

# Society & Natural Resources

## An International Journal

ISSN: (Print) (Online) Journal homepage: [www.tandfonline.com/journals/usnr20](http://www.tandfonline.com/journals/usnr20)

# City Limits: Urban Nature Rules and the Role of Civic Engagement in Minneapolis—St. Paul Metro Area, USA

Meghan R. Klasic, Kristen C. Nelson, Forrest Fleischman & Claire Lister

**To cite this article:** Meghan R. Klasic, Kristen C. Nelson, Forrest Fleischman & Claire Lister (2024) City Limits: Urban Nature Rules and the Role of Civic Engagement in Minneapolis—St. Paul Metro Area, USA, *Society & Natural Resources*, 37:10, 1471-1490, DOI: [10.1080/08941920.2024.2378286](https://doi.org/10.1080/08941920.2024.2378286)

**To link to this article:** <https://doi.org/10.1080/08941920.2024.2378286>

 View supplementary material 

 Published online: 22 Jul 2024.

 Submit your article to this journal 

 Article views: 89

 View related articles 

 View Crossmark data 



# City Limits: Urban Nature Rules and the Role of Civic Engagement in Minneapolis—St. Paul Metro Area, USA

Meghan R. Klasic, Kristen C. Nelson, Forrest Fleischman, and Claire Lister

Department of Forest Resources, University of Minnesota—Twin Cities, St. Paul, MN, USA

## ABSTRACT

Formal rules define urban governance, yet in democratic systems like the United States, institutions governing public input shape decision-making. Governance literature needs more breadth on how civic engagement varies across types of nature and its implications for urban social-ecological systems. We analyzed five cities' ordinances within the Minneapolis-St. Paul metropolitan region, identifying nature-based rules and civic engagement mechanisms. We found ten engagement mechanisms across six nature types, primarily discussed within zoning ordinances—farm animals being the exception. Public hearings were the most frequently mentioned engagement mechanism, yet they have documented biases toward elite perspectives. Despite codification of engagement opportunities, it remains unclear whether utilized mechanisms support substantive input and influence into urban nature governance. Our study not only lays groundwork for research on how to address the inequitable distribution of nature-related benefits and burdens felt by some urban communities, but also inspires further exploration into this crucial area of study.

## ARTICLE HISTORY

Received 30 August 2023

Accepted 14 May 2024

## KEYWORDS

Governance; institutions; local regulations; Minneapolis—St. Paul; municipality; zoning

## Introduction

Civic engagement can foster diversity and inclusion in urban governance, which may support more equitable distribution of benefits from nature. Civic engagement also upholds the democratic process and allows for the integration of place-based experiential knowledge (Day 1997), and thus may help address social, economic, and environmental injustices (Chetty et al. 2014; Corbett and Le Dantec 2018) and achieve better decision implementation and environmental outcomes (Newig 2007; Wagenet and Pfeffer 2007). Civic engagement in the management of urban nature is determined by formal rules, and in city ordinances that define how civil society can be involved in managing different aspects of city life, from zoning to business licenses to emergency response. While much research exists on civic engagement in city governance (e.g. Farkas 2012; Fraser 1990; Robbins 2007; Simmons 2007; Young 2000), more research on engagement within city governance of nature is needed. This paper aims to fill this gap by examining city ordinances about civic engagement with nature in five municipalities in Minnesota, USA.

**CONTACT** Meghan R. Klasic  [klasic.meghan@epa.gov](mailto:klasic.meghan@epa.gov)  U.S. Environmental Protection Agency, Office of Research and Development, Great Lakes Toxicology and Ecology Division, 6201 Congdon Blvd. Duluth, MN 55804, USA.

 Supplemental data for this article can be accessed online at <https://doi.org/10.1080/08941920.2024.2378286>.

© 2024 Taylor & Francis Group, LLC

We broadly define urban nature to include trees, lawns, stormwater, wildlife, etc. on public and private land within a city's boundaries. Nature-related city ordinances determine how aspects of nature are managed and who has a say in how that nature is managed. Rules about urban nature management processes affect who benefits and who is impacted by nature-related decisions. Relatively little is known about how civic engagement is formalized within ordinances about nature or how these engagement mechanisms vary across types of urban nature (e.g. trees, water, wildlife). To address this gap, we examine the civic engagement mechanisms discussed in city ordinances to understand civil society's role in nature-related decision-making, how this role varies across types of nature, and how formalized civic engagement facilitates or undermines the inequitable distribution of nature benefits and burdens.

### ***City Governance***

Decision-making at the city level is controlled through bylaws, regulations, and ordinances detailing permitted and prohibited actions, enforcement mechanisms, and governance processes. In the United States, city ordinances are publicly available documents outlining local regulations and requirements to be implemented within the city, county, village, or town. Ordinances are legally binding sets of rules describing who has decision-making authority and to what degree. Rules cover various topics like governance structure, human health and safety, parks and environmental management, and zoning. Ordinances define how residents can and should be involved in decision-making. For example, a city's ordinances may require a public hearing on establishing new zoning ordinances to hear about the proposed changes and offer evidence for or against the proposed actions (League of Minnesota Cities 2024). In democratic systems, city ordinances are dynamic and influenced by input and discussion, such as through public hearings. The process for enacting ordinances is determined by the state and/or by a locally approved charter and involves discussion within the city council or specialized committees, before being subject to a public hearing, and ultimately being approved or rejected by the city's administration (StateScape 2023).

Zoning ordinances are the most common approach to urban planning in the United States (Maantay 2001); they describe the geographical organization of lands and waters within a defined boundary. Ordinances control land uses and spacing by dividing cities into zones and explaining required actions associated with development and redevelopment, while protecting human welfare. Zoning ordinances prescribe how residential, agricultural, and other lands should be managed, and explicate requirements and recommendations about landscaped and green spaces, impervious surfaces, and conservation (Arendt 2013). Understanding how civil society is integrated into formal institutions like ordinances can highlight opportunities for developing more equitable urban governance decisions.

### ***Civic Engagement in City Governance***

Scholars define civic engagement in many ways. We prefer Adler and Goggin (2005, 241): "...how an active citizen participates in the life of a community in order to

improve conditions for others or to help shape the community's future." City civic engagement may be done through formalized policy or informal channels and social norms. Neighbors may have unwritten or unspoken (informal) expectations on how frequently lawns should be mowed, while a neighborhood association may have rules dictating the maximum allowable height for grass (formal). Enforcement is prompted when formalized rules are broken, like a written warning or fine. We focus on a subset of formal institutions, called city ordinances, that outline expectations of civil society within the city's boundaries. We examine how and where, in ordinances, civic engagement is discussed about urban nature.

The importance of civic engagement in city governance processes is debated across urban planning and governance (Fagotto and Fung 2006; Holden 2011), public administration (Callahan 2007; Irvin and Stansbury 2004; Molokwane and Lukamba 2018), collaborative governance (Gollagher and Hartz-Karp 2013; Scott 2015; Sønderskov 2019), and environmental justice (Bulkeley, Edwards, and Fuller 2014; Wilson, Heaney, and Wilson 2010). Civic engagement allows decision-making to reflect diverse perspectives (Bush and Doyon 2017; Pellizzoni 2003; Steele 2001), build trust and compliance (Bulkeley, Edwards, and Fuller 2014; Herian et al. 2012; Sabatier et al. 2005), promote learning (Gerlak et al. 2018), and may result in improved socio-environmental outcomes (Biddle and Koontz 2014; Newig 2007). If too many voices are at the table, conflict may increase, breaking the collaborative governance process (Klasic and Lubell 2020). Civic engagement takes time and can be expensive to do meaningfully (Nabatchi et al. 2012). Still, in the United States, civic engagement remains a priority for city governments (Innes and Booher 2004; Jager et al. 2020; Jun 2013; Portney 2005) and is supported by state and federal programs (Hui, Ulibarri, and Cain 2020).

A major focus of civic engagement research is understanding different engagement types. Arnstein's (1969) participation ladder aligns engagement types with the levels of power a citizen has in decision-making. On the bottom rung, citizens are not involved, while on the top rung, citizens are actively engaged. Thomas (1995) produced a similar model to represent decision-making autonomy; the bottom step indicates the public is not involved in decision-making and the top step represents decision-making informed by broad public consultation. In another framing, Timney (1998) shows engagement as three models, including active citizens (ownership of the process), passive citizens (engagement as a formality), and transitional citizens (shared ownership and engagement). A commonality across models is that civic engagement is a continuum ranging from minimal to maximal participation and authority in decision-making. At the minimal end, civic engagement reflects one-way information sharing where individuals have no authority in the decision-making process.

