Bike and Car Sharing is a Form of MaaS(Mobility as a Service) in city

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Sharing Bike

From 2016, bike-sharing from Internet to solve short distance travel problems in China has attracted widespread attention and become hot point in urban smart governance.

According to government report, until 2016, the rental market size of shared bike reached 45 million yuan and user scale reached 4 million people. At present, the registered users of shared bike are over 1 billion in China.

According to statistics, by the end of 2017 June, the number of national bicycle sharing software has been more than 30, In addition to the earlier Mobike and ofo, there are Xiaoming bike, blue bike, panda bike and so on. Along with the prosperous market, shared electric bicycles and cars appear.

Online Car-hailing Platform

Didi Dache has become the most popular online car-hailing platform including general taxi, Zhuanche(special car), shunfengche(person with similar destination or same direction use a same car).

On this platform, there are over 20 million orders per day and it covers most of Chinese cities

1 Service to Public

2 Service to Government

4 Service to Research

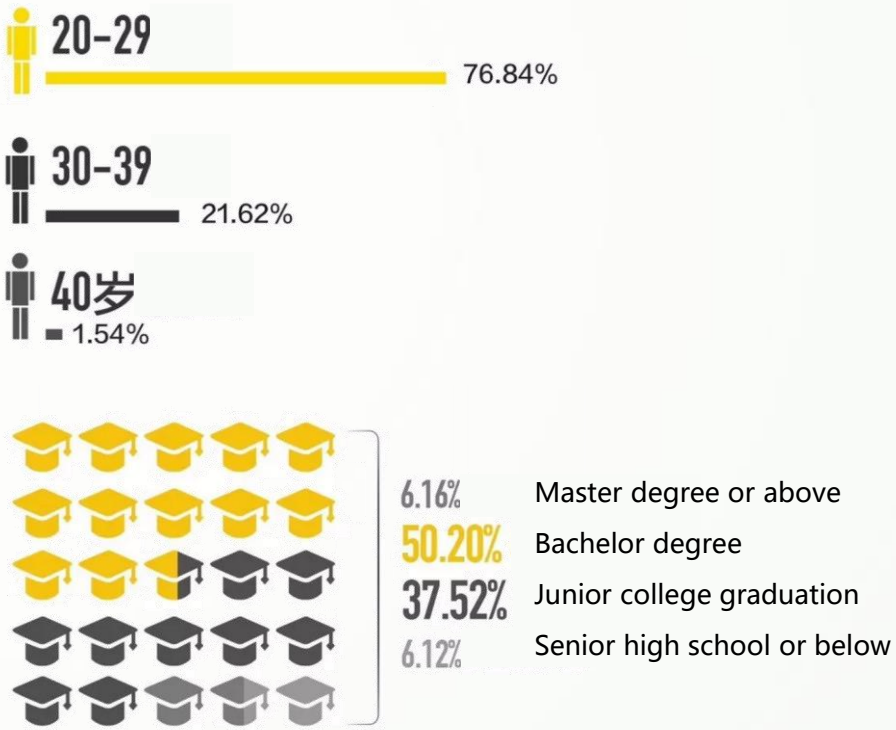
Job Opportunities

Job opportunities

According to Sharing Bike Industry Employment Research Report issued by State Information Center in 2017, at present, China's sharing bicycle industry shares 100 thousand jobs. In the first half of this year, there were about 70 thousand new jobs added, which accounting for about 1% of new urban employment. It means that every 100 new jobs added, there are 1 people work for sharing bicycle services.

- Logistics personnel
- Bicycle manufacturer
- APP platform staffs
- Smart lock manufacturers
- Operation and maintenance personnel

