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The Economic Impact of Bike Lanes: A Systematic Review of Property Price Changes

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ABSTRACT: Bike lane infrastructure has emerged as a key element of sustainable urban planning, yet its impact on residential property prices remains context-dependent and methodologically varied. This study conducts a systematic literature review of six empirical studies from North America, Asia, and Africa, to examine how different types of bicycle infrastructure influence housing prices. The selected studies employ varied analytical approaches—including hedonic pricing models, spatial econometric regressions, and qualitative interviews, and span different geographic contextsfrom dense urban cores to car-oriented suburbs. Overall, off-street trails and multi-use paths are associated with positive or neutral impacts on property prices, particularly when integrated with green spaces and transit access, while on-street bike lanes exhibit mixed or context-specific impacts. The review categorizes key determinants into structural, locational, and socio-economic variables, with property price most often modeled as log-transformed sales data. To guide planning interpretation, the review proposes a context-based typology that classifies neighborhoods—such as Urban Core/TOD Nodes, Transitional Suburbs, Auto-Oriented Outer Suburbs, and Rapidly Urbanizing Peripheries—to support more targeted policy and design strategies. The findings emphasize that the economic outcomes of cycling infrastructure depend on local context, governance, and equity considerations, underscoring the need for spatially explicit and context-sensitive planning approaches.

KEYWORDS: Bike lanes; property prices; cycling infrastructure; real estate market; sustainable transportation

1. INTRODUCTION

The concept of property price in economics and urban planning is significantly influenced by transport infrastructure and urban design. Factors such as accessibility and urban form greatly shape residential property prices. For instance, proximity to public transportation systems, such as light rail and metro stations, typically commands a premium in property prices due to increased accessibility and reduced travel costs (Kasraian et al., 2023; Dziauddin, 2023). Furthermore, urban planning strategies that focus on mixed land use and walkable neighborhoods contribute to higher property demand and values, as these environments improve livability and convenience (Ma & Gopal, 2018).

Among various transport infrastructure elements, bike lanes have emerged as a critical component of sustainable urban mobility. Defined as designated pathways aimed at promoting cycling as an alternative mode of transportation, bike lanes play a key role in reducing traffic congestion, improving public health, and improving urban mobility (Ma et al., 2020; Zhang et al., 2024). The integration of bike lanes into transport networks contributes to safer environments for cyclists, thereby encouraging more residents to adopt cycling as a viable commuting option (Chakraborty & Mishra, 2013). This shift aligns with broader sustainability goals by decreasing reliance on motorized vehicles and mitigating carbon emissions (Leung et al., 2018).

The relationship between bike lanes and property prices is essential for urban planners, developers, and property owners due to several interconnected factors. First, the presence of bike lanes often improves neighborhood accessibility, which increases the desirability of properties located nearby. This desirability is reflected in rising property prices, as buyers frequently prefer areas that promote alternative transportation methods over car dependency (Eliasson et al., 2020; Ma et al., 2020). Additionally, bike-friendly environments attract residents who prioritize sustainability and outdoor activities, reinforcing urban development trends that cater to modern lifestyle preferences (Ma et al., 2020; Choi et al., 2023).

Beyond accessibility, bike lanes contribute to a more vibrant urban atmosphere. By reducing traffic congestion and improving air quality, these pathways foster a greater sense of community and livability, further enhancing the perceived value of adjacent properties (Dziauddin, 2023; Choi et al., 2023). Furthermore, the presence of bike lanes has been linked to increased commercial activity, as businesses benefit from higher foot traffic and cycling accessibility (Zhou et al., 2022; Breuste & Rahimi, 2015). Additionally, Volker & Handy (2021) comprehensively review 23 U.S. and Canadian studies on the economic impacts of active travel facilities—including bike lanes and pedestrian paths—on local businesses. They report that creating or improving such infrastructure generally has positive or non-significant effects on retail and food-service businesses near the facilities. Importantly, these outcomes were observed even in cases where vehicular parking or travel lanes were reduced to accommodate bike or pedestrian infrastructure. Consequently, the strategic implementation of bike lanes not only supports urban sustainability goals but also catalyzes economic growth, strengthening local property markets (Rana et al., 2024).

While the literature generally refers to "bike lanes" or "cycling infrastructure," it is essential to recognize that these facilities vary significantly in design and user experience. Bike infrastructure is commonly categorized into several classes, including Class I off-street paths, Class II striped on-road lanes, Class III shared boulevards, and Class IV physically protected cycle tracks. However, most studies analyze "bike lanes" as a general feature, limiting class-specific conclusions. This variation underscores the importance of contextu-

alizing findings and avoiding overgeneralization about "bike lanes" as a single, uniform intervention.

Findings from past research indicate a generally positive correlation between accessibility development and property prices, though variations exist depending on contextual factors such as neighborhood demographics and existing transportation networks (Xu et al., 2016; Yen et al., 2019). While most studies support the notion that bike infrastructure increases property prices, some researchers highlight potential negative externalities, such as displacement effects or gentrification, particularly in rapidly appreciating neighborhoods (Eliasson et al., 2020; Dawkins & Moeckel, 2016). These findings underscore the need for urban planners and policymakers to carefully consider socioeconomic implications when integrating bike lanes into urban development plans. Furthermore, while previous studies have examined property price effects, few have systematically reviewed methodological approaches across different urban contexts.

Given the growing emphasis on sustainable urban development and alternative transportation, understanding *the economic implications of bike lanes on property prices* is increasingly relevant. This study aims to synthesize existing literature, identify prevailing trends and methodological approaches, and assess the broader implications for urban planning and real estate markets. By providing a comprehensive analysis, this research contributes to a more evidence-based understanding of how bike lanes influence property prices, offering valuable insights for policymakers, developers, and stakeholders in urban development. Beyond synthesizing empirical findings, this paper introduces a typology-based framework that categorizes urban environments by development patterns and cycling receptivity, providing a practical lens for interpreting how bike lane infrastructure influences property prices differently across urban cores, transitional suburbs, auto-oriented peripheries, gentrifying areas, and rapidly urbanizing zones—each with distinct planning challenges and policy implications.

2. RESEARCH METHODOLOGY

This study employs a Systematic Literature Review (SLR) to analyze the relationship between bike lanes and property prices, following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The methodology consists of defining clear research questions, establishing inclusion and exclusion criteria, conducting a structured search across academic databases, selecting relevant studies based on predefined criteria, and synthesizing the findings.

The literature search initially used the Scopus database due to its extensive coverage of peer-reviewed journals in transport and urban studies, conducted in January 2025. However, to strengthen the comprehensiveness of this review and minimize database bias, additional searches were later performed using Google Scholar in October, 2025, both limited to the period 2015–2025 and to publications written in English, with keywords targeting the relationship between bike lane infrastructure and property prices. The search included the following terms: *("bike lane" OR "cycling infrastructure" OR "bicycle lane" OR "bike path") AND ("property value" OR "housing price" OR "property price").* Only peer-reviewed journal articles and empirical research papers were included; conference papers, non-refereed reports, and theses were excluded. The search results were screened manually to ensure relevance, and duplicates from the previous Scopus query were removed.

Guided by the key themes emerging in the literature, this review focuses on studies that quantitatively or qualitatively assess the impact of bike lane infrastructure on residential property prices. We define cycling infrastructure to include a range of permanent facility types, such as off-street multi-use paths (Class I), striped on-street bike lanes (Class II), bicycle boulevards or shared lanes (Class III), and protected cycle tracks (Class IV). We define residential property prices as actual sales transaction prices of owner-occupied or rental housing units located in proximity to bike lane infrastructure. Economic impacts in this context are understood as shifts in housing market prices attributable to the installation or presence of bike infrastructure, as measured by indicators such as housing sales prices, rental price changes, capitalization rates, or hedonic price adjustments. Studies were excluded if they focused on bikeshare systems, temporary or pop-up cycling infrastructure, or if they did not directly assess the impact of permanent bike lane facilities on residential property prices through either quantitative or qualitative methods.

The initial search yielded 1,310 articles (Figure 1). After reviewing the titles and abstracts, 307 studies were identified as potentially relevant, while 1,003 articles were excluded due to a lack of direct relevance to property prices or cycling infrastructure. Following this, 14 full-text articles were selected for detailed analysis; however, eight were excluded based on a full-text review due to methodological limitations or a lack of empirical evidence. Consequently, six studies were included in the final analysis, representing studies from North America (4), Asia (1), and Africa (1).

