

Documenting Land Use Practices in South Kensington,
Philadelphia: *Terra Nullius or Terra Incognita?*



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Documenting Land Use Practices in South Kensington, Philadelphia

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Introduction

Along with the distal nature that fuels cities' metabolism (Newell and Cousins), there is also local nature within cities. Although cities are often thought of as the antithesis of nature, in reality, they contain multiple natures across different scales, from single street trees and spontaneous vegetation sprouting from cracks in sidewalks to vast urban forests, parks, and wetlands (Bolund and Hunhammar). Indeed, in this century of cities, it is vital to ensure that the rapidly increasing urban populations, have access to urban nature due to the widespread social and ecological benefits it provides.

Despite the importance of access to urban nature, parks, and greenspace, research has documented disparities in access to these urban environmental amenities based upon racialized and/or class-based demographics (Schwarz et al.; Boone et al.; Rigolon; Wen et al.). Differential access to these urban environmental amenities is an environmental justice issue, as fair access to resources is included in the Principles of Environmental Justice adopted in 1991 (First National People of Color Environmental Leadership Summit). As Pulido (2000) argues: "Coming to terms with white privilege compels researchers to understand not only how privilege repels environmental burdens, such as polluting industry, but also how it might attract more than its fair share of environmental amenities (p. 769)."

While there have been numerous studies examining the benefits and distribution of formal urban greenspace (e.g., parks and urban forests), less attention has been given to informal greenspace (IGS) in cities (Rupprecht and Byrne, Rupprecht, Byrne, Garden, et al.). Following Rupprecht and Byrne (2014), we conceptualize IGS as non-remnant, spontaneous urban vegetation, excluding parks, gardens, ornamental plantings, and agricultural areas from consideration as IGS. That said, the level of management, land use, site history, form, scale, and neighborhood context all vary between IGSs (Rupprecht and Byrne). IGS consists of everything from vacant lots to street right of ways to vegetation growing in cracks and holes in the urban fabric.

This study focuses upon the South Kensington and Olde Kensington neighborhoods of Philadelphia, Pennsylvania. The study area serves as an example of a formerly marginalized neighborhoods in a post-industrial city undergoing significant sociodemographic change, with the area's total population and median household income increasing by over 15 percent between 2010 and 2016. As part of an initial, exploratory investigation of this rapidly shifting socio-ecological landscape, we used aerial imagery to conduct a census of formal and informal greenspace in the neighborhood. Greenspaces were digitized using Google Earth Pro. Remotely sensed greenspaces were verified in the field, the primary land use of the parcels documented, and nearby community institutions (e.g., churches, social services, schools, etc.) mapped.

A total of 351 greenspaces are documented in this study area, making up 97,579 square meters, or 9.98 percent of the total study area. The vast majority (69 percent) of these were informal greenspaces, (i.e., vacant lots, street or railway verges and riverbanks), which, on average, were considerably larger than formal greenspaces (parks), (309.5 square meters vs. 207.1 square meters). The informal and formal greenspaces that we documented provide a broad suite of benefits to Olde Kensington residents. The predominance of IGS suggests that it has strong potential to increase greenspace access and address environmental justice concerns. However, there are also several challenges associated with IGS, including the potential for environmental gentrification and the ephemerality of these often-

liminal spaces. We argue that partial formalization can help to minimize these challenges, providing resources to stabilize IGS while allowing them still to remain under community control. Planners should work with residents to provide resources to support their informal management of these green spaces.

Literature Review

The twenty-first century is the century of cities. Half of the world's population has been urban since 2008, with that percentage predicted to increase to almost 70 percent by 2050 (United Nations). While rapid urbanization has occurred in different ways in particular places across the world, in general, we have seen exponential growth in the number, population, and physical extent of urban areas (Seto et al.). We have also seen the appropriation of nature by cities increasing as they grow in both size and intensity of resource consumption (Bolund and Hunhammar). Cities are connected to, and dependent upon, distant hinterlands that provide resources and serve as sinks for wastes (Wachsmuth et al.; Heynen et al.; K. C. Seto et al.). The world's 27 megacities (those with populations over ten million), as of 2010, consumed 9 percent of global electricity, 10 percent of gasoline, and produced 13 percent of the world's solid waste, despite comprising only 6.7 percent of the world's population (Kennedy et al.).

