

**RESPONSES TO FEEDBACK AND SUGGESTIONS RAISED DURING
THE LONG-TERM PLAN REVIEW (LTPR) PUBLIC ENGAGEMENT**

Introduction

As part of the Long-Term Plan Review (LTPR), the Urban Redevelopment Authority conducted a public engagement exercise from July 2021 to August 2022. The exercise aimed to better understand Singaporeans' aspirations and hopes for our future urban environment, and shape a collective vision and shared values to guide the development of our long-term land use plans and strategies. In the course of the engagement, more than 15,000 people from all walks of life shared their views and ideas with us through various platforms, including facilitated discussions, workshops, polls, and written feedback. In addition, close to 50,000 people visited the LTPR Space for our Dreams exhibition at The URA Centre and roving exhibitions around Singapore, and there were around 150,000 visits to the LTPR webpages.

We have prepared this document to:

- 1) Reflect the feedback and suggestions shared with us, categorised based on the themes of the LTPR Exhibition from June to August 2022, and summarised for readability;
- 2) Present existing and planned initiatives that support these suggestions; and
- 3) Share our considerations in assessing the feasibility of the suggestions.

The responses within this document should be read in the context of the LTPR, and are updated as of December 2022. We continue to welcome feedback on how we can better plan for Singapore's future urban environment.

Contents

LIVE 4

 1. Cater to demographic trends and housing aspirations 4

 2. Encourage social mixing and inclusiveness 7

WORK 13

 3. Provide more opportunities for people to live nearer to their workplaces, facilitate telecommuting 13

 4. Regulate industrial and commercial uses more flexibly 16

PLAY 20

 5. Facilitate Sea Sports and Recreation, Embrace our Islandness 20

MOVE 22

 6. Enhance walking and cycling as mobility options, make getting around easier for all 22

CHERISH 30

 7. Strengthen sense of ownership, belonging, community, continuity and memory 30

STEWARD 41

 8. Nature, greenery and water 41

SUSTAIN 51

 9. Sustainability and Climate Change 51

PLANNING APPROACH 59

 10. Be flexible about use of space 59

 11. Make good use of above, underground, and sea space 63

 12. Planning practices 69

LIVE

1. Cater to demographic trends and housing aspirations

S/N	Feedback from Public Engagement	Our Response
1.	<p>With our ageing population, seniors should have a range of affordable options for living - whether independently, along, with roommates, or with their families.</p> <p>Seniors' living options should suit their care and dependency needs over time.</p> <p>Seniors should get to stay in the places they are familiar with ("ageing-in-place").</p>	<ul style="list-style-type: none"> • It is important to support our seniors' housing needs, especially when one in four Singaporeans is expected to be 65 years of age or older by 2030. We do so by: <ul style="list-style-type: none"> ○ Innovating with public housing typologies. <ul style="list-style-type: none"> ▪ Since the late-90s, HDB has been developing Studio Apartment (SA) housing for seniors with social communal facilities operated by voluntary organisations etc., built in close proximity to facilities like the neighbourhood centres. Thus far, a total of 72 SA projects have been developed across the towns. ▪ In 2015, HDB introduced the 2-room Flexi Scheme. Under the scheme, seniors aged 55 and above can choose to buy a 2-room Flexi flat on short lease with lease options ranging from 15 to 45 years (in 5-year bands) as long as the chosen lease lasts them and their spouses till at least age 95. ▪ In 2021, MND, HDB and MOH jointly introduced Community Care Apartments, an assisted living typology which integrates senior-friendly housing with care services that can be scaled according to seniors' needs, and support them in ageing independently in the community. The second pilot Community Care Apartments will be launched in Queenstown in 2022. ○ Partnering the private sector to co-create new housing products that could enhance the quality of life for our elderly. <ul style="list-style-type: none"> ▪ As a start, we have launched a pilot private assisted living sale site at Parry Avenue in Hougang in 2022. • We will continue to update our plans to support residents physically, socially and mentally through various life stages. <ul style="list-style-type: none"> ○ We aim for all towns to have a variety of marketing and eating facilities near their homes, and active ageing centres, parks, clinics and other key amenities within walking distance.

		<ul style="list-style-type: none"> ○ We aim to make these everyday journeys accessible and friendly to people of all abilities, including seniors who might face difficulty walking or be on wheelchairs and mobility devices - for example, by widening walkways and ensuring barrier-free accessibility. ○ We will journey with residents to pilot science-based initiatives to support them in leading healthy and purposeful lives. <ul style="list-style-type: none"> ▪ An example is the multi-stakeholder collaborative Health District @ Queenstown, where residents and community partners will co-create and pilot solutions to enhance the health and well-being of residents across their life stages. ▪ With demographic changes, we will continue to study and propose necessary measures to ensure HDB estates meet the needs of residents over time.
2.	<p>We want rental housing to be an affordable housing option, for example, through public housing schemes, more co-living developments, or having more developments be “build-to-rent” rather than “build-to-sell”. This will:</p> <ul style="list-style-type: none"> a) Help more people develop a better sense of autonomy and independence. b) Encourage mixing of people from different socioeconomic backgrounds. c) Allow more people to experience and 	<ul style="list-style-type: none"> ● Home ownership has been the cornerstone of our public housing policy and is a key tenet of Singapore’s social compact, as it gives families stability, a concrete stake in Singapore’s progress, and helps develop a sense of rootedness. The majority of Singaporean households prefer to own their home, and we support their home ownership goals through the provision of generous housing grants and subsidies. ● We understand that some may not be quite ready for home ownership and require additional assistance and support. For low-income households with no other housing options, we provide highly subsidised rental housing under the Public Rental Scheme. This will be paired with social support from Government agencies and community partners to help households in public rental housing overcome the various challenges they face, to achieve stability, self-reliance and social mobility. When they are ready, HDB’s Home ownership Support Team will support them with personalised guidance on buying a flat of their own, to help them achieve home ownership. ● Through the public engagements, we heard some suggestions on co-living, a housing model where tenants rent rooms in a purpose-built development that has communal spaces. <ul style="list-style-type: none"> ○ Private developers have already started to respond to this demand by providing new co-living housing products, such as LyF and Hmlet. This supplements the wide range of open market rental options – of varying sizes, locations, and rental rates – available in HDB and private estates in Singapore, which already cater to those who prefer to rent.