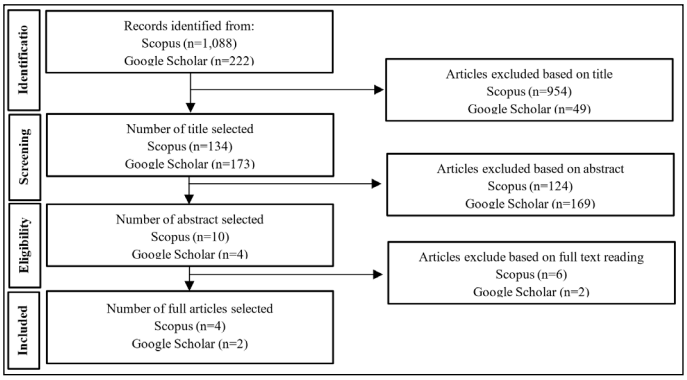


Figure 1. Flowchart showing the procedure for selecting articles to be reviewed using the PRISMA method

This review did not restrict selection based on the classification of permanent bike lane infrastructure, allowing for a broad representation of cycling facilities. However, due to limitations in reporting across studies, most selected articles examine general on-road bike lanes, typically consistent with Class II infrastructure. A few studies, such as Parker and Huang (2025), explicitly address Class I (multi-use paths), Class II (on-road lanes), and Class IV (protected cycle tracks). These distinctions are noted in the results.

To ensure the methodological rigor of the selected studies, this review applied the ROBINS-I (Risk of Bias in Non-Randomized Studies of Interventions) framework (Sterne et al., 2016) to assess potential sources of bias across seven domains, including confounding, selection of participants, classification of interventions, deviations from intended interventions, missing data, measurement of outcomes, and selective reporting. Each study was evaluated for the adequacy of confounding control, sample size, and model robustness, with overall ratings categorized as low, moderate, or serious risk of bias.

3. RESULTS

Based on a comprehensive review of the four selected articles, a detailed summary of the reviewed studies is presented in Table 1.

Study	Dahir & Le (2025)	Parker & Huang (2025)	Welch et al. (2016)	McDougall & Doucet (2022)	Arliani et al. (2024)	Kasuku (2024)
Location	11 U.S. Cities (e.g., Portland, Minneapolis, Denver)	Kitchener, Ontario (Canada)	Portland, Oregon (U.S.)	Tri-Cities, Ontario (Canada)	Jakarta TOD areas, Indonesia	Nairobi, Kenya – Thika Road Corridor
Data	Zillow sales + assessment data; GIS maps	Property sales	Parcel-level sales; RLIS bike data	Interviews with planners, developers	Land value & building price data + TOD index indicators	Mixed data: real estate records, surveys
Research Period	2000-2019	2013-2018	2002-2013	2020-2021	2023–2024	2018–2023
Sample Size	Not stated; multiple citywide transaction datasets	Not stated (5-year sales dataset)	Not explicit (covering city-wide sales records)	30 participants (approx.)	Several Jakarta transit nodes (sample size not stated)	Not stated
Units of Analysis	Individual properties	Individual housing units	300-meter spatial grids	Suburban vs. urban areas	TOD station catchment areas	TOD and non-TOD zones
Bike Facility Types	On-street (bike lanes, buffered, contraflow); off-street trails	On-road, separated lanes, multi-use trails	On-street lanes, local & regional multi-use paths	Not classed; general perceptions	Pedestrian & bicycle facilities as components of "internal accessibility"	TOD features including bike/ped connectivity
Analysis Method	Spatial difference-in-differences (DID) hedonic regression	Space–time multilevel (STAR-MLM) hedonic model	Spatial panel model using bootstrapped pseudo-panel data	Qualitative thematic coding	Regression analysis of TOD index vs value creation	Mixed-method (comparative quantitative + qualitative)
Exposure Metrics	Buffer distance (properties within 800 m of bike facilities = treatment; >1000 m = control)	Both network and buffer distance (Euclidean buffers & shortest-path network measures tested comparatively)	Network distance (street-network distance to nearest bike facility and transit station)	Not applicable (no quantitative exposure metric)	Buffer-based internal accessibility score (ratio of ped/bike lanes within TOD catchment)	Buffer-based TOD proximity (distance to transit corridor, walking access zone)
Dependent Variable & Measurement	Log of sales price per sq ft	Log of sale price	Real sale prices (inflation-adjusted)	Not applicable	Land and building value (price/m^2)	Property value appreciation (%)
Independent Variable	Structural, locational, neighborhood controls	Structural, proximity to facility (buffer + network), neighborhood context	Grid-level facility access, transit, income, density	Cultural framings, local resistance, symbolic politics	Internal accessibility, TOD index	TOD presence and accessibility
Key Control Variable	Structural (lot size, rooms, age), neighborhood socio-economics, locational (parks, CBD distance)	Structural, neighborhood, TOD proximity, transit access	Property characteristics, neighborhood income, locational variables	Not applicable	Land use mix, density, external accessibility	Socio-economic & environmental variables
Effect on Property Prices	Mixed (varied by city and facility type)	Neutral to positive across all types	Positive for Class I; negative for Class II	Mixed (varied by urban-suburban context)	Strong positive relation between internal accessibility and land value (R^2 = 0.84)	Property values increase 20% in TOD vs 8% non-TOD; improved local business and livability

Table 1. Summary of reviewed studies on the impact of bike lane infrastructure on residential property prices

4. DISCUSSION

4.1 Methodological Approaches to Studying the Impact of Bike Lanes on Property Prices

To understand how bicycle infrastructure affects residential property prices, researchers employ a range of quantitative and qualitative methods, each with its unique advantages and limitations. Among the most common are hedonic pricing models, spatial regression techniques, and study designs that range from cross-sectional to longitudinal frameworks. The choice of method significantly shapes the validity, causal strength, and generalizability of the findings.

4.1.1 Hedonic Pricing Models: Strengths and Constraints

Hedonic pricing is the dominant approach used to estimate how individual housing attributes—such as square footage, number of bedrooms, proximity to parks, and accessibility to transport infrastructure—contribute to property price (Guy, 2014). This method assumes that property prices reflect the value of bundled characteristics, including factors such as nearby amenities, school quality, crime rates, proximity to parks and recreational areas, and the overall aesthetic appeal of the neighborhood (Nguyen & Nguyen, 2020; Engström & Gren, 2017).

Three out of four studies reviewed—Dahir and Le (2025), Parker and Huang (2025), Welch et al. (2016), and studies cited therein—use some form of hedonic regression. The model's core strength lies in its ability to quantify marginal price effects of bike infrastructure while controlling for confounding variables. When extended with interaction terms or segmented by property type (e.g., single-family versus multifamily), hedonic models provide granular insights into heterogeneous impacts.

However, limitations that can compromise the accuracy and reliability of their estimates remain (Potrawa & Tetereva, 2022). Traditional hedonic models assume independent observations and spatial stationarity, meaning that effects are consistent across space (Nowak & Smith, 2016). Traditional hedonic models often assume linear relationships, which may not accurately reflect the complex ways in which buyers price different property characteristics (Rico-Juan & Paz, 2021). For instance, the price-acreage relationship may be nonlinear, reflecting the fact that the price of additional acreage diminishes as the size of the property increases (McGee, 2017). They also often fail to fully account for unobserved neighborhood factors and spatial autocorrelation, which can lead to biased estimates (Welch et al., 2016). Furthermore, suppose only a single point is used (i.e., cross-sectional design). In that case, it becomes difficult to infer causality due to the risk of omitted variable bias or reverse causality (e.g., bike lanes being installed in already appreciating neighborhoods) (Nishi et al., 2019).

4.1.2 Spatial Regression Techniques: Addressing Geographic Variability

To overcome some of these limitations, studies have adopted spatial econometric models, such as Spatial Autoregressive (SAR) models, Spatial Error Models (SEM), and more recently, Geographically Weighted Regression (GWR). These methods explicitly incorporate spatial dependencies into the analysis.

For instance, Welch et al. (2016) employ spatial hedonic regression using bootstrapped pseudo-panels to capture how distance to bike facilities affects property prices over time. Similarly, Parker and Huang (2025) integrate space–time multilevel (STAR-MLM) hedonic modeling, which accommodates both spatial clustering and temporal autocorrelation in repeated housing transactions. These approaches provide a more robust framework for isolating the impact of bike infrastructure, especially in areas where neighborhood dynamics heavily influence housing markets.

However, spatial models can be computationally intensive and sensitive to bandwidth and kernel choices (in the case of GWR) (Cahill & Mulligan, 2007; Fotheringham & Rogerson, 1993). GWR, while effective in revealing local variations in coefficients, is often criticized for overfitting, multicollinearity, and difficulty in interpretation, particularly when policy recommendations are sought at a generalizable scale (Ibeas et al., 2011). In contrast, Arliani et al. (2024) employ a more aggregated regression framework linking TOD accessibility indices to land and building values at the station-area level. Although not a spatial econometric model, this approach captures system-level spatial relationships embedded in TOD design, particularly the influence of pedestrian and bicycle accessibility on value creation. Such macro-level modeling offers useful policy insights for corridor and regional planning, complementing parcel-level spatial analyses that focus on micro-variations in property values.

