

Assessing the Relative Amenity Value of Accessibility and Neighbourhood Quality in Nanjing, China



Universiteit Utrecht

Hong HU Ph.D. Candidate, Urban & Regional Research Centre Utrecht, Faculty of Geosciences, Utrecht University
Supervisors: dr. Stan Geertman, prof. dr. Pieter Hooimeijer

h.hu@geo.uu.nl

Brief Summary

- The relation between housing price and amenity has been systematically analyzed in western countries using hedonic price models. However, knowledge of the amenity effect on housing price in China is still quite limited.
- According to the literature, three broad categories have an impact on housing prices: dwelling attribute, accessibility, and neighbourhood quality.
- The empirical results show that:
 - although in western counties, accessibility and neighbourhood quality show a relative equal effect on housing price, in our study accessibility exerts fairly stronger impact;
 - among different accessibility indicators, distance to metro stop is a determinant factor for residents when buying a house, even taking into account of rapid car accessibility;
 - neighbourhood quality also exerts impact on housing price but relatively weak;
 - compared to neighbourhood amenities, neighbourhood disamenity "presence of heavy industry in neighbourhood" have strongly negative effect on housing price.

Study Area



Figure 1: Location of Nanjing

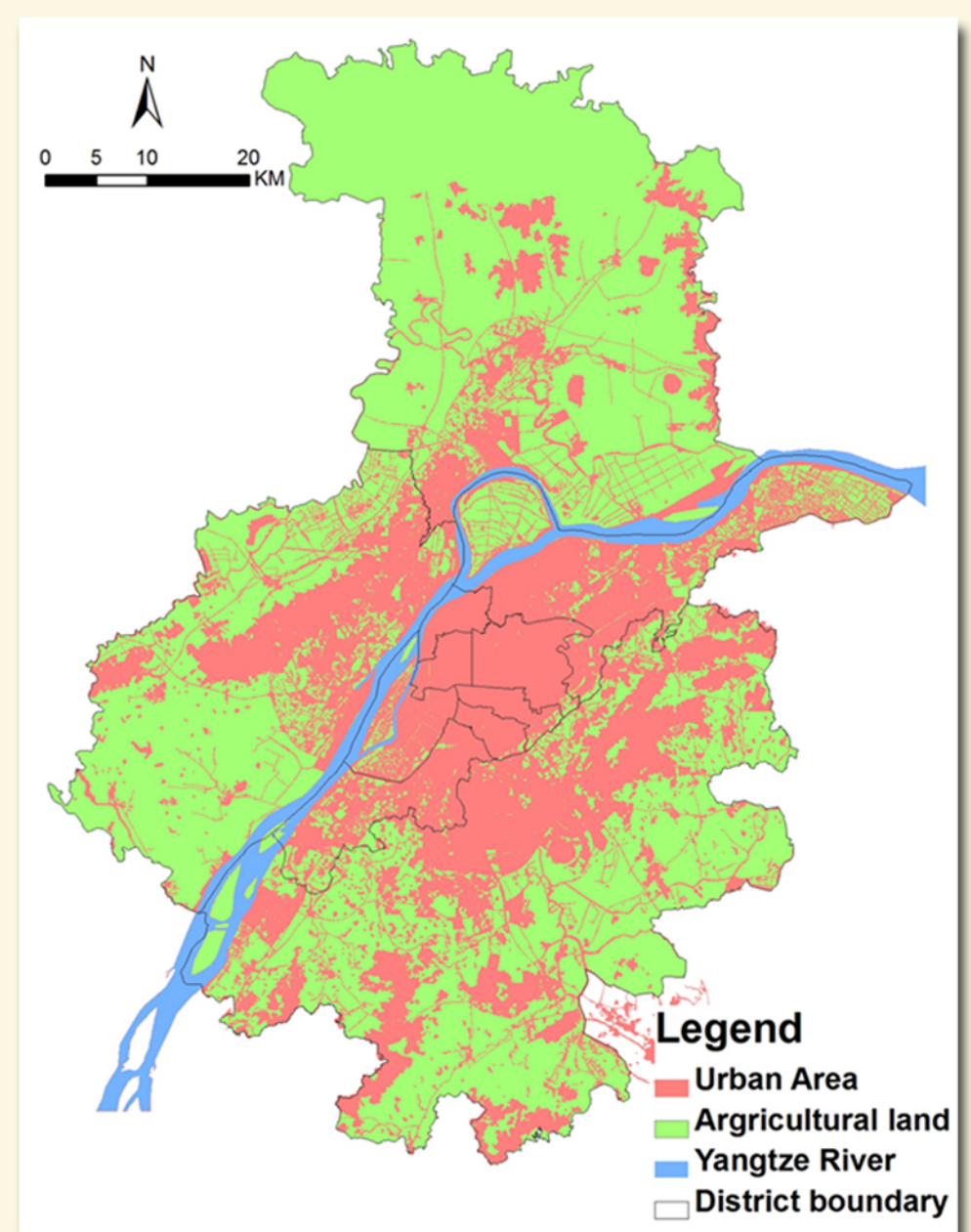


Figure 2: Urban area of Nanjing

Land Use Map

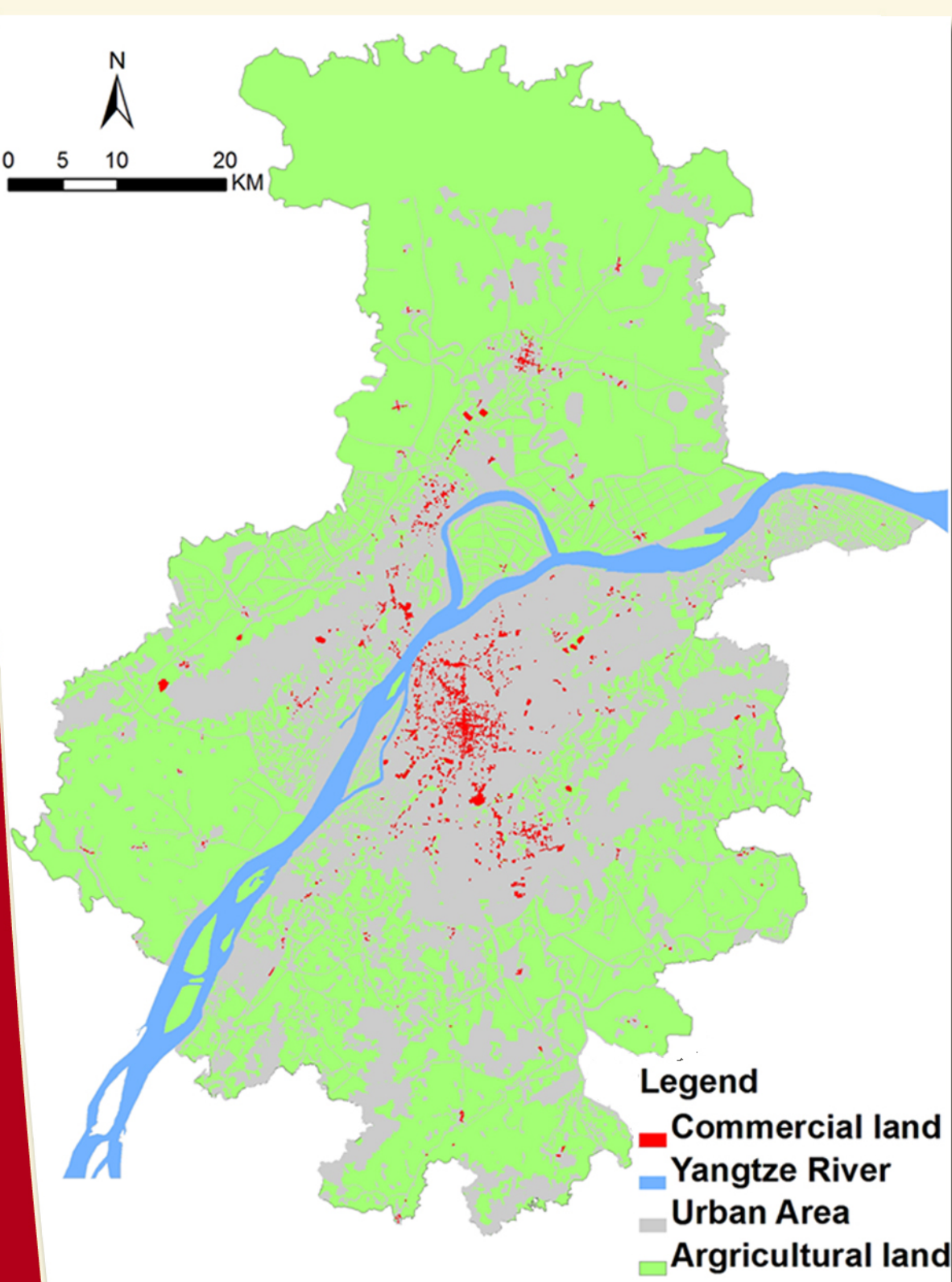


Figure 3: Commercial land use

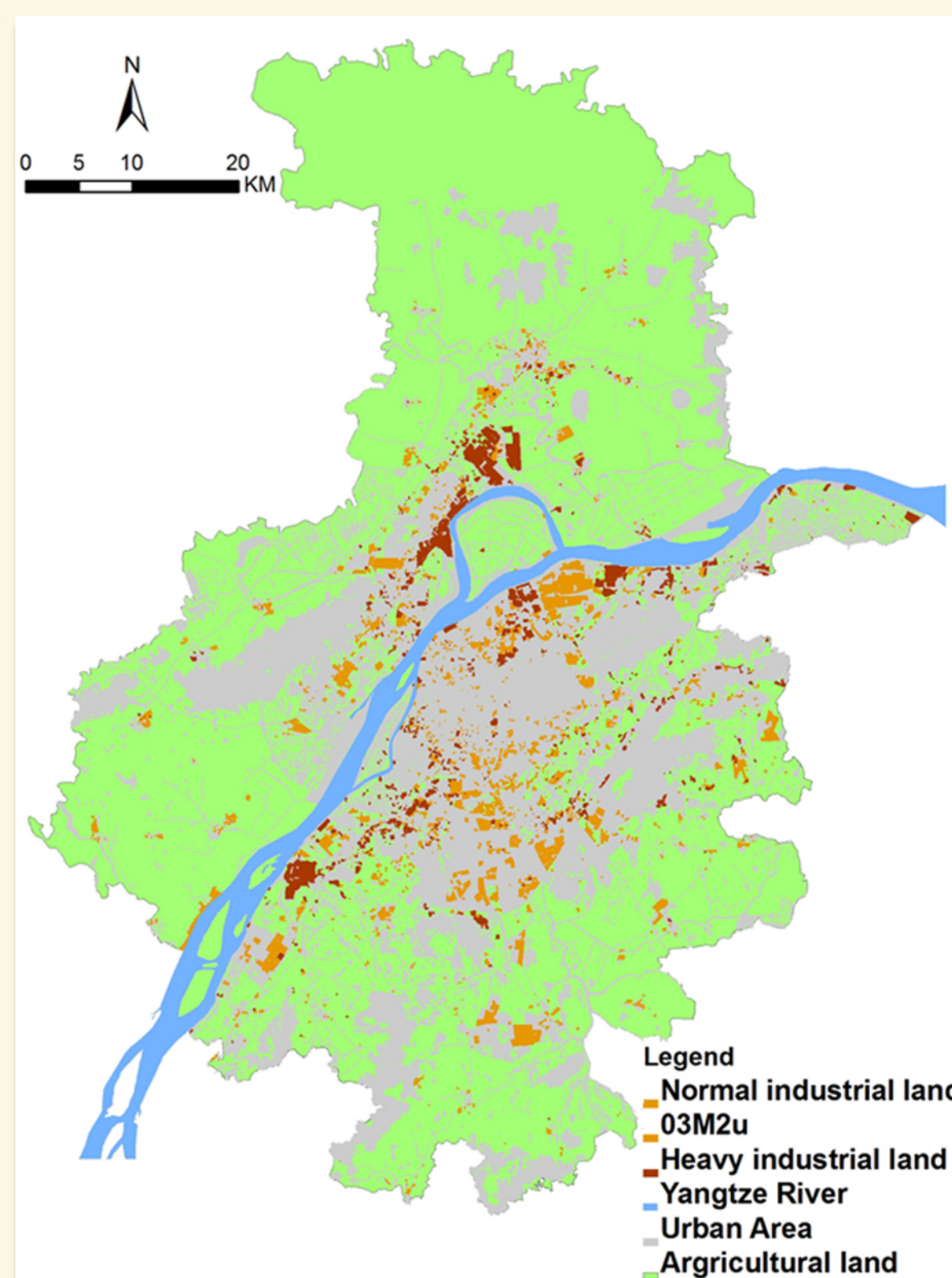


Figure 4: Industrial land use

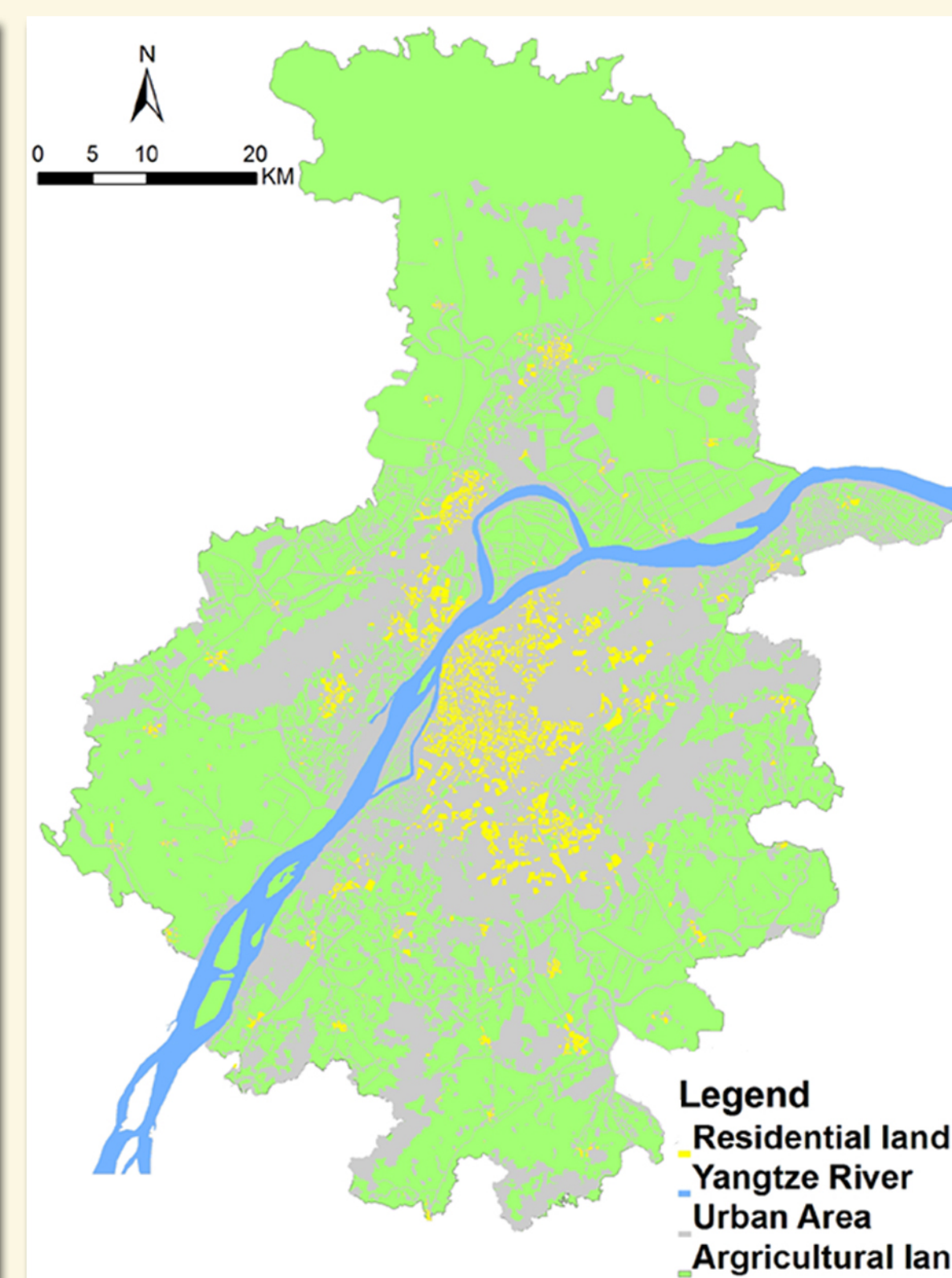


Figure 5: Residential land use

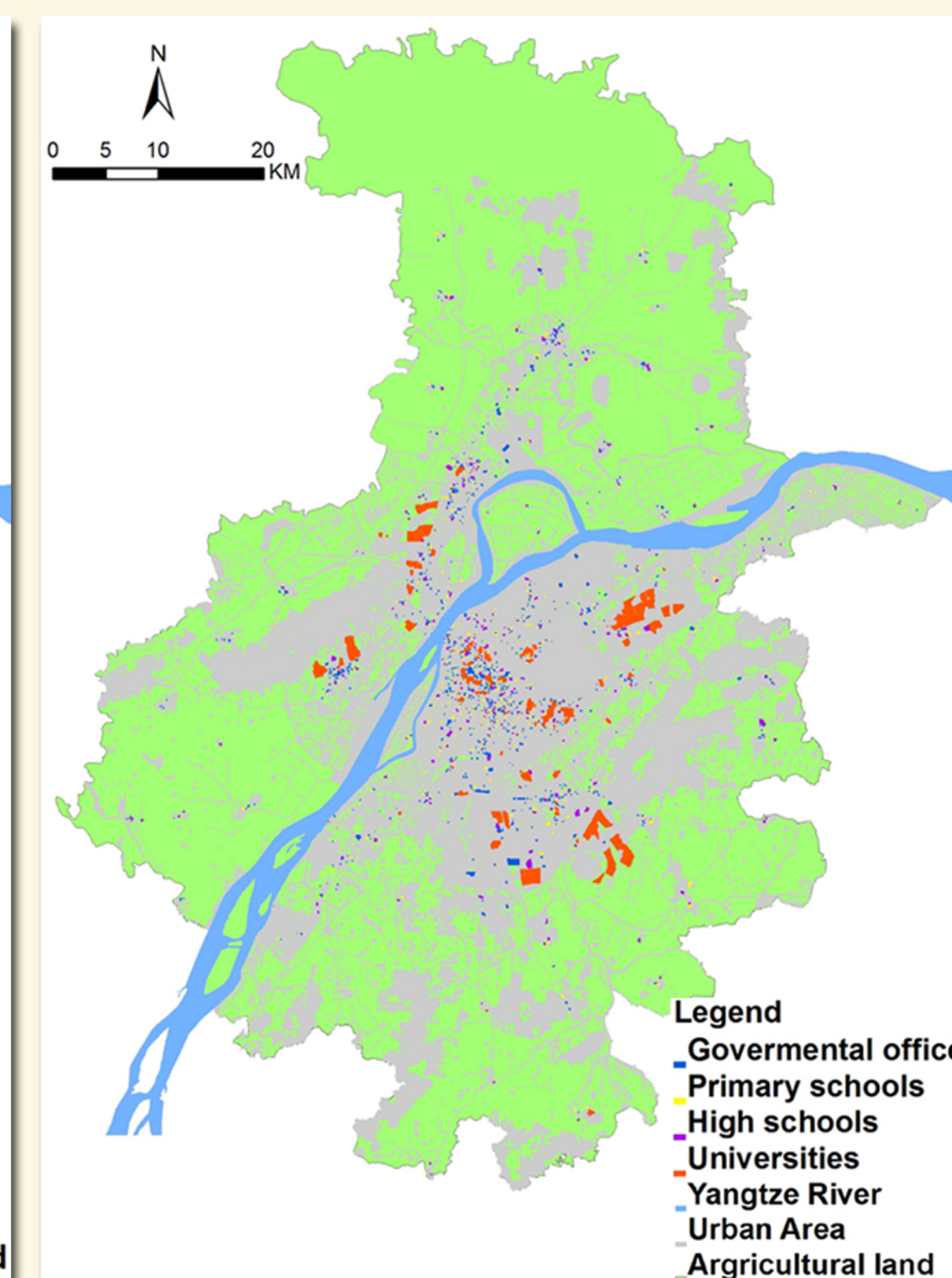


Figure 6: Governmental & educational land use

