7

# More than 'Where You Do Football': Reconceptualizing London's Urban Green Spaces through Green Infrastructure Planning

*Meredith Whitten*

## Introduction

Lauded for their wide-ranging environmental, social and economic benefits, urban green spaces increasingly are presented as a 21st-century policy and planning panacea for addressing prominent global challenges, such as climate change mitigation (Mathey et al, 2011), public health (Kabisch et al, 2016), and biodiversity and habitat loss (Aronson et al, 2017). In particular, the multifaceted contributions green spaces make in densely developed and populated cities are recognized (Haaland and van den Bosch, 2015). Such contributions are magnified when green spaces are considered part of a broader network of natural and vegetated features, including street trees, vegetated roofs and walls, and verges (WHO, 2017; Massini and Smith, 2018).

However, in practice, urban green spaces rarely realize this full potential (Meerow, 2020). With a focus on London, this chapter argues that instead of being considered as critical, functional elements of a multifunctional, interconnected system of green infrastructure (GI), green spaces continue to be narrowly conceptualized as passive, aesthetic amenities, detached from the city around them (Reeder, 2006b). This is reinforced by planning processes that focus on individual spaces and by a fragmented GI-related governance. A gap between the policy ambitions of GI and practical implementation of

GI leads to missed opportunities to address (or at least mediate) the negative impacts of urbanization (Meerow and Newell, 2017; Meerow, 2020).

First, this chapter situates GI within a broader resurgence of infrastructural studies. It then discusses the evolution of GI as a framework and a practice. The case of London is laid out, providing context for the city's efforts to shift from a focus on traditional parks and conventional uses of these spaces, to a modern, inclusive approach that integrates a diversity of green features into the city's burgeoning footprint. The final sections discuss findings regarding the challenges cities like London face in trying to reach ambitious GI goals.

The chapter draws from qualitative research conducted from 2014 to 2019 in Inner London, which comprises the British capital's 13 most central boroughs. Inner London makes up 20 per cent of Greater London's geographical footprint, yet comprises 40 per cent of its population (GLA, 2017, 2018a). Specifically, the research was set in three boroughs: Islington, Tower Hamlets and Wandsworth. Each was one of the ten most densely populated boroughs in Greater London (GLA, 2018a), as well as among the five boroughs with the largest net gain in residential units (GLA, 2021b). As such, these three boroughs are dense and growing denser. This reflects London Plan policies calling for more compact development in Inner London (GLA, 2021a), and has ramifications for the boroughs' ability to supply green spaces to address the needs of their growing populations.

Primary data was collected through semi-structured interviews with participants whose work involves green space, including representatives from local and regional governments, charities and community groups, and developers, housing providers and landscape architects. Secondary research methods included site observation and archival work, which fleshed out details of issues – such as around heritage – that emerged from interviews.

## A green-hued 'infrastructural turn'

Two decades ago, Graham and Marvin (2001) catapulted the study of infrastructure into the heart of urban studies. Their influential and inspirational work has led to a reconceptualization of infrastructure from mundane and predictable to dynamic and innovative (Wiig et al, Chapter 1, this volume). While this motivated the deeper study of 'the vital processes and politics of the cables, wires, pipes and roads that undergird urban development' (Wiig et al, 2022: 1), attention on a networked approach to the urban natural environment remained, much like green spaces themselves, somewhat of an afterthought. Indeed, discourse about infrastructure and nature usually hinged around well-trod conflicts between the built and natural environments (Campbell, 2016) and the resultant negative impacts, such as habitat fragmentation (Bekker and Iuell, 2003).

Yet, Graham and Marvin inspired a generation of scholars who have questioned the meaning of infrastructure, 'shifting ideas about what infrastructure actually *is*' (Wiig et al, 2022: 3, emphasis original). This has introduced the vision of infrastructure to urban landscape planning (Wiig et al, 2022), illustrating such a 'radical transformation' (Enright, 2022: 101) envisioned by Graham and Marvin. A green-hued 'infrastructural turn' fits well with the study of urban nature. For one, the natural environment is dynamic and constantly changing, as is infrastructure (Wiig et al, 2022). Cities and urban infrastructure exist 'within a constant state of flux' (McFarlane and Rutherford, 2008: 364). This makes an infrastructural approach to deeply embedded and rigid notions of green space instructive.

Further, with a global, urgent climate emergency and continuing environmental degradation, including in dense, urban environments, 'infrastructure is increasingly more than the concrete and the cabled. It is also the green and growing' (Gabrys, 2022: 14). Indeed, nature is infrastructural (Gabrys, 2022). GI, like other infrastructures, is thus critical in contesting and facilitating urban change (McFarlane and Rutherford, 2008). Yet, GI wrestles with a foundational fragmentation. Unlike other infrastructures, such as road or transport networks, GI did not originate from a strategic perspective. Rather, GI has the challenge of developing what has long been a localized and piecemeal approach to a city–nature coexistence – namely in the form of individual, local parks and green spaces – into a strategic, networked perspective. Conceptualizing these spaces on a citywide scale runs counter to well-entrenched and local approaches to planning. Also, green space has typically been considered as a 'cosmetic afterthought' (DOE, 1996: iii) at the end of development, rather than seen as essential and considered from the onset, as traditional infrastructures usually are. Further, given that infrastructure is inherently political (McFarlane and Rutherford, 2008), a shift to implementing GI remains a challenging work in progress.

## Growing green infrastructure

In response to increasing urbanization and heightened global awareness of environmental crises – including the climate emergency, mass extinctions and irreversible degradation – modern, developed cities, such as London, have sought to expand the role of urban green space by connecting it with critical urban systems and services, including urban cooling, flood prevention and habitat restoration (Gill et al, 2007). As such, cities are positioning their green spaces as essential elements within a wider network of GI (Tzoulas et al, 2007). From this perspective, green space goes beyond public parks to include natural features, such as street trees, private gardens, housing amenity spaces, vegetated roofs and fencing, green walls, swales, verges, indoor gardens, and churchyards (Mell and Whitten, 2021).

Yet, more than just a definitional expansion, this shift extends to why and how green spaces are provided, what services these spaces are expected to deliver, and who plays a role in creating, managing and maintaining them. Further, this shift to GI is meant to portend a more strategic and less siloed approach to greening the urban environment, while holistically and simultaneously addressing climate change and ecological considerations, social development and economic valuation (Mell, 2015).

Benedict and McMahon provided an early, influential definition of GI as 'an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations' (2002: 12). The concept's guiding principles include spatial connectivity, multifunctional landscapes, access to nature, and integrated policy and practice networks (Kambites and Owen, 2006; Wright, 2011; Lennon, 2015; Mell and Clement, 2019; Meerow, 2020). As such, GI refers to a range of green elements that are strategically planned, managed and connected at both a spatial and administrative scale (Matthews et al, 2015).

