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Evidence From Chicago

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ABSTRACT

Problem, research strategy, and findings: Several U.S. cities have implemented vacant lot greening programs as planning strategies to address decreased tax base, crime, and other issues associated with high land vacancy in marginalized neighborhoods, yet little is known about the benefits of programs that transfer city-owned lots to private owners. Using a mixed methods approach, we studied whether and how private ownership matters for vacant lot condition-care in Chicago's (IL) Large Lot Program, which allows property owners to purchase vacant city lots on their block for \$1. We compared visual changes in vacant lot condition-care between the purchased "treatment" lots and matched "control" lots through a difference-in-differences technique. Our findings demonstrate a causal effect of private ownership: Whereas condition-care of the control lots decreased between 2014 and 2018, it significantly increased for treatment lots in the year after sale (2015) and continued to rise through 2018. Also, increases in Large Lot condition-care did not vary based on whether owners lived on the block. Focus groups with Large Lot owners showed that ownership empowers residents by reducing illicit and dangerous behaviors, expressing an ethic of care through vacant lot improvement, and continuing a legacy of land tenure tied to family and neighborhood. Further research is needed to strengthen our understanding of spatial contagion effects from treatment to nearby control lots.

Takeaway for practice: Our findings show that ownership-based vacant land greening initiatives like the Large Lot Program effectively improve condition-care regardless of whether lot owners live on the same block. Focus group findings suggest that such initiatives could be integrated into community-based safety programs and could be boosted by funding to create community amenities.

Keywords: land ownership, urban greening, urban vacancy, visual assessment

Vacant land is a significant issue in many post-industrial cities around the world (Nassauer & Raskin, 2014; Newman et al., 2016; Schilling & Logan, 2008). In the United States, the sheer extent of land vacancy is especially notable: 16.7% of land in large cities was vacant in 2016, with higher rates in the South (23.5%) and Midwest (21.2%) and lower rates in the Northeast (9.3%; Newman et al., 2016). Urban vacancy is the result of decades-long deindustrialization processes, governmental subsidies to suburbanization, and systemic racism that led to urban disinvestment (Dewar & Manning Thomas, 2013; Newman et al., 2016; Sugrue, 2014). At local levels, high land vacancy contributes to significant maintenance costs and a decreased tax base for cities and a

dissolving social fabric, higher crime, and declining health outcomes for nearby residents (Nassauer & Raskin, 2014; N. Sampson et al., 2017; Schilling & Logan, 2008). Marginalized groups, such as Black communities, are particularly affected by these issues because they are overrepresented in high-vacancy neighborhoods (Ehrenfeucht & Nelson, 2020; Ganning & Tighe, 2015).

Recently, planners have responded to urban vacancy and its related problems by implementing programs to green or repurpose publicly owned vacant land (Crauderueff et al., 2012; Dewar, 2006; Schilling & Logan, 2008). In one type of program (e.g., Philadelphia [PA], Baltimore [MD]), vacant lots are "cleaned and greened" to mitigate blight and provide public use, with the municipality or nonprofits retaining ownership

(Crauderueff et al., 2012; Heckert & Kondo, 2018). These initiatives have contributed to lower crime, increased property tax revenue, and improved health outcomes (Branas et al., 2018; Dewar, 2006; Heckert & Mennis, 2012; Kondo et al., 2016). Yet, these programs necessitate constant investment from public agencies and non-profits for maintenance and policing, putting into question their financial and social sustainability (Crauderueff et al., 2012).

In another type of program, public agencies sell vacant lots to nearby property owners for a nominal price (Crauderueff et al., 2012; Ganning & Tighe, 2015; Stern & Lester, 2021). These “side yard” programs delegate greening and beautification responsibilities to private property owners, who can expand their yards, share community gardens, or build structures (Crauderueff et al., 2012; Ganning & Tighe, 2015). Although these programs can also increase property tax revenue (Ganning & Tighe, 2015) and lower crime (Stern & Lester, 2021), little is known about the array of benefits because most programmatic research on vacant lot greening has focused on initiatives where parcels remain publicly owned (e.g., Branas et al., 2018). Of particular interest to planners is whether initiatives that rely on private owners to green vacant land in high-vacancy neighborhoods result in personal and community benefits for marginalized populations.

In this study, we examined how the transfer of city-owned vacant lots to private ownership has affected their condition and care. We measured condition-care as a key construct describing expressions of vacant lot stewardship because these visible, measurable “cues to care” have contributed to increased health, wellbeing, social capital, and community safety (Nassauer & Raskin, 2014; N. Sampson et al., 2017). Our work centered on Chicago’s (IL) Large Lot Program, which transfers city-owned vacant lots (hereafter referred to as “Large Lots”) to qualified property owners on the city’s south and west sides, two areas characterized by high shares of land vacancy, poverty, and Black residents (City of Chicago, 2020).

We used a mixed methods research design, combining a difference-in-differences (DID) analysis to test the effects of the Large Lot policy intervention and focus groups with new owners to understand the policy’s impacts on communities. The DID findings show a causal effect of private ownership: Whereas condition-care of city-owned, unsold lots slightly decreased between 2014 and 2018, it significantly increased for Large Lots in the year after purchase (2015) and continued to rise through 2018. Further, improvements in Large Lot condition-care did not differ based on whether individual owners lived on the same block. The focus groups showed that Large Lot ownership empowers residents because it helps reduce illicit and

dangerous behaviors, expresses an ethic of care, and continues a legacy of land tenure.

These results demonstrate that ownership-based vacant lot greening initiatives can be effective tools to increase condition-care in high-vacancy neighborhoods, which is beneficial for planners working in cities with few resources (see Schilling & Logan, 2008). Our quantitative findings do not show that selling vacant lots to owners who live on the same block results in stronger benefits than selling lots to any property owner, contrary to recent findings on crime (Stern & Lester, 2021). However, the focus group discussions on community control suggested that planners could integrate side yard programs into community-based safety initiatives. Our findings on an ethic of care suggest that cities and nonprofits could provide funding support to new owners to create community spaces such as gardens and playgrounds.

