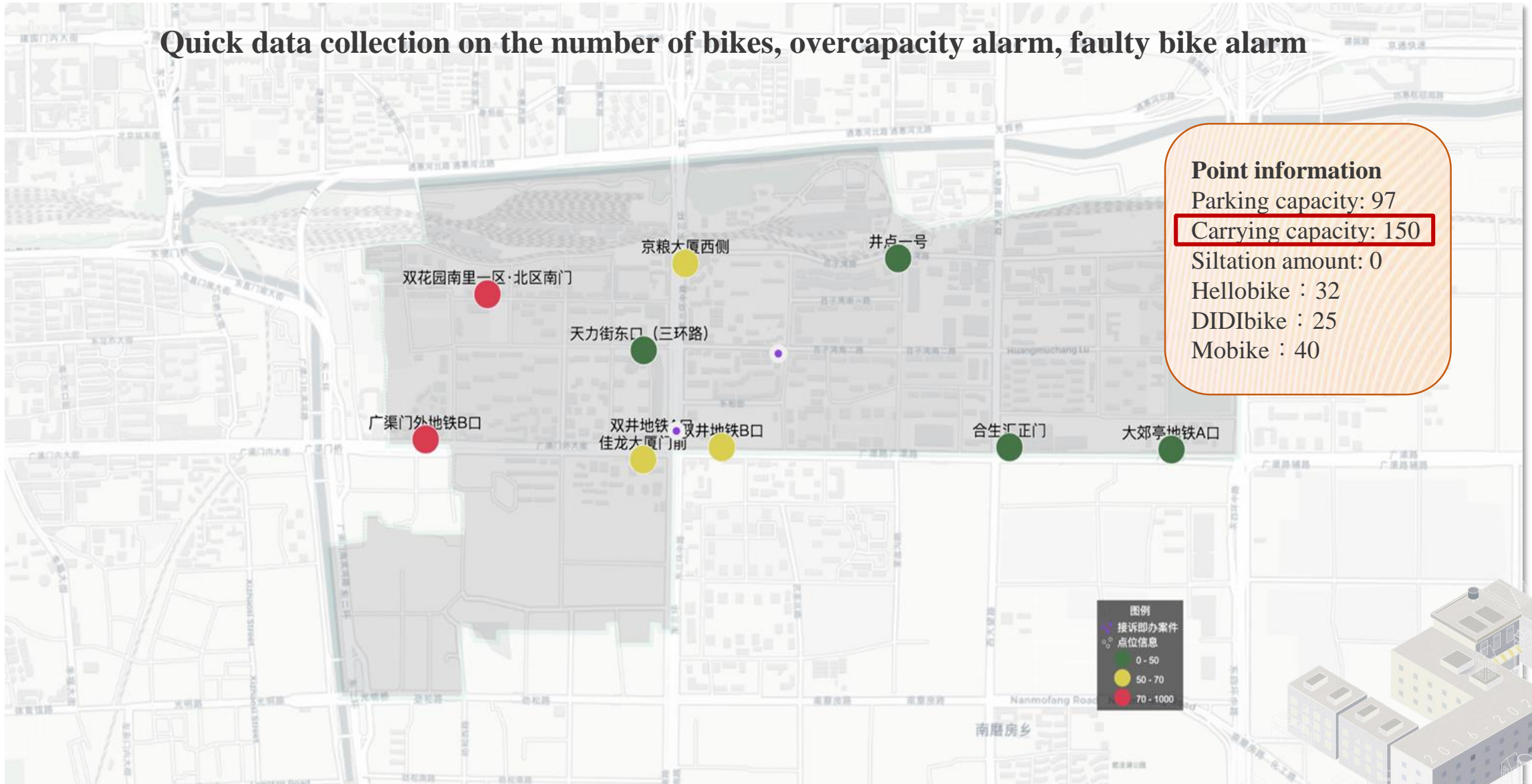
Evolve by continuous development and testing