The term 'green infrastructure' burst on the scene, with its 'meteoric' (Lennon, 2015: 958) rise as a planning tool taken up by countries and cities, industries, and sectors largely occurring in the first 20 years of the 21st century (Mell et al, 2017). GI went 'from a reference in planning policy to the basis of emerging national policy' in just two years (2008–10) in England (Wright, 2011: 1005). Yet, of course, the concept and practice of GI did not 'come out of nowhere' (Thomas cited in Wright, 2011: 1004). Various explanations of its emergence exist (Wright, 2011; Mell, 2016). GI draws from landscape ecology (Roe and Mell, 2013; Lennon, 2015), conservation (Seiwert and Rößler, 2020), greenbelts (Amati and Taylor, 2010), greenways (Fábos, 2004) and garden cities (Howard, 1902), among others. GI's underlying principles of multifunctionality and interconnectivity are visible in the work of influential and prolific US landscape architect Frederick Law Olmsted and English urban planner Ebenezer Howard (Meerow, 2020).

GI notably diverges from traditional green space planning by equating urban greening with a city's other physical infrastructure (Mell, 2015). Planning for GI occurs at the beginning of development, concurrent with planning for grey infrastructure, such as transportation and utility networks (Eisenman, 2013). As such, GI can be seen as 'an organising framework for urban form and growth' (Eisenman, 2013: 288). And the use of the term infrastructure is deliberate (Lennon, 2015), as it is meant to overcome the idea that green spaces are solely 'a community amenity, an extra, even a frill' (McMahon, 2000: 4). Thus, GI 'represents a dramatic shift in the way local and state governments think about green space' (McMahon, 2000: 4), transforming green space from 'doing nothing to doing something' (Lennon, 2015: 964). The linking of green and grey infrastructure enables a broader network to be planned and designed more holistically (Benedict

and McMahon, 2002; Davies and Lafortezza, 2017). Indeed, the strategic aspect of GI is fundamental and further departs from typical aesthetics-led green space planning (Amati and Taylor, 2010). Instead of considering each green space or green element as an independent, delineated site, GI focuses on how different elements function as a system to collectively provide a more beneficial, effective cumulative impact (McMahon, 2000; Mell, 2008).

While the simplicity of Benedict and McMahon's (2002) seminal definition has contributed to broad applicability and adoption of GI across varied disciplines, it also masks understanding of the 'variation in ecological, social and economic benefits that green space can provide' (Mell, 2019). Further, the broadness of the definition is seen as ambiguity that can lead to GI being a 'corruptible' (Wright, 2011: 1003) and 'nebulous' (Meerow, 2020) concept. Variations in defining GI across disciplines and geographies contribute to a definitional chaos, with Mell et al observing that 'there are currently as many interpretations of GI as there are people engaging with the concept' (2017: 335). Indeed, much of the GI literature remains preoccupied with defining the concept (Lennon, 2015; Whitten, 2023).

Definitional fragmentation reflects different geographical and disciplinary contexts (Mell and Clement, 2019; Matsler, et al, 2021). In North America, GI is rooted in stormwater management, while in the UK and Europe, GI planning is predominantly conceptualized around socio-economic functions of green space (Mell and Clement, 2019). In China, GI revolves around aesthetic improvement, real estate value and the promotion of 'sponge cities' to deliver the government's urban sustainability agenda (Matsler, et al, 2021). With discourse around GI becoming more localized rather than moving towards international consensus (Mell et al, 2017), GI's capacity for serving as a comprehensive and unifying framework that accommodates competing perspectives is uncertain (Whitten, 2023). Fragmented definitions and disjointed approaches to GI in practice limit its use and integration into wider service delivery efforts and make it more challenging to assess GI performance, establish standards and share knowledge (Matsler et al, 2021). Indeed, inherent trade-offs and conflicting priorities exist with planning for human–natural systems (Campbell, 2016), contributing to gaps between policy rhetoric about greening the urban environment and practical implementation of GI (Dempsey, 2020; Meerow, 2020).

## Greening London

Envisioning a city with a broad range of green elements woven throughout its built environment would seem a natural extension of the story London tells about itself as both a global city and as a green city. London has a rich spatial legacy of parks, gardens, green squares and commons, reflecting the prominence access to nature has held throughout the city's post-industrial

history (Garside, 2006). And, while many of the city's more than 3,000 existing parks and green spaces were inherited from previous eras, many are more recently established (Reeder, 2006a). This continuum of green spaces has been central to how London has evolved and developed (Reeder, 2006a, 2006b; Whitten and Massini, 2021). Indeed, from green wedges in Abercrombie's Greater London Plan 1944 (Lemes de Oliveira, 2014) to green roofs and walls in the London Plan 2021 (GLA, 2021a), green space in some form has been fundamental to the city's urban form.

London generally is considered 47 per cent green (GiGL, 2019). Variations in definitions and measurement impede cross-urban comparisons. Even within London, an exact amount of green space is difficult to pin down, as much of the data are provided by local authorities, who rely on varying definitions and methods of data collection, thus limiting pan-London comparability. Despite the prominence of well-known parks, such as Hyde Park, London's overall greenness comes from a range of green typologies, which fits with the concept of GI. For example, parks and gardens constitute just 5.83 per cent of London's total green space (GiGL, 2019). In recent years, London also has experienced a proliferation in green roofs, with 1.5 million square metres of green roofs in Greater London (including 291,598 sq m in Central London), an increase of nearly 39 per cent from the previous year (Grant and Gedge, 2019). Some 21 per cent of London lies under tree canopy, greater than the national average of 16 per cent (LUFP, 2020).

The Greater London Authority (GLA), the city's regional governance body, has adopted policies and strategies to enhance and increase GI in London (GLA, 2021a). First introduced in the 2008 London Plan – the Mayor of London's spatial development strategy – GI has evolved to feature prominently in a wide range of GLA policy and strategies (CRP, 2016), illustrated by Table 7.1.

Yet, while the GLA plays an influential role in steering policy and planning change, London's 33 local governments – 32 boroughs plus the City of London – have responsibility for interpreting that policy through local context and delivering GI in practice, giving the capital a fragmented governance structure (Travers, 2004) (see Figure 7.1). And, while the GLA was an enthusiastic early adopter of GI, this ambition has not been matched by all boroughs, as GI remains a relatively new concept to policy makers, planners and other practitioners (Mell, 2015; LGSC, 2020). While some local governments, like the City of London, have robust GI policies, others have adopted a weak policy, and half of London's boroughs do not have any GI strategy (LGSC, 2020). Although this variation allows for local priorities, it also presents challenges for developing a strategic and spatially and administratively connected GI approach beyond the local level.

