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THE IMPACT OF HIGH-SPEED RAIL ON HOUSING PRICES: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

High-speed rail (HSR) networks have expanded rapidly since 2000, yet no systematic review has examined the conditions under which HSR generates measurable effects on residential property and land values. This paper presents a systematic review of 26 peer-reviewed empirical studies organized around five themes: 1) system maturity, 2) city hierarchy, 3) network position, 4) local station location and transit connectivity, and 5) catchment area and distance decay. The evidence supports a positive relationship between HSR and housing prices in most contexts, but insignificant or negative findings in Taiwan, Italy, and peripherally located Chinese cities demonstrate that premiums are not guaranteed. The direction and magnitude of how a housing market may response depends on a hierarchy of conditioning factors, with broader urban and economic conditions shaping the degree to which station placement, network connectivity, and local transit integration matter. Cities that are large, well-connected, and served by centrally located stations have the most consistent premiums, while peripheral stations with weak transit links tend to produce negligible or negative effects, a pattern documented almost exclusively in East Asia. Few studies observe housing markets for more than ten years after opening, and fewer still isolate HSR accessibility from the public investment that typically accompanies new stations, limiting how broadly these findings apply. Future research should examine how housing markets react as networks mature, how public investment alongside new stations shapes those outcomes, and whether identified patterns hold in contexts outside East Asia, where the vast majority of existing research has been conducted.

RÉSUMÉ

Les réseaux ferroviaires à grande vitesse (FGV) se sont rapidement développés depuis 2000, pourtant aucune revue systématique n'a examiné les conditions dans lesquelles le FGV génère des effets mesurables sur les valeurs des propriétés résidentielles et foncières. Cet article présente une revue systématique de 26 études empiriques évaluées par des pairs, organisées autour de cinq thèmes: 1) la maturité du système, 2) la hiérarchie urbaine, 3) la position dans le réseau, 4) la localisation de la gare et la connectivité aux transports locaux, ainsi que 4) l'aire de chalandise et les effets de distance. Les données soutiennent une relation positive entre le FGV et les prix de l'immobilier dans la plupart des contextes, mais des résultats insignifiants ou négatifs à Taïwan, en Italie et dans des villes chinoises périphériques démontrent que des plus-values ne sont pas garanties. La direction et l'ampleur de la réponse du marché immobilier dépendent d'une hiérarchie de facteurs conditionnels, les conditions urbaines et économiques générales déterminant dans quelle mesure l'emplacement des gares, la connectivité du réseau et l'intégration aux transports locaux jouent un rôle. Les grandes villes bien connectées, desservies par des gares centralement situées, affichent les plus-values les plus constantes, tandis que les gares périphériques avec de faibles liaisons de transport tendent à produire des effets négligeables ou négatifs, un phénomène documenté presque exclusivement en Asie de l'Est. Peu d'études observent les marchés immobiliers pendant plus de dix ans après l'ouverture, et encore moins isolent l'accessibilité du FGV des investissements publics qui accompagnent généralement les nouvelles gares, ce qui limite la portée de ces résultats. Les recherches futures devraient examiner comment les marchés immobiliers réagissent à mesure que les réseaux arrivent à maturité, comment les investissements publics accompagnant les nouvelles gares influencent ces résultats, et si les tendances identifiées se vérifient dans des contextes en dehors de l'Asie de l'Est, où la grande majorité des recherches existantes a été menée.

ACKNOWLEDGEMENTS

What a privilege it was to be so all consumed and overwhelmed during my time as a graduate student learning about cities, trains, and the trials and triumphs of academia. While I leave the 4th floor with many fond memories and rich learnings, what I am most grateful for are the lifelong friendships that my time at McGill nourished.

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INTRODUCTION

INTRODUCTION

Introduced in Japan with the Tokaido line in 1964, high-speed rail (HSR) is rail infrastructure that enables passengers to travel at least 250 km/h on newly built lines or 200 km/h on upgraded lines (Campos & Rus, 2009; Givoni, 2006). With over 60,000km in operational track and another 16,000km under construction globally as seen in Figure 1, administrations worldwide have significantly invested in HSR since 2000 (UIC, 2025) for nation-building, political integration, and to move people more efficiently (Albalate & Bel, 2012). This rapid expansion in HSR has increased access between connected cities, allowed for urban regeneration, and reshaped urban hierarchies (Garmendia et al., 2012), with evidence showing that nearby property values can either capitalize on improved accessibility or depreciate from associated negative externalities (Hensher et al., 2012). Given the significant cost to build at $14.8 – 44.4USD million per kilometer (Huang & Du, 2021), understanding how HSR affects the communities it connects, including housing markets, is necessary from both a policy and planning perspective.

Rooted in urban economic theory, the value of property increases as the direct and opportunity cost of travel falls (Alonso, 1964). HSR reduces inter-city travel times while integrating regional markets, increasing the possibility of interaction with a greater range of opportunities (Hansen, 1959). HSR stations provide those living nearby with access to a greater pool of economic opportunity at a lower cost, which can be capitalized into price premiums compared to distant properties. The measure and reach of these potential opportunities amplify further if the HSR network is integrated with the local transit network. At the same time, HSR stations also generate negative externalities including noise, congestion, and vibrations which can suppress nearby property values. **The impact HSR has on nearby housing markets is therefore not uniform but instead depends on a range of conditioning factors.**

"Given the significant cost to build at $14.8 – 44.4USD million per kilometre, understanding how HSR affects the communities it connects, including housing markets, is necessary from both a policy and planning perspective."

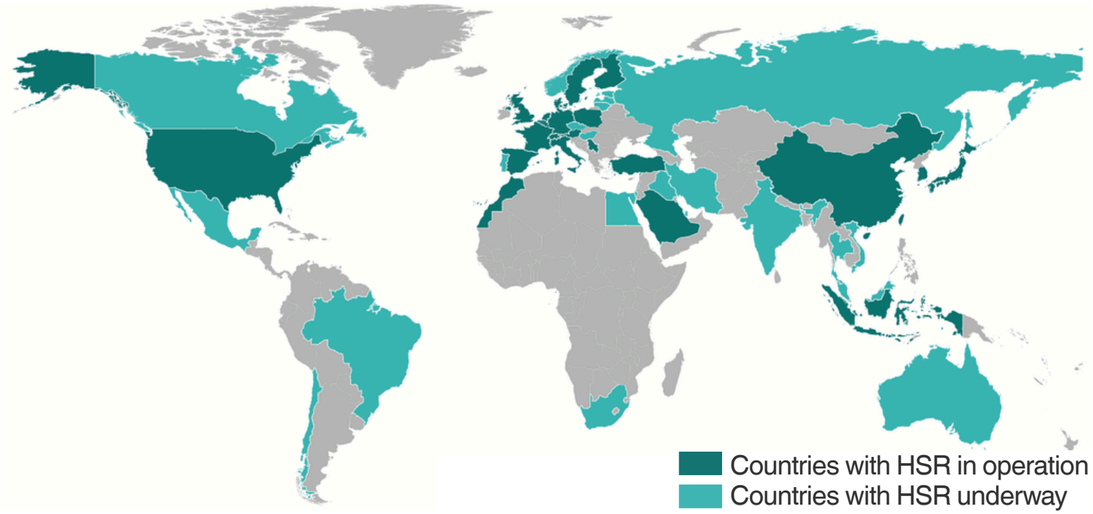

Fig. 1. *HSR in operation and construction globally (UIC, 2025)*

INTRODUCTION

The relationship between rail infrastructure and property values has been investigated through several meta-analysis which have consistently found that outcomes vary by infrastructure type, maturity of the rail system, service characteristics, geographic context, distance to stations, and methods used (Debrezion et al., 2007; Mohammad et al., 2013; Rennert, 2022; Wu et al., 2020). However, none of these studies include HSR which operates at speeds and distances that conventional and urban rail systems do not.

