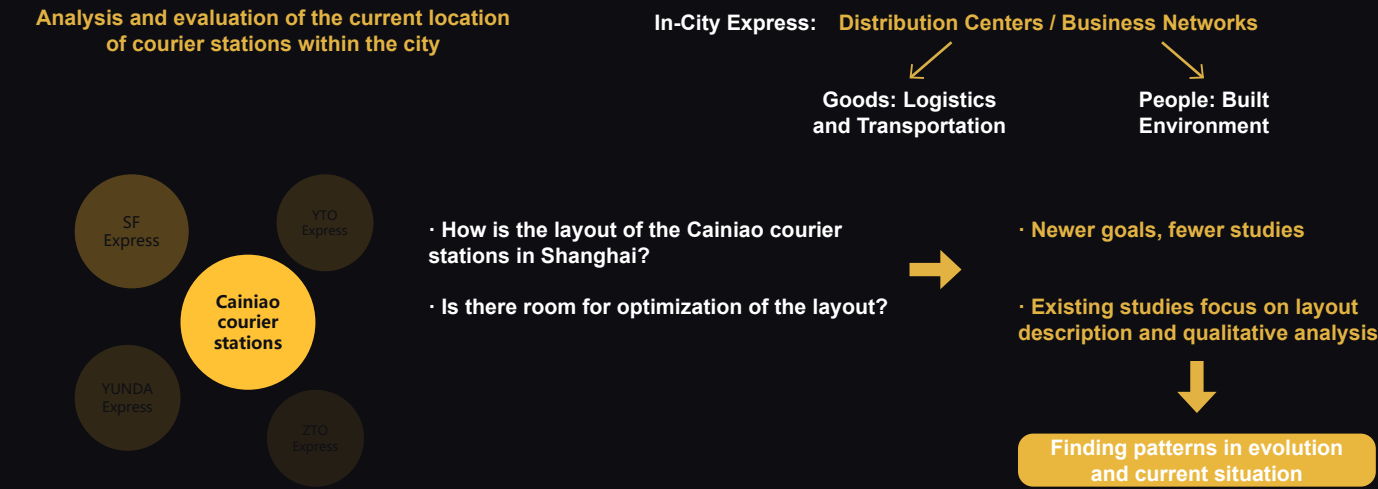


Analysis of the Spatial Distribution of Express Courier Stations and Assessment of Site Selection Effectiveness

—A case study of Cainiao courier stations in the central area of Shanghai



Research Object: Directly operated Cainiao courier stations with both self-pickup and delivery services

Research Question:

- In the face of the increase in delivery costs, how are Cainiao courier stations laid out in cities?
- How should new courier stations be located?

Problem Dismantling: Analyze layout characteristics, identify influencing factors and models, and conduct current effectiveness analysis / site selection guidelines.

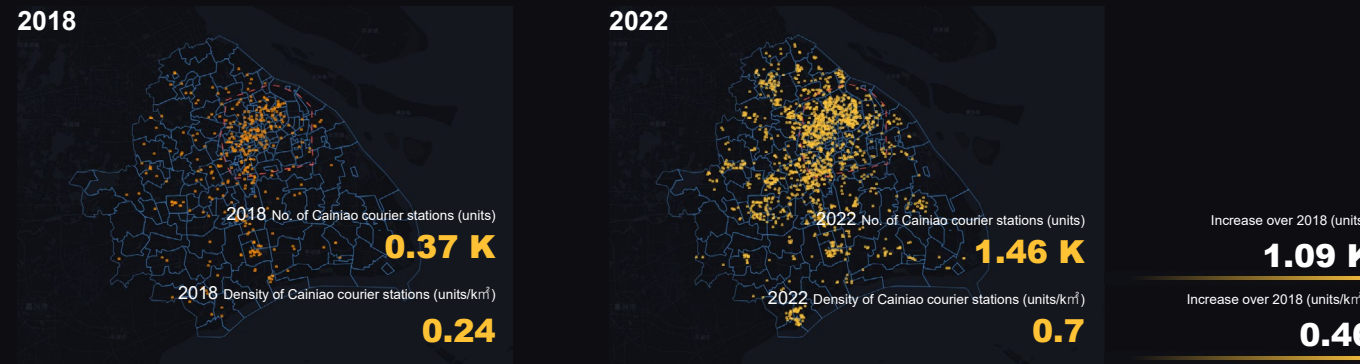
Scale	Problems	Objects
Macro	Characterizing the spatial and temporal evolution of courier station distribution.	Shanghai city area (except islands)
Meso	Identify meso-influencing factors and models that are "fit for courier station" and evaluate the supply and demand for street-scale courier station layouts.	Shanghai central area (Street Administrative Area)
Micro	Identify micro-environmental characteristics "fit for courier station" and propose an effectiveness evaluation of the current situation based on specific indicators.	Individual station locations