Like formal greenspaces, IGS can provide both environmental and social benefits to cities. Recent systematic reviews of the potential for IGS to increase biodiversity in cities found that ecologists reported a high number of species across different IGS types and taxa, more even than some rural areas, lawns, and forests (Rupprecht, Byrne, Garden, et al.; Riley et al.). In terms of social benefits, recent systematic reviews found that many researchers had documented the recreational value of IGS and its ability to provide residents with connections to nature (Rupprecht, Byrne, Ueda, et al.; Riley et al.). IGS can also serve as a public space and provide for a greater diversity of uses and users than formal parks, which often limit the types of activities allowed within them and the hours they can take place (Campo; Thompson). Others have argued that IGS can provide opportunities for what Holston (Holston) terms insurgent citizenship, individual and group actions that

allow for creative, playful, and often unsanctioned uses of urban space (Dewar and Thomas). IGS can serve many of the same purposes as formal greenspaces (and indeed, serve some residents better), making it a potential solution to environmental justice issues in urban greenspace access.

Along with the benefits of informal greenspaces, there are also several challenges. First, the benefits can lead to increased property values and result in environmental gentrification. Second, relying on informal land-use practices and stewardship places heavy expectations on residents' continued upkeep (Brownlow, 2011; Foster, 2018). Third, informal greenspaces are challenging to secure permanent land tenure for and are often lost to development (Kinder; Safransky; Campo). Finally, informal greenspaces that are not maintained can become hazards rather than amenities (Brownlow, 2006; Foster and Newell).

The many benefits that greenspaces—both informal and formal—provide to urban residents can lead to an increased desirability of neighborhoods and rising property values. Eventually, increased property taxes and rents can displace current residents, resulting in a shift in neighborhood demographics. Scholars have termed this environmental gentrification, green gentrification, or eco-gentrification (Dooling; Quastel; Miller; Anguelovski, Connolly, et al.). While most research has focused upon large-scale, high-impact park and green infrastructure projects (Anguelovski, Connolly, et al.; Anguelovski, Connolly, et al.; Rigolon and Németh; Miller), the demonstrated increased amenity values in urban areas in proximity to urban greenspaces, urban gardens, and forests make it imperative for planners to consider the possibility of environmental gentrification at the outset of greenspace planning (Horst et al.; Rigolon and Németh).

Informal greenspaces can increase access to urban environmental amenities, however, recent research cautions against relying solely on volunteer stewards to maintain these spaces. Neighborhoods in need of greenspace improvements are often otherwise marginalized, and residents may not have the capacity to voluntarily maintain informal greenspaces (Fyfe and Milligan; Pincetl; Perkins 2009). Relying on volunteers in these vulnerable communities makes them responsible for

overcoming decades of systemic disinvestment on their own (Perkins 2010). Thus, those who do not have time and money to contribute are further marginalized (Thompson). The time and effort required for upkeep is a frequent cause of burnout among volunteers working to improve environmental quality in their neighborhoods (Kinder; Foster, 2016). Lack of capacity is often explained as residents' failure to take an interest in and steward their neighborhoods (Brownlow, 2011).

Also, informal greenspaces may be ephemeral elements of the urban fabric, disappearing either due to the loss of volunteer stewards described above or the inability to secure permanent land tenure. The literature abounds with examples of informal urban gardens and parks lost due to development pressure in their neighborhoods (Smith and Kurtz; Drake and Lawson; Camps-Calvet et al.). Informal greenspaces are often seen as a temporary stop-gap until a “higher-order” economic land use becomes feasible and can potentially make vacant lots and neighborhoods more appealing to development (Cutts et al.; Guitart et al.). Given the many benefits that informal greenspaces provide, planners should consider methods to ensure redevelopment does not result in neighborhoods losing their greenspaces.