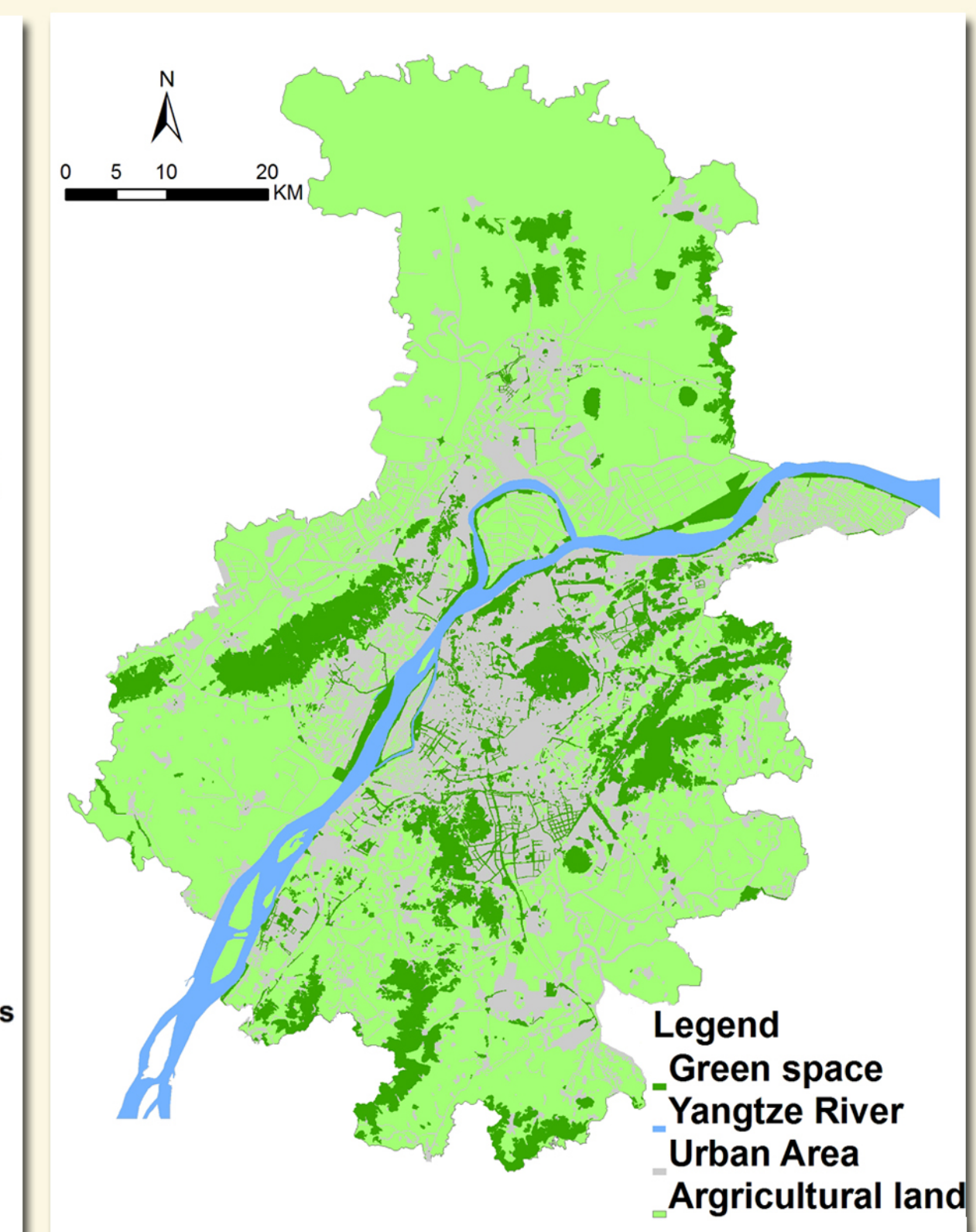


Figure 7: Green area land use

Geographical Theory

- Trade-off theory (Alonso, 1964) between accessibility to activities and property price. People are willing to pay more for high accessibility to certain activities because this implies easy access, short travel time and low commuting fees.
- Trade off between travel time and time spent on a specific activity. People's tolerance of travel time depends on the type of activities (mandatory or discretionary) and the stay time for these activities.
- Influential distance of various amenities on housing price is different.