Datas-based courier station siting platform construction

Macro scale - Analyzing the Spatial and Temporal Evolution of Courier Station Distribution

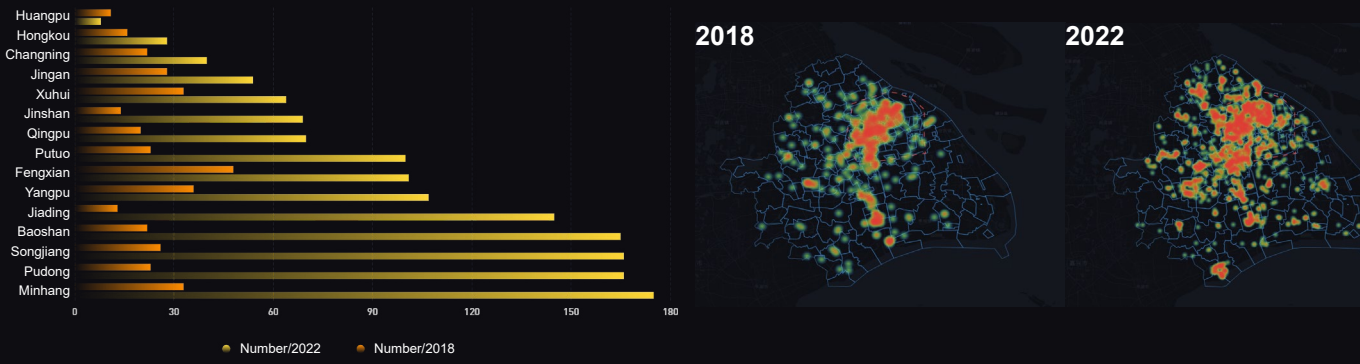
Volume Distribution - Significant Increase in Volume

In 2018, the Cainiao courier station layout in Shanghai was primarily concentrated in the city center, adopting a "single-core" configuration with the highest station density. However, by 2022, the distribution of Cainiao stations in Shanghai had become more dispersed.



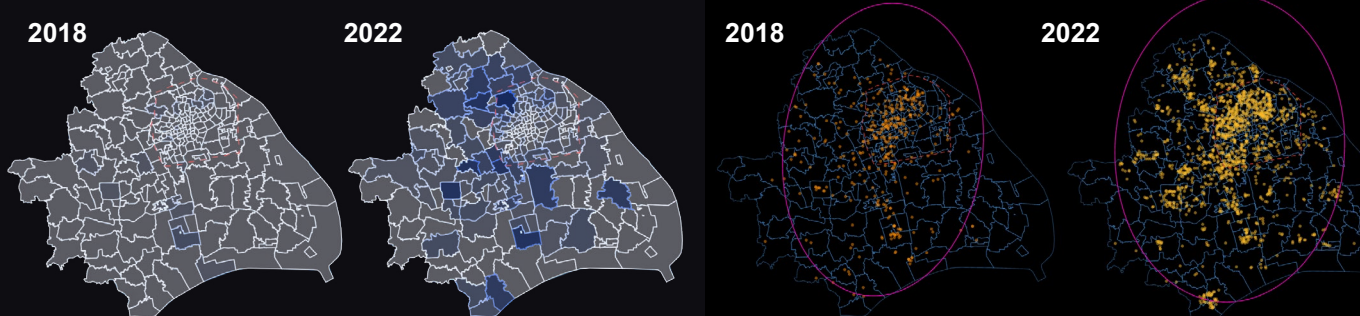
Spatial Distribution - Diffusion Trend, Suburbs Growing at a Significantly Higher Rate than Central Areas

