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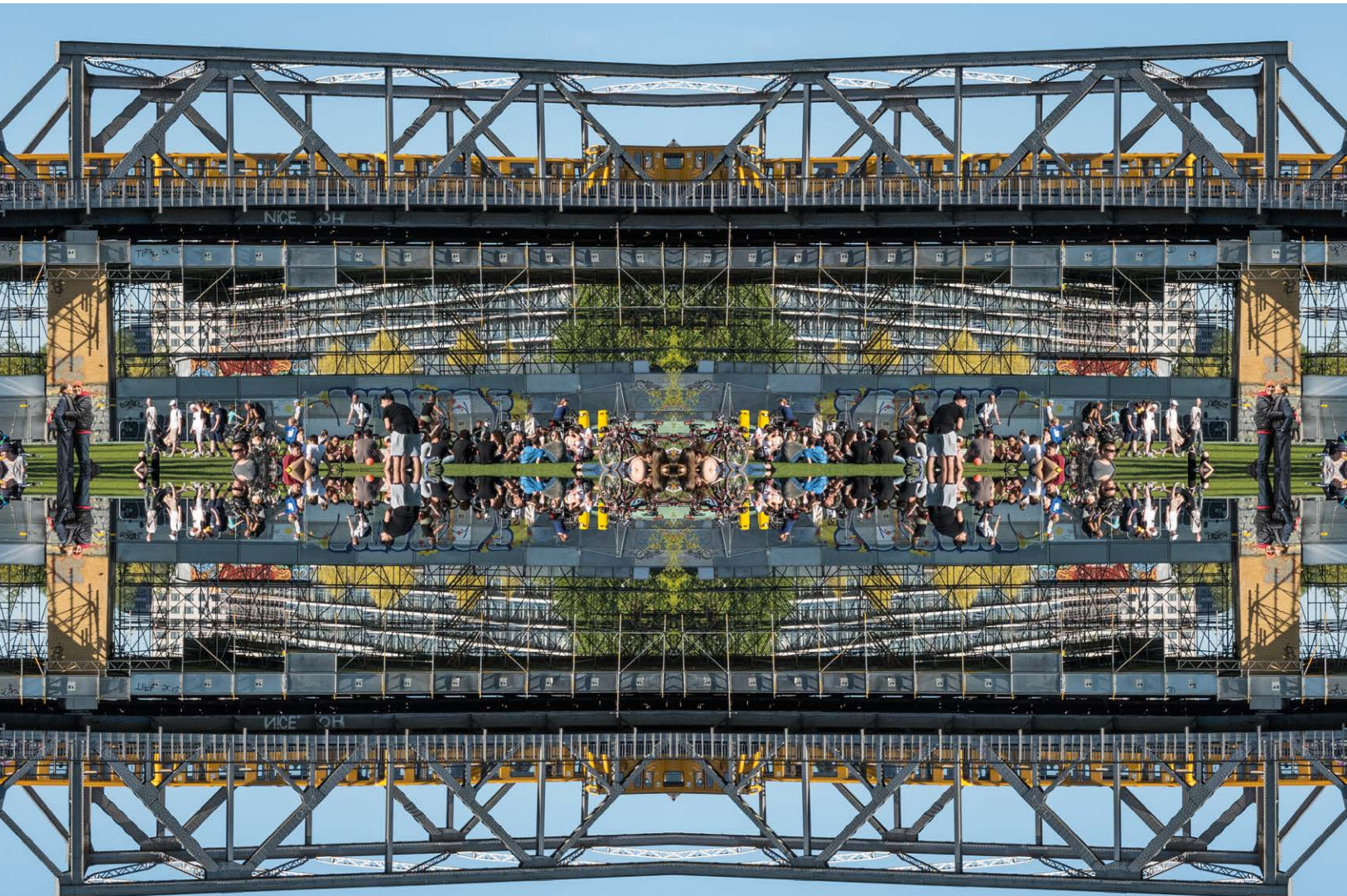
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## Compact cities



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# Landscapes for compact cities

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The pursuit of urban sustainability is a goal that is belatedly gaining traction in the urban design of many cities worldwide, hastened by concerns over the increasing extent of the impact of humans on the earth's functions and its ability to continue to sustain human needs. In this effort, a key planning concept that is widely associated with sustainable urban development is the idea of the 'compact city', a form of urban design that emphasizes dense, proximate urban development, efficient and well-linked public transport systems, and easy accessibility of public amenities and job opportunities.

