

## Unequal Traveling: How School District System and School District Housing Characteristics Shape the Duration of Families Commuting

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**Abstract :** In many countries, governments have responded to the growing demand for educational resources through school district systems, and there is substantial evidence that school district systems have been effective in promoting inter-district and inter-school equity in educational resources. However, the scarcity of quality educational resources has brought about varying levels of education among different school districts, making it a common choice for many parents to buy a house in the school district where a quality school is located, and they are even willing to bear huge commuting costs for this purpose. Moreover, this is evidenced by the fact that parents of families in school districts with quality education resources have longer average commute lengths and longer average commute distances than parents in average school districts. This "unequal traveling" under the influence of the school district system is more common in school districts at the primary level of education. This further reinforces the differential hierarchy of educational resources and raises issues of inequitable educational public services, education-led residential segregation, and gentrification of school district housing. Against this background, this paper takes Nanjing, a famous educational city in China, as a case study and selects the school districts where the top 10 public elementary schools are located. The study first identifies the spatio-temporal behavioral trajectory dataset of these high-quality school district households by using spatial vector data, decrypted cell phone signaling data, and census data. Then, by constructing a "house-school-work (HSW)" commuting pattern of the population in the school district where the high-quality educational resources are located, and based on the classification of the HSW commuting pattern of the population, school districts with long employment hours were identified. Ultimately, the mechanisms and patterns inherent in this unequal commuting are analyzed in terms of six aspects, including the centrality of school district location, functional diversity, and accessibility. The results reveal that the "unequal commuting" of Nanjing's high-quality school districts under the influence of the school district system occurs mainly in the peripheral areas of the city, and the schools matched with these high-quality school districts are mostly branches of prestigious schools in the built-up areas of the city's core. At the same time, the centrality of school district location and the diversity of functions are the most important influencing factors of unequal commuting in high-quality school districts. Based on the research results, this paper proposes strategies to optimize the spatial layout of high-quality educational resources and corresponding transportation policy measures.

**Keywords :** school-district system, high quality school district, commuting pattern, unequal traveling

**Conference Title :** ICUPRDIS 2022 : International Conference on Urban Planning, Regional Development and Information Society

**Conference Location :** Vienna, Austria

**Conference Dates :** December 29-30, 2022