In 2018, the Cainiao courier station layout in Shanghai was primarily concentrated in the city center, adopting a "single-core" configuration with the highest station density. However, by 2022, the distribution of Cainiao stations in Shanghai had become more dispersed.



Street Level - The Number of Stations in the Streets around the Outer Ring has Increased Significantly

Compared with 2018, the number of Cainiao courier stations in the towns and cities around the Outer Ring Highway in 2022 increased significantly, with the most significant increases in Dachang Town in Baoshan District and Xinzhuang Town in Minhang District.



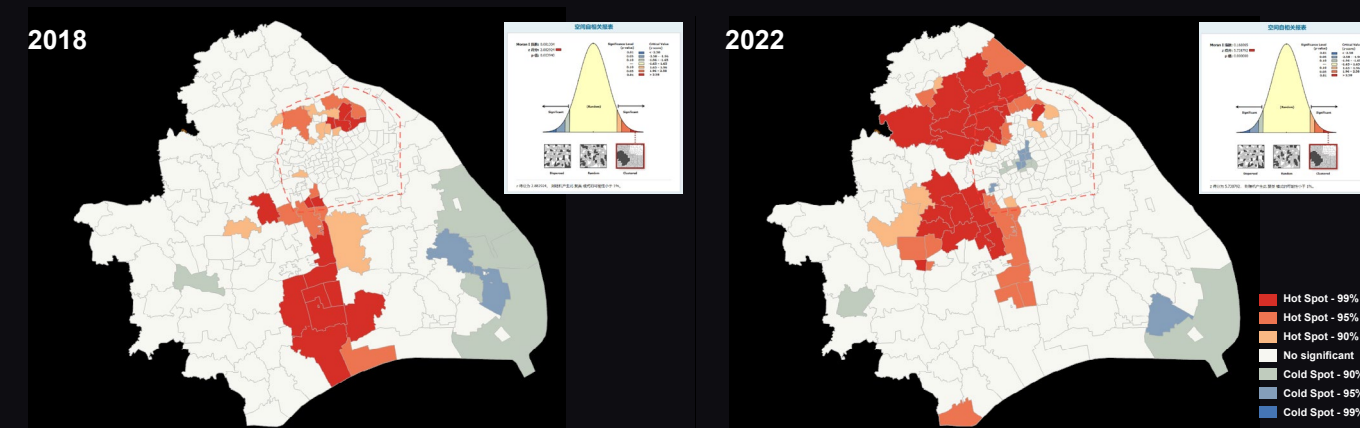
Directional Distribution - Full Diffusion with Reduced Directionality

Compared with 2018, the service scope of Shanghai's Cainiao courier stations was expanded and the directionality was weakened in 2022; the center of the distribution was located near Hongqiao Street, and the clustering area was roughly distributed in the northeast-southwest.