Available data

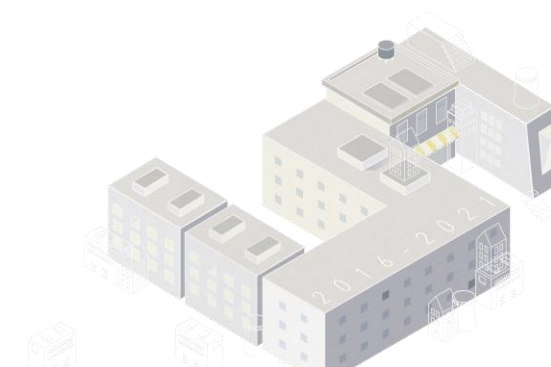
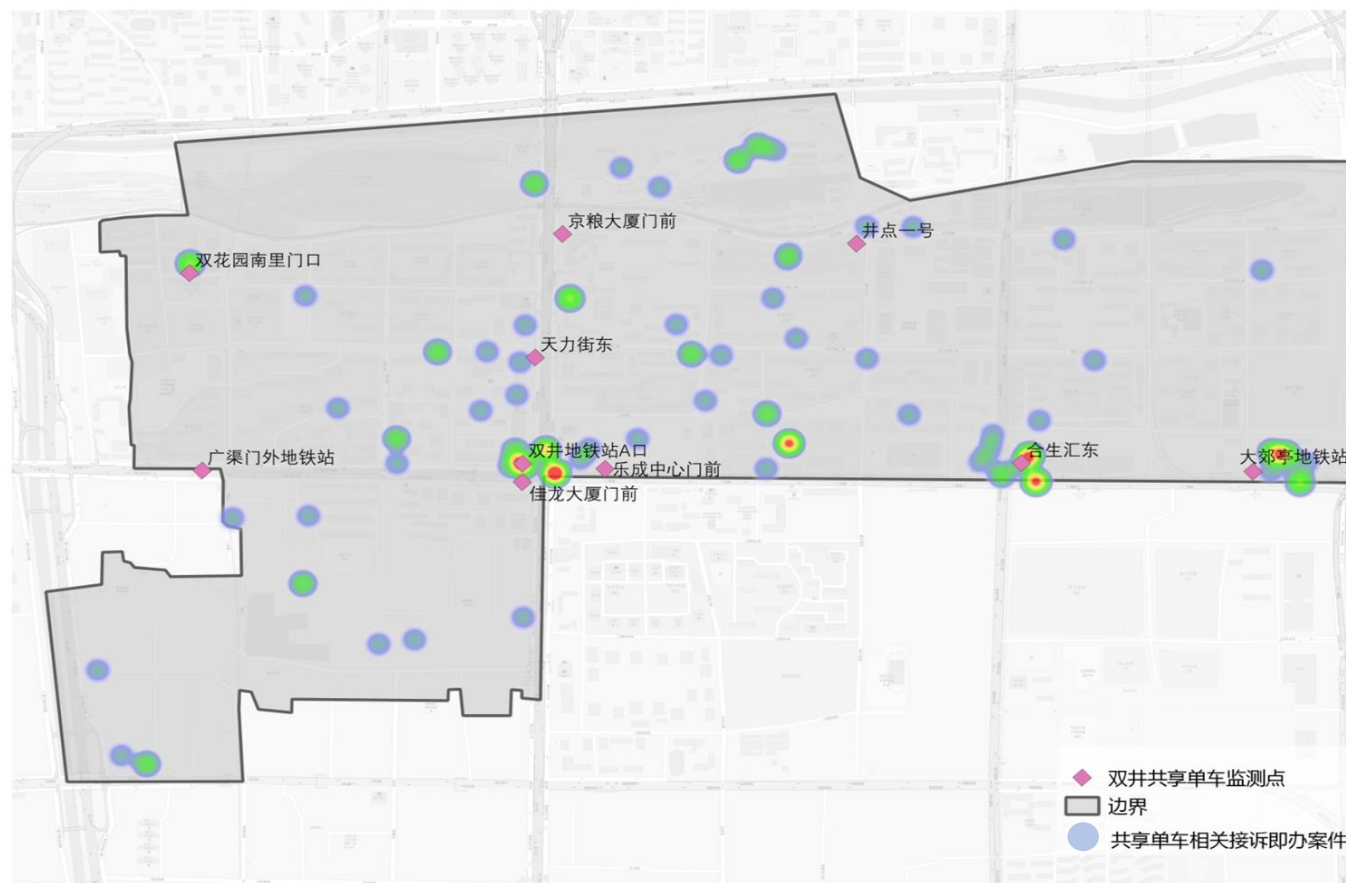
Quick data collection on the number of bikes, overcapacity alarm, faulty bike alarm



Management tool upgrading enabled the transformation of governance mechanisms



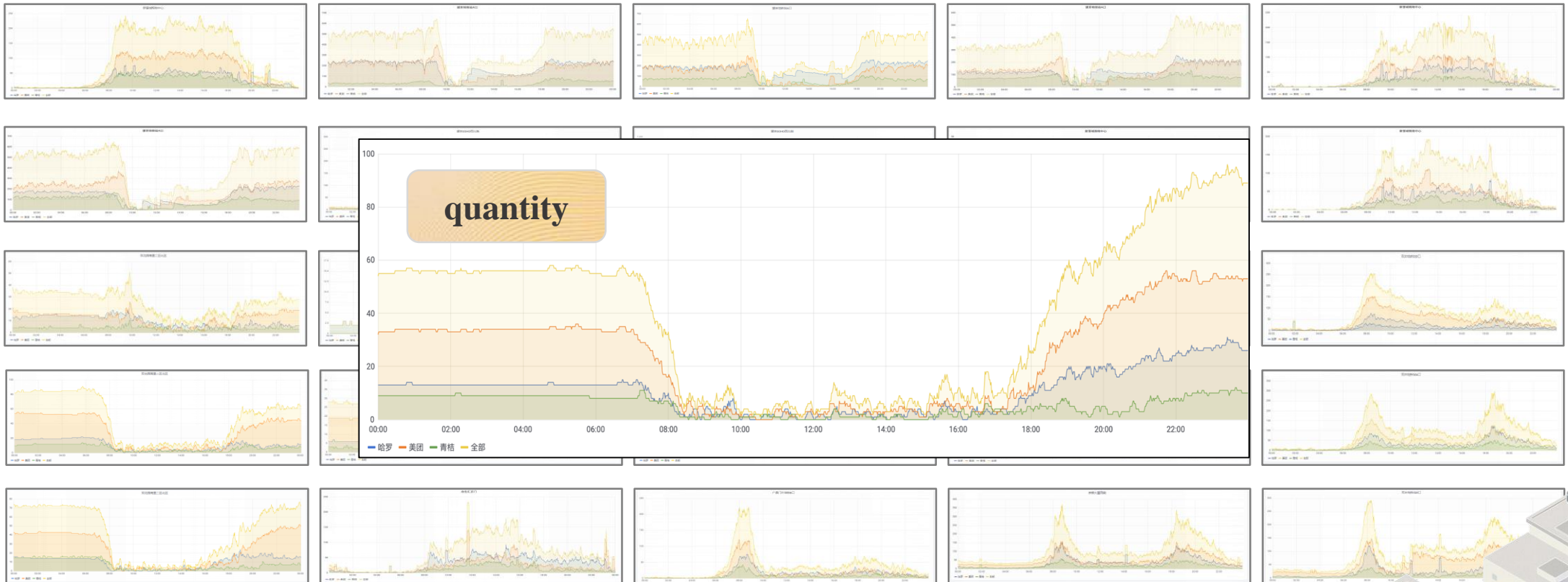
Through the spatial analysis of the actual situation of complaints and supervision on the 12345 complaint hotline, we have identified the key governance areas.





Data mining

By observing the parking rules at different locations, we can set up the travel modes and service needed of all locations to provide a basis for the optimization of shared bike management





Data mining

Simplified into three types of travel modes

“Work”

Shopping mall Office building

Super market Comprehensive office

....

“Transit”

Subway Bus

Housing oriented station Working oriented station

....

