




RESEARCH ARTICLE

From access toward sovereignty: A scoping review of municipal land access policies for urban agriculture in the United States

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Accessing land—and protecting that access—for the purpose of growing food and other agricultural products is a significant challenge in urban agriculture (UA), an issue exacerbated by racial and wealth disparities and high land values in cities. While local policies and programs supporting the use or sale of public land for UA have increased steadily since the early 21st century, limited research has examined the diversity, accessibility, and permanency of mechanisms facilitating land access and tenure. To address this gap, we compared the availability and characteristics of land access mechanisms across the 40 most populous U.S. cities. While 75% of cities employed at least one mechanism to facilitate land access, few (20%) offered multiple options. Mechanisms facilitating temporary use of public land for UA such as Adopt-A-Lot programs and city-run farms and gardens were more common than those enabling more secure tenure through long-term leases, land trusts, and simplified sales processes. Most policies and programs explicitly focused on local residents and nonprofit/community groups rather than for-profit entities. Nearly half (45%) of cities designed their land access mechanisms with a focus on equity or supporting underserved populations. Less than a quarter of cities offered subsidized water access, liability insurance, soil testing, or funding to complement public land access. The diversity of available mechanisms for facilitating land access underscores how different cities are enabling UA for different goals. Additionally, the incongruence between advocates' demands for land sovereignty and the mechanisms currently offered raise questions about the extent to which cities are advancing permanent land reforms or provisional interventions at risk of revocation. Our findings may be of use to policymakers and advocates who are creating, comparing, and adapting land access policies and programs to best address growers' needs and advance sustainable and equitable food transformations.

Keywords: Urban agriculture, Urban garden, Urban farm, Land disposition, Land access

1. Introduction

Land access is the top challenge cited by young farmers in the United States (Ackoff et al., 2017) and is a significant challenge as well for young or new farmers across the world including in Benin (Amegnaglo and Soglo, 2019), Canada (Laforge et al., 2018), the European Union (Zondag et al., 2015), Scotland (McKee et al., 2018), and Thailand (Faysse et al., 2019). Indeed, the United Nation's Sustainable Development Goal 2.3 includes "Secure and equal

access to land" as a key priority toward achieving zero hunger by 2030. Accessing land in cities—and protecting that access—for the purposes of growing food is no exception, especially amid the growing popularity of urban agriculture (UA). Although concerns about land access and tenure for UA have been raised in a few cities for decades (Boston Parks and Recreation Department, 2002; Schmelzkopf, 2002), the issue has been elevated in academic literature (Horst et al., 2017; Meenar et al., 2017) and

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practitioner resources (Winig and Wooten, 2013; Rosen et al., 2018). Local governments have begun addressing some of these concerns through establishing policies and programs to increase access to—and the tenure of—land used for UA concurrent with the growth of public policies to enable, regulate, or support UA (Halvey et al., 2021). As urban land is more expensive and limited than rural land, policies and programs to increase UA land access tend to concentrate on publicly owned land, where affordability can be controlled and green spaces may already exist or can be converted to UA sites.

Different options for facilitating access to public land have been described in the literature, and these options appear to vary significantly across cities in terms of formality, autonomy, and permanency. Some cities offer municipal community garden programs which incorporate farms and gardens into public park infrastructure, allowing residents to rent a plot on a season-by-season basis (Hodgson et al., 2011). Others provide temporary mechanisms, such as Adopt-A-Lot programs or streamlined short-term leases to allow residents to gain access to vacant land to practice UA (Witt, 2013). One well-recognized challenge of these temporary mechanisms is that the property on which UA operations are located is vulnerable to redevelopment (Horst et al., 2017; Meenar et al., 2017). Acknowledging that it can take years of labor, soil remediation, material and structural investments, and social network building to foster vibrant UA operations, some cities are pursuing longer-term land disposition solutions, whether through property purchase programs, long-term leases, or land trusts (Horst et al., 2017; Meenar et al., 2017). The diversity of land access options available reaches many different audiences, ranging from hobby gardeners to urban farmers seeking to make an income to resettled refugees from agrarian backgrounds. In some cases, small urban farms serve as an opportunity to train farmers to eventually scale up into larger operations either within or outside of the city.

Issues of power and equity manifest themselves in who has access to public land to produce food, and how that access is controlled. Researchers have documented disparities in access to land, government funding, and political support for UA efforts led by lower-income communities and/or Black, Indigenous, (and) People of Color (BIPOC) groups compared to those led by white and middle-class groups (Barraclough, 2009; Cohen and Reynolds, 2014; Poulsen, 2017). These are compounded by complex histories of land dispossession from Indigenous (Banner, 2007; Ruppel, 2008) and Black (Taylor, 2018; Francis et al., 2022) people in the United States. Building off the international La Via Campesina movement, these historical and ongoing inequities have spurred efforts in the United States, especially among BIPOC communities, to advance self-determination and food sovereignty to assure “the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems” (Declaration of Nyéléni, 2007). The politics around land access and property rights have been a key tenet of the food sovereignty movement, further expounded by Borras and Franco’s (2012, p. 6) framing

of land sovereignty as “the right of working peoples to have effective access to, use of, and control over land and the benefits of its use and occupation.” Although different than the agrarian reform politics advanced in the Global South, U.S. food and land sovereignty movements are increasingly incorporating community control of land into their priorities (Whyte, 2015; Roman-Alcalá, 2018; Glowa and Roman-Alcalá, 2020).

The literature discussing land access pertaining to UA is limited. Most academic studies focus on land tenure struggles in the context of individual cities. Winig and Wooten (2013) and Rosen and colleagues (2018) discuss various pathways to access land from different cities across the United States, though they do not quantify the prevalence of certain mechanisms offered across cities or the range of different land access mechanisms within individual cities. To our knowledge, no study has systematically gathered and compared the array of public land access mechanisms for UA available across cities.

To address this gap, we quantify the availability and characteristics of public land access mechanisms across the 40 most populous U.S. cities. The accessibility of these mechanisms, including application requirements and efforts to incorporate or prioritize equity considerations, are then examined. This research also explores the extent to which cities are augmenting access to public land with other support needed for growing on that land, including resources to address concerns about historical and present soil contamination, water access, and liability insurance. We conclude by discussing key themes and challenges observed across different policies and cities.