However, while the compact city idea has been actively promoted by numerous international organizations such as the EU, OECD, and UN-Habitat since the 1990s, there are still questions about whether compact development should be pursued as a universal planning concept.<sup>1</sup> There seem to be three reasons for this. The first is related to its definition—the term compact city, like other urban development concepts such as 'sustainable development' and 'resilience', still lacks a precise and widely accepted operational definition. For instance, while the idea of dense development underpins the concept, which built or human densities qualify a development as 'compact' is still unclear. This question is also intimately associated with the spatial scale to which compact urban form is applied. Dense developments at the scale of a neighbourhood, a block, a town, a city, or an urban agglomeration or metropolitan area can have manifestly different social, ecological, and economic outcomes, and therefore the scale at which compactness should be pursued is still unclear. A second reason for questioning the compact city form is that the desired outcomes of compact development are not just dependent on achieving density, but are also shaped by socioeconomic and cultural contexts surrounding the development. This correlation is particularly evident when considering developed versus developing economies—which uncovers doubts about the merits of a direct translation of lessons learned in compact urban design from developed economies to developing economies. In developing economies, urban densification often seems to exacerbate rather than mitigate urban challenges such as inequitable access to urban amenities, crowdedness, and urban poverty. A third objection to

the compact city form, even in developed economies, relates to the repercussions that high urban density can have on the quality of life, such as a reduced sense of community, inadequate urban amenities, a feeling of crowdedness, and a decline in psychological health.<sup>2</sup> Denser developments also seem to contribute to higher levels of exposure to environmental pollution.<sup>3</sup> Perhaps the most intuitively understood and widely-recognized problem of a compact urban form is that densification is also accompanied by a reduction of open space. The logic is obvious: in a finite land area, more land set aside for buildings and infrastructure, especially under conditions of high land cost, simply means less land for parks, plazas, woodlands, and other forms of green and open spaces in the city.

However, on balance, considering the positive evidence for and the fundamental goals of the compact city argument, we suggest that the limitations highlighted above do not negate the fact that the idea of the compact city promoting urban sustainability still holds many promises. As a planning concept, compact city development still requires clarity in its definitions, forms and functions, and the development of means of implementation, but not its abandonment. Continued efforts are needed to pursue critical discussions to advance knowledge of the compact city and the possibilities it offers for future urban developments.

This special issue of *JoLA* aims to contribute to this goal. We seek to highlight particularly the key role of landscapes in the discourses on compact city design. Our specific focus is on landscapes in cities, which we simply term 'urban landscapes'. As cities are socioecological systems, we take a broad definition of 'urban landscapes', referring to not just predominantly green spaces in the city, but considering any area in the city that is jointly shaped by human and natural factors. Urban landscapes are relevant in the discourse of urban development as they support human well-being in the dense built environment and offer a variety of other social and ecological benefits. However, the continuous and successful performance of urban landscapes is strictly related to the capacity of a compact city to accommodate them.

Density, compactness, and greenery are often perceived as mutually incompatible or conflicting goals when related to contemporary urban design. We suggest, however, that a more nuanced understanding of the current theoretical debate and the innovative design practices it informs, together with the policies and programmes focusing on the intersection between landscapes and compact development that are being implemented globally, can inspire a more seamless integration of landscapes in compact cities and urban areas. The contributions to this special issue of *JoLA* highlight the manifold intersections, synergies, and contests between urban landscapes and compact development.