While urban greenspaces are almost exclusively promoted by academics, planners, and practitioners to provide positive benefits to residents, they can also serve as disamenities (Lyytimäki and Sipilä; Gómez-Baggethun and Barton; Roman et al.), especially when not maintained (Brownlow, 2006). While perceptions of, and preferences for, the amount of maintenance greenspaces receive vary among urban residents (Lyytimäki and Sipilä; Kinder), formal and informal green spaces that become overgrown through a lack of maintenance can be perceived as signs of neglect and lend negative stigmas to the neighborhoods they are located in (Foster and Newell; Rupprecht, Byrne, Ueda, et al.; Kinder; Riley et al.). In extreme cases, lack of care for and control of urban greenspaces can lead to fear of crime (Lyytimäki and Sipilä) and the avoidance of these areas by residents (Brownlow, 2006). In other words, urban greenspaces can serve as hazards instead of amenities if they are not maintained.

Despite the four challenges of IGS outlined above, it remains an essential amenity in a world that is urbanizing rapidly. Recognizing and minimizing the challenges will increase the urban quality of life and make cities more livable and just. The first step is documenting current conditions on the ground in cities to be incorporated into the planning process.

Methods

Study Area

Like many other North American cities, Philadelphia is seeking solutions to vacancy and sustainability challenges. Driven by deindustrialization, racial unrest, and other social and economic factors, the loss of many businesses and middle-class residents in the second half of the twentieth century eroded the city's tax base and left tens of thousands of parcels vacant. Philadelphia has started to rebound from these challenges. According to the U.S. Census Bureau (2011), the city's population grew in 2010 for the first time since 1950. However, the legacy of decades of decline has left the city with high concentrations of poverty, vacant land, and rampant inequality across the metropolitan area. Poverty and economic inequality persist in the urban core and broader region, with Philadelphia having the fourth highest Gini coefficient (a standard measure of economic inequality) among major U.S. cities (U.S. Census Bureau, 2012). Poverty and racialized minorities remain spatially concentrated (Adams et al.), and poorer residents pay higher rates for everyday goods and services (Fellowes and Katz). Field research on poverty alleviation in Philadelphia has explored methods of improving the quality of living by emphasizing the household economy and the value of jobs that respond to the everyday needs of household members (Yapa).

Philadelphia serves as an ideal urban greenspace case study due to the high numbers of vacant lots and the innovative efforts by the city and its residents to revitalize the city through greening. Philadelphia has several organizations and programs devoted to the cleaning and greening of vacant lots. One leading revitalization effort is the Philadelphia Land Care (PLC) program run by the Pennsylvania Horticultural Society (PHS) that works to clean and green the vacant lots

scattered throughout the city. Specifically, PHS was responsible for greening 5,763 vacant parcels with projects starting in the late 1990s. Research has found that the PLC program reduces differences in greenspace access, promoting environmental justice (Heckert). However, these programs could potentially lead to environmental gentrification, as greened lots were found to increase the property values of surrounding parcels (Heckert and Mennis).

The South Kensington and Olde Kensington neighborhoods were historically a mix of residential and manufacturing uses, including furniture manufacturers, breweries, and the Stetson Hat Factory, which employed 5,400 workers at its peak in 1915 (Snyder). Bounded on the West by 5th Street, on the North by Berks Street, to the East by Front Street, and to the South by Girard Avenue, our study area is approximately one-third of a square mile (Figure 1). Like much of Philadelphia outside of Center City, the area is still struggling with high vacancy levels and concentrated poverty. However, the area has recently seen a return of development, both residential and commercial, grew in population from 6,831 in 2010 to 7,852 in 2016 (a 15 percent increase) (U. S. Census Bureau 2010; U.S. Census Bureau 2016). Additionally, the median household income increased by over \$6,000 (a 17.5 percent increase) between 2010 and 2016 (U. S. Census Bureau 2010; U.S. Census Bureau 2016). These increases in population and median household income are significantly larger than those happening citywide, with Philadelphia seeing a 2.2 percent increase in population and an 8.9 percent increase in median household income between 2010 and 2016 (U. S. Census Bureau 2010; U.S. Census Bureau 2016). Like many areas with incipient or ongoing gentrification, the neighborhood is now home to a cluster of artist spaces and initiatives, including those that have relocated from elsewhere due to being priced out (Saffron).