	<p>appreciate different parts of Singapore.</p> <p>d) The build-to-rent model could encourage developers to cater to occupiers with specific needs (for example, different types of disability).</p>	<ul style="list-style-type: none"> • We recognise that changing societal trends may reshape how some Singaporeans perceive home ownership. We will continue to study carefully how Singaporeans' preferences and aspirations evolve over time and continue to develop our public housing programme to meet changing needs.
<p>3.</p>	<p>Flats should be designed in a way that we can reconfigure the layout easily, to suit changes in our lifestyles.</p> <p>For example, providing smaller living rooms and larger individual rooms, setting aside space for home businesses, or having more multifunctional / non-prescribed spaces.</p>	<ul style="list-style-type: none"> • For new flats, HDB has tried to design them so that columns are at the outer edges of the unit where feasible. <ul style="list-style-type: none"> ○ This offers homeowners the flexibility to reconfigure the internal walls of their homes more easily, to suit their evolving needs – for example, they can combine or create more rooms as they need. ○ Under the Construction Transformation Project (CTP), a hybrid precast system will enable HDB to design and build flats using a beamless flat plate system, which results in consistently higher headroom compared to flats in typical BTO projects which have beams. As a result, residents will have greater flexibility in configuring the layout of their flat. This construction method will be piloted at the upcoming Garden Waterfront I & II @ Tengah BTO project, which will be launched in November 2022. • HDB's 2-room flexi typology is also designed to support an elderly person: depending on their needs, the layout with flexible space can accommodate a caregiver or serve as a study area. • HDB is also exploring providing a wider choice of internal layouts that support different lifestyles and work-from-home arrangements. For example, homes can be designed with more open floor plans so that owners can configure the spaces according to their needs.

2. Encourage social mixing and inclusiveness

S/N	Feedback from Public Engagement	Our Response
1.	<p>We should mix different housing types, to encourage healthy interaction and understanding among people from different income groups.</p> <p>For example, mix rental flats with sold flats, mix private and public housing, and build public housing next to private developments.</p>	<ul style="list-style-type: none"> • Today, some parts of Singapore are homogenous clusters of public or private housing. As new towns are built and existing ones redeveloped, we strive to further mix different housing types to encourage more interaction between residents of different backgrounds. • At the town level, we plan to have a mix of public and private housing. For example, the new residential town around the upcoming Bayshore MRT Station will have a mix of private and public housing; and where there are opportunities to do so, we will explore injecting public housing and amenities in some private estate areas . • Within a single HDB precinct or block, you can also find a mix of different flat types on the same floor, so neighbours can potentially come from a variety of family types, different generations and backgrounds. • To ensure that public housing is kept inclusive and diverse across Singapore, and that HDB towns continue to be home to residents from all walks of life, public rental flats will be built at BTO projects. <ul style="list-style-type: none"> ○ There are BTO projects in towns such as Woodlands, Bukit Batok, Sengkang, Pasir Ris and Kallang Whampoa, where sold units are mixed with rental units within the same block and on the same floor. ○ The pilot project launched under the Prime Location Public Housing (PLH) Model at Rochor has an integrated block of sold and rental flats.
2.	<p>We should plan for people of different ages, abilities, and needs to interact and care for one another. This will help revive “kampung culture”.</p> <p>For example, integrate childcare with eldercare, integrate youth housing with senior housing, and build parks between</p>	<ul style="list-style-type: none"> • We will continue to encourage interaction and care between people of different ages, abilities, and needs, by planning for different facilities to be close to each other. For example: <ul style="list-style-type: none"> ○ We try to site childcare and elderly facilities close to each other, so children and seniors can have more activities together. <ul style="list-style-type: none"> ▪ One example is Kampung Admiralty, where the Active Ageing Centre (Care) is located next to My First Skool. The proximity of the facilities and shared spaces between them have facilitated NTUC Health and NTUC First Campus to organise inter-generational activities and provided opportunities for the seniors and preschoolers to interact and bond with one another throughout the year.

	<p>kindergartens and nursing homes.</p>	<ul style="list-style-type: none"> ▪ Another example is the intergenerational playground at St Joseph’s Home for the old to play alongside the young. The playground provides a common space and activity for residents of St Joseph’s Home and children from the infant and childcare centre co-located within it to interact with one another through play. ○ HDB designs 3-Generation Family Playgrounds, where play and exercise equipment for different ages are located in the same area, so families can play, work out and relax together. • We will also continue to design community spaces in HDB estates to be inclusive and accessible to all. <ul style="list-style-type: none"> ○ Since the 2000s, all HDB playgrounds have adopted Universal Design Guidelines and are designed to be accessible to persons on wheelchairs. The playgrounds are also designed to accommodate children of different age groups and abilities. ○ Some playgrounds have features, such as sensory play panels and wheelchair-accessible merry-go-rounds, that can be enjoyed by children on wheelchairs. Learning from the intergenerational playground at St Joseph’s Home, communal playgrounds can also be designed in such a way where they serve as common spaces for people of different ages to interact with one another. ○ Wheelchair-friendly fitness equipment is also provided at elderly fitness corners.
<p>3.</p>	<p>We want more public, communal spaces (“urban living rooms”) where people from all walks of life can gather and interact more “organically”.</p> <p>This creates touchpoints for neighbourly bonding / “kampung spirit”, fosters a culture of inclusivity, caring and kindness, and helps with mental and physical wellbeing and support.</p>	<ul style="list-style-type: none"> • We will continue to plan for accessible communal spaces, for people from different walks of life to gather and interact. <ul style="list-style-type: none"> ○ Within individual developments, we plan for accessible spaces like void decks, precinct pavilions, sky gardens, and rooftop gardens, to be informal spaces where residents can interact. ○ At the town and neighbourhood level, we plan for neighbourhood parks, community hubs and event plazas, to serve as communal gathering places for activities and relaxation. Spaces such as HDB town plazas are regularly activated by public agencies, community groups, and other organisations for community events and activities. ○ Beyond our towns, we will also continue to plan for accessible public spaces around the island, as venues for all of us to “chill out”. These could take the form of regional and national parks and gardens, such as the Bishan-Ang Mo Kio Park or the Singapore Botanic Gardens, as well as public promenades, such as the one at Marina Bay.