Background

Condition-Care of Urban Vacant Land

The residential landscape of neatly maintained homes and yards on tree-lined streets figures highly in the American imaginary (Gandy, 2005; Robbins, 2007). Attractive neighborhoods command higher property values and frequently relate to other quality-of-life indicators including lower crime and increased social ties (Troy & Grove, 2008; Wolfe & Mennis, 2012). Private ownership can motivate residents to protect their investment through property maintenance and improvement (Aarland & Reid, 2019; Heidelberg & Eckerd, 2011). Although this self-interest is reinforced through ordinances requiring owners to maintain their property to specific minimum standards (e.g., weed regulations), an unwritten yet powerful set of neighborhood-based social norms promotes a larger ethic of care indicated by neatly trimmed lawns, colorful gardens, and other cues to care (Nassauer & Raskin, 2014; Nassauer et al., 2009). Together, these visible indicators help define residents’ expressions of condition-care in the neighborhood landscape (Gobster, Rigolon et al., 2020).

When neighborhoods succumb to high rates of vacancy, this structure of self-interest, standards, and norms governing property condition-care unravels. Remaining residents may continue to maintain the condition of their property and sometimes even appropriate and maintain nearby vacant lots without formal ownership in a process known as “blotting” (Armbrorst et al., 2008). But when the lack of upkeep of vacant properties reaches a tipping point, a neighborhood no longer feels like a neighborhood. This can result in a loss of social cohesion and invite crime and other anti-social behaviors (R. J. Sampson & Raudenbush, 1999). In this context, improvements in vacant lot condition-care

through greening programs are an important first step to address urban vacancy issues (Pearsall & Lucas, 2014).

Vacant Land Greening and Private Ownership Initiatives

Because private ownership is a core tradition of the residential landscape in the United States, vacant land greening/repurposing programs that return city-held parcels to resident-owners have intuitive appeal and deserve further investigation (Crauderueff et al., 2012; Dewar, 2006; Schilling & Logan, 2008). Although affordability barriers exist in some programs, many cities have sold lots for as low as \$1 (e.g., Buffalo [NY], Chicago, Milwaukee [WI], and Philadelphia) or less than \$400 (e.g., Cleveland [OH], Detroit [MI], and Pittsburgh [PA]; City of Milwaukee, 2017; Crauderueff et al., 2012; Ganning & Tighe, 2015; Stern & Lester, 2021).

Programs transferring public vacant land to private-sector ownership have advantages for cities to put property back on the tax rolls and shift maintenance burdens to new owners (Crauderueff et al., 2012; Dewar, 2015; Ganning & Tighe, 2015), but they have their critics. Hackworth (2014) argued that such neoliberal initiatives focus on economics without considering other community benefits and can also spur land speculation. Yet, some programs incorporate checks and balances to ensure that benefits favor long-time neighborhood residents (Ganning & Tighe, 2015; Gobster, Hadavi et al., 2020). For example, many programs restrict vacant land sales to nearby property owners to limit speculation (City of Chicago, 2020). Further, St. Louis's (MO) "Mow to Own" program requires residents to maintain their prospective lot for 2 years before purchase (The Land Bank of Kansas City Missouri, 2020). Because many programs target high-vacancy neighborhoods that are also majority Black, such programs help increase land ownership among Black residents (see Ehrenfeucht & Nelson, 2020), which might help those residents build wealth.

Literature Gaps and Research Questions

Much of the evidence about the benefits of vacant lot greening/reuse programs comes from studies wherein public agencies maintain ownership of such lots (e.g., Kondo et al., 2016). Studies of programs that transfer lots to private ownership have been limited, focusing on the visual conditions of vacant lots (Dewar, 2015; Gobster, Hadavi et al., 2020), crime (Stern & Lester, 2021), and sense of community (Stewart et al., 2019). None of those studies have addressed the impact of private ownership by comparing lots that were transferred with those retained by public agencies. Dewar (2015) found that vacant lots sold through managed sales (land banks) had better visual conditions than those

sold through auction in Detroit and Flint. Yet, her study did not assess presale conditions or the condition of other properties remaining in public ownership. Research in Chicago examined visual conditions before and after sale but did not consider the conditions of unsold, city-owned lots (Gobster, Hadavi et al., 2020). A systematic comparison of these "treatment" and "control" lots is necessary to isolate the effect of private ownership because the unsold lots could be improved through informal "blotting" or periodic maintenance by cities (Gobster, Rigolon et al., 2020).

Beyond evaluating the program-related effects of land transfer, little is known about the meanings of vacant lot ownership, especially for racially/ethnically minoritized residents who have experienced disinvestment and systemic racism against their community. Much of the research on residential yard care has focused on suburban, predominantly White neighborhoods, and it is unknown whether the same type of ideals and norms apply to high-vacancy marginalized neighborhoods or whether broader personal and social goals drive residents' purchase and care of vacant lots (Nassauer et al., 2009).

Given these literature gaps, we asked two interrelated questions linking vacant lot condition-care and ownership: Do vacant lots sold through the Large Lot Program see greater improvements in condition-care over time compared with other city-owned vacant lots? What are the personal and social meanings of ownership for new Large Lot owners?

By answering these questions, we contribute to the literature on urban vacancy and greening in three ways. First, we demonstrate the causal effect of private ownership on vacant lot condition-care, improving upon our previous work and other studies that were not designed to isolate the impact of ownership (Dewar, 2015; Gobster, Hadavi et al., 2020). Second, we show that different types of private ownership (individuals living and not living on the same block of their Large Lot) have similar impacts on condition-care, which also advances our previous research and provides a complementary analysis to Stern and Lester's (2021) recent work on crime. Third, we explore the meanings of vacant lot ownership among low-income Black residents, broadening previous research on residential yard care beyond White suburbia (e.g., Nassauer et al., 2009) and expanding our work on vacant land and place attachment (Stewart et al., 2019). This analysis uncovers the Large Lot Program's impact on marginalized urban communities, including how vacant lot greening leads to empowerment for individuals and neighborhood groups. Here, we define *empowerment* as newly recognized strengths that become mobilized due to municipal policies supporting community benefits, such as

greening (Amdam, 2010; Friedmann, 1992; Westphal, 2003).