While the revitalization of our study area brings many positives to residents, it also raises concerns surrounding gentrification and greenspace loss (formal and informal) discussed above. By documenting current greenspace, historic greenspace, and changing neighborhood demographics, we can better understand how to redevelop without

displacing current residents and losing greenspaces and their many benefits.

Study Area, South and Olde Kensington, Philadelphia

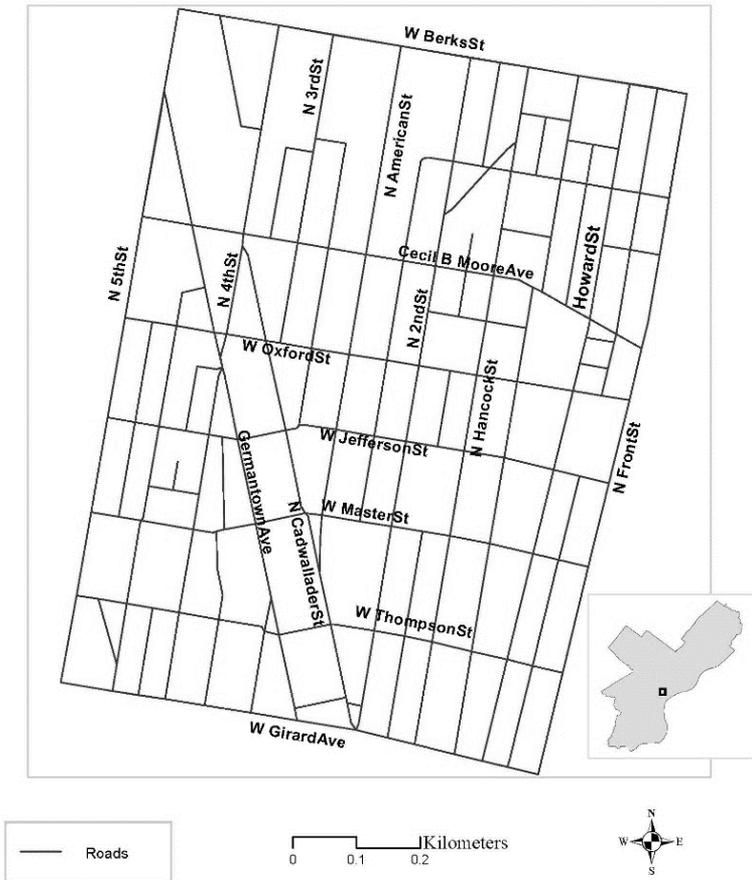


Figure 4: Study Area

Urban Greenspace Census

Google Earth has emerged as a popular remote sensing option due to its freely available high-resolution imagery and low technical barriers. Thus, part of our reason for choosing it to complete the urban

greenspace census was to create a methodology replicable by community groups, nonprofits, and activists that might have less access to resources and technical skills. Furthermore, historical aerial imagery availability allows for time series analyses, and compatibility with geographic information systems allows for more advanced geospatial and statistical analyses. Recent geographical research has utilized aerial and street view imagery provided by Google Earth to analyze urban environmental phenomena, including street trees (Berland and Lange), gardens (McClintock et al.; Oda et al.), and informal footpaths (Foster and Newell).