Literature on the topic that is specific to HSR is limited to a case-study report by Hensher et al. (2012) that reviewed eight HSR lines in Europe and Asia finding mixed results, a book chapter by Cheng and Chen (2022) which provided a high-level summary of seven studies concluding that effects vary by city, spatial range and station location, and a conceptual review by Gong and Li (2022) which examined HSR's territorial impacts on urban land development across regional, city, and station-area scales. Beyond these syntheses, no meta-analysis or systematic reviews have specifically examined the conditions under which HSR generates measurable effects on residential property and land values, despite a substantial amount of empirical literature being published on the topic since 2020.

"... no meta-analysis or systematic reviews have specifically examined the conditions under which HSR generates measurable effects on residential property and land values ... "

This systematic literature review asks:

1) To what extent and under what conditions does HSR impact housing prices;

2) How do station, city, and network-level characteristics shape the direction, magnitude, and spatial reach of impact?

By organizing the evidence around five conditioning themes, **this review provides a systematic account of how these factors jointly shape HSR's effect on residential property and land values**, offering insight for planners and policymakers on how to anticipate and plan for housing market reactions.

The remainder of this paper presents the systematic search methodology used, a summary of the 26 retained studies, and findings organized around five themes before a discussion on the results and concluding policy and research implications.

SEARCH STRATEGY

SEARCH STRATEGY

Figure 2 summarizes the process of identifying the selected **26 studies** for analysis. When considering only articles published in **English** between **2010 to 2025**, 17 of the studies were published during or after 2020, highlighting the topic's recent relevance. All but 1 (Di Ruocco et al.) of the studies assess HSR stations in East Asia, with the majority being in China (18), followed by Japan (4), Taiwan (2), and Hong Kong (1). Housing/property prices (16) and land prices (8) are the most used dependent variables, while one study instead used an urban land price index (1) and another used a real estate investment variable (1). Given the literature's reliance on property transaction data, hedonic pricing (11) and difference-in-difference (DiD) (9) models are the dominant methods used, with a smaller subset applying quasi-experimental designs including Propensity Score Match-DiD (3) and spatial econometric models to account for selection bias and geographic spillovers.

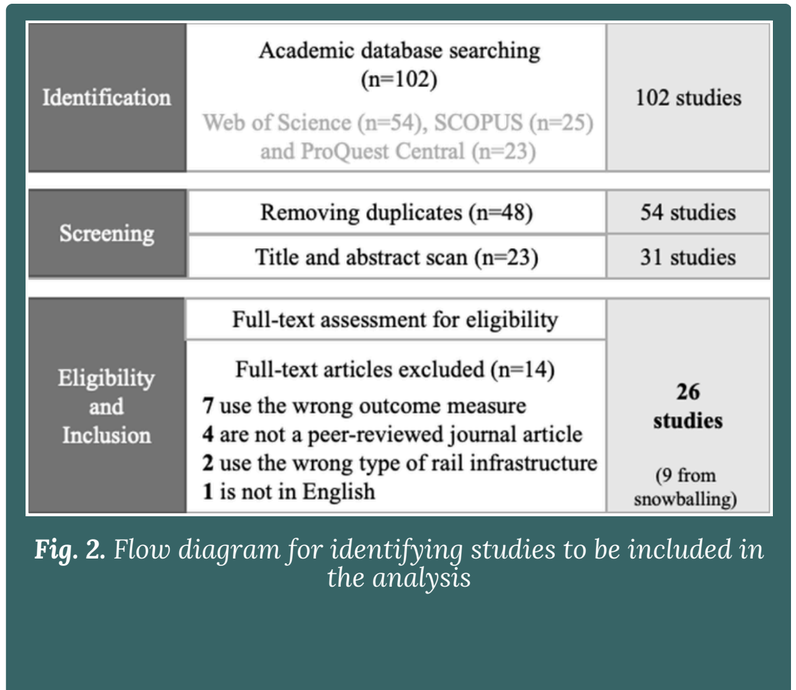

Fig. 2. *Flow diagram for identifying studies to be included in the analysis*

Five themes were identified, each addressing a different level at which HSR affects housing markets:

1. **Maturity of the HSR System:** differentiates how housing markets react across phases of a system's lifecycle
2. **City Hierarchy:** examines how urban size and status shape the direction and magnitude of impact
3. **Network Position:** considers the influence of connectivity to the broader HSR network
4. **Local Station Location and Transit Connectivity:** addresses intra-city station placement and integration with local transit networks
5. **Catchment Area and Decay Patterns:** assesses how price effects vary spatially

ARTICLE THEMES

Each article relates to one or more of the five themes, as indicated in Figure 3a and 3b:

	Andersson et al. (2010)	Bao and Mok (2020)	Chang and Diao (2022)	Chang et al. (2022)	Chen et al. (2022)	Chen and Haynes (2015)	Cheng et al. (2025)	Deng et al. (2023)	Di Ruocco et al. (2025)	Diao et al. (2017)	Geng et al. (2015)	Yang et al. (2022)	Huang and Du (2021)
Country	Taiwan	China	China	China	China	China	China	China	Italy	China	China	China	China
Research question or objective	What is the impact of HSR station accessibility on land values in Tainan area	What is the impact of the West Kowloon Station on residential property prices across HSR maturity	Assess property values around HSR stations and connected metro stations	Quantify the causal impact and verify spatial mismatch of land leases from HSR development	What is the impact of HSR on housing values and how do effects differ by city size	What is the transfer price of residential and commercial land before and after HSR development	What is the impact of HSR expansion on local housing at the sub-city level	What is the impact of increased HSR frequency on local urban housing prices and in neighbouring areas	Evaluate changes in property prices near HSR stations	What is the impact of intracity access to intercity transport and the implications of HSR stations on accessibility and residential property values	What are effects of the Beijing South Railway Station on housing prices	Does the urban network hierarchy brought by HSR affect real estate investment	What are the impacts of HSR on land price
Themes	5	1, 5	4	2, 4	2	2	1, 4	3	4	4	5	2, 3	1, 2

Themes: 1) maturity of the HSR system; 2) city hierarchy; 3) network position; 4) local station location and transit connectivity; 5) catchment area and decay patterns