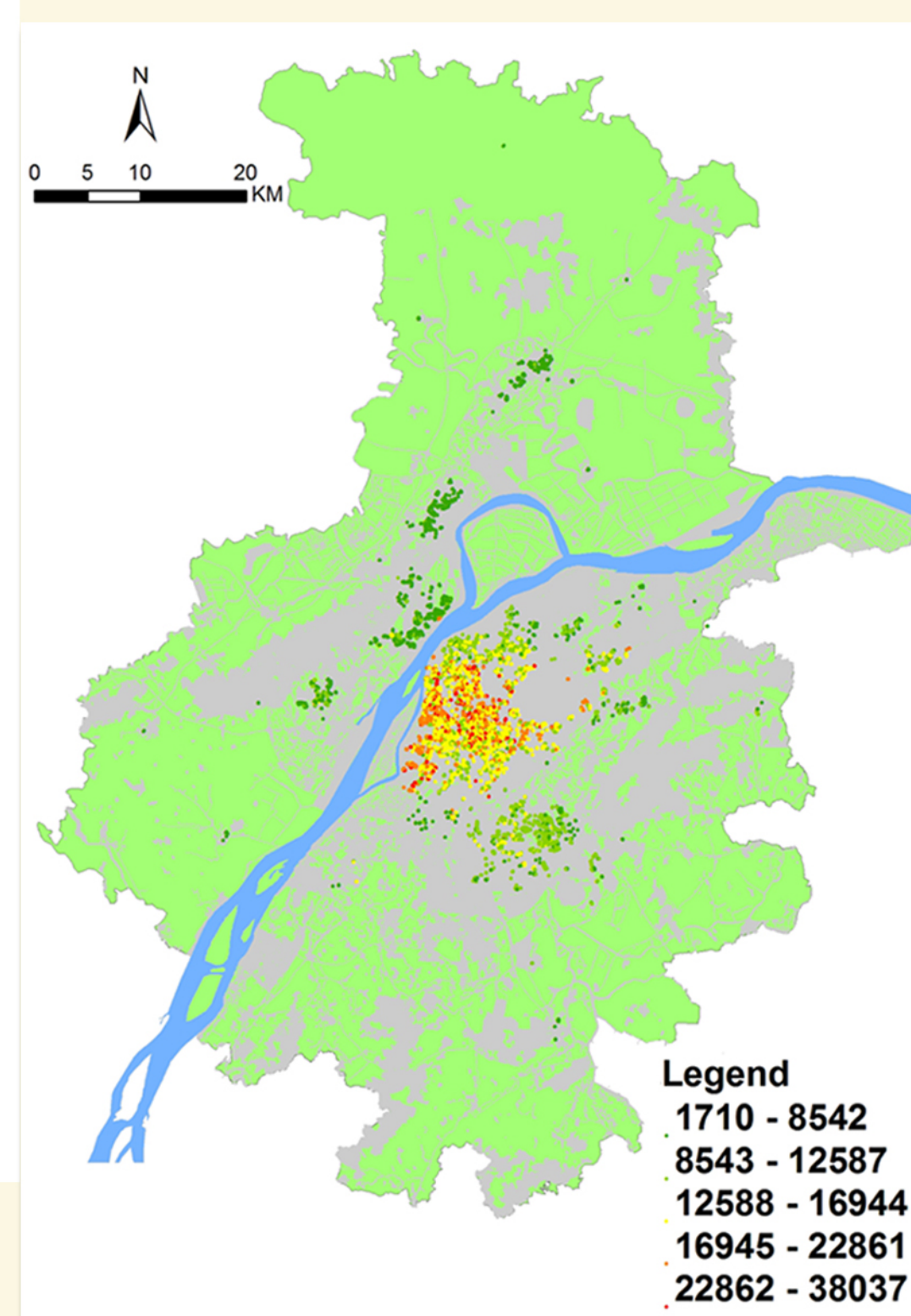
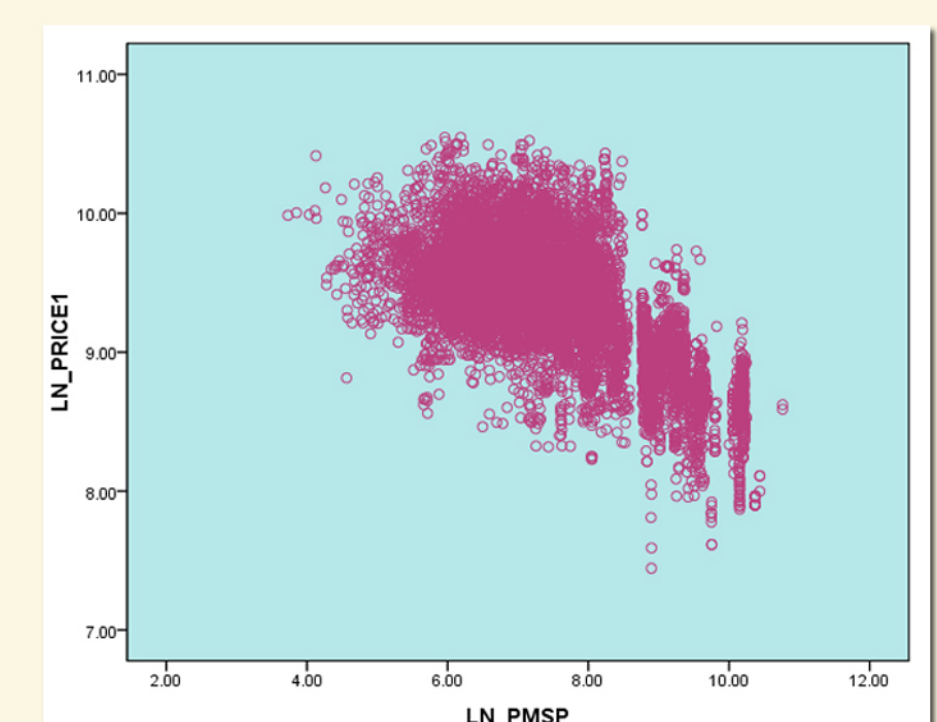
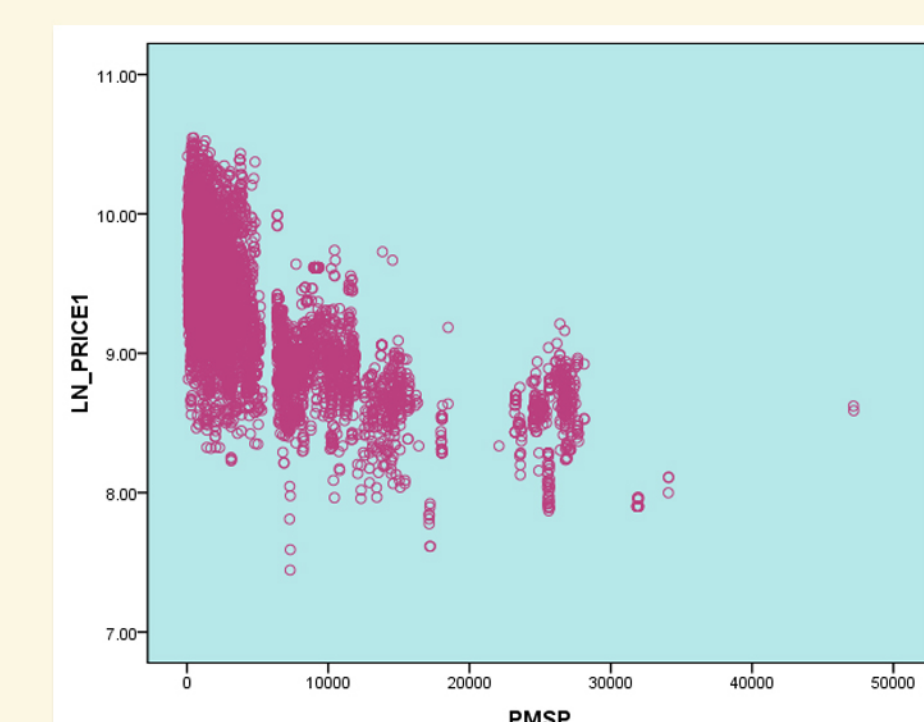
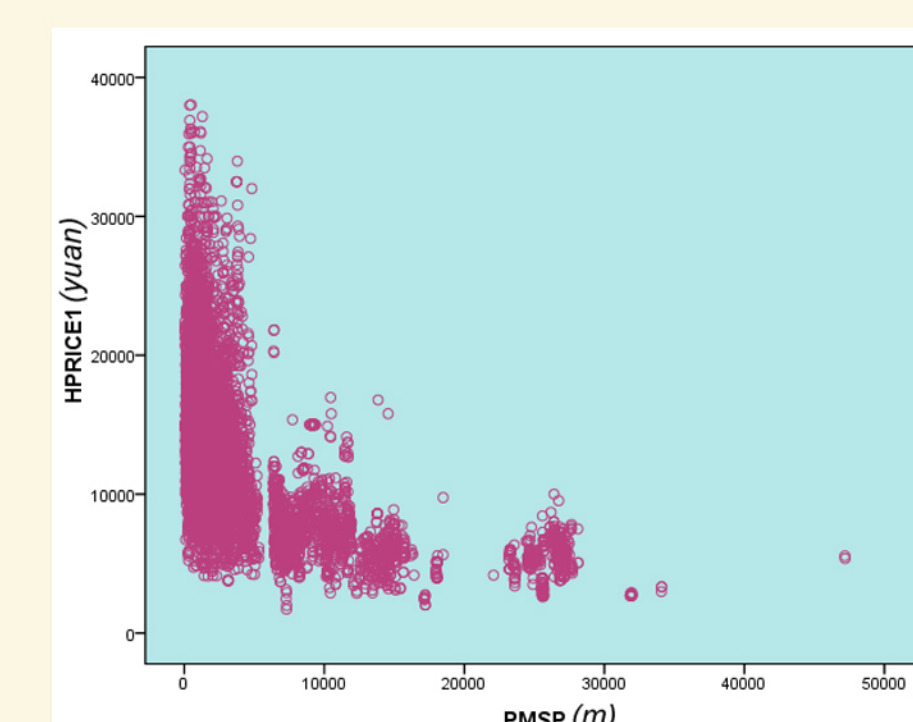


