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Review paper

Impact of Infrastructure Development on Property Prices in Developing Urban Areas: A Systematic Review

Gita Puspa Artiani^{a*}, Oei Fuk Jin^b

^aCivil Engineering Department, Universitas Krisnadwipayana, 13720, Indonesia

^aCivil Engineering Department, Universitas Tarumanegara, 11440, Indonesia

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ABSTRACT

Research on the relationship between infrastructure development and property values remains essential in the context of rapid urbanization. While existing studies predominantly highlight direct influences such as transportation networks and public amenities, limited attention has been given to broader dimensions, particularly sustainability and smart technologies. This study contributes to the literature by systematically reviewing publications from 2020 to 2025, highlighting how infrastructure development influences property prices through sustainable urban planning and the integration of smart infrastructure. Using the Systematic Literature Review (SLR) method supported by bibliometric tools (VOSviewer and Publish or Perish), this research identifies four major themes: accessibility, public service provision, regulatory frameworks, and the adoption of green and smart technologies. The findings reveal that although the positive correlation between infrastructure and property values is well established, gaps remain in addressing long-term impacts of green building strategies, energy efficiency, and the economic implications of smart infrastructure. The novelty of this study lies in framing these underexplored themes as emerging research priorities, offering new insights for policymakers, urban planners, and developers in aligning infrastructure investment with sustainable and technologically adaptive urban growth.

1. Introduction

Infrastructure development has long been recognized as a cornerstone of economic growth, particularly in developing urban areas. For nations like Indonesia, it serves as a crucial strategy for promoting sustainable development, enhancing economic efficiency, and addressing urbanization challenges. The Indonesian government, through its national medium-term development plan (RPJMN) 2020–2024, envisions the realization of an advanced, sovereign, and independent Indonesia [1]. A key aspect of this vision is equitable infrastructure development, aimed at bridging the disparities between urban and rural areas to facilitate balanced growth nationwide. The government's dual mission of promoting fair development and ensuring environmental sustainability is pivotal to the overarching goal of inclusive urbanization. While economic progress is often reflected in infrastructure expansion, increased service availability, and growing urban populations, infrastructure development also presents significant challenges, particularly in terms of environmental sustainability. The rapid growth of the construction sector, driven by infrastructure projects, creates economic

opportunities but raises concerns about ecological degradation. In this context, this study hypothesizes that infrastructure development not only drives economic growth but also directly influences property values, especially when sustainability principles and smart technologies are integrated into urban planning. Accordingly, this research narrows its focus to examine the relationship between infrastructure development and property values within developing urban environments, highlighting sustainability as a central dimension of analysis.

In response to these concerns, Indonesia's Ministry of Public Works and Housing issued Ministerial Regulation No. 9 of 2021, which aims to guide the construction industry in adopting sustainable practices. This regulation aligns with global efforts, including those of the United Nations, to strike a balance between economic development, environmental stewardship, and social equity [2]. The framework outlined in these regulations emphasizes the importance of addressing three fundamental pillars: promoting economic growth and community welfare, preserving the environment, and reducing social disparities. In parallel, the relationship between infrastructure development and property values in

*Corresponding author: Civil Engineering Department, Universitas Krisnadwipayana, 13720, Indonesia

E-mail address: gita_artiani@unkris.ac.id (Gita Puspa Artiani)

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developing urban areas has garnered increasing attention. Improved infrastructure, particularly in transportation, utilities, and public amenities, has a profound impact on property values. Evidence suggests that areas with enhanced infrastructure experience higher demand for real estate, resulting in increased property prices. However, while rising property values signal economic progress, they also contribute to social challenges, including affordability issues and growing inequalities within the urban population.