“Home”

Old community Commercial Residential

Compound Apartment house

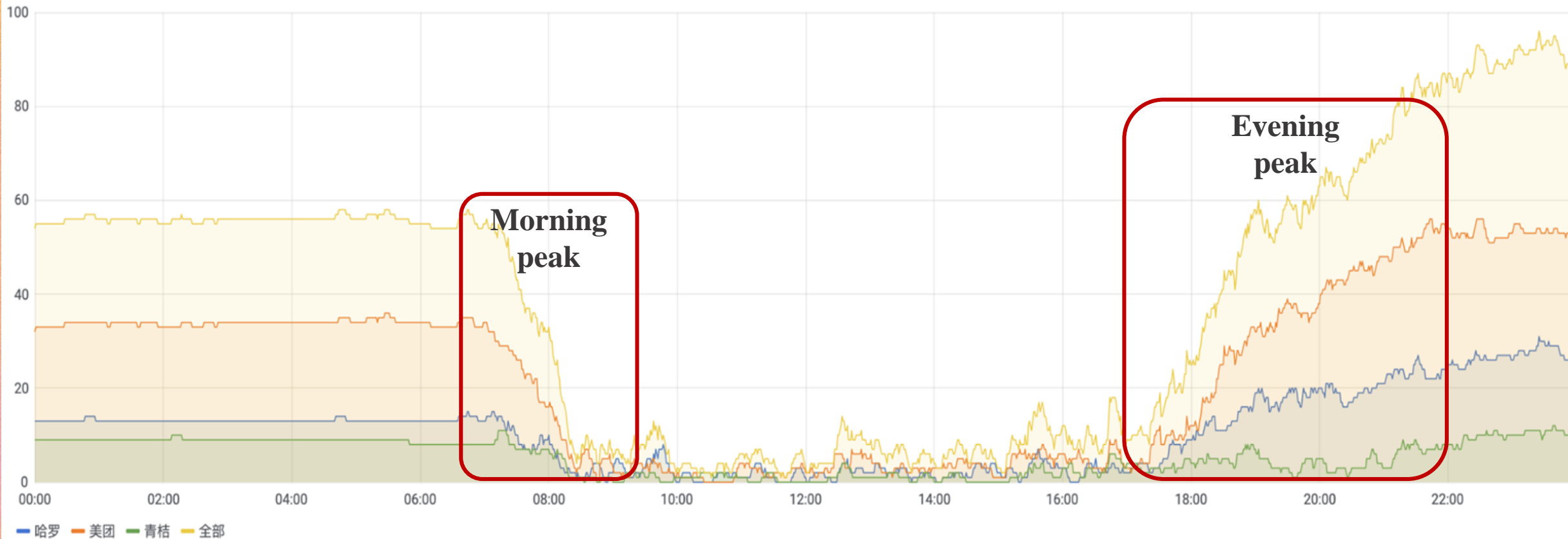
....

Data mining



Type of residence

“Home”

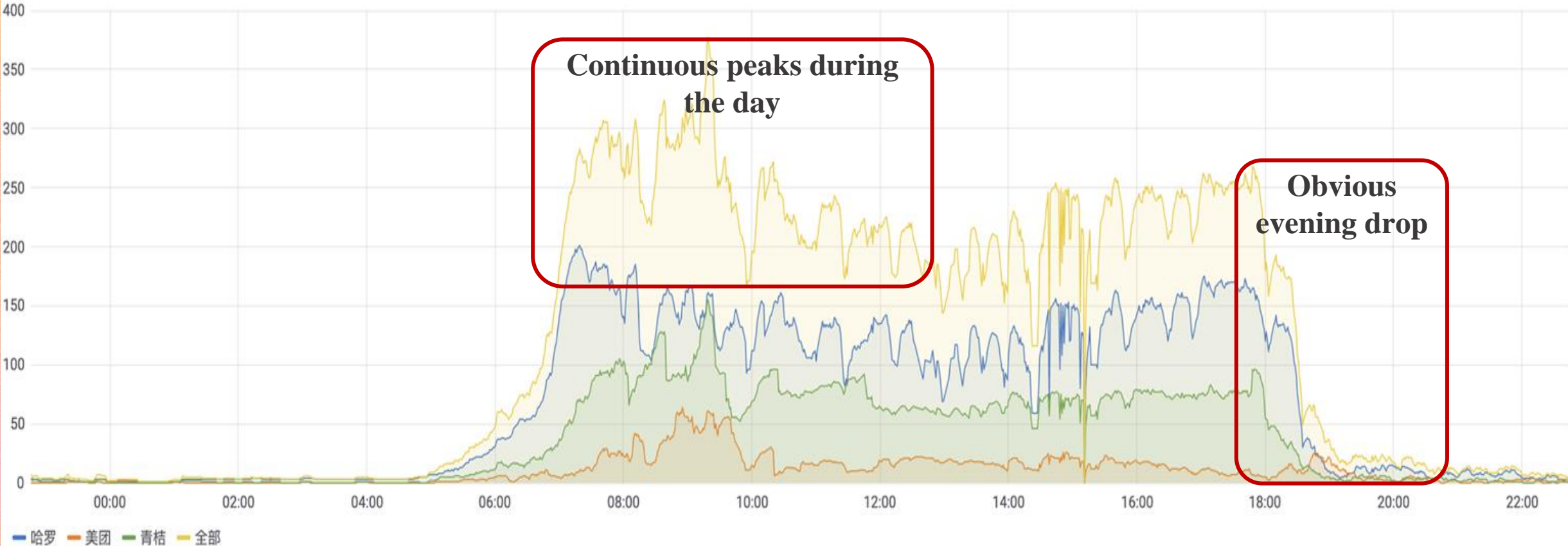


Data mining



Subway station

“Transit”