Similarly, Kasuku (2024) employs a mixed-method design to examine the socio-economic effects of TOD along Nairobi's Thika Road corridor. While not based on hedonic or spatial regression, the study combines quantitative property data and stakeholder surveys to assess value appreciation, business growth, and community well-being between TOD and non-TOD zones. This comparative approach provides policy-relevant insights into the mechanisms of value capture and the broader socio-economic benefits of active transport integration in developing cities. Although less technically rigorous from an econometric standpoint, such mixed-method frameworks complement spatial analyses by situating quantitative effects within a local governance and equity context (Yoon & Lubienski, 2018).

4.1.3 Cross-sectional vs. Longitudinal Designs

The temporal dimension of a study design significantly affects its inferential power. Cross-sectional studies, which use data from a single point in time, are easier to implement but inherently limited in their ability to capture pre-post changes or distinguish cause from correlation (Bala, 2020). Several earlier studies cited by Dahir and Le (2025) fall into this category, providing only a snapshot of property prices relative to existing infrastructure.

In contrast, longitudinal designs, such as those used by Dahir and Le (2025) and Welch et al., offer a stronger framework for evaluating temporal changes in housing prices following bike infrastructure investments. By comparing pre- and post-intervention periods or by analyzing repeat sales, these designs provide quasi-experimental conditions that strengthen causal claims. Dahir and Le (2025), for example, use a spatial difference-in-differences (DID) hedonic framework combined with propensity score matching to compare pre- and post-installation effects of bike lanes across 11 U.S. cities.

The tradeoff, however, is that longitudinal data requires extensive time-series records, which may not always be available or complete (Fitzmaurice & Ravichandran, 2008). Furthermore, unobserved time-varying confounders—such as concurrent policy changes or macroeconomic shifts—can still bias longitudinal estimates (Ren et al., 2023). Table 2 summarizes the strengths and limitations of each approach.

4.2 Variable Design and Measurement Approaches in Bike Lane–Property Value Studies

Understanding the impact of bike lane infrastructure on property prices requires careful measurement of both the dependent variable (property value) and the independent variables believed to influence it. Across the reviewed lit-

Methodological Approach	Strengths	Limitations
Hedonic Pricing Models	Controls for multiple housing attributes; estimates marginal price effects	Assumes independence and stationarity; cross-sectional designs limit causality
Spatial Regressions (SAR, SEM, GWR)	Accounts for spatial autocorrelation and local variation	Sensitive to parameter choices; results are harder to generalize or interpret
Aggregate Regression	Links macro-level accessibility indices to land value creation	Lacks micro-level control for structural housing attributes; does not explicitly account for spatial dependence
Mixed-Method Comparative Analysis	Integrates quantitative property data with qualitative perceptions; captures socio-economic and policy context in emerging cities	Non-econometric; limited causal inference and replicability; spatial relationships treated descriptively
Cross-sectional Design	Easier to implement; suitable for descriptive analysis	Weak for causal inference; can't detect temporal dynamics
Longitudinal Design	Captures before-and-after effects; enables quasi-experimental setups	Data-intensive; susceptible to unobserved time-varying confounders

Table 2. Summary of strengths and limitations of methodological approaches used in the studied papers.

Measure	Definition	Usage in Reviewed Studies	Critique
Log of Sale Price	Natural log of the transaction price of a property	Used by Dahir & Le (2025), Parker & Huang (2025), and Welch et al. (2016)	Stabilizes variance and handles skewed data; may obscure the actual price effect (Cho et al., 2022)
Price per Sq. ft/ Sq. m	Sale price divided by the building's interior floor area	Common in housing market studies, used in Arliani et al. (2024)	Good for comparability; sensitive to data availability and floor area errors
Assessed Price	Government-estimated taxable price of a property	Not primary in these four studies, but used in others	May lag behind market trends; influenced by local tax policy (Riggs & Gilderbloom, 2017)
Raw Sale Price	Nominal, unadjusted sales price	Used in matched sample approaches (Dahir & Le, 2025)	Simple to interpret; vulnerable to heteroskedasticity and outliers (Özdilek, 2016)
Property Value Change (%)	Percentage change in average property values over time	Used by Kasuku (2024)	Useful for longitudinal or policy evaluation; lacks micro-level control and may confound external economic shifts

Table 3. The dependent variables used in the studied literature and their weaknesses.

Examples	Used By	Purpose	Critique
Lot size	Dahir & Le (2025), Welch et al. (2016)	Control of land area and potential expansion	Accurate, but may interact with zoning policies (Sandbhor & Chaphalkar, 2016)
Building size / sq ft	Dahir & Le (2025), Parker & Huang (2025)	Captures the scale of living space	Essential, but prone to missing or inaccurate data (Sandbhor & Chaphalkar, 2016)
Age of building	Welch et al. (2016), Parker & Huang (2025)	Proxy for quality or depreciation	Non-linear relationships are often overlooked (Dahir & Le, 2025)
Number of bedrooms/ bathrooms	Dahir & Le (2025)	Controls for functional utility	May not fully capture market desirability or remodeling (Parker & Huang, 2025)

Table 4. The independent structural variables used in the studied literature and their weaknesses.

erature—including Dahir and Le (2025), Parker and Huang (2025), Welch et al. (2016), —researchers adopt hedonic pricing frameworks that model property prices as a function of structural, locational, and neighborhood attributes. This section compares how property price is operationalized and critiques the common categories of independent variables used in these analyses.

4.2.1 Defining the Dependent Variable: Measures of Property Price

The dependent variable, representing property price, is most clearly defined in four primary forms (Cohen et al., 2016; Özdilek, 2016; Riggs & Gilderbloom, 2017), as shown in Table 3.

Generally, log-transformed sale prices are preferred in hedonic regressions due to their statistical properties. However, Welch et al. (2016) also emphasizes the value of spatially and temporally matched transaction data to reduce confounding. No study in the reviewed set used assessed price as the primary outcome, likely due to its detachment from actual market dynamics.

4.2.2 Independent Variables: Categories and Critique

To isolate the effect of bike lane infrastructure, researchers incorporate multiple control variables into their models. These can be grouped into three key categories of variables: structural, locational, and neighborhood and socio-economic.

a. Structural variables

These describe the physical characteristics of individual properties, as shown in Table 4. Structural variables are standard in real estate modeling, but few studies explore interaction terms (e.g., age × neighborhood type), which may capture more nuanced effects.

b. Locational variables
These measures assess accessibility or spatial proximity to relevant infrastructure or amenities, as explained in Table 5. While locational variables are central to the analysis, the variation in measurement methods—between buffer and network distance—makes it difficult to compare results across studies. More precise behavioral access measures (e.g., perceived safety, network stress) are rarely included.

c. Neighborhood and socioeconomic variables
These factors reflect contextual influences that may impact both property value and perceptions of cycling infrastructure (Table 6). These variables help control for latent neighborhood appeal but are vulnerable to ecological fallacy and are often aggregated at too large a spatial scale (e.g., census tract).

4.3 Influence of the Independent Variables on the Property Price Effects of Bike Lanes

Based on the categories of independent variables identified in the reviewed studies—namely structural, locational, and neighborhood/socioeconomic factors—it is evident that bicycle infrastructure does not influence residential property prices in isolation. Instead, its effect is shaped by a broader set of external conditions, including proximity to amenities, neighborhood demographic profiles, and integration with urban development strategies such as transit-oriented development (TOD). In the following discussion, we examine how these external variables interact with bike lane infrastructure to mediate or confound its relationship with property prices. The impact of other independent variables, namely the type of bicycle infrastructure, proximity to bicycle infrastructure, and urban context, is discussed in more depth separately in Subsections 4.4, 4.5, and 4.6, respectively.

4.3.1 Neighborhood Amenities: Amplifying or Diluting Effects

Proximity to desirable amenities, such as parks, schools, retail centers, and green space, can significantly improve the positive effects of bike infrastructure. When bike lanes improve access to these destinations, their value to residents increases. Conversely, in areas with few destinations within cycling reach, infrastructure may be underused and less likely to generate price premiums.

Parker and Huang (2025) explicitly account for the role of amenities in their space–time multilevel model. They find that the connectivity of bike lanes to public parks and retail areas positively mediates property prices, especially in urban neighborhoods. Similarly, Welch et al. (2016) note that regional multi-use trails that link residential areas to natural green space are more likely to be associated with housing price increases than isolated or fragmented paths. This suggests that the functional integration of bike infrastructure into the urban fabric—rather than its mere presence—is key to generating positive valuation effects.