2. Methods

This analysis expands upon a previous examination of public policies related to UA from the 40 most populous cities in the United States as of 2010, which examined policies (including city plans and priorities, regulations, guidance, city-operated programs, and policy recommendations) related to UA published by municipal government, quasi-governmental entities, or independent organizations in partnership with municipal government (Halvey et al., 2021). For that analysis, policies were compiled between June 2019 and June 2020 through a combination of government web page and Google searches, using key search terms and inclusion and exclusion criteria detailed in Appendix A of Halvey et al. (2021). Government staff were contacted directly to verify that search results adequately represented UA policies in each city; in 43% of the cities, contacts replied and verified the policy compilations. As part of the broader examination, UA policies were coded based on whether they addressed one or more of 12 topics, including soil safety (Lupolt et al., 2022), animal husbandry, and public land access. One hundred and fifty public policies from 38 cities were identified that addressed the access or disposition of public property for UA use in some way (two cities did not include any policies addressing public land access). In that analysis, “public property” referred to land owned by government agencies or under tax liens; it excluded policies focused exclusively on accessing or encouraging the use of

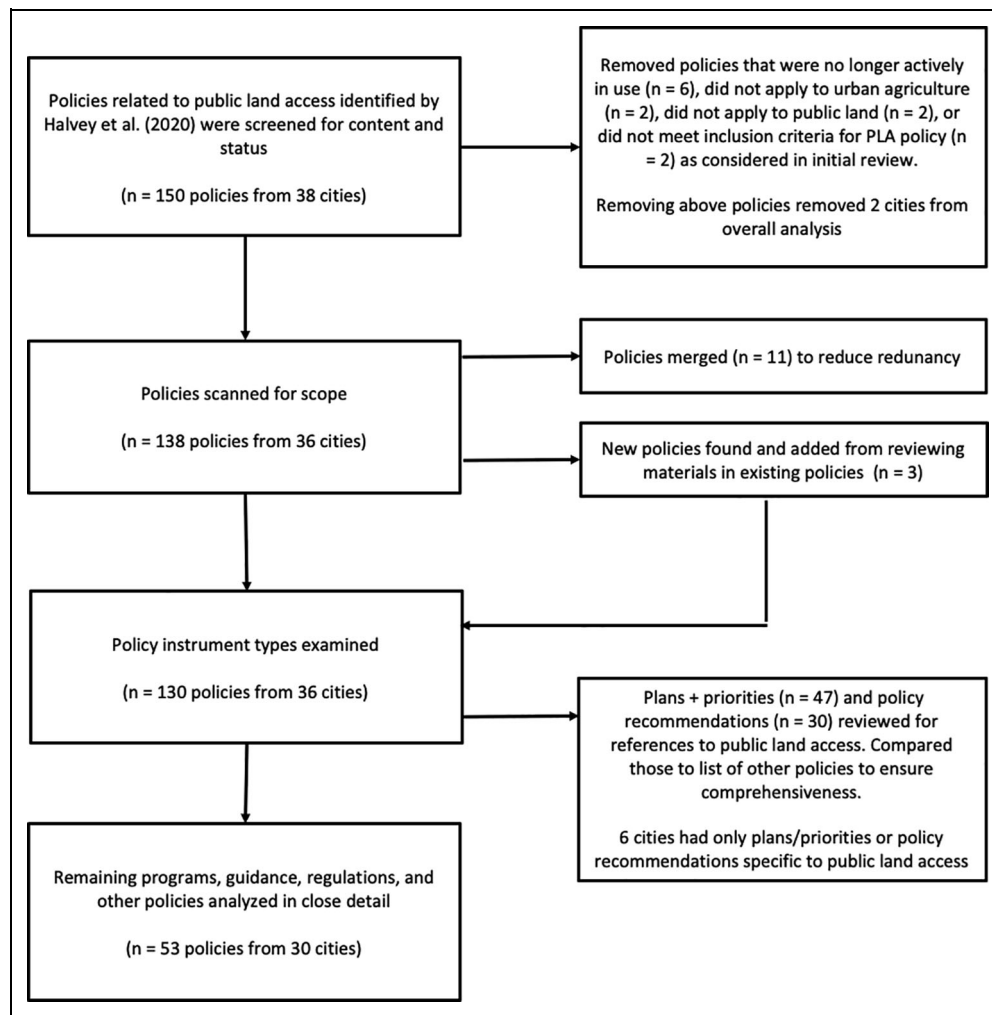


Figure 1. Flow diagram illustrating process for identifying public land access policies for analysis. This figure demonstrates the process for how policies identified by Halvey et al. (2021) as pertaining to public land access were screened for current status, inclusion criteria, scope, and redundancy. Of the 150 policies from 38 cities initially identified, 53 policies from 30 cities were selected to analyze in the current article.

privately owned land for UA, such as self-help nuisance abatement (Witt, 2015) or tax incentives for food production on private land, although many cities are also employing those mechanisms to increase land access. It also excluded policies from public entities that operate separately from municipal government agencies within a city (e.g., public school districts, public libraries).

For this current article, the original list of 150 policies from 38 cities that had been identified as having any content pertaining to accessing public land for UA were examined more closely. Twelve of these policies were removed due to not meeting inclusion criteria for the current study; removing these policies left 138 policies from 36 cities (two cities' only policies were removed) (Figure 1). Of the remaining policies, 11 were merged to reduce redundancy and 3 were added based on additional information learned from reviewing the other policies, resulting in 130 policies to be examined. Seventy-seven of these 130 policies from 31 cities were plans, strategies, or lists of nonbinding priorities (grouped together in the previous review as "plans or priorities") or "policy recommendations" which reference other

policies or programs to facilitate access to public land for UA. Due to the aspirational and unenforceable nature of many plans and policy recommendations, these documents were reviewed for all textual references related to existing or future public land access programs to ensure the city's offerings were adequately captured in the other policies for the city but were not analyzed further.