Age and Education Background



Green Mobility

Green Mobility

Convenience to short-distance travel

Decrease the traffic transfer

Decrease private car use

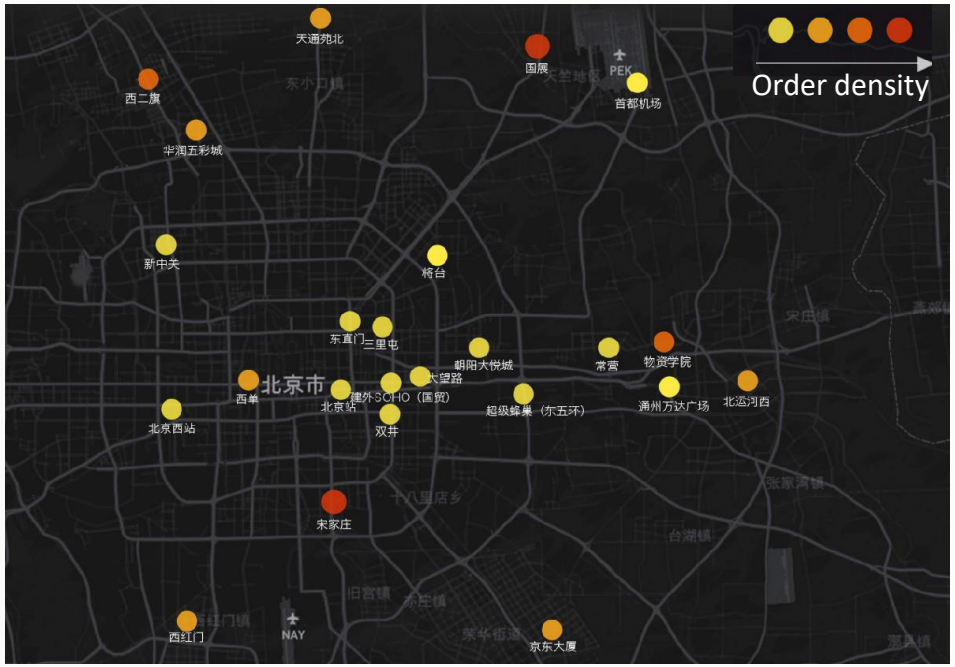
Slow down the traffic pressure

Drop exhaust emission

Create better living place for human health

Green Mobility

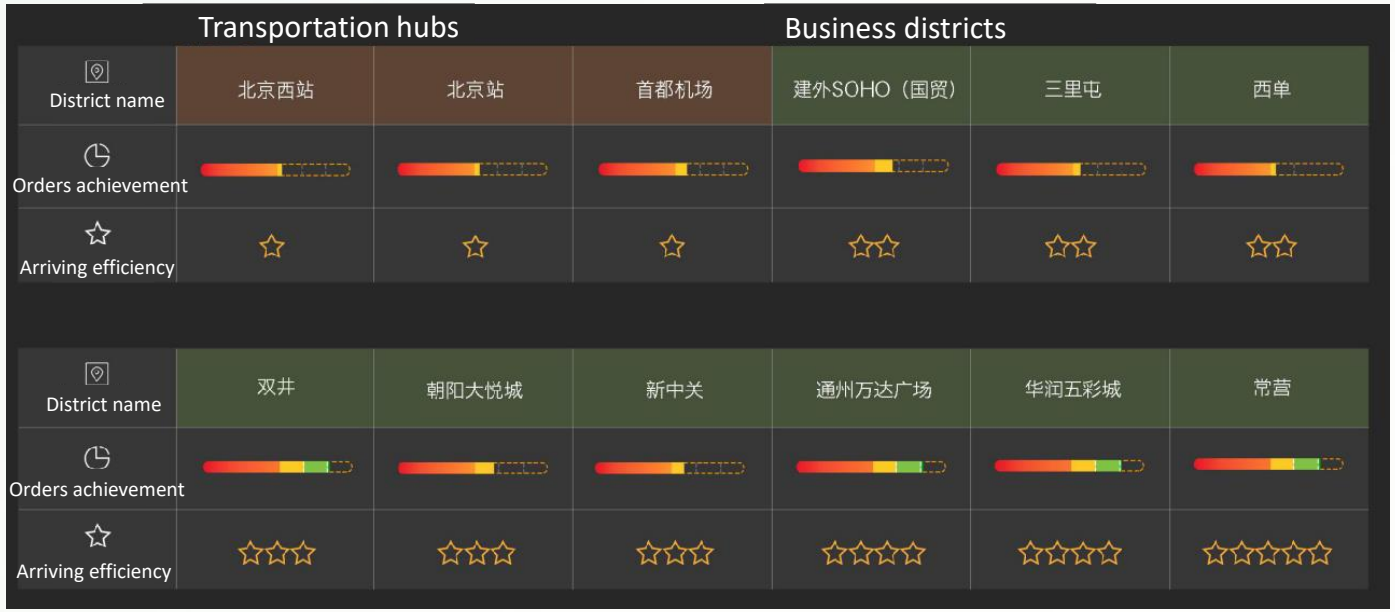
At Didi platform, in the second quarter in 2017, the total distance of travel relying on shunfengche(person with similar destination or same direction use same cars) arrived 1 billion kilometers. Chengdu, Beijing and Tianjin are most popular cities in shunfengche usage.



The popular points of Shunfengche in Beijing

The popular points of Shunfengche in Shenzhen

According to ***Traffic Report of Major Cities in China*** from Didi Company



According to ***Traffic Report of Major Cities in China*** from Didi Company

Didi use two index to check the green mobility condition, and find that there are still many requirements of green mobility is not meet. The condition in Shenzhen is better than Beijing.

Top ten cities in Shunfengche usage:
1 Chengdu ;
2Beijing;
3Tianjin;
4Shenzhen;
5Guangzhou;
6Hangzhou;
7Changsha;
8Wuhan;
9Suzhou;
10Qingdao

Upper table: Shufengche condition in Beijing
Below table: Shunfengche condition in Shenzhen

Smart governance

Smart Governance

This figure shows the condition of traffic congestion in Chinese typical cities, it is positive to the smart arrangement of police, the optimization of public transport and reasonable restriction of private cars and so on.

	City	Traffic Performance Index	Average travel speed
1	哈尔滨市	1.690	28.83
2	西安市	1.655	31.41
3	兰州市	1.652	32.26
4	西宁市	1.624	30.11
5	石家庄市	1.618	33.61
6	重庆市	1.594	32.98
7	北京市	1.570	33.81
8	济南市	1.556	34.31
9	成都市	1.538	34.18
10	呼和浩特市	1.525	34.13

According to ***Traffic Report of Major Cities in China*** from Didi Company

Smart Governance

Along with the popularity of online car booking, the technological platform also bring benefits to supervise traffic congestion on peaking hours.