Conversely, individuals may have sole authority over decision-making (Bishop and Davis 2002; Epting 2020; Scavo 1993; Tadili and Fasly 2019). In between, civic engagement reflects debate and collaboration between civil society and government, like through community meetings or co-production (Edelenbos 2000; Singh et al. 2021). Engagement models focus on the two extremes (non-engagement, fully active engagement), despite most forms of engagement occurring somewhere in between (Callahan

2007). Thus, we set out to identify the nuances of engagement mechanisms formalized in city ordinances.

Recent civic engagement scholarship examines the legitimacy of the decision-making process. Legitimacy includes representation and inclusivity, acceptance of the decision, and fairness; these concepts are fundamental in formal institutions like city ordinances because decision-makers have been elected to represent the public's interest. Engagement is pointless if it does not influence outcomes (Paavola 2007). Procedural justice literature mirrors this idea, arguing for representation and inclusive and substantive roles in transparent decision-making (Koski et al. 2018; Siddiki, Kim, and Leach 2017). City governance is relevant to analyses of just civic engagement because it purports to be *closer to the people*; the small decision-making sphere may increase government accountability (Manor 1999) and allow society to discern whether the government is meeting its expectations (Montalvo 2009). Regardless of the decision made, civil society will be more accepting of the outcome if they deem the decision-making process as fair and legitimate (Johansen et al. 2022).

Formal institutions and civic engagement scholarship evaluate and seek to increase civic engagement levels. For example, Piette (1990) examined formal institutions of engagement in the context of Community Health Councils and the fluoridation of water supplies in England and Wales. Piette (1990) concluded that early engagement in decision-making leads to increased societal representation, social learning, and acceptance of decision outcomes. In the U.S., a study of Milwaukee's Neighborhood Strategic Planning process showed that community organizations may leverage formal rules of civic engagement to address power imbalances in decision processes (Ghose 2005). In Norway, studies examining the Norwegian Planning and Building Act's requirement to integrate engagement in city planning processes show that 67% of cities reported implementing only the minimum engagement requirements (Hanssen and Falleth 2014; Ringholm, Nyseth, and Sandkjaer Hanssen 2018). While more traditional engagement mechanisms like public hearings were prevalent, Ringholm, Nyseth, and Sandkjaer Hanssen (2018) found indications that more innovative mechanisms like workshops and charrettes were used but not reported on in the literature. More recently, Kilbane and Roös (2023) found that charrettes are useful tools that "...offer time-sensitive planning and design response to the creation of sustainable and resilient cities and landscapes" (239).

Traditional formal engagement mechanisms like public hearings and comments are often institutionalized in natural resource management contexts in the United States. However, studies argue that these traditional approaches do not facilitate meaningful engagement (see for example, Applegate 1998; Konisky and Beierle 2001; Yosie and Herbst 1998). When traditional mechanisms are employed local planning processes often report low engagement numbers and a lack of representation (Huxley 2000; Young 2000). Put aptly, Innes and Booher (2004, 419) argue that "Most of these [traditional engagement] methods discourage busy and thoughtful individuals from wasting their time in going through what appear to be nothing more than rituals designed to satisfy legal requirements." As a result, city governments worked to codify new, more deliberate, and legitimate engagement mechanisms in decision-making. Two examples are citizen juries and roundtables.

## ***Civic Engagement in Urban Nature Governance***

Urban areas include several different “types of nature” like trees and vegetation, wildlife, water, soil, farm animals like chickens and bees, etc. Nature and its health produce benefits and burdens felt by urban residents. Trees may reduce stress and anxiety (Beyer et al. 2014; Nesbitt et al. 2017) and can play a critical role in adapting to climate change (Greene, Robinson, and Millward 2018). Purposeful species selection can combat infestations (e.g. emerald ash borer), improving shade and food access. Maintaining healthy urban forests (McLain et al. 2014; Poe et al. 2013) and raising honeybees or chickens (Egerer and Kowarik 2020) may help address food deserts and bolster resident income. Protecting or conserving marshes and swampland can reduce costs related to flooding or sea level rise (Arkema et al. 2013). Increasing urban nature access combats the environmental impacts of concentrated populations like air pollution, extreme heat, and flooding (Taylor and Hochuli 2015). Yet, access to and availability of, nature across cities is heterogeneously distributed (Heynen 2003; Keeler et al. 2019) which may produce burdens on some residents, particularly communities of color (e.g. Montambault et al. 2017; Walker et al. 2023). In a study of 15 U.S. states, Donovan et al. (2013) show that cardiovascular mortality and respiratory illness rates increase in counties with emerald ash borer infestations. Additionally, bare patches, open wastewater, and other *unhealthy* urban environments may negatively impact the health and wellbeing of residents (Lyytimäki and Sipilä 2009). Walker et al. (2023) show that historical policies like racial covenants are a key driver in determining access to green space in Minnesota. Civil society can provide local knowledge and expertise on urban nature and environments and the benefits and burdens experienced. These studies highlight the importance of understanding how cities engage society in nature-related decision-making.

Research about formal rules for civic engagement in nature emphasizes the processes involved in creating or amending institutions rather than the degree to which engagement is included in the institutional language. Zhang et al. (2009) explain that tree ordinances should respond to community motivations, stating that civic engagement is important in defining ordinances. Guidelines for developing tree ordinances identify mechanisms for and the importance of civic engagement in developing institutional language (Bernhardt and Swiecki 2001). Dickerson, Groninger, and Mangun (2001) show that communities with large populations, high education levels, and high per capita income likely have tree ordinances.

More empirical studies are needed to examine civil society’s role in local formal institutions (Callahan 2007). Even in the extensive research on civic engagement, there is uncertainty on which of these mechanisms, and in what context, leads to a more equitable distribution of nature benefits (Jager et al. 2020). To fill this knowledge gap, we study nature-related city ordinances to find where engagement is codified, what the engagement mechanisms are, and how the mechanisms vary across types of nature. In doing so, we contribute to a deeper discussion on how these engagement mechanisms support or undermine legitimate nature governance processes and the benefits and burdens they produce.

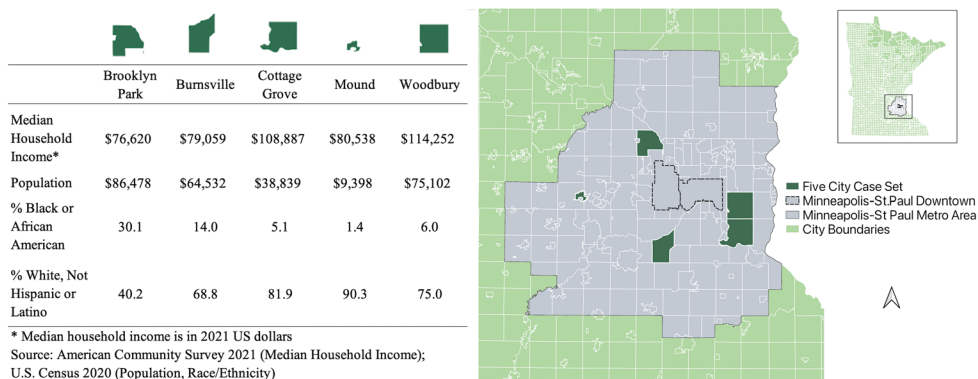
Recognizing that most research focuses on the extremes of engagement (e.g. information sharing, full decision authority), yet most engagement occurs between these

extremes, we chose to inductively analyze our data to allow civic engagement mechanisms to emerge in a bottom-up manner, rather than a priori applying an existing framework. This approach to social science allows our analysis to reflect the unique needs of the local context. The approach is employed in various fields (see Ostrom's 1990 on common-pool resources or Mastrandrea et al. (2010) on climate change adaptation).

## Methods

The study area is the seven-county metropolitan region of Minneapolis-St. Paul, Minnesota is in the United States and is also the newest site within the National Science Foundation's Long-Term Ecological Research (LTER) network. LTER research goals focus on assessing and tracking long-term social-ecological change across the region. Of about 180 cities and townships across MSP, we semi-randomly selected five (Figure 1) to represent a breadth of sociodemographic information, including the most and least racially diverse (Brooklyn Park and Mound, respectively) and the highest median household income (Woodbury). Burnsville and Cottage Grove were randomly selected from the remaining cities. Selecting cities from the same region allows us to analyze the variability of civic engagement mechanisms across types of nature under a constant federal, state, and regional governance system and a consistent biophysical climate.