Only 30 cities had policies beyond the plans, strategies, list of nonbinding priorities, or policy recommendations pertaining to public land access. These 53 remaining policies (which had been classified as programs, guidance, regulations, or "other" policies in the previous review) were analyzed more closely to identify whom the policies were intended to serve, and the various mechanisms used to facilitate and support land access. Through an iterative process, we developed a form (Appendix B) to categorize each policy into seven "land access mechanism" types (Table 1) and document characteristics of each program. These characteristics included the intended audience and equity considerations, application and permitting requirements, costs, duration and renewability options, size and number of

Table 1. Emergent public land access mechanisms

Land Access Mechanism		Definition	Entity that Manages Administrative Operations	Legal Instrument to Access
Program	City-run farm or garden program	A program offering residents a plot to rent and grow food within a farm or garden on public land. In most cases, volunteer site coordinators and participants are responsible for day-to-day operations and maintenance, but city government staff support administrative tasks including plot registration, location selection, and public-facing information about sites.	City	Overarching site: n/a (owned and run by city) Access to individual plot within site: Permit or agreement
	Outsourced garden program management	A program connecting multiple food-producing farms or gardens on public land that is managed or coordinated by an external organization ^a on behalf of municipal government through a public-private partnership. In most cases, volunteer site coordinators and participants are responsible for day-to-day operations and maintenance, but partner organization staff support administrative tasks including plot registration, location selection, and public-facing information about sites.	Partner organization ^a	Public-private partnership between city and organization; land access agreements vary by city and include contracts, licenses, and leases
	Adopt-a-lot program (also known as adopt-a-plot or adopt-a-spot) ^b	A program that provides permission for groups or business to clean up and maintain a green space for a temporary period, typically developed as an interim land use with a revocable license agreement, cooperative agreement, or permit. Volunteer engagement and other administrative tasks are typically managed by the individual site.	Individual site	License agreement, cooperative agreement, or permit
	Land lease program	A program that provides exclusive access to public land, either via city government or a Land Bank, to be able to produce food for a certain period through a more formal lease arrangement. Volunteer engagement and other administrative tasks are typically managed by the individual site.	Individual site	Lease
Other mechanism	Land trust ^b	A land trust is a 501(c)(3) nonprofit organization whose mission is to preserve land for conservation or, in the case of a community land trust, to provide affordable access to land resources to a community. For the purposes of this analysis, only land trusts supported in some way by city government were cataloged.	Typically offered in conjunction with program above after site is established for certain period	Sale (to land trust) or conservation easement

(continued)

Table 1. (continued)

Land Access Mechanism	Definition	Entity that Manages Administrative Operations	Legal Instrument to Access
Land sale mechanism ^b	A mechanism to sell public or tax lien land to groups, individuals, or businesses by City government or a Land Bank for UA.	Individual site	Sale
Inventory of public land that could be used for UA ^b	Documented and/or mapped resource of publicly available land identified because of specific criteria that make it suitable for UA. These lands may be under government agency oversight or be tax lien properties and could be accessed through other mechanisms described above.	n/a	n/a

^aIn most cities with outsourced garden management, the same partner organization manages numerous sites for the city.

^bAlthough some land access mechanisms may be used for other purposes, only programs or organizations that explicitly mentioned growing food as a possible use of land were cataloged for this analysis.

sites (when applicable), and resource provisions or requirements. The form was piloted by two team members to ensure adequacy and consistency of data captured and further refined based on feedback from two external partners with experience in UA land access policies. Two researchers independently reviewed and cataloged the public land access programs; data associated with the reviewed policies were downloaded and differences reconciled by a third team member. During this final review of the policies, some fields which had not yielded many results were removed, while others were reframed or modified slightly to better represent the details found across all policies.

In reviewing the public land access policies, questions arose that needed clarification in 36 of the 38 cities. Team members identified and emailed or called city staff between September 2021 and August 2022 to ask the questions. Overall, staff in 27 (75%) cities provided responses to questions clarifying policy details or information about policy implementation. If no contact was made with city staff after at least two emails or voicemails, or the staff member did not know the answer to a question, the researcher noted the ambiguity or unspecified information in the final dataset.

The form to collect information about each policy was collected in Airtable. The raw data were reviewed, cleaned, clarified, and analyzed in Microsoft Excel. See Supplementary Data for the full dataset.

3. Results

We present our results by first quantifying the prevalence of land access mechanisms offered across all cities investigated, followed by a summary of key characteristics associated with each mechanism. We then examine the accessibility of these programs, including the scope of application and permitting requirements and

the extent to which program offerings are designed to address equity considerations. Lastly, we explore how cities both augment access to land acquired through these programs with resource provisions and limit the use of that land through certain restrictions and requirements, all within the scope of balancing the public benefits and burdens of UA in their cities.

3.1. Scope of public land access policies per city

Among the 36 cities with active policies pertaining to accessing public land for UA, 31 had plans/priorities or policy recommendations pertaining to public land access for UA and 30 offered mechanisms (city-run farm/garden programs, outsourced garden program management, Adopt-A-Lot programs, land lease programs, land trusts, land sales mechanisms, and inventories of land that could be used for UA) to specifically facilitate that access (**Table 2**). Six cities (Louisville, Memphis, Miami, Nashville, Phoenix, and San Antonio) had plans/priorities or policy recommendations related to public land access but no mechanisms to facilitate access. The most common land access mechanisms were outsourced garden program management (40% of cities with at least one land access mechanism), Adopt-A-Lot programs (40% of cities), and city-run farm/garden programs (37% of cities). Programs enabling more secure tenure through simplified sales mechanisms (23% of cities with at least one land access mechanism), leases (20% of cities), and land trusts (17%) were less commonly offered. Additionally, 23% of cities offered an inventory of available land that could be used for UA through one of its other land access mechanisms.