**Table 7.1:** Select GLA-supported GI publications

| Document | Publication date | Examples of GI-related provisions |
|---|---|---|
| London Plan | 2021 | Requires all major developments to include urban greening as a fundamental element of site and building design; introduces the use of an Urban Greening Factor to evaluate the quantity and quality of urban greening provided by a development proposal; sets out protections for London's greenbelt. |
| London Environment Strategy | 2018 | Sets out policies to increase the city's overall greenness to 50%; increase tree canopy cover by 10%; and to enhance biodiversity. |
| London Transport Strategy | 2018 | Puts increasing urban greening at the core of the Healthy Streets strategy; promotes increased urban greening to encourage walking and cycling. |
| London Urban Forest Plan | 2020 | Collaborative plan to protect, manage and enhance London's urban forest. |
| Grey-to-green guide | 2020 | Provides guidance for turning grey areas of impermeable surfacing to green. |
| London Sustainable Drainage Action Plan | 2016 | Promotes the awareness, and the retrofitting, of sustainable drainage systems. |
| Natural Capital Accounts for Public Green Space in London | 2017 | Demonstrated the economic value of health benefits to Londoners from the city's public green spaces. |
| All London Green Grid Supplementary Planning Guidance | 2012 | Guidance for policy framework to promote the design and delivery of green infrastructure across London. |

London's green ambitions also run up against the realities of urban growth. Like other cities, such as Portland, Oregon (US), Düsseldorf (Germany) and Asahikawa (Japan), that have deliberately sought to curtail their sprawling footprint through urban containment policies, London faces barriers to expanding traditional green space (Haaland and van den Bosch, 2015; GLA, 2018b, 2021a). Between 2001 and 2011, London's population grew 11.6 per cent, more than any city/region in England (ONS, 2012). Today, London has a population of more than 9 million, the largest in its history. By 2041, population is projected to reach 10.8 million (GLA, 2021a). London also is significantly more densely populated than other English cities (ONS, 2012; GLA, 2018a). The city's population density has increased, in part, as the result of an emphasis on compact development to minimize sprawl

**Figure 7.1:** London's 32 boroughs and the City of London


Source: Greater London Authority. Contains Ordnance Survey data © Crown copyright and database rights

and its diseconomies (Scanlon et al, 2018; GLA, 2021a). An increase in infill and vertical development has led to more demand pressure on existing green space and constrained provision of new conventional green spaces (GLA, 2021a). This pressure is exacerbated by a critical housing shortage, with 66,000 new homes needed annually for 20 years to keep pace with demand (GLA, 2021a). As such, policies that call for compact development have implications for how green space is integrated into the changing urban environment.

## Discussion

A network of GI comprising vegetated and natural elements, such as parks and gardens, green roofs, living walls, street trees, sustainable drainage systems (SuDS) and housing amenity spaces, can contribute to increasing and improving urban greening across cities, such as London, while simultaneously providing valuable health and ecological benefits (Hansen and Pauleit, 2014; Mell, 2019). Yet, the research discussed here found that a gap exists between the theoretical and policy discourses that equate green space with GI, and practical approaches to greening the urban environment. This is because of challenges shifting to a strategic, holistic perspective on urban greening from a deeply entrenched focus on conventional parks and gardens, as well as spatial disconnection and administrative fragmentation in GI delivery.

### *Conceptual embeddedness*

Formal efforts to integrate nature into rapidly urbanizing places emerged in 19th-century Victorian England (Conway, 1991). Despite the innovation and economic advancement of industrializing English cities, the Victorians were decidedly anti-urban (Hulin, 1979). They considered the city dirty, corruptive and unhealthy (Malchow, 1985; Dempsey, 2009). This underscored their reverence for the countryside, which they viewed as pure, wholesome and restorative (Welch, 1991). Social reformers and others drew on this obsessive veneration for the pastoral idyll to address their concerns about overcrowding and the unhealthy and unsanitary urban environment in which the poor and working classes lived (Reeder, 2006b; Jones, 2018). This led to creation of public parks, a 'particularly Victorian solution' (Brück, 2013: 196) to address not only concerns about physical health, but also moral behaviour (Reeder, 2006b). With nature used as a counterpoint to population and development density, parks and green spaces from the outset were conceptualized as separate from the city, purposely detached from the rest of the urban environment (Gabriel, 2011). Indeed, for the Victorians,

'the "country-in-town" principle had almost become an obsession both with town-planners and social reformers' (Hulin, 1979: 17).

The theme of bringing the countryside into the city featured prominently in this research. For example, a council green space officer said the purpose of providing green space in London "is to encapsulate the countryside". Such comments tie directly to the Victorians' 'pastoral ideal' (Malchow, 1985: 97) and illustrate a path-dependency of urban green space as the antithesis of urban infrastructure. London's green spaces remain "frozen in time", as noted by a regional charity officer, by adherence to a traditional look and function that has become the accepted, or institutionalized, way of doing things. Contemporary green space planning practices are built on values and ideals about nature established centuries ago, 'with layers of values and understandings left from earlier times influencing new initiatives through institutional remembering and the strength of tradition and culture' (Clifford, 2016: 388).

Participants discussed urban green spaces as spaces 'other' to the city – as separate and disconnected from other urban features. A council green space officer described "complaints" that Wandsworth Council receives due to increasing and changing usage of green spaces, such as a proliferation of benches and sports pitches meant to attract visitors to local green spaces. Instead, the green space officer said, residents expect green spaces to be more representative of a space away from the bustle and noise of Inner London: "The number of people who don't recognise that [people in the park making noise] is a perfectly valid thing … is unbelievable."

Similarly, a green space officer in Islington said residents expect the borough's green spaces to provide places for "quiet contemplation", despite Islington's long tenure as the densest borough in England, small parks and green spaces, and overall least amount of green space of London boroughs, except for the City of London, which is a statistical outlier (GLA, 2017). In Tower Hamlets – England's densest (ONS, 2021) and second-fastest-growing borough (ONS, 2018) – participants described urban green space as "space away from the density and the buildings" (council green space officer) and "quieter areas that people appreciate more" (council planner). Yet, given the increasing populations and infill and vertical development in these boroughs, they are unlikely to replicate the idealized peace and quiet of the countryside.

Figure 7.2, an advertisement that featured on London public transport, demonstrates how urban green space as technically in, but conceptually distant or fragmented from the city continues to be perpetuated. The advertisement connects one of London's newest urban green spaces, Queen Elizabeth Olympic Park – located in a heavily urbanized and intensively developing area in East London – with anti-urban thought (Malchow, 1985). Again, this underscores the Victorian belief that the city is a place

**Figure 7.2:** Advertisement for Queen Elizabeth Olympic Park


Source: Meredith Whitten

that needs escaping, and the countryside is a desirable place to escape to (Hulin, 1979; Brück, 2013).

Emphasis on the 'enduring strength of the imaginary of the "rural idyll"' (Harrison and Clifford, 2016: 602) remains central to English identity and cultural heritage (Lowenthal, 1991; Mischi, 2009) and 'fundamentally shapes how we [the English] design policy and make planning decisions' (Harrison and Clifford, 2016: 585). A deeply embedded cultural preference for the countryside has resulted in a 'powerful cultural institution' (Mace, 2018: 2) that contributes to an enduringly inflexible concept of green space. Indeed, a council planner observed that maintaining "the Victorian legacy" continues to influence green space planning today. This puts the approach to green space management increasingly at odds with a present-day, culturally diverse population, with more than one third of Londoners born outside of the UK (GLA, 2017).

Further, the firm grip of cultural heritage on the conceptualization of green space can conflict with principles of GI, which espouse modern and dynamic approaches to integrating nature into constantly changing cities (Thomas and Littlewood, 2010). Preserving urban green space for its connection to the past becomes a concern when it impedes the use of green space as a planning tool to address contemporary and urgent challenges, such as climate change. Indeed, an executive from a national planning organization commented that

urban green spaces are "culturally very rich and very interesting, but they are looking back to the past, rather than looking forward to the future".