To identify institutions about nature, we collected city ordinances by searching city websites. In some cases, city websites were linked to an external ordinance database like American Legal Publishing's Code Library (2023), a repository of U.S. city ordinances. We downloaded the most recent and full ordinance document for each city. Ordinance documents in this study were between 380 and 683 pages, with an average length of 561 pages. City ordinances are living documents; they reflect amendments (new, repealed, or modified ordinances) as cities discuss, vote, and approve them. The city ordinances analyzed in this paper were collected in 2021, and the last amendments



**Figure 1.** The study site in the Minneapolis-St. Paul metropolitan region. Sociodemographic information for five cities analyzed (left) and location of five cities in relation to downtown Minneapolis and St. Paul, MN (right).



written ranged from April 2021 to December 2021. Throughout this paper, we refer to these documents as “city ordinances” or “ordinances” to avoid confusion with our approach to contextual “coding”.

Two researchers coded the city ordinances using Atlas.ti, a qualitative coding software program. Following Saldaña (2013), we developed a coding structure of primary and sub-codes to relate ordinance language to our research questions. Our codebook (Supplemental Information) reflects qualitative themes building on the work by Larson et al. (2020) and Sisser et al. (2016) and leveraging knowledge from the research team. We identified any ordinances about nature broadly defined as water, vegetation, wildlife (e.g. deer, birds, coyotes), and soil. Any mention of nature not falling into one of these four categories (e.g. apiaries, open land) was initially coded as “other nature”. The four initial nature types align with the broader MSP LTER research design. During coding, we noted whether the text was within or outside of the ordinances’ Zoning section. To minimize bias, researchers first coded a subset of ordinance texts together, discussing the application of codes. Then, researchers coded ordinance texts separately, meeting regularly to debrief.

There are two important qualifying statements about our coding approach. First, we included ordinances about easements in this analysis only if they mentioned a vegetation-related term. We made this decision because easements may refer to cement or pavement roads or walkways which are outside the scope of our study. Additionally, easements are a policy construct rather than a biophysical occurrence (our focus). Second, we did not include ordinances about city council or related appointments. Literature argues that when citizens are placed into positions of power, they no longer represent civil society but a more elite group (Brownell 1975). Following coding, we extracted the subset of excerpts discussing nature and civic engagement. We first reviewed the ordinance text which focused on nature. Based on the commonalities, we grouped our ordinances into six types of nature, our four initial categories (water, vegetation, wildlife, soil), and two additional categories, farm animals, and land/open space (See topics and key terms of each type of nature in Supplemental Information). We then used margin coding, a process of reading text and noting emergent ideas, to develop a set of cohesive civic engagement themes for comparison and discussion (Charmaz 2014).

## Results

We identified 124 unique ordinance text excerpts. Several excerpts discussed more than one type of nature or civic engagement mechanism. In these cases, we applied all appropriate codes. If an excerpt discussed fertilizer use on vegetation and impacts on water, we coded it as vegetation *and* water. As such, the totals reported in the results exceed 124. We focus our results and discussion on how engagement mechanisms vary across types of nature and the implications of the mechanisms for addressing urban nature benefits and burdens. However, we recognize that looking at engagement patterns across cities (e.g. by suburban/urban or by sociodemographic information) may also provide insights into the distribution of benefits and burdens (see Supplemental Information).



## Nature

Across the excerpts, nature types (denoted with *italics*) identified include “land/open space” (e.g. agricultural land or airshed), “farm animals” (e.g. bees, goats), “soil” (e.g. erosion), “vegetation” (e.g. trees, lawns), “water” (e.g. stormwater), and “wildlife” (e.g. deer, birds). The most frequently mentioned nature type is “land/open space” (38.1%) followed by “vegetation” (24.2%), “water”, “soil”, “farm animals”, and “wildlife” (Table 1).

## Civic Engagement Mechanisms

We identified ten civic engagement mechanisms. Engagement mechanisms were mentioned 310 times (Table 2), meaning ordinances discussed multiple mechanisms. For example, an ordinance about site plan reviews may involve a city staff meeting and public hearing. The most frequently discussed civic engagement mechanism was “public hearings” (61%), followed by “perceived public needs” (9.7%). The least frequently mentioned civic engagement mechanisms were “city staff meetings” (1.0%) and “group comments” (1.6%).

Most civic engagement mechanisms in city ordinances infer little to no control over decision-making. The second most frequently mentioned mechanism, “perceived public needs”, refers to ordinances in which a government decision-maker, like the City Council or Zoning Board, asserts their knowledge of what the public wants and will decide based on those wants. For example, a Woodbury (2021) ordinance reads:

The Board of Zoning Appeals may authorize upon appeal in specific cases such relief or variance from the terms of this chapter **as will not be contrary to the public interest** and only for those circumstances... (emphasis added)

Very few ordinances allow for collective decision-making (“group comments” or “city staff meetings” codes). Brooklyn Park (2021), for example, discusses the role that neighbors may play in collectively reporting animal nuisances:

The keeping of an animal that annoys other persons is a public nuisance and is unlawful...**Upon the receipt of a written complaint of such annoyance signed by the occupants of two or more neighboring properties**, the Animal Control Officer must notify the owner of such animal that the nuisance must be abated... (emphasis added)

**Table 1.** Type of nature identified across 124 ordinance excerpts. Several ordinances discussed more than one type of nature, so total number of references (column 2) equals more than 124. Percentage of each nature's excerpts discussed within the zoning section of the ordinances is presented in column 3.

| Nature          | Total no. of references <sup>a</sup> | Percent within zoning section of ordinances <sup>b</sup> |
|-----------------|--------------------------------------|----------------------------------------------------------|
| Land/open space | 118                                  | 89.8%                                                    |
| Vegetation      | 75                                   | 64.4%                                                    |
| Water           | 68                                   | 77.9%                                                    |
| Soil            | 34                                   | 76.5%                                                    |
| Farm animals    | 8                                    | 0.0%                                                     |
| Wildlife        | 7                                    | 85.7%                                                    |

<sup>a</sup>Some type of nature was mentioned 310 times across 124 unique excerpts.

<sup>b</sup>A total of 238 of the 310 (76.8%) mentions of nature occurred within the Zoning section of the municipal ordinances.

**Table 2.** Civic engagement mechanisms identified across 124 ordinance excerpts (column 1) with their definitions (column 2). Several ordinances discussed more than one engagement mechanism, so the total number of references (column 3) equals more than 124. Percentage of each engagement mechanism's excerpts discussed within the zoning section of the ordinances is presented in column 4.

| Civic engagement mechanism | Definition                                                                                                                                              | Total no. of references | Percent within zoning section of ordinances <sup>a</sup> |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------|
| Public hearings            | Individuals can address council to provide evidence for/against a topic, but there is no requirement for council to respond or act                      | 189                     | 79.9%                                                    |
| Perceived public needs     | Government authority will represent the needs or values of the public in their decision-making (needs or values is the language used in the ordinances) | 30                      | 73.3%                                                    |
| Public meetings            | Government can or must hold an open meeting for the public; specific municipalities may allow or prohibit public from speaking or sharing advice        | 22                      | 100.0%                                                   |
| Individual comments        | Individuals have opportunity to submit oral/written comment                                                                                             | 19                      | 73.7%                                                    |
| Information sharing        | One-way communication for the purposes of education or informing; either government to public or public to government                                   | 15                      | 40.0%                                                    |
| Decision-making            | Individuals having sole discretion of decision-making                                                                                                   | 11                      | 90.9%                                                    |
| Participation              | Individuals are allowed to participate in a process (what participation entails is ambiguous)                                                           | 8                       | 75.0%                                                    |
| Seek individual approval   | Individuals must seek approval from government for a preferred decision (e.g. an exception to an existing standard)                                     | 8                       | 25.0%                                                    |
| Group comments             | Multiple individuals collectively having discretion of a decision                                                                                       | 5                       | 80.0%                                                    |
| City staff meetings        | Individuals or groups that can or must meet with city staff                                                                                             | 3                       | 100.0%                                                   |

<sup>a</sup>A total of 240 of the 310 (77.4%) mentions of civic engagement occurred within the Zoning section of the municipal ordinances.