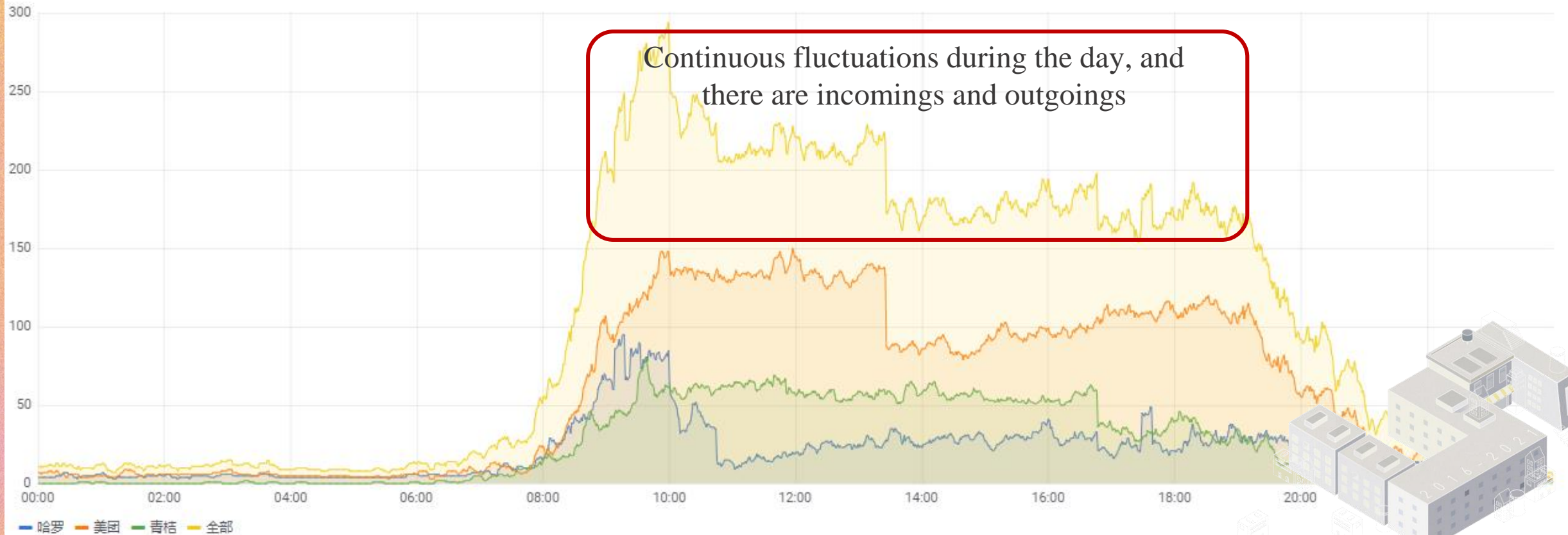


Data mining

Comprehensive office building

“Work”

Continuous fluctuations during the day, and there are incomings and outgoings

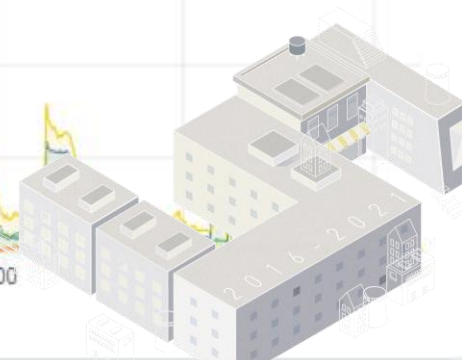
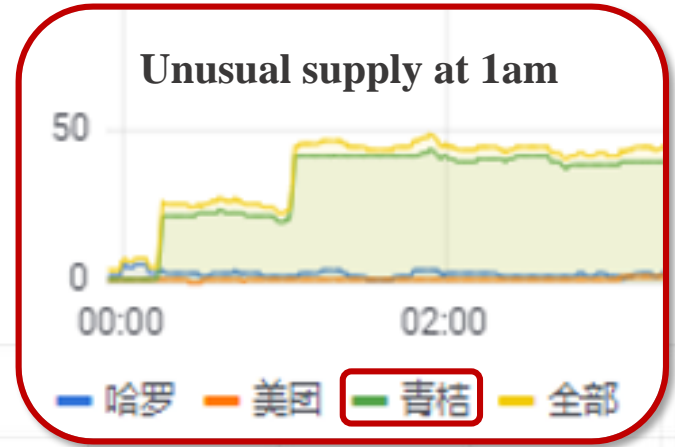
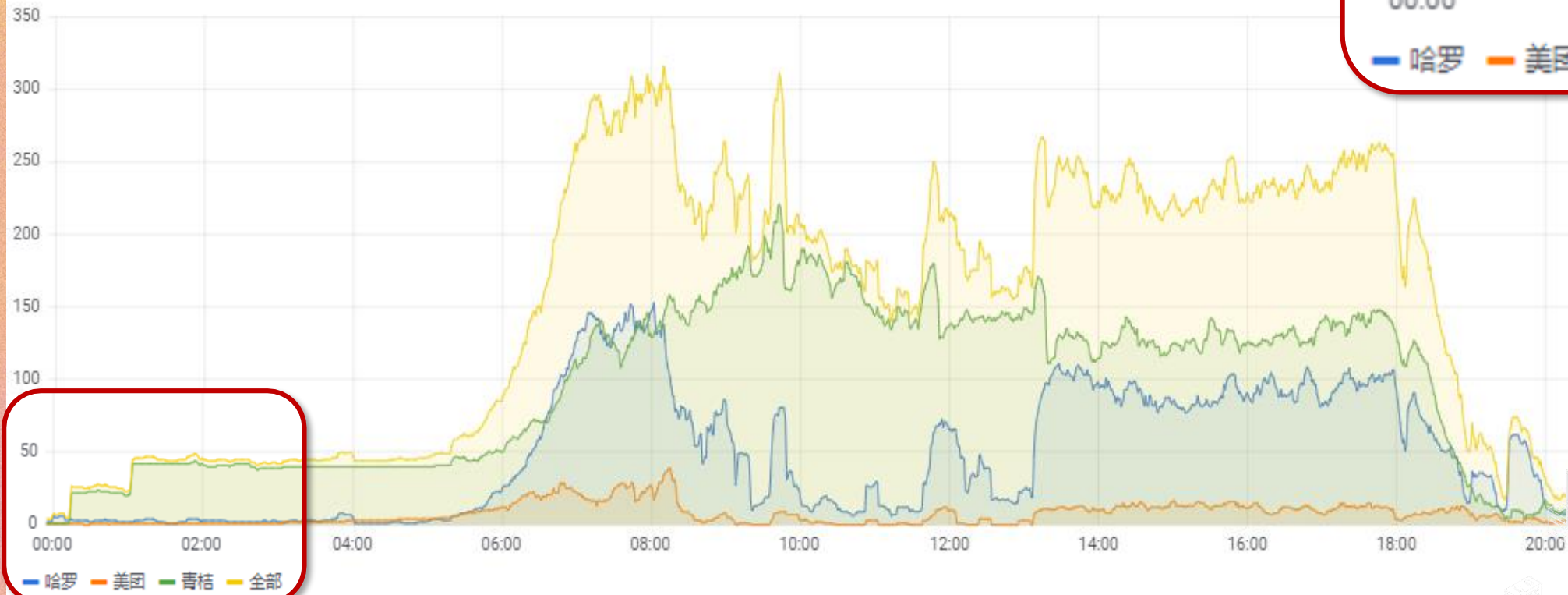