A few cities offered more than one land access program of the same mechanism type, often tailored for different audiences. For example, Detroit's Land Bank Authority offers three land disposition programs (categorized in this study as "land sales mechanisms") for UA: a community

Table 2. Land access policies per city

City, Ordered by Population Rank	Land Access Goals or Priorities Plan/Priorities or Policy Recommendations	Land Access Mechanisms						
		Programs				Other Mechanisms		
		City-run Farm/Gar-den Program	Outsourced Garden Program Management	Adopt-A-Lot Program	Land Lease Program	Land trust	Land Sales Mechanism	Inventory of Public Land Available for UA
1. New York City, NY	X		X	X		X		X
2. Los Angeles, CA	X			X				
3. Chicago, IL	X				X	X		
4. Houston, TX	X	X		X				
5. Phoenix, AZ	X							
6. Philadelphia, PA	X		X	X	X		X	
7. San Antonio, TX	X							
8. San Diego, CA				X				
9. Dallas, TX	X						X	
10. San Jose, CA	X	X						
11. Austin, TX	X			X				X
12. Jacksonville, FL			X					
13. Fort Worth, TX		Public land access not addressed in urban agriculture policies						
14. Columbus, OH				X				
15. San Francisco, CA	X	X						X
16. Charlotte, NC		Public land access policy originally identified did not meet inclusion criteria						
17. Indianapolis, IN	X	X						
18. Seattle, WA	X	X	X	X		X		
19. Denver, CO	X		X					
20. Washington, DC	X		X	X	X			X
21. Boston, MA	X				X		X	
22. El Paso, TX	X	X						
23. Detroit, MI	X						X	
24. Nashville, TN	X							
25. Portland, OR	X	X						X
26. Memphis, TN	X							
27. Oklahoma City, OK	X	X						
28. Las Vegas, NV		Public land access policy originally identified did not meet inclusion criteria						
29. Louisville, KY	X							
30. Baltimore, MD	X	X		X	X	X	X	X
31. Milwaukee, WI	X		X			X	X	
32. Albuquerque, NM			X					

(continued)

Table 2. (continued)

City, Ordered by Population Rank	Land Access Goals or Priorities Plan/Priorities or Policy Recommendations	Land Access Mechanisms						
		Programs				Other Mechanisms		
		City-run Farm/Garden Program	Outsourced Garden Program Management	Adopt-A-Lot Program	Land Lease Program	Land trust	Land Sales Mechanism	Inventory of Public Land Available for UA
33. Tucson, AZ		Public land access not addressed in urban agriculture policies						
34. Fresno, CA	X		X					
35. Mesa, AZ			X					
36. Sacramento, CA	X	X						
37. Atlanta, GA	X		X	X				X
38. Kansas City, MO	X			X	X		X	
39. Colorado Springs, CO	X	X	X					
40. Miami, FL	X							
Number of cities with each mechanism type	31	11	12	12	6	5	7	7

partnership program for nonprofit, faith-based, and community development organizations; a side lot program for individuals/entities seeking to purchase an adjacent side lot; and an economic development program for nonprofits and for-profit businesses seeking larger parcels of land. Public land not owned by the Detroit Land Bank Authority may also be purchased from the Detroit Building Authority and the Detroit Economic Growth Corporation through different processes. Because of the difficulty in distinguishing the number of programs within one city consistently across cities (e.g., some cities offer all options within the same umbrella program while others do not), we only analyze whether a city employs a specific land access mechanism.

Eight cities offered more than two types of land access mechanisms, with Baltimore providing the greatest variety and number (six) of land access mechanisms. Two cities (Detroit and Dallas) focused on land sales as their sole land access mechanism; others either focused exclusively on shorter-term access options or a combination of short-term and permanent mechanisms.

3.2. Summary of key characteristics of land access mechanisms across cities

While the land access mechanisms were inductively categorized through comparing how they offer land access (e.g., legal instruments, administrative responsibilities), they also differed in other characteristics such as who they focus on, the length of access, and costs to growers (Table 3).

Overall, most mechanisms explicitly focused on individual residents or households (81% of mechanisms that specified intended audiences) and nonprofit groups (54%) rather than for-profit entities (33%) or unincorporated community groups (33%). Individual residents or households were the typical intended audience for both city-run farm or garden programs and outsourced garden program management (Table 3), where residents/households are often able to adopt a plot in an existing site. In a few cases, these programs may only be open to certain residents (e.g., youth residents of the New York City Housing Authority for the Farms at NYCHA Initiative); however, most were open to anyone who lives, or in some cases works, within the city. Nonprofit organizations or groups sponsored by nonprofit organizations were the typical intended audience for Adopt-A-Lot and land lease programs, though some programs were also open to individual residents, unincorporated groups, or for-profit entities (Table 3). Some cities had separate application processes for nonprofit and for-profit entities, such as the Atlanta Grows-A-Lot program which distinguishes requirements for urban gardens and urban farms. Side lot programs were one of the most common land sales mechanisms, aimed at supporting individual households in purchasing an adjacent vacant lot. Cities which offered simplified mechanisms to purchase larger lots for urban food growing often allowed nonprofit and for-profit entities to apply, though in some cases eligibility for noncompetitive sales processes or certain grants was limited to only nonprofit entities.

Table 3. Intended audience, cost, and duration of land access mechanisms (N = 53)

Land Access Mechanism Type	Intended Audience				Annual Cost ^a	Typical Duration
	Individual Residents	Unincorporated Community Groups	Nonprofit Organizations or Groups	For-profit Businesses		
City-run farm or garden program (n = 12)	T	O	O	None	Plot fees for individual growers ^b : \$0–150 (median: \$39) Cost of maintenance, utilities, and so on included in fees	Plot access: 1 year Overarching site: n/a (owned and run by city)
Outsourced garden program management (n = 12)	T	R	R	R	Cost to partner organization for using land: \$0–100, although most cities don't specify Cost of maintenance, utilities, and so on is responsibility of partner organization	Plot access: 1 year, though two cities' terms are 2–3 years Overarching site: varies
Adopt-A-Lot program (n = 12)	O: Some cities allow individual household to adopt adjacent vacant side plot	O	T	O	Plot fees: Some sites with member plots require dues for individual growers ^b : \$0–150 (median: \$56) Cost for adopting lot: \$0–150 (median: \$0) Cost of maintenance, utilities, and so on is responsibility of site	One year, though two cities' license terms are 4–5 years
Land lease program (n = 6)	O	R	T	O	Plot fees: Some sites with member plots require dues (amounts variable/not specified) Cost of leasing lot: \$0–200 (median: \$63), although most cities don't specify Cost of maintenance, utilities, and so on is responsibility of site	3–5 years, though two cities' lease terms are only 12 months
Land trust (n = 6)	Depends on type of program above through which site was originally established				Plot fees: Some sites with member plots require dues (amounts variable/not specified) Cost of land trust membership: \$0–300 (median: \$1)	Some trusts require sites to renew agreement every 4–5 years Permanent sale
Land sales mechanism (n = 9)	T: Many cities allow individual household to purchase adjacent vacant side plot	R	O	O	Cost of side lots: \$41–1,000 Cost of larger lots: variable. Some cities offer 20%–33% discount off fair market price	

T = Typically (>75% of programs met that characteristic); O = Occasionally (25%–75% of programs met that characteristic); R = Rarely (less than 25% of programs met that characteristic).