We hypothesized that private ownership will help improve vacant lot condition-care. First, because property owners concentrate most of their wealth in their property, they protect their financial investment (McCabe, 2013). Second, institutional racism has resulted in Black communities distrusting government agencies and has led to wealth inequities between Black and White families (Berglund, 2020; McIntosh et al., 2020; Stivers, 2007). Due to this distrust and inequities, opportunities for Black ownership can be a step in an empowerment process through which residents take matters into their own hands to improve their neighborhoods.

Research Design and Methods

Using a sequential mixed methods design, we first employed a DID approach (quantitative analysis) to test whether private ownership fosters increased vacant lot condition-care (Creswell, 2009). We then used focus groups (qualitative analysis) to explore how ownership matters for new lot owners.

Chicago's Large Lot Program

Developed in the context of the Green Healthy Neighborhoods plan, Chicago's Large Lot Program seeks to address land vacancy issues by transferring city-owned vacant lots to qualified property owners (City of Chicago, 2020). The ongoing program covers parts of Chicago's South and West sides, two areas characterized by high vacancy, large shares of low-income Black residents, and decades of disinvestment (City of Chicago, 2020; Wilson, 2018). Managed by Chicago's Department of Planning and Development (DPD), the program was launched in 2014 and transferred the first batch of lots in 2015, with successive annual rounds of sales through 2019 (City of Chicago, 2020). During each round, property owners (including individuals and organizations) without past-due tickets or taxes can apply to buy one or two city-owned vacant residential lots on their block or the adjacent block for \$1 each. Like other programs, the low sale price makes lots affordable for prospective vacant lot owners (Stern & Lester, 2021).

Individuals are eligible to purchase Large Lots even if they do not live on the same block as the Large Lot they intend to buy; they only have to own a property on the same block (City of Chicago, 2020). Among our sample of 198 purchased lots (see below), 139 (70%) are owned by individuals living on the same block, 41 (21%) by individuals not living on the same block, and 18 (9%) by organizations (e.g., nonprofits and developers). This distinction is important because different types of individual ownership have been linked to disparate impacts

on crime in the context of this program (Stern & Lester, 2021).

For a sale to occur, both DPD and the local alderman (i.e., city council member) have to provide approvals. Specifically, DPD checks for administrative issues (e.g., unpaid fees), whereas aldermen often evaluate whether vacant properties can be used for other public purposes (e.g., community gardens) and, in many cases, deny sales for such reasons (Podmolik, 2015; Qin, 2018; D. Wu, 2019). Such aldermanic prerogative can make the sale process opaque, similar to other programs (Dewar, 2006).

Purchase through the Large Lot Program comes with a few restrictions for new owners (e.g., Ganning & Tighe, 2015): They must maintain their lot (e.g., mow the grass), pay property taxes (\$672 per lot in 2018, on average), fence the lot if not directly side-adjacent to their property, and retain ownership for at least 5 years to limit speculation (City of Chicago, 2020). Although building is allowed on Large Lots, so far, most owners have created private or shared green spaces, including yards, vegetable gardens, and play areas (Gobster, Hadavi et al., 2020).

Although the Large Lot Program includes areas on the South and West sides, our quantitative analysis centers on sections of Greater Englewood (Figure 1), a South Side planning region and the focus of the Green Healthy Neighborhoods plan (City of Chicago, 2014). We examined this area because it is a quintessential high-vacancy neighborhood with low land values and little to no gentrification pressures (Atuesta & Hewings, 2019; Butler, 2016). Important for our analysis, it also has a large number of sold Large Lots and city-owned lots that can be used as controls.

Quantitative Methods: Difference-in-Differences Analysis

We used a DID analysis to analyze how the condition-care of purchased Large Lots (henceforth "treatment lots") changed after their sales compared with a matched sample of city-owned vacant lots that were not sold (henceforth "control lots"). This quasi-experimental approach, which has been used in other studies of vacant lot greening (see Kondo et al., 2016; Stern & Lester, 2021), enabled us to isolate the effect of private ownership on vacant lot condition-care. Without such control for comparison, it is hard to ascertain whether the improvements are caused by the Large Lot policy intervention or some other reason (e.g., increase in city mowing of city-owned lots).

DATA AND MEASURES

We collected open access data describing neighborhood demographics and housing at the census block

