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Before the trees fall: Rethinking the governance of contested green spaces in Ukrainian cities

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Abstract

In the context of climate instability and increasing urban pressure, green spaces in Ukrainian cities remain vulnerable to fragmentation, neglect, and encroaching development. Despite their recognized ecological and social value, green spaces are often governed in a fragmented and inconsistent manner. Based on 18 expert interviews across seven cities and spatial analysis of contested green zones in Kyiv, Odesa, and Zaporizhzhia, this thesis investigates how urban green spaces are defined, protected, and disputed in Ukraine. It identifies key challenges, including contested definitions, legal and institutional gaps, weak governance, underfunding, and procedural injustice. The findings reveal that all green spaces are potentially contested due to non-transparent land use and the absence of strategic planning. The thesis proposes a new governance model that combines spatial inventorying, legal reinforcement, cross-sectoral coordination, and community co-management.

Keywords: green spaces, urban governance, conflicts, green infrastructure, Ukraine.

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Introduction

In Ukrainian cities, green spaces have historically played an important role in urban life – offering ecological functions, spaces for recreation, and a sense of shared place. Yet today, they are increasingly marked by legal ambiguity, uneven protection, and institutional neglect. Many green areas are valued and actively used by local communities, but lack formal recognition or management. Others are included in planning documents yet remain degraded, unmaintained, or targeted for development.

Since 2014, and especially after the full-scale Russian invasion in 2022, urban land governance has gained renewed attention. Municipalities face the combined pressures of decentralization, infrastructure recovery, and long-term displacement. However, green spaces remain peripheral in both national policy and local investment – governed ad hoc, if at all. In this vacuum, parks and informal green commons are often contested or quietly lost.

This thesis argues that green space governance in Ukraine requires urgent revision. Current practices are shaped by outdated legal frameworks, fragmented responsibilities, and low political prioritization. As cities adapt to climate risks, wartime conditions, and shifting urban demands, green areas remain one of the most undervalued and vulnerable forms of public infrastructure. Without reform, Ukrainian cities risk not only the ecological decline of their landscapes, but also missed opportunities for climate adaptation, community well-being, and spatial equity.

To examine these issues, the thesis asks: How are urban green spaces governed in Ukraine, and what barriers exist to more accountable, inclusive, and ecologically informed management? The research is based on eighteen semi-structured interviews with planners, officials, ecologists, activists, and architects across seven cities, alongside mapping of contested green zones in Kyiv, Odesa and Zaporizhzhia.

Literature review

This literature review explores the contested governance of urban green spaces in contemporary cities. As cities densify, rebuild, and reconfigure in response to social and environmental change, green spaces have emerged as critical but conflicted terrains. The review synthesizes post-2000 academic debates across several

interlinked themes: definitions and conceptual framings of green space; governance models and policy instruments; land-use tensions and zoning logics; environmental, political, and socio-spatial conflicts; and the broader societal roles of green infrastructure in promoting health, equity, and community resilience. By drawing on case studies from Europe, North America, and beyond, the review highlights both the promise and the contradictions of urban greening in the 21st century.

Definitions of Green

The literature on urban environmental planning employs several closely related terms, such as green spaces, green areas, green zones, and green infrastructure, each with distinct yet overlapping meanings. These definitions differ in emphasis depending on whether the source focuses on ecological function, spatial planning, public health, or social equity.

The term green space is perhaps the most widely used in both academic and policy discourse. Clark (2017) offers a broad and inclusive definition, describing green spaces as "large and small (sometimes very small) areas of urban open space, normally with vegetation, which are not built up or constructed over, which can be privately or publicly owned, and which have different and changing purposes and perceptions over time" (Clark et al. 2017, 2). The URGE consortium (2004), cited in European urban planning literature, defines urban green spaces as public and private open spaces in urban areas, "primarily covered by vegetation, which are directly (e.g., for active or passive recreation) or indirectly (e.g., by influencing the urban environment) available to users" (URGE Team 2004, in Haaland and van den Bosch 2015, 762). Meanwhile, the World Health Organization introduces a more technical approach, identifying green urban areas as spaces of at least 0.25 hectares, accessible to the public, and primarily vegetated - explicitly excluding green roofs, cemeteries, and small street verges (WHO 2016). Similarly, the European Environment Agency expands the definition to include parks, private gardens, street trees, greenways, green roofs, and semi-natural areas, provided they contribute to the ecological or social functions of the city (EEA 2014).

The term green area is often employed in spatial planning contexts and may refer more specifically to designated land-use categories within municipal master plans. A study on Nordic countries further categorizes green areas as including town squares, street greenery, green roofs, and small lakes, although the legal definitions and governance responsibilities vary by country (Lidmo et al. 2022). Additionally,

European green structure planning often uses the term "green areas" to denote spatial units assessed for size, continuity, and connectivity in ecological networks (Hansen and Pauleit 2014, 518).

The designation green zone is less standardized internationally but often appears in contexts where urban planning aims to limit sprawl or protect peri-urban landscapes. In Iraq, for example, green zones are defined through local planning as areas whose primary purpose is ecological protection or urban buffering. Khaleefah and Alwan (2022) argue that strategic green zone planning, supported by GIS-based indicators and legal performance standards, is crucial to achieving equitable and sustainable cities (Khaleefah and Alwan 2022, 3). Similarly, in Hong Kong, the "green belt" classification in statutory planning is used to delineate natural areas intended for limited or no development, yet the effectiveness of such designations is often constrained by weak enforcement mechanisms (Tang 2006).

The concept of green infrastructure (GI) serves as an umbrella framework that incorporates the types mentioned above while embedding them in a strategic planning paradigm. Benedict and McMahon (2006) define GI as "an interconnected network of natural areas and other open spaces that conserves natural ecosystem values and functions and provides associated benefits to human populations" (Benedict and McMahon 2006, 12). Ahern (2011) refines this definition in the urban context, viewing GI as "spatially and functionally integrated systems of natural and constructed landscapes that provide multiple ecosystem services and landscape functions to a broad public" (Ahern 2011, 141). While widely adopted in climate resilience policy, the term's conceptual flexibility may undermine its practical clarity; Mell (2016) warns that GI is often a "shapeshifting" term, interpreted variably across disciplines and administrative cultures (Mell 2016, 82).

The term urban green commons (UGCs) refers to collectively managed green spaces within cities, rooted in the tradition of common property systems. Colding and Barthel define UGCs as "physical green spaces in urban settings of diverse land ownership that depend on collective organization and management and to which individuals and interest groups participating in management hold a rich set of bundles of rights, including rights to craft their own institutions and to decide whom they want to include in management schemes" (Colding and Barthel 2013, 157). These bundles of rights are drawn from classic common property theory (Schlager and Ostrom 1992) and typically include access, withdrawal, management, and sometimes exclusion. The key feature of UGCs is not the ownership of land but the

ability of a defined group to actively manage it. UGCs encompass a wide range of green spaces including allotment gardens, PAC-gardens (public-access community gardens), Bürgerparks, and ecological restoration sites on public or corporate land. Empirical cases from Berlin, Stockholm, and Cape Town illustrate how such commons emerge in contexts of social crisis, underfunded public green infrastructure, or after institutional disruptions (e.g., post-reunification Berlin), offering a model for socially rooted, adaptive, and resilient urban ecosystem governance. Scholars note that UGCs may offer benefits such as enhanced biodiversity conservation, cultural integration, reduced public maintenance costs, and "cognitive resilience building" by restoring citizens' sense of place and connection to the biosphere (Colding and Barthel 2013, 158–162).

Urban greenery is a broad term encompassing all forms of vegetated space in cities, including those that are public, private, or semi-public. As described in Plüschke-Altof and Sooväli-Sepping (2022), urban greenery includes traditional forms like parks and gardens, but also extends to "street trees, cemeteries, sports fields, balconies, urban forests, as well as urban wastelands and wilderness." The term is thus more inclusive than technical land-use categories such as "green area" or "green belt," acknowledging informal, vertical, and micro-scale vegetation. It often includes spaces such as courtyards, rooftop gardens, or guerrilla gardening sites that may not fall under conventional planning regimes but hold significance for urban ecology, well-being, and social life. In smart city and sustainability discourses, urban greenery is increasingly framed as both infrastructure and public health resource–contributing to air purification, heat reduction, mental health, and social cohesion. As described in European green infrastructure planning documents, urban greenery functions as a network of interconnected landscape elements that are both ecological and cultural assets, essential for climate adaptation and the liveability of dense urban environments (Ravetz et al. 2013).

These definitional variations underscore the need for analytical precision in urban research on green spaces. Whether emphasizing form, function, ownership, or governance, the terminology used reflects underlying assumptions about what roles green environments should play in the urban fabric.

Management of Recreational Areas and Green Governance

Urban green space management has shifted from a purely technical task, such as mowing, planting, and cleaning – toward a more complex system of governance.

This governance integrates planning, ecological design, stakeholder negotiation, and long-term institutional collaboration. Increasingly, researchers conceptualize this system as green governance or urban environmental governance, encompassing the norms, responsibilities, and structures that guide how recreational and vegetated areas are planned, protected, and used.

Germany offers both challenges and successes. While public and private landowners are legally obligated to maintain green areas and ensure safety, underfunding and neglect have led to degradation in many cities. Nonetheless, cities like Freiburg and Munich have implemented comprehensive green infrastructure programs. A notable regional innovation is the Emscher Landscape Park in the Ruhr area, where former industrial lands were repurposed as multifunctional recreational corridors through EU, federal, and municipal collaboration (Lidmo et al. 2022).

The concept of mosaic governance, introduced by Buijs et al. (2016), presents a more networked model. It recognizes the diversity of actors – government agencies, community groups, NGOs, and private landowners – involved in green space planning and maintenance. This flexible arrangement allows co-management of spaces like community gardens and informal parks, adapting to local capacities and needs. A frequently cited example is the Granton Community Gardeners project in Edinburgh, where residents manage unused plots of land to grow food, host events, and create ecological corridors (Elands et al. 2015).

However, political ecologists have raised concerns about governance shifts. Konijnendijk et al. (2014) argue that "governance with or without government" can enable the privatization or exclusion of marginalized communities if legal protections are weak. This critique is particularly relevant in cities experiencing real estate-driven redevelopment, where recreational land may be rezoned or sold under pressure from market actors.

More integrative models emerge from landscape ecology. Haaland and Konijnendijk van den Bosch (2015) recommend connecting parks, forests, and small green pockets into "ecological continuums" to support urban biodiversity and climate adaptation. This model highlights the importance of buffer zones and habitat connectivity, particularly in compact and rapidly densifying cities.

Together, these cases illustrate that there is no single model for managing urban recreational areas. Instead, cities combine legal mandates, ecological principles, and participatory practices based on institutional capacity and socio-political context.

Table 1. Models of Green Governance and Recreational Area Management

Model	Definition	Examples	Key Features	Source
Centralized Public Management	Managed by municipal agencies under legal mandate	Freiburg, Munich	Formal control, public budget, top-down regulation	Lidmo et al. 2022
Mosaic Governance	Shared management by multiple actors (state + civic + NGOs)	Edinburgh (Granton Gardeners)	Flexible roles, co-creation, adaptation	Buijs et al. 2016
Grassroots/Community-Led	Managed and maintained by local residents without formal support	Stockholm PAC-gardens, Cape Town commons	Self-organization, low institutional input	Colding and Barthel 2013
Landscape Ecological	Managed through ecological connectivity	Copenhagen, Berlin green corridors	Focus on connectivity, biodiversity,	Haaland and van den

	and habitat principles		planning integration	Bosch 2015
Fragmented or Sectoral	Management distributed across departments with limited coordination	Addis Ababa, Bahir Dar	Delays, conflict over land uses, under-implementation	Jemal and Moges 2021
Market-Oriented/Privatized	Delegated or shifted toward private actors and developers	Hong Kong Green Belt	Rezoning, land conversion, weakened public protection	Tang 2006

Conflicts Related to Urban Green Spaces

While urban green spaces (UGS) are commonly celebrated for their ecological, health, and social benefits, they are also sites of deep conflict and contestation. The literature increasingly frames UGS as politically and socially charged arenas where competing interests, visions, and inequalities are negotiated.

A primary source of conflict arises from green gentrification – the process by which environmental improvements in historically marginalized areas attract more affluent residents and investors, driving up land values and contributing to the displacement of low-income communities. Rigolon and Németh (2018) argue that while green infrastructure projects often claim to promote sustainability and well-being, they also serve as tools of urban transformation aligned with real estate markets and middle-class preferences. This dynamic is echoed in the work of Gould and Lewis (2016), who examine the paradox of "green gentrification" in Brooklyn and other cities, where urban greening projects disproportionately benefit

privileged groups at the expense of long-standing residents. Similar observations are made in Eastern European cities where "re-naturing" strategies exclude informal users and ethnic minorities from newly formalized park spaces (Plüschke-Altof and Sooväli-Sepping 2022).

The second source, related to the first one, is the commodification of green space, particularly in contexts of fiscal austerity and neoliberal urban governance. In their analysis of Finsbury Park in London, Smith, Osborn, and Vodicka (2022) show how municipal authorities lease public parks to private event organizers to raise revenue, resulting in spatial exclusions and restricted access for everyday users. The park becomes a "semi-public" space whose value is measured in economic rather than social terms – a trend observed in other UK and Northern European cities where budget-constrained municipalities increasingly monetize green assets.

A third source of conflict lies in procedural and interactional injustices, where particular social groups are excluded from decision-making or their cultural practices are not recognized as legitimate. In Tallinn, for example, the removal of self-managed community gardens sparked opposition from residents who felt that their informal stewardship had not only ecological but also symbolic value (Pungas et al. 2022). Similar cases have been documented in Stockholm and Malmö, where youth and immigrant communities report feeling unwelcome or targeted by surveillance in "cleaned up" parks designed to appeal to wealthier user groups (Clark 2017).

Conflicts are also exacerbated by urban densification policies, especially in compact cities where land for development is scarce. Tappert, Klöti, and Drilling (2018) document the contested nature of urban gardens in Zurich and Basel, which are often viewed by city planners as transitional uses rather than permanent fixtures. As cities pursue "smart growth," informal or semi-formal green areas–including brownfields, wetlands, and spontaneous vegetation–are often rezoned for housing or commercial development, despite their local ecological and cultural importance.

From a political ecology perspective, scholars argue that these conflicts reflect deeper structural inequalities and spatial power asymmetries. Sandberg, Bardekjian, and Butt (2015) suggest that green spaces should be seen not as neutral or universally accessible amenities, but as products of political and economic decisions. The meanings of green space vary – what may symbolize nature and escape for some can signify displacement and control for others. This lens is

particularly useful in analyzing conflict-prone areas such as Protasiv Yar in Kyiv, where a historically valued recreational hillside became the site of a development battle between residents and private investors. Activists there argued not only for ecological preservation but for the right to shape their city's spatial future – what Lefebvre famously called "the right to the city" (Harvey 2008).

Another emblematic case is the Länsi-Pasila neighborhood in Helsinki, where tree-felling and park reconstruction prompted protests from residents who felt excluded from early-stage design processes. Here, urban greenery was reinterpreted not only as an ecological asset but also as a contested cultural and emotional landscape.

In sum, conflicts over UGS manifest as struggles over space, rights, recognition, and urban futures. They expose the contradictions of sustainable city narratives and raise critical questions about who benefits from urban greening, whose values are embedded in design decisions, and what mechanisms exist to contest or renegotiate these processes.

Table 2. Types of Urban Green Space Conflicts and City Cases

Type of Conflict	Description	City / Case	Key Drivers	Source
Green Gentrification	Environmental upgrades leading to rising property values and displacement	Brooklyn, NY	Market-oriented greening, real estate pressure	Gould and Lewis 2016; Rigolon and Németh 2018
Commodification of Public Parks	Monetization of public green spaces, restricting everyday access	Finsbury Park, London	Municipal austerity, event leasing, neoliberal urbanism	Smith, Osborn, and Vodicka 2022
Procedural Injustice	Exclusion of local groups from decision-making and planning processes	Tallinn, Estonia	Top-down planning, weak recognition of informal users	Pungas et al. 2022

Interactional Injustice	Disregard for culturally specific or informal uses of green space	Stockholm, Malmö	Biased norms of "proper" park behavior; surveillance	Clark 2016
Compaction vs. Preservation	Conflict between densification goals and preserving existing informal or ecological green spaces	Zurich, Basel	Compact city policies, limited urban land	Tappert, Klöti, and Drilling 2018
Privatization / Development Conflict	Tensions between public interest and private development agendas	Berlin, Germany	Lack of land-use transparency, investor pressure, fiscal austerity, real estate pressure	Colding and Barthel 2013
Aesthetic / Design-Based Conflict	Mismatches between resident expectations and landscape changes	Länsi-Pasila, Helsinki	Tree removal, lack of consultation	Plüschke-Altof and Sooväli-Sepping 2022
Symbolic / Cultural Conflict	Green space interpreted differently across social groups (e.g., as heritage vs. wasteland)	Multiple (e.g., Berlin, Cape Town)	Socio-spatial memory, uneven recognition	Sandberg, Bardekjian, and Butt 2015

Urban Green Spaces at the Nexus of Environmental Conflict, Ecosystem Governance, and Climate Adaptation

Urban green spaces occupy a contested intersection between environmental conservation, social equity, and climate resilience. The literature increasingly emphasizes that these spaces are not neutral landscapes but rather dynamic socio-ecological arenas shaped by conflicting interests, uneven governance, and shifting environmental demands. They embody what Addas (2023, 35) terms "ecological contradiction" – simultaneously celebrated as sustainability solutions while remaining embedded in systems of exclusion, commodification, and political struggle.

One aspect of this contradiction is reflected in environmental conflict over the ownership, access, and development of green spaces. These conflicts arise not only from scarcity of land but from structural inequalities in urban governance. Wolch, Byrne, and Newell (2014) argue that environmental injustice is deeply spatialized in cities: low-income and minority neighborhoods consistently have poorer access to green amenities and are more vulnerable to the ecological "bads" of pollution, heat, and infrastructure failure. Meanwhile, better-resourced areas often benefit from investment in park infrastructure, ecological corridors, or nature-based solutions (NBS), reinforcing patterns of spatial inequality.

At the same time, urban green spaces are increasingly understood as critical ecosystems that provide both ecological services and cultural value. These include microclimate regulation, biodiversity conservation, stormwater absorption, and recreation. Yet, governance of these ecosystems often suffers from fragmentation, scale mismatches, and lack of institutional coordination. Research from Stockholm, for example, shows how urban biodiversity and landscape connectivity are undermined by planning regimes that treat green spaces as decorative rather than functional infrastructure (Borgström et al. 2006; Ernstson et al. 2010). Barthel et al. (2005) further demonstrate that privately managed green spaces, such as home gardens and community plots, are rarely integrated into official green space planning, despite their substantial ecological value.

In response, some cities have introduced formal mechanisms for protecting ecologically valuable zones. Sweden offers a notable example through its system of national urban parks and municipal nature reserves, governed under the Environmental Code (Lidmo et al. 2022). However, even legally protected areas face

ongoing political pressure and contestation when development priorities conflict with conservation mandates. Green infrastructure planning is thus inseparable from questions of land governance, legal authority, and public participation.