One way the powerful cultural institution of the countryside is embedded in planning policy is through the 27 statutory planning consultees (HM Government, 2015). Two consultees – Historic England and the Gardens Trust – approach urban green space from a heritage perspective. The 15 national park authorities comment on development that could affect land in national parks, none of which are urban. Despite the grassroots London National Park City Foundation successfully campaigning to recognize London as a 'national park city', this is not a land-use designation, and no national park authority for London will be established (NPCF, 2019).

Natural England, the government's advisor on the natural environment, is most aligned with urban green space interests, several participants said. The non-departmental body designed a 'Framework of Green Infrastructure Standards', which provides guidance to local authorities and other stakeholders about including GI in new residential developments, as well as greening existing public spaces (Natural England, 2020). However, participants said Natural England rarely comments on local issues – and almost all green space issues are addressed locally, most notably through local authority decision making. Thus, statutory champions exist for green spaces, but primarily related to heritage or non-urban spaces.

Funding also impedes adopting a GI planning approach. During a decade of austerity (Lowndes and Gardner, 2016), local authorities drastically cut their budgets for non-statutory services, including green space (Whitten, 2019). To fill the budget gap, they have turned to other funding sources, most notably the National Lottery Heritage Fund (NLHF), which has made substantial investment in UK parks (Clark, 2004; Eadson et al, 2020). Participants described efforts where local authorities prioritized heritage parks or heritage-related structures and uses over other types of GI because of the greater likelihood of receiving heritage funding than other grants. For example, a council green space officer questioned whether Tower Hamlets Council would have received a £5 million NLHF matching grant – a total £10 million investment – for restoring the borough's flagship Victoria Park in 2010 if the park did not have heritage value.

Limited options for large-scale investment beyond heritage-related funding further embeds a heritage focus, affecting the ability to manage urban green spaces as a modern system of GI. For example, Tower Hamlets Council's decision to apply for heritage funding had an impact on the types of improvements the council could make in Victoria Park. A council green space officer commented:

> 'Because it was a heritage fund we went for, we couldn't touch any of our sports facilities or anything. We couldn't spend any of the money

> on that. In some elements they [NLHF] wanted a lot of the Victorian designs brought back in … It all is very much to do with heritage and history.'

NLHF funding has further influence because its grants are matching grants and come with a requirement that a council maintain the improvements for up to ten years or lose the funding. Thus, local authorities' reduced green space budgets can go towards maintaining a heritage focus long term (Dempsey and Burton, 2012). A national charity manager addressed this:

> 'In some cases, they [the local authority] spent £6 million, £7 million, so that's going to be a challenge for an organisation. "How do I fund those two parks that have HLF investment from my parks budget if I have to maintain them because there's a real risk of that money being clawed back?" Does that happen at the expense of parks in the surrounding area?'

As such, heritage-oriented funding can divert a local authority's resources away from integrating green spaces into a network of GI. A national charity officer commented on this:

> 'There are a number of individual parks, which, largely thanks to the Heritage Lottery Fund, are now really nice, but they're little islands … Particularly thinking about climate change, public health, demographics – going forward, I think we need new sorts of green spaces that do an awful lot of different things at the same time … Every little space we've got is going to have to work a lot harder at providing a lot of different things.'

This is not to argue that heritage is not relevant to GI. Indeed, sociocultural aspects, such as heritage, are integral to the concept of GI, including community engagement and buy-in (Mell and Clement, 2019; Whitten, 2023). Rather, rigid adherence to a path-dependent fixation on a rural idyll impedes adoption of a more diverse and flexible range of green features that are strategically planned and maintained to address 21st-century challenges.

### *Spatial disconnection*

An approach to parks as 'little islands' contributes to spatial fragmentation, contradicting GI's fundamental principle of interconnectivity (Kambites and Owen, 2006; Thomas and Littlewood, 2010). Many of London's urban green spaces are fenced, gated and locked at certain times, essentially disconnecting these public spaces from urban life (Figure 7.3).

**Figure 7.3:** Edwardian-era brick around South Park


Source: Meredith Whitten

The ornate and elaborate gates at many park and green space entrances bluntly differentiate these spaces from the city around them, 'marking as significant the transition from the chaos of the streets to spaces of calm and order' (Brück, 2013: 201) while protecting urban green space 'from the realities of its city surroundings' (Conway, 1991: 10). Passing through the gates powerfully signals visitors are leaving the city and stepping into the countryside (Rosenberg, 1996), indicating green spaces are 'literally and symbolically a world apart' from the city (Conway, 1991: 10). Within the fences, a green space's design, including horticultural choices and physical layout, deliberately contrasts to the city (Rosenberg, 1996). Although efforts such as rewilding, which seeks to reinstate natural landscape processes (Rewilding Britain, 2022), and 'no-mow' periods, when mowing is suspended to allow grass and wildflowers to grow and enhance biodiversity (Plantlife, 2022), are increasing in policy discourse and planning practice, a particular vision of 'conforming to an Arcadian ideal' (Malchow, 1985: 98) in which nature is 'organized and artfully displayed' (Pendlebury, 1997: 246) remains powerful.

Planning has been a leading sector in adopting GI, as GI's guiding principles fit well with planning's enthusiastic embrace of sustainability as a 'transcendental ideal' (Gunder, 2006: 209). Yet, at the same time that planning policy promotes GI, planning standards sustain spatial fragmentation. Most

local authorities have adopted planning standards such as open space per capita, distance to open space and prevention of net loss of open space (Whitten, 2022), echoing wider trends in quantification as part of the turn towards new public management dating back to the 1990s (Dunleavy and Hood, 1994). Established at an arbitrary point in time, these standards do not reflect contemporary urban realities, including a denser, more vertical urban form. As such, they often are unrealistic and distract from a GI approach. For example, despite its standard of 1.2 ha of open space per 1,000 head of population, Tower Hamlets Council acknowledged that 'in the context of acute housing need in the Borough, such quantities [of green space] are not achievable' (2011: 19).

Such standards typically consider only conventional green spaces, not the broader network of green elements, such as vegetated roofs, increasingly required through planning processes to green the urban environment (Whitten, 2022). A prominent example is housing amenity space, which is not considered green space in planning terms even though these spaces are often green, can provide similar benefits as conventional parks and, in some cases, are larger than formally designated parks (Whitten, 2022). In some boroughs, including Islington, the amount of green space in housing estates and developments exceeds that in public parks (Whitten, 2022). In fact, 4.1 per cent of London comprises housing amenity space, not significantly less than the 5.8 per cent designated as parks and gardens (GiGL, 2019).

While vegetated roofs and green verges do not offer the same opportunities for recreation and sport that a public park does, these GI elements help address other policy and planning priorities, such as biodiversity gain and flood mitigation, in an increasingly crowded urban environment. Benefits from such non-conventional green elements could contribute to reducing health inequities, for example through air filtration, shading and cooling, and opportunities for quiet reflection (Tzoulas et al, 2007). Spatially connecting a range of GI elements does not supplant existing parks, but rather supplements them by expanding the benefits a network of urban greening can provide (Whitten and Massini, 2021).

