

Charting the environmental and social consequences of soft-power strategies through the experiential urban design choreography of Singapore's Changi Airport-Marina Bay Corridor.

The Changi-Marina Bay Corridor: green strategies for Singapore's soft power

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Prior to the surge of COVID-19 in 2020, Changi International Airport was ranked as the 'world's best airport', registering a record of 65.6 million passenger movements in 2019.¹ At a time of intense global competition in the aviation industry, Changi has been delivering strategies to sustain its reputation as an innovative transportation hub. Exceeding John Kasarda's idea of 'aerotropolis',² over three decades Changi has evolved into something more than a cluster of aviation-oriented businesses. The transnational capitalist class of international travellers is provided with a high level of services, facilities, and amenities, accessing the entertainment and consumeristic experience, intrinsic to Singapore.³ Its latest addition designed by Safdie Architects,⁴ the multi-awarded Jewel (2014–19), is a new concept of airport facility informed by an experiential approach where a multistorey shopping mall is integrated to a lush tropical forest and capped by a funnel-like glazed skin.⁵ The space is cut through by a light railway suspended in the mall's void, in continuous transit. Combined with the central iconic waterfall, the rhythm of the train evokes a sense of relentless precision and motion, characteristic of the 'engine' that regiments the entire city-state of Singapore. Transcending the airport boundaries,⁶ Changi represents a staged introduction to the city in which it now seems naturally embedded. Adjacent to the arrival area of Terminal 1, the funnel-like glazed structure is a threshold 'where the world meets Singapore, and Singapore meets the world',⁷ to the point that 'it becomes hard to say where exactly the airport ends, and the city begins.'⁸

Reflecting on the phenomenon of global urbanism and challenging the established assumption that it is typical for a contemporary city to have a skyline punctuated by signature architectures,⁹ Keller Easterling discusses the role of infrastructure in the making of contemporary urbanism, looking at architecture through the concept of 'formula', instead of that of the 'masterpiece'. She argues that 'buildings are often no longer singularly crafted enclosures, uniquely imagined by an architect, but reproducible products set within similar urban

arrangements.'¹⁰ Considered through the lenses of 'urban arrangements' or 'systems', rather than stand-alone objects, the Jewel – as well as the many other landmarks located in the southern part of the island of Singapore – can be regarded as components of a larger, stage-managed infrastructural project. The Jewel marks one of the two extremities of the leg that runs between Changi Airport and the area of Marina Bay via the East Coast Parkway (from now on, ECP), a coherent urban arrangement whose articulation can be identified as a singular infrastructural system, where it is sometimes difficult to distinguish between what it does and what it says.¹¹

In the wake of Easterling's theory, this article questions the interpretation of those architectural projects that punctuate the southern part of Singapore as independent interventions – urban fantasies for the contemporary traveller. The leg from Changi Airport to Marina Bay via the ECP is considered here as a distinctive and coherent infrastructural system, an urban corridor (hereafter Changi-Marina Bay Corridor, or simply, the Corridor), instrumental to Singapore's soft power. In so doing, it forges a reflection on the synergy between political agendas and urban infrastructure in city making and marketing, to boost the image of a 'first-class city' that Singapore aims to convey globally. The history and structure of the Changi-Marina Bay Corridor are explored to provide a background to the present urban strategies of Singapore.

With the Singaporean approach to planning under state capitalism, the dimension of its future is marketed overseas by advanced media strategies deployed to reinforce the idea of the city 'punching above its weight'.¹² Singapore promotes itself as an 'incubator' of ideas, a laboratory where contemporary design mechanisms are tested before finally leaping beyond its boundaries into other realities. Infrastructure has always been a key component of Singapore's economic strategy.¹³ For example, to future-proof Singapore against intensifying competition, its government is embarking on expensive projects, such as the construction of the High-Speed Rail between Jurong



1 The Jewel, Changi Airport, Singapore, view of the waterfall and tropical forest, 2019.

and Kuala Lumpur; the mega port in Tuas; and Terminal 5 at Changi Airport.¹⁴ Motivated by the intention to turn a functional piece of infrastructure – the passage from airport to city – into a highly-charged scenography, the Changi-Marina Bay Corridor offers a unique response to a usually problematic urban connection. While most cities are still working according to the idea of compressing the leg between their airports and downtowns by express trains (Paris, London, Seoul, and Beijing), or dedicated tunnels (Brisbane), Singapore has instead intensified the *raison d'être* of its corridor by considering it as both an urban 'link' and 'spectacle'.