The climate crisis further amplifies the significance and tension surrounding urban green spaces. Green infrastructure (GI) is increasingly promoted as a tool for both climate mitigation (carbon sequestration, air quality) and adaptation (flood prevention, urban cooling). The European Commission (2016) defines GI as "a strategically planned network of natural and semi-natural areas… designed and managed to deliver a wide range of ecosystem services." Cities like Copenhagen and Melbourne have implemented hybrid "blue-green" systems to manage flood risk and heat, integrating green corridors and permeable surfaces with conventional infrastructure (Tyler and Moench 2012; Brears 2023). In Japan, Nakamura (2022) documents how urban forests and peri-urban watersheds are being reframed as green infrastructure following the failure of grey systems during extreme weather events.

Nevertheless, operationalizing climate-resilient GI across cities remains challenging. Kabisch et al. (2017) identify persistent barriers such as regulatory fragmentation, financing gaps, and lack of long-term institutional commitment. In many cases, political will lags behind technical knowledge, resulting in green space plans that remain aspirational or under-implemented. As a result, while urban green spaces are essential for achieving environmental and climate goals, they are also contested terrains–entangled in broader debates about land use, governance, and justice.

Land Use Conflicts and Functional Zoning in Urban Green Space Governance

Land use conflicts over urban green spaces are frequently rooted in the structures and logic of zoning systems. Zoning laws–whether promoting densification, regeneration, or "smart growth"–often prioritize economic development while marginalizing ecological and recreational values. As a result, functional zoning becomes a key battleground in debates about how green space is preserved, reclassified, or lost.

In many cities, especially under policies of urban intensification, green spaces are viewed as underutilized land, vulnerable to redevelopment. Leffers (2014) analyzes how intensification in Ottawa, Canada, justified by discourses of sustainability and density, in practice resulted in the replacement of modest homes and green lots

with large luxury developments, even when no rezoning was technically required. Zoning bylaws emphasized building envelopes and technical specifications rather than neighborhood character or green preservation. This often triggered community resistance centered on the "loss of space" or the erasure of local socio-ecological functions.

In Sweden, the compact city model – based on densification and mixed-use planning – has created renewed competition over urban land. Tappert, Klöti, and Drilling (2018) document how urban gardening plots in cities like Zurich and Basel are removed or relocated to accommodate residential development. Zoning plans often treat these informal green spaces as transitional uses, failing to recognize their long-term ecological or community value.

Zoning conflict is not limited to Western democracies. In Seoul, South Korea, greenbelt areas originally designed to contain sprawl and preserve ecological corridors were rezoned in 1999 to allow selective development. Environmental groups opposed these changes, warning that opening up greenbelt land for high-density housing would degrade urban biodiversity and exacerbate overcrowding. The rezoning led to fragmented land governance and undermined trust in the city's commitment to urban sustainability (Bengston and Youn 2006).

More nuanced zoning tools are also emerging, such as Norway's "blue-green area factor", which requires developers to account for the quality and quantity of green space in land-use calculations. This tool aims to promote ecological coherence and multifunctionality in urban districts. However, as planners admit, the factor supplements but does not override legally binding zoning regulations, meaning that green structures still lack strong protection in the face of densification or infrastructure expansion (Lidmo et al. 2022).

Across all these cases, zoning is both a regulatory tool and a discursive terrain. It shapes how green spaces are categorized, whether as buildable land, protective buffers, or recreational infrastructure, and it mediates conflicts between ecological values and urban growth imperatives. As Haaland and van den Bosch (2015) argue, even when cities adopt sustainability principles, zoning practices often reduce green space to a secondary consideration, vulnerable to reinterpretation under economic or political pressure.

Urban Sprawl and Compact Urban Development

Urban form has a profound influence on the structure and accessibility of green spaces in cities. Two contrasting development paradigms – urban sprawl and compact urban development – generate divergent impacts on land use, ecological integrity, and social equity. Both models carry trade-offs for green space governance.

Urban sprawl refers to low-density, automobile-dependent, and spatially expansive development that often leads to the fragmentation of natural landscapes and inefficient infrastructure. Johnson (2001) defines sprawl as an urban form characterized by excessive land consumption and spatial dispersion, with considerable environmental costs. While sprawling suburbs may offer more private green space and ecological buffers in peri-urban zones, they also foster land-use inefficiency, habitat loss, and limited access to public green infrastructure (Haaland and van den Bosch 2015).

By contrast, compact urban development is promoted in many policy frameworks as a sustainable alternative to sprawl. It emphasizes high-density, mixed-use, transit-oriented growth designed to reduce carbon emissions and preserve open land at the urban fringe. The European Commission, for example, links the compact city model to resource efficiency and sustainable urban mobility (Lidmo et al. 2022). However, this densification-oriented model presents significant tensions in relation to urban green space availability, particularly within already developed city cores.

Haaland and van den Bosch (2015) argue that densification tends to result in the infill development of residual green areas, including pocket parks, courtyards, and underused public lands. As residential demand intensifies, these spaces are often targeted for housing or infrastructure projects, leading to a net reduction in per-capita green space. Moreover, vulnerable populations in older or denser neighborhoods are disproportionately affected by green space loss, since they are less likely to have private alternatives such as gardens or courtyards.

The Swiss and Swedish contexts illustrate this paradox. In Basel and Zurich, for example, local governments have removed or displaced allotment gardens, community-managed parks, and informal green areas to accommodate infill development. Tappert, Klöti, and Drilling (2018) describe how these contested green spaces are frequently categorized as "temporarily available" or "transitional," even when they serve as longstanding ecological and social assets. The compact city paradox emerges here: while densification is pursued in the name of environmental

sustainability, it may undermine the very green infrastructure and social cohesion it claims to promote.

Further compounding the issue is the social inequality embedded in compact development strategies. Research from the UK, Brussels, and the Nordic countries reveals that densification disproportionately affects neighborhoods with limited political power, where access to high-quality green space is already constrained. Kabisch and Haase (2013) warn that green space loss in compact cities often lacks adequate compensation mechanisms and intensifies environmental injustice in marginalized communities.

To address these challenges, scholars and planners call for integrated green infrastructure planning. This includes embedding green space factors–such as Malmö's legally backed requirements for vegetated surfaces–into urban design and zoning regulations (Lidmo et al. 2022). Such approaches can help cities balance ecological resilience with housing and infrastructure needs. However, as Kabisch et al. (2017) emphasize, qualitative metrics, such as biodiversity value, accessibility, and social use, must accompany quantitative green space targets to ensure just and effective outcomes.

Instruments for Urban Green Space Management: From Strategic Systems to Local Tools

The management of urban green spaces depends on a diverse array of planning instruments, technologies, and governance tools. These range from integrated green infrastructure strategies that operate across scales and sectors to zoning tools, ecological valuation methods, and community-level practices. Understanding how these instruments function and interact offers insight into how cities operationalize the protection, expansion, and quality of their green environments.

At the most complex level are strategic green infrastructure plans, which integrate multiple policy areas (land use, transport, climate, biodiversity) into a coherent vision. In Nordic countries, such plans are embedded in legal frameworks like Sweden's Environmental Code (SFS 1998:808), which allows municipalities to create local green structure plans as legally binding spatial documents (Lidmo et al. 2022). Similarly, the European Commission's Urban Greening Plans and the Green City Accord require municipalities to report on biodiversity, access to green space, and pollution reduction, using agreed indicators (Zulian et al. 2022).

Valuation tools and ecological accounting systems represent a growing instrument class that quantifies the functional value of green spaces. These include Italy's "green balance" approach, which requires a no-net-loss accounting of vegetated areas, and Sweden's Grönytefaktor (Green Space Index), which scores development projects based on vegetation retention, permeability, and ecosystem service potential (Barthel et al. 2005; Zulian et al. 2022). While not always legally binding, such tools influence project approval and urban design.

At the regulatory level, zoning instruments remain foundational. These include green belts, which restrict urban expansion (as in Seoul and Hong Kong), and green lines, which structure internal continuity between parks, corridors, and ecological nodes. However, these tools vary in their legal weight–green belts often suffer from reclassification under political or economic pressure, while green lines serve as advisory guidelines in spatial plans (Bengston and Youn 2006; Tang et al. 2007).

More granular tools include green space monitoring protocols, such as WHO's Urban Green Space Indicator (UGSI), which set population-based targets for access to vegetation, usually within a 300 m walking distance of each resident (Annerstedt van den Bosch et al. 2015). These indicators are increasingly used in public health and environmental justice assessments but are not yet fully embedded in statutory planning.

Finally, community-based recording and stewardship instruments play a key role in informal green governance. Urban green commons, allotment gardens, and community park groups often maintain their own maps, inventories, and design frameworks. Although not institutionalized, these practices often shape local legitimacy and mobilize residents for political advocacy, as shown in cases like Protasiv Yar in Kyiv or Granton Gardeners in Edinburgh (Colding and Barthel 2013; Elands et al. 2015).

Table 3. Comparative Overview of Urban Green Space Management Instruments

Instrument Type	Function	Scale of Use	Example(s)	Source

Strategic Green Infrastructure Plans	Integrate land use, biodiversity, and resilience planning	City/Regional/National	Sweden GI Plans, EU Urban Greening Plans	Lidmo et al. 2022; Zulian et al. 2022
GIS-Based Planning Platforms	Monitor green cover, guide design, assess spatial equity	City	Stockholm Parkdata	Barthel et al. 2005
Ecological Valuation Tools	Score/quantify service value, track no-net-loss	Project/City	Grönytefaktor (Sweden), Green Balance (Italy)	Zulian et al. 2022
Zoning Tools: Green Belts	Restrict outward expansion, preserve open buffers	Metro/Peri-urban	Seoul Green Belt, Hong Kong Greenbelt	Bengston and Youn 2006; Tang et al. 2007
Zoning Tools: Green Lines	Guide connectivity and internal landscape structure	Neighborhood/City	Stockholm, Malmö park networks	Sweden report
Indicator Systems (e.g., UGSI)	Benchmark population access and distribution of green space	City/National	WHO UGSI standard (300m proximity rule)	Annerstedt van den Bosch et al. 2015
Monitoring Protocols	Track vegetation trends, biodiversity,	Project/City	Uzbekistan satellite-based monitoring	Uzbekistan report

	and greening progress			
Community-Based Recording	Stewardship and inventory of informal green assets	Neighborhood	Granton Gardeners, Protasiv Yar	Colding and Barthel 2013; Elands et al. 2015

Community Building, Health, and Broader Societal Benefits of Urban Green Spaces

Beyond their ecological and spatial functions, urban green spaces offer profound social, cultural, and psychological value, serving as places of community-making, health promotion, and collective identity formation. These "softer" but no less critical functions of green infrastructure are increasingly recognized as core to urban resilience and sustainability.

Research in environmental psychology and public health has consistently shown that access to green spaces contributes to improved mental and physical health outcomes. Urban greenery supports stress reduction, increases physical activity, and enhances cognitive restoration (Wolch, Byrne, and Newell 2014). WHO policy documents now frame green space as a form of preventive health infrastructure, particularly valuable for children, the elderly, and low-income communities (Annerstedt van den Bosch et al. 2015).

Moreover, green spaces support community cohesion and social trust. Parks, gardens, and green courtyards offer spaces where people of diverse backgrounds can gather, encounter one another, and co-create shared urban experiences. This is particularly evident in contexts of demographic diversity or post-conflict urban recovery. For example, Elands et al. (2015) show how community gardening initiatives in the Netherlands and the UK function not only as recreational sites, but also as platforms for civic learning, intercultural exchange, and place-based identity formation.

In Ukraine, grassroots campaigns to defend green spaces such as Protasiv Yar in Kyiv have transformed recreational areas into civic arenas of democratic practice, where residents contest top-down development and reassert their collective right to the city. As Barthel and Colding (2013) argue, urban green commons carry what they term social-ecological memory – a capacity to reproduce knowledge, values, and care practices associated with local ecosystems. These commons become critical sites for rebuilding civic infrastructure in cities undergoing rapid social, ecological, or political change.

In post-industrial or vulnerable neighborhoods, green infrastructure also serves a symbolic function, helping to reduce stigma and foster a sense of local pride. In the case of Detroit and parts of the Ruhr region, large-scale greening initiatives have been framed as both environmental regeneration and community restoration, emphasizing inclusion and dignity in cities often defined by abandonment or decline (Beatley 2010; Ravetz 2013).

Urban green spaces thus emerge not only as instruments of planning and environmental management, but as social and emotional infrastructures that underpin urban life. They help to anchor memory, sustain health, and mediate belonging. Recognizing these dimensions is essential for avoiding narrow, technocratic approaches to green space governance and for designing policies that reflect the lived realities of urban residents.

Ukrainian Academic Perspectives on Urban Green Space

Ukrainian academic literature presents a growing body of research on urban green space (UGS), reflecting the particular challenges of spatial inequality, post-socialist land governance, and limited institutional capacity. Studies across cities such as Kyiv, Lviv, Kharkiv, Dnipro, and smaller urban centers demonstrate a strong emphasis on spatial analysis, accessibility, ecological valuation, and legal fragmentation.

One major theme is the inequitable accessibility of green spaces. In a GIS-based study of Kyiv, Shyshchenko, Havrylenko, and Tsyhanok (2021) found that although the city has 54.8% vegetation coverage, only 45.4% of residents have access to public green spaces for daily recreation within 500 meters of their homes, and 15.5% lack such access within one kilometer. Similarly, Petryshyn, Marynovska, and Kovalchuk (2022) analyzed green area accessibility in Lviv and revealed spatial

disparities in pedestrian access, despite the city formally meeting national DBN standards for per capita green space. Studies from Kharkiv and Dnipro corroborate these findings, showing that although green areas are quantitatively sufficient, they are unevenly distributed – concentrated in peripheral or industrial zones, and often disconnected from densely populated residential districts (Buchavyi, Lovynska, and Samarska 2023; Morar et al. 2022).

The second core theme is institutional fragmentation and regulatory inconsistency. A nationwide inventory of urban green infrastructure (2021) highlighted that Ukrainian municipalities often lack consistent methodologies for calculating vegetation share, with conflicting standards–such as the use of both 25% and 40% thresholds across different legal documents. Derkulskyi (2016), writing about Kyiv, emphasized the failure of municipal planning documents to legally define and enforce "green lines" – spatial boundaries that would protect public green areas from encroachment or rezoning. He further noted that reclassification of green spaces as "buffer" or "mixed-use" zones often serves as a legal loophole for future development.

The comparative perspective also plays a central role in this literature. Lishchynskyy, Tsarenko, and Pukalo (2021) compared EU and Ukrainian urban greening practices, observing that Ukrainian cities rely heavily on large parks while lacking intermediate-scale infrastructure such as green corridors, linear parks, or green roofs. This weakens network connectivity and limits the multifunctionality of urban green systems.

The climate and health dimensions of green spaces are also gaining scholarly attention. Studies from Kharkiv and Dnipro link urban vegetation to microclimate regulation, biodiversity support, and human health. Remote sensing and NDVI-based analyses show the ecological potential of existing green zones but also expose underutilization due to poor accessibility or lack of legal designation (Buchavyi, Lovynska, and Samarska 2023; Morar et al. 2022). Several authors explicitly reference WHO's urban greening recommendations, calling for Ukrainian adaptation of international standards for green infrastructure and environmental justice.

Smaller towns such as Bolekhiv, Yaremche, and Truskavets have also been assessed. A national report on sustainable urban development (2023) found that such towns often have higher relative vegetation cover than large cities like Kyiv or Odesa.

However, they too lack updated planning instruments and integration between ecological priorities and zoning decisions.

Finally, while Ukrainian municipalities have developed digital inventories and mapping platforms for green infrastructure, these remain underutilized. The Urban Green Infrastructure Inventory (2021) notes that such tools are not routinely incorporated into spatial planning or participatory budgeting processes. Scholars argue for greater institutionalization of green space data within urban policy and for stronger civic oversight of how green land is zoned, classified, and developed.

In sum, Ukrainian academic literature underscores that while many cities formally exceed minimum green space provision thresholds, serious concerns remain around accessibility, legal protection, ecological functionality, and institutional coherence. Strengthening urban green governance in Ukraine will require not only quantitative expansion but deeper integration of ecological, legal, and social perspectives into planning practice.

Theoretical Framework

This study is grounded in interdisciplinary perspectives on urban green space governance, drawing from the conceptual fields of green infrastructure, urban green commons, post-socialist urban transformations, and institutional analysis. These frameworks are essential for understanding how green spaces in Ukrainian cities are conceived, governed, and contested in conditions shaped by ecological stress, socio-political transition, and spatial inequality.

In this research, green spaces are understood not narrowly as administratively zoned areas but more broadly as an interconnected network of vegetated spaces within urban fabric. This includes formally designated parks and forests as well as street greenery, riverbanks, recreational buffers, community gardens, and even informal or transitional spaces. The use of the term "green spaces" over "zones" or "areas" allows for a more comprehensive interpretation aligned with contemporary European and ecological planning paradigms, particularly those framed under the multifunctional green infrastructure model (Lishchynskyy, Tsarenko, and Pukalo 2021).

The green infrastructure (GI) concept serves as a central analytical framework. GI refers to strategically planned networks of natural and semi-natural areas designed to deliver ecosystem services and support biodiversity, water management, and climate adaptation. While widely used in EU urban policy and planning, the GI approach is only partially embedded in Ukrainian spatial systems due to legal inconsistencies, underfunding, and administrative fragmentation (Urban Green Infrastructure Inventory 2021). Nevertheless, the GI lens enables a holistic assessment of how urban green systems can serve ecological, social, and economic purposes simultaneously.

A second important framework is derived from the theory of urban green commons (UGCs). Colding and Barthel (2013) define UGCs as urban green spaces collectively managed by users rather than administered solely by the state or private sector. These commons are characterized by local governance arrangements, shared responsibility, and resilience to institutional disruption. The UGC concept is especially relevant to post-socialist cities like those in Ukraine, where formal municipal capacities are often limited and green space preservation increasingly relies on civic initiative and local stewardship.

The post-socialist urban governance perspective provides a third lens. Ukrainian cities, like many across Eastern Europe, face specific institutional and legal legacies, including opaque zoning systems, weak enforcement, fragmented authority, and inconsistent land categorization. Derkulskyi (2016) identifies the absence of legal "green lines" as a core weakness in Kyiv's planning system, enabling piecemeal development in ecologically valuable or recreational areas. Broader scholarship on post-socialist urban transformation highlights how privatization, informality, and the residuals of Soviet-era planning create contested and unstable governance regimes for green spaces (Hirt 2012).

Moreover, current political and environmental realities demand a revised theoretical lens. The full-scale Russian invasion of Ukraine in 2022 has radically altered urban priorities, disrupting infrastructure, increasing displacement, and placing new emphasis on social cohesion, trauma recovery, and environmental safety. In this context, green spaces must be understood not only as environmental or aesthetic features but as infrastructures for public health, civil stability, and urban resilience. The importance of mental health recovery, safe gathering areas, and flexible community design all point to the need for more adaptable, human-centered green space frameworks.

