REIMAGINING SUSTAINABLE URBAN COMMUNITIES IN HONG KONG

Using environmental and social urban design principles to create future new towns.

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Hong Kong began building New Towns in the 1970s in response to a post-war period of rapid population growth. From the first-generation developments (Tsuen Wan, Sha Tin, and Tuen Mun) to the second-generation ones (Tai Po, Yuen Long, and Fanling/Sheung Shui) built in the 1980s and early 1990s, the continued development of the Special Administrative Region's (SAR) new towns has had a significant impact globally, especially in Asia.[1]

The territory's approach has provided pivotal insights into population decentralisation and housing supply, as well as the creation of self-contained communities, and public transport nodes within a high-density urban form.[2] These insights have been applied to the design of its third-generation new towns, as well as to a series of new planned "New Development Areas" (NDAs) located near the border with Mainland China. From land-use mix to transport planning and the creation of social space, Hong Kong's city planners are refining their strategies to address emerging challenges such as environmental sustainability, social sustainability, and community placemaking.[3]

In this article, we explore three conceptual strategies that draw on lessons from the planning achievements of existing new towns to improve the long-term vibrancy and sustainability of these new settlements. They include The Hybrid City, The Ecological City, and The Happy City.

TOWN PLANNING IDEAS HONG KONG-STYLE

Inspired by British construction methods and European Modernist planning theories, Hong Kong has devised a unique model of urban development, distinct from its traditional urban areas. The towns were planned as self-contained communities comprising public and private housing, industrial areas for employment, and a town centre that offered social, cultural, and commercial facilities. The designs aimed to balance density and liveability by combining compact high-rise building typologies with abundant public spaces and facilities. Similar to what was envisioned under English urban planner Ebenezer Howard's Garden City concept,[4] living and working zones were separated from each other, but in view of the territory's land scarcity, compact high-rise districts were constructed

with vertically-separated systems for vehicular traffic and pedestrian flow. This high-density urban design promoted walking and public transport use, and improved access to facilities and services for residents, while also reducing environmental impact.

Compared to Hong Kong's organically-expanded urban core, the new towns offered planned urban environments that support health and well-being, implementing the latest design standards for public space and recreational facilities. The increased accessibility and diversity of facilities encourage social interaction and a sense of belonging, which can enhance the social sustainability of communities.[5] However, such high-density cities can also produce negative effects such as increased prices, reduced access to green spaces, and social exclusion.[6]

We highlight four key considerations from Hong Kong's experience of designing new towns.

Planning balanced and mixed land-use patterns

A key consideration in creating vibrant, diverse, and socially-inclusive new town environments is the underlying planning philosophy of land-use planning. Hong Kong's first generation of new towns emphasised 'balanced development', which meant that equal proportions of public and private housing were spatially mixed. This was done to prevent segregation between the low-income and middle classes. In turn, the land-use planning of the second generation of new towns separated industrial and residential land, using landscape features as buffer areas. As the third-generation new towns were planned around high-connectivity transport nodes, there has been less emphasis on the integration of living and working spaces. Nevertheless, the large Transit-Oriented Development (TOD)-based commercial centres[7] (such as in Ma On Shan and Tseung Kwan O) and the SAR's highly distributed education and healthcare networks offer a range of local employment opportunities and services.

Our study of the land-use condition of the three generations of new towns found that the proportion of residential land is similar across all towns (30 to 35 percent). In fact, the third-generation new towns have increased proportions of commercial land, while the size of industrial land has been significantly reduced. The open space land ratio has remained constant at 15 percent throughout the new town planning stages. This corresponds with the 'compact city' development model, in which the size of public open spaces is restricted by planning regulations and the economic parameters of high-density development. Surveys, however, have found that while Hong Kong residents are satisfied with the quality of public space facilities provided in most districts, the accessibility to and variation of activity spaces should be improved.[8] To enable universal access to sports and recreation, a range of public spaces should be distributed across urban districts, instead of being grouped together in a large central park. Also, quantity-based planning requirements should be accompanied by qualitative design principles, so that there are more engaging and supportive open spaces.[9]