In some cases, ordinances allow for exceptions to the rule, if an individual first seeks approval (“seek individual approval”). For example, a Cottage Grove (2021) ordinance states:

It is unlawful for any person to willfully cut down, deface, break, injure, chemically damage, or pierce with nails or other objects, any tree located, standing or growing upon any public place within the corporate limits of the City, **without first having obtained the written permission** of the Public Works Director. (emphasis added)

Finally, very few nature ordinances allow members of civil society to have individual decision-making authority (“decision-making”). Ordinances allowing for individual autonomy largely pertain to “farm animal” management. A Cottage Grove (2021) ordinance on poultry reads:

The City shall grant a license...after the applicant has sought the written consent of **one hundred percent (100%) of the owners or occupants** of privately or publicly owned real estate that are **located adjacent**... (emphasis added)

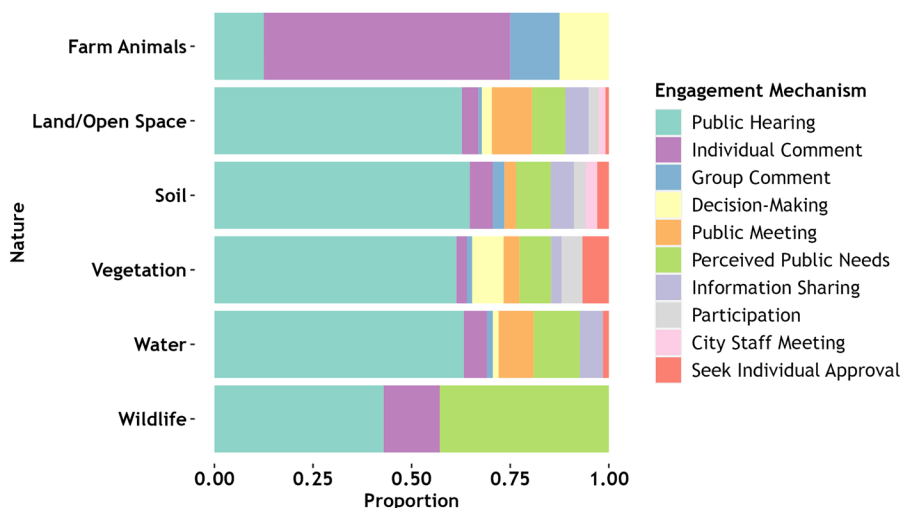
Most civic engagement mechanisms are found within the Zoning section of municipal ordinances (Table 2). “Public meetings” and “city staff meetings” are solely found in the Zoning section.

### **Nature–Civic Engagement Patterns**

Several patterns emerge when we analyze the relationships between nature and civic engagement (Figure 2). First, “public hearings” are the most frequent civic engagement mechanism for five of the six nature types. “Wildlife”-related ordinances are also dominated by “perceived public needs”. Comparatively, “farm animal” ordinances most frequently mention “individual comments”.

Second, there is variability in the number of civic engagement mechanisms tied to each nature type. Ordinances about “land/open space” are tied to 10 civic engagement mechanisms, followed by “soil”, “vegetation”, and “water”, each associated with nine civic engagement mechanisms. Comparatively, “wildlife”-related ordinances mention three engagement mechanisms. “Farm animal”-related ordinances mention four engagement mechanisms, two of which allow for individual or collective authority (“decision-making”, “group comments”) in decision-making.

Third, there is some variation in the civic engagement mechanism dominated by nature type (Table 3). “Land/open space” is the most frequently mentioned nature associated with five types of engagement mechanisms (“city staff meetings”, “information sharing”, “perceived public needs”, “public hearings”, and public meetings). Both “farm animals” and “land/open space” frequently mention the use of “individual comments”, while “vegetation” is the most frequently mentioned nature linked to “decision-making”, “participation”, and “seeking individual approval”.



**Figure 2.** Proportion of nature-related ordinances that discuss different civic engagement mechanisms.

### Discussion

A variety of civic engagement mechanisms are utilized within nature-related city ordinances. The extensive literature by Arnstein (1969) and others shows that engagement occurs on a spectrum from one-way information sharing to full autonomy in decision-making. However, in our case set, we found engagement mechanisms are largely one-way, placing weight on one end of the spectrum. These findings suggest that while engagement may broadly occur across rungs of the ladder (to take from Arnstein), there is quite a bit of variation within a single ladder rung or step. For example, public hearings and public meetings may allow civil society to attend and, in many cases, speak at both events. However, the formal participation processes for these two mechanisms may be vastly different. Public hearings may require a speaker to pre-register and submit comments ahead of time, while public meetings may have a set period when anyone present may speak. These seemingly subtle differences in the process may influence who is participating, what is being shared, and ultimately, the decision that is made. These critical differences would be lost if both mechanisms were lumped into the same ladder rung. In the future, researchers should examine whether this *in-rung* differentiation appears across systems and cases, and furthermore, what it means for decision outcomes. Below, we explore three main patterns and themes from our data analysis.

#### Civil Society can Share Input but There is No Guarantee It Means Anything

Formal institutions of nature-based civic engagement yield two primary findings concerning how civil society may be involved in urban nature governance. First, seven of the ten civic engagement mechanisms allow individuals to share their opinions orally or in writing. While this is better than disallowing civil society to share views and evidence, most mechanisms do not grant individuals authority over decisions. Less than 10% of excerpts allow individual or collective (e.g. multiple neighbors signing an agreement) decision-making. It is unclear the extent to which individuals’ input is considered in decision-making. While nature-related ordinances allow representation and discussion, they do not require that civil society’s input be used in decision-making; this raises the question of whether urban nature formal institutions are emphasizing civic engagement mechanisms that

**Table 3.** Count of ordinance excerpts that discuss each nature-civic engagement mechanism combination (N= 310).

|                             | Land/open<br>space | Vegetation | Water | Soil | Wildlife | Farm animals |
|-----------------------------|--------------------|------------|-------|------|----------|--------------|
| Public hearings             | 74                 | 46         | 43    | 22   | 3        | 1            |
| Perceived public needs      | 10                 | 6          | 8     | 3    | 3        | 0            |
| Public meetings             | 12                 | 3          | 6     | 1    | 0        | 0            |
| Individual comments         | 5                  | 2          | 4     | 2    | 1        | 5            |
| Information sharing         | 7                  | 2          | 4     | 2    | 0        | 0            |
| Decision-making             | 3                  | 6          | 1     | 0    | 0        | 1            |
| Participation               | 3                  | 4          | 0     | 1    | 0        | 0            |
| Seek individual<br>approval | 1                  | 5          | 1     | 1    | 0        | 0            |
| Group comments              | 1                  | 1          | 1     | 1    | 0        | 1            |
| City staff meetings         | 2                  | 0          | 0     | 1    | 0        | 0            |

facilitate respect, learning, and trust, as called for in procedural justice work (Tyler 2006). Lack of authority may erode the legitimacy of the decision process and as a result, alienate the public. In the absence of legitimate processes, cities may inadvertently contribute to unequal benefits and burdens from nature experienced by residents. Future analysis should examine how civic engagement mechanisms translate into decisions, and to what degree local authorities and managers adopt civil society expertise.

Public hearings are mentioned six times more than the next most frequently discussed engagement mechanism. Why are public hearings so common? One explanation is the link between the Comprehensive planning processes and ordinance development. Comprehensive plans outline community goals and actions to address long-term land development and related zoning ordinances (Kelly 2012). Every state has a law requiring public hearings to be incorporated into the planning process to allow citizens to address and raise issues (Kelly 2012). The use of public hearings may bleed over into ordinance language.

While public hearings allow resident representation and involvement, their implementation late in the planning process may need to be revised to foster community engagement and input (Jolley 2007). In Minnesota, state statute Section 394.26 requires public hearings to be announced at least ten days prior in an official county newspaper. While residents have the right to be heard and present evidence, they do not necessarily have the right to cross-examine others' evidence or provide rebuttal evidence. Cities may design strict procedural rules on public hearing processes, requiring evidence to be submitted before the public hearing event. For example, a public hearing notification in Brooklyn Park on whether residential dwellings should be allowed to keep four hens, states that written comments should be received *prior to the hearing* (Brooklyn Park 2023). The proliferation of public hearings in city planning and related to urban nature management decisions, may hinder the quantity and quality of resident input. Public hearings are typically held at city hall instead of in the community that is being impacted, potentially limiting the participation of community members. Rather than fostering evidence-based, collaborative problem-solving, public hearings encourage organized opposition (Godschalk, Brody, and Burby 2003). Therefore, public hearings may reinforce the status quo and/or deter civil society, preventing them from having substantive representation in decision-making. The rigidity and location of public hearings may exacerbate justice concerns by excluding individuals from already overburdened communities. Cities should reflect on their decision-making procedures and question the implications of the employed civic engagement mechanisms for legitimacy and the distribution of nature benefits and burdens.