This systematic literature review aims to provide a comprehensive synthesis of the literature regarding the impact of infrastructure development on property values in developing urban areas. Using bibliometric analysis, this study identifies key trends, examines the relationship between infrastructure and property prices, and explores existing research gaps. By highlighting the multidimensional impacts of infrastructure development, this review contributes to the growing body of knowledge on the subject. It offers critical insights for policymakers, urban planners, and developers striving to balance growth with equity and sustainability in urban environments.

2. Method

The research method for this systematic literature review (SLR) begins with determining the primary research objective, which is to understand the impact of infrastructure development on property prices in developing urban areas. To achieve this objective, the review focuses on analyzing studies related to infrastructure development and its influence on property prices, using a structured and systematic approach. Before diving into the analysis of relevant articles, a comprehensive exploration of the theoretical frameworks and key concepts related to infrastructure development and property value is conducted. This includes identifying the main factors that have been shown to influence property prices, such as transportation networks, accessibility, urban planning, and government policies. The data used in this research is secondary data, specifically scientific articles published in peer-reviewed journals. These articles are selected based on their relevance to the research topic, publication year, and methodological rigor. The method for collecting related articles involves searching renowned academic databases, such as Scopus and Elsevier, using advanced search tools to filter articles that meet the inclusion criteria. The inclusion criteria for the articles include those published between 2020 and 2025 that are focused on infrastructure development, property values, urban planning, or similar topics, and articles that provide empirical data or theoretical insights related to the effect of infrastructure on property prices. The search settings in the Scopus database include language preferences (in English and Indonesian) and a filter for publications from the years 2020 to 2025. The search terms used include "infrastructure development," "property value," "urban development," and other related keywords to gather the most relevant articles.

Data collection and analysis in this study were conducted through a systematic and transparent process, supported by several software applications. Mendeley was used for reference management and citation organization, VOSviewer for bibliometric analysis and visualization of keyword

networks and research trends, and Publish or Perish for evaluating citation metrics, including the *h-index* and *g-index*. To ensure research transparency and replicability, the review protocol was developed in accordance with the PRISMA guidelines. The inclusion criteria focused on peer-reviewed articles published between 2020 and 2025, addressing infrastructure development, property values, and related aspects of urban planning. Each article was reviewed for clarity of research design, adequacy of data, and strength of evidence.

Bibliometric indicators, such as the *h-index* and *g-index*, were not only calculated but also interpreted contextually. The *h-index* was used to capture the productivity and citation impact of authors contributing to this field. At the same time, the *g-index* emphasized highly cited works that disproportionately shape the discourse. These indicators were interpreted in relation to thematic trends, highlighting influential publications and identifying research gaps. After the articles were collected, organized, and appraised, a thematic analysis was conducted to identify key trends, relationships, and underexplored areas within the existing literature. This combination of systematic review, bibliometric mapping, and quality appraisal ensured that the findings were grounded in robust and relevant evidence.

3. Result and Discussion

3.1. Presenting the Results

This research for relevant literature yielded a collection of 600 journals and articles containing the keywords Property Value, Real Estate, Infrastructure Development, and urban planning. This review examines the influence of infrastructure development on property prices in developing urban areas, focusing on key factors such as transportation networks, public amenities, and government policies. The study also identifies emerging themes within this field and highlights the relationships between infrastructure improvement and property value increase.

3.2. Discussion

A significant portion of the literature discusses the impact of transportation networks on property values. The development of roadways, rail systems, and proximity to major transport hubs consistently prove to be key factors influencing property demand. Properties located in areas with enhanced transportation access tend to see higher demand and subsequently higher property prices. This theme is particularly prominent in developing urban areas, where new transportation projects often catalyze growth in property markets [3]. In addition to transportation, the development of public amenities such as parks, healthcare facilities, and educational institutions plays a crucial role in increasing property values. The results indicate that none of the proximities to the bus stop, train station, or motorway link has had a significant effect on housing value [4]. Research indicates that neighborhoods with accessible green spaces and well-developed public services attract higher property investments, as they provide an enhanced quality of life for residents. This section discusses how these amenities, often integral to urban planning initiatives, create desirable living conditions and contribute to increased real estate value.