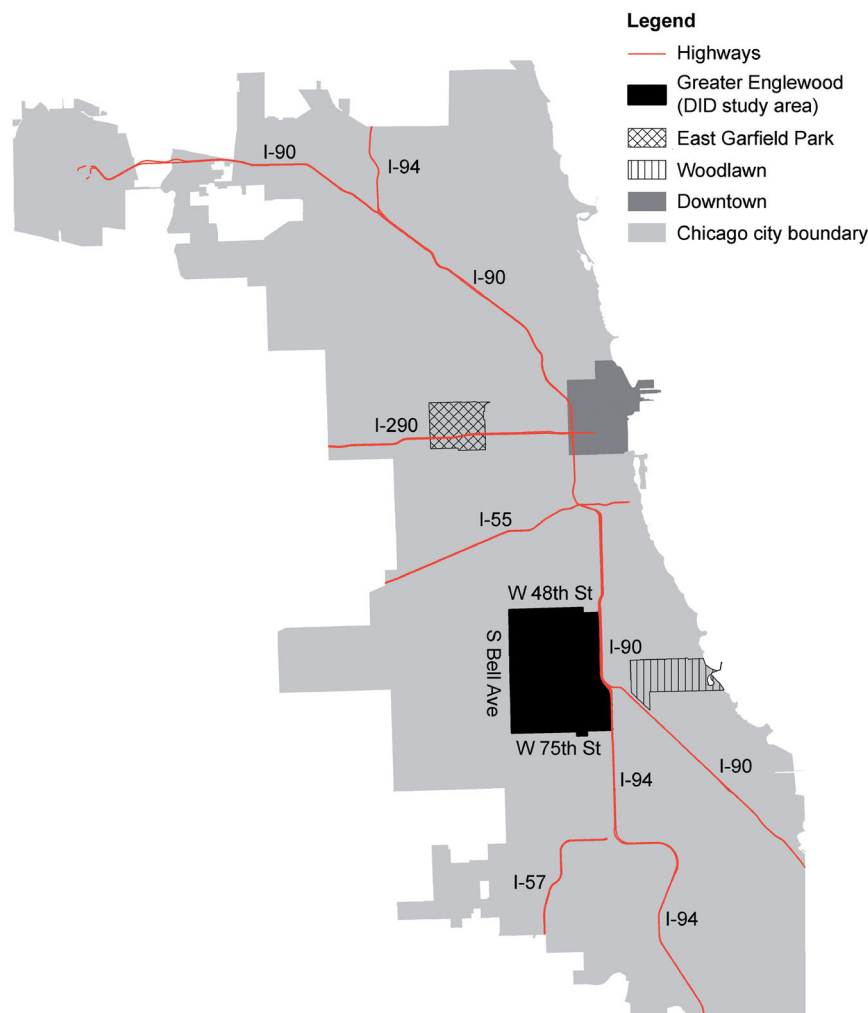


Figure 1. Location of the study areas in the City of Chicago.

group level (U.S. Census Bureau, 2020) and vacant land at the parcel level (City of Chicago, 2018), as well as data from the City of Chicago's DPD describing the location of Large Lots and other available city-owned lots for sale (see Table 1 for full information). We used vacant lots as the unit of analysis and assigned variable values from block groups to all lots falling within their boundaries.

Among the 424 Large Lots sold in November/December 2014 and January 2015 (first round of sales), 198 Large Lots fell within the study boundary (Figure 1) and were selected as the treatment lots that were transferred to private ownership. To select the control lots, we used two criteria based on previous work on vacant lot greening (Branas et al., 2011; Heckert & Mennis, 2012; Kondo et al., 2016). First, control lots had to be located in the same area of the city, hence the importance of restricting our study area to where there was a wider availability of city-owned vacant lots. Second, control lots had to be located more than 300 ft from

treatment lots (sold in 2015) and other Large Lots sold in subsequent rounds of sales. We used this latter criterion to avoid potential spatial contagion effects; being near well-maintained Large Lots might encourage other residents to take care of ("blot") unsold city-owned lots they lived next to (Armbrorst et al., 2008; Hunter & Brown, 2012; Krusky et al., 2015). Based on these criteria, we identified 746 potential control lots in the study area.

Next, we used propensity score matching to select a subsample of control lots with similar characteristics to the treatment lots (Technical Appendix A). Through this process, we created two equivalent groups of lots (treatment and matched control) that significantly differed only based on whether they were sold to private ownership (see Kondo et al., 2016). Building on related research, we selected three matched control lots for each treatment lot based on similarities in demographics (income, education, and race) and vacancy (vacant housing and vacant land; Branas et al., 2011; Heckert &

Table 1. Variable names, descriptions, data sources, and means.

Variable name	Description	Data source	Mean (SD)
Dependent variable			
Condition-care scale	Rating of condition-care for vacant lots: -1, "mismanaged"; 0, "unmanaged"; 1, "periodically managed"; 2, "regularly managed"; 3, "small-scale gardens and other cues to care"; 4, "moderate-scale gardens and other cues to care"; 5, "extensive gardens and other cues to care"	Authors (see Technical Appendix B)	1.36 (0.98)
Independent variables			
Treatment	Lot sold through the Large Lot Program = 1; lot not sold = 0	City of Chicago	N/A
Time	Factor variables describing years: 2014 = 0, 2015 = 1, 2016 = 2, 2018 = 3	N/A	N/A
Treatment * Time interactions	Interaction terms created by Treatment = 1 × Time = 1, 2, and 3	City of Chicago	N/A
Control variables			
Lot size	Lot surface in square feet	City of Chicago	3,758 (1,876)
% Vacant lots	% of vacant lots in a census block group	City of Chicago	23.46 (12.66)
% Non-Hispanic Black	% of non-Hispanic Black residents	ACS	80.21 (20.26)
% College	% of people aged 25+ with at least a bachelor's degree	ACS	8.65 (6.03)
Income	Median household income	ACS	\$28,780 (\$10,941)
% Vacant housing	% of vacant housing units	ACS	27.44 (13.72)
% Owner-occupied	% of owner-occupied housing units	ACS	37.60 (20.33)
Population density	No. residents/acre	ACS	16.88 (10.08)
% Single-family housing	% of housing units classified as single-family	ACS	36.01 (23.49)

Note: ACS = American Community Survey 2018, 5-year estimates, data at the census block group level (133 block groups).

Mennis, 2012). The samples of treatment ($n = 198$) and matched control ($n = 594$) lots did not significantly differ based on any of the matching characteristics.

The dependent variable of the quantitative analysis is the *condition-care scale*, a valid and reliable 7-point rating scale we developed based on neighborhood audit tools and visual landscape assessments (e.g., Krusky et al., 2015; Nassauer & Raskin, 2014) and described in earlier work (Gobster, Rigolon et al., 2020). The 7-point condition-care scale includes visual elements representing physical disorder and signs of care, with ratings ranging from -1 (*mismanaged vacant lots showing safety hazards, vandalism, and notable erosion*) to +5 (*lots with well-tended gardens, playgrounds, or spaces for social gathering*; see [Table 1](#) for rating criteria and [Figure 2](#) for examples of treatment Large Lots receiving different rating levels). As a planning tool, the numbering system is intended to increase the reliability of use by planners and research assistants after a brief

training session, with the 0 point (*unmanaged*) equivalent to doing nothing, positive values indicating some care, and a negative value indicating mismanagement.

We used the scale in field and virtual (photo-based) assessments to rate treatment and matched control lots for 2014 (year before purchases), 2015 (one growing season after purchase), and 2016 and 2018 (2 and 4 years after purchase). [Technical Appendix B](#) provides details about the instrument and its application.