	<p>To more purposefully foster social mixing, programming and activities should be organised at such communal spaces.</p>	<ul style="list-style-type: none"> • Private developers can also create public spaces within their building compounds. <ul style="list-style-type: none"> ○ URA’s Privately-Owned Public Spaces scheme incentivises private developers to create such spaces at the ground level, where they are most accessible to the public, and can contribute to the urban fabric. ○ One example of such a privately-owned public space is Tanjong Pagar Park, part of the Guoco Tower development right above the MRT Station. • Residents and other community stakeholders have also been organising activities in their everyday spaces, such as in heartland void decks and streets, with funding support from the Lively Places Programme.
<p>4.</p>	<p>We should be more inclusive towards traditionally NIMBY (“Not-In-My-Backyard”) facilities, such as: foreign worker dormitories, nursing homes, mental health facilities, funeral parlours.</p>	<ul style="list-style-type: none"> • While some may be comfortable with living near such uses, based on the feedback we have received, we are also aware that some are not. Our plans will have to take into consideration the broader social acceptance of such uses within the community. • In some cases, these developments may also result in genuine disamenities to neighbouring uses, such as noise, traffic, or smoke. • Where possible, we try to plan for and design such facilities sensitively, so they can serve the community well, while minimising any disamenities to surrounding uses. <ul style="list-style-type: none"> ○ Government-built nursing homes are designed sensitively to accommodate the needs of both the community and nursing home residents. For example, we try to provide communal spaces such as communal plaza and community gym (where feasible) for both the community and nursing home residents. This also encourages social interaction and co-sharing of amenities with the surrounding community to foster inclusivity. In addition, we also try to dovetail the façade design of the nursing homes with surrounding housing development, as well as having fenceless design and sheltered linkways (where possible) to achieve connectivity with the surrounding community. ○ Another example of sensitive development is a site at Woodlands that was launched for the development of a new private funeral parlour complex. As part of the tender requirements, the operator is required to confine funeral activities, rituals and processions within the facility with screening measures, avoid open air burning, provide a centralised burning chamber for paper offerings, and implement traffic management plans to mitigate against traffic disamenities during peak periods.

		<ul style="list-style-type: none"> We hope that with better design, and as mindsets change over time, our urban environment will be able to better reflect the inclusivity that our society values.
5.	<p>We should plan with sensitivity towards the needs of Autistic persons, those with ADHD, and persons with disabilities (including invisible disability).</p> <p>For example, crowded MRT stations and malls can be overly stimulating for some.</p> <p>We should consider planning for more sensory gardens, flats with not so bright lighting and less noise, and assisted living for the more severely affected people.</p>	<ul style="list-style-type: none"> We agree with the feedback, and will work closely with relevant stakeholders to plan more conscientiously for the needs of Autistic persons, those with ADHD, and persons with disabilities in our physical environment, in line with the recommendations in the recently launched Enabling Masterplan 2030 (EMP2030). <ul style="list-style-type: none"> One of the strategic themes of EMP2030 is to create physical and social environments that are inclusive to all members of society, including persons with disabilities. Another strategic theme of EMP2030 is to enable persons with disabilities to live independently, including through developing new community living models that enable persons with disabilities to live and age in place in the community. The full EMP2030 report can be found at https://go.gov.sg/emp2030. Some public transport facilities have set aside commuter-care rooms, for special needs commuters who need access to a quiet and calming space. <ul style="list-style-type: none"> Bus interchanges: Since end 2019, LTA has implemented Commuter Care Rooms at new bus interchanges. To date, 4 bus interchanges at Yishun, Jurong East, Woodlands and Pasir Ris have a Commuter Care Room catered for commuters with special needs. In addition, LTA will also implement Commuter Care Rooms for existing bus interchanges when they undergo major upgrading, if space permits. MRT stations: The first Commuter Care Room (“WeCare Room”) at NSL Canberra station was opened by SMRT in September 2020 to cater to commuters with invisible disabilities. LTA will continue to work with Public Transport Operators (PTOs) to facilitate the implementation of Commuter Care Rooms in the station network where suitable spaces within stations are available. New generation ticketing machines located in rail stations and bus interchanges are designed to be user-friendly so that passengers in wheelchairs can also use the machines with ease. Top-Up Kiosks are available at all MRT stations and the Assisted Service Kiosk (which has additional customer-centric features such as a video call function to communicate with call centre agents) is available at newer rail stations.