### ***Tension between Animals and Urban Areas***

Most types of nature are tied to all or many of the civic engagement mechanisms we identified in city ordinances. Farm animals, that is, raising chickens, goats, and bees were the exception. This differentiation is likely explained through examining the history of farm animals and urban areas. While early United States cities relied on farm animals for waste management, transportation, and food supply (Duffy 1992),

the nuisances created by farm animals (e.g. waste, dust, public health impacts) prompted cities to remove or otherwise ban farm animals from urban areas. Zoning ordinances were one tool to exclude farm animals from cities (Brinkley and Vitiello 2013). A cursory search of Minnesota State Statutes<sup>1</sup> shows that many previously existing rules on apiaries and poultry have been repealed. This history of exclusion may explain why we do not see farm animals in city zoning ordinances. A renewed interest in urban agriculture and animal husbandry in the twenty-first century translates into sporadic efforts to reintegrate farm animals into local planning; this trend may be essential for overburdened communities seeking additional sources of food and income. In Minnesota, some cities have ordinances allowing beekeeping, raising hens for eggs, and using goats for removing weeds. In several cases, residents must obtain neighbors' signatures before a city grants them approval to raise animals.

### ***Traditional Approaches to Zoning Highlight Pervasive Inequities in Nature-Related Civic Engagement***

Most nature-related civic engagement was discussed within the zoning section of city ordinances. Comprehensive planning processes, which put forth proposed zoning language, urge consideration of land and open space, water, shorelands, soils, forests and woodlands, parks, flood plains, agriculture, wildlife habitat, and landscaping and yard elements. Therefore, it is plausible (and was supported by our analysis) to expect an emphasis on these aspects of nature within city zoning ordinances.

An emphasis on nature-based civic engagement in city zoning ordinances may also shed light on one driver of the inequitable distribution of nature benefits and burdens across urban spaces. Historically, zoning ordinances were used to restrict housing supply, thus increasing prices and excluding lower-income communities (Lewyn 2017). This *exclusionary zoning* has expanded over the last 20 years as middle-class residents moved into urban cores that offer more amenities. Housing prices in urban centers increased by more than 50% between 2000 and 2015 (Hilts 2015). Additionally, even when zoning and land-use regulation processes trigger public hearings, and thus supposed opportunity for civic engagement, in practice, public hearing processes exacerbate political and representative inequalities, giving a platform to already privileged voices (Einstein et al., 2019; Schlozman et al., 2012). It is therefore plausible that local rules on urban nature are being shaped by the values and desires of an elite few. As comprehensive plans are implemented, new nature-based amenities reflecting the elite few may entice middle-income populations to move into lower-income and minority communities (Anguelovski et al., 2018; Tozer et al., 2020). Whether on purpose or not, this elite *capture* of what nature should look like and how it should be managed may continue or exacerbate a cycle of inequality. This pattern has already been observed. For example, in Albina, Oregon, sustainable development efforts (including green space renewal) in the 1990s led to tripled housing prices, a loss of cultural character, and displacement of the Black community (Bates, 2013; Goodling et al., 2015). Thus, the displaced community fails to reap the benefits of the renewed green space. If engagement mechanisms and processes do not sufficiently support a diverse civil society in decision-making, or if the available mechanisms are too restrictive (e.g. public hearings)

then exclusionary policies may reinforce or expand the inequitable distribution of nature burdens (or benefits) felt by particular communities.

## Limitations

There are three main limitations to this early research. First, we lay out one approach to analysis and provide a foundation for future work on formal institutions of urban nature governance toward more equitable distribution of nature benefits and burdens. Our small N precludes us from making general claims on formal institutions of nature-based civic engagement, but the study does set us up to replicate similar studies across multiple cities in Minneapolis-St. Paul and across cities with similar historical development history along the Mississippi River. Second, we use textual analysis to understand how city ordinances formalize nature-based civic engagement. While discussing these mechanisms' potential limitations, we do not measure actual implementation of engagement nor resident involvement or quality of involvement. Finally, we focus on patterns between civic engagement and nature as they emerge in city ordinances. We do not measure or substantively analyze how a city's sociodemographic profiles or geography (urban/suburban) influence city ordinance language, urban nature governance, or civic engagement mechanisms employed. These issues could be a future research stage to link policy with behavior and the long-term outcomes of these interactions. Our data revealed wide variation in engagement mechanisms across the five cities, so future research should explore these themes to understand how factors such as capacity and governance structure influence city ordinance language and processes (Andrews et al. 2009; Norris 2004; van Holm 2019; Zhang and Yang 2009).

## Conclusions

City government is touted as being *closer to the people*. To examine civil society's role in managing urban nature, we qualitatively analyzed nature ordinances for five cities in the Minneapolis-St. Paul metropolitan region. Our research yielded three main findings. First, we found a diversity of civic engagement mechanisms codified in city ordinances that suggest, at least on paper, civil society can provide input into nature management. However, we found that overall, cities codify traditional approaches like public hearings, which minimize discussion and may undermine legitimate decision processes and reinforce inequitable nature burdens. Second, our analysis shows the ongoing tension between farm animals and urban areas. A renewed interest in urban animal husbandry to address inequities in food access and boost income may be driving a shift in city ordinances on farm animals. Third, we found most discussion of nature-based civic engagement within the zoning section of city ordinances. City zoning ordinances utilize public hearings, an engagement approach known to support power imbalances and give voice to the privileged. As a result, urban nature may reflect only one set of values. As comprehensive plans are implemented, the limited view of what nature is and how it should be managed may exacerbate power imbalances and lead to harmful gentrification as lower-income and minority communities are driven out of city centers. This *elite capture* may reinforce inequities in urban nature governance. Given the growing and persistent importance of civic



engagement in urban planning, a lack of legitimate decision-making processes will exacerbate the inequitable distribution of nature benefits and burdens some urban communities feel. This work begins to unravel questions of how formal institutions of civic engagement facilitate or undermine inequities in urban social-ecological systems.

## Note

1. See [revisor.mn.gov/statutes](http://revisor.mn.gov/statutes) for an online repository.

## Acknowledgments

The authors thank Drs. Francesca Pia Vantaggiato and Mark Lubell for their valuable feedback at the Midwest Political Science Association Conference. Additionally, Forrest Fleischman acknowledges the receipt of a fellowship from the OECD Co-operative Research Programme: Sustainable Agricultural and Food Systems in 2023–24.

## Funding

This work was made possible by the Minneapolis—St. Paul Metropolitan Area (MSP) Urban Long Term Ecological Research Program, through its grant with the National Science Foundation (DEB-2045382).

## References

- Adler, R. P., and J. Goggin. 2005. What do we mean by “civic engagement”? *Journal of Transformative Education* 3 (3):236–53. doi: [10.1177/1541344605276792](https://doi.org/10.1177/1541344605276792).
- American Legal Publishing Code Library. 2023. *American Legal Publishing's Code Library*. <http://www.codelibrary.amlegal.com>
- Andrews, R., G. A. Boyne, J. Law, and R. M. Walker. 2009. Centralization, organizational strategy, and public service performance. *Journal of Public Administration Research and Theory* 19 (1):57–80. doi: [10.1093/jopart/mum039](https://doi.org/10.1093/jopart/mum039).
- Anguelovski, I., J. Connolly, and A. L. Brand. 2018. From landscapes of utopia to the margins of the green urban life. *City* 22 (3):417–36. [10.1080/13604813.2018.1473126](https://doi.org/10.1080/13604813.2018.1473126).
- Applegate, J. S. 1998. Beyond the usual suspects: The use of citizens advisory boards in administrative decisionmaking. *Indiana Law Journal* 73:903–58.
- Arendt, R. G. 2013. *Growing greener: Putting conservation into local plans and ordinances*. Washington, DC: Island Press.
- Arkema, K. K., G. Guannel, G. Verutes, S. A. Wood, A. Guerry, M. Ruckelshaus, P. Kareiva, M. Lacayo, and J. M. Silver. 2013. Coastal habitats shield people and property from sea-level rise and storms. *Nature Climate Change* 3 (10):913–8. doi: [10.1038/nclimate1944](https://doi.org/10.1038/nclimate1944).
- Arnstein, S. R. 1969. A ladder of citizen participation. *Journal of the American Institute of Planners* 35 (4):216–24. doi: [10.1080/01944366908977225](https://doi.org/10.1080/01944366908977225).
- Bates, L. K. 2013. Gentrification and displacement study: Implementing an equitable inclusive development strategy in the context of gentrification, Urban Studies and Planning Faculty Publications and Presentations. doi: [10.15760/report-01](https://doi.org/10.15760/report-01).
- Bernhardt, E. A., and T. J. Swiecki. 2001. Guidelines for developing and evaluating tree ordinances. *Phytosphere*. <http://www.phytosphere.com>
- Beyer, K. M. M., A. Kaltenbach, A. Szabo, S. Bogar, F. J. Nieto, and K. M. Malecki. 2014. Exposure to neighborhood green space and mental health: Evidence from the survey of the health of

