



Research Article

The Regional Impact of Nanjing Urban Rail Network Accessibility on Residential Property Purchase Intention

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Abstract: This study examines the regional impact of Nanjing's urban rail network accessibility on residential property purchase intention, highlighting the interplay between transportation infrastructure and real estate dynamics. As urban rail networks enhance connectivity, they are expected to influence buyer behavior and property values. The research explores how factors such as environmental quality, market conditions, and psychological influences shape purchase intentions among potential buyers. By analyzing data from various neighborhoods affected by the urban rail system, the findings reveal a significant positive correlation between accessibility and property purchase intention, with buyers increasingly valuing sustainable living environments. This study contributes to the understanding of the role of transportation infrastructure in urban development and its impact on residential real estate markets, drawing on insights gathered from a sample of 390 participants in the Nanjing area.

Keywords: Regional Impact, Residential Property Purchase Intention, Urban Rail Network Accessibility.

1. Introduction

The research on the regional impact of accessibility to Nanjing's urban rail transit network on residential home purchase intention stems from the increasingly important role of urban rail transit systems in shaping urban development patterns and real estate markets (Liu et al., 2021). As Nanjing's urban rail transit network continues to expand, it presents a unique opportunity to examine how improved accessibility influences the preferences and investment decisions of homebuyers in various urban areas. This study is based on the observation that proximity to railway stations is generally associated with rising housing prices and changes in residential demand (Dong, Zheng, & Kahn, 2020). However, it also raises concerns about affordability, social equity, and spatial differences in urban growth. The research combines urban planning, transportation geography, and real estate economics to understand the complex interactions between transportation infrastructure and real estate market dynamics. In addition, this study fills a gap in existing research on the local impact of transportation accessibility on home purchase intention, especially in the context of a rapidly developing Chinese city like Nanjing, where rapid urbanization and infrastructure investment are changing residential patterns and socioeconomic structures (Li, Huang, Li, & Zhang, 2016). The regional impact of Nanjing's urban rail transit network on residential property purchase intention involves multiple interrelated factors. As the urban rail transit network expands, the accessibility of various areas in the city has significantly improved, making previously less desirable areas more attractive to potential homebuyers. Since residents generally prefer areas with convenient public transportation, this increase in accessibility can lead to higher housing prices in areas covered by the rail transit network (Chen & Haynes, 2015).

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This research examines the regional impact of Nanjing urban rail network accessibility on residential property purchase intention with the following objectives: To examine the influencing mechanisms of enhancing the residential property purchase intention based on the impact of urban rail network accessibility, with the variables of psychological and social influence, environmental factors, and market conditions. To offer suggestions for the residential property of the Nanjing urban rail network accessibility by enhancing buyers' satisfaction through economic and market value.

2. Literature Review

Accessibility Theory

Accessibility Theory suggests that the ease with which individuals can reach various destinations plays a crucial role in shaping their decisions, especially in the realm of urban living (Handy, 2005). When applied to urban rail networks, it highlights how enhanced access to transportation options can significantly boost the appeal of residential properties. As urban rail networks become more user-friendly and widespread, they reduce travel times and elevate convenience levels for residents. This transformation makes neighborhoods located near these rail lines far more attractive for prospective homebuyers. Individuals are increasingly drawn to areas with superior rail connectivity since it aligns with their growing need for efficient mobility and easy access to employment opportunities, essential services, and recreational amenities. This increased intention to purchase homes in well-connected areas underscores the profound implications that transportation infrastructure has on urban development and the dynamics of real estate markets (He, 2020).

Urban Economic Theory

Urban Economic Theory examines how urban infrastructure, particularly rail networks, influences local economic dynamics (Guo & Qian, 2023). Specifically, it highlights the impact of urban rail accessibility on the intention to purchase residential properties. The theory suggests that both the availability and quality of transportation infrastructure can significantly drive economic activity within a given area. Enhanced rail access not only facilitates commuting but also connects residents to jobs, services, and amenities, thereby increasing the attractiveness of residential properties. As commuting becomes more convenient and opportunities more accessible, neighborhoods see a rise in desirability, which in turn boosts property values and increases the likelihood of home purchases (Kaneko, Nakagawa, Phun, & Kato, 2019).