Thus, for this study, it is necessary to adopt a theoretical framework that extends beyond technocratic land use classifications and integrates systemic, inclusive, and adaptive models of green governance. This includes interpreting green spaces as infrastructure (via the GI lens), as shared resources (via UGC theory), and as products of political-economic transition (via post-socialist urban studies). These conceptual tools provide the foundation for analyzing how Ukrainian green spaces are managed, contested, and potentially re-imagined in the face of conflict, reconstruction, and climate instability.

To better understand the institutional, legal, and political dynamics shaping green space governance in Ukrainian cities, this thesis focuses on the ways green areas become contested, how local actors respond, and what mechanisms (formal or informal) exist to manage or prevent conflict. It explores governance not as a fixed structure but as a field of negotiation, where multiple actors with different interests, capacities, and interpretations of "green space" interact. The study is guided by the following research questions:

1) What are the current conflicts in green spaces?

2) How are conflicts over the boundaries and purpose of green spaces resolved?
3) What is the role of local governments in conflict resolution?
4) How can local governments prevent conflicts from recurring?

Methodology

This research uses a qualitative case study approach to investigate the governance of urban green areas in Ukraine, with particular attention to contested or conflict-prone zones. The study combines semi-structured interviews with spatial analysis (mapping) to explore both institutional practices and physical geographies of green space management.

Between April and May 2025, eleven expert and activist interviews were conducted across five Ukrainian cities, including Kyiv and Zaporizhzhia. Respondents were selected using purposive and snowball sampling, targeting individuals with practical knowledge or professional responsibilities related to green space planning, maintenance, advocacy, or regulation. Interviews followed a semi-structured format, allowing for comparability across themes while also capturing contextual insights. Transcripts were thematically coded based on predefined and emerging categories.

In parallel, the study incorporates mapping of green areas in selected case cities – initially Kyiv and Zaporizhzhia. This component involves identifying existing green zones, areas at risk of development, and locations of documented conflicts. Mapping draws on satellite imagery, open-source geospatial data, municipal plans, and activist archives. The purpose is to visualize the spatial distribution of contested green zones and to link interview-based governance analysis with concrete territorial patterns.

This mixed-method strategy enables the research to connect what people say about green space governance with what is actually happening on the ground. By linking interviews with maps, the research shows where conflicts over green areas occur and how different actors try to manage or prevent them. This helps build a fuller picture of how green zones are protected, used, or threatened in Ukrainian cities.

Profile of Respondents

Given the lack of reliable quantitative data on the governance of urban green spaces in Ukraine, particularly in conflict-prone or legally ambiguous areas, this study relies on semi-structured expert and activist interviews as its core methodology. Existing statistics do not sufficiently capture how green spaces are defined, managed, or contested in practice, nor do they reflect the institutional fragmentation, legal uncertainty, or political dynamics that influence these spaces at the local level. Moreover, national-level datasets often omit informal uses, civic interventions, or conflicts that do not escalate into formal court proceedings.

Qualitative interviews were therefore chosen to explore lived experience, practical knowledge, and institutional logics that shape urban green area management. This approach allows the researcher to trace inconsistencies between formal policy and real-world governance, understand motivations behind institutional inaction, and identify both barriers and opportunities for reform.

The study draws on eighteen semi-structured interviews conducted in April-May 2025 with a strategically selected group of respondents involved in the governance, planning, and protection of urban green areas in Ukraine. The sample includes individuals from national-level policymaking, municipal administrations, urban planning professions, environmental NGOs, and grassroots activist initiatives.

Several respondents hold formal positions in city governments or municipal services, including those responsible for landscaping, environmental management, or spatial planning. Others are experts and practitioners in architecture, ecology, or land use, whose professional work intersects with green infrastructure issues. A third group comprises activists and community organizers engaged in public campaigns to protect local parks, wetlands, and riverbanks from development or mismanagement.

Geographically, the sample spans a range of urban contexts, including large metropolitan centers (such as Kyiv and Zaporizhzhia), medium-sized cities (such as Vinnytsia and Rivne), and suburban or peri-urban territories (such as Irpin). This diversity allows the study to capture different governance challenges, from post-industrial land degradation to new development pressures on ecologically valuable zones.

Overall, respondents were selected to reflect institutional diversity and first-hand experience with the mechanisms (and failures) of green space management. Their perspectives provide insight into both formal structures and informal practices that shape green areas, as well as the conflicts and contradictions that arise from them.

Mapping

In this study, OpenStreetMap (OSM) was used as a key data source for identifying and analyzing green spaces across selected urban districts. OSM is a collaborative geospatial platform to which both individual volunteers and institutions contribute data based on satellite imagery, field observations, and official records. While this open model ensures broad coverage and adaptability, it also introduces variability in tagging practices. As such, a clear methodological rationale was required for selecting which OSM tags to include in the analysis.

The core analysis focuses exclusively on polygon-based features that consistently represent structured and recognizable green areas. The selected tags include:

- leisure=park – public parks designed for recreation and everyday use;
- leisure=garden – small landscaped or commemorative green spaces;
- landuse=forest – areas designated for forestry or officially recognized as forest land;
- natural=wood – territories physically covered by trees, irrespective of legal status or governance.

These tags were selected due to their spatial consistency, relevance to formal and semi-formal green infrastructure, and suitability for area-based analysis.

Other OSM tags related to greenery were generally excluded due to issues of inconsistency and limited analytical utility. For example, natural=tree represents individual trees as point features. While such elements contribute to urban ecology, they are mapped irregularly and cannot be reliably aggregated into district-scale indicators. Likewise, tags such as landuse=grass, natural=grassland, landuse=meadow, or leisure=nature_reserve are often applied unevenly across cities or used for spaces that are ambiguously maintained. Their inclusion would risk analytical distortion, particularly in areas with inconsistent mapping intensity.

However, in a limited number of illustrative cases, the tag landuse=grass is retained – specifically where it is visibly used to represent areas with established tree

plantings, such as green corridors between urban development and the coastline, as observed in Odesa. In these instances, imagery and field observation confirm that such areas function as tree-covered public space, despite the technical tag referring to grassy land use. This exception is noted in the visual analysis but excluded from broader quantitative calculations.

By restricting the analysis to a core set of polygonal green space tags, with limited exceptions made for illustrative clarity, this study aims to ensure both methodological consistency and relevance to the lived experience of urban greenery.

Findings

What Is a Green Space?

Interviewees across different cities emphasized that the very definition of a "green space" is often unclear and contested. There is no single, unified understanding of what qualifies as a green zone in urban contexts – environmentalists, urban planners, land surveyors, and officials may each interpret the term differently, each "with their own truth". Several respondents noted that in practice *any* area marked in green on a city master plan tends to be called a green zone, even if it lacks clear ecological value or cover.

The absence of formal criteria for what constitutes a green space – for example, what minimum share of tree cover or permeable soil it should have – means that almost any patch of land with some vegetation might be labeled a green zone. One official admitted, *"The problem is defining what a green zone is. Now it sounds like an area that is green on the master plan. We don't have criteria for [it]."* This ambiguity can be problematic: without a clear definition or quality benchmarks, the mere presence of something green on a map does not guarantee that it functions as a meaningful urban green space.

Beyond definition, **the quality and functionality of green spaces** emerged as a critical concern. Interviewees argued that not all "green" areas actually provide environmental benefits. One expert lamented that a trampled plot of weeds or a thin lawn, though fiercely defended by some as a "green zone," often contributes little to ecology or comfort. As he put it, *"This is not a green zone at all; just as a lawn is not a green zone – it's an ecological catastrophe"*. In his view, genuine green infrastructure must have robust vegetation structure and ecosystem services – *multi-layered plantings that regulate temperature, retain moisture, purify air, absorb dust and noise, and support biodiversity*.

By contrast, many urban "green" spaces in Ukraine today are either overly manicured lawns or neglected scrub that **lack such ecological productivity**. This perspective suggests that the definition of green space should shift from a simplistic aesthetic or land-use label to a more functional one. Several respondents argued for clear *criteria to distinguish a truly "quality" green zone – one that delivers shade, cooling, beauty, and habitat – from nominally green but low-value spaces. "I would advise you to mention in your work the criteria for defining and assessing what is*

good, what is bad, what a quality green zone is, and what a green zone is in general... Give a normal definition," one interviewee urged, highlighting the need for better conceptual clarity in policy.

Moreover, **thinking about urban green space is evolving** from seeing isolated parks or patches toward viewing the city's greenery as an integrated network. Some experts prefer the term *"urban green infrastructure"* to emphasize connectivity and functionality. *"It's no longer comfortable for me to talk about green zones as separate objects. I consider the European terminology – urban green infrastructure – to be more correct... Green infrastructure is something whole,"* explained an arborist from Vinnytsia. In practical terms, this means recognizing that street trees, small squares, riverbanks, private gardens, and even solitary old trees all contribute to the overall green fabric of the city and should be accounted for. One Odesa planner pointed out that traditional metrics ignore scattered greenery: *"Everything is green... a very large number of trees, but they are solitary... And they are usually not included in this calculation [of green space per capita]. They count purely by parks. So, it's a difficult situation."*

Interviewees advocated rethinking how green space is measured so that **every piece of living green infrastructure is valued**, not just officially designated parks. They also suggested shifting the focus from quantitative norms (such as a target square meters of green per resident) to **qualitative outcomes** like biodiversity presence or cooling effects. For instance, instead of only counting hectares, one respondent quipped that *"perhaps we should stop talking about greening and start talking about biodiversity... Until we see a hare in our cities – that's our criterion"* for a healthy urban ecosystem. This illustrates a broader sentiment that urban green spaces should be defined and judged by the *benefits they provide* – ecological, social, and health – rather than just by area or an outdated label.

In summary, the findings indicate a need to **establish a clearer definition and typology of urban green spaces** in Ukrainian cities. Such a definition would incorporate *quality metrics (canopy cover, species diversity, soil condition)* and *functional criteria (cooling, air cleaning, recreation)* rather than relying on nominal designations. By adopting a more holistic concept of green spaces as *critical urban infrastructure* – connected networks of parks, trees, waterways, and natural areas – cities can better assess what they have and plan for what they need. This reconceptualization sets the stage for addressing the many problems surrounding green spaces, as discussed in subsequent sections.

Types of Problems

Interviewees collectively painted a sobering picture of the myriad problems facing urban green spaces in Ukraine. These problems range from concrete threats like land development and poor maintenance to broader issues of public perception and climate stress. **Almost every city represented in the interviews experiences a combination of the following challenges:**

1. Loss of Green Spaces to Development: A dominant theme is the ongoing *"nibbling away"* of parks and natural areas for construction. Respondents recounted numerous cases where parts of parks, floodplains, or other green zones have been illegally allocated or gradually built over by private developers. In Odesa, for example, the official list of parks and squares has been manipulated over time, and even protected parkland has shrunk: *"'Yunist' Park, after inventory, instead of the 12.5 hectares in the master plan, now effectively has only 4 hectares. The rest went for development"*. Similar accounts emerged from other cities. In Kyiv, large swathes of the ecologically valuable Osokorky wetlands were nearly lost to apartment complexes, and decades-old public parks (like Sovski Ponds) have faced piecemeal construction. In Zaporizhzhia, an activist described how a central park (Denys Tarasov Park) was slated for a shopping mall until citizens intervened.

These examples illustrate a systemic problem: *urban green areas are often seen as "reserve" lands for lucrative real estate projects*, and officials or courts have allowed rezoning or leasing of these lands, sometimes clandestinely. One expert noted that this has been happening *"for decades… you have a green zone, and then it turns out a building is supposed to be erected there"*. Notably, developers sometimes actively degrade a green site to justify its conversion. *"They commit deliberate arsons… to discredit it. They say, 'It's a dump,' deliberately set fires, destroy [the greenery],"* said a Kyiv ecologist, describing tactics used to make natural areas seem derelict so that construction will be accepted. The cumulative effect of these practices is a **steady reduction of public green space**, especially in rapidly growing districts where land values are high. Without stronger protections, even formally designated parks can lose land bit by bit.

2. Deterioration of Existing Greenery through Poor Maintenance: Beyond outright loss of land, many interviewees stressed that the *quality of existing green assets is declining due to mismanagement*. A striking concern is the prevalence of **barbaric pruning and removal of trees**. In multiple cities, utility or parks

departments engage in aggressive tree cutting – topping canopies, cutting major limbs – under the guise of "rejuvenation" or safety, but in reality causing long-term damage. *"We observe every year how they destroy our trees... this 'rejuvenating pruning'... they cut everything with one saw, leaving only a trunk. The tree will suffer and then simply dry up,"* an ecologist in Kyiv reported. Another expert bitterly noted that the entire system seems geared toward removing trees rather than preserving them: *"It is profitable for them to cut trees, saw them, sell firewood, and spend money on planting new seedlings. One gets the impression that the system is aimed not at preserving trees, but at ensuring they die, so that budget funds can be spent again [to replace them]"*. This cynical observation speaks to **perverse incentives** within municipal services (a topic expanded in Section 6).

Improper care extends to lack of wound treatment (leading to rot after cuts) and the practice of paving or concreting over tree root zones, which slowly strangle trees. Maintenance is often reactive and cosmetic rather than strategic – for instance, mowing grass to "keep tidy" even during heatwaves or mowing wildflower areas that could be left to support biodiversity. One arborist-activist described the maintenance approach as **fire-fighting**: *"Everything operates on the principle of 'mow from here until lunchtime'... The services work on the whims of local complaints – if someone says a tree might fall, they cut it down just because someone is afraid. That's not how services should work"*. Such short-term and unprofessional practices contribute to the *gradual degradation of the urban tree canopy and green cover*, even in areas that remain officially green.

3. Governance Gaps and Lack of Protection Measures: Many problems stem from institutional and legal gaps (explored in detail in Section 4). A key issue raised was the **absence of proper land documentation and clear boundaries for green spaces**, which makes protecting them extremely difficult. *"All our parks and squares are being 'nibbled away' due to the lack of land survey documentation and established boundaries. Without this, it is impossible to protect the recreational zone from development,"* explained a deputy from Odesa. In practice, if a park has never been formally surveyed and registered as a parkland parcel, pieces of it can be carved off under different pretexts. Additionally, interviewees noted that *urban planning documents are often flawed or ignored*. Zoning plans sometimes conflict with master plans, and environmental norms (such as the requirement of 12 m² of green space per person) are routinely unmet or overridden. An Odesa official admitted that *"urban planning documentation... is ineffective, adopted without adherence to*

environmental norms and [with] expert assessments often corrupt". This creates a situation where **regulations exist on paper but are not enforced**, allowing illegal construction permits and rezoning to slip through. Another facet of this governance problem is the abolition of mandatory public hearings for new developments back in 2011, which several veterans of civic activism noted. Without early public notice and input, residents often discover a project only when construction is already underway. In short, weak governance and loopholes constitute a *fundamental problem underlying many specific conflicts and losses*.

4. Public Attitudes and Awareness Issues: A more subtle problem identified is the ambivalent attitude of the public (and some officials) toward urban nature. On one hand, Ukrainians often profess to love green parks, but on the other hand, many do not value everyday trees or understand ecological needs. *"People love trees – to be in someone else's yard,"* joked one activist, noting that some residents appreciate greenery only at a distance. In their own courtyards, trees may be seen as a nuisance (dropping leaves, casting shade). *"Many people don't value trees; they write requests to 'fell the tree.' You arrive – it's a beautiful tree [but someone just didn't want to rake leaves],"* she recounted. This mindset leads to frequent requests for tree removal, even of healthy trees, adding pressure on local authorities who may then order needless cuttings to appease complaints.

On the flip side, there is also a segment of the public and activist community with an extreme preservationist stance – refusing to remove even dangerously decayed trees or demanding unrealistic compensatory planting. According to a city council specialist, *"there are two categories of people: some say 'everything needs to be cut down, topped,' others – 'don't touch the trees.' Neither is right."* Such polarization can turn decision-making about green spaces into a battleground of extremes rather than a balanced, expert-guided process. Underlying both tendencies is a general lack of education on urban ecology: citizens (and some officials) may not fully grasp the importance of green spaces for urban livability, or the proper ways to care for them. Encouragingly, a few respondents noted that *attitudes are slowly changing as climate impacts become visible. "The hotter the summer becomes, the more people understand that shade from a tree is important,"* one ecologist observed, though she added it's still "not enough" understanding for more complex issues like flood control. Overall, **low public awareness and inconsistent attitudes** present a social challenge that exacerbates physical problems.

5. Environmental and Climate Stresses: Urban green spaces in Ukraine are also suffering from broader environmental stresses. Air pollution, intensive urban heat, and soil compaction in cities make it difficult for trees and plants to survive without special care – care that is often lacking. *"For a tree to grow in urban conditions, it is very difficult now… In cities that care for their residents, they plant as many trees as possible. In our case, it's the opposite: trees are cut down, asphalted over, or wrongly pruned, and then the tree dries up,"* said a Kyiv ecologist, highlighting how *anthropogenic stress and neglect together* imperil urban flora. In addition, new pests and diseases have emerged: for instance, **ash dieback** (a lethal fungal disease) and leaf miner infestations on horse chestnuts are spreading, but responses have been inadequate. *"No one turned to entomologists [for the ash pest]. And the entomologists who know about it didn't approach the department either,"* one expert noted, pointing to a gap in mobilizing scientific expertise. Invasive plant species (like ragweed or amorpha) also proliferate on disturbed lands, often unchecked. Climate change is compounding these issues – extreme heat and drought put trees under stress, and episodes of heavy rainfall test the capacity of urban drainage and vegetation. Floodplains and wetlands, which could mitigate flooding, are themselves being built on or degraded. These environmental pressures mean that **urban greenery requires more attentive management than ever**, but as noted, such management is often missing.

6. Impact of War and Crises: Although not initially an environmental issue, the war since 2022 has influenced green space governance. Some interviewees observed that the full-scale invasion has diverted public attention and city budgets toward immediate security and infrastructure needs, **potentially exacerbating the neglect of parks and trees**. A municipal official from Lviv explained that before the war, mayors took pride in visibly investing in green improvements, whereas now *"public improvement has ceased to be the main trump card… it's often an object of criticism"* and thus tends to be downplayed or postponed. In other words, beautifying parks is no longer politically fashionable when compared to repairing wartime damage or funding defense initiatives. This has led to funding cuts for greening projects and a general *"politics of indifference"* – a topic we detail in Section 6. Additionally, the war has affected the activist landscape: many community activists were mobilized into the armed forces or other war efforts, and tragically some prominent environmental defenders (such as Roman Ratushnyi in Kyiv or Denys Tarasov in Zaporizhzhia) lost their lives.

One expert from Irpin noted that this has weakened the capacity to fight for green zones in some cases, as *the pool of experienced leaders shrank and public focus shifted*. At the same time, the fundamental conflicts around green spaces have not gone away – *"I wouldn't say anything has changed. Our 'dendrophobes' were the same before the war and have remained so,"* she said, meaning that those who opposed tree conservation did not relent even during wartime. In summary, the war introduced new constraints (financial and human-resource) that compound the existing problems, even as it has left the underlying development pressures and maintenance issues essentially unchanged.