- Wisconsin. *International Journal of Environmental Research and Public Health* 11 (3):3453–72. doi: [10.3390/ijerph110303453](https://doi.org/10.3390/ijerph110303453).
- Biddle, J. C., and T. M. Koontz. 2014. Goal specificity: A proxy measure for improvements in environmental outcomes in collaborative governance. *Journal of Environmental Management* 145:268–76. doi: [10.1016/j.jenvman.2014.06.029](https://doi.org/10.1016/j.jenvman.2014.06.029).
- Bishop, P., and G. Davis. 2002. Mapping public participation in policy choices. *Australian Journal of Public Administration* 61 (1):14–29. doi: [10.1111/1467-8500.00255](https://doi.org/10.1111/1467-8500.00255).
- Brinkley, C., and D. Vitiello. 2013. From farm to nuisance: Animal agriculture and the rise of planning regulation. *Journal of Planning History* 13 (2):113–35. doi: [10.1177/1538513213507542](https://doi.org/10.1177/1538513213507542).
- Brooklyn Park. 2021. Municipal ordinances. American Legal Publishing's Code Library. Accessed June 15, 2024. <https://www.codelibrary.amlegal.com>
- Brooklyn Park. 2023. Public hearing regarding the proposed ordinance change allowing four hens at residential properties (3/28/2022). Public Notices. Accessed June 15, 2024. <http://www.brooklynpark.org/public-notice/>
- Brownell, B. A. 1975. The commercial civic elite and city planning in Atlanta, Memphis, and New Orleans in the 1920s. *Journal of Southern History* 41 (3):339–68. doi: [10.2307/2206403](https://doi.org/10.2307/2206403).
- Bulkeley, H., G. A. S. Edwards, and S. Fuller. 2014. Contesting climate justice in the city: Examining politics and practice in urban climate change experiments. *Global Environmental Change* 25:31–40. doi: [10.1016/j.gloenvcha.2014.01.009](https://doi.org/10.1016/j.gloenvcha.2014.01.009).
- Bush, J., and A. Doyon. 2017. Urban green spaces in Australian cities: Social inclusion and community participation. State of Australian Cities Conference, Adelaide, Australia.
- Callahan, K. 2007. Citizen participation: Models and methods. *International Journal of Public Administration* 30 (11):1179–96. doi: [10.1080/01900690701225366](https://doi.org/10.1080/01900690701225366).
- Charmaz, K. 2014. *Constructing grounded theory*. London, England: Sage Publications.
- Chetty, R., N. Hendren, P. Kline, and E. Saez. 2014. Where is the land of opportunity? The geography of intergenerational mobility in the United States. *Quarterly Journal of Economics* 129 (4):1553–623. doi: [10.1093/qje/qju022](https://doi.org/10.1093/qje/qju022).
- Corbett, E., and C. A. Le Dantec. 2018. The problem of community engagement: Disentangling the practices of municipal government. Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems. Montreal, QC Canada.
- Cottage Grove. 2021. Municipal ordinances. American Legal Publishing's Code Library. <http://www.codelibrary.amlegal.com>.
- Day, D. 1997. Citizen participation in the planning process: An essentially contested concept? *Journal of Planning Literature* 11 (3):421–34. doi: [10.1177/088541229701100309](https://doi.org/10.1177/088541229701100309).
- Dickerson, S., J. Groninger, and J. Mangun. 2001. Influences of community characteristics on municipal tree ordinances in Illinois. *Arboriculture & Urban Forestry* 27 (6):318–25. doi: [10.48044/jauf.2001.035](https://doi.org/10.48044/jauf.2001.035).
- Donovan, G. H., D. T. Butry, Y. L. Michael, J. P. Prestemon, A. M. Liebhold, D. Gatzliolis, and M. Y. Mao. 2013. The relationship between trees and human health: Evidence from the spread of emerald ash borer. *American Journal of Preventive Medicine* 44 (2):139–45. doi: [10.1016/j.amepre.2012.09.066](https://doi.org/10.1016/j.amepre.2012.09.066).
- Duffy, J. 1992. *The Sanitarians: A History of American public health*. Champaign, Illinois: University of Illinois Press.
- Edelenbos, J. 2000. *Proces in vorm: Procesbegeleiding van interactieve beleidsvorming over locale ruimtelijke projecten [Process in form: Process guidance of interactive policy making on local spatial projects]*. Lemma, TU Delft.
- Egerer, M., and I. Kowarik. 2020. Confronting the modern Gordian knot of urban beekeeping. *Trends in Ecology & Evolution* 35 (11):956–9. doi: [10.1016/j.tree.2020.07.012](https://doi.org/10.1016/j.tree.2020.07.012).
- Einstein, K. L., M. Palmer, and D. M. Glick. 2019. Who participates in local government? Evidence from meeting minutes. *Perspectives on Politics* 17 (1):28–46. doi: [10.1017/S153759271800213X](https://doi.org/10.1017/S153759271800213X).
- Epting, S. 2020. Participatory budgeting for environmental justice. *Ethics, Policy, & Environment* 23 (1):22–36. doi: [10.1080/21550085.2020.1746003](https://doi.org/10.1080/21550085.2020.1746003).