Fig. 3a. *Article themes*

ARTICLE THEMES

Each article relates to one or more of the five themes, as indicated in Figure 3a and 3b:

	Kanasugi and Ushijima (2018)	Liu et al. (2021)	Low and Lee (2020)	Man and Mok (2016)	Murakami and Seya (2022)	Nickelsburg et al. (2020)	Okamoto and Sato (2021)	Ren et al. (2023)	Rungskunroch et al. (2020)	Wang et al. (2019)	Wang et al. (2018)	Zheng and Kahn (2013)	Zhou and Zhang (2021)
Country	Japan	China	Taiwan	Hong Kong (China)	Japan	Japan	Japan	China	China	China	China	China	China
Research question or objective	Do HSR benefits capitalize in residential land prices	Does HSR network accessibility have a positive impact on urban housing prices	Does the introduction of HSR increase land prices and how does the effect vary with across stages of economic, societal, and infrastructural development	How does the market behave following land acquisitions for HSR development	Does HSR have hierarchical impacts on urban growth	Is HSR caused by regional economic growth or a causal factor of it	How and to what degree does HSR affect economic geography	What is the impact of intercity community by HSR on housing prices between a main and satellite city	What are the impacts of a HSR network on population dynamics and land pricing	What is the total impact of HSR on housing prices	What roles does HSR have in changing housing prices; How and to what extent does the HSR network affect city-level housing prices	Do Chinese bullet trains contribute to housing price appreciation	What is the distributional impact of HSR on industrial development using housing price premiums
Themes	1	2, 3	2	1	2, 3	1, 2	2, 5	2, 3	5	2	2	2, 3	2

Themes: 1) maturity of the HSR system; 2) city hierarchy; 3) network position; 4) local station location and transit connectivity; 5) catchment area and decay patterns

Fig. 3b. *Article themes*

MATURITY OF THE SYSTEM

Maturity of the system refers to how housing markets react across different phases of a system's lifecycle.

MATURITY OF THE SYSTEM

Housing market tends to respond differently to HSR projects during their lifecycle, spanning announcement, construction, opening, and eventual operation periods (Bao & Mok, 2020; Huang & Du, 2021). For instance, the effects of the same stations or corridors on housing prices may differ across stages of system development. While the reviewed articles show that HSR affects the value of housing throughout each phase of its lifecycle, the greatest emphasis has been placed on the pre-operational phases. Markets appear to capitalize upon anticipated accessibility gains from reductions in travel time starting as early as the project's announcement (Bao & Mok, 2020; Kanasugi & Ushijima, 2018; Man & Mok, 2016) or confirmation of construction plans (Huang & Du, 2021). As a result, **studies focusing solely on post-opening periods may underestimate the total impact of HSR on housing markets.**

"Housing market tends to respond differently to HSR projects during their lifecycle, spanning announcement, construction, opening, and eventual operation periods."

Several studies identify positive externalities in housing markets prior to HSR operations. In Hong Kong, Bao and Mok (2020) found that residential property prices around the West Kowloon Station rose most sharply before opening, with the announcement premium exceeding that observed during its construction period. Studying the same corridor, Man and Mok (2016) found that government notices of compulsory underground acquisition needed to build the HSR tunnel generated a 15.1% price premium across all 267 affected properties. Apartment units in the affected buildings were acquired by private developers and sold for 134.5% more than comparable units not subject to compulsory acquisition, reflecting speculative land assembly activity rather than accessibility gains (Man & Mok, 2016). Similar pre-operational effects have been found outside of Hong Kong. In Japan, residential land prices rose by 1.73–1.87% near a terminal station and by 1.00–1.43% near an intermediate station following the announcement of a construction plan for a HSR line, despite it being at least 16 years from opening (Kanasugi & Ushijima, 2018). At a country-wide scale, Huang and Du (2021) found that land prices in Chinese HSR-served cities rose by 8% during the construction period relative to non-HSR cities, a premium the authors attributed to "positive public perceptions or expectations about HSR connections."

Cheng et al. (2025) provide further evidence of anticipation effects at the sub-city level, finding that housing markets in areas outside of city boundaries across China's Jiangsu Province had already responded to future accessibility gains provided by HSR during its planning phase, with no significant housing price changes once operations began. **Although these studies demonstrate that housing markets respond to informational signals about future connectivity and accessibility gains well before operations commence, the conditions under which anticipatory effects emerge are inconsistent across station types, city sizes, and administrative contexts.**

MATURITY OF THE SYSTEM

Not all locations benefit equally from HSR stations, with the reviewed studies identifying several conditions under which positive externalities are absent, reversed, or offset. Kanasugi and Ushijima's (2018) study of the impacts of Japan's HSR construction announcement highlights this clearly. While residential land prices increased in areas where the future line would reduce travel times to Tokyo, the anticipatory price premiums were absent in municipalities experiencing population decline. **Without sufficient demand, housing markets in smaller and more peripherally located areas are not likely to experience premiums from new HSR stations regardless of project phase or future accessibility gains** (Kanasugi & Ushijima, 2018). This relationship is explored more thoroughly in the following City Hierarchy section.

Beyond the condition for necessary demand, housing markets near HSR stations can also be vulnerable to external shocks. Properties near the West Kowloon station, for example, that experienced the highest price premiums during the station's announcement and construction periods, also experienced a significant reduction in the east-west connectivity premium during Hong Kong's political unrest in 2019, with properties within 2km of the terminus being the most affected (Bao & Mok, 2020).

The terminus station's connectivity to Mainland China, a major reason for the previously identified housing price premium, became a liability during periods of tension between Hong Kong and China, suggesting that stations separated by national borders may be particularly sensitive to geopolitical conditions (Bao & Mok, 2020).

A further and distinct negative externality emerges when HSR effects are examined over the long term at the regional, rather than station, level. Nickelsburg et al. (2020) used prefecture-level data to examine the full lifecycle of Japan's Shinkansen from 1964 to 2010. The authors found that the Shinkansen's maturity is associated with a 35.2% reduction in prefecture-wide land prices relative to what would have been expected in the network's absence, in addition to a significant decline in urban density and an increase in urban sprawl. By lowering the cost of travel to major employment centres, the Shinkansen allowed households to relocate to less expensive peripherally located areas while maintaining access to urban labour markets (Nickelsburg et al., 2020). The aggregate result was that the broader metropolitan areas served by the Shinkansen became more affordable as demand for housing moved away from dense urban cores, even as land near stations continued to appreciate.

Nickelsburg et al. (2020) were the only authors to study the macro-level effects of HSR on housing markets across a range of several decades rather than years, capturing findings that a shorter observation period and more narrow station-area focus of hedonic and DiD methods used elsewhere in this theme may not have captured.

The evidence supports HSR affecting housing markets throughout its entire lifecycle, although the direction, size, and distribution of the effects depend on the system phase, city context, and scale considered. These findings are subject to geographic and temporal limitations shared across all five themes in this paper, which may affect their generalizability, and are addressed collectively in the discussion below.