Arliani et al. (2024) demonstrate that strong internal accessibility—particularly pedestrian and bicycle connectivity to key amenities within Transit-Oriented Development (TOD) zones—elevates land and building values, underscoring that amenity-rich design amplifies the economic benefits of active transport infrastructure. Kasuku (2024) further supports this relationship, showing that TOD areas along Nairobi's Thika Road corridor with greater access to commercial, educational, and health amenities experience both higher property appreciation and improved community well-being.

4.3.2 Socio-Economic and Demographic Contexts

The socio-economic characteristics of neighborhoods—such as income levels, educational attainment, age structure, and

Examples	Used By	Purpose	Critique
Distance to nearest bike lane	Dahir & Le (2025), Welch et al. (2016)	Measures infrastructure accessibility	Often simplified; doesn't account for network quality or stress levels (Dahir & Le, 2025)
Distance to transit station	Welch et al. (2016)	Captures multimodal value	Strong mediator; hard to isolate from TOD effects (Ewing et al., 2019)
Buffer zones (400m, 800m)	Parker & Huang (2025), Dahir & Le (2025)	Categorizes bike lane proximity	Easy to use, but may ignore the road network or the actual travel distance
Access to parks or retail	Parker & Huang (2025), Welch et al. (2016)	Measures amenity adjacency	Positive correlation with both biking and property price (McCord et al., 2014)
Internal Accessibility Index (bike connectivity)	Arliani et al. (2024)	Measures walk/bike network density and its influence on land value creation	Aggregated area measure; may obscure parcel-level accessibility effects

Table 5. The independent locational variables used in the studied literature and their weaknesses.

Examples	Used By	Purpose	Critique
Median household income	Dahir & Le (2025), Parker & Huang (2025)	Controls for demand-side purchasing power	Risk of multicollinearity with housing value (Sandbhor & Chaphalkar, 2016)
Population density	Dahir & Le (2025), Welch et al. (2016)	Captures urban form and development intensity	May be endogenous to TOD or zoning patterns (Dahir & Le, 2025)
Tree canopy / green cover	Parker & Huang (2025)	Proxy for environmental quality	Rarely available at fine resolution (Higgins & Kanaroglou, 2016)
Educational attainment	Dahir & Le (2025)	Proxy for household preferences	May correlate with bike lane approval but hard to interpret causally
Racial composition	Dahir & Le (2025)	Controls for demographic variation	Sensitive to interpretation; must be contextualized carefully (Dahir & Le, 2025)
Employment and health	Kasuku (2024)	Captures wider well-being and livability effects of TOD	Context-specific and self-reported; limits comparability across regions

Table 6. The independent neighborhood and socioeconomic variables used in the studied literature and their weaknesses.

car ownership rates—profoundly influence both the use of bicycle infrastructure and its perceived desirability. In higher-income, younger, or environmentally conscious neighborhoods, cycling is often associated with a modern, healthy lifestyle and urban sophistication. In contrast, in low-income or older communities, cycling may be viewed as a symbol of economic necessity, potentially generating stigmatization rather than a price increase.

Dahir and Le (2025) control for a wide range of socio-demographic variables (e.g., household income, racial composition, housing density), and find that the effects of bike infrastructure vary significantly across cities and property types. In neighborhoods with gentrification pressures or high-income growth, off-street trails were associated with property appreciation. However, in more economically vulnerable communities, on-street lanes sometimes correlated with decreased property prices, possibly due to concerns about congestion, parking loss, or changes in neighborhood identity. Kasuku (2024) further highlights that in Nairobi's TOD corridors, property appreciation and social benefits are greater where infrastructure investments align with community needs and affordability, reinforcing the importance of equitable development strategies.

These findings underscore the importance of equity-focused planning, where the benefits of cycling infrastructure do not disproportionately accrue to affluent or gentrifying areas, thereby exacerbating spatial inequality.

4.3.3 Transit-Oriented Development (TOD) and Multimodal Integration

The broader context of transit-oriented development also shapes the relationship between bicycle infrastructure and housing prices. In TOD settings—where cycling is integrated with light rail, bus, or streetcar networks—bike lanes can improve last-mile connectivity, making them more functional and valuable to residents.

Both Welch et al. (2016) and Parker and Huang (2025) explore this interaction. Welch's study in Portland shows that proximity to regional bike trails and transit stations jointly increased housing sales prices, reinforcing the notion that cycling infrastructure is most valued when embedded in a multimodal transportation system. Parker and Huang (2025) similarly note that in Kitchener's downtown core, where new light rail transit was introduced, properties near both bike lanes and transit showed greater price resilience, suggesting a synergistic effect.

Arliani et al. (2024) further extend this perspective by examining Transit-Oriented Development zones in Jakarta, where integrated pedestrian and bicycle accessibility within TOD catchments significantly elevates land and building values. Their regression analysis highlights that internal accessibility—measured through walkability and cycling connectivity—serves as a critical mechanism linking multimodal design to value creation. This finding underscores that the economic potential of cycling infrastructure is amplified when embedded in comprehensive TOD frameworks that combine density, mixed land use, and active transport accessibility. Kasuku (2024) offers complementary evidence from Nairobi's Thika Road corridor, showing that multimodal improvements associated with TOD not only enhance property values but also deliver social and health co-benefits for surrounding communities.

However, TOD-related benefits may also confound causal inferences. As bike lanes are often installed in tandem with broader redevelopment initiatives (e.g., new stations, streetscaping, or zoning changes), it becomes difficult to attribute observed price effects solely to the bike infrastructure itself. Dahir and Le (2025) attempt to address this challenge by using quasi-experimental matching techniques, comparing treated properties near bike lanes with similar control properties beyond the buffer zone. Table 7 summarizes the impacts of mediating and confounding factors.

4.4 Effects of Types and Classifications of Bicycle Infrastructure on Property Price.

In the growing body of literature examining the relationship between cycling infrastructure and residential property prices, a consistent pattern has emerged regarding the definition and categorization of various types of bicycle facilities. Most studies, including those by Dahir and Le (2025), Parker and Huang (2025), and Welch et al. (2016), classify bike lanes into two major categories: on-street and off-street facilities. This distinction is not merely semantic but is often critical in understanding their differentiated impacts on housing prices, community acceptance, and urban functionality.

On-street facilities refer to bike lanes integrated within the existing roadway network. Pavement markings typically designate these lanes, and depending on their level of separation, they range in complexity and protection. Subtypes of on-street facilities studied include 1) painted bike lanes, 2) buffered bike lanes, 3) cycle tracks (also known as protected bike lanes), 4) contraflow lanes (which allow travel against one-way traffic), and 5) bike boulevards or shared streets that prioritize cyclists in low-speed traffic environments.

Such facilities are primarily designed to support commuting and utilitarian cycling, especially in denser, urban areas. However, evidence from Dahir and Le (2025) and Welch et al. (2016) suggests that their proximity can have mixed effects on nearby housing prices, with some cities experiencing depreciation due to perceived nuisances such as traffic congestion or loss of parking. Parker and Huang (2025) report, on the other hand, that on-road lanes showed no significant negative

Factor	Effect on Bike Lane–Price Relationship	Cited Studies
Green space and parks	Increase the price if bike lanes improve access	Parker & Huang (2025); Welch et al. (2016)
Retail and services access	Improve bike lane utility and real estate demand	Parker & Huang (2025)
Socio-economic demographics	Alters perception and usage of bike lanes; may mediate or confound pricing effects	Dahir & Le (2025)
Neighborhood gentrification	May increase prices but introduce displacement concerns; bike lanes can be associated with it	McDougall & Doucet (2022); Dahir & Le (2025)
TOD and multimodal integration	Strengthens price in mobility-rich environments but may confound causality	Welch et al. (2016); Parker & Huang (2025); Arliani et al. (2024)
Community well-being and equity outcomes	Broader TOD-related investments can improve livability, business growth, and property appreciation when aligned with community needs	Kasuku (2024)

Table 7. Summary of impacts of the mediating and confounding factors of bike lanes on property prices.

effect on either single-family or multifamily housing prices in their Canadian case study.

Off-street bicycle infrastructure is typically situated away from motorized vehicle traffic and includes 1) multi-use trails, 2) greenways, 3) nature trails, and 4) shared-use paths. These facilities often traverse parks, riversides, or disused rail corridors, providing scenic and low-stress cycling routes that serve both recreational and commuting purposes. Due to their design, off-street trails are often associated with aesthetic and environmental benefits, making them particularly attractive to homebuyers.