Government policies, including land value capture and urban regeneration strategies, also play a significant role in determining property prices. Studies suggest that governments that incentivize infrastructure investment through public-private partnerships (PPP) or other urban regeneration mechanisms can stimulate property price growth. This section examines how various government-led initiatives and policies have influenced property markets, with a focus on case studies from developing urban regions. Sustainability has emerged as an important factor influencing property prices. As cities prioritize green infrastructure, including renewable energy systems, eco-friendly public transportation, and sustainable urban design, properties located within these environments are increasingly in demand. This section explores the increasing significance of green building technologies and their impact on property values, particularly in environmentally conscious buyer markets.

Recent literature also explores the integration of smart infrastructure in urban development. The concept of smart cities, where technologies such as the Internet of Things (IoT) are utilized to manage resources efficiently, has been shown to impact property values positively. This sub-section discusses how smart infrastructure, such as IoT-powered utilities and energy-efficient systems, has increased the desirability of properties, aligning with global trends in digital urbanism [5]. The review highlights regional variations in the impact of infrastructure development on property prices. For example, in Southeast Asia, where transportation infrastructure projects are often rapidly implemented, the correlation between infrastructure development and the increase in property value is particularly strong. Conversely, in older urban areas in Europe and North America, the focus has shifted towards upgrading existing infrastructure, with significant impacts on the surrounding property values. This section explores these regional differences and the factors that drive these trends in SLR. Not only that, public transit infrastructure may increase residential property values by improving accessibility and reducing commute expenses in urban areas [6]. The findings indicate a shift from traditional infrastructure impacts to a focus on sustainability and technology-driven solutions in urban areas. Increasingly, research emphasizes the importance of energy-efficient buildings, smart technology, and sustainable urban planning as key drivers of property value growth. This section examines the evolving trends, including the adoption of green technologies and smart systems, and their contributions to both property value growth and broader urban sustainability objectives.

3.3. Data Metrics from Initial Search Results

The systematic literature review process involves collecting and organizing data from selected articles based on predefined search parameters. To assess the overall scope and impact of the research field, data metrics from the initial search results are compiled and analyzed. These metrics help quantify the extent of literature on the topic and offer insight into the publication trends. For instance, as shown in Table 1 below, various data metrics, including the number of publications, citation counts, and citation frequency over the years, are presented. These data metrics provide an overview

of the academic activity in the field of infrastructure development and its impact on property prices.

The initial database search through Scopus yielded 600 records related to the topic of "Property Value, Infrastructure Development." During the identification stage, duplicate records (N = 283) were removed, leaving 317 unique articles. In the screening stage, titles and abstracts were reviewed to ensure relevance to the research focus, and 47 records were excluded because they were tangential or lacked a direct link to infrastructure or property value.

At the eligibility stage, 270 full-text articles were thoroughly assessed. Specific exclusion criteria were applied, including:

1. Focusing on financial resilience at the firm or organizational level rather than urban property contexts.
2. Studies addressing macroeconomic indicators without direct relation to infrastructure development or property values.
3. Publications that lacked empirical data, methodological rigor, or theoretical relevance to the scope of this review.

As a result, 192 articles were excluded based on these criteria. The final inclusion stage resulted in 78 articles that met the requirements for quality, methodological soundness, and relevance, which were subsequently analyzed in depth.