However, while pursuing innovation through projects such as the Corridor, the city is prepared to forgo issues of an environmental and social nature, which are little to the transient travellers. On the one hand, this article critically analyses the rhetorical use of landscaping ingrained in the Corridor to attract foreign investment and tourism, where the artificialisation of green intervention has overwritten the presence of the native vegetation and morphology. On the other hand, we reflect on the less evident but nonetheless drastic split that the Corridor has made between the city's southern residential areas and foreshore. While cutting through the urban tissue of part of the island seamlessly and without interruption, the Corridor does in fact separate out and disadvantage substantial residential areas, turning Singapore's successful green strategies into urban injustice. The twofold nature of the corridor – at the same time,

that of the 'connector' and 'divider' – thus reflects Singapore's intrinsic ambiguity: its manifestation of global ambitions set against its local realities.

Green urbanism as a tool for soft power

The segment from Changi Airport through the Jewel, ECP, passing by the Singapore Flyer and ending at the Gardens by the Bay dominated by the Marina Bay Sands integrated resort, is a curated succession of urban artefacts designed to impress those landing in the city-state. Staged over time, and built according to a consistent design narrative, this urban arrangement is now the standard-bearer of Singapore's soft power,¹⁵ instilling the perception of Singapore as a pioneering city. According to Joseph S. Nye, soft power is the ability to achieve a goal 'through attraction rather than coercion or payments. It arises from attractiveness of a country's culture, political ideals and policies.'¹⁶ Alan Chong has examined the notion of soft power in relation to Singapore, discussing how the city-state has used resilience to overcome its limitations due to its territorial scarcity, shortage of primary resources and political vulnerability. In Singapore, 'generating soft power was a choice, not an inheritance.'¹⁷ As part of a set of specific strategies of soft power, Singapore has used green practices through architectural



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design and urban planning to establish a competitive model in the global market.

Part of the design logic underpinning the Changi-Marina Bay Corridor derives from Singapore's history, precisely, its urban plans of the 1960s related to the greening of the city. Making a 'First impression' was certainly one of the priorities of Singapore's first Prime Minister Lee Kuan Yew, who ruled the city-state from its foundation in 1959 to 1990. In the approximately thirty minutes that it takes to transfer from one point to the other of the Corridor, Singapore comes across as a city dominated by vegetation. With its verdant tropical environment enhanced by iconic facilities, the run from the airport to the most international area of Singapore showcases a vision of 'a city of beauty, character and grace, with nature, water bodies and urban development weaved together.'¹⁸

However, Singapore's greening process far from reflects the original conditions of the local vegetation and morphology of the island, where the natural setting has been deeply manipulated and altered.¹⁹ The effort of boosting the verdant character of Singapore was promoted by a political action that began on 16 June 1963, when Lee planted a pink mempat tree in front of cameras and journalist to broadcast the celebration of trees throughout the island. This emblematic moment reflected the tropical fecundity of much of Southeast Asia combined with the planning of the modern developmental state.²⁰ This event marked the launching of the well-renowned 'Garden City' campaign, advocating a vision for the city-state to

² View of Marina Parade, its residential buildings and the split from the shore caused by the presence of the ECP and its green corridor.

become 'clean and green', and to demonstrate the stability of the nation after its independence, using green space as key elements for nation formation. In Yew's vision, the nation's steadiness was to assist with the increase in foreign investment and promote economic growth. The need to leverage the global comparative advantage of the city-state was identified as a key priority by Yew, who believed that if Singapore was to survive in the modern world it had to accept 'the need to go whatever direction world conditions dictate'.²¹ In this scenario, crafting the identity of Singapore as a city that intertwines urban development with nature and water, leisure with work, culture, and commerce, has become an approach to enable the city-state to successfully compete within the Asia Pacific Region and globally.²²

The 'Garden City' concept was pursued through the Clean and Green Movement (1969) to raise the country's physical standards of living; generate a healthy urban environment; and foster the citizens' sensitivity and awareness towards the natural environment through initiatives like 'Keep Your City Clean' and 'Tree Planting Day'.²³ The 'Garden City' campaign was integrated in the first concept plan for Singapore in 1971.²⁴ Subsequently, the 'Tropical City of Excellence' vision was introduced in the early 1980s, after problems related to urban health,

housing, employment, and transportation in Singapore had been addressed, and city planners could turn their attention to policies to improve the quality of life of Singaporeans, not least the idea of providing the city with distinctive character and identity.²⁵ In 2012 the greening process evolved into the vision of Singapore as 'A City in a Garden'. According to this new agenda, Singapore had to become 'a bustling metropolis nestled in a lush mantle of tropical greenery',²⁶ where architecture does not accommodate vegetation anymore: in reverse, it is vegetation to welcome architecture.