		<ul style="list-style-type: none"> • NParks aims to create more restorative and therapeutic landscapes across more green spaces to promote and support human health and wellbeing. One of the key plans is to establish 30 therapeutic gardens across Singapore by 2030. <ul style="list-style-type: none"> ○ Designed using evidence-based design principles, therapeutic gardens are deliberately planned to facilitate people’s interactions with nature and improve the well-being of their visitors. ○ Therapeutic gardens are specially designed to offer a richer, wider range of sensory experiences, through the selection of plants, hard landscaping and any garden materials that appeal to all our five senses. They are also designed for universal access. <ul style="list-style-type: none"> ▪ For example, the recently opened Therapeutic Gardens at Pasir Ris Park and Bedok Reservoir Park are designed with many opportunities for sensory engagement with a rich palette of colourful, textured and fragrant trees, shrubs, flowers, edible and medicinal plants. Areas of tranquility have also been incorporated to provide visitors with a serene and calming environment to practice mindfulness and focus. ○ To date, 9 therapeutic gardens (TGs) have been established in parks across Singapore, including at Jurong Lake Gardens, Telok Blangah Hill Park, and Bedok Reservoir Park in 2022. ○ Working with Advisers and Town Councils, the effort to introduce therapeutic landscapes is being scaled up in heartland areas to provide easier access to immersive greenery closer to where residents live. <ul style="list-style-type: none"> ▪ To date, 3 TGs have also been implemented in heartland areas in the Hong Kah, Yew Tee and Kolam Ayer constituencies. ▪ This effort will continue to be scaled up in more housing precincts and community care facilities. • NParks also works with HDB, Town Councils and community care partners to implement therapeutic horticulture nodes. These are organisations or locations, such as eldercare homes, senior care facilities, VWOs, as well as special schools, where therapeutic horticulture programmes are conducted. To date, 56 therapeutic horticulture nodes have been established. • The Building and Construction Authority’s Code on Accessibility sets out the essential requirements for making the built environment accessible. It is regularly reviewed to meet the changing needs of the population,
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		<p>including those of persons with disabilities. Today, all new buildings and existing buildings that undertake addition and alteration (A&A) works are required to meet the requirements of the prevailing Code. Accessibility features include:</p> <ul style="list-style-type: none">○ Accessible building entrance, accessible toilet, and signage to provide directions on accessible routes through the building.○ Elderly-friendly features such as grab bars, family-friendly features such as lactation rooms, and accessible features for persons with visual/hearing impairments, such as braille / tactile features.
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WORK

3. Provide more opportunities for people to live nearer to their workplaces, facilitate telecommuting

S/N	Feedback from Public Engagement	Our Response
1.	<p>We want more job areas and opportunities outside of the city centre, so we can work nearer to where we live.</p> <p>This will save commuting time and is more environmentally-friendly.</p>	<ul style="list-style-type: none"> • Since the 1990s, we have adopted decentralisation as a key planning strategy. <ul style="list-style-type: none"> ○ Planning for commercial and employment nodes in different parts of Singapore: <ul style="list-style-type: none"> ▪ Provides businesses with alternative choices; ▪ Brings jobs closer to homes, which helps to reduce commuting times; ▪ Reduces the crowding on public transport infrastructure into the city; and ▪ Provides amenities for residents and workers in the area. • We consider carefully the overall commercial quantum planned in Singapore and its distribution. <ul style="list-style-type: none"> ○ This ensures that we are able to build up a critical mass of commercial activities with good amenities at various job nodes. • To sustain Singapore’s economy and ensure a diversity of job opportunities, workplaces, and environments for all, we will continue to improve the variety of commercial, business park and industrial nodes as part of our polycentric approach for workplaces to be closer to homes. <ul style="list-style-type: none"> ○ We will continue to strengthen nodes, including Commercial nodes such as Woodlands Regional Centre, Jurong Lake District and Tampines Regional Centre; as well as Business Park nodes such as Punggol Digital District, Changi Business Park, and one-north and Science Park. ○ Job nodes will continue to be to be designed with people in mind, to provide a range of job options and amenities to support businesses and the community. <ul style="list-style-type: none"> ▪ Our industrial estates can become more vibrant with live and play options. The ground level of the estate will be accessible to the public with amenities, while co-living spaces above blocks that house clean industries can provide homes for workers in the estate. • Even as we plan for more jobs outside of the city, we will continue to shape our CBD as the prime commercial district in Singapore, and enhance its vibrancy with more live-in population.

		<ul style="list-style-type: none"> ○ This will help maintain our status as a global hub and a city on the world stage.
2.	<p>Many will still work in the city centre. We should plan for more affordable housing options in or near the city, whether through new developments, or encouraging the conversion of existing commercial uses there.</p> <p>We should put more affordable and family-oriented amenities in the city centre to support a population there, for example, schools, hawker centres, recreation.</p>	<ul style="list-style-type: none"> ● We will inject more mixed-use developments and homes in the city centre, and provide more amenities to support a live-in population. <ul style="list-style-type: none"> ○ In addition to providing more opportunities for people to live nearer to where they work, this will also transform the city centre into a vibrant, 24/7 district for live, work, and play, and help Singapore remain attractive to business and talent. ○ Our city centre will have a range of amenities to cater for all, including parks, public spaces, and eating establishments. ● We will introduce more public housing in and near the city, where feasible. <ul style="list-style-type: none"> ○ The Prime Location Public Housing (PLH) model ensures that flats in prime and central locations, such as the city centre and HDB towns surrounding it, remain affordable and accessible to home-buyers. ● For private housing, we have put in place development incentive schemes to facilitate more mixed-uses in the city centre. <ul style="list-style-type: none"> ○ The CBD Incentive scheme has been in place since 2019 to encourage developers to refresh existing office developments in the CBD with more mixed-uses, such as residences and hotels, as well as social/community amenities that will benefit the community at-large. ○ The Strategic Development Incentive scheme has also been in place since 2019 to encourage the redevelopment of older buildings in strategic areas into new, bold and innovative developments that will positively transform the surrounding urban environment. ○ We welcome more innovative proposals from developers to rejuvenate our city.
3.	<p>Telecommuting and hybrid work arrangements could become increasingly commonplace. We want our homes to be more conducive for all household</p>	<ul style="list-style-type: none"> ● We aim to design HDB flats for greater flexibility to meet work-from-home needs. <p>HDB flats could be designed with more open floor plans. HDB currently does this by pushing columns in new flats to the edges wherever possible, so that homeowners can have greater flexibility in reconfiguring their home layout. Some residents could then plan their flats to have more rooms to accommodate teleconferencing and working from home, whereas others may opt for bigger rooms.</p>