Spatial fragmentation also impedes multifunctionality. Despite GI planning emphasizing the importance of factoring in multiple benefits to green spaces, 'decisions about where to site green infrastructure' are often opportunistic or based on one or a few benefits, rather than strategically focused on maximizing the full range of desired functions (Meerow, 2020: 3). Participants discussed limitations to multifunctionality given the pressure on Inner London green spaces for traditional uses, particularly sport and recreation. A regional green space charity executive called this "a fundamental challenge", adding that "green space ought to be seen as multifunctional, but too often it's not seen like that. It's seen as 'oh, this is where you do football'". Indeed, despite GI implying the ability to 'have

it all' (Horwood, 2011: 971), a more limited focus perseveres in practice (Mell and Clement, 2019).

### *Administrative fragmentations*

GI represents a shift from traditional approaches to planning that typically have addressed competing agendas through administrative and sectoral silos (Scott and Hislop, 2019), such as government departments working in isolation on issues like biodiversity or recreation (Rall et al, 2019). As an organizing framework, GI aims to overcome silos by reimagining parks, gardens, trees and other natural features as a strategic, multifunctional working landscape rather than as isolated elements, thus embedding a collaborative approach across once-fragmented teams and organizations (Kambites and Owen, 2006; Whitten, 2020).

Yet, local government organizational structures and funding processes can impede such collaborative ambitions. Typically, green space functions are organizationally structured with other non-statutory services (for example, leisure centres) or services seen as an amenity (such as libraries). Meanwhile, other departments or disciplinary teams have responsibilities for various aspects of GI. For example, Planning secures GI through negotiations and decisions around development. Highways oversees installation and management of SuDS and street trees; Health manages initiatives that promote use of green spaces for physical and mental health; and Housing manages amenity green spaces in housing estates (Figure 7.4). A regional charity executive said this fragmentation of green space management at the local level reflects disintegration at the national level:

> '[There are] silos within central government because parks are under the DCLG [Department for Communities and Local Government], but it's considered a cultural service by many. It doesn't come under the Department of Culture, Media and Sport. It's in a separate department. The two departments don't talk to each other. Then you extend that argument to, say, health or education and, again, no dialogue. All those silos have their funding schemes, as well. And, you have exactly the same in local authorities.'

This results in green space and other GI elements being both administratively and functionally separate, which 'can render the governance arrangements complex and fragmented' (Dempsey et al, 2016: 445). As such, "everybody is putting demand on the finite space", a council green space officer said. With GI spread among different departments and responsibilities, the benefits of administrative connectivity of GI are not realized. Internal fragmentation also affects council officers' interactions and negotiations with developers,

**Figure 7.4:** Housing amenity space

Source: Meredith Whitten

with a developer describing local authorities' GI activities as "a fragmented puzzle of opinions".

Green space's non-statutory status makes it vulnerable to budget cuts (Dempsey, 2020; Whitten, 2019). Indeed, despite green space being fundamental to a number of statutory services, investment in green space is 'precarious and disproportionately subject to tight fiscal pressures' (Dempsey and Burton, 2012: 13). While austerity measures introduced in England from 2010 affected all local government services, the deepest cuts occurred in discretionary functions (Brown and Wilson, 2015; Centre for London, 2018). Across the UK, 92 per cent of green space managers experienced cuts to their revenue budgets between 2013 and 2015 (NLHF, 2016). Spending on open space, which includes green spaces, by London councils decreased 18 per cent in four years, allowing for inflation (London Councils, 2015; LAEC, 2016).

As local governments' green space resources have been cut, they increasingly have turned to other partners, including developers, homebuilders and housing associations, charities and community organizations, to deliver, manage and maintain green spaces (Dempsey et al, 2016). This 'ongoing shift from (local) government green space management to a governance structure involving local non-governmental stakeholders' (Mathers et al, 2015: 126) has ramifications for implementing a holistic approach to urban greening.

In particular, increased reliance on community organizations in green space governance has occurred, with the number of 'friends' groups growing in London (Mathers et al, 2015; LAEC, 2017). Such community organizations often can devote more time and resources to local spaces than a local authority can (Mathers et al, 2015). As a result, community groups, such as the Friends of Luxmore Gardens in Lewisham, have transformed spaces neglected by local government into vibrant parts of the local community infrastructure (Whitten, 2019; FLG, 2022).

Yet, relying on community organizations and other partners presents challenges. These organizations often focus on an individual site, thus do not have a boroughwide or pan-London perspective (Whitten, 2019). A green space charity manager noted: "The penny hasn't dropped for a lot of [community groups] that, although local is important … there's a bigger picture here, there's more at stake". Further, community organizations tend to take on management of smaller green spaces. This can lead these spaces to being managed solely for local use, thus ignoring the critical work smaller spaces contribute to a broad interconnected network of GI, including serving as strategic connectors between larger spaces (Van Herzele and Wiedemann, 2003).

A homogeneity in green space planning and management through a focus on amenity and recreation impedes the GI principle of multifunctionality. Certain functions, such as stormwater collection and climate change mitigation, are not a priority for some community organizations and local residents. This conflicts with policy discourse that increasingly presents multifunctional, spatially integrated and administratively connected GI simplistically as a panacea (Meerow, 2020; Whitten, 2022).

## Conclusion

Urban green spaces increasingly are recognized for their wide-ranging contributions to human and ecological health. With crises such as the climate emergency, chronic health conditions and biodiversity loss commanding growing attention from policy makers and planners – as well as the public – urban policy increasingly is positioning green spaces not as an aesthetic amenity, but as critical infrastructure that can play a prominent role in addressing these global challenges. While consensus on a precise definition of GI remains elusive, the use of 'infrastructure' is deliberate, as it 'gives greater weight to the consideration of a broad spectrum of green space issues in planning policy formulation' (Lennon, 2015: 966).

Framing a range of green spaces, beyond the typical narrow focus on parks, as infrastructure 'implies something essential to city living' (Thomas and Littlewood, 2010: 210). This equates urban nature with traditional physical infrastructure, such as transport, utilities and communication, thus filling a gap in infrastructural discourse. Indeed, despite an 'infrastructural

turn', urban studies largely overlooked green spaces as a networked system undergirding modern cities (Gabrys, 2022). Yet, as strategic, critical scaffolding (Eisenman, 2013), GI is recognized as dynamic, evolving and integral to the production of contemporary cities (Wiig et al, 2022).

However, if 'modern infrastructure is constructed by ideas and representations' (Enright, 2022: 102) as much as it is physical materials, shifting conceptualizations and approaches to integrating nature into the urban environment requires more than a change in terminology. Well-entrenched institutions and processes can perpetuate urban green spaces as detached from the city, both spatially and conceptually. Designing and managing a network of green elements to address current and future urban challenges, rather than simply reflecting their historic design and use, is a challenge, given the perseverance of administrative fragmentation, the embeddedness of institutional processes and the inherently political nature of infrastructure (McFarlane and Rutherford, 2008). Ultimately, GI, like other infrastructure, is 'intimately bound up with broader transformation in the geographies of cities and the experiences of urban life' (Graham and Marvin, 2022: 170). As such, GI must continue to evolve as the urban systems in which it exists continue to evolve, as well.

## References

Amati, M. and Taylor, L. (2010) 'From green belts to green infrastructure', *Planning Practice & Research*, 25(2): 143–55.