The smooth succession over five decades of three consecutive green campaigns (namely, 'Garden City', 'Tropical City of Excellence', and 'A City in a Garden') dedicated to the beautification of the city was made possible by Singapore's stable political circumstances. Since the early 1970s, Singapore's People's Action Party (PAP) has continuously governed as a single party, holding political power. Planners of Singapore have worked in steady administrative conditions set by the unchanging regime, implementing long-term planning for development of infrastructure, without



disruptions or contestation that could be caused if there were changes in government. As renowned Singaporean planner Cheong Koon Hean has explained: '[... We] worked to formulate a clear vision of what a new signature image for Singapore as a global city could be and pushed to realise these plans.'²⁷ The greening of Singapore required the adoption of a consistent aesthetic across key urban spaces, especially in the southern part of the city – unsurprisingly, as this was the most exposed to an international audience. Therefore, the beautification of key areas and infrastructure – including expressways, such as the ECP – featured as a priority in the government's agenda.²⁸ Singapore's process of greening has continued to be implemented through different modes across the island, with the Changi-Marina Bay Corridor constituting one of the first and most assertive actions of this wider project of soft power.

Planning strategies for the ECP, Changi, and Marina Bay

The research project 'Logistical Worlds' has reflected on the concept of urban corridors in relation to infrastructural projects:

*Corridors connect zones. Corridors bundle infrastructure along axes to narrow space and accelerate time. Corridors establish channels or pipelines of movement that intensify logistical organization [...] Stable regulations, well-developed communications, efficient transport systems and uniform software implementations are the basic requirements for establishing corridors.*²⁹

Eventually connecting the two main global nodes of Singapore, Changi Airport, and Marina Bay, and operating as an urban corridor, the East Coast Parkway (ECP) has become one of the city's most effective marketing ploys.³⁰ By means of trees with wide foliage granting shade and a central divider strip decorated with flowering shrubs, the Corridor Changi-Marina Bay has become a manifesto for the integration of nature, design, infrastructure, and technology to intensify Singapore's capitalistic experience. One of the first expressways to be built



3 Prime Minister Lee Kuan Yew promoting tree planting for a greener Singapore.

4 Land reclamation process for the development of Marina Bay.



lights along the way, almost dissolving what in other global cities constitutes a busy and often stop-and-start journey. No public transport runs through the ECP to avoid any disturbance of the smooth run from the airport into the city and the local traffic is distributed through the East Coast Road, an artery running in parallel to the ECP – but not visible from it – mainly for the use of local residents and visitors of the East Coast Park. At the point of the Benjamin Sheares Bridge, that connects the expressway to the CBD, travellers are offered panoramic views of the city skyline, Singapore Flyer (2008), and the Marina Bay waterfront, as a welcome to the business heart of Singapore.³⁹

Artificialisation of nature

Since 1981, both Changi and the ECP have been beautified by means of landscaping programmes. However, the desire of tropical vegetation prevailed over the use of local species, as the selection of the *Samanea Saman*, a tree native to Central and South America, demonstrates. Its shade potential as a roadside plant made it a preferable option over local trees. With crowns up to 30 metres wide, the *Samanea Samans* engulf the expressway in a shroud of greenery.⁴⁰ Six-and-a-half-thousand plants were added to integrate Changi's terminal one; fifteen thousand trees and seventy-six thousand shrubs planted along the expressway to the airport and an

7 Point of encounter of the ECP and the Jewel, one of the extremities of the urban Changi-Marina Bay Corridor, 2020.

18-hectare nursery developed to support the greening for the ECP.

In the contemporary rivalry of first-class cities for sustainable urban policies, the green corridor of the ECP needed to be upgraded to continue to appeal to the twenty-first century 'global trotters' entering Singapore via Changi. In early 2000, the corridor was enhanced by the addition of the iconic Jewel and Gardens by the Bay (2006–12), designed by the English office Grant Associates. Built at the extremities of the ECP corridor, the Jewel and Gardens by the Bay are a further confirmation of the environmental turn that Singapore has intensified over the last two decades.⁴¹ The similarity in the green agenda they both carry out shows that they were coordinated to strengthen the strategy of shifting Singapore from a 'Tropical City of Excellence' to 'a City in a Garden'. In the wake of this vision, Gardens by the Bay – the first to be built – with their tropical gardens and amenities integrated with eighteen 'super trees', were connected to the Conservatories and Marina Barrage. These are three green urban machines intended to broadcast Singapore's ambition to fuse nature, technology, and environmental