Morning peaking hours

	City	Traffic Performance Index	Average travel speed
1	哈尔滨市	1.987	24.41
2	重庆市	1.907	27.27
3	西安市	1.898	27.24
4	石家庄市	1.875	28.89
5	北京市	1.853	28.35
6	兰州市	1.807	28.81
7	长春市	1.779	26.17
8	济南市	1.770	30.10
9	西宁市	1.760	27.88
10	呼和浩特市	1.740	29.73

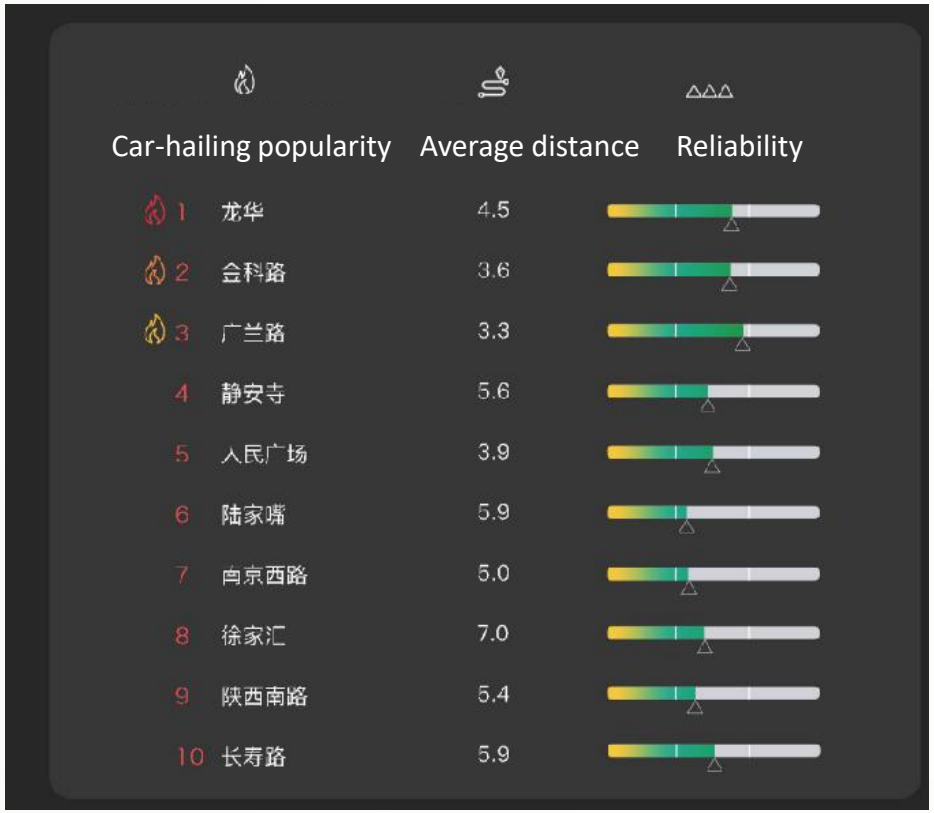
Evening peaking hours

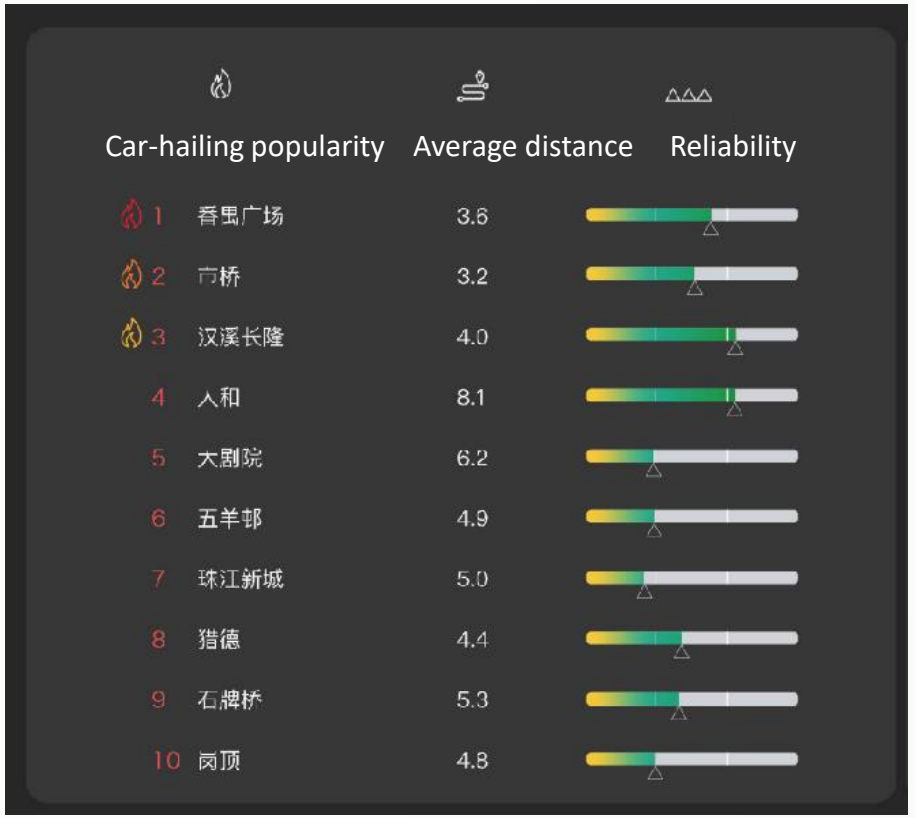
	City	Traffic Performance Index	Average travel speed
1	西安市	1.944	26.66
2	石家庄市	1.881	28.99
3	哈尔滨市	1.881	25.88
4	西宁市	1.861	26.28
5	北京市	1.824	28.90
6	重庆市	1.823	28.64
7	广州市	1.818	29.75
8	福州市	1.783	29.82
9	兰州市	1.782	30.24
10	昆明市	1.771	28.08