<p>members to work and study from home, for example, in terms of noise and private space.</p> <p>Apart from homes, we hope to have more spaces in our neighbourhoods where we can work or attend classes from.</p> <p>For example, void decks can be used as work corners for remote working or home-based learning.</p>	<ul style="list-style-type: none"> ○ Under the Construction Transformation Project (CTP), a hybrid precast system will enable HDB to design and build flats using a beamless flat plate system, which results in consistently higher headroom compared to flats in typical BTO projects which have beams. As a result, residents will have greater flexibility in configuring the layout of their flat. This construction method will be piloted at the upcoming Garden Waterfront I & II @ Tengah BTO project, which was launched in November 2022.. ○ We are exploring different typologies and welcome innovative ideas. ● We have been growing office clusters outside the City Centre in places like the Paya Lebar Central, Tampines regional centre, Woodlands Central and Jurong Lake District to provide work spaces nearer home. ● As part of the Government’s efforts to cater to demand for workspaces near homes, the Government will be making available, via the 1H2023 Reserve List, a commercial site in Punggol, with a 30-year lease tenure for office space. ● As an employer, the government has taken the lead to support remote working closer to homes by providing co-working spaces for public officers’ use, including at JEM, MND building, Mapletree Business City and Our Tampines Hub with the aim to scale up more of such spaces in other suitable locations close to residential areas. ● Public agencies (such as People’s Association and National Library Board) are also introducing community workspaces in suitable locations, for the general public to use. Some examples include: <ul style="list-style-type: none"> ○ Co-working spaces and work-study booths in several Community Centres (CCs), Residents’ Committees (RCs) /Residents’ Network (RNs) Centres, and selected HDB void deck spaces with the support of local Advisers and grassroots organisations. ○ Free-of-charge desk space at some public libraries that can be booked in advance. ○ “Community Living Rooms” within void decks in new developments, which can provide space for social interaction and working. ● Private co-working operators have been looking to introduce more flexible workspaces across Singapore. These workspaces have been appearing in commercial nodes outside the city centre and include hot desks that can be leased for as short as a month as well as on demand booths and desks that can be booked on an ad hoc, pay by minute basis.
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4. Regulate industrial and commercial uses more flexibly

S/N	Feedback from Public Engagement	Our Response
1.	<p>We should allow more non-traditional uses in business and industrial developments - for example, farming, commercial, and even residential and hotel uses in industrial developments.</p> <p>Businesses should also have more flexibility to change between uses within their developments, or have a space fulfil multiple purposes.</p> <p>This will make industrial areas more vibrant and attractive, while allowing businesses to adapt more nimbly to changing trends such as e-commerce, dark kitchens, and automation.</p>	<ul style="list-style-type: none"> • Today, our land use zoning is differentiated to meet the demand of various business needs. <ul style="list-style-type: none"> ○ Business Park zone is for high-tech and R&D-focused activities, Business 1 zone for light and clean industries, and Business 2 zone for heavy industries. Within these zones, there is already provision for businesses to accommodate supporting uses such as ancillary offices and canteens. • For some areas, we can introduce a White quantum to give businesses added flexibility to test out new concepts that may not be traditionally industrial in nature but which can complement industrial activities, such as retail, F&B, showroom and co-working spaces. • In the future, it could be possible for us to integrate more industrial activities with a mix of residential and commercial uses. <ul style="list-style-type: none"> ○ Many industrial activities today still generate noise, dust, smell nuisance or health impact, and hence are currently not suitable to be located near homes. ○ As industrial processes and technology are constantly developing, there should be more options for people to live nearer to their jobs in the longer term, without compromising the quality of the living environment. • We will continue to pilot initiatives to support an evolving economic and manufacturing landscape. <ul style="list-style-type: none"> ○ Under the Enterprise District approach in Punggol Digital District (PDD) and Jurong Innovation District (JID), there is some flexibility to adjust land use mix at the district-level rather than at the individual site-level. ○ Under the “Master developer approach” at new areas like Kampong Bugis, comprehensive master planning and implementation of a district will be undertaken by a single developer who will be able to determine the detailed GPR and mix of uses for individual plots, while adhering to overall GFA caps and performance guidelines to guide the development.

		<ul style="list-style-type: none"> • While we are keen to explore more flexible options with the industry, we need to consider that: <ul style="list-style-type: none"> ○ Expanding the allowable uses on a site also increases price competition for that site, which could then increase the cost to businesses. ○ The allowable uses need to comply with safety requirements, such as fire safety, and we also need to be mindful of uses which might disturb residents in the development or vicinity. • To support high-tech agriculture and aquaculture, we will also consider developing farms in industrial buildings on a case-by-case basis. <ul style="list-style-type: none"> ○ We adopt a selective approach as sufficient industrial space needs to be kept for manufacturing and manufacturing-related uses. We will also need to ensure that the agriculture and aquaculture uses are compatible with the surrounding environment.
2.	<p>Businesses should have access to affordable space for test-bedding of concepts, possibly with shorter leases.</p>	<ul style="list-style-type: none"> • There are several options that businesses can consider for shorter leases: <ul style="list-style-type: none"> ○ State properties and land which are available for interim use of up to 9 years are typically let out for rental through public tender. This mechanism allows interested parties equal opportunities to secure the sites. Businesses may visit SLA’s website to view the list of State properties and land which are available for tender. <ul style="list-style-type: none"> ▪ Some vacant State properties may be rented for a short period of not more than 90 days for events like exhibitions, fashion shows, pop-up restaurants and more (subject to availability and approval). ○ As the impact of flexible work arrangements on office space demand and design will continue to evolve, releasing sites on a variety of tenures and densities will allow variety and experimentation. <ul style="list-style-type: none"> ▪ We are exploring the possibility of rolling out some commercial sites on shorter leases, which will give businesses the flexibility to adapt nimbly to fast changing needs. A recent example is the inclusion on the 1H2023 Government Land Sales Programme Reserve List of a commercial site in Punggol, with a 30-year lease tenure for office space. ▪ Having some sites with shorter tenures will also enable our land uses to be refreshed in shorter cycles. We can explore this in the City Centre, as well as in job nodes closer to homes.