Governance strategy innovation

Screening unnecessary bike supply

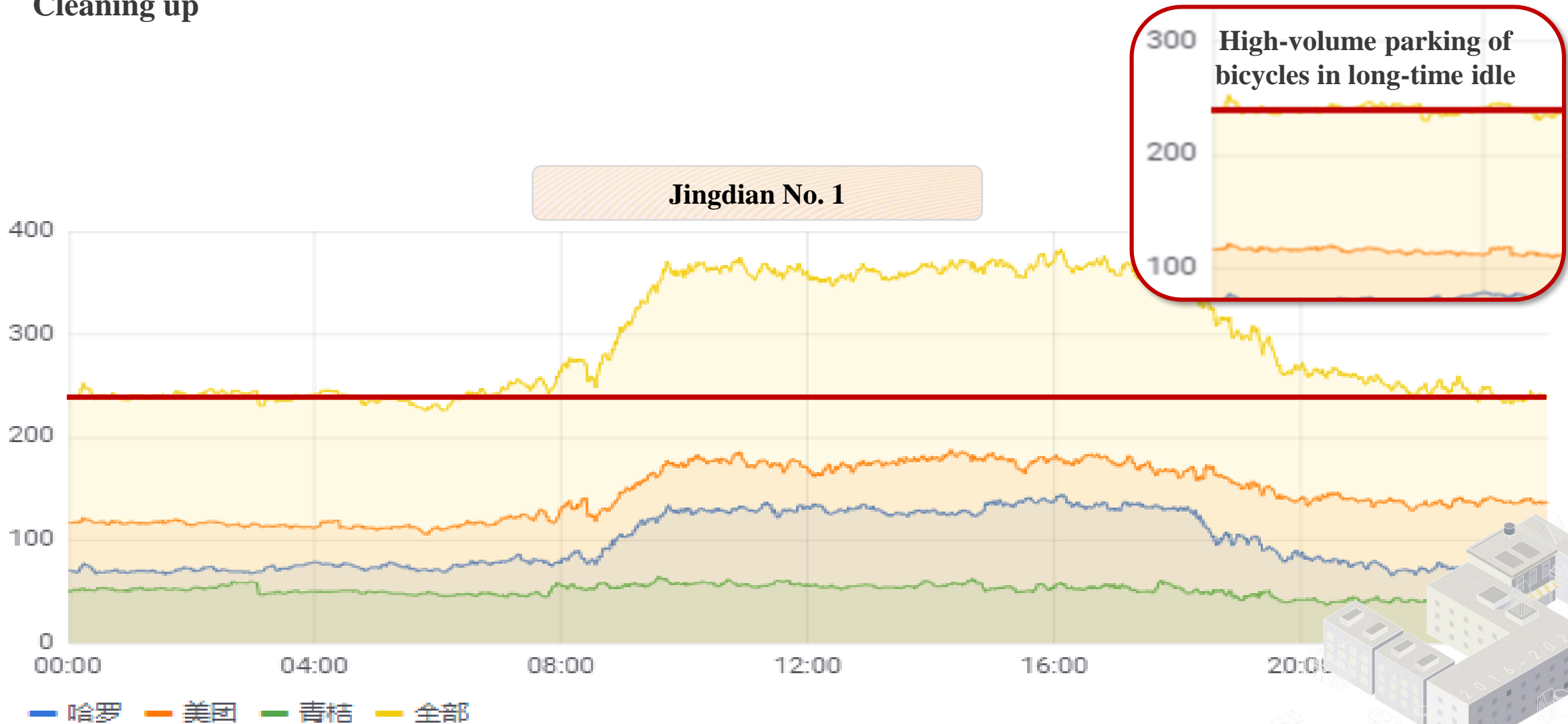
Tiantongyuan Subway Station





Governance strategy innovation

Cleaning up

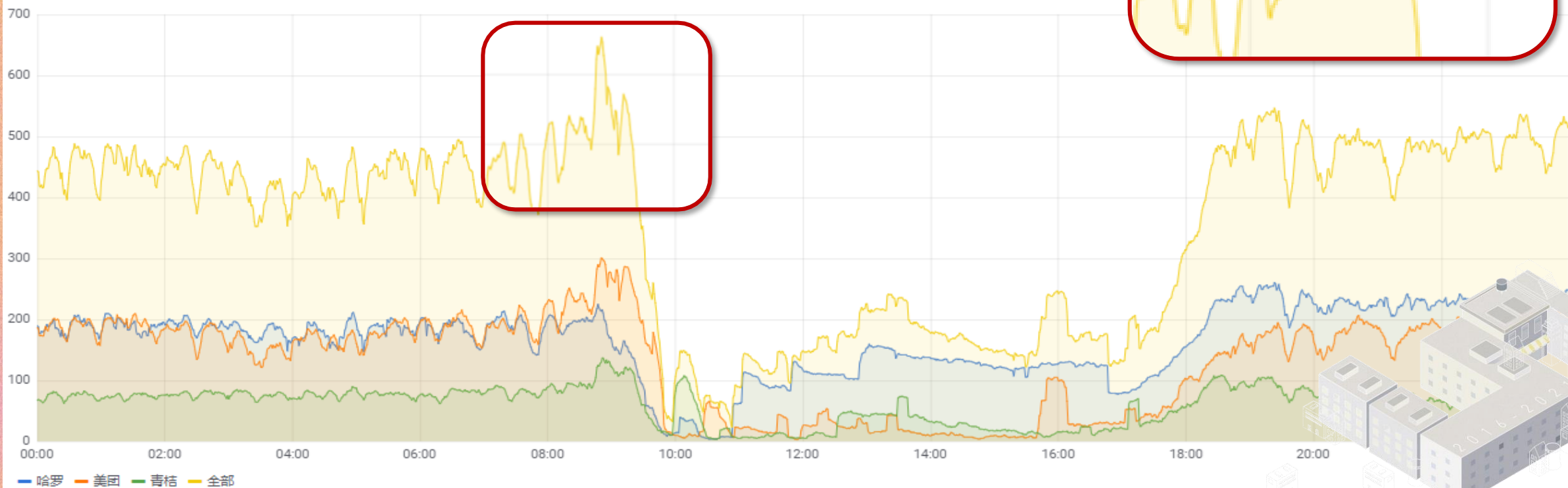


Governance strategy innovation

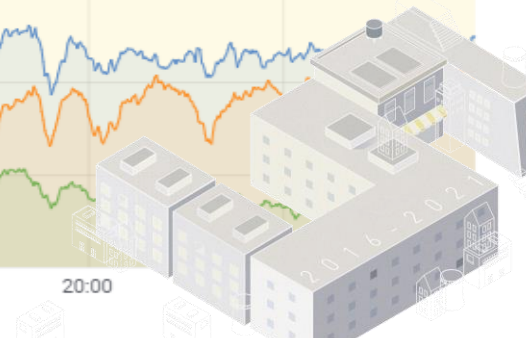


Optimize centralized supply

Wangjing Subway Station