Property Purchase Intention

Definition of Terms Property purchase intention relating to transportation accessibility refers to the likelihood that potential buyers will decide to invest in a property based on the ease of access to transportation options. Various factors, including the perceived convenience and efficiency of public transport systems, road networks, and pedestrian pathways, shape this intention (Leonov, Nakonechnyi, Khalimanenko, Nikolaiko, & Heraimovych, 2023). Buyers often prioritize locations that offer good connectivity to essential services, workplaces, and recreational areas, viewing these attributes as enhancing their quality of life. Psychological and social influences also play a significant role (Zhao, Furuoka, & Rasiah, 2024). Environmental factors such as green spaces and air quality further enhance property desirability (Zhong & Li, 2016). Market conditions, including property prices and interest rates, also shape purchase intentions (Calka, 2019).

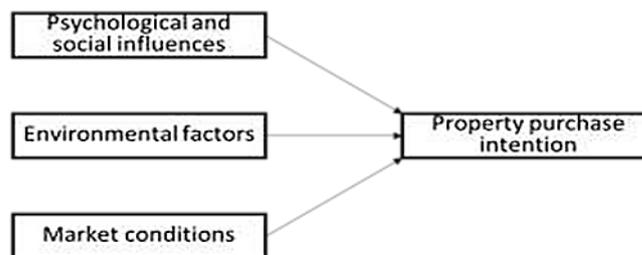


Figure 1. The Conceptual Framework

Conceptual Framework

Psychological influences refer to how individual perceptions and attitudes towards public transportation accessibility shape buyers' intentions (Lei et al., 2022). Social influences also play a significant role, as community norms and peer opinions greatly affect property choices (Choi, Park, & Dewald, 2021). Environmental factors include the physical characteristics of the areas surrounding the rail network (Wen, Shi, & Zhang, 2021). Market conditions significantly influence purchase intentions by shaping the economic landscape for buyers (Wu, Zheng, Wang, & Du, 2020).

Research Restriction

One significant limitation is the lack of comprehensive data on property transactions and buyer demographics, which can hinder the analysis of trends and correlations. Additionally, variations in personal preferences and socio-economic factors among potential buyers can complicate the interpretation of results, making it challenging to generalize findings across different segments of the population. Another restriction may arise from the dynamic nature of real estate markets, where rapid changes in economic conditions, government policies, and urban development can influence buyer intentions in unexpected ways. Furthermore, external factors such as cultural differences and varying levels of public transportation acceptance may affect the study's relevance to other regions or cities. The research may also be constrained by its geographical focus, as findings specific to Nanjing might not be applicable in different urban contexts, limiting the transferability of insights.

Research Hypothesis

The Setting of Correlation between Psychological and Social Influences and Residential Property Purchase Intention

The hypothesis suggests that increased accessibility to Nanjing's urban rail network positively impacts the psychological perceptions and social influences of potential buyers, thereby boosting their intention to purchase residential properties. As proximity to the rail network increases, buyers are expected to perceive greater convenience, reduced commuting stress, and improved lifestyle quality, leading to a more favorable attitude toward buying properties in those areas. Furthermore, social factors such as community expectations and peer opinions about the desirability of living near accessible transportation are expected to further reinforce this intention. In summary, the combined effects of psychological motivations and social validation are expected to significantly enhance property purchase intentions in areas with better urban rail accessibility (Zhang, Chen, Petrovsky, & Walker, 2021). H1: There is a positive correlation between psychological and social influences and Nanjing residential property purchase intention under the urban rail network accessibility (Zhang, Chen, Petrovsky, & Walker, 2021).

The Setting of Correlation between Environmental Factors and Residential Property Purchase Intention

The proposed hypothesis for the correlation between environmental factors and the intention to purchase property, particularly about the accessibility of Nanjing's urban rail network, suggests that favorable environmental conditions will significantly enhance the likelihood of buying residential properties near the metropolitan rail system. It is expected that factors such as air quality, availability of green spaces, and overall aesthetic appeal will positively influence buyers' perceptions of desirability in these areas. As accessibility to the urban rail network improves, properties in environmentally attractive locations are anticipated to be perceived as more valuable, leading to a higher likelihood of purchase. Furthermore, the hypothesis posits that buyers will prioritize properties that not only offer convenient transportation options but also align with their values regarding sustainability and quality of life. This, in turn, reinforces the positive correlation between environmental factors and the intention to purchase property (Xu, Zhang, & Aditjandra, 2016).

H2: There is a positive correlation between environmental factors and Nanjing residential property purchase intention under the urban rail network accessibility (Xu, Zhang, & Aditjandra, 2016).