- Fagotto, E., and A. Fung. 2006. Empowered participation in urban governance: The Minneapolis Neighborhood Revitalization Program. *International Journal of Urban and Regional Research* 30 (3):638–55. doi: [10.1111/j.1468-2427.2006.00685.x](https://doi.org/10.1111/j.1468-2427.2006.00685.x).
- Farkas, M. 2012. Participatory technologies, pedagogy 2.0 and information literacy. *Library Hi Tech* 30 (1):82–94. doi: [10.1108/07378831211213229](https://doi.org/10.1108/07378831211213229).
- Fraser, N. 1990. Rethinking the public sphere: A contribution to the critique of actually existing democracy. *Social Text* 25/26 (25/26):56–80. doi: [10.2307/466240](https://doi.org/10.2307/466240).
- Gerlak, A. K., T. Heikkilä, S. L. Smolinski, D. Huitema, and D. Armitage. 2018. Learning our way out of environmental policy problems: A review of the scholarship. *Policy Sciences* 51 (3):335–71. doi: [10.1007/s11077-017-9278-0](https://doi.org/10.1007/s11077-017-9278-0).
- Ghose, R. 2005. The complexities of citizen participation through collaborative governance. *Space and Polity* 9 (1):61–75. doi: [10.1080/13562570500078733](https://doi.org/10.1080/13562570500078733).
- Godschalk, D. R., S. Brody, and R. Burby. 2003. Public participation in natural hazard mitigation policy formation: Challenges for comprehensive planning. *Journal of Environmental Planning and Management* 46 (5):733–54. doi: [10.1080/0964056032000138463](https://doi.org/10.1080/0964056032000138463).
- Gollagher, M., and J. Hartz-Karp. 2013. The role of deliberative collaborative governance in achieving sustainable cities. *Sustainability* 5 (6):2343–66. doi: [10.3390/su5062343](https://doi.org/10.3390/su5062343).
- Goodling, E., J. Green, and N. McClintock. 2015. Uneven development of the sustainable city: shifting capital in Portland, Oregon. *Urban Geography* 36 (4):504–27. doi: [10.1080/02723638.2015.1010791](https://doi.org/10.1080/02723638.2015.1010791).
- Greene, C. S., P. J. Robinson, and A. A. Millward. 2018. Canopy of advantage: Who benefits most from city trees? *Journal of Environmental Management* 208:24–35. doi: [10.1016/j.jenvman.2017.12.015](https://doi.org/10.1016/j.jenvman.2017.12.015).
- Hanssen, G. S., and E. I. Falleth. 2014. Market-oriented urban planning—Constraining citizen participation. *Local Government Studies* 40 (3):403–28. doi: [10.1080/03003930.2013.834254](https://doi.org/10.1080/03003930.2013.834254).
- Herian, M. N., J. A. Hamm, A. J. Tomkins, and L. M. Pytlik Zillig. 2012. Public participation, procedural fairness, and evaluations of local governance: The moderating role of uncertainty. *Journal of Public Administration Research and Theory* 22 (4):815–40. doi: [10.1093/jopart/mur064](https://doi.org/10.1093/jopart/mur064).
- Heynen, N. C. 2003. The scalar production of injustice within the urban forest. *Antipode* 35 (5):980–98. doi: [10.1111/j.1467-8330.2003.00367.x](https://doi.org/10.1111/j.1467-8330.2003.00367.x).
- Hilts, S. 2015. U.S. housing demand pendulum swinging back to city centers. Fitch Ratings. Accessed June 15, 2024. <https://www.fitchratings.com/research/structured-finance/us-housing-demand-pendulum-swinging-back-to-city-centers-12-08-2015>
- Holden, M. 2011. Public participation and local sustainability: Questioning a common agenda in urban governance. *International Journal of Urban and Regional Research* 35 (2):312–29. doi: [10.1111/j.1468-2427.2010.00957.x](https://doi.org/10.1111/j.1468-2427.2010.00957.x).
- Hui, I., N. Ulibarri, and B. Cain. 2020. Patterns of participation and representation in a regional water collaboration. *Policy Studies Journal* 48 (3):754–81. doi: [10.1111/psj.12266](https://doi.org/10.1111/psj.12266).
- Huxley, M. 2000. The limits of communicative planning. *Journal Planning Education and Research* 19 (4):367–77.
- Innes, J. E., and D. E. Booher. 2004. Reframing public participation: Strategies for the 21<sup>st</sup> century. *Planning Theory & Practice* 5 (4):419–36. doi: [10.1080/1464935042000293170](https://doi.org/10.1080/1464935042000293170).
- Irvin, R. A., and J. Stansbury. 2004. Citizen participation in decision making: Is it worth the effort? *Public Administration Review* 64 (1):55–65. doi: [10.1111/j.1540-6210.2004.00346.x](https://doi.org/10.1111/j.1540-6210.2004.00346.x).
- Jager, N. W., J. Newig, E. Challies, and E. Kochskämper. 2020. Pathways to implementation: Evidence on how participation in environmental governance impacts on environmental outcomes. *Journal of Public Administration Research and Theory* 30 (3):383–99. doi: [10.1093/jopart/muz034](https://doi.org/10.1093/jopart/muz034).
- Johansen, A., D. Collins, A. Temeljotov-Salaj, and G. Hagehaugen. 2022. By the fjord: Successful public and private collaboration in a neighbourhood redevelopment project in Norway. *Proceedings of the Institution of Civil Engineers-Management, Procurement and Law* 176 (4):156–65. doi: [10.1680/jmapl.22.00011](https://doi.org/10.1680/jmapl.22.00011).

- Jolley, G. J. 2007. Public involvement tools in environmental decision-making: A primer for practitioners. *Journal of Extension* 45 (2):26.
- Jun, K. N. 2013. Escaping the local trap? The role of community representing organizations in urban governance. *Journal of Urban Affairs* 35 (3):343–63. doi: [10.1111/j.1467-9906.2012.00620.x](https://doi.org/10.1111/j.1467-9906.2012.00620.x).
- Keeler, B. L., P. Hamel, T. McPhearson, M. H. Hamann, M. L. Donahue, K. A. Meza Prado, K. K. Arkema, G. N. Bratman, K. A. Brauman, J. C. Finlay, et al. 2019. Social-ecological and technological factors moderate the value of urban nature. *Nature Sustainability* 2 (1):29–38. doi: [10.1038/s41893-018-0202-1](https://doi.org/10.1038/s41893-018-0202-1).
- Kelly, E. D. 2012. *Community planning: An introduction to the comprehensive plan*. Washington, DC: Island Press.
- Kilbane, S., and P. B. Roös. 2023. Charrette! An urgent response toward resilient and sustainable cities and landscapes. In *Resilient and sustainable cities*, 277–43. Amsterdam: Elsevier.
- Klastic, M., and M. Lubell. 2020. Collaborative governance: From simple partnerships to complex systems. In *Handbook of US environmental policy*, ed. D. Konisky, 257–73. Massachusetts, USA: Edward Elgar Publishing.
- Konisky, D., and T. C. Beierle. 2001. Innovations in public participation and environmental decision making: Examples from the Great Lakes Region. *Society and Natural Resources* 14 (9):815–26.
- Koski, C., S. Siddiki, A. A. Sadiq, and J. Carboni. 2018. Representation in collaborative governance: A case study of a flood policy council. *American Review of Public Administration* 48 (4):359–73. doi: [10.1177/0275074016678683](https://doi.org/10.1177/0275074016678683).
- Larson, K. L., R. Andrade, K. C. Nelson, M. M. Wheeler, J. M. Engebreston, S. J. Hall, M. L. Avolio, P. M. Groffman, M. Grove, J. B. Heffernan, et al. 2020. Municipal regulation of residential landscapes across US cities: Patterns and implications for landscape sustainability. *Journal of Environmental Management* 275:111132. doi: [10.1016/j.jenvman.2020.111132](https://doi.org/10.1016/j.jenvman.2020.111132).
- League of Minnesota Cities. 2024. Zoning decisions: Informational memo. League of Minnesota Cities. Accessed June 15, 2024. <https://www.lmc.org/resources/zoning-decisions/>
- Lewyn, M. 2017. Does the threat of gentrification justify restrictive zoning? *Real Estate Law Journal* 47:447–61.
- Lyytimäki, J., and M. Sipilä. 2009. Hopping on one leg—The challenge of ecosystem disservices for urban green management. *Urban Forestry & Urban Greening* 8 (4):309–15. doi: [10.1016/j.ufug.2009.09.003](https://doi.org/10.1016/j.ufug.2009.09.003).
- Maantay, J. 2001. Zoning, equity, and public health. *American Journal of Public Health* 91 (7): 1033.
- Manor, J. 1999. *The political economy of democratic decentralization*. Washington, DC: The World Bank.
- Mastrandrea, M. D., N. E. Heller, T. L. Root, and S. H. Schneider. 2010. Bridging the gap: Linking climate-impacts research with adaptation planning and management. *Climatic Change* 100 (1):87–101. doi: [10.1007/s10584-010-9827-4](https://doi.org/10.1007/s10584-010-9827-4).
- McLain, R., P. Hurley, M. R. Emergy, and M. R. Poe. 2014. *Gathering “wild” food in the city: Rethinking the role of foraging in urban ecosystem planning and management*.
- Molokwane, T., and M. T. Lukamba. 2018. Citizen involvement in the formulation of public policy. In *The third annual international conference on public administration and development alternatives* 4(6). South Africa: Stellenbosch University, Saldahna Bay.
- Montalvo, D. 2009. Citizen satisfaction with municipal services. *American Barometer Insights* 1 (14):75–80.
- Montambault, J. R., M. Dormer, J. Campbell, N. Rana, S. Gottlieb, J. Legge, D. Davis, and M. Chakaki. 2017. Social equity and urban nature conservation. *Conservation Letters* 11 (3):e12423. doi: [10.1111/conl.12423](https://doi.org/10.1111/conl.12423).
- Nabatchi, T., Gastil, J., Weiksner, G.M., and M. Leighninger, eds. 2012. *Democracy in motion: Evaluating the practice and impact of deliberative civic engagement*. New York, NY: Oxford University Press.
- Nesbitt, L., N. Hotte, S. Barron, J. Cowan, and S. R. J. Sheppard. 2017. The social and economic value of cultural ecosystem services provided by urban forests in North America: A review and