Even the supply to flatten the peak

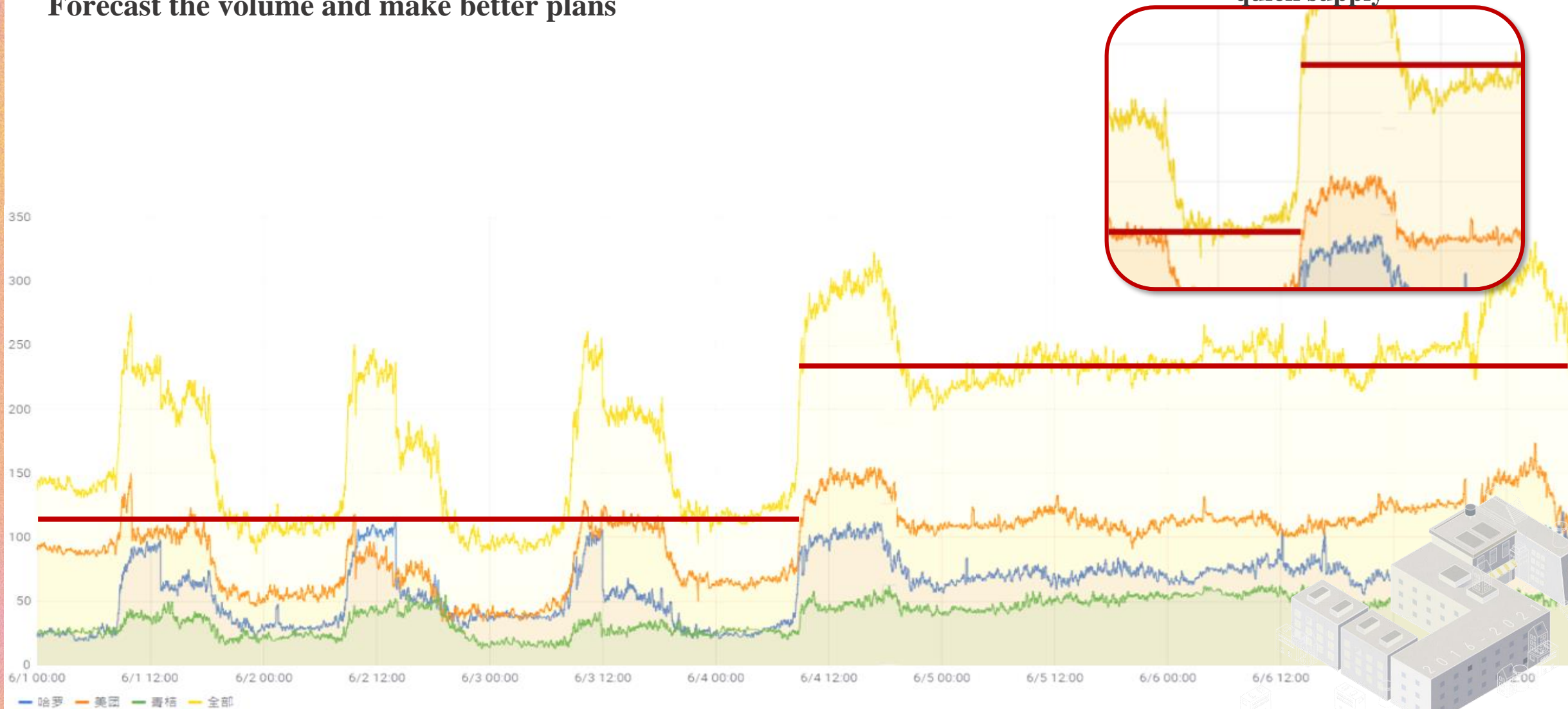


Governance strategy innovation



Forecast the volume and make better plans

Command and dispatch to deliver a quick supply





Shared-bicycle management system

A system for municipal governance with data-based management logic and innovative perception tools