management, to push the city-state as a leading country in urban experimentation. The climate-controlled Conservatories – Flower Dome and Cloud Forest – emerging from the Gardens by the Bay are two independent vaulted structures displaying, respectively, Mediterranean plants and a tropical hill with a 35-metre waterfall and a suspended walkway. As per the use of imported species in the ECP, vegetation is not deployed in Singapore as a celebration of the local biodiversity; instead, nature is understood as a global and technological phenomenon. The eighteen super trees are tree-like structures that operate as a part of the domes' cooling system, as well as being lookouts onto downtown Singapore – their shapes being so future-oriented to feature in the Disney movie *Zootopia* (2016).⁴² Damming the mouth of the Marina Channel, and turning the area into a highly-engineered freshwater reservoir, the seamless structure of Marina Barrage operates as a venue for lifestyle attractions.

The domes at the Gardens by the Bay – the Cloud Forest in particular – and the involuted funnel at the Jewel share similar design solutions, with air temperature, humidity, and light intensity are attentively controlled to respond at once to the needs of the vegetation in combinations to mechanisms of retail and entertainment. They differ in the experience they offer, demonstrating Singapore's ability to quickly surprise its international audience: if the Cloud Forest showcases a natural waterfall that runs over an artificially constructed escarpment – still evoking a natural setting – the Jewel's central cascade, isolated in the middle of the void, is abstracted. Decontextualised from other natural elements and drifting away from the didactic intentions of the Conservatories, the Jewel's water feature falls from a hole at the centre of the dome, turning into a tube that operates as a screen for night lightshows. The Jewel's cascade turns nature into pure spectacle, symbolising Singapore's tendency to use integrated technologies at the crossover of nature and engineering to provide entertainment at urban scale. Both the Cloud Forest and Jewel boast a rigid control of nature, with tropical gardens enriched by a wide variety of plants from different parts of the world – an artificialisation and sensitisation of nature and its delusory ultimate control.

Urban divider

Despite the consistency and continuity of the Changi-Marina Bay Corridor and its role as a green connector, it also acts as a physical divider that illustrates the paradox of urban greening – its creation of social inequality. The lush and thick natural layer, while beautifying the ECP and conveying an image of the green city, intentionally conceals many of its surrounding residential areas. The route of the ECP thus imposes a drastic split between the residential areas of Bedok, Katong, and Marine Parade, the East Coast Park and ultimately the Singapore Strait, generating a double and anachronistic effect of 'connection' and 'division'.

These residential areas remain ordinary at a design level, 'seemingly without architectural qualities'⁴³ – in particular, the Housing & Development Board (HDB) estates – which do not blend into the glamour of the Changi-ECP-Marina Bay's spectacles – nor are they asked to. Also, the 185-hectare East Coast Park that runs in parallel to the ECP, with its 15 km of beach, restaurants and cafés, picnic sites, barbecue pits, tracks for cycling and jogging, and areas dedicated to fishing, endures a state of isolation, with attendance mostly by the local population.

Connections between the residential areas and the waterfront have been made available by means of overpasses, sky bridges, and underpasses, whose essential concrete structures make their presence discreet to the view of the vehicles transiting on through the ECP. The low number of overpasses and the structural and formal minimalism of the pedestrian sky bridges and underpasses, combined with the lush vegetation covering them, result in a strong focus on the linearity of the ECP, intentionally and substantially reducing the perception of its surroundings. Therefore, it can be argued that more than an expressway linking different parts of the city, the ECP has progressively turned into a green arcade connecting two global areas designed to entice visitors – with few direct benefits provided to the local population. The pedestrian links that gives access over and under the ECP to the shore are the symptoms of what it really is: a smooth piece of globally oriented urban infrastructure silently at odds with its location and place. Overall, the deliberate separation of the Changi-ECP-Marina Bay corridor from adjoining residential areas is the illustration of a long-standing, intentional division of Singapore into 'heartland' and 'cosmopolitan' areas, where the latter are mainly spectacular green spaces of consumption and novelty accessible mostly to foreigners and 'modern' locals. This division as a sign of social inequality has gained increasing relevance in the literature, as in the example of Singapore, it becomes an issue of growing concern.⁴⁴

Conclusion: green injustice?