Aronson, M., Lepczyk, C.A., Evans, K.L., Goddard, M.A., Lerman, S.B., MacIvor, J.S., et al (2017) 'Biodiversity in the city: key challenges for urban green space management', *Frontiers in Ecology and the Environment*, 15(4): 189–96.

Bekker, H. and Iuell, B. (2003) 'Habitat fragmentation due to infrastructure', Davis, CA: UC Davis, Road Ecology Center. Available from: https://escholarship.org/uc/item/9693w540 [Accessed 27 January 2022].

Benedict, M.A. and McMahon, E.T. (2002) 'Green infrastructure: smart conservation for the 21st century', *Renewable Resources Journal*, 20(3): 12–17.

Brown, R. and Wilson, B. (2015) Running on Fumes? London Council Services in Austerity, London: Centre for London. Available from: https://www.centreforlondon.org/wp-content/uploads/2016/08/CFL3888_Running-on-fumes_short_paper_12.11.15_WEB-1.pdf [Accessed 21 August 2021].

Brück, J. (2013) 'Landscapes of desire: parks, colonialism, and identity in Victorian and Edwardian Ireland', *International Journal of Historical Archaeology*, 17(1): 196–223.

Campbell, S. (2016) 'The planner's triangle revisited: sustainability and the evolution of a planning ideal that can't stand still', *Journal of the American Planning Association*, 82(4): 388–97.

Centre for London (2018) The London Intelligence, 4, London: Centre for London. Available from: https://www.centreforlondon.org/wp-content/uploads/2018/05/Issue-4-TLI.pdf [Accessed 21 August 2021].

Clark, K. (2004) 'Why fund heritage? The role of research in the Heritage Lottery Fund', *Cultural Trends*, 13(4): 65–85.

Clifford, B. (2016) '"Clock-watching and box-ticking": British local authority planners, professionalism and performance targets', *Planning Practice & Research*, 31(4): 383–401.

Conway, H. (1991) *People's Parks: The Design and Development of Victorian Parks in Britain*, Cambridge: Cambridge University Press.

CRP (Cross River Partnership) (2016) Green Capital: Green Infrastructure for a Future City. Available from: https://www.london.gov.uk/sites/default/files/green_capital.pdf [Accessed 3 February 2022].

Davies, C. and Lafortezza, R. (2017) 'Urban green infrastructure in Europe: is greenspace planning and policy compliant?', *Land Use Policy*, 69: 93–101.

Dempsey, N. (2009) 'Are good-quality environments socially cohesive? Measuring quality and cohesion in urban neighbourhoods', *Town Planning Review*, 80(3): 315–45.

Dempsey, N. (2020) 'Measuring the gap between rhetoric and practice: examining urban green space interventions post-implementation', in N. Dempsey and J. Dobson (eds) *Naturally Challenged: Contested Perceptions and Practices in Urban Green Spaces*, Cham: Springer, pp 167–87.

Dempsey, N. and Burton, M. (2012) 'Defining place-keeping: the long-term management of public spaces', *Urban Forestry & Urban Greening*, 11(1): 11–20.

Dempsey, N., Burton, M. and Selin, J. (2016) 'Contracting out parks and roads maintenance in England', *International Journal of Public Sector Management*, 29(5): 441–56.

DOE (Department of the Environment) (1996) *Greening the City: A Guide to Good Practice*, London: HMSO.

Dunleavey, P. and Hood, C. (1994) 'From old public administration to new public management', *Public Money and Management*, 14(3): 9–16.

Eadson, W., Harris, C., Parkes, S., Speake, B., Dobson, J. and Dempsey, N. (2020) Why Should We Invest in Parks? Evidence from the Parks for People Programme. Available from: https://www.heritagefund.org.uk/sites/default/files/media/attachments/Parks%20for%20People%20report.pdf [Accessed 21 September 2021].

Eisenman, T.S. (2013) 'Frederick Law Olmsted, green infrastructure, and the evolving city', *Journal of Planning History*, 12(4): 287–311.

Enright, T. (2022) 'The infrastructural imagination', *Journal of Urban Technology*, 29(1): 101–7.

Fábos, J.G. (2004) 'Greenway planning in the United States: its origins and recent case studies', *Landscape and Urban Planning*, 68(2/3): 321–42.

FLG (Friends of Luxmore Gardens) (2022) 'About'. Available from: http://www.loveluxmore.co.uk/?page_id=25 [Accessed 27 January 2022].

Gabriel, N. (2011) 'The work that parks do: towards an urban environmentality', *Social & Cultural Geography*, 12(2): 123–41.

Gabrys, J. (2022) 'Programming nature as infrastructure in the smart forest city', *Journal of Urban Technology*, 29(1): 13–19.

Garside, P.L. (2006) 'Politics, ideology and the issue of open space in London, 1939–2000', in P. Clark (ed) *The European City and Green Space: London, Stockholm, Helsinki and St Petersburg, 1850–2000*, Aldershot: Ashgate, pp 92–122.

GiGL (Greenspace Information for Greater London CIC) (2019) 'Key London figures'. Available from: https://www.gigl.org.uk/keyfigures/ [Accessed 12 September 2021].

Gill, S.E., Handley, J.F., Ennos, A.R. and Pauleit, S. (2007) 'Adapting cities for climate change: the role of the green infrastructure', *Built Environment*, 33(1): 115–33.

GLA (Greater London Authority) (2017) 'London borough profiles'. Available from: https://web.archive.org/web/20210511083051/https://data.london.gov.uk/dataset/london-borough-profiles [Accessed 18 August 2021].

GLA (Greater London Authority) (2018a) 'Land area and population density, ward and borough'. Available from: https://data.london.gov.uk/dataset/land-area-and-population-density-ward-and-borough [Accessed 8 May 2021].

GLA (Greater London Authority) (2018b) *London Environment Strategy*, London: GLA. Available from: https://www.london.gov.uk/sites/default/files/london_environment_strategy_0.pdf [Accessed 20 July 2021].

GLA (Greater London Authority) (2021a) *The London Plan: The Spatial Development Strategy for Greater London*, London: GLA. Available from: https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf [Accessed 14 June 2021].

GLA (Greater London Authority) (2021b) 'Planning London datahub: residential completion dashboard'. Available from: https://data.london.gov.uk/dataset/planning-london-datahub [Accessed 14 June 2021].

Graham, S. and Marvin, S. (2001) *Splintered Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition*, New York: Routledge.

Graham, S. and Marvin, S. (2022) '*Splintering Urbanism* at 20 and the "infrastructural turn"', *Journal of Urban Technology*, 29(1): 169–75.

Grant, G. and Gedge, D. (2019) *Living Roofs and Walls: From Policy to Practice*. London: European Federation of Green Roof and Green Wall Associations and Livingroofs.org. Available from: https://livingroofs.org/london-2019-green-roof-report/ [Accessed 14 October 2021].

Gunder, M. (2006) 'Sustainability: planning's saving grace or road to perdition?', *Journal of Planning Education and Research*, 26(2): 208–21.

Haaland, C. and van den Bosch, C.K. (2015) 'Challenges and strategies for urban green-space planning in cities undergoing densification: a review', *Urban Forestry & Urban Greening*, 14(4): 760–71.

Hansen, R. and Pauleit, S. (2014) 'From multifunctionality to multiple ecosystem services? A conceptual framework for multifunctionality in green infrastructure planning for urban areas', *AMBIO*, 43(4): 516–29.