In conclusion, Ukrainian cities face **a complex array of problems** in governing and preserving their green spaces. From the relentless push of private development into parklands, to self-inflicted damage by poor upkeep, to gaps in governance and mixed public attitudes, these issues are interlocking and mutually reinforcing. The next sections explore in depth who is responsible for managing these challenges, why current governance has often fallen short and how new approaches could potentially address the problems identified here.

All Green Spaces Are Contested

A striking finding of this research is that *virtually every urban green space in Ukraine can become a site of contestation.* Interviewees from all regions conveyed that **green spaces are arenas of conflict** – whether between public interest and private profit, between different community factions, or between activists and authorities. This holds true for the smallest neighborhood square as well as large city parks or river valleys: in the words of one architect, *"Any territory in the city is a source of conflict"* because different stakeholders have different desires for it. At a basic level, people compete over how a given green space should be used – a mother with a small child may want quiet and shade, a youth group might want sports grounds or a cafe, and a developer might see the same land as an opportunity for construction. These diverging interests mean that **no significant green space stays truly "neutral" or unchallenged**; decisions about upkeep, facilities, or preservation inevitably provoke debate and often heated dispute.

Beyond everyday use conflicts, the more acute form of contestation discussed by respondents is the battle over *whether a green space should remain green at all*. In recent years, numerous high-profile struggles have played out in Ukrainian cities, where community activists and concerned residents mobilized to save green sites

from development. These conflicts underscore the idea that all green spaces are effectively *"contested spaces."* For example, in Odesa the **Summer Theater** case was frequently mentioned. The Summer Theater, a historically green open area inside a city garden, was targeted by private interests for development. Activists, experts, and many citizens rallied to protect it, leveraging public protests and legal pressure. As a result, *"We did not allow construction there, as planned by local 'tsars' (potentates),"* an Odesa respondent noted with pride. However, achieving this outcome required a protracted fight and the intervention of higher authorities – it was by no means a given. The respondent explained that only strong **political will under public pressure** forced the preparation of protective documentation for the site that had been deliberately omitted to facilitate its sale. This story is emblematic: *even officially protected green monuments can be secretly excluded from registries to enable development*, and only vigilant civic action prevented the loss.

Similar stories were recounted in other cities, highlighting that **no green space is safe by default**. In Vinnytsia, an arborist described the battle over *Khimik Park*, where a church was slated to be built on park grounds. The community feared – rightly – that if a building went up, *"the park will no longer be considered a park… its area will decrease, it will become a square at most, and no protection will apply to it"*. She and other residents organized a petition and gathered the required 1,500 signatures to force public hearings on the project – an instrument that local authorities could not ignore. Eventually, the plan to build on the park was shelved and the municipal Institute for Urban Development even stepped in to facilitate a participatory planning process for the park's future.

This outcome – a *successful defense of a green space* – was won through grassroots initiative and demonstrates how ordinary people often have to act as guardians of parks. In Kyiv, multiple respondents referenced the **Osokorky Ecopark (Osokorky wetlands)** campaign, another citizen-driven effort which began in 2007 and has continued for over a decade to stop housing construction on nearly 200 hectares of lakes and floodplain on the city's edge. Activists formed an NGO, pursued court cases, physically tore down fences at times, and managed to get portions of the area designated as local nature reserves to block development. Yet conflicts persist, with developers suing to overturn protections. In Zaporizhzhia, the case of **Yalanskoho (Tarasova) Park** was highlighted: a private lessee (a powerful businessman) intended to build a mall on this central parkland, leading to public outcry. One activist single-handedly filed an initial lawsuit to protect the park, and later a

broader civic campaign emerged. The issue became deeply political – *"this issue turned into a matter of political balance [in the city council]… the new majority understands that building a mall in a square is very unpopular, but they cannot alienate the votes of the businessman,"* explained a local official. This situation remains unresolved, illustrating how contested green spaces can become **political stalemates**, with economic interests weighed against public sentiment.

A notable pattern is that **contestation often activates new forms of civic engagement and organization**. Each of the examples above gave rise to citizen groups or NGOs focused on that green space (e.g., "Ecopark Osokorky" NGO, Vinnytsia's park defenders, Zaporizhzhia's "Urbanizatsiya" and other initiatives). Through these contests, the public in many cities has become more organized and networked around urban environmental causes. Several respondents were themselves founders or members of such movements. They stressed that while these efforts sometimes succeed, they come at the cost of endless volunteer hours, personal stress, and even legal risks for activists.

Furthermore, *activists acknowledged the need to professionalize their approach in these contests*. One long-time activist noted that early on he was content just to protest, but now *"I talk to [officials] as people, appeal to their humanity… if they mess up, I make it public. The result is more important to me than just hype. I used to be an activist – and that was it. Not anymore."* This statement reflects a maturing in the activist community: moving from confrontational stance alone toward a mix of negotiation, strategic public pressure, and solution-oriented dialogue. Indeed, another interviewee spoke of cultivating a *"small cohort of adequate people"* within the activist circles *"who understand that protests alone don't work… sometimes you need to protest, sometimes you need to work [collaboratively]."* The contested nature of green spaces has essentially forced both citizens and officials to develop new tactics and forums for engagement (this theme of evolving management models is taken up in Section 8).

It is also important to note that **not all contestation is purely citizens vs. authorities**; often, government actors themselves are internally divided or supportive of preservation, and external factors like investors are at play. For instance, in Zaporizhzhia the relative absence of green space conflicts was attributed not to enlightened policy but to a lack of strong outside investors interested in those lands. Where powerful development interests do exist (Kyiv, Odesa, etc.), local governments face intense pressure and sometimes collude with

those interests, prompting pushback from other officials or higher government. An Odesa example showed that when community outcry over a park grew loud, the regional governor's office took action to expedite protective measures.

This suggests that contestation of green spaces can escalate through various levels of governance. In some cases, it even involves international attention: the Osokorky activists connected with international environmental organizations and brought their case to forums like the EU Parliament and Bern Convention, seeking external leverage to protect their green space. Thus, *the contestation of urban green spaces extends from the hyper-local (neighbors arguing over a tree) to the global (mobilizing international conservation support), all converging on the question of who gets to decide the fate of a given piece of urban nature.*

Finally, interviewees pointed out that the **wartime context did not put these contests on hold**. If anything, some development pressures intensified (e.g. demand for new housing in safe cities, or unscrupulous actors trying to take advantage of the chaos), while the capacity of communities to respond was strained. Yet, as noted, fundamental attitudes did not dramatically change overnight – those who prioritized short-term profit or had antipathy to trees remained entrenched, and those who valued green spaces continued to fight for them. One planner wryly noted that Ukraine's notorious *"dendrophobes"* – individuals hostile to trees – are as active as ever in pushing for tree removals or opposing new plantings, war or no war. Therefore, the struggle over green spaces persists through the country's broader turmoil.

In conclusion, **"all green spaces are contested" is not hyperbole but an accurate characterization** of the urban environmental landscape in Ukraine. Parks, squares, riverbanks, and woodlots have become focal points of contention between development and conservation, leisure and profit, present needs and future sustainability. These contests have spurred civic innovation and solidarity, yet they also highlight weaknesses in urban governance. The next section delves into those governance issues – essentially asking, *who is responsible for preventing or managing these conflicts, and why have they so often failed to do so?*

Who Is Responsible? Legal and Normative Gaps

When it comes to the governance of urban green spaces, the interviews reveal significant **ambiguities and gaps in responsibility**. A recurring question was

essentially, "Who should be accountable for protecting and managing these areas?" The findings suggest that responsibility is fragmented across multiple institutions, and existing laws and norms leave many loopholes. This has created a situation in which *no single entity takes full responsibility* for green spaces, and critical tasks fall through the cracks.

One major issue is the **lack of clarity and coordination among city departments and agencies**. Maintenance of green spaces often involves several bodies – for example, a city's parks department (often a *Zelenbud* or Greenery Trust) may handle parks, while a housing/utilities department handles street greenery or lawns, and a land department oversees allocations. Interviewees in Irpin described how this division leads to chaos: *"Public works is responsible for parks… UZN (Housing/Communal Services) is responsible for streets; they mow the grass, but trees on streets are public works. As a result, they don't interact with each other at all, not to mention the land department and utility networks."* In practice, this means no one coordinates where to plant new trees (the housing department might not know where underground cables lie, and the public works folks "guess" and often find out too late).

Inter-departmental silos thus impede any comprehensive green planning. Furthermore, many green areas fall outside any department's jurisdiction entirely. Several respondents noted that *numerous patches of urban green are "not on anyone's balance sheet,"* meaning no municipal entity officially records or cares for them. Such areas, which can include informal parks or strips along lakes, end up neglected – no routine maintenance, no monitoring for illegal activity. As one activist put it, *"No one knows what is happening where… especially since not all areas are even under the jurisdiction of the Greenery Departments. For instance, an entire lake territory was supposedly no one's – not on anyone's balance sheet. Obviously a green zone, right? But because the land plot wasn't allocated, it belonged to no one."* This example shows how the failure to formally assign responsibility (through land allocation or "passportization" of green sites) leaves them vulnerable. In the case he mentioned, it took persistent knocking on bureaucratic doors to even determine who *might* be responsible, by which time parts of the area had already been leased out. In sum, **the current governance structure is highly fragmented**, and vital coordination – for example, between those who plan land use and those who maintain plantings – is often missing.

Another critical problem lies in the **legal and normative framework (or lack thereof) governing urban green spaces**. Many interviewees pointed out that foundational legal tools – like up-to-date land surveys, registries of green zones, and clear regulations – are absent or outdated. One Parliament deputy bluntly stated, *"Most parks, squares, and green zones are not legally registered as land plots… If a land plot is not allocated, then an adjacent land plot can be allocated, encroaching a little on the green zone… If there's no registered land, well, there's just territory [open to claim]."* This highlights a systemic normative gap: **unless a green space is legally demarcated and titled for recreation or conservation use, it has weak protection**. Developers can exploit this by obtaining adjacent land or even portions of the green space itself under different pretexts.

Several respondents underscored the need for formal *"pasportyzatsiya"* (certification) of all green spaces – essentially creating legal passports that define their boundaries and status. While laws exist that allow this, implementation has been slow and inconsistent. In Odesa, for instance, there was an ordinance approving a list of parks back in 2009, but *"changes are still being made to it"* and efforts to add new parks to the list (to protect land) received no support in the city council. This suggests that **political will is a factor** – some local councils simply do not prioritize expanding or updating protective lists.

Moreover, important *national*-level norms are either missing or stuck in the past. A city council deputy from Rivne explained that *"we have a very bad situation with the rules for the maintenance of green plantings. This must be regulated at the state level."* For maintenance standards (pruning, removal criteria, etc.), cities still rely on Soviet-era guidelines or ad hoc local rules, and there is no unified modern arboricultural code in Ukraine. Likewise, Ukraine's **urban planning norms for green space (like the 12 m² per person standard)** exist but are not enforced and may not suit current realities. One planner noted that dense historic cities will never meet the old standard in raw area, and suggested shifting to other indicators (such as permeable surface ratios or qualitative targets) – but such new standards are not yet in place. In the interim, officials can claim a city meets "greening norms" on paper by counting every shrub, while the actual ecological quality remains poor.

Enforcement mechanisms and oversight are also weak. The interviews reveal **gaps in the chain of accountability**: for example, the State Ecological Inspectorate is supposed to oversee environmental law compliance, but in practice its involvement in urban green issues is minimal. *"It includes employees of the State Ecological*

Inspectorate – they came a few times in its entire history [of the tree commission], and only when it concerned restorative value," said an activist serving on a local tree commission. This indicates that the state inspectorate rarely attends to routine urban tree felling decisions, leaving them to local utilities who may not have ecological expertise. Additionally, when illegal acts occur – like unauthorized tree cutting or destruction of parkland – sanctions are either not applied or are too lenient to deter violators. An activist from Kyiv noted that Ukrainian law enforcement often treats green violations trivially: *"If a person is just breaking branches, nothing will happen… If they haven't completely cut down a tree, the police will just leave. [In contrast,] other countries have a stricter system of fines and punishments for destruction, damage, and so on."* In short, **legal enforcement is lax**, and those who damage green assets (unless it is an egregious large-scale case) seldom face serious consequences.

A further complication in assigning responsibility is the **institutional ethos and capacity** of the bodies that do have roles in green space management. Respondents frequently criticized municipal green departments or enterprises for lacking initiative and modern skills. Many city *Zelenbud* (greenery) enterprises are structured as conventional municipal companies (KPs) with bureaucratic cultures. One city council deputy observed that their management often lacks incentive to innovate: *"Municipal enterprises, in most cases, do not want to… or do not have the opportunity [to change]. The essence of any enterprise is to make money, but ours are not profit-oriented and they seldom strive for efficiency."* This points to a misalignment: these entities are called "enterprises" but are really public services, not driven by profit or performance metrics. They may simply consume the annual budget allocation without long-term planning.

Several experts noted that **personnel issues** plague these organizations: there is a *"shortage of specialists… people who can think in terms of reforms"* and many workers are seasonal hires with low motivation. *"An ordinary worker at Zelenbud is not very motivated, has a low salary, and management doesn't really invest in them,"* one official said. In smaller communities, the problem is even starker – *"often one person is simultaneously the architect, land surveyor, ecologist, and engineer"* for an entire town. Such overextension means **professional management of green space is lacking** at the local level; decisions might be made by people without relevant training (leading to, for instance, ill-conceived plantings of decorative bushes where a community park could have been established). And as one interviewee acerbically

noted, there is a common misconception among local decision-makers that *"greening is a field that does not require knowledge or brainpower… Everyone thinks they know how to plant things, so absolutely idiotic decisions are made for common spaces."* This cultural attitude – that greenery doesn't need professional oversight – is part of the normative gap, in that it results in no demand for certified arborists, landscape architects, or urban ecologists in the staffing of city departments.

All these factors contribute to a **vacuum of effective responsibility**. When a green space is threatened or deteriorating, citizens often find themselves navigating a maze: the housing department says the land department allowed a lease; the land department says the environmental department must object; the environmental inspectors are absent; the parks agency complains it wasn't given a budget for that area; and the elected officials might shrug unless public pressure mounts. One frustrated expert highlighted how universities and scientists are rarely consulted by city authorities, even when they have useful data (for example, students monitoring small rivers in a city got no interest from the municipality or inspectorate). This indicates a *lack of institutionalized collaboration* – another gap in governance.

In summary, the governance of urban green spaces in Ukrainian cities is undermined by **unclear mandates, outdated or missing norms, and weak enforcement**. No single entity is clearly accountable from start to finish: *planning, inventory, protection, maintenance,* and *oversight* are all fragmented. Legal tools that should safeguard green zones (like binding land-use designations or strict protection statuses) are either not used to their full extent or can be circumvented. And the normative framework guiding daily management is in need of modernization. These gaps answer the question of "who is responsible" with an unfortunate truth: *at the moment, responsibility is so diffuse that often no one steps up proactively.* This realization led many interviewees to discuss the need for new strategic instruments and management models – essentially, ways to fix these governance failings. The following sections turn to those proposed solutions, starting with the strategic planning instruments that are currently absent.

Absence of Strategic Instruments

A consistent theme in the interviews is that Ukrainian cities lack **strategic instruments** for green space governance. Rather than proactive planning and management, most actions are reactive and ad hoc. Respondents highlighted the absence of city-wide strategies, up-to-date inventories, and systematic monitoring

as critical gaps. In other words, cities often do not know exactly what green assets they have, do not plan for their development or conservation in a long-term way, and do not use modern tools to guide decision-making.

One foundational instrument that is missing or only partially in place is a **comprehensive inventory of green spaces and plantings**. Several interviewees stressed that you *cannot manage what you do not measure or even know. "The second huge problem is the lack of an inventory of green plantings,"* said an ecologist from Rivne. *"If it is carried out sporadically in some regional centers, then… [generally] at all levels we lack systematic accounting of species composition, condition, maintenance needs."* In many cities, the only "inventory" of greenery is an outdated list of parks or the cadastre records of land plots (which, as noted, often exclude parcels that are actually green in reality). There is no unified database that, for example, lists every significant tree or delineates every green space with its size and status. The head of a Kyiv green NGO confirmed this, saying *"currently, we have no centralized accounting system"* for urban trees – some efforts exist in big cities, but they are *"opaque, imperfect, poorly classified."*

The consequence of this is two-fold: (a) authorities cannot strategically prioritize interventions or protections because they lack a full picture, and (b) it opens the door for malfeasance (it is easy to claim a piece of land has no ecological value if no official inventory contradicts that). Some activists have tried to fill the gap themselves; for instance, an Irpin NGO activist described how they started creating a **digital tree map** of the city, using tools like i-Tree to calculate ecosystem services. The local public works department even joined in initial tree-counting efforts. However, populating and maintaining such a map proved challenging due to limited resources and manpower: *"It's not difficult to allocate money for the map and create it. It's difficult to populate it… the department already has enough to do, and who will do this?"* This highlights that while citizen initiatives can kick-start inventories, making them sustainable likely requires formal integration into city management (with dedicated staff or funding).

Monitoring is another strategic function largely missing. Proper monitoring goes beyond a one-time inventory – it means continuously observing the state of green spaces, tracking changes, and assessing health and needs over time. An environmental scientist noted that *"unfortunately, there is no unified approach [today]"* to monitoring urban green plantings in Ukraine and that the regulatory framework has gaps here. Ideally, monitoring would involve various participants

(universities, municipal services, even community volunteers) and modern methods like GIS mapping and periodic surveys. Some positive experiments were mentioned: Odesa, for example, has utilized GIS technologies to map the state of green plantings and make interactive maps. And in Vinnytsia, a project called "Small Rivers of Vinnytsia" involves university researchers collaborating with the community and municipal enterprise to monitor and rehabilitate local streams and their green corridors. These are promising, but they remain isolated cases rather than standard practice.

One expert defined the goal: *"when we talk about monitoring, it is a system of measures carried out constantly and sequentially."* At present, such a systematized approach is absent – monitoring tends to be reactive (e.g., inspecting trees only when a felling permit is requested, or surveying damage after complaints). Furthermore, external conditions like the war have limited some modern monitoring methods (for instance, aerial photography by drones or planes is restricted for security reasons), forcing cities to rely on on-the-ground inspection which they may not be organizing effectively. The **lack of routine monitoring protocols** means emerging threats (like pest outbreaks or tree diseases, or slow encroachments on green land) might not be detected early enough for preventive action.

Another major strategic gap is the absence of **integrated planning documents focused on green infrastructure**. While cities have general master plans and some have environment sections within them, interviewees indicated that these are either outdated or not actionable. *"Landscape planning"* – which would plan green networks and ecosystem services across the urban territory – *"does not exist as a system in Ukraine,"* one expert claimed. For example, a team in Kharkiv developed a professional Green Corridors plan for the city (to link parks and create continuous green pathways), but *"the city ignored it"* for years, only revisiting it later in a piecemeal way. This suggests that even when strategic concepts are formulated (often by academics or activists), they may not be officially adopted or implemented. Similarly, in Rivne a concept for developing *blue-green corridors* was created in 2021 with input from experts. It outlined goals and a plan; however, *"unfortunately, it's not being implemented"*, according to a participant. This pattern – strategies on paper, but no follow-through – underscores a lack of institutional commitment to strategic instruments.

