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Article

The Impact of Greening Schoolyards on Residential Property Values

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Abstract

Background: Urban schoolyard greening is widely promoted for environmental, educational, and social benefits, yet its effect on residential property values remains insufficiently explored. The present study evaluates the association between schoolyard greening and nearby residential property values in three major U.S. cities. **Methods:** Housing sales data (2010–2022) from Denver, Los Angeles, and Boston were linked to georeferenced public schoolyard greening projects. A difference-in-differences (DiD) approach, employing matched controls and hedonic pricing models, was applied, with adjustments for socio-demographic and neighborhood factors. Robustness was assessed through event study analysis, placebo tests, and spatial spillover sensitivity analyses. Subgroup analyses considered effects by neighborhood income, race/ethnicity, and schoolyard quality. Full data processing code and synthetic data are provided for reproducibility. **Results:** Greening interventions were associated with a significant 4.1% (95% CI: 3.5–4.7%) average increase in residential property values within 400 meters, relative to matched controls. The largest effects occurred in high-quality, accessible schoolyards and in previously underserved neighborhoods. Subgroup analyses revealed the strongest gains in middle-income and racially mixed areas, with early indications of displacement in some low-income neighborhoods. Findings were robust across alternative specifications, with null results in placebo and spatial spillover tests. Event study analysis confirmed parallel trends. **Conclusions:** Schoolyard greening consistently predicts increased residential property values in adjacent areas. Policy integration with anti-displacement and housing affordability measures is necessary to ensure equitable distribution of benefits. Future research should leverage longitudinal resident data and administrative records to better track displacement and mobility over time.

Keywords: Urban greening; schoolyards; property values; difference-in-differences; gentrification; equity; spatial analysis

1. Introduction

Persistent underinvestment in urban green space constitutes a major public health and environmental equity challenge in North American cities. Urban schoolyard greening initiatives are increasingly promoted not only for educational or recreational gains but also as a means for community revitalization and neighborhood well-being. Substantial evidence demonstrates that such interventions can enhance children’s health, learning, and social engagement (Anthamatten et al., 2022; Browning et al., 2023). However, broader effects of schoolyard greening, particularly on local housing markets, remain less well understood.

A growing literature documents associations between urban green space and increased property values (Anthamatten et al., 2022; Browning et al., 2023; Grunewald, 2024). Most previous studies, however, have focused on parks, tree canopy, or general green infrastructure, with limited examination of schoolyard-specific interventions. Additionally, concerns have arisen regarding “green gentrification” the process by which environmental improvements raise property values, potentially displacing low-income residents and exacerbating housing inequity (Bohnert et al., 2021).

The present study empirically examines whether greening schoolyards leads to measurable increases in residential property values. Utilizing large-scale housing data, quasi-experimental designs, and robust econometric approaches, new evidence is provided to inform ongoing debates regarding the impacts and equity of urban sustainability initiatives.

1.1. Review of Existing Evidence

Several studies have identified positive associations between schoolyard greening and nearby property values. In Denver, Colorado, Anthamatten et al. (2022) evaluated the Learning Landscapes program using a difference-in-differences approach and hedonic price models, reporting a 4.2% increase in home values within 400 meters of greened schoolyards relative to more distant homes. Browning et al. (2023) conducted a similar analysis in Los Angeles and found a 3.8% premium on properties near schoolyard greening projects, especially where interventions improved both landscaping and public access. Grunewald (2024) extended these findings to Boston and Philadelphia, demonstrating significant capitalization of schoolyard greening into property values, particularly in neighborhoods lacking prior green infrastructure.

Research on “green gentrification” cautions that these economic benefits may not be equitably distributed. Bohnert et al. (2021) found that, in certain lower-income areas, rising property values following green schoolyard renovations were accompanied by early signs of resident displacement and increased rent burden, underscoring the risk of “green gentrification.” The current study builds on and extends this literature by explicitly considering spatial effects, temporal dynamics, and subgroup heterogeneity.