Promoting public transport use and walking

Hong Kong's new towns are served by efficient public transport systems such as the metro, bus, and light rail, which enhance social connectivity and facilitate the economic interaction among different urban nodes. As a result, the SAR is amongst cities with the highest use of public transport per capita.[10] Its relatively low degree of private car use also contributes to its environmental performance, air quality, and pedestrian-oriented streetscapes. These qualities are most apparent in the territory's older urban districts, where historic planning layouts have created narrow roads, which are easy to traverse with pedestrian crossings or elevated footbridges. In the new towns, however, vehicle roads are planned as multi-lane arteries, creating spatial barriers between different housing estates and communities.[11] As the majority of residents live in public housing and do not possess cars, cycling and walking could be integrated more prominently.

While the new towns were built with the intention of creating self-sufficient communities, a significant number of people commute between the new towns and the historic urban core. As most higher-value companies prefer to be located in proximity to one another, and close to the opportunities and services of the central areas, there is pressure to expand existing road and rail networks across the territory. A lack of street-facing retail spaces in some new towns is an additional factor affecting the walkability and liveliness of the street environments, leading to a lack of social integration and opportunities for local entrepreneurialism. While the improvement of these issues in existing new towns is yet to become a policy focus, lessons are being incorporated into the planning of novel new towns, so that there are better quality walking environments and cycling systems.[12]

Designing public spaces for residents' quality of life needs

The development of public space in new towns has undergone significant changes over time. In the early stages of new town development, public spaces such as playgrounds and sports fields mainly served as functional spaces for the residents' daily needs. However, with communities becoming more prosperous and having higher expectations, public space design has gradually evolved to provide a diversity of uses and experiences, such as incorporating more greenery and recreational facilities, and providing spaces for social interaction. As a result, new town residents now have access to a range of public spaces that not only meet their functional needs but also enhance their overall well-being.

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Our study explored the relationship between the number of social activities and the spatial distribution of public spaces within the new towns. The third-generation new towns, which were designed with more widely distributed open spaces and greenery, have a higher probability of social activities occurring in public areas. In comparison, the second-generation new towns, which feature limited recreation spaces in and around their urban core, show fewer outdoor activities taking place. The findings suggest that the design, availability, and accessibility of open spaces play an important role in promoting social activities and community interactions within the new towns.

Designing for better urban micro-climates

Principles to design urban forms in relation to environmental qualities such as urban ventilation, shading, and climate comfort have become significantly more advanced through scientific research in recent decades.[13] Well-designed openings in the urban massing in relation to prevailing wind directions help to prevent the urban heat island[14] effect,[15] cool public spaces, and disperse pollution.[16] Urban climate comfort is closely connected to the improvement of the public realm and quality of life of urban residents, as more comfortable public spaces are also more conducive to recreation and socialising activities which contribute to healthy lifestyle and communities.

Extensive studies have shown that urban greening can lower ground temperatures, and improve air quality and psychological well-being, in addition to their carbon-capturing properties.[17] Green features can include trees, shrubs, grasses, and flowerbeds incorporated in public spaces such as parks, plazas, road and sidewalk elements, and the roofs and facades of urban buildings.[18] Our study found that Hong Kong's new towns are relatively green compared to its older urban districts, and later generations of new towns have higher degrees of greening. As global warming will result in more frequent and intense periods of high temperatures, shaded public spaces and urban ventilation are crucial factors to help residents cope with the effects of climate change. The territory's urban design solutions around urban greening, breeze corridors, and covered walkways could thus be useful for deployment in other cities located in subtropical climate zones.

INTEGRATED PLANNING STRATEGIES FOR SUSTAINABLE URBANISM

Hong Kong is currently developing detailed planning strategies for several new urban expansion projects, including the Kau Yi Chau Artificial Islands, projected to house 550,000 residents, and the Northern Metropolis, aimed at housing 2.5 million inhabitants.[19] Lessons from the planning achievements of existing new towns can be instrumental in ensuring the long-term vibrancy and sustainability of these new settlements. We will now elaborate on a series of conceptual strategies to help create healthy and vibrant urban districts for future communities.