STATISTICAL ANALYSIS

We used a mixed effects DID regression to test for a causal effect of private ownership on vacant lot condition-care. We created a longitudinal data set of treatment and matched control blocks ($n = 792$) with four time observations (2014 = time 0, 2015 = time 1, 2016 = time 2, and 2018 = time 3). We coded time in this manner to differentiate presale condition-care (2014) from condition-care after the first growing season



Figure 2. Examples of vacant lots rated at different levels of the 7-point condition-care scale (from -1 to 5). Photo: U.S. Forest Service.

(September–October 2015), when we expected changes to be visible, and subsequent years (2016 and 2018) to evaluate changes in condition-care up to 4 years after the program's implementation.

Frequently, ordinal dependent variables such as our 7-point condition-care scale are treated as interval ones in regression models (Schroeder, 1984; H. Wu & Leung, 2017). We followed this approach here because the

interpretation of the results is much clearer than in an ordinal regression. The focus of our analysis was less on generating precise measures of the effect of the intervention on the outcome than on determining whether there was a significant and marked effect. The linear regression served this purpose. Also, we estimated an ordinal regression alternative, showing that the linear estimation gave similar results to the ordinal regression (see [Technical Appendix C](#) for the methods and [Technical Appendix E](#) for the results).

In our regression model, we used the treatment (sold Large Lot), the time variables, and several control variables as fixed effects, whereas lots were treated as random effects to account for the clustering of different time observations for the same lot ([Technical Appendix C](#)). Specifically, we included nine control variables describing lot (e.g., surface area) and block group characteristics (e.g., median household income, vacancy, percentage single-family housing) that could confound the relationship between private ownership and vacant lot condition-care (see [Table 1](#)). We selected these control variables based on related studies on vacant lot greening (Branas et al., 2011, 2016; Heckert & Mennis, 2012; Kondo et al., 2016). We treated these variables as fixed effects because they remained constant over time for each lot (e.g., 2014–2018 American Community Survey).

Our independent variables were three interaction terms we created between the treatment binary variable and the time binary variables (Treatment = 1 × Time = 1, 2, and 3). These interaction terms represent the differential changes in condition-care between treatment and matched control lots across time. Positive and statistically significant terms would show that, after purchase, treatment lots saw greater improvements in condition-care than matched control lots. Through these terms, we compared condition-care in each treatment lot before the sale, after the sale, and in two subsequent years (first difference) and then compared this first difference with the corresponding difference in condition-care in the same time frame for the matched control lots that were not sold (second difference).

We also examined whether condition-care varied based on the type of private ownership. To do so, we ran a regression analysis similar to the one described above in which the treatment variable could assume three factor values: control lots (coded as 0), treatment lots with individual owner not living on the same block (coded as 1), and treatment lots with individual owner living on the same block. Through additional tests, we compared whether condition-care varied across these three groups of lots ([Technical Appendix C](#)). We obtained data about owners' addresses from Chicago's DPD. In this analysis, we excluded lots owned by organizations due to their small sample size ($n = 18$).

Qualitative Methods: Focus Groups

To explore the meaning of vacant lot ownership, we analyzed transcripts of three focus groups with Large Lot owners that we conducted in 2015 for a related study (Stewart et al., 2019). In these focus groups, we engaged 25 Large Lot owners (80% female, 76% Black) residing in three Large Lot neighborhoods (Englewood, Woodlawn, and East Garfield Park; see [Figure 1](#)). The focus group questions aimed at understanding participants' perceptions of the purchasing process, visions for their new lots, challenges to lot ownership, and effects of lot ownership on their neighborhood. The prompts for discussion led many participants to characterize what ownership meant to them ([Technical Appendix D](#)).

We conducted a directed content analysis of the 115 pages of text from the focus group transcripts to identify the meanings of Large Lot ownership (Hsieh & Shannon, 2005). Specifically, we looked for keywords such as "ownership," "own," "my property," "buy," and several other synonyms. Through this process, one of the authors developed codes that described different meanings of vacant lot ownership, and these codes were further refined by two other coauthors through an iterative process of comparing and refining the codes. In the final round of a reliability check, we found strong intercoder reliability (84.8%), which allowed coders to work independently to analyze the entire set of transcripts (Creswell & Poth, 2018).

Methodological Limitations

Our methods have some limitations. For the DID analysis, treatment and control lots were not randomly assigned; rather, Large Lot buyers were self-selected and might have been driven by a stronger motivation to improve vacant lots than "blotters" who care for other city-owned lots without purchasing them. Other studies have used randomized controlled trials to randomly assign treatment through vacant lot greening in the context of city-led initiatives (Branas et al., 2018). Also, we excluded control lots that might undergo contagion effects from nearby treatment lots, and such positive contagion might be a potential benefit of the program. Finally, using linear models with an ordinal dependent variable did not enable us to make claims about the magnitude of the coefficients of the treatment variables.

For the focus groups, we did not directly ask questions about ownership, and the focus groups were held within a year of purchase, with the possibility that meanings of lot ownership could evolve over time. Also, focus group participants were not fully representative of the range of owners included in our quantitative analysis. Specifically, participants resided in a broader set of