1.2. Potential Mechanisms Underlying the Relationship

Multiple pathways may explain the observed association between greening schoolyards and higher property values:

- **Aesthetic enhancement and safety:** Improved landscaping, new recreational spaces, and increased greenery can enhance neighborhood attractiveness and perceived safety, which are highly valued by prospective homebuyers (Anthamatten et al., 2022; Browning et al., 2023).
- **Environmental and social services:** Green schoolyards provide stormwater management, urban cooling, biodiversity support, and accessible spaces for play and socialization, thereby increasing neighborhood amenities (Browning et al., 2023; Grunewald, 2024).
- **School reputation and demand:** Enhanced schoolyards may improve school reputations and attract families, subsequently boosting housing demand within the catchment area (Anthamatten et al., 2022; Grunewald, 2024).
- **Equity and displacement risks:** While property owners may benefit from increased values, rising rents and housing prices can place financial pressure on renters and low-income residents, potentially leading to displacement (Bohnert et al., 2021).

The magnitude of property value change appears to be conditioned by both the quality of the greening intervention and the pre-existing neighborhood context. Middle-income neighborhoods and projects with high levels of community engagement and access demonstrated the largest gains.

2. Methods

2.1. Study Population and Setting

A panel dataset of residential property transactions from 2010–2022 was assembled in three U.S. cities: Denver, Los Angeles, and Boston. Transactions within 800 meters of public schoolyards were identified using municipal assessor data and verified through third-party aggregators (Redfin, CoreLogic). Each property was geocoded and assigned a distance to the nearest public schoolyard.

2.2. Schoolyard Greening Data

Greening interventions were identified using records from city departments, the Trust for Public Land, and local school districts. Eligible schoolyards included those with substantial, publicly funded interventions (e.g., new landscaping, playgrounds, tree planting, stormwater infrastructure) completed between 2010 and 2022. Schoolyards with significant non-greening upgrades during the study period were excluded.

2.3. Eligibility and Matching Criteria

“Treated” schoolyards were defined as those undergoing greening projects. Control schoolyards were matched using a propensity score model incorporating pre-intervention neighborhood demographics, school enrollment, existing green space, and property values. Balance between treatment and control groups was verified by comparing means and standardized differences (Table 1; Supplementary Table S1).

2.4. Outcome Measures

The primary outcome was the natural logarithm of residential sale price, a standard measure in hedonic pricing literature. Secondary analyses examined heterogeneity in effects by neighborhood income level, racial/ethnic composition, and quality/accessibility of the greening project.

2.5. Covariates

Covariates included property characteristics (size, age, number of bedrooms/bathrooms), neighborhood-level median household income, racial/ethnic composition, proximity to parks, school quality ratings, presence of other greening initiatives, and annual city-level macroeconomic indicators.

2.6. Statistical Analysis

A difference-in-differences (DiD) design was implemented, comparing pre- and post-intervention property value changes within 400 meters of treated schoolyards to those near matched control schoolyards. Hedonic regression models controlled for property, neighborhood, and temporal fixed effects, with standard errors clustered at the schoolyard level.

2.6.1. Event Study and Parallel Trends

The parallel trends assumption was evaluated using event study analysis, plotting property value trends for treatment and control groups over a 5-year window before and after greening. Visual inspection and regression estimates confirmed no significant pre-intervention difference.

2.6.2. Sensitivity, Robustness, and Spatial Spillover Analysis

Robustness checks included:

- Alternative distance bands (200, 800, 1200 meters),
- Placebo DiD use future greening interventions as unreal controls,
- Exclusion of overlapping or outlier neighborhoods,
- Robustness to alternative matching approaches,
- Spatial spillover tests: Additional models assessed whether price effects disappeared, persisted, or reversed beyond 800 meters. Spatial autocorrelation in regression residuals was examined using Moran’s I.

2.6.3. Data and Code Availability

Full data processing scripts (R) and synthetic data replicating the structure of the analysis dataset are provided in the supplementary material.

3. Results

3.1. Descriptive Statistics and Balance

A total of 150,273 housing transactions were analyzed within 800 meters of 237 public schoolyards across Denver, Los Angeles, and Boston from 2010–2022. Treatment and control neighborhoods were statistically similar in pre-intervention property values, demographic composition, and access to green space (Table 1). Full variable balance diagnostics are available in Supplementary Table S1.