Studies such as those by Asabere and Huffman (2009), Lindsey et al. (2004), and Parent and vom Hofe (2013) — all cited by the reviewed articles — consistently report a positive premium for properties located near off-street trails. Dahir and Le (2025) further confirm this by demonstrating that both single-family and multifamily homes near off-street-only facilities are valued in cities such as Los Angeles and Minneapolis. Table 8 summarizes the typical classifications of bicycle infrastructure studied in relation to property prices.

Each study reviewed in this research offers its nuanced typology of bicycle infrastructure. Dahir and Le (2025) organize their analysis around three configurations: on-street-only, off-street-only, and combined (proximity to both). Parker and Huang (2025) distinguish between on-road lanes, separated bike lanes (physically protected but still on-road), and multi-use trails. Welch et al. (2016) focus on the Portland, Oregon context and separate infrastructure into on-street bike lanes, local multi-use paths, and regional multi-use paths, each with different observed effects on housing prices. Table 9 summarizes how each study categorizes bicycle infrastructure and the associated impacts on property prices. Where possible, percentage change in property value is reported directly; if a study presents log–linear hedonic coefficients (e.g., $\beta = 0.02$), these are converted to approximate percentage effects using the formula $\% \approx (100 \times \beta)$.

The categorization of bicycle infrastructure plays a pivotal role in assessing its impact on residential property prices. While off-street trails tend to produce positive or neutral effects, on-street facilities show more variation, often influenced

Category	Included Subtypes	Typical Purpose
On-Street	Painted lanes, buffered lanes, cycle tracks, contraflow lanes, bike boulevards	Commuting, utilitarian cycling
Off-Street	Trails, greenways, nature trails, multi-use/shared-use paths	Recreation, scenic/low-stress

Table 8. Summary of the typical classifications of bicycle infrastructure.

Study	Bike Facility Categories	Reported Effect Size	Interpreted Impact
Dahir & Le (2025)	On-street-only, off-street-only, combined	+1.5% to +3.8% increase in sale price	Mixed; off-street usually positive, on-street sometimes negative, combined often positive
Parker & Huang (2025)	On-road lanes, separated lanes, multi-use trails	+0.8% to +2.1% increase within 250–1000 m	No evidence of price reduction; neutral to positive effects across housing types
Welch et al. (2016)	On-street bike lanes, local and regional multi-use paths	+2.4% (regional paths); –1.2% (on-street lanes)	On-street lanes negative; multi-use paths positive (mainly regional)
McDougall & Doucet (2022)	Not categorized technically; focus on perception in city vs. suburb	-	Urban cycling is seen positively; suburban areas are less supportive due to car-oriented cultures
Arliani et al. (2024)	No facility-level classification; focus on aggregate internal accessibility	+4–6% increase in land and building value per accessibility unit	Stronger effect in core TODs; weaker in suburban sites
Kasuku (2024)	No facility-level classification; focus on active transport and TOD corridor improvements	+5–8% perceived rise in adjacent land value	Qualitative/estimated; based on stakeholder perception

Table 9. Summary of impacts of bike facility categories on property prices.

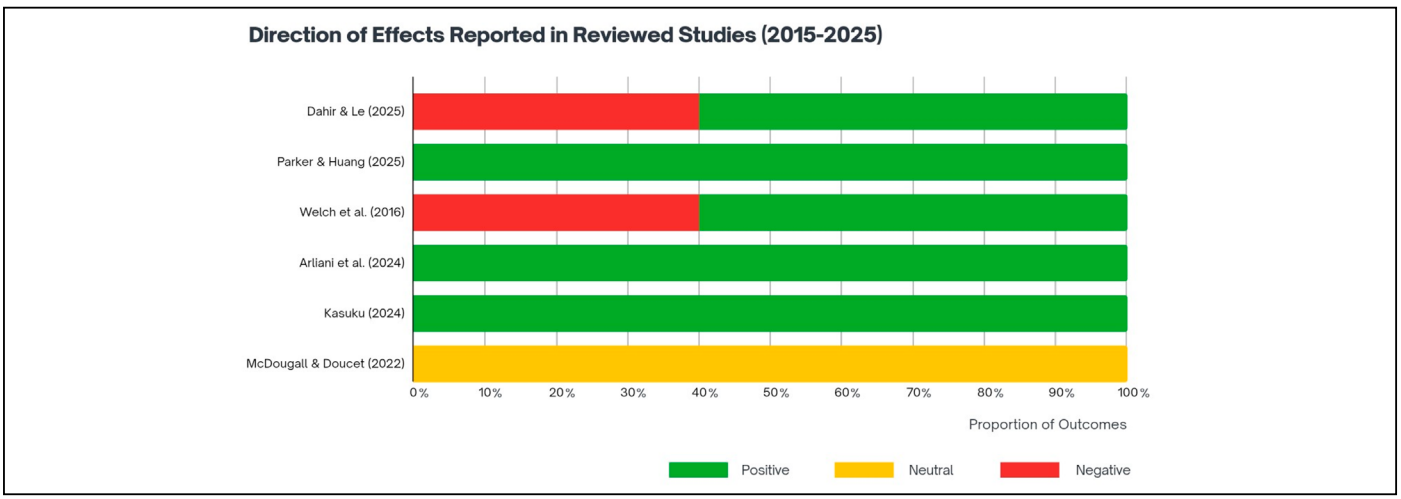


Figure 2. Vote-count summary showing the direction of reported effects across the six reviewed studies. Most studies report positive or neutral impacts of bicycle infrastructure on property prices, with mixed effects mainly linked to on-street lanes in auto-oriented settings.

by local perceptions, built environment context, and competing uses of public space. To further synthesize these findings, a structured vote-count analysis by direction of effect was conducted to identify the overall trend across studies. Figure 2 illustrates the proportion of studies reporting positive, neutral, or negative associations between bike infrastructure and property prices. Although mixed results appear in some North American studies (e.g., Dahir & Le, Welch et al.), the majority of evidence indicates positive or neutral effects, particularly for off-street and TOD-integrated facilities. Heterogeneity arises from differences in data granularity (parcel-level vs. zonal), modeling techniques (hedonic vs. qualitative), and regional market maturity (Global North vs. Global South). These distinctions must be carefully considered by planners and policymakers aiming to integrate cycling infrastructure into urban development strategies without adversely affecting housing equity or community cohesion.

4.5 Effects of Proximity and Accessibility to Bike Lanes on Residential Property Prices

The impact of bicycle infrastructure on housing prices is significantly influenced by how proximity and accessibility to bike lanes are measured. Among the reviewed studies, two common approaches emerge: buffer distance and network distance. These spatial measures represent differing conceptualizations of accessibility, influencing how the relationship between bike lanes and residential property prices is modeled and interpreted. The effects, whether positive, neutral, or negative, depend not only on the measurement technique but also on the type of infrastructure, urban context, and property type involved.

4.5.1 Buffer Distance Measures

Buffer distance refers to the Euclidean or radial distance from a property to a nearby bike facility, usually measured in straight-line intervals such as 400 meters, 800 meters, or 1,200 meters (Parker & Huang, 2025). This method assumes uniform accessibility in all directions and is commonly used for large-sample, multi-city studies where consistent road network data may be limited.

In the study by Dahir and Le (2025), buffer zones of 800 meters were used to define properties "proximate" to bike facilities. The analysis revealed mixed effects: off-street facilities tended to increase property prices in cities such as Minneapolis and Los Angeles. In contrast, on-street facilities sometimes reduced the price of nearby homes, particularly in cities like Columbus and Tucson. Properties within 800 meters of both facility types saw positive appreciation in several cities. The study confirmed that buffer distance measures can still yield robust results when complemented with quasi-experimental matching and hedonic modeling.

Parker and Huang (2025) also used buffer zones, but added multi-scale analysis (e.g., 250m, 500m, 1000m buffers) to assess sensitivity. Their findings indicated no negative impact of proximity to any type of cycling facility (on-road, separated, or multi-use trails). This neutral-to-positive result contrasts with common public concerns (often referred to as "bikelash"). It suggests that fears of property depreciation due to proximity are largely unfounded in this Canadian context.

4.5.2 Network Distance Measures

Network distance, on the other hand, calculates the actual travel path along roads or trails from a property to the nearest bike facility (Amalindo et al., 2021). This approach better reflects true accessibility and how residents would realistically reach a facility (Yap et al., 2023).

The study by Welch et al. (2016) in Portland, Oregon, employed network distance to analyze changes in sales prices from 2002 to 2013. Results showed a positive effect from proximity to off-street multi-use paths, particularly regional ones. Conversely, improved access (shorter network distance) to on-street bike lanes was associated with a negative impact on property prices. This suggests that while residents valued the recreational and scenic aspects of off-street paths, they may have perceived on-street lanes as sources of noise, congestion, or reduced parking availability.