Harrison, G. and Clifford, B. (2016) '"The field of grain is gone; It's now a Tesco Superstore": representations of "urban" and "rural" within historical and contemporary discourses opposing urban expansion in England', *Planning Perspectives*, 31(4): 585–609.

HM Government (2015) Town and Country Planning (TCP) Act (Development Management Procedure) (England) Order 2015 (schedule 4): consultations before the grant of permission. Available from: http://www.legislation.gov.uk/uksi/2015/595/schedule/4/made [Accessed 16 November 2021].

Horwood, K. (2011) 'Green infrastructure: reconciling urban green space and regional economic development – lessons learnt from experience in England's north-west region', *Local Environment*, 16(10): 963–75.

Howard, E. (1902) *Garden Cities of To-morrow*, London: Swan Sonnenschein. Available from: http://www.gutenberg.org/files/46134/46134-h/46134-h.htm [Accessed 22 August 2021].

Hulin, J.-P. (1979) '"Rus in urbe": a key to Victorian anti-urbanism?', in J.-P. Hulin and P. Coustillas (eds) *Victorian Writers and the City*, Lille: Publications de l'Université de Lille III, pp 11–40.

Jones, K.R. (2018) '"The lungs of the city": green space, public health and bodily metaphor in the landscape of urban park history', *Environment and History*, 24(1): 39–58.

Kabisch, N., Strohbach, M., Haase, D. and Kronenberg, J. (2016) 'Urban green space availability in European cities', *Ecological Indicators*, 70: 586–96.

Kambites, C. and Owen, S. (2006) 'Renewed prospects for green infrastructure planning in the UK', *Planning Practice & Research*, 21(4): 483–96.

LAEC (London Assembly Environment Committee) (2016) 'Scoping note: Green Spaces, Appendix 1'. Available from: https://www.london.gov.uk/about-us/londonassembly/meetings/documents/s60651/05a%20Appendix%201%20-%20Green%20Spaces%20Scope.pdf [Accessed 22 May 2021].

LAEC (London Assembly Environment Committee) (2017) *Park Life: Ensuring Green Spaces Remain a Hit with Londoners*. Available from: https://www.london.gov.uk/sites/default/files/environment_committee_-_park_life_report.pdf [Accessed 22 May 2021].

Lemes de Oliveira, F. (2014) 'Green wedges: origins and development in Britain', *Planning Perspectives*, 29(3): 357–79.

Lennon, M. (2015) 'Green infrastructure and planning policy: a critical assessment', *Local Environment*, 20(8): 957–80.

LGSC (London Green Spaces Commission) (2020) London Green Spaces Commission Report. Available from: https://www.london.gov.uk/sites/default/files/4244_-_gla_-_london_green_spaces_commission_report_v7_0.pdf [Accessed 22 August 2021].

London Councils (2015) *Spending Review 2015: London Councils' Submission to HM Treasury*. Available from: https://www.londoncouncils.gov.uk/sites/default/files/Policy%20themes/Local%20government%20finance/LC_Spending_Review01d.pdf [Accessed 15 October 2021].

Lowenthal, D. (1991) 'British national identity and the English landscape', *Rural History*, 2(2): 205–30.

Lowndes, V. and Gardner, A. (2016) 'Local governance under the Conservatives: super-austerity, devolution and the "smarter state"', *Local Government Studies*, 42(3): 357–75.

LUFP (London Urban Forest Partnership) (2020) London Urban Forest Plan. Available from: https://www.london.gov.uk/sites/default/files/londonurbanforestplan_final.pdf [Accessed 11 November 2021].

Mace, A. (2018) 'The Metropolitan Green Belt, changing an institution', *Progress in Planning*, 121: 1–28.

Malchow, H.L. (1985) 'Public gardens and social action in late Victorian London', *Victorian Studies*, 29(1): 97–124.

Massini, P. and Smith, H. (2018) *PERFECT Expert Paper 2: Planning for Green Infrastructure – the Green Space Factor and Learning from Europe*. Available from: https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1551105810.pdf [Accessed 2 February 2022].

Mathers, A., Dempsey, N. and Molin, J.F. (2015) 'Place-keeping in action: evaluating the capacity of green space partnerships in England', *Landscape and Urban Planning*, 139: 126–36.

Mathey, J., Rößler, S., Lehmann, I. and Bräuer, A. (2011) 'Urban green spaces: potentials and constraints for urban adaptation to climate change', in K. Otto-Zimmermann (ed) *Resilient Cities: Cities and Adaptation to Climate Change – Proceedings of the Global Forum 2010*, Dordrecht: Springer, pp 479–85.

Matsler, A.M., Meerow, S., Mell, I.C. and Pavao-Zuckerman, M.A. (2021) 'A "green" chameleon: exploring the many disciplinary definitions, goals, and forms of "green infrastructure"', *Landscape and Urban Planning*, 214: art 104145, https://doi.org/10.1016/j.landurbplan.2021.104145.

Matthews, T., Lo, A.Y. and Byrne, J.A. (2015) 'Reconceptualizing green infrastructure for climate change adaptation: barriers to adoption and drivers for uptake by spatial planners', *Landscape and Urban Planning*, 138: 155–63.

McFarlane, C. and Rutherford, J. (2008) 'Political infrastructures: governing and experiencing the fabric of the city', *International Journal of Urban and Regional Research*, 32(2): 363–74.

McMahon, E.T. (2000) 'Green infrastructure', *Planning Commissioners Journal*, 37: 4–7.

Meerow, S. (2020) 'The politics of multifunctional green infrastructure planning in New York City', *Cities*, 100: art 102621. Available from: https://doi.org/10.1016/j.cities.2020.102621 [Accessed 20 November 2022].

Meerow, S. and Newell, J.P. (2017) 'Spatial planning for multifunctional green infrastructure: growing resilience in Detroit', *Landscape and Urban Planning*, 159: 62–75.

Mell, I. (2008) 'Green infrastructure: concepts and planning', *FORUM*, 8: 69–80.

Mell, I. (2015) 'Green infrastructure planning: policy and objectives', in D. Sinnett, N. Smith and S. Burgess (eds) *Handbook on Green Infrastructure: Planning, Design and Implementation*, Cheltenham: Edward Elgar, pp 105–23.

Mell, I. (2016) *Global Green Infrastructure: Lessons for Successful Policy-Making, Investment and Management*, Abingdon: Routledge.

Mell, I. (2019) *Green Infrastructure Planning: Reintegrating Landscape in Urban Planning*, London: Lund Humphries.

Mell, I. and Clement, S. (2019) 'Progressing green infrastructure planning: understanding its scalar, temporal, geo-spatial and disciplinary evolution', *Impact Assessment and Project Appraisal*, 38(6): 449–63.

Mell, I. and Whitten, M. (2021) 'Access to nature in a post Covid-19 world: opportunities for green infrastructure financing, distribution and equitability in urban planning', *International Journal of Environmental Research and Public Health*, 18(4): art 1527. Available from: https://doi.org/10.3390/ijerph18041527 [Accessed 20 November 2022].