^aAverage calculated only based on sites that specified cost.

^bMay also require or encourage volunteer hours.

Apart from land sales mechanisms, most programs allowing residents or groups to grow on public land cost less than \$200/year (**Table 3**). For city-run farm and garden programs, the cost of renting a plot includes maintenance, utilities, and sometimes other provisions from the city. In other programs, maintenance and utilities are typically the responsibility of the site and not included in the costs associated with accessing the land. Some programs noted the source of funding that allowed them to offer more affordable public land access. For example, the acquisition of the Rio Grande Community Farm (part of the Albuquerque Open Space Farmland Program) was funded through a 2-year sales tax increase (Rio Grande Community Farm, n.d.) and at least one-third of sites in the Seattle P-Patch Program have received funds from open space levies (a property tax increase approved by voters to fund parks, recreation, trails, and open space protection) for parks and green spaces (Glennie, 2020). Boston and New York City have supported many projects through federal Community Development Block Grants (CDBGs), which are offered by the U.S. Department of Housing and Urban Development to support community and economic development activities that benefit low- and moderate-income households, though that funding has decreased at times. In New York City, for example, the Greenthumb program used to be entirely supported by CDBG funding (Mees and Stone, 2012), but City tax levy funds now are used for gardens in neighborhoods that are ineligible for federal CDBG funding because of income level (The City of New York, 2019).

The duration of program offerings generally increased with the extent of formality of the legal instrument associated with the land access mechanism. City-run farm or garden programs and outsourced garden program management both typically offer plots to residents/households within an established site and operate on an annual basis (access is granted for 1 year and must be renewed annually). In the case of sites with outsourced garden program management, the length of contract, license, or lease that the city and partner organization maintain for the land for the overarching site varies by arrangement. Adopt-A-Lot programs also generally operate on an annual basis, though the legal instruments used (e.g., license agreement, cooperative agreement, or permits) do not necessarily provide legal protection and may specify that the city can revoke the access with relatively short-term notice (e.g., 30 days in Baltimore, 60 days in Philadelphia). For groups seeking a longer commitment, leases are typically offered for 3–5-year terms, though only six cities offered such a mechanism. There were no programs which offered standard lease terms over 5 years, although a few sites had successfully acquired longer-term leases outside of standard program terms in Albuquerque, Baltimore, Detroit, and San Jose.

If sites established through Adopt-A-Lot or lease programs cannot afford to purchase land for permanent ownership through a land sales mechanism, they may be able to apply for protection by a land trust. For example, Baltimore City Board of Estimates passed a policy in 2009 permitting the sale of public land used as community-

managed open space with demonstrated strong neighborhood benefits for \$1 to qualified land trusts (Baltimore City Office of Sustainability, 2010). Baltimore Green Space (BGS) is one land trust that provides this service to sites that have been maintained by community members for at least 5 years and meet other criteria for neighborhood and environmental benefits. BGS owns the site and the community members renew a management agreement with BGS every 5 years. Milwaukee provides an alternative example where one organization both provides outsourced garden program management and serves as a land trust. Groundwork Milwaukee's Milwaukee Grows Garden Network functions as "a single point of contact [to] streamline the process for establishing community gardens and sustainable urban agriculture on city land" (Groundwork Milwaukee, n.d.). After groups submit a seasonal garden permit to the city, they join the Network, acquiring liability insurance and protection from the land trust.

3.3. Accessibility of land access mechanisms

Beyond the availability of land access programs, outreach and accessibility is critical to ensuring their adoption and use. Forty-three (81%) land access mechanisms specified how growers (either individuals or organizations of growers) might access land, typically through an application process. The most common application components were plans around site design and planting, demonstrated community support (e.g., community petition, letter of support from a community association), and a budget or financial projections (**Figure 2**). The extensiveness of application requirements differed substantially, with the simplest applications for sites offered through outsourced garden program management and city-run farm and garden programs (requiring an average of 1 and 1.25 application components, respectively) and the most comprehensive application requirements for land lease programs (requiring an average of 8.5 application components). For example, city-run community gardens in Indianapolis, Sacramento, and San Francisco parks required only a name and contact information to join a site or a waitlist. By contrast, Washington, DC's Urban Farming Land Lease Program application required site design, maintenance, and community engagement plans alongside proof of funding sources and being in a good standing on taxes and other bills from the city.

Sixty-four percent of mechanisms described how people can start a new site on public land while 32% enabled people to join existing sites; 15% shared information around both ways of engaging. In the case of mechanisms to start a new site, some cities pre-identified public land available for UA either through inventories of suitable land from which interested applicants could then apply to use through one of the city's land access programs (e.g., Austin, New York City) or through competitive requests for proposals to lease or buy a specific site (e.g., Boston, Washington, DC). Some cities (e.g., Baltimore) ask interested parties to apply for a particular land access program first and then the city will work with them to find land. Others (e.g., San Diego, Seattle) describe a process for