- suggestions for future research. *Urban Forestry & Urban Greening* 25:103–11. doi: [10.1016/j.ufug.2017.05.005](https://doi.org/10.1016/j.ufug.2017.05.005).
- Newig, J. 2007. Does public participation in environmental decisions lead to improved environmental quality?: Towards an analytical framework. *Communication, Cooperation, Participation. (International Journal of Sustainability Communication)* 1 (1):51–71.
- Norris, P. 2004. *Electrical engineering: Voting rules and political behavior*. New York, USA: Cambridge University Press.
- Ostrom, E. 2009. *Governing the commons*. Cambridge: Cambridge University Press.
- Paavola, J. 2007. Institutions and environmental governance: A reconceptualization. *Ecological Economics* 63 (1):93–103. doi: [10.1016/j.ecolecon.2006.09.026](https://doi.org/10.1016/j.ecolecon.2006.09.026).
- Pellizzoni, L. 2003. Uncertainty and participatory democracy. *Environmental Values* 12 (2):195–224. doi: [10.1177/096327190301200204](https://doi.org/10.1177/096327190301200204).
- Piette, D. 1990. Community participation in formal decision-making mechanisms. *Health Promotion International* 5 (3):187–97. doi: [10.1093/heapro/5.3.187](https://doi.org/10.1093/heapro/5.3.187).
- Poe, M. R., R. J. McLain, M. Emery, and P. T. Hurley. 2013. Urban forest justice and the rights to wild foods, medicines, and materials in the city. *Human Ecology* 41 (3):409–22. doi: [10.1007/s10745-013-9572-1](https://doi.org/10.1007/s10745-013-9572-1).
- Portney, K. 2005. Civic engagement and sustainable cities in the United States. *Public Administration Review* 65 (5):579–91. doi: [10.1111/j.1540-6210.2005.00485.x](https://doi.org/10.1111/j.1540-6210.2005.00485.x).
- Ringholm, T., T. Nyseth, and G. Sandkjaer Hanssen. 2018. Participation according to law? The research-based knowledge on citizen participation in Norwegian municipal planning. *European Journal of Spatial Development* 67:1–20.
- Robbins, P. 2007. *Lawn people: How grasses, weeds, and chemicals make us who we are*. Philadelphia, Pennsylvania: Temple University Press.
- Sabatier, P. A., W. Focht, M. Lubell, Z. Trachtenberg, and A. Vedlitz. 2005. *Swimming upstream: Collaborative approaches to watershed management*. Cambridge, Massachusetts: MIT Press.
- Saldaña, J. 2013. *The coding manual for qualitative researchers*. 2nd ed. Thousand Oaks, CA: SAGE Publications.
- Scavo, C. 1993. The use of participative mechanisms by large US cities. *Journal of Urban Affairs* 15 (1):93–109. doi: [10.1111/j.1467-9906.1993.tb00304.x](https://doi.org/10.1111/j.1467-9906.1993.tb00304.x).
- Schlozman, K. L., Verba, S., and H.E. Brady. 2012. *The unheavenly chorus: Unequal political voice and the broken promise of American democracy*. Princeton University Press.
- Scott, T. 2015. Does collaboration make any difference? Linking collaborative governance to environmental outcomes. *Journal of Policy Analysis and Management: [The Journal of the Association for Public Policy Analysis and Management]* 34 (3):537–66. doi: [10.1002/pam.21836](https://doi.org/10.1002/pam.21836).
- Siddiki, S., J. Kim, and W. D. Leach. 2017. Diversity, trust, and social learning in collaborative governance. *Public Administration Review* 77 (6):863–74. doi: [10.1111/puar.12800](https://doi.org/10.1111/puar.12800).
- Simmons, P. 2007. Challenges for communicators in future Australian local government. *Procedia – Social and Behavioral Sciences* 155:312–9. doi: [10.1016/j.sbspro.2014.10.298](https://doi.org/10.1016/j.sbspro.2014.10.298).
- Singh, R. K., A. Singh, K. K. Zander, S. Mathew, and A. Kumar. 2021. Measuring successful processes of knowledge co-production for managing climate change and associated environmental stressors: Adaptation policies and practices to support Indian farmers. *Journal of Environmental Management* 282:111679. doi: [10.1016/j.jenvman.2020.111679](https://doi.org/10.1016/j.jenvman.2020.111679).
- Sisser, J. M., K. C. Nelson, K. L. Larson, L. A. Ogden, C. Polsky, and R. R. Chowdhury. 2016. Lawn enforcement: How municipal policies and neighborhood norms influence homeowner residential landscape management. *Landscape and Urban Planning* 150:16–25. doi: [10.1016/j.landurbplan.2016.02.011](https://doi.org/10.1016/j.landurbplan.2016.02.011).
- Sønderskov, M. 2019. Do local politicians really want collaborative governance? *International Journal of Public Sector Management* 32 (3):320–30. doi: [10.1108/IJPSM-10-2017-0271](https://doi.org/10.1108/IJPSM-10-2017-0271).
- StateScape. 2023. Ordinance process. StateScape. Accessed June 15, 2024. <https://www.statescape.com/resources/local/ordinance-process>
- Steele, J. 2001. Participation and deliberation in environmental law: Exploring a problem-solving approach. *Oxford Journal of Legal Studies* 21 (3):415–42. doi: [10.1093/ojls/21.3.415](https://doi.org/10.1093/ojls/21.3.415).



- Tadili, J., and H. Fasly. 2019. Citizen participation in smart cities: A survey. Proceedings of the 4th International Conference on Smart City Applications, SCA '19. Association for Computing Machinery, New York, USA.
- Taylor, L., and D. F. Hochuli. 2015. Creating better cities: How biodiversity and ecosystem functioning enhance urban residents' wellbeing. *Urban Ecosystems* 18 (3):747–62. doi: [10.1007/s11252-014-0427-3](https://doi.org/10.1007/s11252-014-0427-3).
- Thomas, J. C. 1995. *Public participation in public decisions: New skills and strategies for public managers*. San Francisco, California: Jossey-Bass.
- Timney, M. M. 1998. Overcoming administrative barriers to citizen participation: Citizens as partners, not adversaries. In *Government is us: Public administration in an anti-government era*, eds. King, C.S., and C. Stivers. Thousand Oaks, California: Sage Publications.
- Tozer, L., K. Hörschelmann, I. Anguelovski, H. Bulkeley, and Y. Lazova. 2020. Whose city? Whose nature? Towards inclusive nature-based solution governance. *Cities* 107:102892 [10.1016/j.cities.2020.102892](https://doi.org/10.1016/j.cities.2020.102892).
- Tyler, T. R. 2006. *Why people obey the law*. New Haven, Connecticut: Yale University Press.
- van Holm, E. J. 2019. Unequal cities, unequal participation: The effect of income inequality on civic engagement. *American Review of Public Administration* 49 (2):135–44. doi: [10.1177/0275074018791217](https://doi.org/10.1177/0275074018791217).
- Wagenet, L. P., and M. J. Pfeffer. 2007. Organizing citizen engagement for democratic environmental planning. *Society & Natural Resources* 20 (9):801–13. doi: [10.1080/08941920701216578](https://doi.org/10.1080/08941920701216578).
- Walker, R. H., H. Ramer, K. D. Derickson, and B. L. Keeler. 2023. Making the city of lakes: Whiteness, nature, and urban development in Minneapolis. *Annals of the American Association of Geographers* 113 (7):1615–29. doi: [10.1080/24694452.2022.2155606](https://doi.org/10.1080/24694452.2022.2155606).
- Wilson, S. M., C. D. Heaney, and O. Wilson. 2010. Governance structures and the lack of basic amenities: Can community engagement be effectively used to address environmental injustice in underserved black communities? *Environmental Justice* 3 (4):125–33. doi: [10.1089/env.2010.0014](https://doi.org/10.1089/env.2010.0014).
- Woodbury. 2021. City of Woodbury Minnesota: Code of Ordinances. Municode. [https://library.municode.com/mn/woodbury/codes/code\\_of\\_ordinances/378293](https://library.municode.com/mn/woodbury/codes/code_of_ordinances/378293).
- Yosie, T. F., and T. D. Herbst. 1998. *Using stakeholder processes in environmental decision-making: An evaluation of lessons learned, key issues, and future challenges*. Incorporated, Washington, DC: Ruder Finn Washington and ICF.
- Young, I. M. 2000. *Inclusion and democracy*. New York, USA: Oxford University Press.
- Zhang, Y., and K. Yang. 2009. Citizen participation in the budget process: The effect of city managers. *Journal of Public Budgeting, Accounting & Financial Management* 21 (2):289–317. doi: [10.1108/JPBAFM-21-02-2009-B0006](https://doi.org/10.1108/JPBAFM-21-02-2009-B0006).
- Zhang, Y., B. Zheng, B. Allen, N. Letson, and J. Sibley. 2009. Tree ordinances as public policy and participation tools: Development in Alabama. *Arboreticulture & Urban Forestry* 35 (3):165–71. doi: [10.48044/jauf.2009.029](https://doi.org/10.48044/jauf.2009.029).