01



IoT Perception Network



02



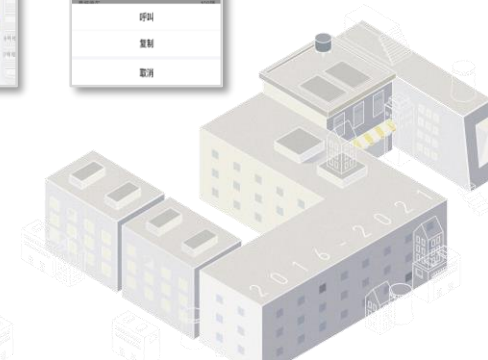
Information Monitoring platform



03

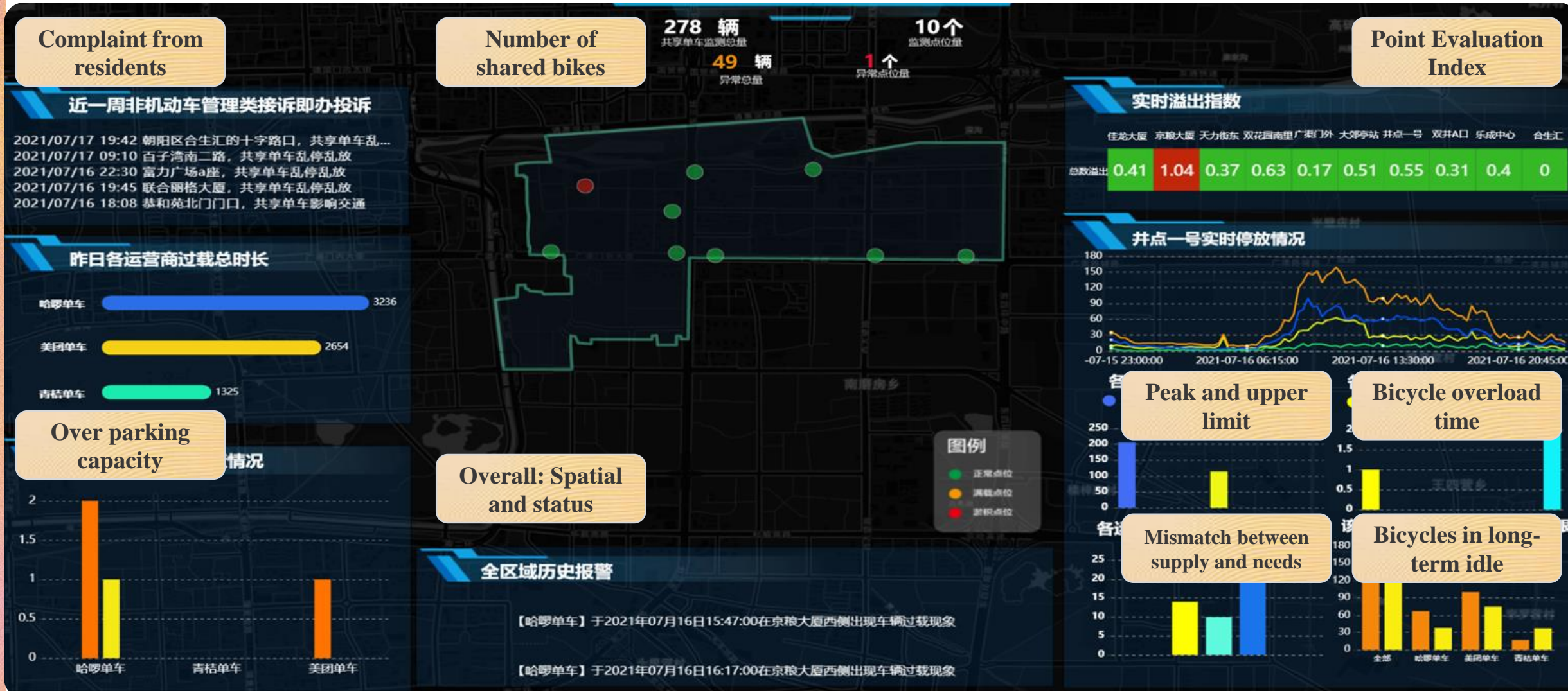


Intelligent Management System





Shared-bicycle management system





Shared-bicycle management system

Smart management tool for mobile devices developed to make a command and schedule, to received the alarm push of abnormal points and abnormal bikes