Importantly, some **new strategic initiatives are starting to emerge** under the influence of European integration and progressive local leaders. For instance, Vinnytsia recently approved a policy called the "Green Course" and began to seriously discuss green space management. An expert from Vinnytsia noted that their Institute for Urban Development and a dedicated greening expert have been thinking about a *management model* for urban green spaces. In Dnipro, an interviewee referenced a project titled "Green Spaces Strategy Development," led by a former municipal official, which aims to map all potential green zones in the city and engage residents in deciding their fate. The logic of that project is to *"identify all potential green zones… map them, and allow residents to vote on whether they want it to be a park or a square… She has created a management tool."* This is a concrete example of a strategic instrument: a citywide GIS map of current and potential greens, combined with participatory planning to designate uses – essentially a Green Space Master Plan. The fact that respondents from other cities pointed to this Dnipro project as a reference shows a growing awareness that **such strategic instruments are needed everywhere**.

European models also encourage this: one expert mentioned that under the EU's biodiversity strategy, cities are expected to develop Urban Greening Plans – strategic documents to expand and connect green spaces. Many Ukrainian cities have joined initiatives like the Covenant of Mayors for climate and sustainable energy, which also imply making adaptation plans (which include green infrastructure for heat reduction and flood control). Thus, there is external pressure and inspiration to adopt strategic planning for greenery. However, not all cities have caught up. Some respondents lamented that local officials remain in a day-to-day mindset and *"do not plan deeper than the annual budget."* For example, only a few cities like Lviv plan budgets two years ahead which allows more strategic projects, whereas most allocate funds year by year, making long-term green programs hard to sustain.

Standards and guidelines are another type of strategic instrument largely absent or outdated. A city that takes green space seriously would typically have local standards for things like tree planting (appropriate species, pit sizes, soil preparation), mowing regimes, or canopy cover targets. In Ukraine, these standards are either the old Soviet GOSTs/DBNs or improvised. One interviewee highlighted that *European cities often have their own urban greening standards* (for example, Kraków or Wrocław in Poland have detailed mowing and planting standards) and

argued that *"Cities can write their own standards; we can translate, adapt, implement, write our own standards."* This is currently not done in most cities – no local norms tailor-made for the local climate and context. Because of that, outdated practices persist (like planting water-loving poplars in dry steppe cities, or planting annual flowers each year instead of perennials). The **lack of updated standards** also means that when contracting out work or planning new projects, cities might use flawed calculations – one respondent gave a startling example of a methodological absurdity: the official calculation method suggested planting 16 shrubs per square meter (an impossibility), leading to hugely inflated cost estimates for landscaping until an expert pointed out the error. This is a direct result of not revising old norms.

Additionally, **nature-based solutions and modern green infrastructure concepts** have not been systematically integrated into city planning instruments. Interviewees who had international exposure noted that things like green roofs, rain gardens, permeable pavements – which are common in European green urbanism – are still seen as novelties or luxuries in Ukraine, rather than standard components. A Lviv official mentioned that at urban planning councils he has started asking developers, *"Where is your green roof?"* when they propose large new buildings, insisting that this is not a whim but a necessity for stormwater management. The fact he has to ask implies there is no regulation requiring it yet. Similarly, a Rivne activist described how they *demonstrated a rain garden* (a small landscaped depression to absorb runoff) as a pilot, but it was later literally filled in by local authorities who perhaps did not understand its purpose – especially once a VIP visit was expected and they reverted to conventional landscaping. This anecdote underscores a *gap in strategic acceptance of new solutions*. If a strategic plan or guidelines were in place that encouraged nature-based solutions, such interventions would be valued rather than undone.

In summary, **Ukrainian cities generally lack the strategic framework and tools needed for effective green space governance**. They often do not maintain comprehensive inventories or maps of green assets, do not have ongoing monitoring programs to inform management, and have not adopted modern green infrastructure plans or standards. The approach to urban greenery has been piecemeal – planting a few trees here, reacting to a crisis there – rather than guided by a coherent long-term vision. This absence of strategic instruments is both a cause and consequence of the governance issues outlined in the previous section. Without data and plans, city officials find it hard to justify strong protective measures or

budget allocations, and without leadership priority, such data and plans are not developed – a vicious circle. Breaking that cycle is essential. Indeed, many interviewees pointed towards the need for *new strategies, management models, and use of expert knowledge* to turn things around. The next section (Funding, Maintenance, and the Politics of Indifference) will discuss how resource allocation and political attitudes have further hindered progress, before we move on to the forward-looking suggestions on new management models that directly address the strategic gaps identified here.

Funding, Maintenance, and the Politics of Indifference

The effectiveness of green space governance is intimately tied to questions of resources and priorities. Interviewees described a pattern of **chronic under-investment, misallocation of funds, and general indifference from decision-makers** when it comes to urban greenery. This section examines how funding and maintenance practices – and the political attitudes behind them – have often perpetuated the problems outlined earlier.

Firstly, it was noted that *municipal budget allocations for green spaces are typically modest and, in recent times, shrinking*. Several respondents mentioned that green initiatives often take a back seat to other urban needs, especially during economic downturns or war. For instance, in Lviv during 2022–2023, a lot of city funding was redirected to urgent priorities like energy infrastructure (due to war damage and energy security needs), leaving little for parks or tree planting. *"I currently see no attempts by the city to invest in greening and parks,"* said one official plainly. This reprioritization can be seen as rational under crisis conditions, but it also reflects a deeper issue: urban greening is not yet viewed as essential infrastructure. One interviewee observed that in the past, mayors proudly spent money on flowerbeds and park makeovers to win voter favor, but now *"any efforts in public improvement are devalued"* and even if something is done, *"they try not to publicize it."* This suggests that politically, green spending has become seen as non-essential or even frivolous during wartime, to the point that city authorities might hide such expenditures to avoid public criticism.

On the other hand, when funds **are** spent on green spaces, they are not always spent wisely. A recurring criticism was the **inefficient and ornamental use of budgets** – pouring money into showy but unsustainable projects. A vivid example given was the penchant for planting large quantities of annual flowers each spring (like

petunias or ornamental beds) which must be replanted every year at considerable cost. *"We still plant annual flowers in spring. It's unclear why, when everything could have been planted with perennials long ago to save money,"* an Odesa planner remarked. Another expert quantified the waste: *"Tulips in carpets… 300,000₴ in one contract, 300,000₴ in another – that's about half a million. Our small city with a very limited budget spends half a million annually during the war on tulips."* The critique here is that such spending is more about **visible short-term aesthetics** (and perhaps political showpieces) than long-term value. Those same funds could have been used to plant hardy perennials or trees that last decades, or to care for existing green assets, but instead they are literally planted in the ground to bloom briefly and die. This reflects a *"budget mastering"* mentality – spending for the sake of using the budget – rather than a strategic investment mindset.

One reform-minded official suggested that their city could *"reduce [the] greening budget by 30%"* without loss of quality simply by cutting unnecessary mowing and annual flower planting, and redirecting those resources to more impactful uses. Indeed, numerous interviewees pointed out that **over-mowing of grass** is another costly practice driven by outdated norms of tidiness rather than ecological or financial sense. Lawns are often kept like carpets at great expense: *"This merciless mowing in the heat, early mowing, frequent mowing where it's not needed… we wrote a whole publication about this,"* said one activist, noting that not only does it waste fuel and labor, it also harms biodiversity and the lawn's own resilience. Yet, city contracts still often mandate a certain number of mowing cycles per season as if more mowing equals better maintenance.

Maintenance equipment and techniques also suffer from *under-investment and stagnation*. Respondents in smaller cities noted that the machinery used by municipal greening enterprises is old and often barely functioning. *"The material-technical base is very outdated… many old machines that need to be written off,"* reported a city council deputy. Nurseries that supply city plantings are similarly in poor shape, with dilapidated greenhouses and limited stock. Despite this, there hasn't been significant funding to modernize them, nor partnerships with private nurseries to ensure a supply of hardy, region-appropriate plants. Instead, some cities still procure the cheapest seedlings (sometimes of low quality or inappropriate species) because of budget constraints or procurement rules that prioritize low upfront cost. One expert lamented this short-sighted approach, saying *"instead of spending money on quality pruning and quality planting, we buy a bucket*

of seedlings from the forestry" – many of which may not survive. Proper planting is capital-intensive (requiring good soil prep, larger planting stock, aftercare), but cities seldom allocate enough for it, leading to low survival rates and wasted efforts.

The **human resource aspect** of maintenance is another critical factor tied to funding. Many respondents described the workforce of municipal green departments as underpaid, aging, or transient. In Soviet times, being a city gardener or forester was a respected technical job; nowadays it often does not attract top talent due to meager wages and seasonal contracts. *"An ordinary worker at Zelenbud… is not very motivated, has a low salary, and management doesn't work on this. There is no investment in people,"* observed one official. Another interviewee noted wryly that a lot of communal workers treat the job as just a stopgap: *"They are temporary, seasonal, just to tide them over… Some have been there 20 years and are very good at propagating plants, but if they are told to plant thujas in a row – that's what they do."* In other words, even experienced workers may not be empowered to apply best practices; they follow orders that often reflect outdated approaches (like planting ornamental evergreens densely, as mentioned). Staff turnover has also been exacerbated by recent crises – some workers left for military service or more stable employment, and replacements are hard to find. In Irpin's case, the activist on the tree commission observed that *"the staff changes a lot now; some go to the front, some left due to the political crisis. They hire people who are completely clueless. Who to teach when there is no stability?"* This points to a vicious cycle: low salaries and support lead to loss of skilled staff, which leads to lower quality work by untrained new workers, which in turn can reinforce management's low expectations. **Training and capacity-building** investments are minimal – though ironically, as some noted, the money wasted on things like excess flowers could easily fund professional courses for the staff.

Overlaying these practical issues is what one might call the **"politics of indifference."** Several interviewees used this phrase to describe an official attitude that ranges from passivity to willful negligence regarding green spaces. In some city governments, green initiatives are low priority unless there is a strong political incentive (like an upcoming election or a personal interest of a mayor). One Odesa urbanist observed that local authorities will implement features like accessibility ramps or inclusive playgrounds now only because they feel they have "no choice" due to external pressure, *"not because they understand why"* – implying a checkbox compliance rather than genuine commitment. In the context of greenery, a similar

pattern emerges: officials may carry out minimum maintenance or plant token trees to show they're doing something, but there is a lack of proactive care or innovation. An extreme example of indifference (or perhaps misplaced priorities) was given by a Rivne activist: during a war memorial project in a small city, the authorities spent a large sum on hardscape and called it done, while the families of fallen soldiers on their own planted and cared for trees to make it a living memorial – the city hadn't thought to include that, and the families actually wanted a green square instead of just monuments. *"The city… poured money into it without asking the families… And the families wanted a square,"* he recounted, highlighting how disconnected local authorities can be from community desires for green, healing spaces.

Politics also affects how private developers engage in public greening. In Lviv, one interviewee noted a recent twist: *developers* of new housing complexes are now investing more in landscaping their premises (courtyards, mini-parks) because they compete for residents who "want to live beautifully". This has led to some high-quality green areas in private developments – sometimes even better than what the city itself provided in older public projects. The positive side is that private investment can raise overall green coverage and quality; the concern is that it may create pockets of well-kept greenery accessible mainly to those in new developments, while public parks languish with little funding. However, it was mentioned that Lviv's leadership set expectations that new developments must include quality public improvement and accessibility. This shows that where *political leadership prioritizes quality*, it can influence outcomes even in private sector involvement. Unfortunately, not all cities enforce such standards.

Finally, *corruption and patronage* cannot be ignored as part of the funding problem. While interviewees spoke cautiously on this, there were hints that some maintenance contracts or municipal enterprise operations may involve kickbacks or "dohovornyaky" (collusive agreements). A Rivne deputy noted problems with outsourcing because of weak procurement services that might lead to collusion instead of true competition. Also, the observation that trees might be deliberately not cared for to secure future planting contracts suggests a corrupt incentive structure. In essence, if money can be made by cutting trees and replanting (especially if the same companies or officials benefit each cycle), there is a financial motive to perpetuate that cycle rather than invest in keeping trees healthy. This cynical dynamic reflects a governance failing discussed earlier, but it is enabled by the allocation and oversight of funds – or lack thereof. Without transparency and

public scrutiny, green budgets can be spent in ways that serve private interests more than the public interest.

In conclusion, **funding and maintenance practices in many Ukrainian cities have been inefficient and guided by short-term or indifferent attitudes**, rather than by sustainability and care. Underfunding of essential maintenance (like proper pruning, watering, soil care) goes hand in hand with wasteful spending on visual projects (lawns, flowers) that do little for long-term green infrastructure. Low investment in people – training the gardeners, hiring arborists – results in continued poor practices like brutal pruning and over-mowing. And at the political level, urban greening is often treated as dispensable unless it serves a political image purpose. This state of affairs has fostered the deterioration and conflicts we saw in earlier sections. However, many interviewees did not simply despair – they offered concrete ideas for reversing this situation through new approaches, smarter use of resources, and inspired models, some drawn from Europe or local experiments. The next section will explore how European models have begun to influence Ukrainian urban greening, and the final section will compile the strategies and management models interviewees proposed to move from indifference to effective stewardship.

European Models as Pressure and Inspiration

Across the interviews, it became clear that European experiences and standards serve as both a **pressure and an inspiration** for Ukrainian cities in rethinking green space governance. On one hand, Ukraine's move towards European integration has brought external expectations – commitments to environmental directives, participation in international initiatives – which press local authorities to improve their green space management. On the other hand, specific models and best practices from European cities offer a glimpse of what is achievable and provide templates that Ukrainian urbanists and activists are eager to adapt.

Several respondents mentioned broad European frameworks that are shaping the agenda. One such framework is the **EU Biodiversity Strategy and related policies**, which call for cities to adopt Urban Greening Plans and set targets for restoring urban nature. *"European strategy for biodiversity conservation [requires] cities to have greening strategies, restore natural areas, preserve pollinators,"* noted an ecologist, indicating that these high-level goals are trickling down as points of reference. While compliance is not mandatory for Ukrainian cities yet, there is an implicit pressure: if Ukraine aspires to EU membership, its cities will eventually be

expected to meet European standards for green cover, air quality, and climate adaptation. This has already led many municipalities to engage with programs like the **Covenant of Mayors** and develop Sustainable Energy and Climate Action Plans (SECAPs). Those plans invariably include sections on green spaces as climate adaptation measures (for cooling and flood mitigation). An environmental scientist from Vinnytsia noted that her city and others are increasingly focusing on climate change adaptation, which *"provides an opportunity to promote the idea of preserving existing green plantings and increasing their number."* In this sense, global and European climate initiatives give local environmental advocates leverage – they can argue that planting trees and safeguarding parks are not just local niceties but part of fulfilling international commitments.

European influence is also evident in **specific standards and knowledge** that are being shared. One respondent highlighted the existence of comprehensive European standards for urban green care – for example, guidelines by the European Arboricultural Council on tree pruning, or city-level rules in EU cities for mowing regimes. These have started to permeate professional discussions in Ukraine. *"There are European standards for care, planting, pruning... People [abroad] are very willing to share; they come here. Just take it and do it,"* said a civic activist, emphasizing that Ukrainian communities could freely tap into this knowledge base. Indeed, international workshops and trainings have been taking place: for instance, Polish and German experts have engaged with Ukrainian municipalities on topics like sustainable urban drainage (incorporating green infrastructure) and ecological landscaping. One planner mentioned that in Poland *"there's a very cool mowing standard"* which Ukraine could adapt. Another interviewee recounted how European experts helped them understand modern nursery practices and species selection. Such exchanges act as **inspiration**, showing that problems Ukraine faces have known solutions. For example, confronted with widespread over-mowing, Ukrainian activists learned how many Western cities now mow less frequently and leave some meadows for pollinators – a practice that could be emulated to save money and improve biodiversity. Facing the issue of fragile young trees dying, they see that European cities invest heavily in site preparation (large tree pits, quality soil, staking, watering) – which suggests Ukrainian cities need to budget for proper planting techniques, not just the sapling itself.

European models have also been inspiring in demonstrating **institutional innovations**. One frequently cited example was **Lviv's introduction of the**

"municipal gardener" institution in 2020. Lviv, learning in part from Western cities, created positions for district head gardeners who act as responsible managers (balance-holders) for green spaces, planning and overseeing maintenance, while much of the actual maintenance work was outsourced to private companies via competitive tenders. An expert noted this as a positive case: *"Lviv is a good example. They introduced gardeners… They plan, forecast, control quality of service provision, and most services are outsourced."* The result was a more efficient use of funds and improved upkeep, to the point that some respondents said new squares in Lviv created through these mechanisms outshine older city-maintained ones. Another example came from **Lutsk**, where the city has long split its green maintenance contracts into lots – one company handles lawn mowing, another handles flowerbeds, another street trees, etc. This allows specialized businesses to compete for each aspect, bringing in perhaps more expertise and preventing monopolies. *"Lutsk… procures in lots: someone does perennials, someone does mowing. Different businesses, even private ones, can enter,"* explained an interviewee, suggesting this increases competition and quality. These models echo practices in some European cities that contract out services while retaining oversight and strategic control within the municipality. For other Ukrainian cities, seeing Lviv and Lutsk succeed provides a **domestic demonstration effect** – these are Ukrainian cities adapting European-inspired models and achieving results, which makes it more convincing that others can do the same.

Another area of European inspiration is **community engagement and participatory practices**. European cities are known for involving residents in urban planning decisions and park design (through public consultations, participatory budgeting, etc.). This concept has influenced activists in Ukraine who push for similar approaches. In Vinnytsia, for example, the idea of crowdsourcing a green map and letting citizens vote on future parks (through the project by a Dnipro expert) is very much in line with European participatory planning trends. Some cities have begun using participatory budgeting for park improvements, a mechanism that originated in Western municipalities. An activist from Rivne mentioned that one of their successful park initiatives started with an *"initiative group"* and utilizing the public budget to fund it, combined with input from hired architects and planners. This mix of *bottom-up and expert-driven planning* mirrors how many European projects are done. Activists also draw inspiration from the **cultural mindset toward green spaces** in Europe: for instance, seeing how cities in Germany or the UK treat large old trees as cherished heritage to be accommodated,

not nuisances to be removed, has emboldened Ukrainian tree activists to demand similar respect for heritage trees. One expert pointed out that *"in other countries, there is a stricter system of fines"* and a culture of care – for example, you would not see healthy century-old oaks felled lightly. This comparison is used to press Ukrainian authorities to tighten their own norms and treat green destruction as a serious offense.

