A Comprehensive Accessibility Evaluation Model for Temporal Public Facilities of Urban Residential Areas Based on Internet Map

Xinxin Zhou, Changbin Wu, LinWang Yuan, Zhaoyuan Yu and Chendi Hu (China, PR)

Key words: Access to land; Land management; Urban renewal; accessility; public facility; urban residential areas; points of interest(POI); route planning API

SUMMARY

Public facilities of urban residential areas which assume many types of service functions are meaningful to urban residential designing and planning. Meanwhile, various public facilities capacity of residential areas changed with time ceaselessly have dynamic and micro characteristics. The development of internet map which contains web map (points of interest, POI; route planning application program interface, RP-API) provides temporal and microcosmic knowledge about residential areas. The purpose of this research is to use different time POI data and RP-API as new sources for characterizing temporal changes of comprehensive accessibility of public facilities of residential areas(CAPF-RA). We establish effective service radius principle, POI category system and design an measurement framework based on web map. In the case, a 5 □km□^2 residential area from Wuxi city, Jiangsu province has been selected as the case study. We calculated two years' CAPF-RA values and compare them for diverse temporal and spatial laws based on 2016, 2017 and 2018 POI data. (1) From the spatial distribution aspect, we can see that the communities with high CAPF-RA values, include: HuiJingYuan, HuaHuiXinCun, Versailles Estate; The low value include LiRen Garden 1#,LiRen Garden 2#. (2) From the temporal sequence aspect, we can find that overall CAPF-RA values of residential areas have rised consistently and developed to spatial centralization continuously. An analysis shows that this method can be used to group different urban communities' accessible public facilities capacity with dynamic and microscopic characteristics. This model method is suitable for studying the coordination and rationality between public service facilities and population scale in multi-tenses and micro-scales, which leads to significant improvements for urban designing and planning.