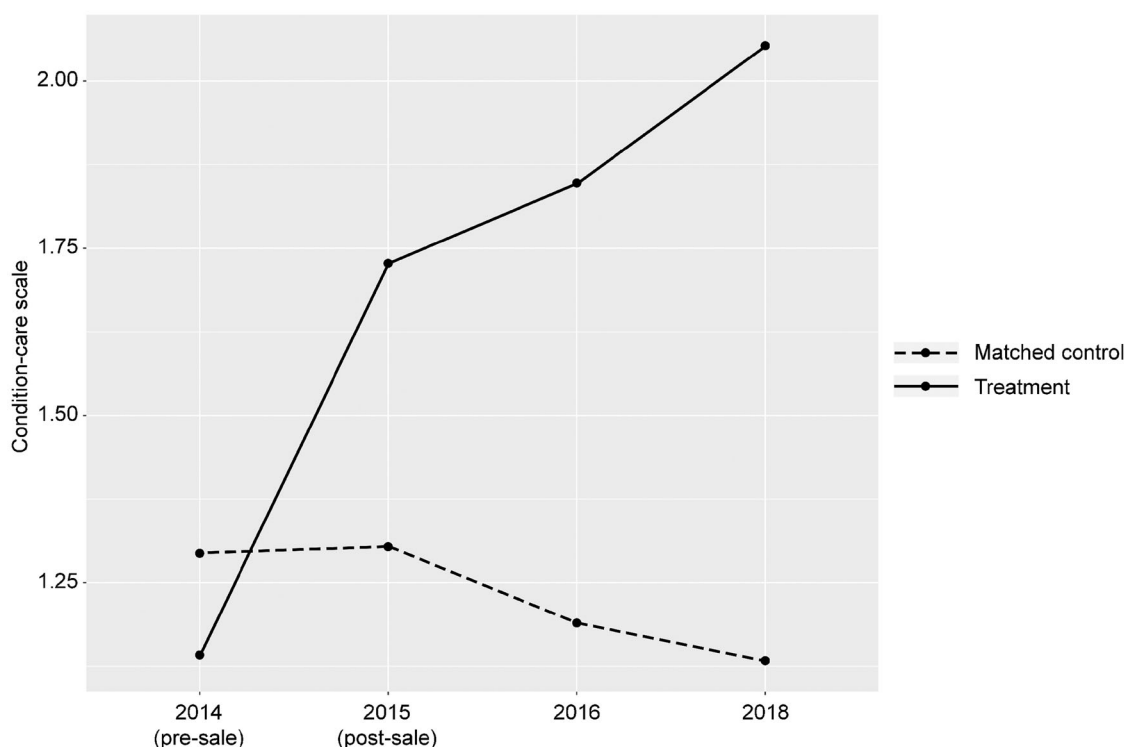


Figure 3. Condition-care across time for treatment and matched control lots. Values are estimated marginal means, representing estimates of condition-care based on the main regression model (Table 2). Differences between treatment and matched control lots are statistically significant in 2015, 2016, and 2018 ($p < .001$).

neighborhoods than the study area for the quantitative work (Englewood, Woodlawn, and East Garfield Park), and they were all neighborhood residents; thus, we did not hear from owners not living in Large Lot neighborhoods. Finally, although community organizations supported resident owners in all Large Lot neighborhoods, Greater Englewood is unique because its residents advocated for the launch of the program (Resident Association of Greater Englewood, 2014). Thus, findings in neighborhoods with less-engaged community organizations might be different.

Results

Private Ownership Matters for Vacant Lot Condition-Care

As we expected, we found that the transfer of vacant lots to private ownership through the Large Lot Program has a causal impact on lot condition-care. Specifically, whereas city-owned matched control lots saw a slight decline in condition-care between 2014 and 2018, privately owned Large Lots experienced a significant increase in condition-care the year after the sale (2015) and continued improvement through 2018 (Figure 3). Table 2 shows that all three interaction terms representing DID are positive and statistically significant at the .001 level, providing evidence that condition-care

increased significantly more for treatment than for matched control lots (see Technical Appendix E for full model specifications). The results are robust to the inclusion of additional control variables representing adjacency to religious, educational, and recreational land uses.

Figure 3 shows that condition-care for treatment lots rapidly increased immediately after the purchase (between 2014 and 2015) and continued to rise in 2016 and 2018. During the same period (2014–2018), the estimated condition-care for matched control lots decreased (see Figure 3), providing support for the effect of Large Lot purchases on condition-care.

Further, Figure 3 highlights that our data display a crossover interaction pattern, wherein the estimated condition-care for treatment lots is lower than the condition-care for control lots before the sale (2014), and the opposite occurs after the sale (2015; Mark & Reichardt, 2009). This crossover interaction suggests that threats to internal validity resulting from self-selection are low (Mark & Reichardt, 2009). Because the control lots had higher condition-care before the sale, our results are unlikely observed because treatment lots are located in blocks where people who took care of vacant land before the Large Lot program (e.g., blotting) and might have been more motivated to purchase a lot.

Table 2. Summary results of the mixed effect regression to determine the impact of private ownership on vacant lot condition-care.

Interaction terms	Estimate	95% Confidence interval	p Value
Treatment * Time 1 (2015)	0.576	0.448–0.704	<.001
Treatment * Time 2 (2016)	0.810	0.666–0.954	<.001
Treatment * Time 3 (2018)	1.072	0.944–1.200	<.001
Pseudo $R^2 = 0.427$			

Notes: Adjusted by Times 1, 2, and 3 (dummies), treatment, lot size, percentage of vacant lots, percentage of non-Hispanic Black, percentage college, income, percentage vacant housing, percentage owner-occupied, population density, percentage single-family housing. Number of observations = 2,787. The regression estimates for interaction terms represent differences between the condition-care of treatment lots after the sale (2015, 2016, and 2018) and matched control lots before the sale in 2014 (treatment = 0, time = 0).

The continued growth in condition-care between 2014 and 2018 for treatment lots shows promising signs that improvements made under the Large Lot Program might be sustainable over the years. Specifically, post hoc tests show that, among treatment lots, condition-care was significantly higher year after year ($p < .01$), except for changes between 2015 and 2016, for which the increase was not significant (Technical Appendix E).

Another important finding is that increases in condition-care after the sale for treatment lots are not dependent on whether owners live on the same block as their Large Lot. Specifically, we found no statistically significant differences in condition-care over time between treatment lots wherein the owner lived or did not live on the same block (Technical Appendix E). Figure 4 shows that the estimated condition-care for treatment lots follows a similar pattern over time regardless of whether the owners live nearby. Large Lots owned by block residents and nonresidents have higher condition-care than control lots after treatment, except for Large Lots owned by nonresidents in 2015 (Technical Appendix E).

Meanings of Vacant Lot Ownership

Through our analysis of focus group transcripts, we found that Large Lot ownership is contextualized across two broad meanings: empowerment and commodity (see Table 3). Empowerment is associated with three subthemes of community control, ethic of care, and family legacy. Lot ownership as commodity is associated with two subthemes of legal responsibility and financial investment.