		<ul style="list-style-type: none"> ▪ We are mindful that while shorter leases give flexibility, they also affect project viability, as developers need time to amortise building costs. As such, such shorter lease sites will likely be of lower intensity, to reduce the capital investment required. ▪ To attract companies to anchor in Singapore and help to build up job nodes, we also need to offer them sufficiently long leases to sink in their investments. Hence, not all sites can be on short leases. • Depending on the industry, businesses may also access various test bedding opportunities and prototyping facilities. <ul style="list-style-type: none"> ○ Jurong Island will serve as a “living” test bed for sustainable solutions, through two innovation calls aimed at developing solutions to accelerate the transition to a circular economy and reduce carbon footprint. <ul style="list-style-type: none"> ▪ First innovation call: The Jurong Island Innovation Challenge (JIIC), launched in Aug 2021 and spearheaded by JTC and Enterprise Singapore, and supported by PUB, NEA, and EDB – crowdsources innovative ideas from startups and small- and medium-size enterprises (SMEs) to enhance the sustainability and circularity of resources. The challenge statements sought to enhance resource efficiency efforts and covered four key themes: energy efficiency, emissions reduction, water management and chemical waste management. ▪ Second innovation call: The Jurong Island Renewable Energy Request-For-Proposals (JI RFP), launched in Oct 2021 by JTC and EMA - focuses on test-bedding innovative energy solutions including renewable energy and energy storage systems such as high-efficiency solar panels and solar deployment on pipe racks and storage tanks to reduce the island’s carbon footprint. ○ Built Environment (BE) firms may test-bed innovative proposals in government “living laboratories”, such as designated areas within Punggol Town and Jurong Lake Gardens. <ul style="list-style-type: none"> ▪ Some examples of BE-related test-bedding proposals include: deployment of urban solutions in towns, building and construction-related technology (such as robotics, automation, aggregated/multifunction facilities management), and nature-based solutions (such as greenery and landscaping).
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¹ Previously known as Textile and Fashion Federation Singapore

PLAY

5. Facilitate Sea Sports and Recreation, Embrace our Islandness

S/N	Feedback from Public Engagement	Our Response
1.	<p>We should use more of our waterways for recreation, such as paddleboarding, canoeing, and swimming.</p> <p>Good examples where inland waterways have been used well are: Bishan-Ang Mo Kio Park, and Punggol Waterway.</p>	<ul style="list-style-type: none"> • We encourage Singaporeans to enjoy our waterbodies, as this will enable them to treasure and be more active guardians of our water resources. We will continue to activate our waterways and reservoirs for recreation and sports activities where possible. Currently water activities such as dragon boating, kayaking, sailing, rowing, fishing etc. are allowed at selected reservoirs - Bedok, Jurong Lake, Lower Seletar, MacRitchie, Marina Bay, Pandan and Punggol. • Proposals for new types of activities and the use of other waterways for recreational activities have to be assessed taking into consideration the impacts of these activities on agencies' operations, water quality, as well as public safety. PUB also needs to consider if the activities are compatible with other competing uses within the reservoir, such as floating solar panels.
2.	<p>We should make better use of our offshore islands – for example, as nature getaways and for tourism.</p> <p>Offshore islands can also be used to house facilities which are challenging to find space for on the mainland, such as farmland, golf courses, air bases, columbaria, and nuclear plants. Alternatively, they can just be used as a source of additional buffer land.</p>	<ul style="list-style-type: none"> • Many of our bigger offshore islands have already been put to use. <ul style="list-style-type: none"> ○ For example, Jurong Island and Pulau Bukom are used for industry, Pulau Semakau for waste management, and Pulau Tekong for military training. ○ Pulau Ubin is part of a lush and idyllic recreational node, along with Changi Point, Pasir Ris, and Coney Island, that will be enhanced to celebrate its unique qualities while retaining its rustic charm. • During the pandemic, offshore islands such as Lazarus and St John's became popular day-tripping getaways. <ul style="list-style-type: none"> ○ Public engagement participants had mixed views – some felt that we should keep such islands pristine and rustic, while others felt we should support increased interest with more amenities and attractions. Some participants suggested eco-tourism as a viable solution, citing the planned eco-tourism hub and resort at Mandai as an example. ○ We will take these views into consideration for future planning.

		<ul style="list-style-type: none"> • Together with Sentosa, Pulau Brani will be transformed into a leisure and tourism destination in a sustainable manner over the next two to three decades. <ul style="list-style-type: none"> ○ Leveraging their island charm, ridge-to-reef connection and proximity to the city, the islands will boast a spectrum of leisure offerings including world class attractions, reimagined beach experiences, as well as expanded nature and heritage trails. Last-mile transport connectivity to and within the islands will also be enhanced. ○ We are currently working on activating parts of the Southern Islands in a sustainable and sensitive manner, by working with industry partners to pilot new concepts. <ul style="list-style-type: none"> ▪ These will include nature and heritage learning journeys, eco-accommodations, and leisure activities with low environmental impact. • In general, making use of our offshore islands will require making them accessible to the public, and the need to build and maintain infrastructure like transport, power, water supply, and waste disposal. We will need to weigh the costs and benefits of doing so. We will also need to assess and mitigate the potential environmental impact of various activities on offshore islands which may generate discharges and emissions into the surrounding waters and potentially affect the ecology there.
3.	<p>We should plan for better recreational use of our sea space, for example, by providing more coastal areas, access to waterfronts, and watersports.</p> <p>We should cultivate a love of the sea, especially amongst the young.</p>	<ul style="list-style-type: none"> • With the seas around us being generally calm, we currently enjoy a wide range of coastal activities such as sailing, windsurfing and stand-up paddling, especially in areas that are away from the main navigational fairways and anchorages that support our busy port and industries. • Going ahead, we will plan for better opportunities for coastal recreation by improving access to the coast. <ul style="list-style-type: none"> ○ Coastal defences can also be integrated with promenades, parks and public spaces along the sea. • Other than the available coastal activities, the Maritime and Port Authority of Singapore also has several initiatives in place to cultivate Singaporeans' love and passion for the sea. They include maritime trails covering significant maritime heritage sites, learning journeys to maritime facilities, regular tours to Raffles Lighthouse, and a Singapore Maritime Gallery at Marina South Pier.