Figure 8: Apartment Records

Methodology

- Continuous distance decay function--accessibility variables (CBD, metro stop, access points of city expressway, railway station, potential job accessibility, square, large park, urban river and lake)



- Block function--neighbourhood quality variables (industry land use, square, park, river and lake, school district, historical heritage)

- Total Model: $LN(P) = \alpha + \beta H + \gamma LN(A) + \eta N + \varepsilon$

- GIS measurement: travel time by public transport network; travel time by Delauney network plus public transport network.

Gravity model to calculate the potential score of job accessibility: $P_i = \sum_j \frac{M_j}{D_{ij}^a}$

Regression Results of Hedonic Price Model

Independent variable	Multivariate regression (adjusted R ² =0.670)				Bivariate regression		
	Unstandardized Coefficients	Standardized Coefficients	t-Ratio	Sig.	Unstandardized Coefficients	Standardized Coefficients	Sig.
Constant	-11.485		-11.780	.000	-0.011	-0.172	0.000
BUILDY	.011	.179	23.207	.000	0.049	0.063	0.000
BATHR	.057	.072	8.251	.000	0.000	0.040	0.000
SIZE	.000	.019	2.016	.044	0.011	0.126	0.000
FLOOR	.000	.005	.820	.412	0.648	0.695	0.000
URAPT	.350	.376	36.900	.000	-0.445	-0.449	0.000
LN_DMSP	-.106	-.289	-32.152	.000	-0.240	-0.656	0.000
LN_BTSP	-.115	-.159	-20.137	.000	-0.291	-0.403	0.000
LN_DAP	-.061	-.147	-15.111	.000	-0.229	-0.553	0.000
LN_BTSP	-.081	-.105	-10.007	.000	-0.446	-0.574	0.000
LN_BTSP	-.043	-.043	-5.464	.000	-0.445	-0.449	0.000
LN_BTJOBCM	.044	.084	8.368	.000	0.303	0.586	0.000
LN_BTJOBNVI	-.011	-.011	-1.532	.125	0.350	0.368	0.000
LN_BTJOBNVI	-.158	-.168	-19.528	.000	0.355	0.377	0.000
NSCDIS	.109	.058	9.380	.000	0.376	0.200	0.000
NRLAK	.070	.041	6.598	.000	0.232	0.125	0.000
NHEIND	-.030	-.034	-4.535	.000	-0.318	-0.355	0.000
NHERI	.051	.034	5.524	.000	0.266	0.175	0.000
NPARK	.029	.020	3.226	.001	0.138	0.098	0.000