European financial instruments are also playing a role. Multiple respondents brought up **international projects and funding** – specifically EU-funded cross-border cooperation projects, the EU's LIFE program for environment, and other grants – as increasingly important for implementing green initiatives. *"Funding has significantly decreased [locally], but opportunities for co-financing through international projects have opened up. Many cities have joined cross-border programs, LIFE, and so on,"* noted a Lviv official. He further explained that when a park is built with support from a cross-border EU project, it tends to be of higher quality: *"When a park is created under a cross-border project here and, for example, in Poland or the Czech Republic, it will usually be better because specialists communicate, and our planners stop doing projects in the simplest and worst way."* This statement underscores two things: **access to European funds brings not just money but expertise and quality standards**, and it effectively raises the bar for Ukrainian projects. City officials involved in such projects gain exposure to European procurement standards, design philosophies, and evaluation criteria, which often emphasize sustainability and inclusivity. For example, Lviv's Zamarstynivskyi Park was rebuilt as part of an EU-supported "Unbroken" initiative (for rehabilitation of war victims) and was done to a very high standard, impressing even locals who had low expectations. The official noted *"you see a park on par with good Polish parks."* This kind of success story exerts a gentle pressure on other cities: if Lviv can have a park that looks European, why cannot we? It also demonstrates to skeptical local politicians that investing in greener, more accessible designs yields tangible benefits like international recognition and citizen satisfaction.

However, the interviews also contain a cautionary note: **European models must be adapted to local conditions**. Blindly copying a norm from elsewhere might not work. For instance, an Odesa planner observed that simply adopting EU per-capita green area standards may be unrealistic for certain Ukrainian cities due to geographic and climatic differences. *"We need to find something of our own,"* he said after noting that even Soviet norms (like 12 m^2 per person) are not met – implying

that cities should tailor greening goals to their context. Another expert mentioned *"regional specifics"* – restoring green landscapes in the Donetsk region's dry steppe will differ from Vinnytsia's more temperate climate. European practice itself acknowledges this (Mediterranean cities green differently than Nordic ones, for example). Ukrainian practitioners are learning to glean principles from Europe but implement them appropriately. One example is dealing with stormwater: European inspiration says incorporate blue-green infrastructure (green roofs, retention basins), but the scale of Soviet-era infrastructure neglect means Ukrainian cities might have to combine these new solutions with traditional upgrades. A Lviv deputy advocated requiring green roofs in new industrial projects because European cities do so to reduce runoff, but he does so knowing it's necessary given local sewer limits, not just because it's fashionable. Similarly, Ukrainian ecologists embraced the European concept of **"heat islands"** – noting research that urban tree canopy can halve surface temperatures – and are using it to argue for more street trees. But they also acknowledge that species chosen must be resilient to Ukraine's specific pests and climate (learning from European invasive species blacklists but also noting some listed invasives might be acceptable in an urban setting if well-managed).

In conclusion, **European models act as both carrot and stick** for Ukraine's urban green governance. The "stick" is the pressure of meeting international standards and not wanting to fall behind peer cities – no mayor wants their city to be seen as backwards or environmentally negligent when comparisons are drawn with EU cities or progressive Ukrainian ones. The "carrot" is the wealth of positive examples and resources: from financing opportunities to technical know-how to simply the vision of greener, healthier cities that Europe exemplifies. Interviewees consistently looked to Europe for ideas on how to reform maintenance practices, how to set up new institutions, how to engage the public, and how to integrate nature-based solutions. The sentiment is that *embracing these models could accelerate Ukrainian cities' progress* from the current contested, under-resourced state of green spaces to a future where parks and urban nature are managed as they are in the best European cities – with professionalism, community involvement, and long-term perspective. The final section will gather the concrete strategies and management model changes that interviewees believe are needed to achieve that vision.

Toward a New Management Model

Facing the multitude of challenges discussed, interviewees did not merely catalog problems – they offered a range of **strategies, instruments, and new management models** to improve the governance of contested urban green spaces. These proposals, drawn from their experiences and inspired by external examples, collectively sketch a roadmap for rethinking how green spaces are managed in Ukrainian cities. In this section, we highlight these proposed solutions, emphasizing the key strategies and tools that respondents believe should form the core of a new management model.

1. Comprehensive Inventory and Monitoring Systems: A first step in any new model is to *know your green assets*. Virtually every expert recommended establishing a **complete digital inventory of green spaces and trees**, and a system for regular monitoring. This means creating up-to-date maps and databases that record the location, size, legal status, and condition of all parks, street greenery, and significant trees. *"You always need to start with accounting/inventory,"* one specialist emphasized, noting that management consists of knowing what you have. Modern GIS tools and community reporting can be harnessed here. For example, activists suggested interactive public maps or apps where residents can help catalog trees and report issues. One NGO already began training people on i-Tree, a tool to assess tree benefits. A new model would formalize this: city departments would maintain these maps (with possibly a dedicated "green GIS" unit) and update them continuously – making data openly available.

Importantly, **monitoring** must be ongoing, not a one-off survey. Respondents advocated for setting up a *municipal tree monitoring program*, potentially involving universities and volunteers, to conduct annual health inspections of trees and periodic biodiversity surveys in parks. As one interviewee explained, *"monitoring… is a system of measures carried out constantly and sequentially"* – so cities should implement routine checks. Some cities might establish a **tree inspector** role (or train existing staff for it). Indeed, several respondents stressed the need to train certified arborists and tree risk assessors who can regularly evaluate trees and advise on care or removal. A Rivne activist noted that during the time authorities waste on ornamental plantings, *"they could train highly qualified tree inspectors… plan professional care"*, and even mentioned that a specialized foundation is ready to help cities train such inspectors. The benefit of robust inventory and monitoring is twofold: it enables *evidence-based planning* (e.g., identifying neighborhoods lacking green space, or scheduling pruning before limbs become hazardous) and increases

transparency and trust. When the public can see data on tree conditions or planned interventions, conflicts can be preempted – decisions will be viewed as grounded in expert assessment rather than arbitrary. In short, the new model would treat urban green like critical infrastructure, monitored with the same diligence as, say, the water network.

2. Clear Legal Designation and Protection of Green Spaces: Many interviewees called for closing the legal loopholes that allow green spaces to be "nibbled away." The new management model must include **securing legal status for all significant green areas**. This means conducting land surveys and officially registering parks, squares, and natural areas with defined boundaries in the cadastre and city master plans. One proposal was to initiate a citywide "*pasportyzatsiya*" campaign – giving every green space an official "passport" (document) that records its size, ecological value, and maintenance responsibility. A deputy from Odesa mentioned how swiftly things moved when political will was there – accounting documentation for a park was prepared "in months" under orders. That kind of urgency should be applied systematically, not just in crisis: each city could create a *Green Space Register* within a year, and pass a council decision confirming protection of those spaces. Additionally, *integrating green infrastructure into statutory urban plans* is crucial. New management practice would ensure that development of any area considers existing green networks; for instance, updating zoning plans so they align with master plan green zones (no more discrepancies as noted in Odesa).

Strategic reservation of land for future parks and green corridors is another instrument: respondents suggested that cities, especially those not yet densely built, proactively reserve and secure plots for parks before they get sold off. *"Those cities with lower land use intensity should inventory and reserve land for blue-green infrastructure objects,"* one expert advised, highlighting an opportunity for secondary cities to plan ahead. Furthermore, a new model would tighten legal enforcement: cities should work with national lawmakers to restore requirements like public hearings for projects affecting green zones and to increase fines and liability for illegal tree cutting or park destruction (taking inspiration from European fine regimes). Assigning clear responsibility is also legal: for every green space, there should be a designated "balance-holder" (which could be a municipal department, a communal enterprise, or even a community management committee) who is legally accountable for its upkeep. Lviv's introduction of district gardeners as responsible custodians is a template – they act as stewards who cannot say "this is

no one's turf". With named responsibility, the public knows whom to approach or blame for a neglected park or unlawful activity there.

3. Institutional Reform: Professional and Accountable Management – A recurring recommendation was to **reform municipal green space management structures** for greater effectiveness. Many interviewees believe the current model of a monolithic *Zelenbud* (green enterprise) handling everything is outdated. Two main reform paths were suggested, which could even be combined: *(a) restructure municipal enterprises to operate with business-like efficiency and transparent goals; (b) outsource specific services to the private sector or NGOs under city oversight.* In either case, a crucial change is separating roles: no longer should the same entity be both regulator (balance-holder) and contractor (service provider) for green spaces. As one deputy put it, *"the balance-holder is also the service provider… they plan themselves, allocate money to themselves, control themselves – this is a system distortion."*

The new model would **separate the client and contractor functions**. For example, the city's environment department (or new Green Infrastructure Department) could act as the planner/oversight body – setting standards, planning projects, and monitoring quality – while maintenance work (planting, mowing, pruning) could be tendered out in competitive lots (to private firms, community cooperatives, etc.). Lviv's example shows this can cut costs and improve service, and Lutsk's multi-lot contracting increases specialization. Over time, if a robust market of landscaping and arborist companies develops, some suggested that *"perhaps these municipal enterprises will not be needed"* at all and cities can focus on contract management and quality control. On the flip side, others suggested *improving the internal capacity* of city green enterprises by introducing performance metrics and revenue models. For instance, a reformed Zelenbud might cultivate its own nurseries to sell plants (bringing income) or offer landscaping services to private clients for a fee, thus becoming partially self-sustaining and motivated to improve.

In either scenario, **investing in human capital** is key. A new model calls for hiring or developing *qualified professionals*: landscape architects, urban ecologists, certified arborists, irrigation specialists. Respondents noted the broad profile required now – *"greening specialist"* is not one narrow field, it spans science and design and public engagement. Training programs (possibly with European support) should be implemented to upgrade the skills of current staff. Additionally, adjusting salary structures to reward expertise and responsibility will help attract

talent. For accountability, the new model can include *performance indicators* for green space managers – e.g., tree survival rate, user satisfaction surveys for parks – rather than just metrics like "number of trees planted" or funds spent. One activist-manager said, *"the survival rate of trees is not an indicator [today]… Instead they count number planted, cubic meters cut."* This must change: success should be measured by how many trees reach maturity and how well green spaces meet community needs, not by how much budget was consumed.

4. Sustainable Funding and Smart Resource Use: The new model must ensure that green space management is not starved of funds, and that funds are used effectively. Several strategies emerged: **increasing and ring-fencing budget allocations for green infrastructure**, pursuing external funding, and eliminating waste. City councils could establish a *minimum percentage of the city budget dedicated to green space*, recognizing it as critical infrastructure (some Western cities do this). At the very least, when development occurs, a portion of development fees should go into a green fund for planting and park creation (some Ukrainian cities already mandate developers to plant trees or pay compensation when they build; this needs to be standardized and strictly used for greening). Another idea is leveraging *public-private partnerships*: e.g., encouraging businesses to sponsor park maintenance or adopt street trees, in exchange for advertising or CSR recognition (this happens informally now, but could be a structured program). Importantly, respondents highlighted cutting inefficiencies to free resources.

The new model would **redirect spending from vanity projects to core needs**. For instance, replacing mass annual flower plantings with perennial landscapes would save money after the initial establishment. One expert estimated a 30% budget saving possible by reducing unnecessary mowing and ornamental displays. That saving can be reinvested in, say, hiring two arborists and buying a tree-lifting machine. Likewise, rationalizing the workforce – by investing in a smaller number of well-trained year-round staff instead of many low-skilled seasonal workers – could improve outcomes without higher long-term cost (since money is currently spent on frequent replantings and fixing failures). Use of modern equipment (like wood chippers, aerial lifts for tree work, irrigation systems) might require upfront investment but pay off in efficiency and safety, and cities should plan for that in budgets or seek grants for such capital costs. A positive development pointed out is **international funding**: the new model aggressively seeks grants from EU programs, climate funds, and cross-border cooperation. Many respondents noted

that opportunities exist now (especially as global focus on climate resilience grows) to get funding for green projects – whether it's a new park, a green corridor, or an urban forestry plan. One interviewee mentioned that *"many foundations now finance projects like 'a greening development plan for X community until 2080'. This should be used."* Indeed, using a €20,000 grant to hire experts to create a long-term greening strategy (which might be "just paper" physically, but extremely valuable guidance) is better than spending the same on a few park benches – this sentiment was explicitly shared. As one activist quipped, *"if there are grants for 20,000 euros, for which you can't install a bench, but you can engage experts who will identify problems and potential – it's worth it."*

This illustrates a shift in thinking: **prioritize funding knowledge and planning** (often grant-eligible) because it leads to better use of all other funds. Finally, the new model would incorporate **economic valuation of ecosystem services** to strengthen funding arguments. By calculating the monetary value of what urban trees and parks provide (in cooling, air quality, runoff absorption), city managers can justify budget requests and measure return on investment. Some interviewees have begun doing this with tools like i-Tree, and it should become standard in proposals. The outcome would be that green spending is seen not as a cosmetic expense but as a cost-saving investment (for example, trees reducing healthcare costs by improving air quality and mental health, etc.).

5. Community Engagement and Participatory Management: A cornerstone of the proposed new model is **actively involving citizens and communities in green space governance**. Nearly every interviewee touched on bridging the gap between authorities and the public. One part of this is improving communication and education: *"We need to talk about [green spaces], explain. The more you talk, the more understanding… Why are trees important? Why is the floodplain important? Talk about specific things happening in your city."* This suggests city officials (and activists) should conduct ongoing public awareness campaigns – through public lectures, social media, signage in parks explaining ecological functions – to raise the baseline knowledge. Some cities started lectures on tree care, but one respondent noted, *"too few people attend. We need to move towards modern trends: podcasts, videos"* to reach people. Educating the public can over time reduce both vandalism and unreasonable "dendrophobic" complaints, as people appreciate the value of trees.

In terms of participation, a new model invites citizens into decision-making processes for green spaces. **Regular public consultations** should precede major decisions like redesigning a park or removing mature trees. For instance, Vinnytsia's use of public hearings (triggered by petition) in the Khimik Park case is a model that could be normalized. Many suggested using participatory budgeting to let communities propose and choose small green projects. Another innovative approach from the interviews is forming **multi-stakeholder commissions or councils** for urban green oversight. Irpin's example of including an activist on the tree inspection commission is a start; this could be expanded to a Green Space Council in each city with seats for NGO representatives, scientists, and concerned citizens advising the city on green matters. Such bodies could review plans, monitor contentious issues, and ensure transparency.

Respondents also emphasized **collaboration with experts and institutions** as part of engagement. A new model breaks the silo between academia and city management: local universities and research institutes should be actively invited to contribute data, expertise, and even student power to urban greening projects. One ecologist said mobilizing scientists can *"strengthen the community's position"* when fighting to save a park, by providing credible reports. The example of a community in Vinnytsia region reaching out to a university department for help to scientifically prove the value of their oak park (to halt cutting) shows how expert-community alliances can influence authority decisions. The new model would formalize partnerships – e.g., an MOU between the city and a university to cooperate on annual tree surveys or to develop a city biodiversity strategy.

Crucially, community engagement is not just about consultation – it can extend to **co-management and volunteerism** in maintenance. Many interviewees celebrate civic volunteer initiatives (tree planting days, park clean-ups) but note they should complement, not replace, city duties. The "Gift a Tree to the City" campaign in Lviv, where citizens donate and plant trees, was cited as a successful example of channeling public enthusiasm. The new model would support such initiatives (provide technical guidance, sites, and aftercare for citizen-planted trees) while also curating them to avoid chaos. One official said the purpose of these campaigns is not just fundraising, *"but about organizing chaotic plantings and avoiding unprofessional decisions"* – essentially guiding citizen energy in the right direction (R18). Indeed, Lviv managed to *"practically eliminate chaotic plantings in parks"* by funneling efforts through organized programs.

This points to a strategy of **harnessing community energy in a structured way**: for instance, having a city-run tree adoption program where communities can request and help plant trees on their streets with city approval and support. Similarly, establishing "Friends of the Park" volunteer groups that work with park administrators can improve upkeep and surveillance (discouraging litter and misuse). Over time, these practices build a sense of shared stewardship: people will protect what they've had a hand in creating. As one activist put it, *"any green zone, even a small one – it's very important that people are properly informed, asked for their opinions, and involved... things are done for people."* In the long run, genuine participation not only improves plans (by aligning them with user needs) but also reduces conflict – citizens are less likely to protest or vandalize a project they co-designed.

6. Strategic Planning and Greening for the Future: Finally, interviewees unanimously called for a shift from reactive management to **strategic, long-term planning** for urban green spaces. The new model envisions each city having a forward-looking *Green Infrastructure Strategy* or *Urban Greening Plan* that aligns with climate adaptation goals and urban development plans. This strategic plan would map out a *city-wide ecological network*: connecting parks with tree-lined streets and green corridors along rivers or rail lines, integrating **blue infrastructure** (water bodies, wetlands) as essential elements. One expert insisted, *"All green zones in cities should be interconnected in some kind of blue-green infrastructure network."* This means planning green space not as isolated islands but as part of a continuous system – an approach that increases ecological resilience and recreational opportunities. Strategies would include specific targets, such as increasing per capita green space to a realistic number, improving tree canopy cover by X% by year Y, and ensuring every neighborhood has a park within a 10-minute walk. They would also identify sites for new parks (especially in rapidly developing or underserved areas) and outline steps to acquire or reserve that land.

Climate change adaptation is a major driver in strategic planning: respondents highlighted the need for measures like **green roofs, permeable pavements, and preservation of floodplains** to manage stormwater and reduce heat. A deputy noted he now always asks developers "Where is your green roof?" – if this becomes standard, cities can mitigate "heat islands" and flooding. New development guidelines should require a certain percentage of plot to be green/permeable, as some EU cities do, and encourage planting of large-canopied trees to shade streets.

Additionally, strategic plans must address **species selection for future climate**: updating planting lists to favor drought-tolerant, pest-resistant species suitable for urban environments. As one scientist said, *"approaches must consider colossal climate changes… species used 50 years ago cannot all be used now."* Ukraine has already started listing invasive species not to plant; cities should incorporate those guidelines. Conversely, planting palettes should diversify to avoid monocultures – a lesson learned from diseases wiping out single-species plantings. *"If we plant monocultures… it's a danger, because if one tree is affected, it spreads to all. Therefore, such plantings should be of different species,"* an expert noted.

Another pillar of strategic thinking is **adaptive management**. Interviewees stressed that rules and plans should not be static; they need periodic review and flexibility to respond to new information or conditions. For example, local public improvement rules (which include green space maintenance norms) should be updated perhaps every 5 years to incorporate new techniques or respond to citizens' feedback. A responsive management model would allow adjustments – say, if a particular mowing regime is found harmful, change it mid-season rather than stick to a flawed plan. This is a departure from the Soviet-style rigid norms; it requires a management culture open to innovation and feedback.

Finally, respondents believed that **fostering a cultural shift** is part of the new model – where both officials and the public come to see urban nature not as decorative "nice-to-have" bits, but as *integral to city life and development*. One city official reflected that *"Five years ago, greening was about benches, beautiful lights, mown lawns. Now it's not like that; it's about land use. It has become much more complicated."* This encapsulates the transformation: from a simplistic beautification approach to a sophisticated, integrative approach treating green spaces as a form of land use that provides critical services. The new management model, as described by interviewees, fully embraces that complexity. It seeks to embed green planning into *every aspect of urban governance* – from education and health (using parks for therapy and well-being) to infrastructure (using trees and soils to manage water and heat). As Ukrainian cities rebuild and develop, especially after the destruction of war, there is a unique chance to "build back greener" – to avoid mistakes of the past and put these new models into practice.