According to ***Traffic Report of Major Cities in China*** from Didi Company

Smart Governance

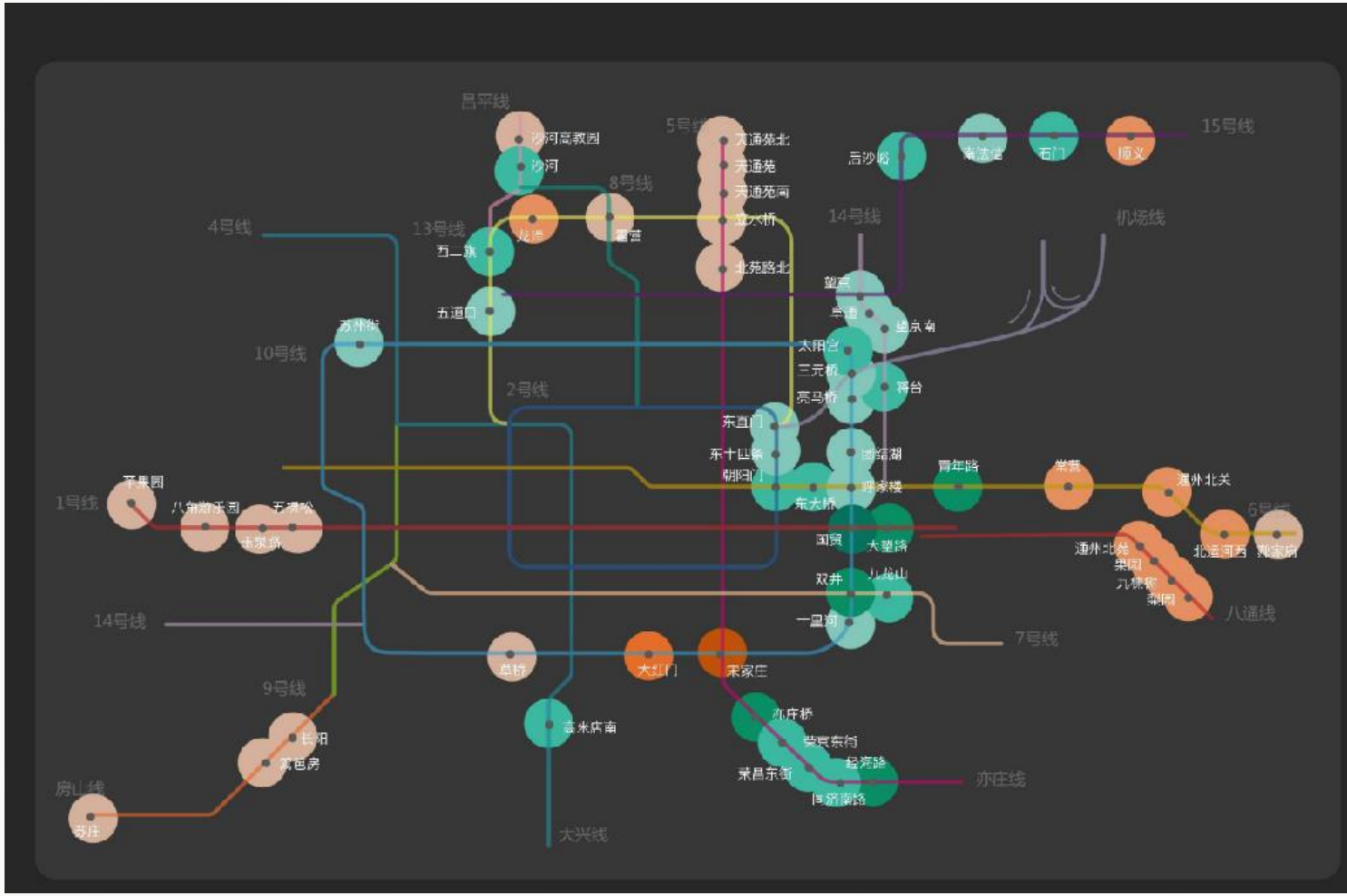
The following tables show the car-hailing popularity at every metro stop, the average travel distance and reliability(that refer to the waiting time of order accepted) in Shanghai and Guangzhou. For citizens, they can arrange reasonable time for their trip, and for the taxi company, they can adjust the location of taxi supply and for government, they can rethinking urban patterns and traffic lines plan.