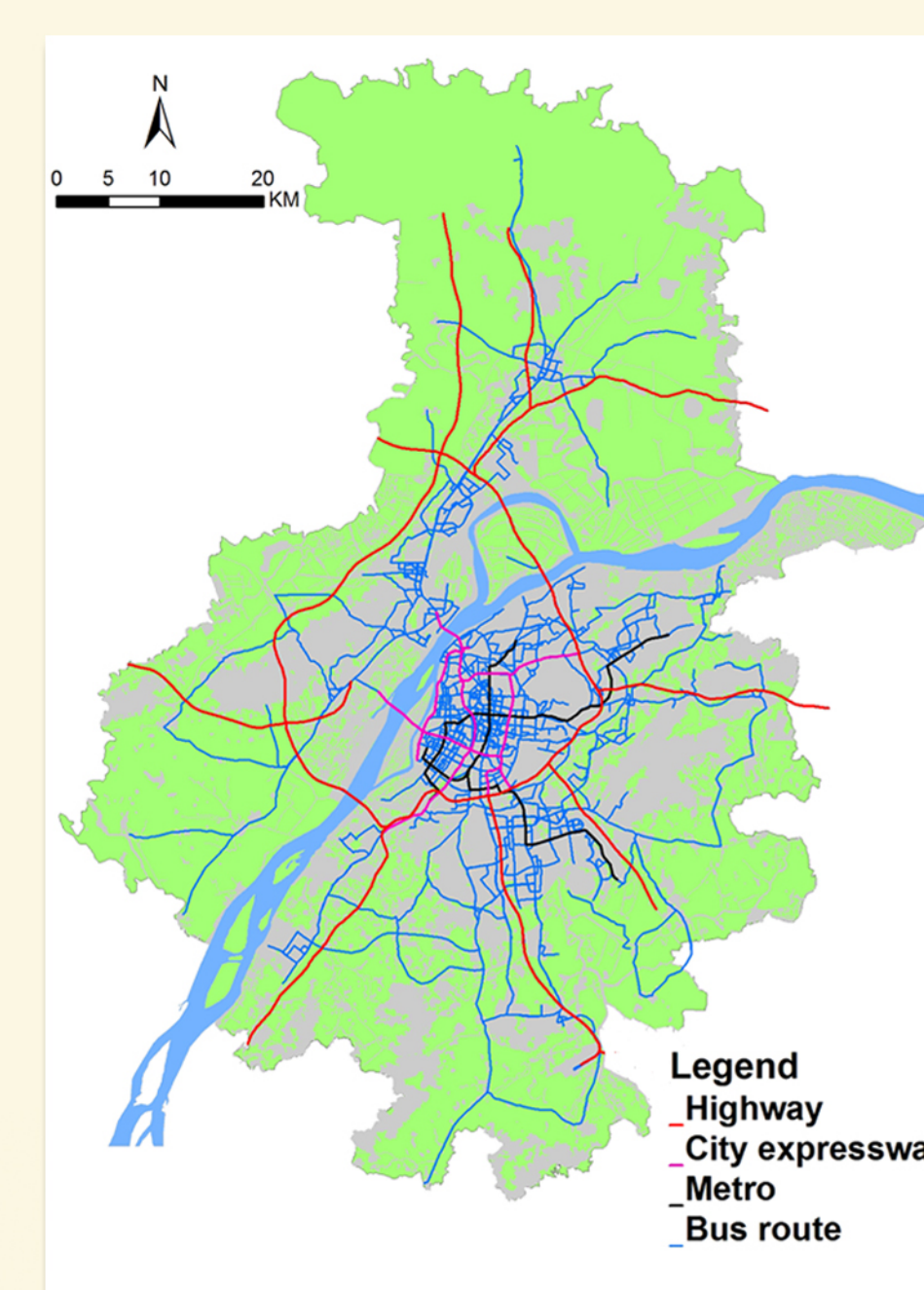


Figure 9: Public transport network

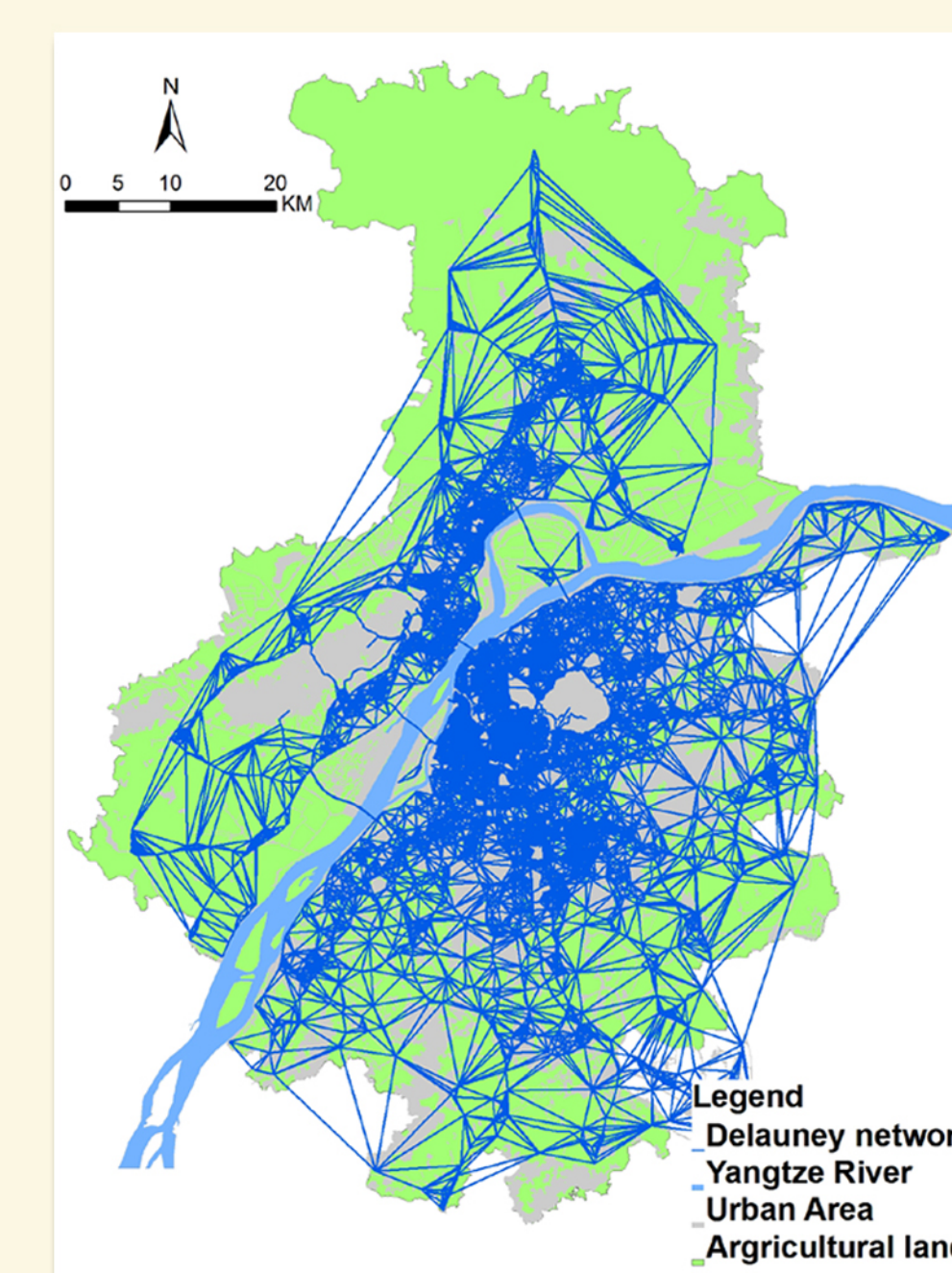