### **Are landscapes constrained or protected by compact development: A question of scale**

In the call for papers for this special issue, we asked whether landscapes are constrained or safeguarded by compact development. We believe that it is fundamentally a question of scale—to what spatial extent, within or outside the urban boundaries, is the idea of compact urban design being applied? Is compact development or densification applied to a development site, the urban core, or to a whole metropolitan area comprising urban areas and their adjacent peri-urban and rural lands? The following three scenarios illustrate possible outcomes and why scale matters.

The first scenario, related to the expansion of urban areas into rural areas in metropolitan regions, produces one of the most severe consequences of urban expansion: the loss of biodiversity through land cover changes, habitat fragmentation, and degradation. As Richard Weller and his co-authors highlight in their essay 'Hotspot cities: Identifying peri-urban conflict zones', urban expansion the world over continues to intrude into biodiversity hotspots, with predictable and dramatic consequences for biodiversity in the region. More alarmingly, in most regions where the threats are high, urban policies are not adequate or explicit in proposing and pursuing mitigating practices. In this context, compact urban design might be seen positively as a means to contain urban sprawl into these vestiges of biodiversity-rich areas. However, as Weller and his co-authors point out, the strategy cannot be simply one of containment or limiting growth; it must be accompanied by a holistic approach considering the social, ecological, and economic factors driving urban growth and biodiversity loss.

The second scenario concerns infill developments, redevelopment of brownfields, or densification and redevelopment of older low-density zones throughout the city, within the urban boundary, usually at the expense of green open spaces or remnant vegetation that had been left undeveloped. In the process, the overall amount of green space in the city is com-

promised. An example of this process is provided by Ranja Hautamäki in her article titled 'Contested and constructed green in the compact city: A case study of Helsinki City Plan 2016'. In the name of compact development under the pressure of population growth, Helsinki revised its land use master plan to accommodate growth areas despite compromising several of Helsinki's well-known 'green fingers', the radial green zones that originated in the 1910s as a result of the first town planning schemes. As the significant cultural values of the 'green fingers' can be lost in this process, it emerges clearly that the potential changes to the green areas are not just about space alone. There is thus a policy dilemma: constrain urban expansion into the regional green areas, or increase density within the urban boundary at the expense of green open spaces? A similar situation is also encountered in cities such as London, Seoul, and Stockholm with still substantial green belts, but which are also grappling with accommodating urban growth. Compact development can thus lead to benefits at the metropolitan or regional scale but adverse impacts at smaller spatial scales. Interestingly, a reverse example of the second scenario can also occur, in which brownfield sites are converted to green spaces. An example is given by Noël van Dooren. In his contribution for the *Under the Sky* section, he discusses Park am Gleisdreieck in Berlin as a successful integration of urban development with a large park that offers spaces for active and passive recreation including, at the same time, areas for the conservation of biodiversity in the city.

In the third scenario, at the parcel or block scale, highrise, high-density developments can take up the majority of the development site, with no or little green spaces incorporated into the parcel. The extreme forms are perhaps exemplified by parcel-scale developments in business districts in Hong Kong, New York City, Singapore, etcetera, a process driven by the high land cost and the need to maximize developmental potential. But yet such high-density and highrise developments are also valuable in safeguarding valuable open spaces between built-up areas. Thus, the discussion about the pros and cons of compact urban development must first clarify the spatial scale one uses to examine benefits and impacts.