Point overload distribution notice



Record clearing response behavior



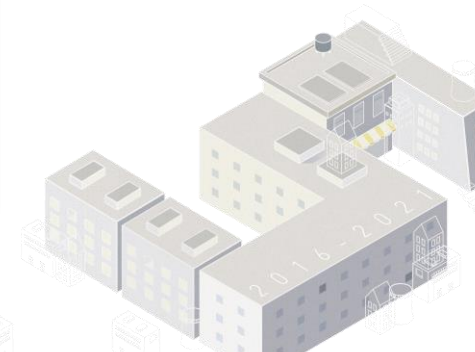
Achieve long-term assessment



Clearance staff

manager

staff member

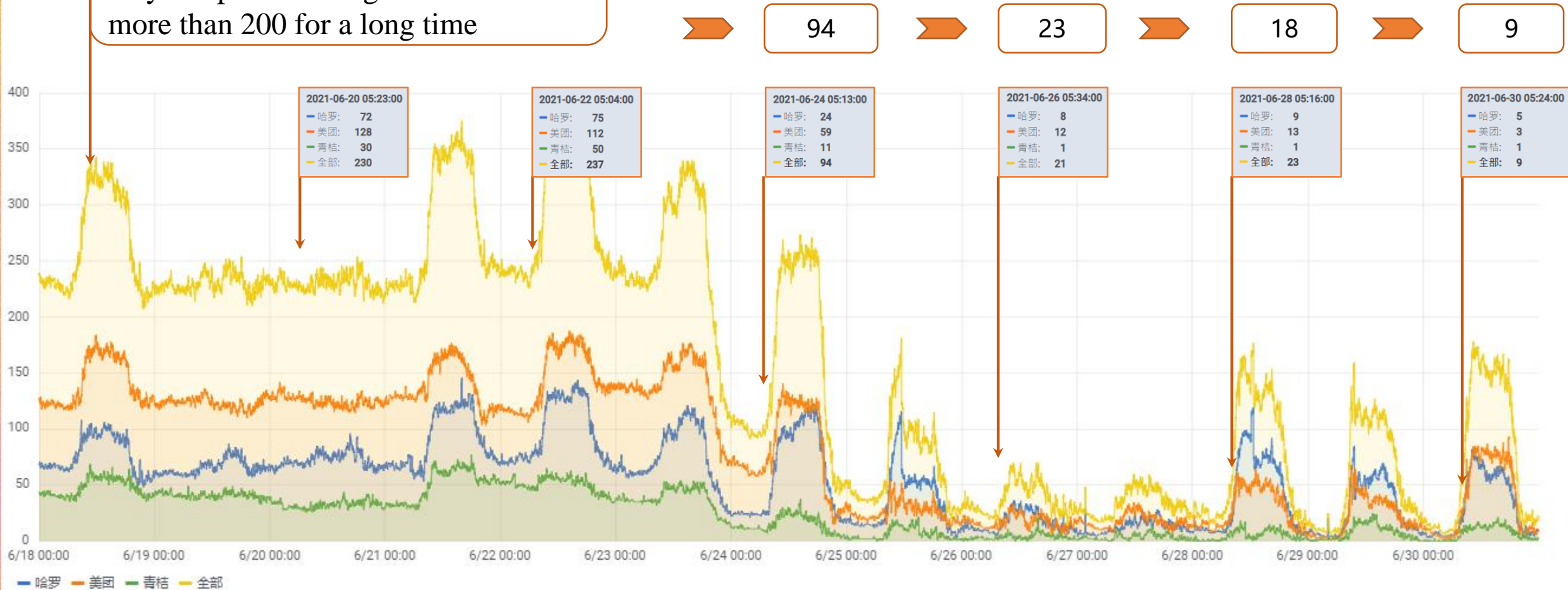




Results

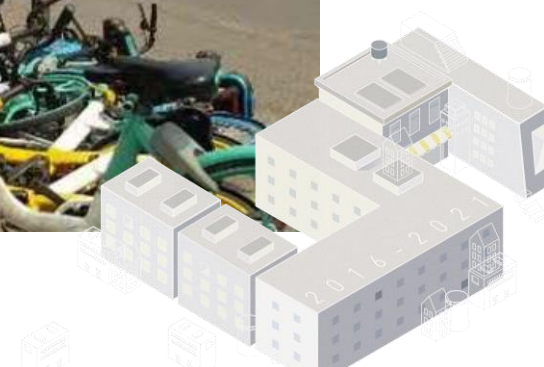
Changes along Baiziwan Road after management

Before governance, the number of bicycles parked at night maintained at more than 200 for a long time



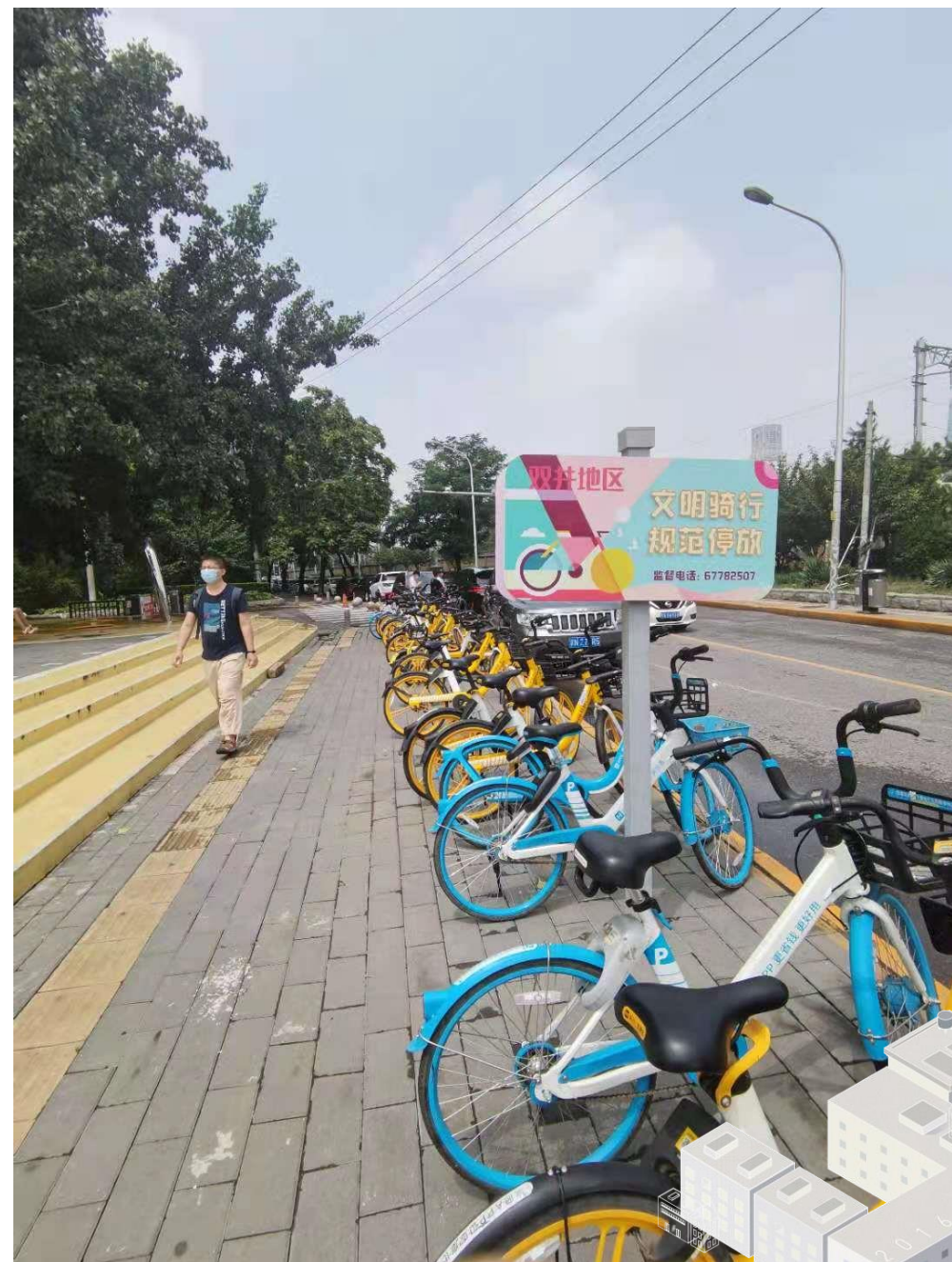


Two hundreds bicycles parked before the management





This is what it looks like
after governance takes
place





**We hope more streets
can go back what
it should have been**

Thanks!