Within this 'green orthodoxy', the marriage of urban development and horticultural interventions has reproduced a paradox whereby some elements provide widescale social benefits, while others produce acute injustices.⁴⁵ This has been seen in cities such as Barcelona, where neighbourhood regeneration and greening interventions intertwined with the redevelopment of large post-industrial areas in or close to the city centre and anchored around new real estate developments, have turned into a double-edged sword. The green interventions have contributed to the city's global commitments towards sustainability but have left foreigners better positioned in housing market dynamics, causing locals to feel increasingly excluded and displaced by inflated prices.⁴⁶

Also, the Corridor makes explicit the key argument in the current literature that urban greening, especially of the consumption-oriented variety, does not eliminate other environmentally unsustainable



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practices or growing climate risks; instead, those practices often co-inhabit and thrive side-by-side via glamorous greening projects and their accompanying real estate developments.⁴⁷ Here what has been called ‘green gaps’⁴⁸ appear in areas with strong locational and infrastructural advantages within the urban fabric, seen as opportunities to finance new commercial and residential real estate developments. These gaps are exploited to generate a new potential ‘green rent’ by municipalities, private investors, and privileged residents, ultimately creating enclaves of green urban living situated away from low-income, local populations.

As such the Changi-Marina Bay Corridor represents how urban greening injustice expands materially (in green infrastructures, projects, physical resources, and ecologies) and immaterially (via explicit plans, discourses, and branding) as municipalities transform existing landscapes into privileged ‘green’ utopias. In return, the material and immaterial (re)production of urban greening physically and symbolically delimits space within the green city orthodoxy eventually producing injustices for particular groups of residents that cannot be ignored within the hegemony of greening.⁴⁹ This observation is emerging as a recent trend in Singapore as studies have found that, on the one hand, planning areas with relatively high vegetation cover are characterised by a mix of land uses, primarily commercial and private residential housing. On the other hand, public housing, which houses approximately 85% of the population, retain moderate to low levels of vegetation cover per capita.⁵⁰

Another environmental issue related to the Corridor has been Singapore’s land constraints: a continuous challenge for the development of the island’s economy. As other areas of the island,

8 Internal view of the structure of the Cloud Forest at the Gardens by the Bay, 2020.

9 Internal view of the structure of the Jewel, 2020.

including Changi and Marina Bay, the ECP was planned on reclaimed land as part of the East Coast land reclamation project, which encompassed about 1,525 hectares of land reclaimed for transport, recreational, and housing purposes. Land reclamation is a common practice that other Asia Pacific urban areas, such as the cities of Hong Kong and Macau and Malaysia, have pursued to expand their territories, creating new land configurations that have fuelled the contemporary phenomenon of real estate speculation.⁵¹ Since the 1960s, Singapore’s total land area has expanded from 581 to 724 square kilometres⁵² and the population has grown to 5.6 million people.⁵³ The demand of land for industry, housing, and infrastructure, and more recently for commerce and green space projects, has been satisfied through continuous – and expensive – land reclamation in deep-water areas.⁵⁴ Even when land reclamation has existed since colonial times in Singapore, much of the reclamation works that have made Singapore’s contemporary urban development possible have been initiated in the 1960s, with the aim to extend the foreshore south of the city centre and generate prime real estate for high-value densification projects.⁵⁵ The costs and environmental impacts of these works have been substantial, not only affecting the various resources from which sand is extracted nationally and in other Asian-Pacific countries,⁵⁶ but also presenting risks related to climate change and rising sea levels in the region.⁵⁷ Land reclamation has caused the degradation and elimination of Singapore’s coastal ecosystems.

Coastal forests and mangroves have vanished with only their flora surviving on costal cliffs and offshore islands. The toxic chemicals present in infill substances have also polluted marine ecosystems.⁵⁸ The environmental impact of land reclamation practices not only affect countries like Cambodia, which have been used to export sand for infill purposes. Sand dredging licenses are being allocated in rivers and estuaries along Cambodia's coastline. Concessions have been authorised for protected areas and near significant ecosystems and habitats.⁵⁹

Gardens by the Bay at Marina Bay is considered a 'green relief' in the densely planned Marina Bay area,⁶⁰ and combine as 'world-class' green facilities, together with the UNESCO World Heritage Singapore Botanic Gardens.⁶¹ While Gardens by the Bay is an Institution of Public Character and registered charity under the Charities Act and received the Charity Transparency Award in 2019, serving as 'a strong public service element [...] a national garden that presents wide-ranging floral displays and community programmes to a broad segment of the population',⁶² its communal vocation can be questioned. If it is true that Gardens by the Bay can be accessed publicly, especially after the completion of the new metro station, their location and configuration suggest that they are targeted for a super-rich population rather than

resident locals. Most of the park is freely accessible to all visitors, however costs incur for entering its main facilities, such as the Conservatories and the Skywalk among the super trees. The proximity and direct access to Marina Bay Sands effectively turns the Gardens into the resort's backyard. With their sleek amenities, lush vegetation, and impeccable maintenance, Gardens by the Bay are included in touristic circuits, resembling a theme park rather than a public amenity.