"The evidence supports HSR affecting housing markets throughout its entire lifecycle, although the direction, size, and distribution of the effects depend on the system phase, city context, and scale considered."

CITY HIERARCHY

City hierarchy refers to how a city's size and position in the urban system condition whether housing prices respond to HSR connectivity and to what degree.

CITY HIERARCHY

The benefits from HSR are not distributed equally, as a city's size and position in the urban hierarchy shape both whether and to what degree housing prices are affected.

When aggregating their findings across 285 Chinese cities, Wang et al. (2018) found that the introduction of HSR increased average city housing prices by 13.9%. After categorizing the cities by China's administrative classification system, findings became more nuanced with national central cities experiencing a 31.7% increase in housing prices, and regional central cities a 19.6% increase, both substantially above the national average(Wang et al., 2018). Chen et al. (2022) similarly found that although high-tier Chinese cities, including first and second-tier cities, saw residential land prices rise by 12.2% on average during the opening year of new HSR stations, results varied when separated by city status. City-wide residential land prices in first-tier cities continued to grow to 16.8% and 17.1% in years 3 and 4, while second-tier city effects peaked during the opening year and became insignificant beginning in year 2, a pattern the authors attributed to agglomeration effects in larger cities taking longer to materialize but producing larger price premiums. Yang et al. (2022) provided more support for this dynamic, finding that real estate investment concentrated in better-connected cities as China's HSR network grew between 2007 and 2017.

However, the authors also noted that the network became progressively less hierarchical over this period, suggesting that as HSR expanded into smaller cities, real estate investment began to distribute more widely across the urban system. Evidence from Japan points to the same concentration of gains in larger cities. Examining the extension of the Shinkansen to Japan's Kyushu region, Okamoto and Sato (2021) found that land prices increased by 10.7% in the region's largest city and by 8.5% in the second largest.

> ***"Smaller, more peripherally located, and lower status cities can also experience increases in housing prices, although through different mechanisms than their dominant counterparts."***

Smaller, more peripherally located, and lower status cities can also experience increases in housing prices, although through different mechanisms than their dominant counterparts. By connecting these cities with larger labour markets, HSR enables residents to access the economic benefits offered by major cities without paying the high cost of living in them.

In China, for example, Zheng and Kahn (2013) found that secondary cities experienced a 4.5% increase in housing prices for every 10% gain in labour market accessibility once connected to megacities, as HSR reduced the travel time between cities of different tiers.

Using a metropolis-satellite city model, Ren et al. (2023) similarly showed that HSR increased the demand for housing near stations located in the periphery of satellite cities, as commuters trade high metropolitan housing costs for cheaper living in smaller connected cities. **At the national scale, housing price effects were found to be strongest in small and medium-sized cities in central and western China, where HSR enabled the greatest relative improvement in market access** (Wang et al., 2019). Cities that ranked lower in China's administrative classification system also experienced greater capitalization effects per unit of increased HSR connectivity (Huang & Du, 2021), suggesting that marginal accessibility gains are highest in cities that previously lacked connectivity. The magnitude of these effects is not determined by city rank alone, with Low and Lee (2020) finding that across Taiwanese cities, contextual factors including unemployment rates, interest rates, population density, and the presence of free trade zones moderate the size of HSR land price effects as much as the level of accessibility gained.

CITY HIERARCHY

Several studies identified cities being negatively affected by new HSR connections, most commonly finding that dominant cities can siphon economic activity, population, and housing demand away from smaller ones.

The siphon effect was documented in Japan, where residential land prices in smaller intermediate cities fell between 6.7% and 10.2% following the opening of the Kyushu Shinkansen (Okamoto & Sato, 2021), and in China, where smaller cities in the northern and inland regions lost housing demand to dominant megacities following HSR connections (Wang et al., 2018).

Zhou and Zhang (2021) similarly found that housing prices near HSR stations in smaller peripheral cities grew more slowly than those in larger core cities, suggesting that **HSR can draw economic activity toward dominant cities at the expense of smaller ones.** Dominant cities are not guaranteed to benefit from HSR connectivity however, with Chen and Haynes (2015) finding that new HSR station accessibility had a negligible or negative effect on housing values in capital cities along the Beijing-Shanghai HSR.

Chang et al. (2022) found that in smaller Chinese cities, local governments increased land leasing activity around suburban HSR stations in anticipation of demand that did not materialize, as residents chose to move toward urban centres once connected by HSR rather than peripherally located 'new town' developments. The authors found that housing supply around suburban HSR stations increased without sufficient demand, even as urban residential land prices rose by 14.3%, a mismatch they connect to China's well-documented ghost town problem. Nickelsburg et al. (2020) found that land price reductions associated with Shinkansen maturity in Japan were not felt equally across the urban hierarchy, with smaller prefectures and those without major stations experiencing greater land value declines, suggesting that HSR may also widen the economic gap between cities over time.

Across the reviewed studies, HSR tends to raise housing prices in dominant and well-connected cities. Housing markets in smaller and more peripherally located cities can also be affected depending on whether the accessibility gains HSR provides are strong enough to attract demand, rather than redirect it toward larger urban centres.

"HSR tends to raise housing prices in dominant and well-connected cities but can also benefit smaller, more peripherally-located cities if accessibility gains are significant."

NETWORK POSITION

Network position refers to an individual station's relationship to the broader network including how many other stations can be reached and how quickly.

NETWORK POSITION

The relationship individual stations have to the broader HSR network, including how many cities can be reached, and how efficiently, determines how value is generated and distributed across housing markets. Studies that ignore a station's position within the HSR system may therefore misattribute the effects of network connectivity to station characteristics and underestimate the influence HSR networks have on housing markets.

Examining cities' aggregate access to the economic activity of all connected cities, Zheng and Kahn (2013) found that HSR network connections increased the market potential of secondary Chinese cities substantially between 2006 and 2010. The HSR network accounted for 59% of market potential gains in connected cities, which the authors associated with rising housing prices.

“Studies that ignore a station's position within the HSR system may therefore misattribute the effects of network connectivity to station characteristics and underestimate the influence HSR networks have on housing markets.”

Liu et al. (2021) similarly found that for every one standard deviation increase in HSR network accessibility, urban housing prices increased by 10.3%, on average, across 285 Chinese cities between 2009 and 2017. HSR service frequency also shaped housing markets, with Deng et al. (2023) finding that commercial housing prices in Yangtze River Delta cities increased by 4 yuan, on average, with each additional daily HSR service. The authors also identified positive spillover effects in neighbouring cities that strengthened as the regional network densified, providing evidence that increased housing demand in one city propagates through the network to raise prices in connected cities.

Yang et al. (2022) further found that as China's HSR network expanded, the concentration of rail services through a small number of major hub cities diminished. Real estate investment spread more broadly as smaller cities gained HSR connections, suggesting that network maturity progressively redistributes housing market gains across the urban system.

Although the studies reviewed in this theme used diverse methods to assess network-level effects, Liu et al. (2021) were the only authors to apply social network analysis. Using degree centrality and closeness centrality, the authors measured both the number of direct connections a city has and how quickly it can reach all the other cities in the network. The remaining studies measured network accessibility through proxies such as service frequency or travel time, which reflect the intensity of HSR use rather than the position of cities within the network.