The Hybrid City

Hong Kong's urban vibrancy has long since been fuelled by neighbourhoods with dense combinations of different types of people and activities. While some new towns have separated social and economic functions, this proposal embraces the fine-grained mixing and interaction of live, work, and play for organic forms of innovation. Instead of traditional planning approaches based on land use, which use zoning and single ownership of

urban plots, this vision assumes a three-dimensional function mix model which responds more effectively to the opportunity offered by vertically-separated circulation systems.

An example of this approach is illustrated in Figure 1, which is part of a catalogue of planning studies that explores different public space networks, function mixes, and urban densities. It achieves a development density (floor area ratio) of eight, which is similar to that of Hong Kong's existing transit-connected new town areas. At ground level, cars are kept outside of the cluster to prioritise walking and cycling. A group of separated podium blocks surround internal garden plazas and

The Ecological City concept explores how urban planning measures can promote eco-friendly behaviour and activity routines, such as using sustainable forms of commuting, including walking and cycling.

EXAMPLE OF A THREE-DIMENSIONAL PLANNING MODEL FOR HYBRID URBAN NEIGHBOURHOODS

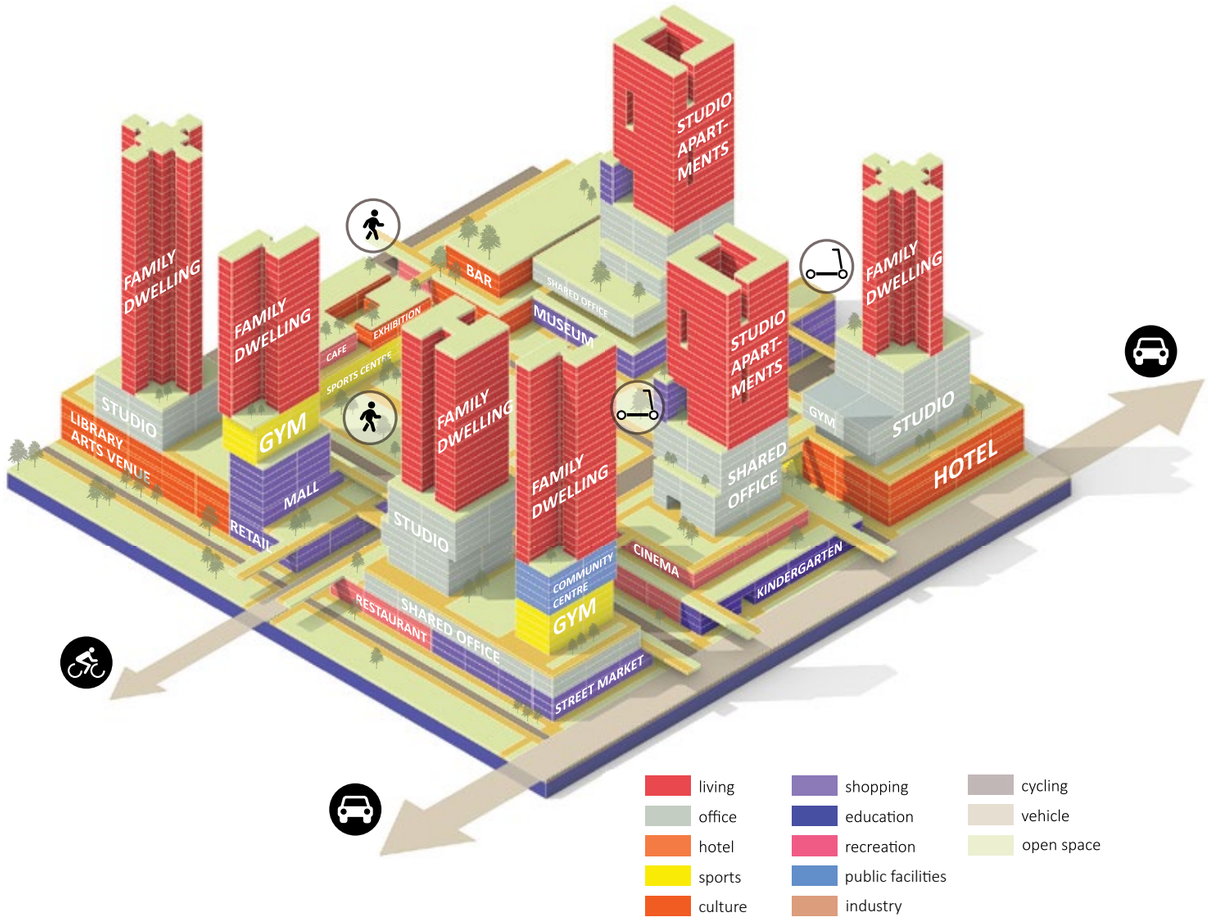

FIGURE 1[20]

URBAN SECTION OF THE ECOLOGICAL CITY

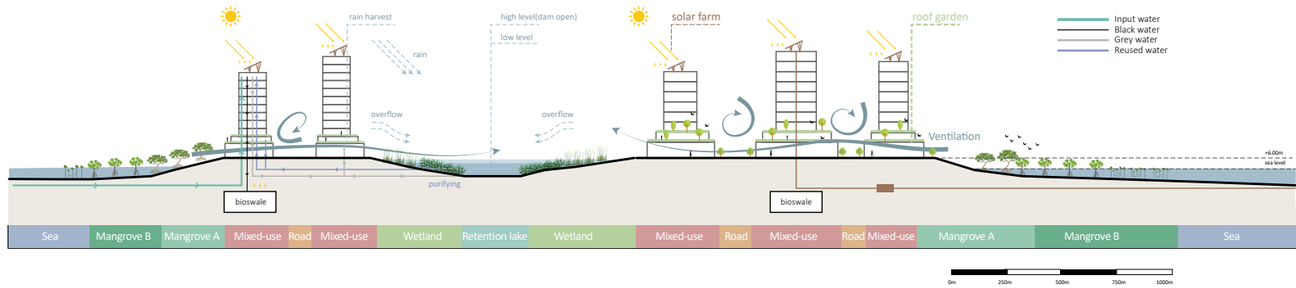

FIGURE 2[21]

has schools, healthcare, and sports and cultural venues. At the top of this first layer, an elevated second pedestrian level connects a mixture of shops, co-working offices, and restaurants housed in a second layer of podium blocks. Family and studio apartment towers are positioned above, to bring together residents from different backgrounds or social classes.