To conduct a census of greenspaces, we worked parcel by parcel through each block in the study area, using Google Earth Pro's Add Polygon tool to digitize each greenspace we found. Street View imagery was used to validate findings from aerial imagery, which was examined at a flat plane and an eye altitude of 700-850 feet. Parcel and block layers served as further reference data to aid the digitizing process. We also categorized the greenspaces based upon land use (vacant, residential, industrial, commercial, park, religious, educational, social services, and other), vacancy status (based upon lack of structures rather than residency), and whether they were formal or informal greenspaces (based upon evidence of maintenance). Greenspaces that stretched across multiple parcels of different uses were categorized based on the land use and vacancy status of the parcel containing the most significant percentage of the greenspace. To ensure accuracy between digitizers, we performed an inter-rater reliability evaluation by having each digitizer independently digitize thirty randomly sampled blocks and then compared the results. This analysis differs from previous IGS investigations in urban areas by conducting a complete census of a neighborhood rather than using a sampling scheme to estimate IGS for an entire city (Rupprecht and Byrne).

Ground Truthing Urban Greenspaces

To validate the remote sensing results, we confirmed each remotely sensed urban greenspace in the field. In August of 2019, in two teams of two, we walked each block of the study area to complete our neighborhood's urban greenspace census. For each block, the field

auditors had a printout of the aerial imagery that included any of the greenspace polygons identified via Google Earth Pro and a greenspace characteristics spreadsheet. Auditors confirmed greenspaces in the field, noted those lost and marked any changes in their spatial extents. Based upon visible signs of management, auditors classified greenspaces as formal or informal. We also confirmed the land use type and vacancy status for each greenspace in the field.

Results and Discussion

We documented 351 greenspaces in our study area in 2016, totaling 97,579 square meters, or 9.98 percent of the total study area (Figure 2). The average area per greenspace was 278 square meters, while the largest greenspace had an area of 11,516.4 square meters. The vast majority were IGS (243, or 69 percent), as was most of the greenspace area (75,209 square meters, or 77.1 percent). Informal greenspaces were, on average, considerably larger than formal greenspaces (309.5 square meters vs. 207.1 square meters). A significant portion of the study area—7.7 percent—was covered by informal greenspace.

In terms of land use, 193, or 55 percent of the greenspaces, were on vacant land, while 125, or 35.6 percent, were on residential parcels. On average, greenspaces on vacant lots were more than six times larger than those on residential ones (387.6 versus 61.3 square meters). Other notable findings from our land use analysis (Table 1) include the larger average size (758.6 square meters) of greenspaces on industrial land uses and the low percentages of greenspaces in the neighborhood that were formal parks (2.8 percent of the number of greenspaces, and 3.5 percent of the area). While we associate these formal parks with urban greenspace, there were almost twenty-five times as many informal greenspaces in our study area.

South and Olde Kensington, Philadelphia



Figure 5: Greenspaces of Olde & South Kensington (2016)

Land Use	N	N %	Area	Area %	AVG Area
Vacant	93	55	74800.3	76.7	387.6
Residential	125	35.6	7657.1	7.9	61.3
Industrial	11	3.1	8355.8	8.6	759.6
Park	10	2.8	3447.7	3.5	344.8
Religious	7	2	2268.7	2.3	324.1
Commercial	2	0.6	268.1	0.3	134.05
Other	2	0.6	243.5	0.3	121.7
Educational	1	0.3	538	0.5	538
Total	351	100	97579.2	100	278

Table 1: Land Uses of Greenspaces

Note: Area and average area are square meters

The greenspaces that we documented, informal and formal, provide a broad range of environmental and social benefits to Olde Kensington residents. Informal greenspaces were predominant (69 percent of those in the neighborhood), demonstrating their potential to increase greenspace accessibility and reduce environmental injustices. However, as discussed above, informal greenspaces also exhibit several challenges. The following reflects upon potential ways to maximize the benefits of IGS while minimizing the challenges.