Figure 10: Delauney network

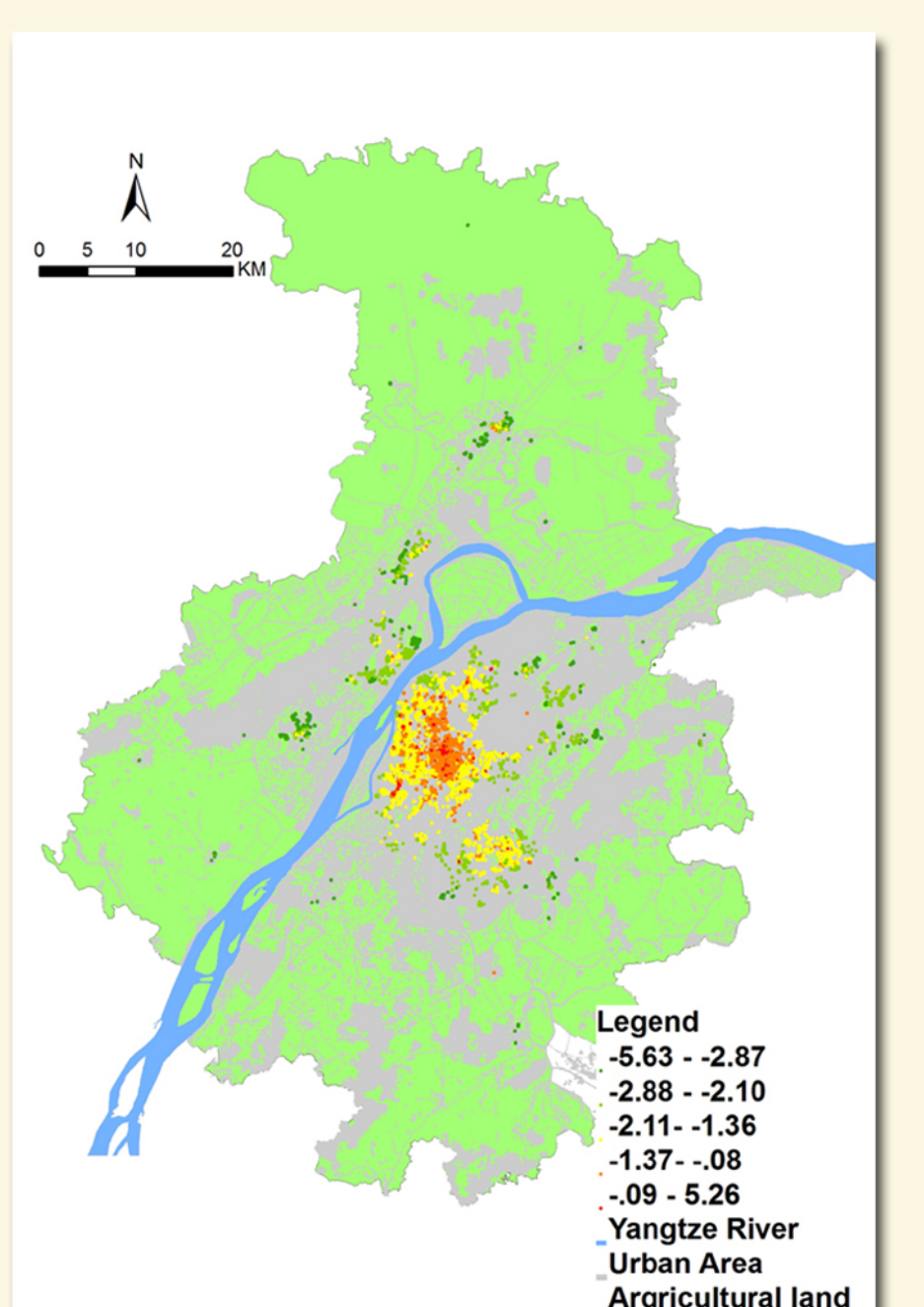


Figure 11: Job potential score