Similarly, Parker and Huang (2025) applied both buffer and network distance metrics in a space–time multilevel hedonic model. Their findings reaffirmed that network distance to bike lanes did not negatively affect property prices and, in some cases, was associated with slight appreciation. Their dual-metric approach demonstrated that network distance provides a more nuanced understanding of accessibility impacts, especially in grid-like or irregular road networks common in mid-sized cities. Table 10 summarizes how each study applied distance measures and their respective findings.

4.5.3 Interpreting Positive, Neutral, and Negative Effects

Across the four studies, the type of infrastructure and urban context are key in determining the direction of the price effect:

a. *Positive effects* are most associated with off-street trails and multi-use paths, especially when they offer scenic, quiet, and safe environments for recreation and mobility. These benefits tend to outweigh any perceived nuisances, especially in dense urban cores.
b. *Neutral effects* are often found in newer suburban or transitional areas where bike infrastructure is present but not yet integrated into daily mobility culture. Parker and Huang's (2025) findings in Kitchener suggest that even in areas of moderate cycling uptake, facilities do not reduce home prices.

Study	Distance Metric	Facility Type	Effect on Property Prices
Dahir & Le (2025)	Buffer (800m, 400m)	On-street, off-street, combined	Off-street: Positive; On-street: Mixed to negative
Parker & Huang (2025)	Buffer & Network	On-road, separated, multi-use	All types: Neutral to positive (no negative found)
Welch et al. (2016)	Network Distance	On-street lanes, multi-use paths	On-street: Negative; Multi-use paths: Positive
McDougall & Doucet (2022)	Qualitative (perceptual)	Not measured technically	Urban cycling is seen as positive, suburban response mixed
Arliani et al. (2024)	Accessibility Index (TOD-based, non-distance)	Pedestrian and cycling links within TOD zones	Higher internal accessibility associated with higher land and building values
Kasuku (2024)	Zonal Comparison (TOD vs. non-TOD)	Active transport and transit corridors	Property values and well-being higher in TOD zones; lacks distance quantification

Table 10. Summary of distance metrics used to measure bike lane proximity in each studied literature and their impacts on property prices.

c. *Negative effects* are generally limited to on-street bike lanes located on arterial roads where changes to parking, street width, or traffic flow may generate resident complaints or reduce perceived convenience for motorists.

4.6 Urban–Suburban Differences in the Impact of Bike Lanes on Housing Prices

The effect of bicycle infrastructure on residential property prices is not uniform across all geographic contexts. A recurring theme in the literature is the contrast between urban and suburban neighborhoods in terms of both the perceived and real estate impacts of nearby bike lanes. These differences are shaped by urban morphology, mobility culture, and levels of automobile dependence, all of which influence how cycling infrastructure is perceived by residents, developers, and the broader housing market.

4.6.1 Contrasting Built Environments and Mobility Patterns

Urban neighborhoods, especially those developed before widespread automobile use, are typically characterized by higher densities, mixed land uses, grid street patterns, and existing multimodal transport options (McDougall & Doucet, 2022). These spatial configurations are more supportive of active transportation, including cycling. Suburban areas, by contrast, often feature single-use zoning, cul-de-sac layouts, and wide arterial roads, which prioritize car travel and create physical and cultural barriers to cycling (McDougall & Doucet, 2022).

McDougall and Doucet (2022) explicitly focus on the urban–suburban divide in the Region of Waterloo, Canada. Their qualitative research with realtors and developers reveals that cycling infrastructure is positively viewed and promoted in urban cores, where residents are more likely to perceive cycling as a viable and desirable mode of transportation. In contrast, in auto-oriented suburban neighborhoods, cycling infrastructure is often seen as incompatible with local travel habits, leading to skepticism or even resistance to its implementation. Suburban buyers and developers typically emphasize driveway access, road capacity, and parking, viewing bike lanes as potential threats to those priorities. Similarly, Arliani et al. (2024) observe that TOD zones in Indonesia's urban centers, characterized by higher density and mixed land uses, show stronger value gains from active transport accessibility compared to peripheral or suburban areas, reflecting how built form mediates economic response to mobility investments.

4.6.2 Cultural Acceptance and Lifestyle Framing

Beyond the physical layout, urban and suburban neighborhoods differ in terms of cultural acceptance of cycling. In urban settings, particularly among younger or more environmentally conscious demographics, cycling is often associated with sustainability, health, and progressive urban development. In these contexts, proximity to bike lanes can improve a property's appeal and positively impact its market price (McDougall & Doucet, 2022).

In contrast, suburban "bikelash"—a term used in both McDougall and Doucet's (2022) and Parker and Huang's (2025) work—describes resident fears that bike lanes may reduce home prices by attracting outsiders, removing on-street parking, or introducing unfamiliar behaviors into car-centric communities. Parker and Huang (2025) address this resistance by statistically testing whether cycling facilities have an impact on property prices in suburban and transition zones within Kitchener. Their results indicate that, despite resident concerns, there is no evidence of price depreciation, even in suburban areas, suggesting a mismatch between perception and actual market response. Kasuku (2024) echoes this in Nairobi's TOD corridors, noting that cultural perceptions of cycling and public transport remain key barriers in car-oriented suburban communities, even when infrastructure is improved.

4.6.3 Auto-Dependence and Functional Price of Bike Infrastructure

Another dimension of the urban–suburban distinction lies in the functional use of bicycle infrastructure. In urban areas, bike lanes often serve a mobility function, enabling commuting, short errands, and connections to public transit (Pelechrinis et al., 2017). This utilitarian price increases the attractiveness of cycling facilities to residents and potential homebuyers. As documented by Welch et al. (2016) and Dahir & Le (2025), homes near off-street or protected bike lane in urban environments tend to experience price appreciation.

In contrast, suburban cycling is often limited to recreational use (City Cycling, 2012), which reduces the practical price of infrastructure investments. This distinction was emphasized by McDougall and Doucet (2022), who noted that suburban residents often fail to see cycling as a serious transport mode. Consequently, even when bike lanes are provided in suburban neighborhoods, they may be underutilized and undervalued by residents, leading to weaker or neutral effects on home prices. Table 11 summarizes key contrasts across urban and suburban contexts in relation to bike lanes and housing prices according to McDougall and Doucet (2022).

4.7 Socio-Political and Perceptual Challenges in Interpreting Property Price Outcomes of Bike Infrastructure

Beyond empirical data and modeling, the interpretation of how bike lanes affect property prices is shaped by powerful socio-political dynamics and stakeholder perceptions. Issues such as "bikelash" and NIMBYism (Not in My Back Yard) influence public attitudes, policymaking, and the reception of infrastructure investments, as well as broader political ideologies. These dynamics not only shape community support or resistance but also color how research findings on property prices are received, debated, or dismissed by stakeholders, including homeowners, developers, and local officials.

4.7.1 Bikelash: The Emotional Politics of Urban Change

The term bikelash describes organized or vocal community resistance to cycling infrastructure, often rooted in fears that

Dimension	Urban Context	Suburban Context
Built Environment	Dense, mixed-use, grid street network	Low-density, single-use, auto-oriented street design
Mode of Cycling Use	Functional (commuting, errands)	Primarily recreational
Cultural Perception	Positive (sustainable, modern, active)	Skeptical or resistant (loss of space, outsider fear)
Real Estate Marketing	Promoted by developers as amenity	Rarely emphasized, sometimes avoided
Impact on Housing Prices	Often positive, especially near off-street facilities	Mixed or neutral; positive effects are less consistently seen
Example from Studies	McDougall & Doucet (2022); Welch et al. (2016); Dahir & Le (2025); Arliani et al. (2024)	McDougall & Doucet (2022); Parker & Huang (2025); Kasuku (2024)

Table 11. Summary of urban and suburban context differences.

bike lanes will disrupt familiar patterns of mobility, parking, or neighborhood identity (McDougall & Doucet, 2022). These concerns are particularly intense in areas where car dependence is high and where bike lanes are perceived as imposed rather than co-designed. Bikelash often emerges in the form of public hearings, petitions, or inflammatory media discourse, framing bike lanes as wasteful, dangerous, or socially divisive.

Parker and Huang (2025) discuss bikelash in the Canadian city of Kitchener, where older homeowners expressed concern that new bike lanes would reduce their home equity by eliminating street parking, increasing noise, and attracting "unwanted" outsiders. This emotional resistance persisted despite the study's empirical finding that bike infrastructure had no negative effect on housing prices. In this case, the perception of harm—not the measurable market response—drove opposition.

Similarly, McDougall and Doucet (2022) identify bikelash in suburban areas of the Waterloo Region, where residents feared that cycling infrastructure would lead to traffic disruptions, longer commute times, or changes to their neighborhoods. Their research shows that bike lanes are sometimes associated with cultural and political identities, with opposition more likely in conservative, auto-oriented suburbs, and support higher in progressive, urban cores.