NETWORK POSITION

Not all evidence points in the same direction however, with Murakami and Seya (2022) finding that over a 30-year period, the proximity of residential properties to HSR stations consistently affected land prices more than the degree to which cities were connected to the broader Shinkansen network. Notably, while cities such as Nagoya, Osaka, and Kyoto experienced land price increases as their connectivity to Tokyo improved, the same effect was not observed in Tokyo itself after 2005, suggesting that even the most dominant city in a mature network will not indefinitely benefit from network expansions. **Local accessibility therefore proved to be the stronger force even within a mature and extensively developed HSR system.**

Ren et al. (2023) identified a further caveat, finding through a theoretical model tested against data from Shanghai and Jiaxing, that although additional HSR connections between cities benefitted the broader urban system, they also raised housing prices in smaller connected cities. This occurred as commuters relocated to smaller cities seeking cheaper housing costs, gradually eroding the affordability that had made those cities attractive in the first place.

The positive findings reviewed in this section should be interpreted with caution, given that most studies could not fully confirm that it was HSR itself, rather than pre-existing economic advantages, that drove housing price growth in connected cities. HSR investment is allocated strategically, with governments prioritizing cities with strong economies, meaning that studies that do not account for this risk overstating the effect of network connectivity on housing prices. Only Zheng and Kahn (2013) addressed this directly, using an instrumental variables approach to isolate the effect of HSR connectivity from the pre-existing economic activity of connected cities, finding that their corrected estimates were considerably smaller than their unadjusted ones.

Reviewed together, these findings suggest that a city's position within the broader HSR network shapes housing markets across connected cities, and the scale of effects depends on how network position is measured, which cities are examined, and whether the analysis accounts for governments' tendency to direct HSR investment toward already economically strong cities.

LOCAL STATION LOCATION AND TRANSIT CONNECTIVITY

Local station location and transit connectivity refers to where within a city a station is placed and how well it integrates with existing local transit.

LOCAL STATION LOCATION AND TRANSIT CONNECTIVITY

The reviewed literature shows that where a HSR station is located in its region and how well it connects to existing urban transit determine both the size of the effect and whether accessibility gains from HSR are realized in housing prices at all.

When HSR stations are centrally located and well connected to existing urban transit, housing prices increase. Studying a four-year period during which Shenzhen's metro system did not change, Chang and Diao (2022) found that the opening of a new HSR line in China integrated with the local metro system generated an average 7% increase in housing prices around all metro stations. More specifically, housing values increased by 63.6% around metro stations within 15 to 25 minutes of metro travel time from the HSR station, by 16.6% between 25 to 35 minutes, and by 29.2% between 35 to 45 minutes, with the effect diminishing beyond 45 minutes. Diao et al. (2017) found similar results at the station level; before the Hangzhou-Shanghai HSR line opened, construction suppressed housing prices near an inner-city station being built in Hangzhou, with prices peaking 2.5km away. Once operations began, prices rose closer to the station rather than further away, a pattern the authors speculated may have been partially driven by super-commuter demand for HSR services. Di Ruocco et al. (2025) similarly found that across 13 Italian HSR stations, the presence of HSR raised residential property values overall, though the strength of this effect varied considerably by station context.

Station location also generates negative externalities that suppress housing prices in certain areas. The same study by Chang and Diao (2022) identified a distinct local effect alongside their network findings where housing values decreased by 11.5% to 13.3% in the immediate vicinity of the Shenzhen North HSR station relative to areas further away, which the authors attributed to the negative externalities of the stations itself, including noise, crowding, and increased traffic. Separately, metro stations within 5 to 15 minutes of metro travel time from the HSR station experienced a 7.7% decline, suggesting that the redistribution effect of HSR connectivity does not benefit all parts of the metro system equally. Di Ruocco et al. (2025) identified a similar pattern, with residential values declining near metropolitan station areas, which the authors attributed to high levels of traffic, tourism, and investment activity concentrated in major urban centres. Besidees the negative effects associated with living near HSR stations, stations located too far from the city centre may have no effect on housing markets. Diao et al. (2017), for example, found that new HSR stations in China were built an average of 11.23km from city centres, compared to 4.12km for upgraded existing stations.

The inner-city travel time to these newly built HSR stations by public transit offset, on average, 52.6% of the accessibility gains HSR provided, compared to 23.9% for upgraded, more centrally located stations. In the same study, the Guangzhou South Railway Station, built 17km away from its city centre, had no observable effect in the short term on surrounding residential prices, as its poor public transit connectivity largely negated the time savings HSR provided. As with most findings in this theme, this result captures only the first few years following the station's opening and may change as the station matures, and surrounding areas develop.

LOCAL STATION LOCATION AND TRANSIT CONNECTIVITY

The presence of administrative borders can also affect housing markets when HSR stations are nearby. Cheng et al. (2025) found that areas inside city boundaries that gained HSR accessibility from a new station opening outside their boundary experienced a 20% relative decline in housing prices, the opposite of what improved accessibility should lead to. This reflects the siphon effect, in which economic activity, investment, and employment concentrate in the city hosting the station, leaving areas that gained accessibility but not the station itself at a relative disadvantage.

The evidence suggests that HSR raises housing prices most reliably when stations are centrally located and well-integrated with existing urban public transit. When stations are located poorly, whether in the suburbs with weak transit connections or across an administrative border, they can offset or even reverse housing price increases.

"The evidence suggests that HSR raises housing prices most reliably when stations are centrally located and well-integrated with existing urban public transit."

CATCHMENT AREA AND DISTANCE DECAY

Catchment area and distance decay refers to how far from a station the effects on housing prices remain detectable, and how the relationship between distance and price is not always linear within that range.

CATCHMENT AREA AND DISTANCE DECAY

The effects of HSR stations on housing prices are geographically bounded and diminish with distance, becoming negligible beyond certain context-specific thresholds. Within that range, however, the relationship is not linear and depends on local conditions.