### **Land sharing or land sparing in compact cities: A matter of trade-offs**

It has been suggested that the ways to manage growth of cities can be framed as two contrasting approaches of 'land sparing' and 'land sharing'. The former emphasizes reducing the spatial extension of urban land expansion, whereas the latter focuses on less intensive land uses, with the built areas being more spread out.<sup>4</sup> Both forms have immense consequences on the amount and spatial pattern of green spaces, and both approaches can be seen in compact cities. This

point is illustrated through contrasting two cities: Singapore and Hong Kong, which are also the cities of study in the paper by Yun Hye Hwang and Zi En Jonathan Yue, and by Chi Yung Jim. Both cities are compact and green cities, and both have relatively similar population densities, but with built density in Hong Kong being much higher than in Singapore.<sup>5</sup> However, the differences in the distribution of green spaces could not be starker. While green areas are well-dispersed in Singapore, leading to a pervasive sense of the presence of vegetation throughout the city,<sup>6</sup> in Hong Kong green spaces are generally lacking in the dense urban cores, being more concentrated in the urban fringe, where they form large country parks.<sup>7</sup> The perception corroborates landscape metrics showing that Hong Kong has a higher level of overall green cover than Singapore, green patches that are larger and less fragmented, and green spaces that on average lie further from one another than in Singapore.<sup>8</sup> Both contrasting urban forms and distributions of built areas and green spaces are consequences of geographical constraints (such as the hilly terrain in the urban fringe of Hong Kong that is difficult to develop), and specific land policies that respond to differing socioeconomic conditions in the cities (such as land use policies requiring setback of development from site boundaries and having adequate green spaces in the interstitial spaces between buildings in Singapore). But both cities also face similar trade-offs between land development and conservation of green spaces. Given the paucity of development areas in urban cores in Hong Kong, should country parks be freed up for development to relieve urban pressures? This is currently being debated,<sup>9</sup> but such a land-sharing approach will be at the expense of the highly popular and needed country parks. In Singapore, in the quest to build more liveable spaces with adequate proximate green spaces, inevitably, urbanization will continue into green sites as the population grows. These green sites are primarily secondary forests that when developed will lead to the loss of considerable socioecological values.<sup>10</sup> Should a land-sparing approach be taken, conserving these forests and further densifying current built-up areas to densities similar to that of Hong Kong? What will be the possible consequences on the liveability of such densified areas, on human well-being, and resource consumption? These questions do not have simple answers as they require difficult trade-offs. They are also not without contests—civil society organizations and affected communities exert certain political pressures on decision making through public debates and contests. Decisions on landscapes are thus also driven by political considerations. The issues surrounding land developments are fundamentally wicked problems and vexing policy dilemmas that necessitate careful engagement of the affected citizenry and weighing of trade-offs. Currently, very little empirical evidence, such as understanding ecological implications and socioeconomic impacts, exists to provide insights for decision making.<sup>11</sup> More research in this area would be valuable.

### Opportunities to advance landscapes in compact cities

Despite being dominated by built structures, the city nevertheless possesses opportunities for landscapes to be woven into the urban fabric.<sup>12</sup> These spaces can be in the form of remnant patches of vegetation, vacant open spaces, sidewalks, building roofs, surfaces, and so forth. The growing international efforts to green roofs and walls attest to human agency and its capacity to innovate. Green roofs and building walls should, however, be viewed as the low-hanging fruits; to advance the future of landscapes in compact cities, the key role will be played by the significance of landscapes as critical elements of cities, the capacity to imagine new possibilities for integrating the city and the landscape, and the capacity to continue to innovate. Other contributions in this issue exemplify the advances in approaches, methods, and management of landscapes in compact cities.

The first example is Zealandia, a visionary sanctuary for native biodiversity in Wellington, New Zealand. Its position elevates it to a particularly remarkable case study, as it is located on the outskirts of Wellington, next to a highly built-up urban zone. Beyond its contribution to conservation, Zealandia is important as a bridge to connect the local urban community to the cultural meanings and respect for the land. As Bruno Marques and his co-authors emphasize in 'Bicultural landscapes and ecological restoration in the compact city: The case of Zealandia as a sustainable ecosanctuary', the goals of Zealandia are consistent with the Māori's beliefs on, respect for, and care of the land. By uncovering the latent meanings of Zealandia through narratives drawn from cultural understanding of the Māori's association with the land, a restored landscape like Zealandia that is in close proximity to the community in a dense urban environment can serve to reinforce an attitude of care and stewardship of natural resources, which in turn fosters a more sustainable approach to land management.