Arliani et al. (2024) likewise highlight the importance of participatory planning in reducing resistance to mobility-oriented projects within TOD zones. Their findings suggest that early community engagement and clear communication about accessibility and economic benefits can mitigate opposition and foster local ownership of cycling and pedestrian improvements.

4.7.2 NIMBYism and Fear of Change

A closely related phenomenon is NIMBYism, where residents support general infrastructure improvements but resist them when implemented in their immediate surroundings (Schively, 2007; Wolf, 1987). NIMBY objections to bike lanes often focus on the removal of on-street parking, increased congestion, or aesthetic changes to quiet residential streets.

Dahir and Le (2025) reference these sentiments in their U.S.-based multi-city analysis. In some cities, on-street bike lanes were installed in communities where homeowners feared a decline in property prices, even though in several cases, prices remained stable or increased. These fears are frequently based on misinformation or lack of trust in municipal planners, compounded by prior experiences of unconsulted urban change.

NIMBYism is not necessarily irrational. It may reflect legitimate concerns about poor design, exclusion from the planning process, or rapid changes in neighborhood character. However, when not addressed, it can hinder evidence-based investments that offer broader community benefits (Dahir & Le, 2025).

Kasuku (2024) observes similar resistance patterns in Nairobi's TOD corridor projects, where mistrust in public authorities and insufficient stakeholder involvement led to public skepticism toward transport-oriented infrastructure. He argues that without community participation, even well-intentioned accessibility upgrades may be perceived as externally imposed and inequitable.

4.7.3 Developers and Realtors: Between Market Demand and Political Caution

Developers and real estate agents occupy a complex and ambiguous space in the discourse surrounding bike lanes and property prices. On the one hand, they often recognize that proximity to active transportation infrastructure can increase marketability, particularly in walkable urban neighborhoods that are attractive to young professionals and environmentally conscious buyers (Dahir & Le, 2025; Welch et al., 2016). On the other hand, in more traditional or suburban markets, they may avoid emphasizing bike infrastructure to avoid alienating car-oriented clientele.

McDougall and Doucet (2022) provide detailed insights from interviews with realtors and developers. In urban cores, bike lanes were often actively promoted as amenities, linked to lifestyle branding and increased walkability. In the suburbs, however, some developers were wary of associating new developments with cycling, perceiving it as politically controversial or niche. This divergence reflects how market logic intersects with local political climates, influencing the narrative surrounding bike lanes and property prices.

In line with this, Arliani et al. (2024) find that property developers in Indonesian TOD areas tend to leverage active mobility branding to attract investment, while remaining cautious in suburban or car-dominated zones where demand for walkable or bikeable environments is still emerging.

4.7.4 Discrepancy Between Perception and Evidence

One of the clearest patterns across studies is the discrepancy between perception and reality. While multiple empirical studies—such as those by Welch et al. (2016), Dahir and Le (2025), and Parker and Huang (2025)—show that bike infrastructure often has neutral or positive effects on housing prices, this evidence is frequently overshadowed by evident, emotionally charged resistance. In such environments, even neutral research findings are met with skepticism, and anecdotal evidence can carry outsized weight in public debates. Table 12 summarizes the socio-political challenges.

Kasuku (2024) further notes that this perception gap is amplified in Global South contexts, where limited data transparency and communication barriers contribute to persistent public doubts about the real economic benefits of sustainable transport projects.

4.8 Planning Policy Implications: Leveraging Evidence for Mid-Sized and Rapidly Urbanizing Cities

The reviewed studies offer a robust and increasingly nuanced understanding of how bicycle infrastructure interacts with housing markets. Their implications extend well beyond ac-

Challenge	Definition	Effect on Interpretation	Key Studies
Bikelash	Organized resistance to cycling infrastructure	Promotes fear of devaluation; politicizes planning decisions	Parker & Huang (2025); McDougall & Doucet (2022); Arliani et al. (2024)
NIMBYism	Localized opposition to neighborhood changes	Undermines implementation despite broad support	Dahir & Le (2025); Kasuku (2024)
Perception vs. Evidence	The gap between empirical data and public beliefs	Empirical findings are often ignored or contested by stakeholders	All studies
Developer Ambivalence	Mixed enthusiasm depending on urban vs. suburban context	Marketing of bike infrastructure shaped by political risk	McDougall & Doucet (2022); Arliani et al. (2024)

Table 12. Summary of socio-political challenges in bike infrastructure installation.

ademic theory and are directly relevant to urban planning policy, particularly in mid-sized cities and rapidly urbanizing areas. These urban contexts are increasingly tasked with advancing sustainable mobility, housing affordability, and public space equity—often simultaneously and with limited resources. Translating research into policy requires planners and decision-makers to move beyond generalizations and engage in context-sensitive, evidence-informed strategies.

4.8.1 Recognizing the Local Context: No One-Size-Fits-All

A key takeaway is that the impacts of bike infrastructure are highly context-dependent. While off-street trails and multimodal integration generally generate positive or neutral effects on property prices, these outcomes are shaped by neighborhood type, access to amenities, socio-demographics, and local politics. As such, planners should avoid assuming uniform benefits across a city and instead perform localized assessments when evaluating or justifying investments in cycling infrastructure.

In mid-sized cities—such as Kitchener, Waterloo, or Portland, as studied in the reviewed literature—the urban form is often a hybrid of dense cores and sprawling suburban rings. In these cities, bike lanes can support smart growth and TOD goals, but only if their design and placement align with resident needs, the land use context, and the local mobility culture.

4.8.2 Policy Takeaways for Planners and Policymakers

Based on the evidence, several key recommendations emerge for urban planning practice:

a. Design for Connectivity, Not Just Proximity. Bike infrastructure should not exist in isolation, but rather connect residential areas to meaningful destinations, such as transit, parks, schools, and employment hubs. Network-based planning can improve the real estate value of bike lanes and broaden their utility.
b. Address Public Perceptions Proactively. Given the prevalence of bikelash and NIMBYism, planners must communicate research findings that demonstrate bike lanes do not negatively impact property prices. Public engagement strategies should include co-design processes, community workshops, and myth-busting communication campaigns to foster meaningful participation.
c. Integrate Bike Lanes into Broader TOD and Equity Framework. In areas undergoing rapid transit investment, bike lanes can amplify last-mile access—but only if paired with affordable housing, safe streets, and green infrastructure. Equity must be a cornerstone to avoid displacing vulnerable populations during neighborhood upgrading.
d. Use Data and Mapping Tools for Fine-Grained Targeting. Modern GIS and spatial modeling methods enable planners to identify where bike lanes are most likely to generate positive impacts, including value uplift or changes in travel behavior. This can inform phased implementation strategies and avoid costly misplacement.
e. Monitor Impacts Longitudinally. Especially in fast-changing areas, planners should establish monitoring systems that track housing market changes before and after bike lane installation to inform future investment decisions.

4.8.3 A Framework for Policy Interpretation

To guide the application of these findings in cities, a typology of neighborhood and city contexts is proposed below (Table 13). This framework can help tailor infrastructure planning and communication strategies to the specific setting. This typology promotes differentiated yet coordinated policy approaches, ensuring that cycling infrastructure serves as both a means of transportation and a mechanism for equitable urban transformation.

Figure 3 illustrates the proposed typology visually, positioning the reviewed case cities along two key dimensions—urban density and transit intensity (x-axis) and cycling culture or mode share (y-axis). Cities such as Portland and Kitchener occupy the upper-right quadrant, representing mature, multimodal contexts where cycling is well integrated into daily mobility, while Jakarta and Nairobi fall into the lower-left quadrant, illustrating rapidly urbanizing settings with emerging active transport systems.

Together, Table 13 and Figure 3 demonstrate how contextual differences shape the economic and social outcomes of cycling infrastructure, reinforcing the importance of context-sensitive and equity-focused planning approaches.

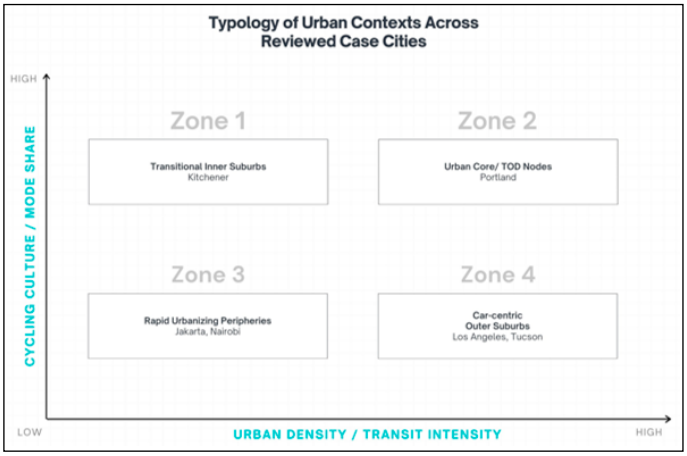


Figure 3. Typology of urban contexts across the reviewed case cities.