This vision calls for rational and modular architectural structures to ensure long-term flexibility, and the possibility for adaptation to changes in the economic and lifestyle preferences of local communities. Generic building structures which can easily be converted among retail, office, and residential uses are accessed by a centrally-designed and managed system of ground-level and elevated pedestrian walkways and plazas, which becomes a vibrant mixing chamber for diverse urban functions, people, and cultural events. Underground metro nodes and trunk roads are combined with ground-level low-speed traffic and multi-level walkways, using a volumetric massing and function planning system to create pedestrian-friendly and green urban environments.

The Ecological City

To create environmentally-sustainable and liveable high-density urban neighbourhoods, comprehensive planning and urban design strategies are needed. This novel new town vision is rooted in detailed research on circular processes relating to energy use and resource consumption. Rainwater retention and household water recycling systems shape the urban form, while coastal parks help create neighbourhoods which support ecological regeneration and human health.

The conceptual arrangement of the neighbourhoods revolves around creating a series of self-contained communities, which are grouped by ecological zones that increase contact between housing and nature. Sustainable mobility systems such as self-driving electric buses and 'pay-per-ride' self-driving cars connect the communities, and private vehicles are banned. One of the key intentions of this conceptual design is to explore how urban planning measures can promote eco-friendly behaviour and activity routines, such as using sustainable forms of commute, including walking and cycling.