Like the Jewel at Changi, Gardens by the Bay come across as a new twenty-first-century green typology, a facility that injects leisure directly into the public realm, blurring the distinction between public space and private entertainment. Despite the publicly accessible 'façade' that this major project portrays, its access is limited, away from groups such as disadvantaged low-waged and transient migrants, or the increasingly elderly population that are often unseen in these parts of the city but characterise a majority in other residential areas of Singapore. This shows that the cosmopolitan experience embedded in the city's green projects is an exclusive construct planned through development strategies that only reach certain groups of the population.⁶³ Here is the paradox of Singapore's twofold condition: realities running in parallel as instruments of city making, ensuring its global success despite its local inequality.

Notes

1. Skytrax, 2019 World Airport Awards <<https://www.worldairportawards.com/>> [accessed 21 May 2020].
2. John D. Kasarda and Greg Lindsay, *Aerotropolis: The Way We'll Live Next* (New York, NY: FSG, 2011).
3. Leslei Sklair, *The Transnational Capitalist Class* (Oxford: Blackwell Publishers, 2001).
4. Namely, the 2016 International Architecture Award, MAPIC Awards 2016: Best Futura Shopping Centre and MIPIM Asia Awards 2016: Best Futura Project.
5. Before designing the Marina Bay Integrated Resort (2011) and the Jewel (2019), Safdie Architects completed other projects in Singapore, including Sky Habitat Residential Development (2016) and Cairnhill Road Condominiums (2003).
6. *Global Airport Cities*, ed. by Oliver Clark (London: Aviation Media Ltd, 2010).
7. Aaron Chong, 'Jewel Changi Airport Opens its Doors to First Visitors', *Channel News Asia* (11 April 2001). <<https://www.channelnewsasia.com/news/singapore/jewel-changi-airport-opens-its-doors-to-first-visitors-11433164>> [accessed 14 May 2020].
8. Max Hirsh, 'What is Airport Urbanism?' <https://airporturbanism.com/content/1-home/airport-urbanism_max-hirsh.pdf> [accessed 20 May 2022].
9. Robert Powell, 'View from Singapore', *The Architectural Review*, 211 (2002), 36–7.
10. Keller Easterling, *Extrastatecraft: The Power of Infrastructure Space* (New York, NY: Verso, 2014).
11. *Ibid.*, p. 14.
12. *Planning Singapore: The Experimental City*, ed. by Stephen Hamnett and Belinda Yuen (Abingdon: Routledge, 2019), pp. 2, 8.
13. *Ibid.*
14. Ng Jun Sen, 'Bold Moves in Infrastructure: Thinking Big Pays Off for Singapore Planners', *The Straits Times* <<https://www.straitstimes.com/politics/thinking-big-pays-off-for-planners>> [accessed 20 May 2020].
15. Joseph S. Nye Jr, *Soft Power: The Means to Success in World Politics* (New York, NY: Public Affairs, 2009).
16. Nye, *Soft Power: The Means to Success in World Politics*, p. x.
17. Alan Chong, 'Singapore and the Soft Power Experience', in *The Diplomacies of Small States: Between Vulnerability and Resilience*, ed. by Andrew F. Cooper and Timothy M. Shaw (London: Palgrave Macmillan, 2009), pp. 65–80.
18. Singapore Urban Redevelopment Authority (URA), *Living the Next Lap: Towards a Tropical City of Excellence* (Singapore: Urban Redevelopment Authority, 1991).
19. Timothy P. Bernard and Corinne Heng, 'A City in a Garden', in *Nature Contained: Environmental Histories of Singapore*, ed. by Timothy Barnard (Singapore: NUS, 2014), p. 281.
20. *Ibid.*, pp. 281–306.
21. Euston Quah, 'Excerpts of Quotes on Singapore's Future from Founding PM Lee Kuan Yew, ESM Goh Chok Tong, PM Lee Hsien Loong', in *Leading Insights on Economy and Environment from 50 Singapore Icons and Beyond*, ed. by Euston Quah (Singapore: World Scientific Publishing, 2015), p. XXVI.
22. Chua Beng Huat, 'Singapore as a Model: Planning Innovations, Knowledge Experts', in *Wordling Cities: Asian Experiments and the Art of Being Global*, ed. by Ananya Roy and Aihwa Ong (Hoboken, NJ: John Wiley & Sons, 2011).
23. Jun Yi Ong, 'Building the Garden City: The Clean and Green Movement in Singapore, 1965–2010' (unpublished doctorate thesis, The University of Sydney,