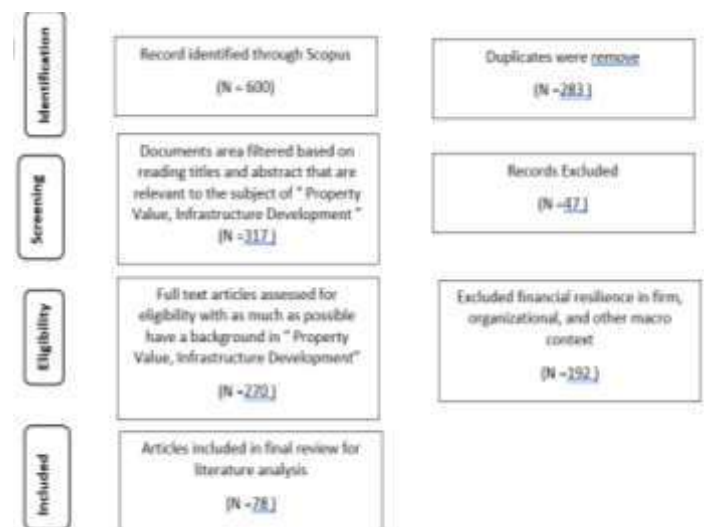


Fig. 1. Data retrieval and selection of an article

Fig. 1 illustrates the PRISMA flow diagram summarizing this systematic selection process. The integration of PRISMA ensures methodological transparency and replicability of the review, while clarifying how the inclusion and exclusion criteria shaped the final dataset. This step is critical to validating the reliability of the findings, as it highlights not only the quantity of studies analyzed but also the rationale behind narrowing the scope to the most relevant and methodologically robust literature.

Table 1. Data metrics from the initial search result for "Property value, infrastructure development"

Description	Data
Publication Years	2020 - 2025
Citation Years	5 (2020 – 2025)
Papers	270
Citations	2,010
Cites per Year	402.00
Cites per Paper	7.44
Cites per Author	830.99
Papers per Author	134.71
Authors per Paper	2.62
H Index	23
G Index	37

Table 1 provides insight into the extensive research on infrastructure development and property prices, with high

citation counts indicating the significance and influence of these studies within the academic community. The H Index and G Index offer additional insights into the educational impact of the research, where a higher index indicates a greater degree of citation impact. Following the secondary data collection using the Publish or Perish tool, which involved analyzing 270 articles, the interpretation of key terms in the systematic review presents an overview of the most frequently mentioned terms and their relevance scores in **Table 2**. This analysis provides valuable insights into the central themes and dynamics discussed across the literature on infrastructure development and its impact on property values in urban settings.

Table 2. Data metrics from the initial search result for “Property value, infrastructure development”

Term	Occurrences	Relevance Score	Explanation
infrastructure development	108	0.732	The most frequently occurring term indicates that infrastructure development is the central focus of the study.
property value	90	0.6731	Frequently discussed alongside infrastructure, highlighting the crucial relationship between infrastructure development and property value.
urban development	90	0.5	Focused on the growth and expansion of urban areas, which is an essential context for this study.
infrastructure investment	24	1.2074	Although less frequent, its high relevance indicates that investment in infrastructure is a crucial aspect of the study.
property price	16	1.2076	A highly relevant keyword referring to property prices, which are influenced by infrastructure and urban development.
urbanization	12	1.4436	The urbanization process is closely related to changes in property values and infrastructure development.
real estate value	10	1.4546	Focuses specifically on the value of real estate properties, with a high relevance score, integral to property value analysis.
green infrastructure	8	1.2526	Appears as a critical sustainability element in urban infrastructure development.
urban planning	8	1.2163	Urban planning plays a pivotal role in controlling infrastructure development and its effects on property values.
housing price	7	1.6174	Housing prices are an essential indicator in the study of the impact of infrastructure on the property market.
residential property value	7	2.2269	The term with the highest relevance score indicates its central importance in the study of the impact of infrastructure on property value.
relationship	7	1.9229	Focuses on the relationship between variables (e.g., infrastructure and property value) in the analysis.
access	6	1.1223	Accessibility is a key factor linking infrastructure development to property value.
evidence	6	1.3263	Empirical evidence supporting the relationship between infrastructure development and property value in the study.
urban development process	5	1.5869	The process of urban development provides the dynamic context for how infrastructure affects property values.