In conclusion, moving *"toward a new management model"* means implementing a suite of interlocking reforms: **data-driven management, legal fortification of green assets, institutional efficiency and transparency, adequate funding,**

community co-governance, and strategic planning for resilience. The interviewees collectively provided a vision where contested green spaces would become better protected and proactively managed commons, rather than afterthoughts or battlegrounds. Achieving this will require political will and continued advocacy, but the tools and ideas are at hand – many already piloted successfully in Ukrainian cities or available through European cooperation. By clearly highlighting and prioritizing these strategies, the thesis underscores a hopeful path forward: one in which Ukrainian cities not only save their existing trees and parks from falling (as the title metaphor suggests) but also cultivate thriving green spaces for future generations, governed in a participatory, sustainable, and wise manner.

Green Inventory: Mapping Results

The first step of the model, "Inventory," not only opens the chain of six steps, but also creates the foundation on which all subsequent actions rest. Without a complete, publicly accessible registry, it is impossible to monitor losses, set standards, or ultimately hold anyone accountable. That's why green infrastructure inventory should start with Green-Space Passporting - digital "passports" for each site, which records the boundaries, ownership, function, environmental indicators, and accountable balance sheet holder.

Importantly, this approach is already beginning to be adopted by cities. For example, in April 2025, the Department of Municipal Economy of the Odesa City Council signed a contract for UAH 1.13 million to inventory 603 thousand m² of green space in the Prymorskyi district (Intent Press 2025). The terms of reference include tree measurement, certification of objects, and mapping of each plot on a topographic basis. This case study proves that inventory is not an abstract requirement - it is already included in procurement plans and can become a mandatory standard for other communities.

Thus, "Inventory" is the starting line where existing layers are brought together, gaps are identified, and a passport system is laid down. The maps of Kyiv, Odesa, and Zaporizhzhia serve as a prototype: they show how cities can integrate data from different sources, involve citizens in verifying boundaries, and move from chaotic lists to a full-fledged Green Cadastre.

The comparative analysis focuses on three Ukrainian cities — Kyiv, Odesa, and Zaporizhzhia — each representing a different urban context and administrative capacity. Within these cities, one district was selected per case: Pecherskyi in Kyiv, Prymorskyi in Odesa, and Komunarskyi in Zaporizhzhia. These districts were chosen based on their population size, land area, and the availability of official documentation on green spaces (Annex). In addition, they differ in landscape structure and proximity to environmental assets such as rivers or coastal zones. The selection aimed to reflect both central and peripheral urban conditions while ensuring manageable spatial units for GIS-based analysis.

The comparison reveals notable mismatches between OpenStreetMap (OSM) data, local master plans, and cadastral boundaries. In some areas, for example, polygons tagged as landuse=grass on OSM are in fact wooded or tree-covered spaces according to field observations and municipal maps. In other cases, green zones are present in OSM or visual imagery but missing from the official cadastre, especially in informal or interstitial zones. A further limitation concerns data availability: due to its proximity to the front line and increased security restrictions, no public cadastral vector data could be obtained for Zaporizhzhia. This creates a gap in verification and highlights how spatial data accessibility remains uneven across regions affected by war.
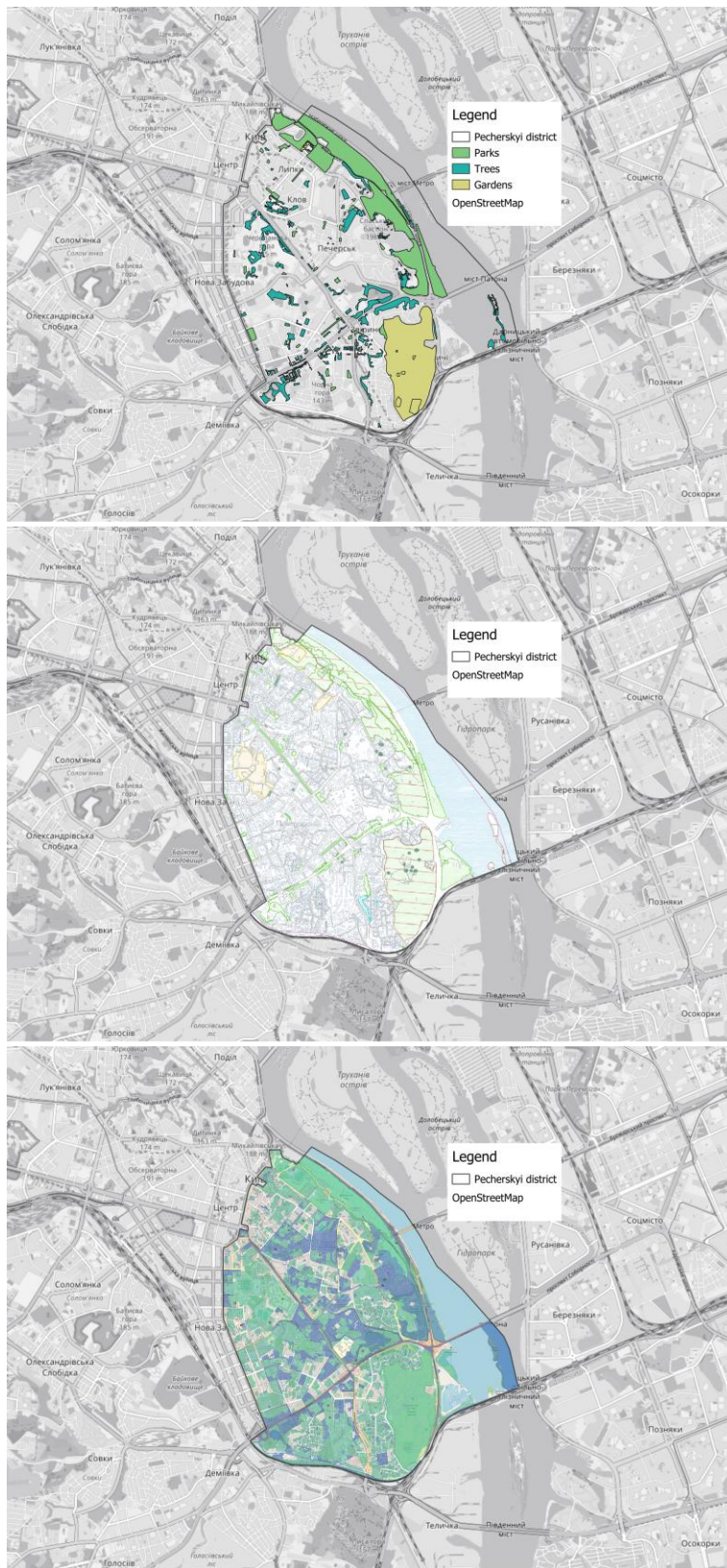
Map 1-3. Pecherskyi District (Kyiv): comparison of green space boundaries based on OSM, urban planning documents, and cadastral data.
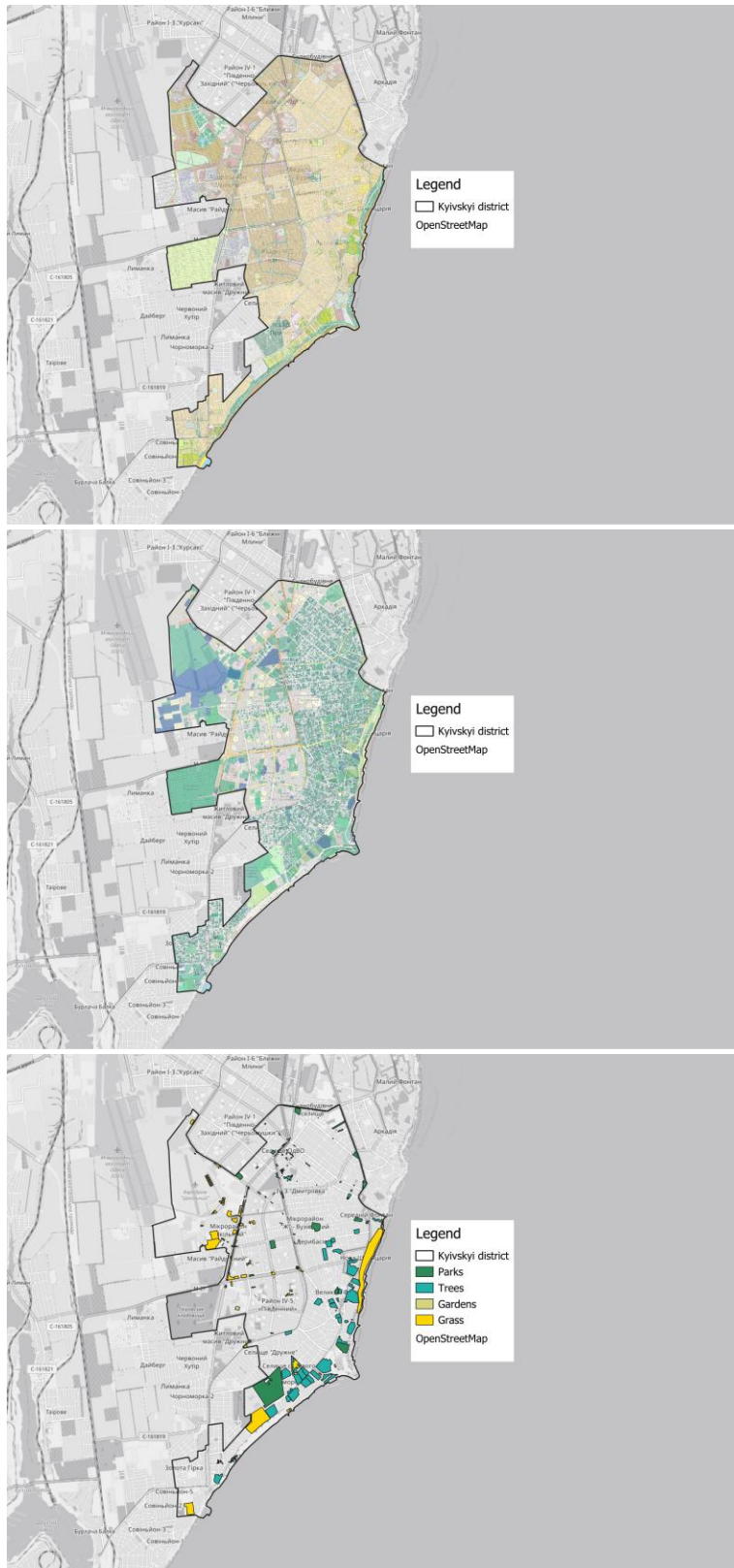
Map 4-6. Prymorskyi District (Odesa): coastal green corridors with mismatches between official plans and OSM tagging (e.g. grass vs. tree cover).
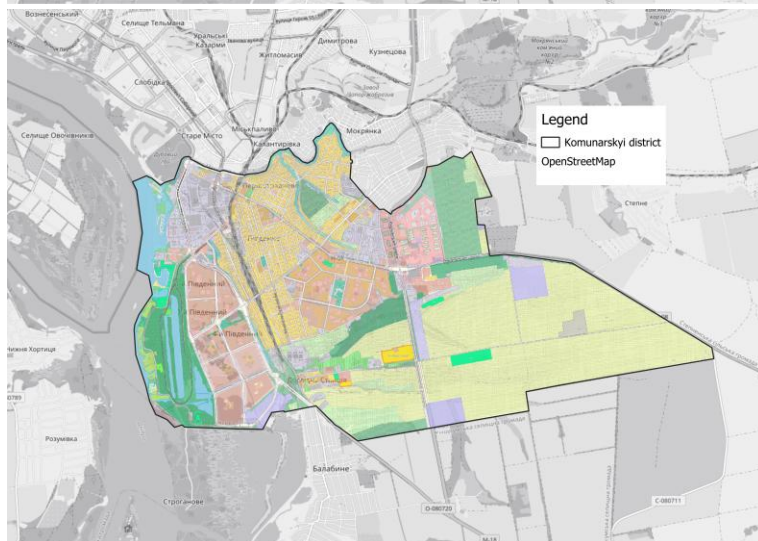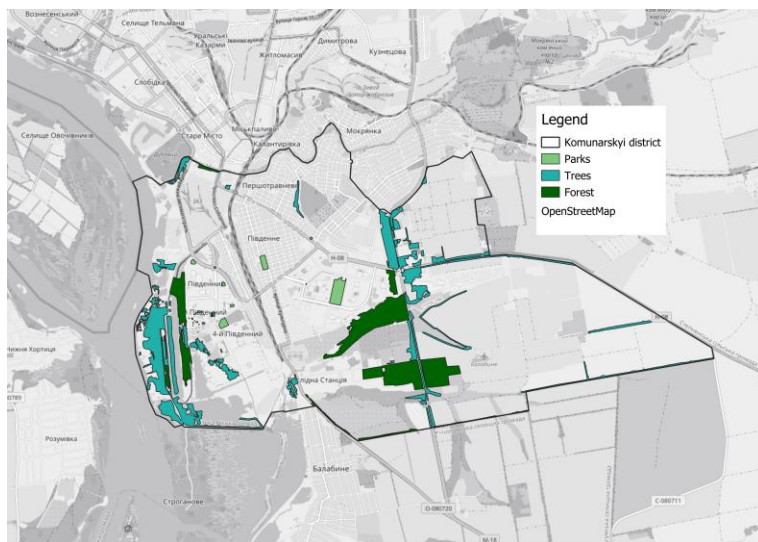
Map 7. Komunarskyi District (Zaporizhzhia): analysis of green areas using OSM and general planning maps in the absence of cadastral vector data.

Discussion

Two cross-cutting issues emerged from the interviews that cannot be solved through management reform alone: the lack of sustained political will and the limited institutional expertise within green space governance. These factors shape not only the implementation of policy, but also what types of policies are imagined, prioritized, or avoided altogether.

1) Political Will and the Limits of Reform Without Politics

Political will was a featured concern in nearly every interview – not necessarily in the form of overt obstruction, but as a pattern of avoidance, short-termism, and symbolic gestures without follow-through. Respondents repeatedly described how city officials express support for green initiatives publicly while quietly shelving them or prioritizing construction interests behind closed doors. As one respondent put it, "We held public hearings. People gave feedback. Nothing happened" (specialist of the city council, Zaporizhzhia).

This problem is magnified in the current wartime context. With no local elections under martial law, many municipal leaders remain in power indefinitely, regardless of performance. Several interviewees implied that this creates stagnation – both in civic accountability and in administrative urgency. The absence of electoral cycles may reduce the pressure to act, while simultaneously weakening the political energy of active citizens who, under normal conditions, might rally to replace ineffective leadership.

Yet the problem is deeper than wartime suspension. Even under normal circumstances, green space issues are rarely politically profitable. They do not generate visible results within a single term, nor do they mobilize powerful constituencies. As your interview findings show, green spaces are often treated as "leftover" concerns – valuable only when they can be converted into projects with ribbon-cuttings or revenue. This reflects what political ecologists call soft politics: domains that are symbolically supported but materially underprioritized.

Addressing this challenge is not simple. While some respondents expressed hope that European integration might generate external pressure for reform (e.g., through funding conditionalities or legal harmonization), others cautioned that no amount of outside alignment will substitute for internal political leadership. One

respondent said it clearly: "If the mayor doesn't care, nothing moves" (planner, Kyiv). This reality demands a long-term strategy of institutional change, civic mobilization, and integration of green issues into broader agendas like climate resilience and public health – where the stakes, and incentives, are higher.

2) Institutional Capacity and Expertise Gaps

Another significant barrier to effective green space management lies in the lack of professional education and ecological knowledge among those in charge. Many respondents described situations in which city workers, contractors, or even department heads made decisions without any background in landscape ecology, biodiversity, or environmental planning. "They mow everything down because they think it looks cleaner," said a dendrologist (Kyiv). "No one explains why some grass should grow longer or why dead wood matters."

This is not only a matter of individual competence, but of institutional design. Few municipalities have dedicated green infrastructure units. Most rely on legacy agencies or fragmented functions divided across land departments, housing offices, and utility services. Even when intentions are good, staff often lack access to training, guidelines, or updated knowledge. "We wanted to create a tree inventory," said one former municipal employee (Vinnytsia), "but we didn't have the tools – or people who knew how to use them."

The problem is most acute when cities outsource maintenance to private contractors. Because bids are awarded to the lowest bidder, there is no requirement (or incentive) to hire ecological professionals. As a result, essential practices – soil care, pest control, selective pruning – are neglected in favor of superficial mowing and planting. Some respondents suggested partnerships with universities, NGOs, or international programs to strengthen capacity, but noted that this depends on municipal leadership recognizing the problem in the first place. Without acknowledgment of the expertise gap, the status quo remains.

This finding reflects what scholars of infrastructures of care emphasize: that maintenance is not only about budget, but about knowledge and attention. When institutions lack both, even well-funded projects can deteriorate quickly. As one interviewee noted, "We've seen beautiful parks die because no one knew how to take care of them.

Conclusion

This thesis examined how green spaces are governed in Ukrainian cities and why they so often become contested. Through fourteen interviews with practitioners, officials, and activists across six cities, and supported by spatial analysis of conflict-prone zones, the study revealed that urban green areas, despite their environmental, social, and symbolic value, remain institutionally fragile and politically marginal.

The findings confirm that all green spaces are contested, though the types of conflict vary: legal ambiguity, access disputes, development pressure, functional neglect, or unclear ownership. These problems are not isolated incidents but symptoms of deeper structural issues such as fragmented governance, outdated legal frameworks, and lack of administrative tools. Green areas exist in a governance vacuum, where no actor holds full responsibility and civic care is not recognized in law.

The research shows that existing systems are unable to ensure the long-term protection and maintenance of urban green space. Even when strategic plans exist, they are rarely enforced. Funding mechanisms are weak, ecological expertise is scarce, and political commitment is inconsistent, especially during wartime, when elections are suspended and accountability is limited.

Despite these challenges, the thesis also highlights potential directions for change. Civic initiatives already play a critical role in defending and caring for green spaces, embodying the principles of urban green commons. Respondents offered concrete solutions: a unified green cadastre, green space passports, clearer mandates, and participatory budgeting. These ideas are the basis for a new model of governance that treats green space not as leftover land, but as essential infrastructure to be legally protected, ecologically sustained, and democratically managed.

In a context of reconstruction, climate adaptation, and shifting urban priorities, green spaces must be redefined as strategic assets. Rethinking their governance is not only a matter of ecological policy, but of justice, resilience, and the right to the city.

References

Addas, Abdullah. 2023. "The Concept of Smart Cities: A Sustainability Aspect for Future Urban Development Based on Different Cities." *Frontiers in Environmental Science* 11. https://doi.org/10.3389/fenvs.2023.1241593.

Ahern, Jack. 2011. "From Fail-Safe to Safe-to-Fail: Sustainability and Resilience in the New Urban World." *Landscape and Urban Planning* 100 (4): 341–343. https://doi.org/10.1016/j.landurbplan.2011.02.021.

Barthel, Stephan, Johan Colding, Thomas Elmqvist, and Carl Folke. 2005. "History and Local Management of a Biodiversity-Rich, Urban Cultural Landscape." *Ecology and Society* 10 (2): Article 10. https://www.jstor.org/stable/26267721.

Beatley, Timothy. 2010. *Biophilic Cities: Integrating Nature into Urban Design and Planning*. Washington, DC: Island Press. https://doi.org/10.5822/978-1-59726-986-5.