According to ***Traffic Report of Major Cities in China*** from Didi Company(based on orders at metro stops in Didi company in the second quarter, 2017)

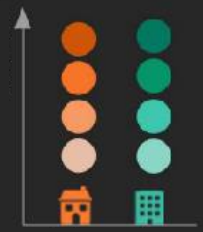
Smart Governance



It is useful to observe jobs-housing balance through divided the car-hailing orders at metro stops into two types according to the location : the working district and housing district.

Beijing has relative serious jobs-housing separation， especially at Tongzhou, Fangshan, Xierqi, Wangjing and other peripheral areas where there are insufficient public transport and the on-line car booking become efficient tool to connect the metro stops and the living or working places.

Car hailing popularity



Housing district. & working district

According to ***Traffic Report of Major Cities in China*** from Didi Company(based on orders at metro stops in Didi company in the second quarter, 2017)

Research

Functional and morphological polycentricity
Functional urban areas
The quality of urban clusters' development

Our work

Most of existing case studies on urban form are for a single city, few of them are for a large body of cities, ranging from a single city, a city region, even to a city system for a whole country.

Our groups work use millions of car-hailing records in 2016 for the whole Chinese from one famous online platform . We then propose a multi-scale framework on using the national-wide and fine-grained trips for understanding Chinese cities and city regions in spatial dimension

Research

1

Functional & morphological polycentricity

All Chinese cities at the city level

2

Functional urban areas

All cities with sufficient trips are generated, considering the inconsistence between the administrative boundary and functional boundary of a Chinese city

3

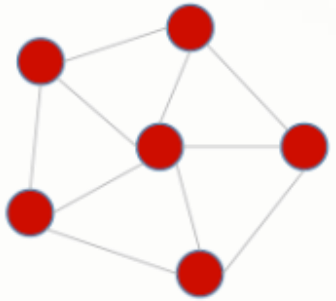
Urban clusters' development quality

It has been evaluated from three aspects, the total flow scale, the inter-city flows distribution in a city region and the rate between inter-city flows in a city region and total inter-city flows.

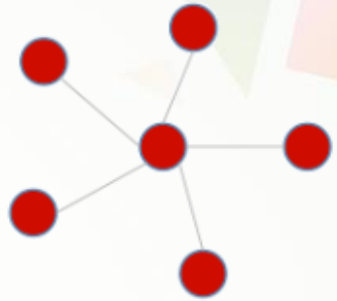
Functional & morphological polycentricity

Morphological polycentricity

Morphological monocentricity



Functional polycentricity



Functional monocentricity

Traditional research method of urban polycentricity is based on typical cities, while we use big data to study the polycentricity of a large body of cities in China.

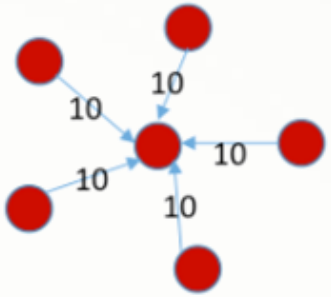
Traditional research on urban polycentricity based on human density or job density. It could reflect the morphological polycentricity. We study both functional & morphological polycentricity by using car-hailing data from one famous on-line car hailing platform which detailedly record the orientation township and destination township of every order.

The functional polycentricity reflects the connections and network degree among different centers

Functional & morphological polycentricity

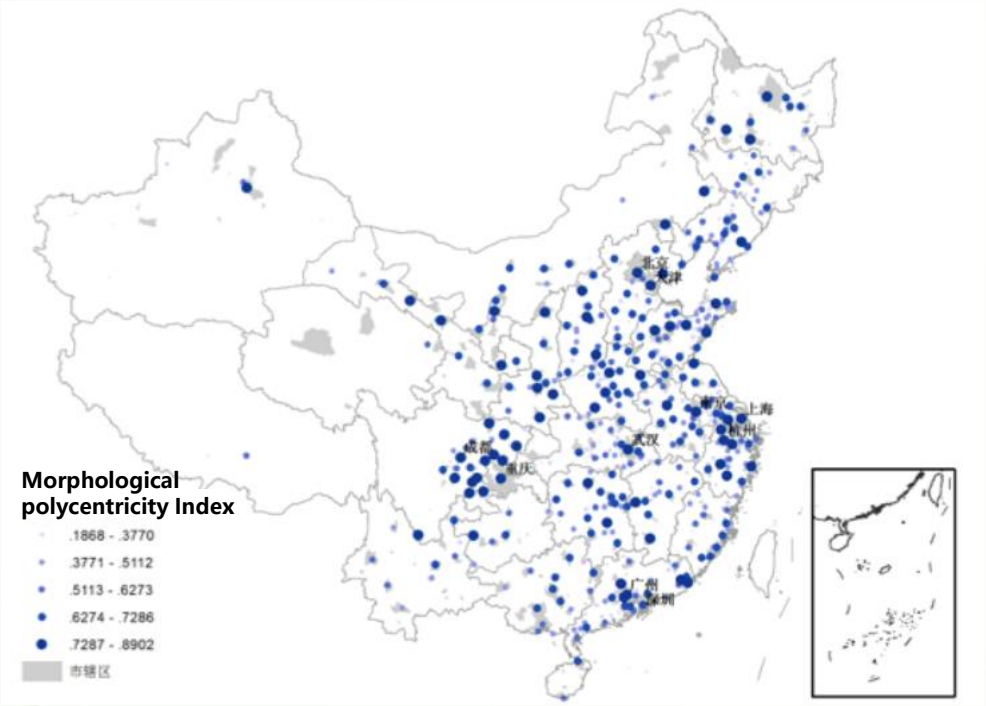
Using inflow volume to evaluate morphological polycentricity