The Setting of Correlation between Market Conditions and Residential Property Purchase Intention

The proposed hypothesis examines the relationship between market conditions and the intention to purchase property, with a particular focus on the influence of accessibility to Nanjing's urban rail network. It suggests that favorable market conditions will increase the demand for residential properties located near this transportation system. Specifically, when economic indicators such as low interest rates, high employment rates, and strong housing demand coincide with improved access to the urban rail network, potential buyers are likely to show a greater willingness to invest in these properties. Additionally, the hypothesis posits that in a strong market, the perceived value of properties close to the rail network will rise, further boosting purchase intentions. In contrast, during weaker market conditions, while the intention to buy may decrease, the appeal of being near the urban rail network will remain an essential factor in influencing buyer decisions. Overall, the hypothesis suggests that market conditions interact with the advantages of transportation accessibility to significantly influence property purchase intentions (Yang, 2020).

H3: There is a positive correlation between market conditions and Nanjing residential property purchase intention under the urban rail network accessibility (Yang, 2020).

3. Research Methods

Population and Sample

This research population of Gen Z was selected in Guangzhou, China, and participated in apparel purchase behavior through social media. A sample of 392 was collected for this study's analysis in March 2025 through the WeChat Survey Platform.

This study's minimum research sample size is based on the study of Kadam Bhalerao (2010)

1. The margin of error (confidence interval) – 95%
2. Standard deviation 0.5
3. 95% - Z Score = 1.96
4. Sample size formula = $(Z\text{-score})^2 * Std\ Dev * (1 - StdDev) / (\text{margin of error})^2$
5. $(1.96)^2 * 0.5(0.5) / (0.05)^2$
6. $(3.8416 * 0.25) / 0.0025$

$$7. 0.9604 / 0.0025 = 384$$

8. 384 respondents would be needed for this study based on a confidence level of 95%

Research Model Correlation Analysis

Correlation analysis is widely used to measure the degree of association between different variables. The Pearson correlation coefficient is commonly used to test the correlation. The value of the correlation co-efficient (r) indicates the strength of the correlation between variables, while the significance level of the correlation is shown in the P-value.

4. Results and Discussion

Results

Correlation Analysis of Psychological and Social Influences, and Residential Property Purchase Intention

The correlation coefficient r between psychological and social influences and residential property purchase intention is 0.783, and the p-value (P) is 0.000, which is less than 0.01. Thus, psychological and social influences significantly correlate with the property purchase intention.

Correlation Analysis of Environmental Factors and Residential Property Purchase Intention

The correlation coefficient r between environmental factors and property purchase intention is 0.802, and the p-value (P) is 0.000, which is less than 0.01. Thus, environmental factors significantly correlate with property purchase intention.

Correlation Analysis of Market Conditions and Property Purchase Intention

The correlation coefficient r between market conditions and property purchase intention is 0.772, and the p-value (P) is 0.000, which is less than 0.01. Thus, market conditions significantly correlate with property purchase intention.

Discussion

All three hypotheses (H1, H2, H3) are **supported by the empirical results**, demonstrating that psychological/social influences, environmental factors, and market conditions each significantly contribute to residential property purchase intentions under the context of Nanjing's urban rail network accessibility. The findings reinforce the **multidimensional nature of buyer decision-making**, where accessibility interacts with lifestyle perceptions, environmental sustainability, and economic dynamics. This suggests that urban rail infrastructure not only improves mobility but also reshapes housing demand patterns, making transit-oriented development a key driver of urban growth.

Psychological and Social Influences (H1) The strong positive correlation ($r = 0.783$, $p < 0.01$) between psychological/social influences and purchase intention aligns with the Accessibility Theory discussed in the literature review (Handy, 2005; He, 2020). The theory emphasized that improved access to transportation reduces travel time and enhances convenience, which directly influences residential desirability. Our findings empirically validate this theoretical claim, showing that buyers perceive greater lifestyle quality and social validation when living near rail stations. This also resonates with prior studies highlighting the role of community norms and peer expectations in shaping property choices (Choi, Park, & Dewald, 2021). Thus, the empirical evidence confirms that accessibility not only improves

mobility but also strengthens social desirability, reinforcing the literature's emphasis on psychological and social dimensions of buyer behavior.

Environmental Factors (H2) The very strong correlation ($r = 0.802, p < 0.01$) between environmental factors and purchase intention supports the literature's assertion that environmental quality amplifies the attractiveness of transit-oriented neighborhoods. Previous studies noted that green spaces, air quality, and urban aesthetics enhance property values when combined with accessibility (Zhong & Li, 2016; Wen, Shi, & Zhang, 2021). Our findings extend this by showing that buyers in Nanjing prioritize sustainable living environments, confirming the literature's claim that accessibility alone is insufficient without favorable environmental conditions. This suggests that rail-connected areas with environmental amenities are perceived as premium residential choices, consistent with Xu, Zhang, & Aditjandra's (2016) findings on the synergy between transit access and environmental appeal.