The Ecological City concept uses design thinking for urban plans and section. Figure 2 illustrates how different sustainable planning principles can be integrated into a comprehensive architectural and urban design approach. Gaps among small-scale podium blocks allow natural ventilation at ground level and connect pedestrians from external to internal waterfront parks. At the seaside, indigenous mangrove species protect the coast from erosion, provide animal habitats, and support residents' health and well-being. Retention lakes within the neighbourhood allow for rainwater harvesting, waste-water filtration, and recycling. Buildings are equipped with roof gardens and solar farms which contribute to urban cooling, biodiversity, and renewable energy production.

The Happy City

Taking urban quality of life and residents' health and well-being as a starting point, this planning vision explores new ways to plan stimulating and diverse neighbourhoods. Building on Hong Kong's 'modular' planning approach to construct new towns out of a series of individual neighbourhoods, the plan explores a system of varied self-contained communities connected by social and cultural infrastructure. The cultural system consists of a network of pathways, spaces, and facilities for sports, recreation, and participation in cultural events.

The overall planning approach of this vision is anchored in the principle of circle-packing, combining differently-sized neighbourhoods with varying mixtures of housing types and facilities, to give residents a wide range of lifestyle and community atmosphere choices. Figure 3 shows how the clustering strategy of small, medium, and large island

communities can create a rich urban configuration with close contact with nature. The different neighbourhoods include a 'high-synergy' creative and innovative district, and a 'holiday' area which promotes socialisation and the exploration of new forms of recreation. The 'active' communities feature vibrant, fine-grained street networks that promote entrepreneurship and exchange, while the 'slow-life' communities have large residential courtyards as safe havens for children and senior citizens.

All areas promote walking, community-forming, and synergies among living, working, and education. Their urban form and function mix adapts to location-based opportunities such as the proximity to transport nodes and valuable elements of the natural environment. The urban density is carefully balanced to aim for programmatic synergies and economic productivity, while creating a high-quality public realm in close connection to extensive waterfront spaces.

CONCLUSION

The review of Hong Kong's past and present approaches to the development of new towns, as presented in the article, highlights the significant challenges and opportunities associated with large-scale urban development. Hong Kong's new towns, inspired by the Modernist town planning ideal of healthy and well-organised urban lives, have incorporated a set of unique and context-specific architectural and urban design principles. Their compact, high-density urban configurations produce efficient and sustainable qualities such as highly integrated public transport networks and fine-grained mixed-use areas for economic and social vibrancy.

CONCEPTUAL LAYOUT OF AN ALTERNATIVE VISION FOR THE KAU YI CHAU ARTIFICIAL ISLANDS

FIGURE 3[22]

An increased understanding of environmental principles has resulted in improved micro-climate design, which addresses comfort, safety, and well-being needs in the context of global warming and climate change.

As Hong Kong plans a series of additional new towns to fulfil its aims to deliver economic, social, and sustainable development, the successes and challenges of its existing new towns can inspire truly 'new' planning visions for urban communities of the future. The three speculative planning visions presented in this paper explore the potential of innovative urban design thinking, in response to the specific challenges of the territory's urban expansion, as well as the global need for sustainable development and societal progress. Each of the projects is focused on a different key concept, exploring the spatial implications of planning for high degrees of function mixing and flexibility, the systematic integration of ecological principles, or the prioritisation of community diversity and quality of life. Beyond the key themes, each project is in fact aimed at addressing all of these aspects, as the practice of urban design development involves a complex balancing act of economic, technical, and social planning objectives. An overarching theme across these studies is that future urban settlements should no longer be conceived through top-down technical and economic optimisation, but through a focus on human-centric values, their environmental needs, and long-term aspirations. The new models for the new town of the future envision cities as open-ended systems, capable of dynamic adaptation to the inevitable changes in our social, technological, and ecological environments. AMI

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Endnotes

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