- Faculty of Architecture, Design and Planning, 2016).
24. Mamico Fujiyama and Toshikazu Ishida, 'Spatial Form for Intensive Urban Greenery in Singapore: Possibility of Skyrise Greenery as Social Capital for Non-Energy Benefits toward a Low-Carbon Society', *Proceedings from the 7th International Network of Tropical Architecture Conference* (Brisbane, Aus.: School of Architecture, The University of Queensland, 2019).
 25. Shirlena Huang, 'Planning for a Tropical City of Excellence: Urban Development Challenges for Singapore in the 21st Century', *Built Environment*, 27 (2001), 112–28.
 26. Ng Lang, 'A City in a Garden', Civil Service College of Singapore (2018) <<https://www.csc.gov.sg/articles/a-city-in-a-garden>> [accessed 20 May 2020].
 27. Planning Institute of Australia, 'Cheong Koon Hean interview', *Planning News*, 41 (2015) <<https://www.planning.org.au/documents/item/6456>> [accessed 22 May 2020].
 28. Neo Boon Siong, June Gwee, Candy Mak, 'Growing a City in a Garden', in *Case Studies in Public Governance: Building Institutions in Singapore*, ed. by June Gwee (London: Routledge, 2012).
 29. Brett Neilson and Ned Rossiter, *Logistical Worlds No. 1, Infrastructure, Software, Labour* (Creative Commons Attribution License, 2014).
 30. Peter Ho, Liu Thai Ker, Tan Wee Kiat, *A Chance of a Lifetime: Lee Kuan Yew and the Physical transformation of Singapore* (Singapore: Centre for Liveable Cities and Lee Kuan Yew Centre for Innovative Cities, 2016).
 31. Phang Sock Yong, 'Strategic Development of Airport and Rail Infrastructure: The Case of Singapore', *Transport Policy*, 10 (2003), 27–33.
 32. Singapore concept plans divide the city-state in five regions: Central, North, North East, and West. Each region is divided into fifty-five planning areas. The Central Region comprises twenty-two planning areas of which eleven form the Central Area.
 33. James T. White, 'Pursuing Design Excellence: Urban Design Governance on Toronto's Waterfront', *Progress in Planning*, 110 (2016), 1–41.
 34. Gardens by the Bay <<https://www.gardensbythebay.com.sg/>> [accessed 16 May 2020].
 35. Hup Chor Gor and Chey Kiang Heng, 'Shaping Singapore's Cityscape through Urban Design', in *50 Years of Urban Planning in Singapore*, ed. by Chye Kiang Heng (London: World Scientific Publishing, 2016).
 36. Kah-Wee Lee, 'Regulating Design in Singapore: A Survey of the Government Land Sales (GLS) Programme', *Environment and Planning C: Government and Policy*, 28 (2010), 145–64.
 37. Chor Gor and Kiang Heng, 'Shaping Singapore's Cityscape through Urban Design'.
 38. Safdie Architects, Marina Bay Sands Integrated Resort (2011) <<https://www.safdiearchitects.com/projects/marina-bay-sands-integrated-resort>> [accessed 20 May 2020].
 39. Lim Tin Seng, The A(YE), B(KE), and C(TE) of Expressways, Biblioasia, undated <<http://www.nlb.gov.sg/biblioasia/2018/07/08/the-aye-bke-and-cte-of-expressways>> [accessed 20 May 2022].
 40. Simon Chiang, 'East Coast Park', State of Buildings (n.d.) <<https://stateofbuildings.sg/places/east-coast-park>> [accessed 11 May 2022].
 41. Rodolphe De Koninck, *Singapore's Permanent Territorial Revolution: Fifty Years in Fifty Maps* (Singapore: NUS Press, 2017).
 42. See drawing from the Disney movie *Zootopia* co-directed by *Wreck-It Ralph's* Rich Moore and *Tangled's* Byron Howard, exhibited at 'Disney: Magic of Animation', Art Science Museum, Marina Bay, Singapore, 26 October 2019 to 29 March 2020.
 43. Rem Koolhaas, 'Singapore Songlines', in Rem Koolhaas, OMA, Bruce Mau, *SMLXL* (New York, NY: Monacelli, 1995), p. 1021.
 44. Emily Y. X. Soh and Belinda Yuen, 'Singapore's Changing Spaces', *Cities*, 28:1 (2015), 3–10 <<https://doi.org/10.1016/j.cities>>.