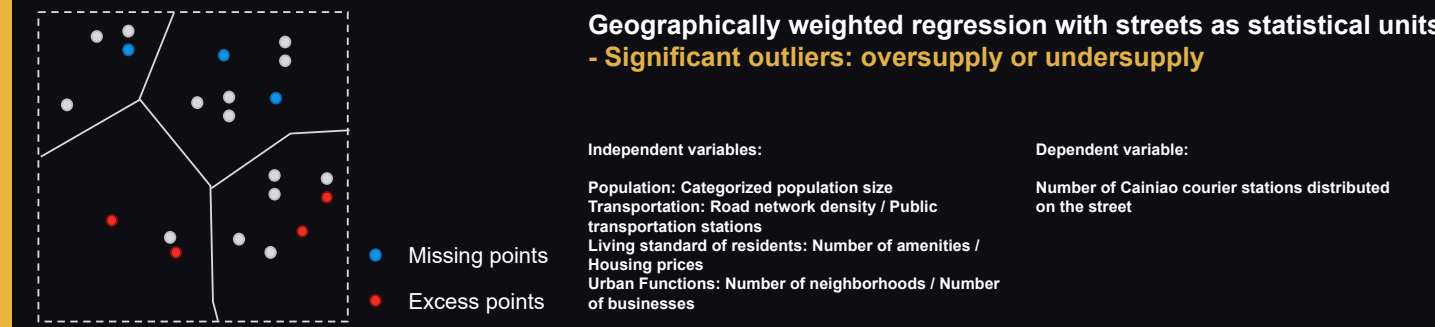
Spatial Autocorrelation Analysis - Suburban Gathering

The spatial distribution of Cainiao courier stations in both 2018 and 2022 was characterized by significant clustering. Compared with 2018, the clustering was enhanced in 2022, with high-value clusters forming in some streets in Baoshan District, Jiading District, Songjiang District and Minhang District around the Outer Ring Highway; low-value clusters mainly appeared in the city center, Huangpu District, and in some streets close to the administrative boundary of Shanghai.