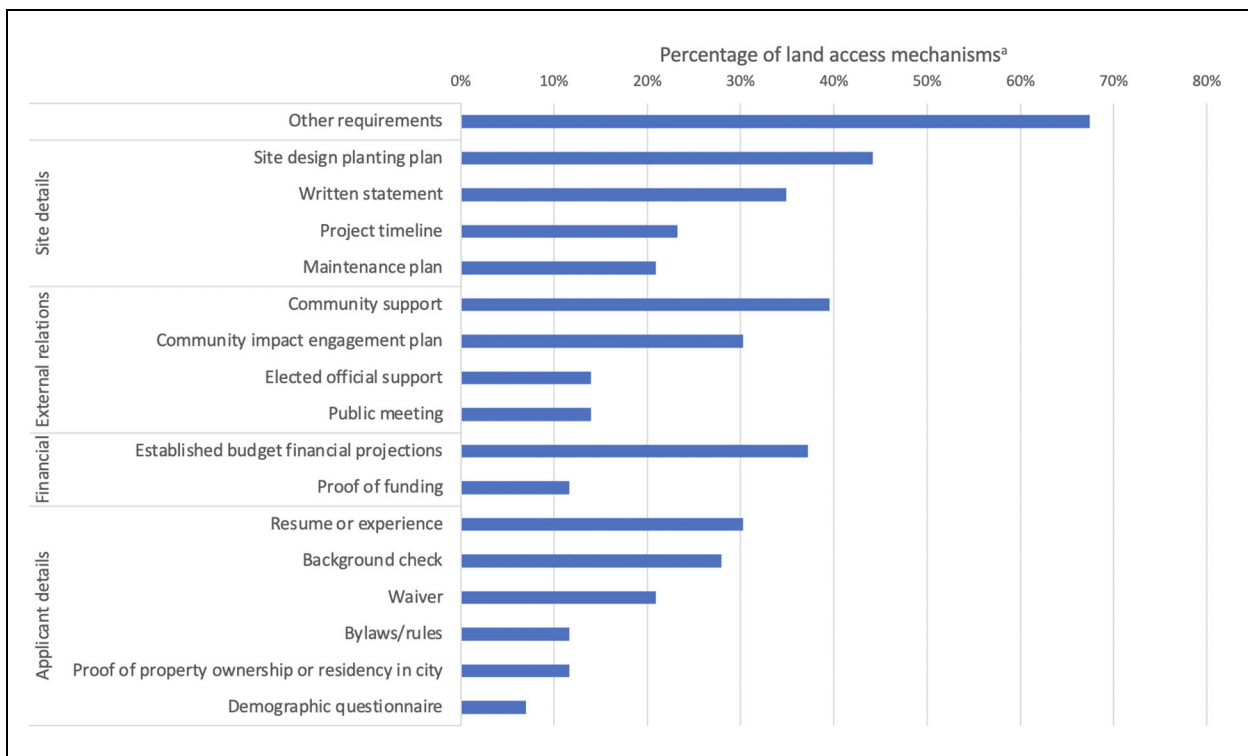


Figure 2. Land access mechanism application requirements. This figure illustrates the percentage of land access mechanisms that contain certain application components, including questions specific to the site or applicant, external relations, and financial details. ^aThis denominator includes only the 43 mechanisms that specify if/how to access them (whether by application, calling, etc.).

supporting individuals and groups who have independently identified public land they would like to use for the purposes of UA. And still others (e.g., Detroit) offer a mix of the above strategies.

Eighteen cities (60% of cities with at least one land access mechanism) incorporated equity considerations into at least one of their land access mechanisms. Fifty-three percent of land access mechanisms mentioned or prioritized accessibility for priority demographic groups, including for people with disabilities (36% of mechanisms), people with low incomes or who face food insecurity (22%), people of color (16%), women (11%), elderly or youth (7%), or for other groups (9%). Thirty-eight percent of land access mechanisms mentioned or prioritized accessibility based on geography (e.g., neighborhoods with low food access or low income). Additionally, 19% of land access mechanisms have integrated practices to foster equity such as by publishing program materials in languages other than English (11%) and offering anti-racism trainings to participants (7%).

3.4. Program operations

The development of UA operations, especially grassroots community efforts, often requires additional support beyond mechanisms to simplify land access. Some cities augment their land access mechanisms with subsidized resource provisions offered either by the city directly or by a city partner. Examining at the city level, 23% of the 40 cities examined offered subsidized water access, 20%

offered liability insurance, and 15% offered subsidized soil testing at least some of the time.

Twenty-four (45%) land access mechanisms provided details about water access and costs; of these, seven provided discounted municipal water use, five provided free municipal water use, six included water use costs in their annual plot fees, and one provided a free cistern with one fill up of water each year. Some cities also clarified if and how they supported the installation of water systems. For example, New York City's GreenThumb program provides free water usage to sites but requires sites to secure funds to install water systems (including through requests to elected officials). By contrast, a grant from the City of Atlanta's Mayor's Office of Resilience helps pay for water meter installation at urban farms and gardens, but it is unclear if sites must pay for the cost of water usage.

Twenty (38%) land access mechanisms specified whether liability insurance was required or optional. Of these, nine offered liability insurance through a city partner and one included its coverage in the garden fees. An additional six mechanisms required UA groups to carry liability insurance but did not provide or subsidize it.

Eighteen (34%) land access mechanisms discussed soil testing to alleviate concerns about potential contamination. Of these, 12 required testing either soil at the site or soil brought in from outside sources in at least some circumstances. An additional three mechanisms recommended but did not require soil testing. Three mechanisms featured free soil contaminant testing at least some

Table 4. Rules and restrictions of public land access mechanisms (N = 53)

Management Practices	Permitted, with Restrictions in Some Cases			Restricted, with Excep- tions in Some Cases		Not Specified
	Allowed	Recommended	Required	Discouraged	Prohibited	
<i>Types of products grown/raised</i>						
Composting	14	8	5	0	0	26
Hardscaping	16	0	0	0	3	34
Beekeeping	10	0	0	0	4	39
Chicken husbandry	9	0	0	0	3	41
Other livestock husbandry	6	0	0	0	3	44
<i>Pest management practices</i>						
Organic growing practices	0	6	14	0	0	33
Integrated pest management	0	3	6	0	0	44
<i>Other management practices</i>						
Planting pollinator-attracting perennials and native plants	1	3	3	1	0	45
Pollution runoff control	3	3	5	0	0	42
Water conservation	1	8	7	0	0	37
Onsite food sales (e.g., farm stands)	10	0	0	7	5	31
Offsite food sales (e.g., farmers markets, Community Supported Agriculture)	7	0	0	6	4	36
Pets	6	0	0	0	9	38

of the time but not necessarily for all sites on public land. An additional three mechanisms included provisions for soil contaminant testing at a discounted or free prices by city partners. Of the eight mechanisms with descriptions of what would happen if soil tests revealed unacceptable levels of contaminants, four required growers to plant in raised beds and to implement other practices for reducing soil exposure, two required remediation, one did not permit continued UA development on the site, and one did not permit the continued use of contaminated soil brought in from offsite.