Mell, I., Allin, S., Reimer, M. and Wilker, J. (2017) 'Strategic green infrastructure planning in Germany and the UK: a transnational evaluation of the evolution of urban greening policy and practice', *International Planning Studies*, 22(4): 333–49.

Mischi, J. (2009) 'Englishness and the countryside: how British rural studies address the issue of national identity', in F. Reviron-Piégay (ed) *Englishness Revisited*, Newcastle upon Tyne: Cambridge Scholars, pp 109–24.

Natural England (2020) A Rapid Scoping Review of Health and Wellbeing Evidence for the Framework of Green Infrastructure Standards. Available from: http://publications.naturalengland.org.uk/file/5992890930298880 [Accessed 12 October 2021].

NLHF (National Lottery Heritage Fund) (2016) State of UK Public Parks. Available from: https://www.heritagefund.org.uk/sites/default/files/media/attachments/state_of_uk_public_parks_2016_final_for_web%281%29.pdf [Accessed 19 August 2021].

NPCF (National Park City Foundation) (2019) 'Frequently asked questions'. Available from: https://www.nationalparkcity.london/faq [Accessed 12 February 2022].

ONS (Office for National Statistics) (2012) 2011 census: population and household estimates for England and Wales, March 2011. Available from: www.ons.gov.uk/ons/dcp171778_270487.pdf [Accessed 30 November 2021].

ONS (Office for National Statistics) (2018) 'Subnational population projections for England: 2018-based'. Available from: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/subnationalpopulationprojectionsforengland/2018based [accessed 25 September 2021].

ONS (Office for National Statistics) (2021) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland, mid-2020: 2021 local authority boundaries. Available from: https://www.ons.gov.uk/file?uri=/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland/mid2020/ukpopestimatesmid2020on2021geography.xls [Accessed 28 June 2021].

Pendlebury, J. (1997) 'The statutory protection of historic parks and gardens: an exploration and analysis of "structure", "decoration" and "character"', *Journal of Urban Design*, 2(3): 241–58.

Plantlife (2022) 'No Mow May'. Available from: https://www.plantlife.org.uk/uk/discover-wild-plants-nature/no-mow-may [Accessed 15 February 2022].

Rall, E., Hansen, R. and Pauleit, S. (2019) 'The added value of public participation GIS (PPGIS) for urban green infrastructure planning', *Urban Forestry & Urban Greening*, 40: 264–74.

Reeder, D. (2006a) 'London and green space, 1850–2000: an introduction', in P. Clark (ed) *The European City and Green Space: London, Stockholm, Helsinki and St Petersburg, 1850–2000*, Aldershot: Ashgate, pp 54–64.

Reeder, D. (2006b) 'The social construction of green space in London prior to the Second World War', in P. Clark (ed) *The European City and Green Space: London, Stockholm, Helsinki and St Petersburg, 1850–2000*, Aldershot: Ashgate, pp 65–91.

Rewilding Britain (2022) 'Defining rewilding'. Available from: https://www.rewildingbritain.org.uk/explore-rewilding/what-is-rewilding/defining-rewilding [Accessed 15 February 2022].

Roe, M. and Mell, I. (2013) 'Negotiating value and priorities: evaluating the demands of green infrastructure development', *Journal of Environmental Planning and Management*, 56(5): 650–73.

Rosenberg, E. (1996) 'Public works and public space: Rethinking the urban park', *Journal of Architectural Education*, 50(2): 89–103.

Scanlon, K., Whitehead, C. and Blanc, F. (2018) *A Sustainable Increase in London's Housing Supply?* London: London School of Economics and Political Science. Available from: https://www.lse.ac.uk/geography-and-environment/research/lse-london/documents/Reports/REPORT-LSE-KEI-digital.pdf [Accessed 25 September 2021].

Scott, A. and Hislop, M. (2019) 'What does good GI policy look like?', *Town & Country Planning*, 88(5): 177–84.

Seiwert, A. and Rößler, S. (2020) 'Understanding the term *green infrastructure*: origins, rationales, semantic content and purposes as well as its relevance for application in spatial planning', *Land Use Policy*, 97: art 104785. Available from: https://doi.org/10.1016/j.landusepol.2020.104785 [Accessed 20 November 2022].

Thomas, K. and Littlewood, S. (2010) 'From green belts to green infrastructure? The evolution of a new concept in the emerging soft governance of spatial strategies', *Planning Practice & Research*, 25(2): 203–22.

Tower Hamlets Council (2011) *An Open Spaces Strategy for the London Borough of Tower Hamlets, 2006–2016, Mid-point Update*. Available from: http://www.queenelizabetholympicpark.co.uk/-/media/lldc/local-plan/local-plan-examination-documents/other-strategy-papers/s17-tower-hamlets-open-space-strategy-mid-point-update.ashx?la=en [Accessed 8 July 2021].

Travers, T. (2004) *The Politics of London: Governing an Ungovernable City*, Basingstoke: Palgrave Macmillan.

Tzoulas, K., Korpela, K., Venn, S., Yli-Pelkonen, V., Kaźmierczak, A., Niemela, J. and James, P. (2007) 'Promoting ecosystem and human health in urban areas using green infrastructure: a literature review', *Landscape and Urban Planning*, 81(3): 167–78.

Van Herzele, A. and Wiedemann, T. (2003) 'A monitoring tool for the provision of accessible and attractive urban green spaces', *Landscape and Urban Planning*, 63(2): 109–26.

Welch, D. (1991) *The Management of Urban Parks*, Harlow: Longman.

Whitten, M. (2019) 'Blame it on austerity? Examining the impetus behind London's changing green space governance', *People, Place and Policy*, 12(3): 204–24.

Whitten, M. (2020) 'Contesting longstanding conceptualisations of urban green space', in N. Dempsey and J. Dobson, (eds) *Naturally Challenged: Contested Perceptions and Practices in Urban Green Spaces*, Cham: Springer, pp 87–116.

Whitten, M. (2022) 'Planning past parks: overcoming restrictive green space narratives in contemporary compact cities', *Town Planning Review*, 93(5): 469–93.

Whitten, M. (2023) 'Engaging resilience: integrating sociocultural dimensions into green infrastructure planning', in C.G. Sant'Anna, I. Mell and L.B. Schenk (eds) *Planning with Landscape: Green Infrastructure to Build Climate-Adapted Cities*, Springer Nature.

Whitten, M. and Massini, P. (2021) 'How can inequalities in access to green space be addressed in a post-pandemic world? Lessons from London', in R. Van Melik, P. Filion and B. Doucet (eds) *Global Reflections on COVID-19 and Urban Inequalities, Volume 3: Public Space and Mobility*, Bristol: Bristol University Press, pp 87–96.

WHO (World Health Organization) (2017) *Urban Green Spaces: A Brief for Action*, Copenhagen: WHO. Available from: https://apps.who.int/iris/rest/bitstreams/1363607/retrieve [Accessed 22 September 2021].

Wiig, A., Karvonen, A., McFarlane, C. and Rutherford, J. (2022) '*Splintering Urbanism* at 20: mapping trajectories of research on urban infrastructures', *Journal of Urban Technology*, 29(1): 1–11.

Wright, H. (2011) 'Understanding green infrastructure: the development of a contested concept in England', *Local Environment*, 16(10): 1003–19.