In 'Intended wildness: Utilizing spontaneous growth for biodiverse urban greenery in a tropical city', Yun Hye Hwang and Zi En Jonathan Yue advance the view that landscapes, even in the high-density environment of a compact city like Singapore, can afford to be 'wilder'. As opposed to the more tamed and manicured landscape typologies prevalent in the island city-state, wilder landscapes are more effective in fostering natural ecological processes rather than precluding them. They can provide more functional values to city dwellers in terms of exposure to more diverse and varied landscapes and a wider range of flora and fauna. However, the key to the wider adoption of wilder landscapes as urban landscapes rests not only in applying ecological knowledge to design, it is also dependent on the popular perception of this type of landscape. After all, the benefits urban dwellers derive from landscapes are dependent on their attitude towards nature; the social perspectives of landscape management thus cannot be ignored.

As wilder urban landscapes aim at eliciting imagination and fostering a dialogue of the ecological benefits of dense forested areas in the dense city, the *Thinking Eye* section shows how intangible negative effects of urban density—such as air pollution—can be made visible to stimulate discussion on more liveable urban environments. With their *Smogware* project, architect Iris de Kievith and designer Annemarie Piscaer want to heighten the awareness of air quality in the city of Rotterdam by revealing ‘the invisible particulate matter from traffic pollution’.<sup>13</sup>

In their article ‘Back on the street: Vienna, Copenhagen, Munich, and Rotterdam in focus’, Lilli Lička and Jürgen Furchtlehner suggest that space shortage in compact cities has become a driving force for the renewed attention for the exploitation of streets as social spaces. The potential is obvious: almost 90 per cent of Vienna’s public space are streets, and as a type of space that is encountered on a daily basis by city dwellers, greater design attention should be given to create more comfortable and convivial spaces out of this precious but underutilized resource.

In compact cities, in fact, both the aboveground and subterranean environment create considerable challenges for the optimal growth of urban vegetation, especially the trees that form the backbone of most urban landscapes. Herein lies a common problem—landscape designs, however nicely represented and conceived, cannot be implemented and sustained unless they are grounded by a deep understanding of the growth requirements of vegetation. The urban soil, in particular, is the Achilles heel of landscape implementation and does not receive adequate attention in research and design. In ‘Soil volume restrictions and urban soil design for trees in compact urban areas’, Chi Yung Jim clearly illustrates an innovative range of solutions to overcome restrictions in soil volume. The message is important: growing trees in urban landscapes does not need to be restricted to conventional tree pits or planting verges; human ingenuity can conceive a plethora of design solutions as long as landscape is accorded its proper place as a crucial element in the built environment.

The articles in this special issue of *JoLA* provide useful information to develop insights on the conceptual and operational issues surrounding the topics of landscapes in compact cities. Given that the compact city as an urban design approach is likely to grow rather than diminish in importance, more people than ever will be exposed to dense urban conditions. Therefore, ideas on how landscapes should be better considered in compact development will also likely grow in importance. There is a need to continue to attract and develop the scholarship on this topic.