We also examined the extent to which public land access mechanisms placed rules or restrictions on how the land could be used by growers. It was difficult to discern whether restrictions or requirements around management practices differed from the city's overarching zoning restrictions related to UA. As a result, we documented any rules/requirements that were mentioned in documents and resources related to the land access mechanism, even if they applied to all UA operations in the city (**Table 4**). The most commonly required practices were organic growing methods (required by 26% of mechanisms and recommended by another 11%) and water conservation methods (required by 13% of mechanisms and recommended by another 15%). The most commonly restricted practices were having pets onsite (prohibited by 17% of mechanisms) and onsite and offsite food sales (prohibited or discouraged by 23% and 19% of mechanisms each, respectively).

Notably, only 23% of sites explicitly permitted the sale either onsite or offsite of the foods grown on the land accessed through the mechanisms analyzed. Some programs also required other practices such as a minimum number of hours the site is open to the public per week or a minimum number of volunteer hours by participants. Specific provisions around growing practices (e.g., composting, hardscaping, integrated pest management, organic growing practices, stormwater runoff prevention, water conservation, pollinator protection practices), animals on premises (e.g., pets, livestock), food sales, accessory structures, and other management practices for each mechanism analyzed are provided in the supplementary data file.

4. Discussion

This research demonstrated a wide variability of approaches to facilitating land access for UA across the 40 most populous U.S. cities. This diversity underscored how different cities are enabling UA for different goals. For example, many cities focus on offering programs in which residents can gain seasonal access to small plots for household use but not necessarily sizable agricultural production. While such mechanisms can support the socio-cultural and household food security benefits of UA, other cities are embracing the entrepreneurial and broader food access potential of UA through emphasizing land sales and lease mechanisms for larger-scale UA projects.

Among the specific cities offering at least one land access mechanism, 87% offered a mechanism that typically entails 1 year of access at a time (e.g., city-run farm or garden program, Adopt-A-Lot program, or outsourced garden program management). By contrast, only 37% of cities offered a mechanism that typically entails longer-term access (e.g., lease program, land trusts, or sales mechanisms). Within the land lease programs, there were no examples of programs with standard lease terms over 5 years, even though capital investments like hoop houses and soil remediation may not be worthwhile for shorter leases. While lease-to-own models are one pathway used to facilitate farmland access outside of cities (Land for Good, n.d.; Vermont Law School Center for Agriculture & Food Systems, n.d.), we did not find an example of such a mechanism in the 40 cities examined. Concerns about the temporary and revocable nature of short-term land access mechanisms raise questions about the extent to which almost two-thirds of the cities examined can meet the needs of growers who are seeking longer-term stewardship opportunities.

Echoing findings by Halvey et al. (2021), accurately finding and documenting available land access mechanisms proved to be one of the key challenges of this research. Many of the cities' land access mechanisms were listed on different websites with different staff contacts who did not necessarily have information available about all city offerings if potential growers were confused about which program might best fit their needs. Moreover, while some cities had comprehensive application processes for their land access mechanisms, others offered public land for UA use on an ad hoc or informal basis (about which they shared varying degrees of information publicly). The accessibility and potential burden of submitting a complex formal application must be weighed against the challenges of navigating a landscape of ambiguous, though potentially simpler, backdoor processes that may only be known to a few people or organizations. Such considerations are crucial in light of many cities' initiatives to create equitable access to land for UA.

These challenges were compounded by the difficulty in determining the extent to which some of the publicly listed mechanisms were still active. In the case of land inventories, for example, we identified several cities that had developed inventories but did not continually maintain them for long-term use (e.g., Boston, Seattle). Other cities (e.g., Indianapolis, Nashville) maintained web pages describing a land access program, but upon further investigation or contact with city staff we learned the program was no longer open to new applicants. Our results indicate a need for more support for local governments to regularly update public-facing websites and materials, in addition to improved coordination across government agencies. Lastly, a comprehensive portal explaining all of a city's resources available for UA, including land access mechanisms, would go far to support growers' success.

There was also some opacity regarding which types of UA operations particular policies focused on. For example, some mechanisms specifically mentioned community gardens in their documents but may be open to other forms

of UA such as commercial urban farms too (e.g., Dallas' Urban Land Bank Demonstration Program, Chicago's NeighborSpace, Baltimore Greenspace). Although there is a spectrum of UA operation types with varying models of public land access that best fit their needs, cities should be clearer about the intent and audience of their policies from the start. Furthermore, the authorized management practices associated with land access mechanisms should be clearly defined and adaptive based on the type, scale, and extent of agricultural use and accessory functions (e.g., composting, herb drying, beekeeping), as with broader municipal land use and zoning policies for UA (Bennaton, 2019).

Most of the land access mechanisms analyzed in this research align with what Glowa and Roman-Alcalá (2020) have classified as either "civic" UA land politics, grounded in the modernist dichotomy between public and private property rights, or "market-oriented" UA land politics in which UA is supported for its entrepreneurial and temporary nature within broader urban development strategies focused on putting land to its "highest and best use." Echoing the findings by Glowa and Roman-Alcalá (2020), while we were collecting and reviewing policies for the current analysis, we also observed a growing number of organizers from BIPOC communities leading renewed justice-driven efforts to shift the focus of land access initiatives from preserving green spaces to fostering food and land sovereignty, community self-determination, and racial and economic justice. In Baltimore, the Black Yield Institute and Farm Alliance of Baltimore led community conversations to develop policy recommendations around increasing community control of public land for UA as a form of reparations for historical and residual inequities in land ownership (Black Yield Institute and Farm Alliance of Baltimore, 2021). Philadelphia's Parks and Recreation Department contracted with a Black- and Brown-led coalition of growers and a city planning firm to co-create a UA plan detailing how the city will support UA through long-term land access and other services designed and implemented with an anti-racist lens (Jaramillo, 2021; The City of Philadelphia, 2023). Meanwhile, a City of Detroit working group formed in 2019 to streamline land purchasing and permitting processes for UA and other land-based projects (City of Detroit, 2022). A coalition of local food sovereignty advocates have also launched fundraising efforts to rebuild intergenerational Black land-ownership through the Detroit Black Farmer Land Fund. The efforts underway to change land access policies in Baltimore, Philadelphia, and Detroit are emerging, and thus were not reflected in the current analysis of existing policies but offer inspiration for more equitable expansion and restructuring of public land access mechanisms. Additional changes underway to programs in Chicago, Indianapolis, and Phoenix—including those not necessarily focused on equity—demonstrate that this research represents a snapshot in time given the constant evolution of UA policies and programs.