Geng et al. (2015) examined how the effect of HSR stations on housing prices varied by distance. Studying housing prices around Beijing South Railway Station, they identified three distinct catchment areas and decay patterns; prices declined within 0.475km to 0.891km from the station given associated negative externalities, rose between 0.891km and 1.364km as accessibility gains came into effect, and declined again beyond 1.364km at a diminishing rate before becoming negligible past 11.7km. Similar distance decay patterns emerged in Japan following the full opening of the Kyushu Shinkansen with the largest housing price increases being in metropolitan areas within 5km from stations (Okamoto & Sato, 2021). HSR stations in Fukuoka and Kumamoto increased residential land prices by 31.3% and 16.9% within 5 km of each station, and by 10.4% and 12.0% between 5 and 10 km, respectively, before effects turned negative or became insignificant beyond 10km. When examining residential property prices around Hong Kong's West Kowloon Station, Bao and Mok (2020) studied a 10km catchment area divided into five 2km zones. The authors found a clear distance decay gradient within the three closest zones where prices rose by 14% within 0 to 2km, 9% within 2 to 4km, and 7% within 4 to 6km from the station following the project's announcement. Within the 10km range, the gradient shifted considerably and even reversed across the system's announcement, construction and operations (explained in Theme 1), illustrating that **catchment premiums are not only geographically confined but can also change with time.**

When necessary conditions are not met, housing prices may not be affected by HSR regardless of station proximity. In Tainan, Taiwan, where fares cost 70% of the median monthly wage and the suburban station is located 30 to 40 minutes away from the city centre, Andersson et al. (2010) found no meaningful relationship between HSR and residential prices. The authors noted that because Taiwan's housing stock consists almost exclusively of apartments, there was no demand for larger suburban properties that may drive housing price appreciation elsewhere. Without affordable fares and demand for suburban living, housing prices were unaffected regardless of distance from the station. Given that the study draws on transaction data from the same year the Taiwanese HSR opened, however, these findings should be interpreted with caution, as price effects may not yet have had time to materialize. Rungskunroch et al. (2020) similarly found that while HSR capitalized into property prices within 5km of stations in Shanghai, government land price controls prevented these effects from extending to the regional scale, indicating that institutional contexts can constrain the spatial reach of the catchment area along with physical and financial barriers.

> **"... catchment premiums are not only geographically confined but can also change with time ..."**

CATCHMENT AREA AND DISTANCE DECAY

Across the reviewed literature, when certain conditions are met, housing prices tend to decrease in the immediate vicinity of HSR stations, increase at moderate distances, and become negligible beyond a certain threshold. **The conditions for this pattern to hold, including sufficient demand, physical and financial accessibility to the station, alignment between station location and administrative boundaries, and a housing market in which intercity accessibility generates commuting activity**, are documented in East Asian contexts, although whether they apply consistently enough elsewhere to serve as reliable planning benchmarks remains untested.

DISCUSSION

DISCUSSION

Research Questions

This literature review asked two questions. First, to what extent and under what conditions does HSR impact housing prices? On this, **the literature consistently supports the positive effect that HSR can have on housing prices, with premiums varying substantially by the five identified conditioning themes**. Research in Taiwan where findings were insignificant (Andersson et al., 2010), and in both Italy (Di Ruocco et al., 2025) and peripherally located Chinese cities (Cheng et al., 2025) where findings were negative, also demonstrate that housing prices do not consistently rise because of HSR infrastructure. The second question asked how station, city, and network-level characteristics shape the direction, magnitude, and spatial reach of impact. On this, the reviewed articles show that **cities that are highly ranked, well-positioned within the broader HSR network, centrally located, and well-integrated with local transit systems are most likely to be associated with housing price increases**.

Rather than a single effect size, the literature points to a hierarchy of factors that influence the presence and magnitude of housing market response. In terms of influence, broader urban and economic conditions are most responsible for moderating the degree to which station, network, institutional and service characteristics impact housing premiums. Figure 4 illustrates this hierarchy with urban and economic factors (land use, population, city-ranking, labour market, housing supply) as the most significant, followed by station and network factors (network position, travel time savings, local transit connectivity, station distance to city centre), institutional and temporal factors (fiscal policy, project phase, political stability, planning decisions), and service factors (fare cost and service frequency) as the least consequential.

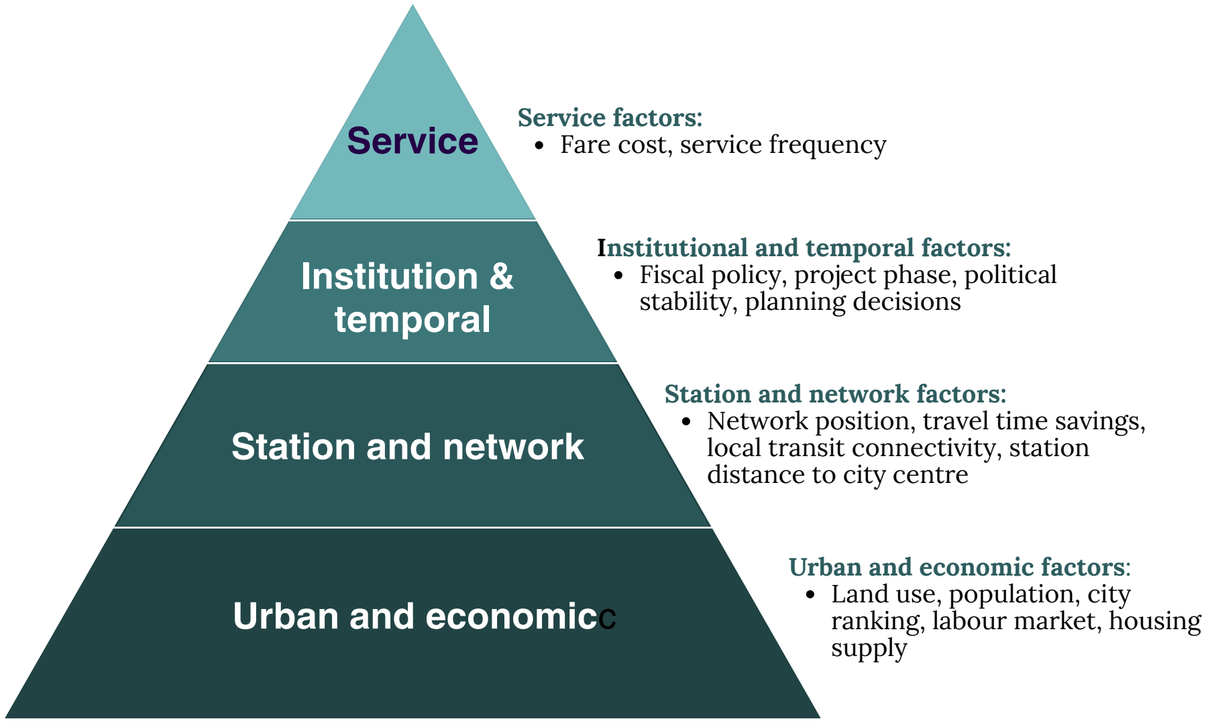

Fig. 4. *Hierarchy of Influential Factors*

DISCUSSION

Areas of Contention

What remains contested is how these factors interact and vary by HSR station. The first unresolved question is whether HSR connectivity to comparatively more dominant urban areas benefits or harms secondary cities. While some studies document economic activity being siphoned away from secondary cities towards dominant ones following HSR connection (Okamoto & Sato, 2021), others find that peripheral cities benefit from spillover effects, gaining resources and population once connected to larger metropolitan regions (Ren et al., 2023; Zheng & Kahn, 2013). Zhou and Zhang (2021) are the only authors to consider how a city's industry structure influences the response of housing markets, finding that manufacturing economies are more likely to generate spillover effects while service economies are more likely to be affected by siphon effects.