Table 2 shows that infrastructure development (108; 0.732), property value (90; 0.6731), and urban development (90; 0.5) are the most frequently occurring terms, emphasizing that the dominant focus of the literature is on the direct relationship between infrastructure development and property values in urban contexts. The relatively lower relevance scores of these high-frequency terms indicate that while they represent well-established topics in the field, their broad and generic nature makes them less specific in capturing nuanced dynamics. In contrast, terms with lower frequency but higher relevance scores, such as residential property value (7; 2.2269), relationship (7; 1.9229), and housing price (7; 1.6174), highlight research areas that, although less commonly addressed, are contextually significant. Their high relevance scores suggest that these

terms are more focused and provide deeper insights into the dynamic link between infrastructure development and property values, particularly within the residential segment, where price sensitivity to infrastructure changes is most pronounced. Furthermore, the presence of terms such as green infrastructure (8; 1.2526) and urban planning (8; 1.2163) expands the literature's perspective beyond conventional physical and economic impacts, indicating a growing interest in sustainability and governance dimensions. Although less frequent, their relatively high relevance scores confirm an emerging shift toward framing infrastructure development not only as an economic driver but also as a tool for sustainable and inclusive urban growth. This pattern suggests that while prior research has predominantly focused on the conventional relationship between infrastructure and

property price appreciation, newer dimensions, such as sustainability, inclusive urban planning, and the long-term impacts on residential property values, remain underexplored. Therefore, the high relevance scores of low-frequency terms indicate critical opportunities for future research to enrich the literature and provide evidence-based insights for infrastructure policies that balance economic efficiency, environmental sustainability, and social equity.

3.4. Final Search Data Metrics

Following the initial search and filtering of results, more refined data metrics are presented, focusing on the articles that were most relevant to the review topic. **Table 3** shows the metrics for the final selection of articles after applying more stringent criteria, including publication relevance and quality.

Table 3. Data metrics from the final search result for “Property value, infrastructure development”

Description	Data
Publication Years	2020 - 2025
Citation Years	5 (2020 – 2025)
Papers	78
Citations	1,101
Cites per Year	104.00
Cites per Paper	5.20
Cites per Author	425.88
Papers per Author	93.42
Authors per Paper	1.89
H Index	18
G Index	27

Table 3 summarizes the bibliometric data from the final selection of 78 articles published between 2020 and 2025. The total of 1,101 citations and an average of 104 citations per year indicate that the topic of infrastructure development and property value continues to attract strong academic attention within a relatively short time frame. The average of 5.20 citations per paper suggests that each study has been

recognized within the scholarly community, reflecting the relevance of the topic to ongoing debates in urban development, property markets, and sustainability. The author metrics provide further insight into collaboration and productivity patterns. With 1.89 authors per paper, the field tends to small-scale research teams, which may indicate specialized expertise or region-specific case studies. An average of 93.42 papers per author, though influenced by database counting methods, highlights the contributions of a few highly prolific scholars who shape much of the discourse. The figure of 425.88 citations per author reinforces the idea that a relatively small number of researchers have produced influential works that underpin the field. The H Index of 18 demonstrates that at least 18 papers within this dataset have each been cited 18 times or more, signifying both productivity and sustained impact. Meanwhile, the G Index of 27 emphasizes that a subset of highly cited articles disproportionately contributes to shaping the knowledge base. This suggests that while a broad set of studies exists, a smaller group of influential works sets the foundation for current and future research trajectories.

Overall, these bibliometric indicators imply that research on infrastructure and property values is not only growing but also consolidating around key authors and seminal works. The combination of high citation activity and the presence of highly relevant but specialized studies points to an evolving field where foundational knowledge is being established, while emerging topics such as sustainability integration and smart technologies present opportunities for deeper exploration and diversification of research agendas.

3.5. VOSviewer Analysis Results

To further analyze the relationships between different research themes, VOSviewer is employed to visualize the connections between keywords, research topics, and trends. The literature is most concentrated.