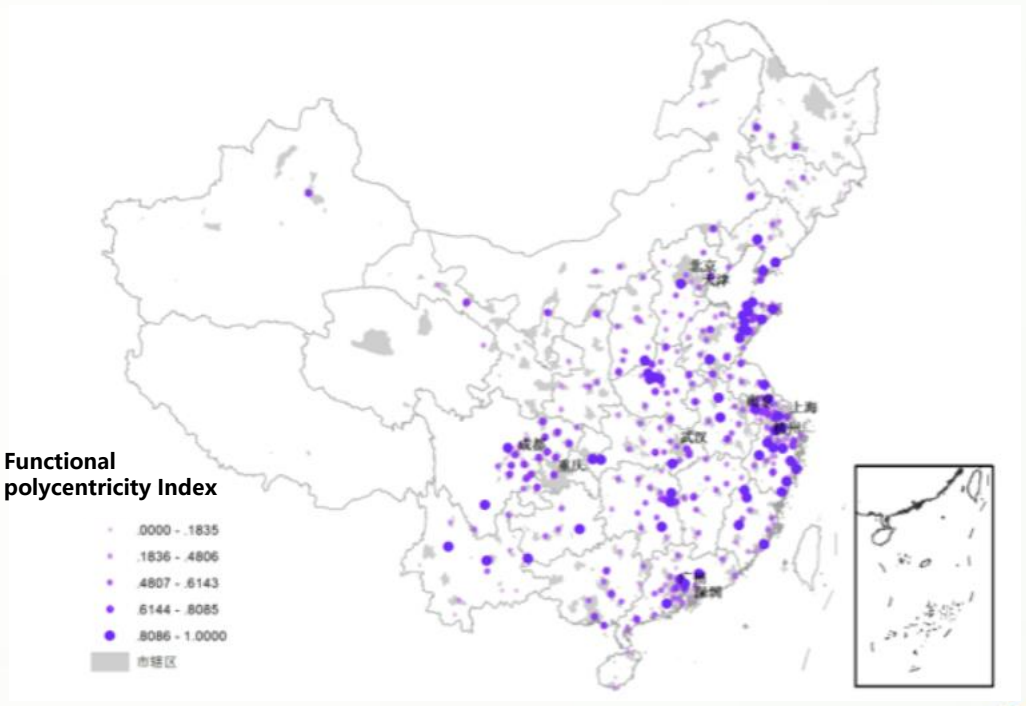
Using indegree to evaluate functional polycentricity



Sketch map

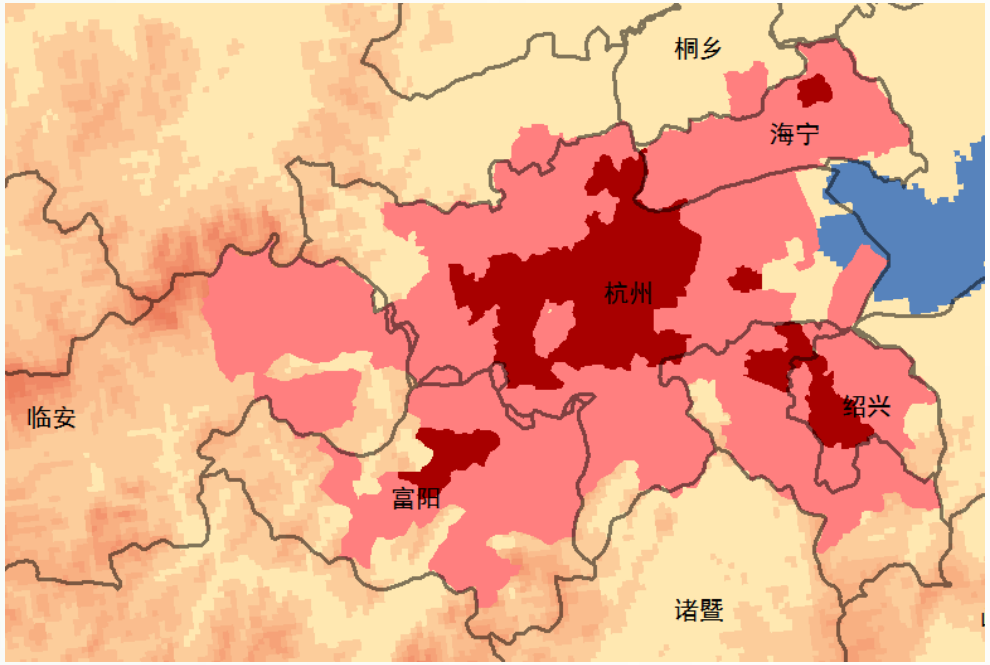
The inflow volume in center point is 50 and the indegree is 5(every point represent a township)