LOT OWNERSHIP AS EMPOWERMENT

The meanings related to empowerment provide insights about broader neighborhood benefits of vacant lot ownership. We describe the three subthemes for empowerment below.

Community control. Participants stated that owning Large Lots enabled them to establish community control over vacant land in ways that deter illicit and dangerous behaviors such as fly dumping, prostitution, driving cars through vacant lots, and drug dealing. When asked about how things changed after purchasing their lot, one participant noted, “There used to be a lot of, you know, I’d walk out ... there’d be toilets back there, all kinds of stuff, you know. And [now] nobody’s back there parking their car, doing the deeds anymore, so. Things like that.” A dialog among two other participants about drivers taking shortcuts across vacant lots indicates what they did to control undesirable behavior:

Participant 1: And I didn’t want that [dangerous drivers] to continue. So by me purchasing it, I neatly fenced it off, and I don’t have that problem anymore.

Facilitator: Okay.

Participant 2: Once you put fence on—okay.

Participant 1: Right. Can’t nobody drive in there now.

Ethic of care. Residents also mentioned that, through ownership, they were able to express an ethic of care for their neighbors that went beyond individual interest. This ethic of care included beautifying their Large Lot to communicate positive neighborhood transformation, creating community spaces in their lot (e.g., playgrounds), and sharing garden beds with neighbors. In a conversation about neighborhood improvement, one participant noted, “I think it really upgrades the community when one has ownership and I think that that was the idea [with my Large Lot purchase].” Another exchange between two residents who discussed what had changed since purchasing the lot further exemplified how their ethic of care radiates to their community:

Participant 3: Anytime you have a workday out in your garden, people drive in the alley and will stop and say “Hey, this is really great,” “Wow, the flowers look really nice.”

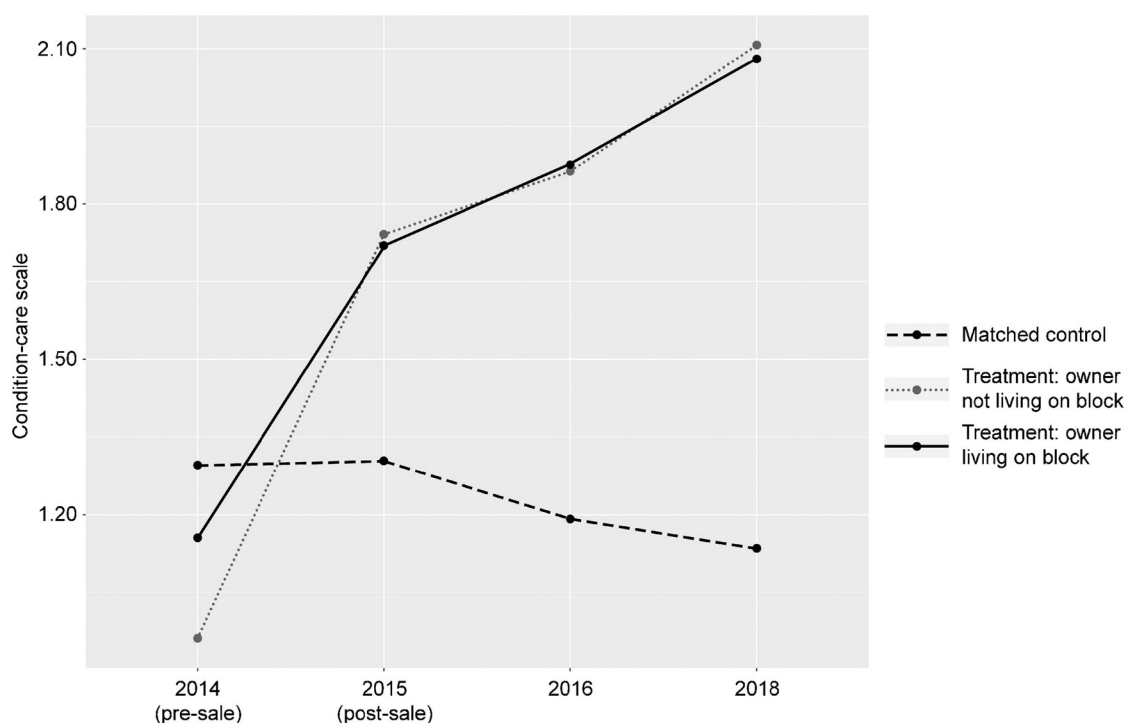


Figure 4. Condition-care across time for control lots, treatment lots with individual owners not living on the block, and treatment lots with individual owners living on the block. Values are estimated marginal means, representing estimates of condition-care based on the regression model with a three-way treatment variable (see Table E3 in Technical Appendix E).

Table 3. Meanings associated with vacant lot ownership.

Empowerment meanings	Commodity meanings
Community control: Ownership gives the opportunity to control illicit or dangerous behaviors on vacant land. Owners can tell people engaging in illegal behaviors (e.g., fly dumping) to stop because it's "in their back yard."	Legal responsibility: Responsibility of private owners or the city to maintain the lot to meet certain legal standards (e.g., fencing lots, mowing).
Ethic of care: Ownership empowers residents to show an ethic of care for their neighborhood. This includes beautification but also sharing spaces and resources with neighbors (e.g., gardens, play areas). This ethic of care empowers the community.	Financial investment: Lots are commodities that have a certain value. They can be used to generate money, now or in the future.
Family legacy: Ownership enables residents to contribute to their family's tradition of land tenure in the neighborhood. It reinforces their commitment to the place, themselves, and neighbors.	

Participant 4: ... [W]hat a powerful difference our garden has made, that it inspires people. ... [T]hat people feel like good things are possible, that not just bottom-feeders live here, that people who care are actually engaged on the ground, and so, it changes ... the culture. But our Large Lot, she [a neighbor] looks out over her back porch to the Large Lot. She owns that place, so to speak, you know, her family comes out and cleans the alley on a regular basis, and it feels like it's theirs. And they treat it like that, like it matters.