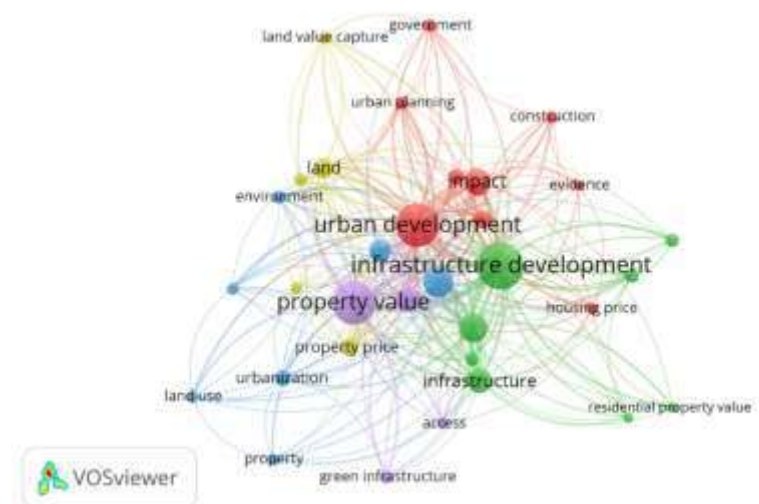


Fig. 2. Mapping results using infrastructure development network visualization

Fig. 2 illustrates the keyword network visualization generated by VOSviewer, which highlights the interconnectedness of various research themes. The visualization reveals three dominant clusters: (1)

infrastructure development and urban development as the core research anchors, (2) property value and its related terms, such as residential property value and housing price, and (3) spatial and planning-related themes, including land, land use, urbanization, and urban planning. The size of the nodes and

the density of connections confirm that these are the most frequently studied topics, forming the foundation of existing literature.

Beyond these central themes, the map also highlights less frequently studied but highly relevant keywords such as green infrastructure, access, and evidence. Although their nodes are smaller, their strong relevance indicates emerging areas of research that directly connect sustainability, inclusivity, and empirical validation to infrastructure and property studies. The relatively weaker linkages between these terms and the dominant clusters point to underexplored themes, suggesting significant opportunities for further investigation.

The connections between impact, government, and construction illustrate that the literature acknowledges policy, governance, and economic dimensions, but these remain loosely integrated with sustainability-focused terms. This disconnect highlights a research gap: while considerable

attention is given to physical and financial outcomes, the integration of governance with sustainability and technological innovation remains limited.

Thus, the visualization is significant not merely as a descriptive map but as an analytical tool to identify research gaps. It shows that while infrastructure and urban development are well-established themes, the intersections with sustainability (green infrastructure), residential affordability (housing price, residential property value), and governance remain fragmented. Addressing these underexplored linkages presents a pathway for future research to advance a more comprehensive understanding of how infrastructure development affects property values within the broader context of sustainable and inclusive urban growth.