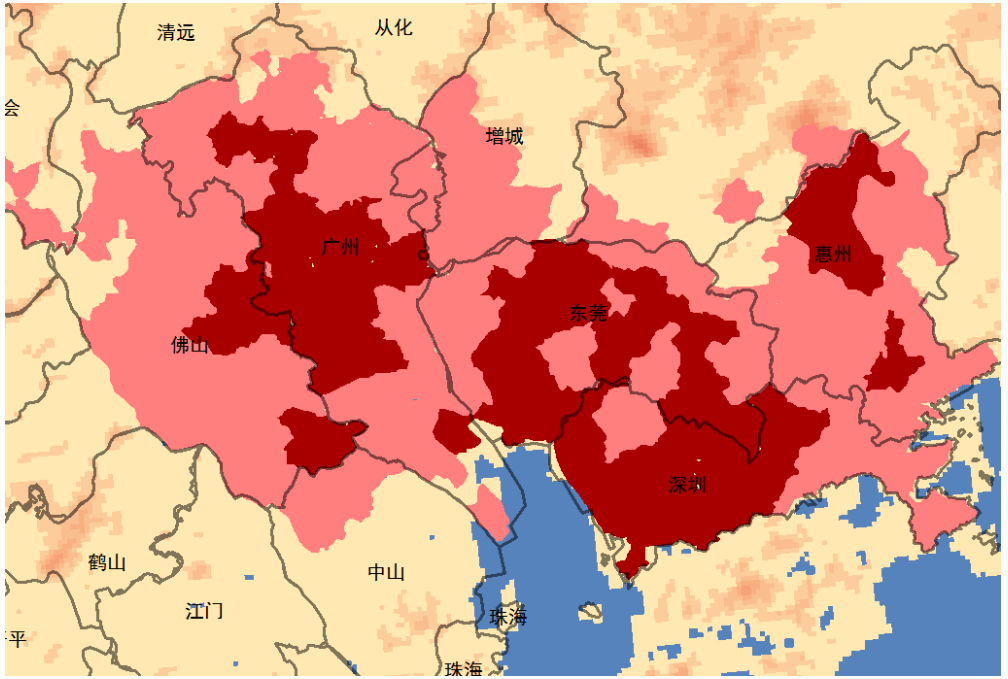


Functional urban areas

With the usage of the travel flows big data at township scale to find the urban functional areas which refer to the influence extent of a city and to identify urban influence boundary. We collect data from 50 thousands Chinese township that including most of Chinese cities and draw FUA maps for all Chinese cities above county level.