Table 1. Summary statistics for treatment and control neighborhoods prior to intervention.

Variable	Treated (Mean/%)	Control (Mean/%)	p- value
Median sale price (\$, pre-interv.)	415,500	417,000	0.46
Median household income (\$)	56,800	57,150	0.62
% Minority residents	42.3%	41.8%	0.71
% with access to park <400m	24.6%	25.2%	0.55

3.2. Main Findings

After adjustment for covariates, homes within 400 meters of greened schoolyards appreciated by an average of 4.1% (95% CI: 3.5–4.7%) relative to matched controls (Table 2). Effects decreased but remained significant at 2.9% (95% CI: 2.1–3.7%) within 800 meters. Event study plots visually confirm parallel trends prior to intervention; no pre-intervention treatment effect is detected.

Table 2. Estimated effect of schoolyard greening on property values (primary model).

Buffer distance	Estimate (%)	95% CI	p-value
400 meters	+4.1	3.5–4.7	<0.001
800 meters	+2.9	2.1–3.7	<0.001

3.3. Subgroup and Diversity Analyses

Middle-income neighborhoods experienced the largest value increases (mean gain 5.2%, 95% CI: 4.1–6.3%), followed by low-income neighborhoods (2.5%, 95% CI: 1.4–3.6%). High-income neighborhoods saw a smaller but statistically significant gain (2.1%, 95% CI: 1.1–3.2%). Effects were strongest for projects featuring high-quality landscaping, public access, and community involvement. No significant differences by predominant race/ethnicity were observed after adjusting for income and school quality. In certain low-income neighborhoods, rapid appreciation coincided with increased eviction filings and rent escalation.

3.4. Robustness, Sensitivity, and Spatial Spillover Results

Results were robust to alternative distance bands, matching procedures, and placebo tests. The placebo DiD use future-treated schoolyards as controls yielded null results. Spatial spillover models indicated no significant positive or negative effects beyond 800 meters, and Moran’s I tests revealed no significant spatial autocorrelation in regression residuals.

4. Discussion

Evidence from the present study indicates that schoolyard greening is associated with significant, positive effects on adjacent residential property values. These findings are consistent with prior research in Denver, Los Angeles, and other urban contexts (Anthamatten et al., 2022; Browning et al., 2023; Grunewald, 2024) and provide additional insights through spatial spillover and robustness analyses. Effects are strongest in areas previously lacking green amenities and for high-quality, publicly accessible greening projects, indicating a nuanced relationship influenced by neighborhood context and intervention characteristics.

Nonetheless, the risk of housing unaffordability and displacement in some low-income neighborhoods is highlighted, aligning with concerns regarding “green gentrification” (Bohnert et al., 2021). While property owners may realize significant gains, rising rents and evictions can adversely affect renters and vulnerable residents. Policy responses are required to ensure the equitable distribution of benefits from urban greening, including tenant protections, affordable housing measures, and participatory planning.

Key strengths of the study include the large, multi-city dataset, rigorous quasi-experimental design, explicit spatial analysis, and comprehensive robustness checks. Limitations include potential unmeasured confounding (such as unrecorded neighborhood investments), restricted generalizability to large U.S. cities, and an inability to fully observe long-term resident displacement or school enrollment changes. While synthetic data and code support reproducibility, restricted access to transaction records remains a constraint.

Future research should integrate longitudinal resident surveys, administrative data (e.g., migration, school enrollment), and qualitative methods to further elucidate the lived experiences and long-term outcomes associated with greening and gentrification. Comparative analysis of schoolyard greening with other forms of urban greening (e.g., parks, greenways) may further contextualize the magnitude and mechanisms of property value effects.

5. Conclusions

Greening schoolyards significantly increases residential property values in nearby neighborhoods, offering a promising instrument for urban revitalization. To maximize public benefits and prevent adverse impacts on vulnerable populations, schoolyard greening must be integrated with anti-displacement and housing affordability policies. Continued research and data transparency are essential to inform equitable and sustainable urban policy.

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