MOVE

6. Enhance walking and cycling as mobility options, make getting around easier for all

S/N	Feedback from Public Engagement	Our Response
1.	<p>We want to be able to walk and cycle more easily to places we go to everyday, such as schools, markets, eateries, shops, healthcare, sports facilities, and parks.</p> <p>This will save travelling time and expenses, and be good for health and the environment. Towns which are self-sufficient with amenities are also better able to withstand unexpected changes, such as pandemics.</p> <p>Walking and cycling paths should be sheltered for comfort, and to encourage usage.</p> <p>Mobile facilities can also improve residents' access to everyday needs.</p>	<ul style="list-style-type: none"> • Plans are underway to enhance walking and cycling connectivity within towns. <ul style="list-style-type: none"> ○ Since the launch of the National Cycling Plan in 2010, we have been progressively rolling out more cycling paths, park connectors and facilities to provide easy access to amenities like MRT stations and town centres. There are also plans underway to expand cycling networks within towns, from about 500km today, to 1,300km by 2030 under the Island-wide Cycling Network (ICN) programme. By then, all HDB towns will have cycling paths to support active mobility. ○ Under the Land Transport Master Plan 2040, we have committed to plan for 20-Minute Towns – that is, by walking, cycling, or taking public transport, you will be able to reach important amenities such as schools, polyclinics, hawker centres, parks, retail shops, and healthcare in 20 minutes. LTA also has a covered linkway programme to provide sheltered connections from major transport nodes such as MRT stations and bus interchanges to the surrounding amenities. • It is easier to implement such walking and cycling infrastructure in new towns. <ul style="list-style-type: none"> ○ In built-up towns, works tend to be more costly and take longer, as we must work around existing conditions like existing buildings or development boundaries, mature trees, roadside facilities such as bus stops, sheltered linkways and ramps, and utilities such as drains and underground services. ○ Nevertheless, we will put in place such infrastructure in built-up towns to improve connectivity whenever there is opportunity, including when estates are being rejuvenated or redeveloped. • In addition to building more walking and cycling paths, we will also plan for our commercial centres as one-stop hubs in central locations that offer various amenities. <ul style="list-style-type: none"> ○ We can explore extending them outwards as lively, attractive linear corridors in future towns, to bring key amenities closer to homes and enliven the streetscape to encourage active mobility. • While we are planning to strengthen residents' access to amenities as well as community and social facilities, mobile facilities can indeed serve communities that do not have ready access to certain public services.

		<ul style="list-style-type: none"> ○ NLB's Mobile Library, MOLLY, travels around Singapore bringing books, services and programmes to under-served communities which do not have ready access to public libraries. ○ The Big MOLLY operates with donations from Kwan Im Thong Hood Cho Temple. It brings books and programmes to those in special needs schools, homes and orphanages, welfare homes and lower income groups. Big MOLLY is equipped with accessible features to accommodate up to five wheelchairs on board the bus at one time. ○ Two mini-MOLLYs were also set up in 2014 to reach out to children aged 6 and below by bringing the library experience to children in childcare centres and kindergartens, as well as children from lower-income or disadvantaged households.
2.	<p>We want better cycling paths that connect between towns, regions, and the city centre, so that cycling will be a more viable transport option over longer distances.</p> <p>Such paths will benefit recreational cyclists, in addition to commuting cyclists.</p> <p>This will be good for health, and is an affordable and sustainable transport choice. It will also help to shift preferences from private car ownership to active mobility.</p> <p>There should be more facilities to support cycling as a commuting mode,</p>	<ul style="list-style-type: none"> ● We are planning to enhance inter-town connectivity for active mobility users. <ul style="list-style-type: none"> ○ Under the Land Transport Master Plan 2040, we have committed to plan for a 45-Minute City – that is, by walking, cycling, or taking public transport, you will spend no more than 45 minutes to complete most peak-period journeys between your home and workplace. ● With respect to walking and cycling in particular, we will plan for inter-town Active Mobility Corridors to support long-distance cycling and walking for commuting or leisure. <ul style="list-style-type: none"> ○ The Geylang to City cycling route was recently completed, facilitating a smoother cycling trip from eastern Singapore to the city centre. There are also ongoing plans to improve cycling connectivity in the western areas, by linking Queenstown to the city. ● We also plan to implement more Transit Priority Corridors to support seamless Walk, Cycle and Ride (WCR) between towns. <ul style="list-style-type: none"> ○ One example is the upcoming North-South Transit Priority Corridor, a 21.5km-long corridor that will run parallel to the CTE, and connect the north to the city. It will feature dedicated bus lanes, cycling trunk routes and pedestrian paths, which will link up with the park connector network and cycling paths within HDB towns along the route. ○ Another upcoming Transit Priority Corridor is along Sin Ming Avenue, between Upper Thomson Road and Marymount Road. It will allow residents in the area to conveniently ride a bus, walk or cycle to