The second unresolved question is whether HSR spreads or concentrates housing price gains where the outcome varies depending on the geographic scale of analysis used. At the inter-city scale, Wang et al. (2018)and Wang et al. (2019) find that HSR lessens regional housing price differences and generates stronger price premiums in central and western Chinese cities compared to eastern ones. When researching the impact of regional administrative boundaries, Cheng et al. (2025) find that HSR stations located outside of a city's jurisdiction can lead to "forgotten corners" where housing prices fall despite improved inter-city accessibility. At the intra-city scale, Chang and Diao (2022)document a redistributive effect where residential values near Shenzhen's HSR station declined while those located in areas along connected metro lines increased.

In both cases, **how housing markets respond to HSR connectivity depends on city-specific conditions and the geographic scale of analysis used, neither of which the literature covers adequately enough to provide a clear basis for predicting where property gains and losses will occur.**

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DISCUSSION

Limitations and Gaps

HSR station openings in China are typically carried out with simultaneous government investment in surrounding infrastructure including roads, public amenities, and commercial and housing developments (Qiao & Ascani, 2025), yet no study isolates the effect of HSR accessibility from these investments which makes it difficult to determine the extent to which premiums reflect rail access rather than city upgrades. Peripheral stations without coordinated investment have been found to produce little to no premium, suggesting the development context, rather than rail access itself, may be the primary driver of housing price increases.

Short observation windows also mean that few studies capture more than ten years of data after opening, limiting what the literature can establish about how housing markets evolve as systems mature.

Most studies also treat connectivity as binary, masking potentially significant differences in service frequency and network growth, while the spillover effects that HSR may generate in neighbouring cities remain largely unexamined.

City hierarchy is also defined inconsistently across the literature, ranging from administrative rank to population size to industrial structure, making direct comparison difficult.

Given these limitations, **the findings of this literature review are best understood as identifying general patterns rather than universally applicable conclusions on the impact of HSR on housing prices.**

Future Research

- Future research should examine how housing markets respond to HSR when located too far from stations to benefit from the inter-city accessibility gains they provide, but close enough to corridors to be negatively affected by the infrastructure's physical footprint.
- Studies that investigate HSR outside of East Asia are also needed given that most findings are based on Chinese systems, where state ownership of land allows coordinated development around stations and there is high population density, which shapes outcomes in ways that may not be applicable in other contexts.
- Finally, as most HSR systems besides Japan have yet to reach the level of network maturity that allows for long-term analysis, the continued monitoring of how housing markets respond as networks age is needed to build on what is currently limited knowledge.

CONCLUSION

CONCLUSION

This systematic literature review examined the relationship between HSR and residential property and land values across 26 studies, identifying five themes through which city, network, station, and service characteristics shape housing market outcomes. The evidence supports a positive relationship between HSR and housing prices in most contexts, though null and negative outcomes were found in Taiwan, Italy, and peripherally located Chinese cities which indicates that premiums are not guaranteed following connectivity. The direction and magnitude of impact depend on a hierarchy of factors, with broader urban and economic conditions setting the baseline within which station, network, and service characteristics operate and influence housing markets.

For planners and policymakers, the most actionable finding is that station location and local transit integration matter as much as access to HSR itself. Cities with centrally located stations that are well-integrated with the existing transit network consistently generate housing price premiums. Conversely, peripherally located stations with weak connectivity risk generating little to no or even suppressing housing prices. Whether HSR benefits or harms secondary cities, and whether its price effects spread across regions or concentrate within them, are questions the literature has not yet answered clearly enough to guide planning decisions. **As HSR networks expand and existing systems mature, so too must the research that informs how we plan for them.**

"As HSR networks expand and existing systems mature, so too must the research that informs how we plan for them."

REFERENCES

REFERENCES

1. Albalate, D., & Bel, G. (2012). The Economics and Politics of High Speed Rail: Lessons from Experiences Abroad. https://doi.org/10.5771/9780739171240
2. Alonso, W. (1964). Location and Land Use: Toward a General Theory of Land Rent. Harvard University Press. https://doi.org/doi:10.4159/harvard.9780674730854
3. Andersson, D. E., Shyr, O. F., & Fu, J. (2010). Does high-speed rail accessibility influence residential property prices? Hedonic estimates from southern Taiwan. Journal of Transport Geography, 18(1), 166-174. https://doi.org/10.1016/j.jtrangeo.2008.10.012
4. Bao, H. X. H., & Mok, D. K. C. (2020). A Link between East and West: How the Guangzhou-Shenzhen-Hong Kong Express Rail Link Affects Property Prices in Hong Kong. International Real Estate Review, 23(3), 993-1021. https://doi.org/10.17863/CAM.56049
5. Campos, & Rus, D. (2009). Some stylized facts about high-speed rail: A review of HSR experiences around the world. Transport Policy, 16(1), 19-28. https://doi.org/10.1016/j.tranpol.2009.02.008
6. Chang, Z., & Diao, M. (2022). Inter-city transport infrastructure and intra-city housing markets: Estimating the redistribution effect of high-speed rail in Shenzhen, China. Urban Studies, 59(4), 870-889, Article 00420980211017811. https://doi.org/10.1177/00420980211017811
7. Chang, Z., Zheng, L., Yang, T., & Long, F. (2022). High-speed rail, new town development, and the spatial mismatch of land leases in China [Article]. Land Use Policy, 115, Article 106014. https://doi.org/10.1016/j.landusepol.2022.106014
8. Chen, J., Chen, X., & Li, T. (2022). Has the Opening of High-Speed Rail Promoted the Balanced Development between Cities?—Evidence of Commercial and Residential Use Land Prices in China. Sustainability, 14(15), 9437. https://doi.org/https://doi.org/10.3390/su14159437
9. Chen, Z., & Haynes, K. (2015). Impact of high speed rail on housing values: an observation from the Beijing–Shanghai line. Journal of Transport Geography, 43. https://doi.org/10.1016/j.jtrangeo.2015.01.012
10. Cheng, J., & Chen, Z. (2022). Socioeconomic Impact Assessments of High-Speed Rail: A meta-analysis. Transport Reviews, 42(4), 467-502. https://doi.org/10.1080/01441647.2021.1979689
11. Cheng, S. Y., Hu, C. X., & Song, Y. X. (2025). High-speed rail expansion and housing prices in the "forgotten corners": Sub-City Level Evidence from Jiangsu Province in China. Economic Analysis and Policy, 86, 1787-1800. https://doi.org/10.1016/j.eap.2025.05.020
12. Debrezion, G., Pels, E., & Rietveld, P. (2007). The Impact of Railway Stations on Residential and Commercial Property Value: A Meta-analysis. The Journal of Real Estate Finance and Economics, 35(2), 161-180. https://doi.org/10.1007/s11146-007-9032-z
13. Deng, T. T., Xu, Z. Q., & Zhang, K. (2023). Impact of Increasing Intercity Connectivity on Local Housing Markets: Study of China's Yangtze River Delta Region. Journal of Urban Planning and Development, 149(1). https://doi.org/10.1061/(asce)up.1943-5444.0000895