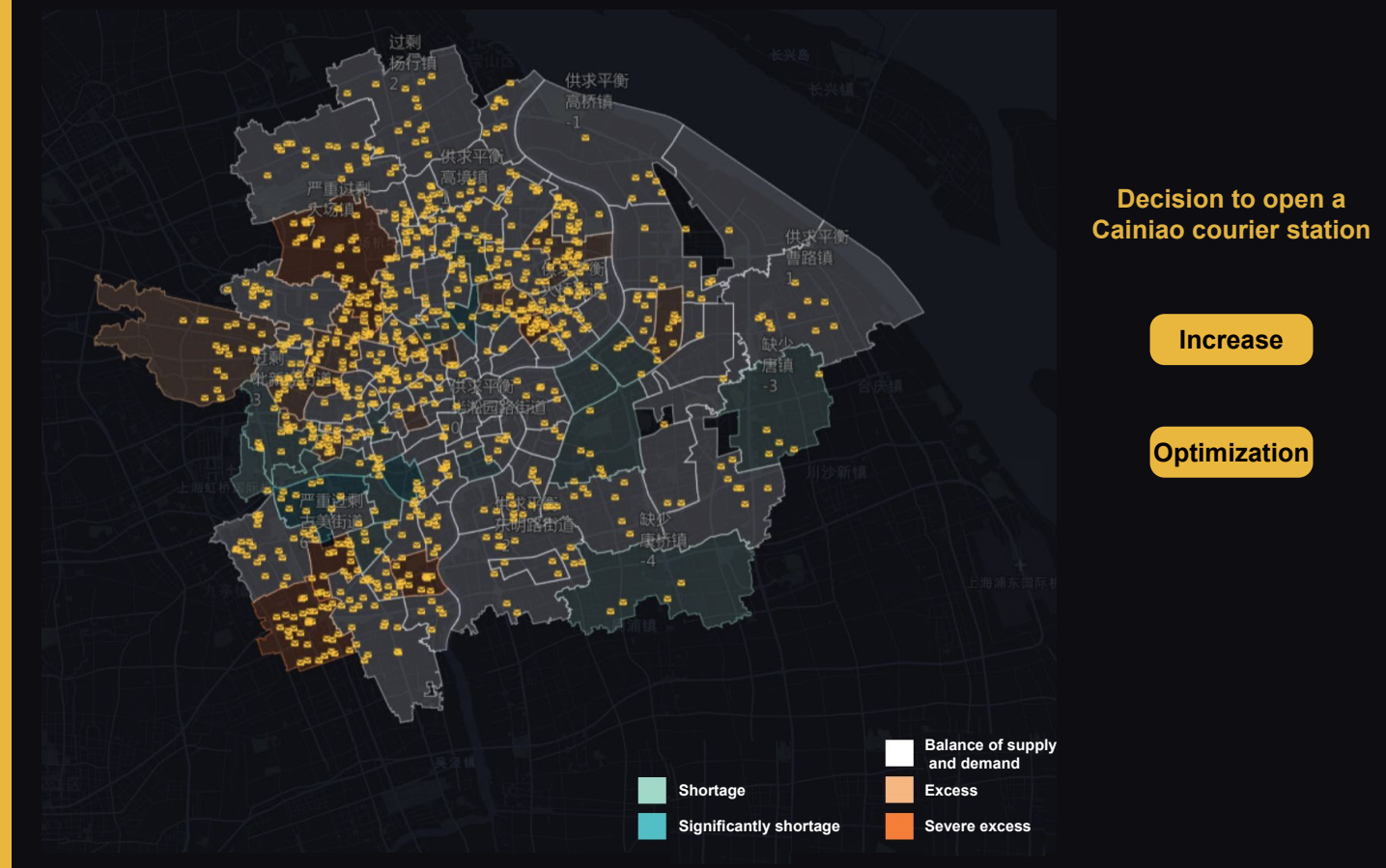


Meso scale - Identifying External Influences that are "Fit for Station"

Hypothesis: at the meso-scale, the distribution of Cainiao courier station configuration was related to the external environment with some regularity.



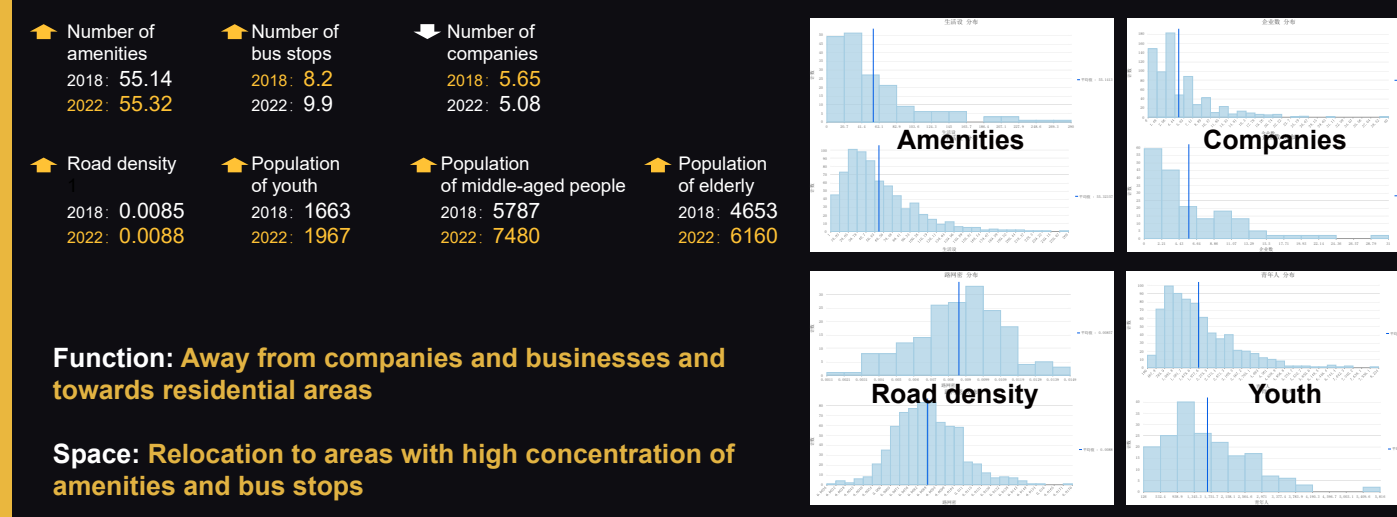
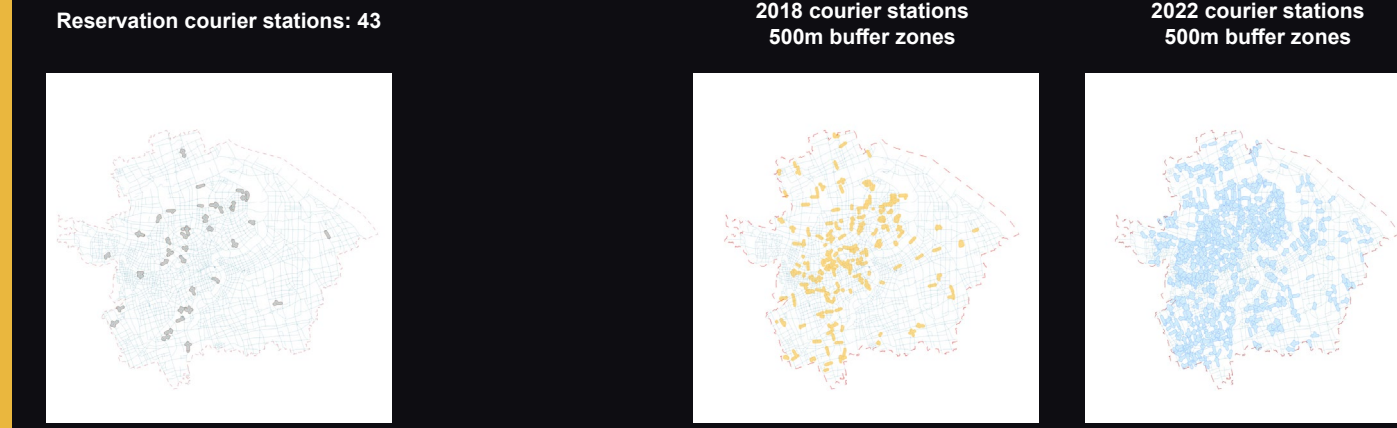
High confidence in results