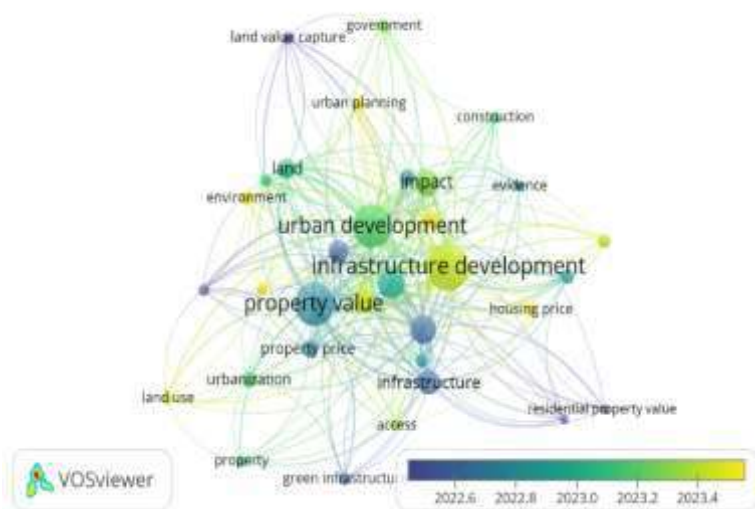


Fig. 3. Mapping results using infrastructure development overlay visualization

Fig. 3 presents the overlay visualization generated by VOSviewer, which illustrates how research focus on infrastructure development and related concepts has evolved. The color gradient offers temporal insight: brighter tones, such as yellow-green, indicate more recent topics that are still receiving active scholarly attention. In comparison, darker blue tones correspond to themes that have been established for a longer period. The visualization reveals that terms such as infrastructure development, property value, urban development, and housing price appear in brighter colors, signifying their emergence as current focal points in the literature. This reflects an increasing academic interest in linking infrastructure expansion directly with property markets and affordability issues in urban contexts. Conversely, themes such as land use, government, and urban planning are represented in darker shades, indicating that these areas have a longer historical presence in the discourse. While well-established, their weaker integration with newer, sustainability-oriented, and property-focused research

highlights a potential fragmentation in the field.

Importantly, the overlay map identifies several emerging but underexplored areas. The positioning and coloring of terms like green infrastructure, residential property value, and access suggest that they are becoming more prominent yet remain insufficiently studied compared to core topics. Their relevance signals a growing need to integrate sustainability, livability, and social equity into the mainstream analysis of infrastructure impacts. This visualization is therefore significant not only in depicting co-occurrence but also in exposing research gaps. It shows that while infrastructure, property value, and urban development are trending themes, their connections to governance, land policy, and environmental sustainability remain less developed. Bridging these gaps presents opportunities for future research to advance a more integrated framework, one that combines economic, spatial, and ecological dimensions in assessing the long-term impacts of infrastructure development on property markets.

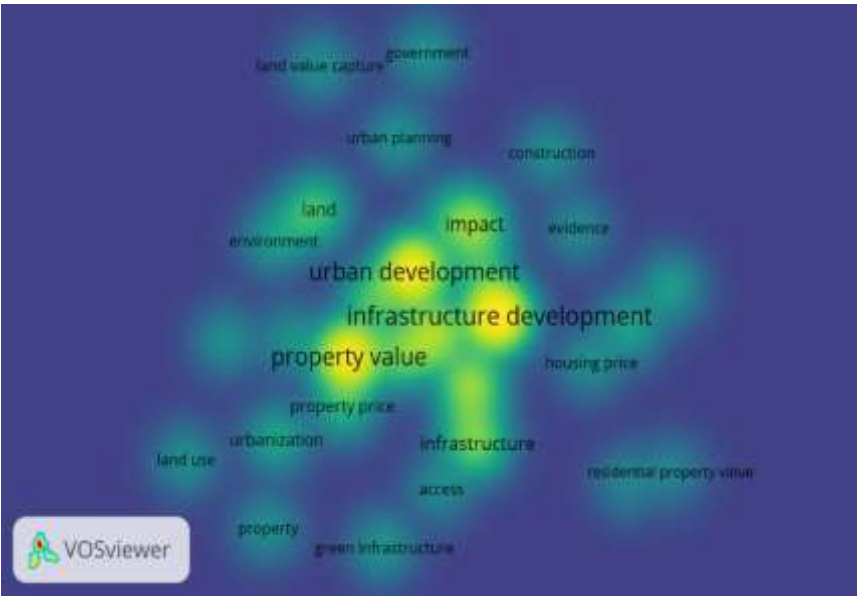


Fig. 4. Mapping results using infrastructure development density visualization

Fig. 4 presents the density visualization generated by VOSviewer, highlighting the concentration of research activity across different themes related to infrastructure development and property value. Brighter areas (yellow to greenish-yellow) indicate topics that have been more frequently discussed in recent years. In comparison, darker areas (blue to green) represent established themes that are less prominent in current debates. The visualization reveals that infrastructure development, property value, and urban development form the highest-density clusters, confirming their status as core research themes in the literature.