This research only examined the presence and characteristics of land access mechanisms in the 40 studied cities. The governance mechanisms through which these public

land access policies and programs are created and implemented could be further examined, including how these policies and programs are administered and funded, how public land is allocated, and who is included in the decision-making processes. A more thorough analysis of facilitators and barriers to the implementation of these land access mechanisms is also warranted. For example, based on our findings, it appeared that some of the more comprehensive programs had only established a few sites thus far, such as the land lease programs in Baltimore and Washington, DC; what is inhibiting their more widespread use? Are implemented programs sufficiently shared with the public, and are budgets allocations of staff time enough to do that outreach? Future research could also explore how other variables such as the density and land scarcity of cities may influence the extent of land access mechanisms offered. For example, are long-term land lease and land sales mechanisms more commonly offered by cities that have relatively large swaths of vacant land available? More research could be done on the extent to which these city programs have provided the foundation for urban farmers to scale up to larger amounts of acreage with long-term land tenure, commercial viability, and organizational sustainability. Qualitative analyses could further explore the challenges growers face in accessing land and how they were overcome. Lastly, in reviewing plans, priorities, and policy recommendations, we found that many official goals or priorities for adding or expanding land access mechanisms have not been implemented. Though possibly due to various reasons such as funding availability and shifting priorities due to the COVID-19 pandemic, it highlights the need to monitor policy and plan implementation.

5. Conclusion

For UA operations to continue to grow and expand, their viability will hinge to a large degree on the availability of mechanisms that reduce the burden of higher city land values and operational costs. Furthermore, affordable land access mechanisms, especially for those with fewer resources, can help provide opportunities for growing food that would otherwise be untenable for many residents. These findings provide a foundation for policymakers and advocates to create, compare, and adapt policies and programs to achieve their priorities for fostering increased public land access. Although this article is focused on the 40 most populous cities in the United States, elements of these mechanisms exist in similar forms in other countries, and land access for UA is a concern around the world.

The limited availability of public land for UA has necessitated careful structuring of land access mechanisms to ensure they achieve their desired outcomes. In many cities, policies have been designed to ensure public land is managed in ways that foster positive community and environmental benefits. Some cities require growers to submit detailed site management, financial, and community impact plans as forms of means testing to help ensure resources are directed toward efforts with sufficient individual and community investment. At the same time,

these requirements must be balanced with an eye toward accessibility for those with the least resources or power. Prioritizing access based on race, income, disability, age, and geography provides opportunities to correct systemic disparities, though longer-term land security opportunities are required to realize the food and land sovereignty that advocates demand.

Affordable land access alone is not necessarily sufficient to make UA operations viable indefinitely. Water access, soil testing, liability insurance, and other material and labor investments can also be expensive but necessary components of UA. For example, the cost of installing irrigation systems and using municipal water, with municipal water prices being higher compared to rural areas, present common economic and technical issues for urban growers (Wortman and Lovell, 2013; Drake and Lawson, 2015). Testing urban soils for contaminants may help protect growers from exposure to harmful metals and is in some cases required through citywide or program-specific policies (Lupolt et al., 2022), though may become cost prohibitive for some operations. As demonstrated by the mechanisms analyzed in this article, some cities and their partner organizations are working to supplement these needs by providing subsidized access to irrigation water, soil testing, and liability insurance, though the proportion of cities providing such support is still relatively small. Many city public land access programs have infrastructure through other agencies to support growers with municipal compost and rainwater harvesting support as well. These become important when considering operational costs, helping to increase efficiencies and conserve natural resources, whether for for-profit or nonprofit operations.

The implementation of public land access mechanisms relies heavily on cities budgeting sufficient agency staff time and supplies for successful program design and outreach. Our observation that numerous cities had identified goals around increasing public land access for UA in official plans but not necessarily created or implemented mechanisms to foster such access illustrates a gap to be addressed between city priorities and actions. Furthermore, the fact that details of many mechanisms were only understood through intensive investigative efforts illustrates more resources are needed to consistently communicate available land access opportunities to the public.

Mechanisms to support public land access for UA are often part of a broader municipal approach to advancing community food security and municipal greening. Although not analyzed in this article, some cities are incentivizing the development of farms and gardens, edible landscaping, green roofs, and other forms of UA on land and buildings owned by private entities too. Cities may also pursue other municipal greening efforts such as urban forestry, organic and food waste reduction, enhanced stormwater management, and improvements to the built environment. The diversity of public land access mechanisms analyzed herein demonstrate pathways toward helping make UA land uses a public good to provide the pluralistic public benefits UA is intended to achieve.

Data accessibility statement

A dataset of land access policies and their associated characteristics was generated and is uploaded as online supplementary data.

Supplemental files

The supplemental files for this article can be found as follows:

Land access policies. Xlsx

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Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

Author contributions

Contributed to conception and design: RES, SNL, RCB, KEN.

Contributed to acquisition of data: RES, KMU, RCB.

Contributed to analysis and interpretation of data: RES, SNL.

Drafted and/or revised the article: RES, SNL, RCB, KEN, KMU.

Approved the submitted version for publication: RES, SNL, KMU, RCB, KEN.

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Knowledge Domain: Sustainability Transitions

Part of an Elementa Special Feature: Land and Sustainable Food Transformations

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