 45. Panagiota Kotsila and others, 'Barcelona's Greening Paradox as an Emerging Global City and Tourism Destination', in *The Green City and Social Justice: 21 Tales from North America and Europe*, ed. by Isabelle Anguelovski and James J. T. Conolly (London: Routledge, 2021).
 46. Cocola-Gant, Agustin, and Antonio Lopez-Gay, 'Transnational Gentrification, Tourism and the Formation of "Foreign Only" Enclaves in Barcelona', *Urban Studies*, 57 (2015), 3025–43.
 47. Isabelle Anguelovski and James J. T. Conolly, 'Introduction', in *The Green City and Social Justice*, ed. by Anguelovski and Conolly.
 48. Isabelle Anguelovski, James Connolly, Anna L. Brand, 'From Landscapes of Utopia to the Margins of the Green Urban Life: For Whom Is the New Green City?', *City*, 22:3 (2018), 417–36.
 49. Isabelle Anguelovski and James J. T. Conolly, 'Introduction', in *The Green City and Social Justice*, ed. by Anguelovski and Conolly.
 50. Puay Yok Tan, James Wang, Angelia Sia, 'Perspectives on Five Decades of the Urban Greening of Singapore', *Cities*, 32 (2013), 24–32.
 51. Michael Goldman, 'Speculative Urbanism and the Making of the Next World City', *International Journal of Urban and Regional Research*, 35 (2010), 555–81.
 52. Singapore Land Authority, 'Total Land Area of Singapore, Singapore's Public Data' <<https://data.gov.sg/dataset/total-land-area-of-singapore>> [accessed 15 May 2020].
 53. The World Bank, 'World Development Indicators Database: Singapore' <https://databank.worldbank.org/views/reports/reportwidget.aspx?Report_Name=CountryProfile&Id=b450fd57&tbar=y&dd=y&inf=n&zm=n&country=SGP> [accessed 15 May 2020].
 54. Ruediger Glaser, Peter Haberzettl, Rory P. D. Walsh, 'Land Reclamation in Singapore, Hong Kong and Macau', *Geojournal*, 24 (1991), 365–73.
 55. Chor Gor and Kiang Heng, 'Shaping Singapore's Cityscape through Urban Design'.
 56. Although Singapore has been efficient in respect to land reclamation, this practice has recently been jeopardised by restrictions that Asian countries have put up on sea sand export, see Fathin Ungku and Rozanna Latiff, 'In Blow to Singapore's Expansion, Malaysia Bans Sea Sand Exports', *Reuters* (3 July 2019) <<https://www.reuters.com/article/us-malaysia-singapore-sand-exclusive/exclusive-in-blow-to-singapores-expansion-malaysia-bans-sea-sand-exports-idUSKCN1TYoC4>> [accessed 20 May 2020].
 57. Samanth Subramanian, 'How Singapore is Creating More Land for Itself', *The New York Times Magazine* (20 April 2017) <<https://www.nytimes.com/2017/04/20/magazine/how-singapore-is-creating-more-land-for-itself.html>> [accessed 14 May 2020].
 58. Fryer Jonas 'Environmental Impacts of Land Reclamation in Singapore', ArcGIS Storymaps (2021) <<https://storymaps.arcgis.com>>.

- com/stories/83d97f8f26fo47a8844516939c4aa445> [accessed 16 May 2020].
59. 'Shifting Sand: How Singapore's Demand for Cambodian Sand Threatens Ecosystems and Undermined Good Governance', Global Witness (2010) <https://cdn.globalwitness.org/archive/files/pdfs/shifting_sand_final.pdf> [accessed 17 May 2020].
60. Timothy Auger, *A River Transformed: Singapore River and Marina Bay* (Singapore: Editions Didier Millet, 2015).
61. Hamnett and Yuen, *Planning Singapore*.
62. Gardens by the Bay <<https://www.gardensbythebay.com.sg/>> [accessed 16 May 2020].
63. Junjia Ye, *Researching Inequality in the Global City, Class Inequality in the Global City: Migrants, Workers, and Cosmopolitanism in Singapore* (London: Palgrave Macmillan, 2016).

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Competing interests

The authors declare none.

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