These topics represent the backbone of existing studies and continue to attract sustained scholarly attention. The presence of bright density around property prices further emphasizes the ongoing relevance of economic indicators in evaluating the impacts of infrastructure expansion. In contrast, peripheral themes such as residential property value, green infrastructure, and access appear in areas of lower density. Their marginal positioning suggests that, although relevant, these topics have not yet received proportional research focus. This suggests potential research gaps, particularly in sustainability-oriented dimensions and the social implications of accessibility in shaping property markets. Similarly, terms such as land value capture and government, positioned in darker zones, illustrate topics that were more prominent in earlier research but have since received reduced attention, creating opportunities for reintegration with newer sustainability and smart infrastructure agendas.

The significance of this density visualization lies in its ability to distinguish between mature research areas and emerging or underexplored themes. It reveals that while traditional themes continue to dominate, the integration of sustainability (including green infrastructure and energy-efficient technology), governance, and social equity into infrastructure property studies remains fragmented. Addressing these underrepresented areas offers a pathway for advancing more comprehensive frameworks that balance economic growth with environmental stewardship and inclusivity in urban development.

Table 4. Thematic clusters of research

Cluster	Authors	Keywords
Infrastructure Development	[5], [7], [4], [8], [9], [10], [5]	Infrastructure, Infrastructure Development, Urban Development, Property Value, Housing Price, Residential Property Value
Property Value & Market	[6], [2], [11], [12], [13], [14], [15], [16], [17], [18], [19], [20], [21]	Land Use, Urbanization, Urban Planning, Government, Impact, Construction, Green Infrastructure, Environment
Urban Planning & Land Use	[22], [23], [24]	
Social & Policy Impact	[25], [26], [3], [27], [28], [29], [30], [31], [32]	
Environmental Considerations	[33], [34]	

Table 4 presents the results of a literature analysis on infrastructure development and its impact on property prices in developing urban areas. The table is organized into clusters based on the main themes identified in the VOSviewer network visualization, which illustrates the relationships between keywords and related research areas. Each article is categorized according to the cluster that reflects its focus, such as infrastructure development, property value, urban planning, and the socio-economic impacts of development. The table includes the article titles, authors, and relevant keywords, providing an overview of how these themes are interconnected.

4. Conclusion

This systematic review demonstrates that infrastructure development has a significant influence on property values in

developing urban areas, with transportation accessibility, public amenities, and policy interventions consistently identified as critical drivers. Beyond these established findings, the bibliometric and thematic analyses reveal several underexplored but emerging dimensions. Specifically, while sustainability elements such as green infrastructure and smart technologies are increasingly referenced, their direct and measurable impact on property values remains insufficiently addressed in the current literature. The critical synthesis of the findings suggests two key implications. First, existing studies predominantly adopt a physical and economic perspective, often overlooking the integration of social equity and environmental sustainability in their evaluation of property markets. Second, the fragmented treatment of governance, urban planning, and technological innovation points to a need for more interdisciplinary approaches.

Future research should move beyond descriptive correlations and focus on longitudinal and comparative analyses to capture the long-term effects of sustainable and smart infrastructure on property values. Greater attention is also needed on cost-benefit dimensions, energy efficiency, and the affordability implications of rising property prices in rapidly urbanizing contexts. By addressing these gaps, scholars and policymakers can develop more comprehensive frameworks that align infrastructure investment with sustainable, equitable urban development.

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Author Declaration

Authors' contributions and responsibilities

The authors made substantial contributions to the conception and design of the study. The authors took responsibility for data analysis, interpretation, and discussion of results. The authors read and approved the final manuscript.

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The authors declare no competing interests.

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