REFERENCES

14. Di Ruocco, I., Mauriello, F., & Pagliara, F. (2025). Real estate market trends in Italy: the impact of High-Speed Rail on property prices. Research in Transportation Economics, 114, 101662. https://doi.org/https://doi.org/10.1016/j.retrec.2025.101662
15. Diao, M., Zhu, Y., & Zhu, J. R. (2017). Intra-city access to inter-city transport nodes: The implications of high-speed-rail station locations for the urban development of Chinese cities. Urban Studies, 54(10), 2249-2267. https://doi.org/10.1177/0042098016646686
16. Garmendia, M., Ribalaygua, C., & Ureña, J. M. (2012). High speed rail: implication for cities. Cities, 29, S26-S31. https://doi.org/10.1016/j.cities.2012.06.005
17. Geng, B., Bao, H. J., & Liang, Y. (2015). A study of the effect of a high-speed rail station on spatial variations in housing price based on the hedonic model. Habitat International, 49, 333-339. https://doi.org/10.1016/j.habitatint.2015.06.005
18. Givoni. (2006). Development and Impact of the Modern High-speed Train: A Review. Transport Reviews, 26(5), 593-611. https://doi.org/10.1080/01441640600589319
19. Gong, W., & Li, V. (2022). The territorial impact of high-speed rail on urban land development. Cities, 125, 103581. https://doi.org/10.1016/j.cities.2022.103581
20. Hansen, W. (1959). How Accessibility Shapes Land Use. Journal of the American Institute of Planners, 25(2), 73-76. https://doi.org/10.1080/01944365908978307
21. Hensher, D., Li, Z., & Mulley, C. (2012). The impact of high speed rail on land and property values: A review of market monitoring evidence from eight countries [Journal Article]. Road & Transport Research, 21(4), 3-14. https://search.informit.org/doi/10.3316/informit.145470162627643
22. Huang, Z. H., & Du, X. J. (2021). How does high-speed rail affect land value? Evidence from China. Land Use Policy,101, Article 105068. https://doi.org/10.1016/j.landusepol.2020.105068
23. Kanasugi, H., & Ushijima, K. (2018). The impact of a high-speed railway on residential land prices. Papers in Regional Science, 97(4). https://doi.org/10.1111/pirs.12293
24. Liu, X. L., Jiang, C. X., Wang, F., & Yao, S. J. (2021). The impact of high-speed railway on urban housing prices in China: A network accessibility perspective. Transportation Research Part a-Policy and Practice, 152, 84-99. https://doi.org/10.1016/j.tra.2021.08.006
25. Low, J. M. W., & Lee, B. K. (2020). A Data-Driven Analysis on the Impact of High-Speed Rails on Land Prices in Taiwan. Applied Sciences-Basel, 10(10), Article 3357. https://doi.org/10.3390/app10103357
26. Man, K., & Mok, P. (2016). An Empirical Study of the Impacts of an Express Rail Link on Property Prices-Hong Kong Evidence. The Appraisal Journal, 84(3), 259-268. https://proxy.library.mcgill.ca/login?url=https://www.proquest.com/scholarly-journals/empirical-study-impacts-express-rail-link-on/docview/1832707367/se-2?accountid=12339
27. Mohammad, S., Graham, D., Melo, P., & Anderson, R. (2013). A meta-analysis of the impact of rail projects on land and property values. Transportation Research Part A: Policy and Practice, 50, 158-170. https://doi.org/https://doi.org/10.1016/j.tra.2013.01.013

REFERENCES

28. Murakami, D., & Seya, H. (2022). Spatial Regression in the Presence of a Hierarchical Transportation Network: Application to Land Price Analysis [Article]. Frontiers in Sustainable Cities, 4, Article 905967. https://doi.org/10.3389/frsc.2022.905967
29. Nickelsburg, J., Ahluwalia, S., & Yang, Y. (2020). High-speed Rail, Urbanisation, and Housing Affordability
30. Evidence from the Shinkansen System. Journal of Transport Economics and Policy, 54(4), 267-288. https://www.jstor.org/stable/27106109
31. Okamoto, C., & Sato, Y. (2021). Impacts of high-speed rail construction on land prices in urban agglomerations: Evidence from Kyushu in Japan. Journal of Asian Economics, 76. https://doi.org/10.1016/j.asieco.2021.101364
32. Qiao, Y., & Ascani, A. (2025). High-speed railway and city industrial upgrading in China: A quasi-experimental study. Applied Geography, 184, 103757. https://doi.org/10.1016/j.apgeog.2025.103757
33. Ren, T., Huang, H. J., Luo, S. D., & Nie, Y. (2023). High-speed rail in China: Implications for intercity commuting and urban spatial structure. Sustainable Cities and Society, 97, Article 104719. https://doi.org/10.1016/j.scs.2023.104719
34. Rennert, L. (2022). A meta-analysis of the impact of rail stations on property values: Applying a transit planning lens. Transportation Research Part A: Policy and Practice, 163, 165-180. https://doi.org/https://doi.org/10.1016/j.tra.2022.06.013
35. Rungskunroch, P., Yang, Y., & Kaewunruen, S. (2020). Does High-Speed Rail Influence Urban Dynamics and Land Pricing? Sustainability 2020, Vol. 12, Page 3012, 12(7). https://doi.org/10.3390/su12073012
36. UIC. (2025). High-Speed Rail Atlas (6 ed.). International Union of Railways. https://uic.org/IMG/pdf/uic_high-speed_atlas_2024.pdf
37. Wang, R., Ye, L., Chen, L., Rong, W., Li, Y., & Liwen, C. (2019). The Impact of High-Speed Rail on Housing Prices: Evidence from China's Prefecture-Level Cities. Sustainability 2019, Vol. 11, Page 3681, 11(13). https://doi.org/10.3390/su11133681
38. Wang, Y. X., Liu, X. L., & Wang, F. (2018). Economic Impact of the High-Speed Railway on Housing Prices in China. Sustainability, 10(12), Article 4799. https://doi.org/10.3390/su10124799
39. Wu, W., Zheng, S., Wang, B., & Du, M. (2020). Impacts of rail transit access on land and housing values in China: a quantitative synthesis. Transport Reviews, 40(5), 629-645. https://doi.org/10.1080/01441647.2020.1747570
40. Yang, H., Wang, C., & You, Y. (2022). The Spatial Structure Evolution of China's High-Speed Rail Network and Its Impacts on Real Estate Investment [Article]. Applied Spatial Analysis and Policy, 15(1), 49-69. https://doi.org/10.1007/s12061-021-09390-7

REFERENCES

41. Zheng, S. Q., & Kahn, M. E. (2013). China's bullet trains facilitate market integration and mitigate the cost of megacity growth. Proceedings of the National Academy of Sciences of the United States of America, 110(14), E1248-E1253. https://doi.org/10.1073/pnas.1209247110
42. Zhou, Z. Y., & Zhang, A. M. (2021). High-speed rail and industrial developments: Evidence from house prices and city-level GDP in China. Transportation Research Part a-Policy and Practice, 149, 98-113. https://doi.org/10.1016/j.tra.2021.05.001