Family legacy. Residents talked about vacant lot ownership as a means to continue a tradition of land

tenure in their community. One participant noted, "Our block is a really nice block, because, ya know, families have been there for three, four generations, they didn't go, they're still there. They have an emotional investment and they've got a monetary investment." Other participants noted that they would never sell their properties in the neighborhood and that Large Lot ownership would enable them to continue to build their family legacy in the community. One participant said,

... [W]e were born and raised and my father, I remember [when] I was a child, my father always said, "Never leave this neighborhood because it's gonna

change, it's gonna come right back around." So now [that we own a Large Lot] we all can have a house on the block if we wanted to.

For some participants, their Large Lot expressed a connection between generations of their family. In the above quote, such connection came forward as a commitment to one's deceased father, with lot ownership embodying a fulfillment of this commitment.

LOT OWNERSHIP AS COMMODITY

Another major personal and social meaning frames lot ownership as a commodity, in which legal responsibility and financial investment are the two subthemes.

Legal responsibility. Participants mentioned their legal responsibility to maintain Large Lots at a minimum standard of grooming. All participants were aware of their contractual obligations to care for their lot. In this context, some participants complained about getting ticketed by the city for not maintaining their Large Lot at a minimum standard. For instance, one said, "I was in a battle with the city board superintendent where the city wanted to ticket me because my lot had overgrown trees. Well, I just received this lot, now you're gonna write me a \$500 ticket?"

Financial investment. Participants also discussed that owning lots was a way to build wealth and that the \$1 nominal fee enabled them to purchase the lot. For example, one participant described time and labor invested in their lot: "We've gotta lot of money invested, a lot of neighbor hours invested, and you know, a whole future plan for the lot." Another participant mentioned that, without the Large Lot Program, "I'd have to pay whatever the market rate [was to buy a lot]. So, to be afforded [a \$1 lot] ... somebody should get a raise for [this idea]."

Policy Implications

Our main findings from this study have important implications for planners and policymakers grappling with urban vacancy:

- *Private ownership through the Large Lot Program improves vacant lot condition-care.* These results support that the transfer of vacant land to private ownership increases visible "cues to care," which have been linked to several community benefits (Nassauer & Raskin, 2014; N. Sampson et al., 2017). Together with work showing positive impacts on crime (Stern & Lester, 2021), our findings provide evidence about the effectiveness of side yard programs that rely on private ownership to address land vacancy.
- *Improvements in Large Lot condition-care are sustained over time.* These findings provide support for the inclusion of side yard programs in medium-term planning efforts that seek to revitalize marginalized communities (e.g., Chicago's Green Healthy Neighborhoods), particularly given their low cost for cities (Crauderueff et al., 2012).
- *Improvements in condition-care do not vary based on whether owners live on the block.* These findings support the choice of the Large Lot Program to sell vacant land to individual property owners who both live and do not live on the block. Yet, Stern and Lester (2021) found that lots with others living on the block had stronger impacts on crime reduction, and therefore more research is needed to evaluate the effects of different ownership types.
- *Vacant land ownership enables community control in limiting dangerous and illicit behaviors.* Because resident owners felt empowered to limit harmful actions on their Large Lots, planners could integrate side yard programs into other efforts that empower marginalized people to improve neighborhood safety, such as community-led safety initiatives (see Sakala et al., 2018).
- *Vacant land ownership helps express an ethic of care.* These findings suggest that side yard programs empower lot owners to undertake actions that provide broader community benefits, including the creation of gardens and playgrounds. Cities and nonprofits could enhance these positive intentions to care for one's neighbors by providing financial incentives and educational resources for resident-owners to create community-oriented spaces on their vacant lots.
- *Vacant land ownership fosters family legacy.* To enhance family legacy in majority-Black neighborhoods, planners working on side yard programs where lots receive multiple applications could consider prioritizing sales to property owners who have lived in the neighborhood for several years and are vested in the uniqueness of their home place (see Stern & Lester, 2021).

Conclusion

In this study, we examined whether transferring publicly owned vacant lots to private ownership improves the condition-care of such lots, focusing on Chicago's Large Lot Program. We found that private ownership through the Large Lot Program has a causal effect on vacant lot condition-care. The condition-care of purchased Large Lots increased the year after the sale (2015) and continued to improve through 2018, whereas condition-care of city-owned matched control lots slightly decreased in the same period. Significant improvements in condition-care year after year show promising signs for the

sustainability of the program. Further, we did not find any significant differences in the condition-care of lots owned by individuals living on the same block and individuals living farther away.

Through focus groups with Large Lot owners, we studied the meanings of ownership and found that private ownership empowers residents and their neighbors. Although ownership is tied to meanings that frame the newly purchased vacant lot as commodity such as legal responsibilities for maintenance and financial investment, ownership also has broader meanings associated with community empowerment. Specifically, ownership helps recognize the capacity for community control over dangerous and illicit behaviors, enables owners to demonstrate an ethic of care that goes beyond one's personal interest, and furthers family legacies of land tenure in the neighborhood. An important characteristic of empowerment is residents' mobilization to connect with neighbors, organizations, and leaders in their community (Amdam, 2010; Westphal, 2003). With several meanings of ownership connecting lot owners to their community, future side yard programs should be integrated into broader urban development processes.

Combined with other research, these findings show that vacant lot greening/reuse programs that transfer city-owned land to private ownership can be part of the solution to the issues of urban vacancy (Stern & Lester, 2021). These side yard programs might be particularly appealing for planners and policymakers because they require few resources for their implementation and can be self-sustaining over time (Schilling & Logan, 2008). Our findings also highlight that initiatives like the Large Lot Program can empower marginalized people to take matters into their own hands and start to improve their neighborhoods. Researchers must keep working with residents, community organizations, and planners to evaluate the long-term impacts of these programs on health, safety, sense of community, Black wealth, and potential gentrification and spatial contagion processes.

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SUPPLEMENTAL MATERIAL

Supplemental data for this article can be found on the publisher's website.

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