Micro scale - What is an effective courier station layout?

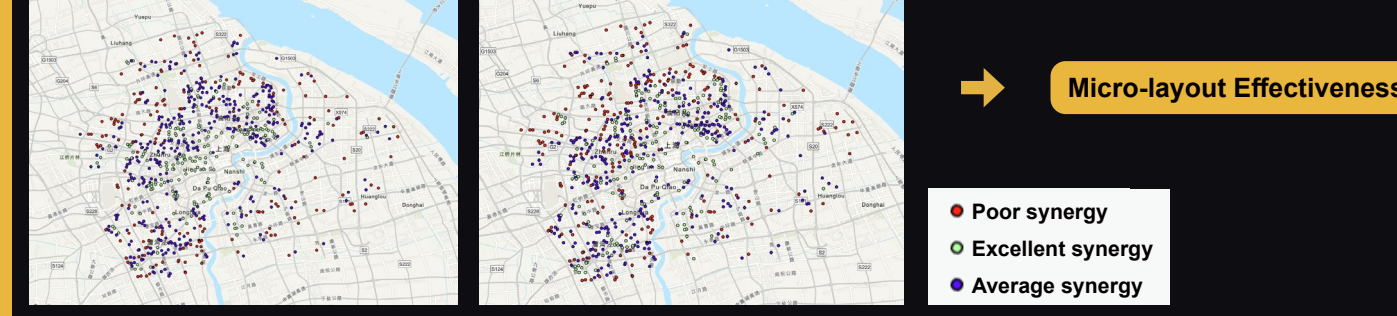
Hypothesis: at the micro-scale, the siting of courier stations was changing towards a more optimal direction.

What micro-environmental features around the courier stations changed as it 'lived' and 'died'?



Function: Away from companies and businesses and towards residential areas

Space: Relocation to areas with high concentration of amenities and bus stops



Group member:
Jinyuan Gu, Wenjing Gong, Xinyi Zhang

Data Source:
- 2018 Cainiao courier stations data: Peking University Open Data Platform | Gaode POI
- 2022 Cainiao courier stations data: self-collected during the workshop | Gaode POI
- Housing price data: Chain Home website in November 2021
- Population data: provided by the workshop
- Amenities data: provided by the workshop

Meso Supply and Demand Analysis

Micro Influencing Factors Analysis