First, IGS's many benefits can work to make neighborhoods more desirable, increasing costs of living and eventually displacing residents. One popular solution to this concern of environmental gentrification is the suite of strategies proposed to be "just green enough (JGE)," that will allow for neighborhood greening without accompanying cycles of gentrification (Curran and Hamilton, 2012; Wolch et al.; Gould and Lewis; Curran and Hamilton, 2018; Byrne et al.). JGE strategies include designing projects that fit the existing character of a neighborhood (Curran and Hamilton, 2012), keeping working-class jobs (Curran and Hamilton, 2012; Walks and Maaranen), and spreading several smaller parks throughout a neighborhood rather than introducing a large, marquee park (Wolch et al.).

Research has found that IGS is not inequitably distributed across urban spaces like formal greenspace, as such, it has been proposed as a strategy to slow green gentrification (Rupprecht and Byrne, 2018). Indeed, IGS aligns with several JGE strategies: it is (in our study area and other locations) primarily composed of smaller greenspaces dispersed throughout neighborhoods rather than centralized in spectacular parks with amenities that draw visitors from across a city, and IGS often fits the existing character of a neighborhood (Rupprecht and Byrne, 2018). More research should investigate the potential of IGS to reduce green gentrification.

Second, a group of challenges associated with IGS centers around the informal nature of the greenspaces themselves. Namely, the lack of proper management places heavy expectations on residents for their continued upkeep, securing permanent land tenure is often complicated, and finally, a lack of maintenance can cause them to become hazards rather than amenities. Negotiating these challenges is more complicated. On the one hand, formalizing informal greenspaces would shift management responsibilities from residents to institutions, permanently preserve greenspaces, and provide maintenance to ensure that they remain amenities. On the other, formalization may eliminate some of the freedom and flexibility that makes IGS relevant to residents (Campo; Rupprecht and Byrne, 2018).

As Rupprecht and Byrne (2014) argue, there is a continuum between formal and informal greenspace rather than a binary. We propose to split the difference, so to speak, by providing public resources to support the stabilization of informal greenspaces while leaving their design and management up to residents. In this way, green spaces can still be designed to meet current neighborhoods' needs rather than attract new, more affluent residents. City planners and officials would shift from designing new parks to redirecting money saved from formal design and management to support residents in informal management (Rupprecht and Byrne, 2018). Such partially formalized greenspaces would utilize the creative imaginaries of residents and the state's resources to develop more just and sustainable urban landscapes.

Conclusion

This study investigated greenspaces in the Olde and South Kensington neighborhoods of Philadelphia. We developed a replicable method for urban greenspace censuses that, due to low financial and technical skills requirements, is suitable for community and advocacy groups seeking to document neighborhood conditions. We used high-resolution aerial imagery to digitize greenspaces in Google Earth Pro and groundtruthed our remote sensing results through field audits.

We documented 351 greenspaces in our study area in 2016, totaling 97,579 square meters, or 9.98 percent of the total study area. The vast majority (69 percent) of these were informal greenspaces, which, on average, were considerably larger than formal greenspaces (309.5 square meters vs. 207.1 square meters). Very few (2.8 percent) of the greenspaces in our study area neighborhood were formal parks.

Our urban greenspace census results highlight the potential of IGS to increase greenspace access, address environmental justice concerns, and improve neighborhood quality of life. However, IGS also brings challenges and benefits, primarily revolving around the potential for spurring gentrification and the ephemerality of these often-liminal spaces. We argue that these challenges can be addressed by directing public resources to IGS while leaving residents in control of their design and management so that they can be preserved while retaining the local character and not encouraging gentrification.

While this research focuses on the City of Philadelphia, the results speak to concerns around the loss of urban greenspace and environmental gentrification in cities worldwide. Philadelphia's challenges in redeveloping neighborhoods without losing formal and informal greenspaces and displacing current residents are like those faced in other shrinking cities (Dewar and Thomas; Lawson and Miller; Herrmann et al.). Future research will explore urban socio-ecological change in more cities to develop a comparative approach that can generate best practices for redevelopment without displacement or greenspace loss. Future research will also include temporal analyses to understand how the amount of greenspace is changing over time and

how demographics are shifting as the neighborhood continues to redevelop rapidly.

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