## NOTES

- 1 See: European Commission, *Green Paper on the Urban Environment: Communication from the Commission to the Council and Parliament* (1990), <https://publications.europa.eu/en/publication-detail/-/publication/0e4b169c-91b8-4de0-9fed-ead286a4efb7/language-en>, accessed 1 September 2018; OECD, *Green Growth Studies, Compact City Policies: A Comparative Assessment* (2012); OECD, *Compact City Policies: A Comparative Assessment* (Paris: OECD Publishing, 2012), doi.org/10.1787/9789264167865-en, accessed 1 September 2018; UN-Habitat, *UN Habitat III Pushes ‘Compact City’* (2016), [www.cfact.org/2016/10/18/un-habitat-iii-pushes-compact-cities/](http://www.cfact.org/2016/10/18/un-habitat-iii-pushes-compact-cities/), accessed 1 September 2018.
- 2 See Glen Bramley and Sinéad Power, ‘Urban Form and Social Sustainability: The Role of Density and Housing Type’, *Environment and Planning B: Planning and Design* 36/1 (2009), 30–48.
- 3 Theodore J. Mansfield et al., ‘The Effects of Urban Form on Ambient Air Pollution and Public Health Risk: A Case Study in Raleigh, North Carolina’, *Risk Analysis* 35/5 (2015), 901–918.
- 4 Brenda B. Lin and Richard A. Fuller, ‘FORUM: Sharing or Sparing? How Should we Grow the World’s Cities?’, *Journal of Applied Ecology* 50/5 (2013), 1161–1168.
- 5 The population density of Hong Kong is 6,690 people per km<sup>2</sup> (source: [www.censtatd.gov.hk/hkstat/sub/sp150.jsp?productCode=D5320189](http://www.censtatd.gov.hk/hkstat/sub/sp150.jsp?productCode=D5320189), accessed 1 August 2018). The population density of Singapore is 7,797 people per km<sup>2</sup> (source: [www.singstat.gov.sg/find-data/search-by-theme/population/population-and-population-structure/latest-data](http://www.singstat.gov.sg/find-data/search-by-theme/population/population-and-population-structure/latest-data), accessed 1 August 2018). The mean built density is higher in Hong Kong at 20,500 people per km<sup>2</sup>, compared with 13,300 people per km<sup>2</sup> at the planning area scale in Singapore. See Puay Yok Tan and Rosita Samsudin, ‘Effects of Spatial Scale on Assessment of Spatial Equity of Urban Park Provision’, *Landscape and Urban Planning* 158, supplement C (2017), 139–154.
- 6 Puay Yok Tan, James Wang, and Angelia Sia, ‘Perspectives on Five Decades of the Urban Greening of Singapore’, *Cities* 32 (2013), 24–32.
- 7 Chi Yung Jim and Michael W. H. Chan, ‘Urban Greenspace Delivery in Hong Kong: Spatial-institutional Limitations and Solutions’, *Urban Forestry and Urban Greening* 18 (2016), 65–85.
- 8 Mahyar Masoudi and Puay Yok Tan, ‘Multi-City Comparison of the Relationships Between Spatial Pattern and Cooling Effect of Urban Green Spaces in Four Main Asian Cities’, *Ecological Indicators* 98 (2019), 200–213.
- 9 See ‘Land Use Feedback to Be Studied’, [www.news.gov.hk/en/categories/infrastructure/html/2017/12/20171205\\_205539.shtml](http://www.news.gov.hk/en/categories/infrastructure/html/2017/12/20171205_205539.shtml), accessed 1 August 2018.
- 10 See Puay Yok Tan, Yuanqiu Feng, and Yun Hye Hwang, ‘Deforestation in a Tropical Compact City Part A: Understanding its Socio-Ecological Impacts’, *Smart and Sustainable Built Environment* 5/1 (2016).
- 11 There are a few studies, such as: Masashi Soga et al., ‘Land Sharing vs. Land Sparing: Does the Compact City Reconcile Urban Development and Biodiversity Conservation?’, *Journal of Applied Ecology* 51/5 (2014), 1378–1386, that provide empirical evidence of how differing urban forms influence socioecological functions in cities.
- 12 Chi Yung Jim, Cecil Konijnendijk van der Bosch, and Wendy Y. Chen, ‘Acute Challenges and Solutions for Urban Forestry in Compact and Densifying Cities’, *Journal of Urban Planning and Development* 144/3 (2018), article number 04018025.
- 13 See the website [www.ser-vies.nl/about](http://www.ser-vies.nl/about), accessed 4 October 2018.



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