4.9 Limitations of previous research and future methodological approaches

Despite the growing body of research supporting the positive influence of bike lanes on property prices, methodologi-

Typology	Key Quantitative Thresholds	Policy Implications
Urban Core / TOD Nodes	Density > 7,500 residents/km^2; Transit supply > 4 routes/km^2; Cycling mode share > 8–10%	Emphasize multimodal integration; promote bike lanes as lifestyle and mobility enhancers
Transitional Inner Suburbs	Density 4,000–7,500 /km^2; Transit frequency = 15–30 min; Cycling share 3–8%	Prioritize off-street/shared-use trails; engage communities early
Auto-Oriented Outer Suburbs	Density < 4,000 /km^2; Transit supply < 2 routes/km^2; Cycling share < 2%	Start with recreational greenways; focus on safe school routes and phased rollouts
Gentrifying or Sensitive Areas	Annual housing appreciation > 5%; Median income growth > 10% in 5 years; Mixed tenure (50–60% owners)	Pair bike infrastructure with affordability safeguards and anti-displacement policies
Rapidly Urbanizing Peripheries	Urban growth > 3% per year; Planned transit corridors < 5 years old; Cycling share < 1%	Integrate bike lanes into master plans; avoid retrofitting costs later

Table 13. The proposed policy interpretation framework regarding bike lane infrastructure implementation.

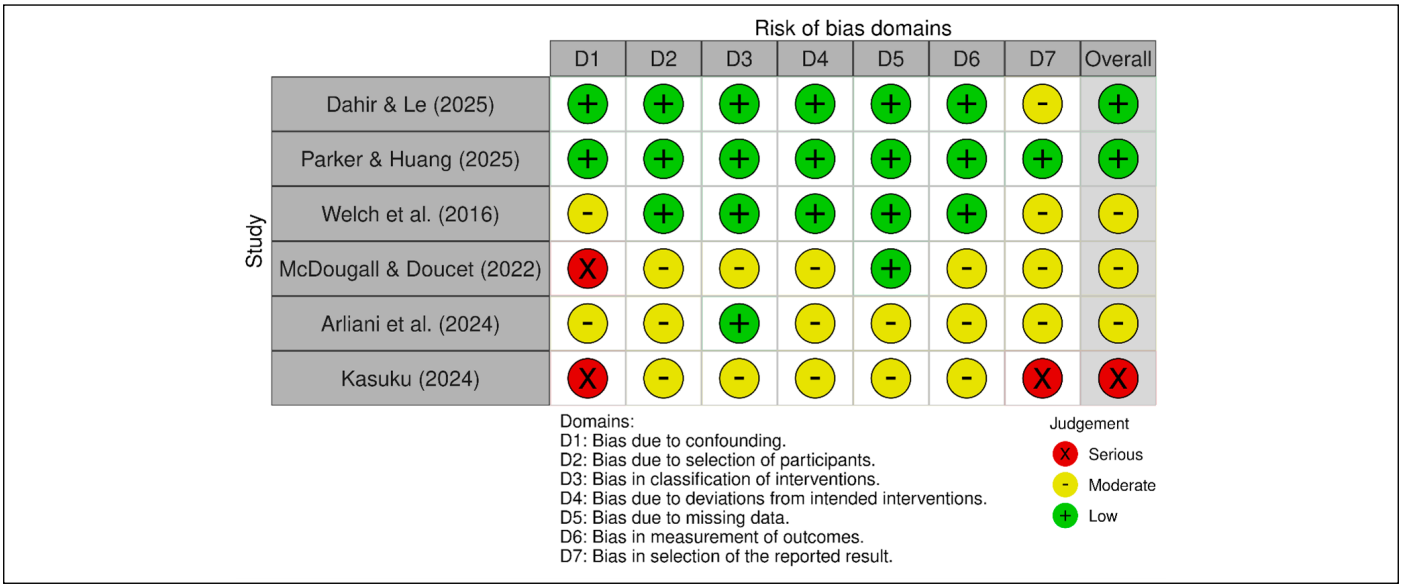


Figure 4. ROBINS-I assessment of methodological quality across reviewed studies.

cal limitations persist. Many studies rely on cross-sectional analyses, which capture only a single point in time and fail to account for long-term trends (Dziauddin et al., 2013). This limitation can obscure the dynamic evolution of property prices and hinder the ability to assess the full economic impact of cycling infrastructure. Omitted variable bias is another concern, as some studies do not fully control for neighborhood characteristics and socioeconomic factors that influence property prices (Iacono & Levinson, 2016). This issue underscores the need for more rigorous statistical controls in future research to ensure that the effects of bike lanes are accurately isolated from other influencing factors. Furthermore, inconsistencies in methodological approaches, ranging from hedonic pricing models to geographically weighted regression, contribute to varied interpretations of the impacts of bike lanes (Mulley & Du, 2012). Standardizing methodological approaches across studies would enhance comparability and allow for more definitive conclusions regarding the economic benefits of bike lanes.

To address these gaps, this paper proposes a methodological improvement that future research can build upon: integrating Geographically Weighted Regression (GWR) to capture local variations in property price effects, and the Heckman selection model to correct for sample bias, particularly in areas where bike lanes are implemented non-randomly (Diao, 2014; Guan & Peiser, 2018). Despite growing interest in GWR, none of the reviewed studies implemented it directly. For instance, cities that choose to install bike lanes in already-gentrifying or high-demand neighborhoods may introduce endogeneity into property price analysis. Furthermore, a Heckman model can address this by modeling the selection process of bike lane implementation and then adjusting the property price estimation accordingly. Similarly, GWR allows researchers to analyze how the impact of bike lanes on property prices varies by neighborhood, enabling more granular, location-sensitive insights that better reflect the urban diversity documented in this review.

These proposed methods should be interpreted in conjunction with the policy interpretation framework developed in this study (Table 13), which categorizes cities based on their infrastructure maturity and development context. Together, the typology and the methodological framework provide a more robust lens through which future studies can interpret the economic implications of bike lane infrastructure, particularly when comparing cities across varied geographical, social, and institutional settings.

While the expanded search included multiple geographical contexts, the majority of empirically rigorous studies remain concentrated in North America and Western contexts. This reflects a broader publication bias rather than search omission, highlighting the need for more geographically diverse research on the real-estate effects of active transportation infrastructure. Furthermore, even though two studies represent emerging contributions from the Global South, but they reveal further limitations: both rely on aggregate accessibility indicators rather than parcel-level spatial data, and neither applies advanced spatial econometric techniques. These constraints, driven largely by data availability and institutional capacity, underscore the methodological and infrastructural gaps that future research in developing cities must overcome to enable cross-regional comparability and causal inference.To systematically evaluate the methodological quality of the reviewed studies, a ROBINS-I (Risk of Bias in Non-randomized Studies of Interventions) assessment was conducted. Figure 4 summarizes the risk levels across seven domains for each study. This evaluation highlights that while North American studies generally demonstrate low risk of bias due to strong confounding control and robust modeling, Global South studies (e.g., Arliani, 2024; Kasuku, 2024) exhibit higher risks due to limited data granularity and lack of causal identification.

5. CONCLUSION

This systematic review synthesized evidence from six empirical studies examining the relationship between bicycle infrastructure and residential property prices. The findings suggest that off-street and multi-use paths generally increase nearby property values, while on-street bike lanes produce mixed or context-dependent effects, influenced by neighborhood form, amenity access, and socio-political acceptance. These variations highlight that the economic outcomes of cycling infrastructure depend strongly on urban morphology and community perception rather than infrastructure type alone.

Nonetheless, this review faces several limitations. The restricted number of included studies, their predominant North American focus, and potential publication bias constrain the external validity of conclusions. Moreover, methodological heterogeneity across studies—ranging from hedonic pricing models to spatial econometric approaches—limits the comparability and meta-analytic synthesis of results.

To inform practical application, this review introduces a context-based typology that classifies urban areas into Urban Core/TOD Nodes, Transitional Inner Suburbs, Auto-Oriented Outer Suburbs, and Rapidly Urbanizing Peripheries. This framework guides planners and policymakers in aligning infrastructure design, community engagement, and equity safeguards with local conditions. Future research should extend the geographical scope, incorporate longitudinal and spatially explicit analyses, and test the typology empirically to enhance understanding of how cycling infrastructure can contribute to both urban livability and equitable land value growth.

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