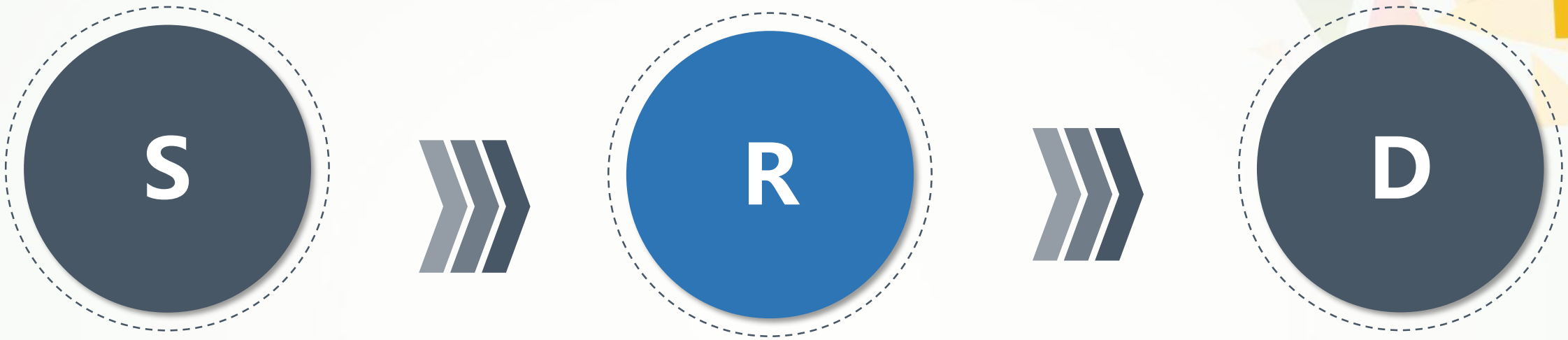


Hangzhou FUA:
Core areas: 4728km^{2}km^2
Peripheral areas: 8591km^2



Guangzhou & Shenzhen FUA:
Core areas: 1225km^2
Peripheral areas: 5115km^2

Urban developmental quality



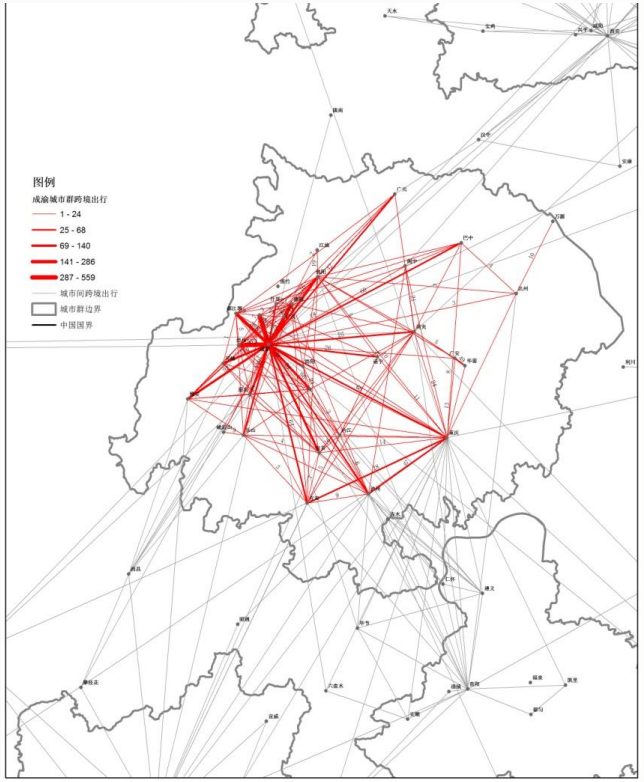
It has been evaluated from three aspects:
The total flow scale(S)

The rate between inter-city flows in a city region and total inter-city flows (R)

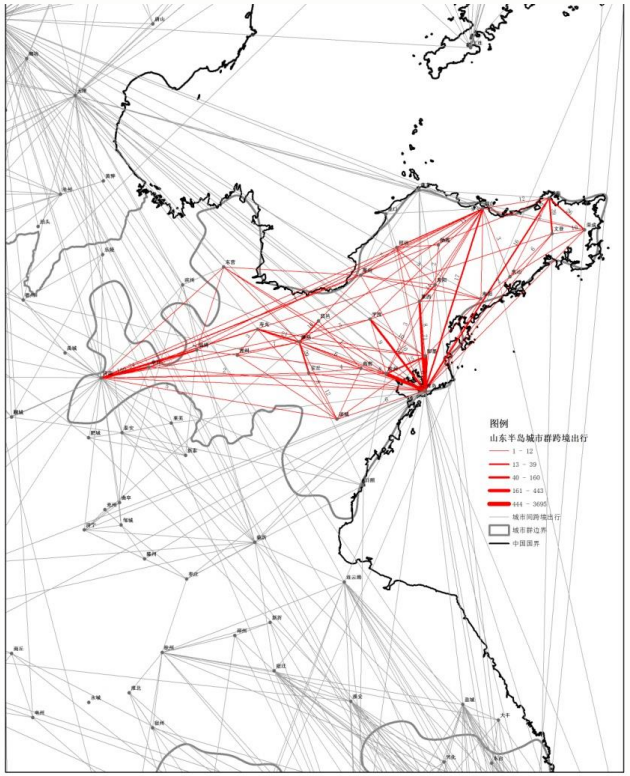
The inter-city flows distribution in a city region (D) (including two parts: the functional distribution and the morphological distribution).

Urban developmental quality

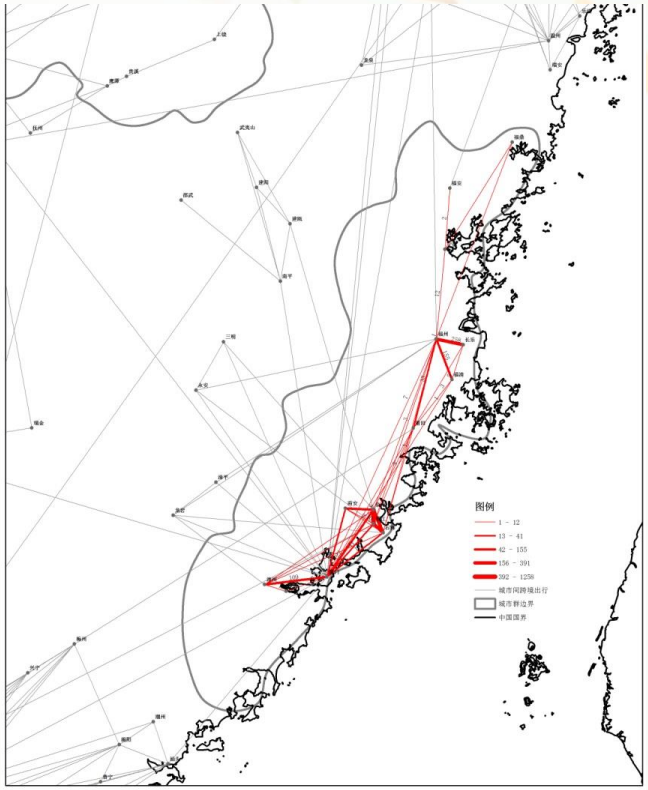
The drawings of top three urban clusters:



Name	Chengyu
Scale	14.30%
Rate	93.83%
Distribution	82.40%
Quality	11.06%



Name	Shandong Peninsula
Scale	20.68%
Rate	92.62%
Distribution	78.98%
Quality	15.13%



Name	Haixia Xian
Scale	11.27%
Rate	98.67%
Distribution	69.24%
Quality	7.70%


Thank You