Benedict, Mark A., and Edward T. McMahon. 2006. *Green Infrastructure: Linking Landscapes and Communities*. Washington, DC: Island Press.

Bengston, David N., and Yeo-Chang Youn. 2006. "Urban Containment Policies and the Protection of Natural Areas: The Case of Seoul's Greenbelt." *Ecology and Society* 11 (1): 3. https://doi.org/10.5751/ES-01504-110103.

Brears, Robert C. 2023. "Copenhagen Becoming a Blue-Green City Through Blue-Green Infrastructure." In *Blue and Green Cities: The Role of Blue-Green Infrastructure in Managing Urban Water Resources*, 115–132. Cham: Palgrave Macmillan. https://doi.org/10.1007/978-3-031-41393-3_6.

Buchavyi, Yuriy, Viktoriia Lovynska, and Alla Samarska. 2023. "A GIS Assessment of the Green Space Percentage in a Big Industrial City (Dnipro, Ukraine)." *Ekológia (Bratislava)* 42 (1): 89–100. https://doi.org/10.2478/eko-2023-0011.

Buijs, Arjen E., Thomas Mattijssen, Judith van der Jagt, Niki Ambrose-Oji, and Bas Elands. 2019. "Mosaic Governance for Urban Green Infrastructure: Upscaling Active Citizenship from a Local Government Perspective." *Landscape and Urban Planning* 186: 15–24. https://doi.org/10.1016/j.landurbplan.2018.03.007.

Clark, Peter, Marjaana Niemi, and Catharina Nolin, eds. Green Landscapes in the European City, 1750–2010. Routledge Studies in Modern European History. London: Routledge, 2017.

Colding, Johan, and Stephan Barthel. 2013. "The Potential of 'Urban Green Commons' in the Resilience Building of Cities." *Ecological Economics* 86: 156–166. https://doi.org/10.1016/j.ecolecon.2012.10.016.

Derkulskyi, Roman. 2016. "Current Status and Trends of Green Zones Use in Kyiv." *Land Management, Cadastre and Land Monitoring* 4: 67–72. https://journals.indexcopernicus.com/api/file/viewByFileId/71063.pdf.

Elands, Birgit H. M., K. Freerk Wiersum, Arjen E. Buijs, and Kati Vierikko. 2015. "Policy Interpretations and Manifestation of Biocultural Diversity in Urbanized Europe: Conservation of Lived Biodiversity." *Biodiversity and Conservation* 24 (13): 3347–3366. https://doi.org/10.1007/s10531-015-0985-6.

Ernstson, Henrik, Sander E. van der Leeuw, Charles L. Redman, Douglas J. Meffert, George Davis, Christine Alfsen, and Thomas Elmqvist. 2010. "Urban Transitions: On Urban Resilience and Human-Dominated Ecosystems." *Ambio* 39 (8): 531–545. https://doi.org/10.1007/s13280-010-0081-9.

European Environment Agency. 2014. *Environmental Indicator Report 2014: Environmental Impacts of Production-Consumption Systems in Europe*. Copenhagen: European Environment Agency. https://www.eea.europa.eu/en/analysis/publications/environmental-indicator-report-2014.

Gould, Kenneth A., and Tammy L. Lewis. 2016. *Green Gentrification: Urban Sustainability and the Struggle for Environmental Justice*. London: Routledge. https://doi.org/10.4324/9781315687322.

Haaland, Christine, and Cecil Konijnendijk van den Bosch. "Challenges and Strategies for Urban Green-Space Planning in Cities Undergoing Densification: A Review." *Urban Forestry & Urban Greening* 14, no. 4 (2015): 760–771. https://www.urbanecosystemrestorations.org/wp-content/uploads/2023/12/Importance-of-Planning-for-Urban-Green-Space.pdf.

Haaland, Christine, and Cecil Konijnendijk van den Bosch. 2015. "Challenges and Strategies for Urban Green-Space Planning in Cities Undergoing Densification: A Review." *Urban Forestry & Urban Greening* 14 (4): 760–771. https://doi.org/10.1016/j.ufug.2015.07.009.

Haase, Dagmar, Nadja Kabisch, and Annegret Haase. 2013. "Endless Urban Growth? On the Mismatch of Population, Household and Urban Land Area Growth and Its Effects on the Urban Debate." *PLOS ONE* 8 (6): e66531. https://doi.org/10.1371/journal.pone.0066531.

Hansen, Rieke, and Stephan Pauleit. 2014. "From Multifunctionality to Multiple Ecosystem Services? A Conceptual Framework for Multifunctionality in Green Infrastructure Planning for Urban Areas." *AMBIO* 43 (4): 516–529. https://doi.org/10.1007/s13280-014-0510-2.

Harvey, David. 2008. "The Right to the City." *New Left Review* 53: 23–40. https://newleftreview.org/issues/ii53/articles/david-harvey-the-right-to-the-city.

Havrylenko, Olena P., Petro H. Shyshchenko, and Yevhen Yu. Tsyhanok. 2021. "The Green Infrastructure within the Framework of a Compact City Concept (by Example of Kyiv)." *Journal of Geology, Geography and Geoecology* 30 (2): 299–308. https://doi.org/10.15421/112124.

Intent Press. "Odesa to Inventory 12,000 Hectares of Land for $1.2 Million by 2025." *Intent Press*, April 2025. https://intent.press/en/news/economy/2025/odesa-to-inventory-12000-hectares-of-land-for-1-2m-by-2025/.

Johnson, Michael P. 2001. "Environmental Impacts of Urban Sprawl: A Survey of the Literature and Proposed Research Agenda." *Environment and Planning A: Economy and Space* 33 (4): 717–735. https://doi.org/10.1068/a3327.

Kabisch, Nadja, Horst Korn, Jutta Stadler, and Aletta Bonn, eds. 2017. *Nature-Based Solutions to Climate Change Adaptation in Urban Areas: Linkages between Science, Policy and Practice.* Theory and Practice of Urban Sustainability Transitions. Cham: Springer. https://doi.org/10.1007/978-3-319-56091-5.

Kabisch, Nadja, Horst Korn, Jutta Stadler, and Aletta Bonn, eds. 2017. *Nature-Based Solutions to Climate Change Adaptation in Urban Areas: Linkages between Science, Policy and Practice.* Theory and Practice of Urban Sustainability Transitions. Cham: Springer. https://doi.org/10.1007/978-3-319-56091-5.

Khalaim, Oleksandra, Olena Zabarna, Taras Kazantsev, Ihor Panas, and Oleksandr Polishchuk. 2021. "Urban Green Infrastructure Inventory as a Key Prerequisite to Sustainable Cities in Ukraine under Extreme Heat Events." *Sustainability* 13 (5): 2470. https://doi.org/10.3390/su13052470.

Khaleefah, N., and W. S. Alwan. 2022. "Green Zone Planning for City Sustainability." *IOP Conference Series: Earth and Environmental Science* 961 (1): 012075. https://doi.org/10.1088/1755-1315/961/1/012075.

Konijnendijk van den Bosch, Cecil C. 2014. "From Government to Governance: Contribution to the Political Ecology of Urban Forestry." In *Urban Forests, Trees, and Greenspace: A Political Ecology Perspective*, edited by L. Anders Sandberg, Adrina

Bardekjian, and Sadia Butt, 55–74. London: Routledge.
https://doi.org/10.4324/9781315882901-4.

Lidmo, Johannes, Maja Brynteson, and Elin Slätmo. 2022. *Nordic Overview of National Support Initiatives in Urban Planning*. Nordregio Policy Brief 2022:7. Stockholm: Nordregio. https://pub.nordregio.org/pb-2022-7-nordic-national-support-initiatives-in-urban-planning/nordic-overview-of-national-support-initiatives-in-urban-planning.pdf.

Lishchynskyy, Ihor, Mariia Lyzun, Evangelos Siskos, Yevhen Savelyev, and Vitalina Kuryliak. 2021. "Urban Green Space: Comparing the EU and Ukrainian Practice." *SHS Web of Conferences* 100: 05007. https://doi.org/10.1051/shsconf/202110005007.

Maruniak, Eugenia, and Sergiy Lisovskyi, eds. 2023. *Ukrainian Cities: Sustainable Development on the Eve of Full-Scale Russian Aggression*. Varna: Euro-Expert.

Mell, Ian C. 2013. "Green Infrastructure: Reflections on Past, Present and Future." *Environmental Science & Policy* 31: 1–7. https://doi.org/10.1016/j.envsci.2012.07.003.

Morar, Cezar, Tin Lukić, Aleksandar Valjarević, Liudmyla Niemets, Sergiy Kostrikov, Kateryna Sehida, Ievegeniia Telebienieva, Liudmyla Kliuchko, Pavlo Kobylin, and Kateryna Kravchenko. 2022. "Spatiotemporal Analysis of Urban Green Areas Using Change Detection: A Case Study of Kharkiv, Ukraine." *Frontiers in Environmental Science* 10: Article 823129. https://doi.org/10.3389/fenvs.2022.823129.

Nakamura, Futoshi, ed. 2022. *Green Infrastructure and Climate Change Adaptation*. Ecological Research Monographs. Singapore: Springer. https://doi.org/10.1007/978-981-16-6791-6.

Petryshyn, Halyna, Nataliya Danylko, and Maryna Peleshchak. 2022. "Accessibility of Public-Use Green Areas in Lviv." *Teka Komisji Urbanistyki i Architektury Oddziału Polskiej Akademii Nauk w Krakowie* 50: 147–161. https://doi.org/10.24425/tkuia.2022.144848.

Plüschke-Altof, Bianka, and Helen Sooväli-Sepping, eds. 2022. *Whose Green City? Contested Urban Green Spaces and Environmental Justice in Northern Europe*. Sustainable Development Goals Series. Cham: Springer. https://doi.org/10.1007/978-3-031-04636-0.

Pungas, Lilian, Bianka Plüschke-Altof, Anni Müüripeal, and Helen Sooväli-Sepping. 2022. "Same, Same but Different? The 'Right' Kind of Gardening and the Negotiation of Neoliberal Urban Governance in the Post-socialist City." In *Whose Green City?*

Contested Urban Green Spaces and Environmental Justice in Northern Europe, edited by Bianka Plüschke-Altof and Helen Sooväli-Sepping, 125–144. Sustainable Development Goals Series. Cham: Springer. https://doi.org/10.1007/978-3-031-04636-0_7.

Ravetz, Joe, Christian Fertner, and Thomas Alexander Sick Nielsen. 2013. "The Dynamics of Peri-Urbanization." In *Peri-Urban Futures: Scenarios and Models for Land Use Change in Europe*, 13–45. Springer Publishing Company.

Rigolon, Alessandro, and Jeremy Németh. 2018. "'We're Not in the Business of Housing': Environmental Gentrification and the Nonprofitization of Green Infrastructure Projects." *Cities* 81: 71–80. https://doi.org/10.1016/j.cities.2018.03.016.

Sandberg, L. Anders, Adrina Bardekjian, and Sadia Butt, eds. 2014. *Urban Forests, Trees, and Greenspace: A Political Ecology Perspective*. London: Routledge. https://www.routledge.com/Urban-Forests-Trees-and-Greenspace-A-Political-Ecology-Perspective/Sandberg-Bardekjian-Butt/p/book/9781138282575.

Schlager, Edella, and Elinor Ostrom. 1992. "Property-Rights Regimes and Natural Resources: A Conceptual Analysis." *Land Economics* 68 (3): 249–262. https://doi.org/10.2307/3146375.

Smith, Andrew, Guy Osborn, and Goran Vodicka. 2022. "The Festivalisation of London's Parks: The Friends' Perspective." In *Festivals and the City: The Contested Geographies of Urban Events*, edited by Andrew Smith, Guy Osborn, and Bernadette Quinn, 19–37. London: University of Westminster Press. https://doi.org/10.16997/book64.b.

Tang, Bo-sin, Siu-wai Wong, and Anton King-wah Lee. 2007. "Green Belt in a Compact City: A Zone for Conservation or Transition?" *Landscape and Urban Planning* 79 (3–4): 358–373. https://doi.org/10.1016/j.landurbplan.2006.04.006.

Tang, Bo-sin, Siu-wai Wong, and Anton King-wah Lee. 2007. "Green Belt in a Compact City: A Zone for Conservation or Transition?" *Landscape and Urban Planning* 79 (3–4): 358–373. https://doi.org/10.1016/j.landurbplan.2006.04.006.

Tappert, Simone, Tanja Klöti, and Matthias Drilling. 2018. "Contested Urban Green Spaces in the Compact City: The (Re-)Negotiation of Urban Gardening in Swiss Cities." *Landscape and Urban Planning* 170: 69–78. https://doi.org/10.1016/j.landurbplan.2017.08.016.

Trinomics, Alterra, Arcadis, Risk & Policy Analysis, Stella Consulting, and the Regional Environmental Center. 2016. *Supporting the Implementation of Green Infrastructure*. Final Report to the European Commission under Service Contract ENV.B.2/SER/2014/0012. Rotterdam: Trinomics. https://trinomics.eu/wp-content/uploads/2016/04/GI-Final-Report.pdf.

Tyler, Stephen, and Marcus Moench. 2012. "A Framework for Urban Climate Resilience." *Climate and Development* 4 (4): 311–326. https://doi.org/10.1080/17565529.2012.745389.

Wolch, Jennifer R., Jason Byrne, and Joshua P. Newell. 2014. "Urban Green Space, Public Health, and Environmental Justice: The Challenge of Making Cities 'Just Green Enough.'" *Landscape and Urban Planning* 125: 234–244. https://doi.org/10.1016/j.landurbplan.2014.01.017.

World Health Organization. 2016. *Urban Green Spaces and Health*. Copenhagen: WHO Regional Office for Europe. https://iris.who.int/bitstream/handle/10665/345751/WHO-EURO-2016-3352-43111-60341-eng.pdf.

Zulian, Grazia, Federica Marando, Peter Vogt, Giulia Barbero Vignola, Javier Babí Almenar, Mayra Zurbarán-Nucci, and Karine Princé. 2022. *BiodiverCities: A Roadmap to Enhance the Biodiversity and Green Infrastructure of European Cities by 2030. Second Report.* EUR 31224 EN. Luxembourg: Publications Office of the European Union. https://doi.org/10.2760/21172.

Annex

Table 1: Zaporizhzhia

District	Area (km²)	Population	Total green zones in the district (units)	Total green zones in the district (units) - according to other calculations	Total area of all green zones (km²)
Voznesenivskyi	50.8	99514	17	16	0.33404
Komunarskyi	61	128770	8	14	0.15163
Dniprovskyi	49.7	133969	28	18	0.67260
Khortytskyi	18.81	117963	3	7	0.24157
Shevchenkivskyi	98	150000	13	13	0.15023
Oleksandrivskyi	11.2	66762	23	20	0.24157
Zavodskyi	56	56200	12	9	0.24212

Table 2: Odesa

District	Area (km²)	Population	Total green zones in the district (units)	Total area of all green zones (km²)
Kyivskyi	47.7	256580	12	1.7644
Khadzhybeyskyi	89.7	242900	16	11.8349
Prymorskyi	24.2	259000	49	11.02976
Peresypskyi	25.3	263000	15	1.65375

Table 3: Kyiv

District	Area (km²)	Population	Total green zones in the district (units)	Total area of all green zones (km²)
Holosiivskyi	156	247600	76	10.6943
Darnytskyi	134	314700	75	4.732948
Desnianskyi	148	358300	84	5.3204
Dniprovskyi	67	354700	89	11.3259
Obolonskyi	108.6	319000	143	6.201565
Pecherskyi	27	152000	59	3.6647
Podilskyi	34	198100	75	2.2277
Sviatoshynskyi	110	340700	94	2.310216

Solom'ianskyi	40	383259	129	2.8235
Shevchenkivskyi	27	218900	157	4.9194

Data sources:

Kyiv

Kyiv City State Administration. n.d. "Raiony Kyieva" [Districts of Kyiv]. Accessed June 4, 2025. https://kyivcity.gov.ua/kyiv_ta_miska_vlada/pro_kyiv/raiony_kyieva/.

Main Department of Statistics in Kyiv. n.d. "Population by District." Accessed June 4, 2025. http://www.kyiv.ukrstat.gov.ua/p.php3?c=1123&lang=1.

Kyiv National University of Trade and Economics. 2022. *Zeleni nasadzhenia m. Kyieva: Reiestr ta struktura* [Green Plantings in Kyiv: Register and Structure]. https://knute.edu.ua/file/MjI=/02903a440fe073ec50366f276a8f45c4.pdf.

Personal Google Drive folder. n.d. "Program for the development of the green zone of Kyiv until 2010." Accessed June 4, 2025. https://drive.google.com/drive/folders/1cLpX1TNF3WLnKoN5hWMBmiV7Si9V9KsO?usp=drive_link

Zaporizhzhia

Zaporizhzhia City Council. n.d. "Rayony" [Districts of Zaporizhzhia]. Accessed June 4, 2025. https://zp.gov.ua/uk/page/rajony.

Zaporizhzhia City Council. 2021. *Socialno-ekonomichnyi pasport Shevchenkivskoho raionu* [Socio-Economic Passport of Shevchenkivskyi District]. https://zp.gov.ua/upload/editor/soc-ek_pasport.pdf.

Zaporizhzhia City Council. 2022. *Pasport raionu stanom na cherven 2022 roku* [District Passport as of June 2022]. https://zp.gov.ua/upload/editor/pasport_rajonu_stanom_na_cherven_2022.pdf.

Zaporizhzhia City Council. 2022. *Pasport rajona (lypen 2022)* [District Passport, July 2022]. https://zp.gov.ua/upload/editor/pasport_rajona_07-2022.pdf.

Zaporizhzhia City Council. 2022. *Pasport stanom na 01.01.2022* [District Passport as of January 1, 2022]. https://zp.gov.ua/upload/editor/pasport_01012022.pdf.

Zaporizhzhia City Council. n.d. *Pasport Zavodskoho raionu* [Zavodskyi District Passport]. https://zp.gov.ua/upload/editor/pasport_zavodskogo_rajonu.pdf.

Zaporizhzhia City Council. 2023. *DRA Passport, 9 Months 2023*. https://zp.gov.ua/upload/editor/dra_pasport__9_misyaciv-2023.pdf.

Zaporizhzhia City Council. 2021. *VRA Passport as of October 2021*. https://zp.gov.ua/upload/editor/vra_stanom_na_01-10-2021.pdf.

Odesa

Diemenchuk, D. O. 2023. "Vykorystannia heoinformatsiinykh system u proektuvanni ta monitorynhu urbanistychnykh landshaftiv" [Use of GIS in the Design and Monitoring of Urban Landscapes]. Odesa State Environmental University. http://eprints.library.odeku.edu.ua/id/eprint/9005/1/%D0%94%D1%94%D0%BC%D1%94%D0%BD%D1%87%D1%83%D0%BA%20%D0%94.%D0%9E..pdf.

Zelenyi List. 2020. "V Odesi ofitsiino isnuie 16 parkiv" [There Are Officially 16 Parks in Odesa]. Accessed June 4, 2025. https://zeleniy-list.od.ua/v-odesse-oficzialno-sushhestvuet-16-parkov/.