Market Conditions (H3) The significant correlation ($r = 0.772, p < 0.01$) between market conditions and purchase intention validates the Urban Economic Theory outlined in the literature review (Guo & Qian, 2023; Kaneko et al., 2019). The theory posited that transportation infrastructure interacts with economic indicators to drive housing demand. Our results confirm this, showing that favorable market conditions (low interest rates, high demand) amplify the impact of accessibility on purchase intentions. Even in weaker markets, accessibility remains a critical factor, echoing Wu, Zheng, Wang, & Du's (2020) synthesis that transit access consistently influences property values across varying economic contexts. This demonstrates that accessibility acts as a stabilizing factor in buyer decision-making, consistent with the literature's emphasis on the interplay between infrastructure and economic dynamics.

Overall, the empirical findings strongly support the theoretical frameworks presented in the literature review. Accessibility Theory and Urban Economic Theory provided the foundation for understanding how transportation infrastructure influences buyer behavior, and this study's results confirm their applicability in Nanjing's context. Moreover, the findings highlight the multidimensional nature of purchase intentions: psychological/social influences, environmental quality, and market conditions interact synergistically with rail accessibility to shape buyer decisions. This convergence between theory and evidence underscores the importance of integrating transportation planning, environmental sustainability, and economic analysis in urban development strategies.

5. Conclusions

This study investigated the influence of psychological and social factors, environmental attributes, and prevailing market conditions on residential property purchase intentions in Nanjing, with particular emphasis on the role of urban rail network accessibility. The findings demonstrate that psychological and social influences exert a substantial impact on buyer decision-making, as perceptions of convenience, reduced commuting stress, and conformity to social expectations collectively strengthen the inclination to invest in properties located near transit nodes. Environmental factors also emerged as critical determinants of purchase intention, with transportation convenience, air quality, green spaces, and neighborhood aesthetics enhancing the desirability of residential areas. Buyers increasingly associate these attributes with improved quality of life, thereby elevating the attractiveness of properties situated in accessible and environmentally favorable locations. Market conditions further reinforced the relationship between accessibility and purchase intention, as favorable economic indicators such as low interest rates, strong housing demand, and stable employment levels amplified the appeal of properties near the rail network. Even under less favorable market circumstances, accessibility remained a decisive factor, underscoring its enduring significance in shaping buyer preferences.

Taken together, these findings confirm that psychological and social influences, environmental factors, and market conditions each demonstrate a positive correlation with residential property purchase intentions under conditions of urban rail network accessibility. This integrated perspective highlights the multidimensional nature of buyer decision-making, where accessibility interacts with lifestyle perceptions, environmental sustainability, and economic dynamics to shape housing demand patterns in rapidly urbanizing contexts.

Managerial Implications

The implications of these findings highlight the need for property developers and urban planners to adopt strategies that integrate accessibility into residential development. Land acquisition near rail stations should be prioritized, as such locations are likely to experience sustained demand and appreciation in property values. Incorporating accessibility into development plans enhances project marketability and aligns with evolving consumer preferences.

In addition, embedding sustainable design principles and environmental considerations into residential projects can attract buyers who place high value on eco-friendly living and quality of life. This approach not only differentiates projects in competitive markets but also contributes to broader goals of sustainable urban development.

Marketing strategies should emphasize the lifestyle advantages of living near the rail network, including reduced commuting times, enhanced connectivity, and improved access to employment and amenities. Effective branding that communicates these benefits can strengthen buyer engagement and positively influence purchase intentions.

Developers should prioritize identifying and acquiring land parcels near rail stations, as these locations are likely to experience higher demand and increased property values (Yang, Wang, & Xiong, 2021). Incorporating sustainable design elements and environmental considerations into developments can attract buyers who value eco-friendly living (Ma, Chen, Li, Ding, & Wang, 2018). Marketing strategies should emphasize the convenience and lifestyle benefits of living near the urban rail network (Huang et al., 2015). Finally, developers and managers must remain responsive to market dynamics. By monitoring economic conditions and adapting strategies accordingly, they can optimize project outcomes and mitigate risks. A strategic focus on accessibility, combined with environmental sustainability and market responsiveness, has the potential to significantly enhance residential property development success and foster long-term buyer satisfaction.

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