	<p>such as showers, lockers, and secure bicycle parking at workplaces.</p>	<p>schools and Bright Hill MRT station. It will also eventually connect to the North-South Corridor at Marymount Road.</p> <ul style="list-style-type: none"> ○ LTA will add around 60 km of Transit Priority Corridors by 2030. These corridors can also be enjoyed by recreational users, and we will continue to plan for these Transit Priority Corridors in the long-term. ● Developments currently enjoy Gross Floor Area (GFA) exemptions for End-of-Trip facilities such as showers, lockers, changing rooms, toilets, and bicycle parking. <ul style="list-style-type: none"> ○ We will continue to work with different sectors to provide facilities that will encourage the adoption of active mobility by making it safer, direct, and more comfortable to walk, cycle or ride.
<p>3.</p>	<p>Pedestrians should feel safe from cyclists and Personal Mobility Devices (PMDs) when walking, especially vulnerable groups like the elderly and the young.</p> <p>Cyclists and PMDs should feel safe from higher-speed vehicles like cars, buses, and heavy vehicles.</p> <p>For example, we should:</p> <ul style="list-style-type: none"> a) Have dedicated / separated / clearly demarcated cycling paths rather than shared paths, b) Have wider paths for pedestrians and cyclists (which will benefit wheelchair-users too), 	<ul style="list-style-type: none"> ● We recognise the importance of designing our walking and cycling infrastructure to be safe and inclusive. <ul style="list-style-type: none"> ○ Many different groups of commuters use our various pathways. ○ Where space permits, a dedicated bi-directional cycling path of 2m width will be implemented, in addition to the existing 1.5m-wide footpath to provide more space for active mobility users. ○ Providing dedicated cycling paths would allow for a safer and more comfortable commuting experience for pedestrians, cyclists and other PMD users. ○ Having said that, in the Singapore context, there is limited land for the provision of dedicated facilities for different groups of commuters, especially in existing built-up areas. ○ We will continue to calibrate our regulations and code of conduct, where needed, to encourage the safe and responsible sharing of paths and road spaces, through education and engagement efforts and working closely with our stakeholders. ○ Safety is a collective responsibility, and we encourage everyone to play their part to help realise our vision of a safe and gracious active mobility culture in Singapore. ● LTA has identified suitable road spaces in built-up areas that can be converted into wider footpaths, cycling paths, bus lanes and community spaces. <ul style="list-style-type: none"> ○ For such road repurposing projects to be successful, it is important to have support from affected stakeholders, as we can expect some impact on road traffic or changes in access for car users.

	<p>c) Reduce / reclaim road space, reduce private vehicle usage / numbers, encourage car-lite, and</p> <p>d) Have more education, rules and enforcement to encourage responsible cycling.</p>	<ul style="list-style-type: none"> ▪ For example, Havelock Road was identified as a location where the footpath could be widened to create a safer and more pleasant pedestrian experience for residents and visitors in the neighbourhood. ▪ As the project involved the removal of roadside parking lots in front of shops, LTA engaged the shop owners and the local community, and took in their feedback, including the request to have barrier-free access. ▪ LTA completed the works to permanently widen the footpath in December 2021. ○ LTA has also engaged the local community in the Tiong Bahru area, and begun the pedestrianisation of Eng Hoon Street and converting the roadside parking lots along Seng Poh Road and Lim Liak Street to wider footpaths. • Over a longer horizon, we will be able to realise more people-centric road and town typologies. <ul style="list-style-type: none"> ○ For example, in Tengah’s Park District, roads will run under the town centre, making it the first car-free town centre in Singapore. ○ By freeing up space at the ground level for shops and recreational use, it will be easier and safer for more to walk, cycle and ride as they go about their daily errands. • However, even as we strive towards our vision of a car-lite nation, we need to bear in mind that our roads must serve different groups of motorists and purposes. <ul style="list-style-type: none"> ○ Roads are still needed for public buses. ○ Roads are also important for economic needs – for example, cargo and goods delivery vehicles are required to support business activities and e-commerce. ○ Roads are needed for emergency services as well.
<p>4.</p>	<p>People with disabilities (for example, those who are wheelchair-bound, visually-impaired, or hearing-</p>	<ul style="list-style-type: none"> • We agree with the feedback and suggestions. Barrier-free infrastructure would support not just persons with disabilities and special needs, but also others including the elderly and parents with young children in strollers.

<p>impaired) should be able to move around more independently, conveniently and safely.</p> <p>This can be achieved through:</p> <ul style="list-style-type: none"> a) Infrastructure, such as barrier-free access / ramps, and lifts at overhead bridges. b) Design of wayfinding and signage, use of tactile flooring, audio-visual cues at bus stops, and leveraging on technology such as mobile apps. <p>Universal design in the Built Environment will also benefit the elderly, parents with strollers, and caretakers of young children.</p>	<ul style="list-style-type: none"> ○ All new buildings and existing buildings undergoing refurbishment works are required to comply with the Code on Accessibility in the Built Environment, which prescribes the accessibility requirements for enabling persons with disabilities to access and use the buildings. The Code is periodically reviewed by a committee comprising representatives from social service agencies, academic institutions, public sector agencies and private industry stakeholders, to meet the changing needs of the community. ○ To shape an inclusive built environment for people of different age and abilities, BCA also promotes Universal Design (UD) by conducting trainings and publishing design guides for industry practitioners, such as the UD Assessor Course and the UD Guide for Public Places. Exemplary projects which adopted UD principles to create a more accessible and inclusive environment for building users are recognised with the BCA Universal Design Excellence Award. ○ All existing HDB towns and estates have been made barrier-free where feasible. This includes improving connectivity between blocks and key precinct amenities, and retrofitting features such as ramps and railings. <ul style="list-style-type: none"> ▪ All new HDB estates are built according to Universal Design principles for an inclusive living environment, which include wider corridors for wheelchair movement, and a wheelchair accessible bathroom within the flat. ○ To aid residents in wayfinding, larger graphics, universally understood pictograms and visual cues such as colour and motifs will be used in new HDB estates to show directions to destinations and facilities. ○ Senior-friendly features and accessibility solutions for existing estates are also provided where feasible, under HDB's Neighbourhood Renewal Programme (NRP) and the Remaking Our Heartland (ROH) programme. Within the flat, HDB's EASE programme provides elderly-friendly fittings such as grab-bars, non-slip tiles and where necessary, ramps for multi-step flat entrances. ○ In addition, as part of building healthy towns; the principles of dementia-friendly neighbourhood are being incorporated in newer housing design to make the built environment safer and easier for persons living with dementia to navigate. ○ NParks regularly upgrades our park infrastructure to provide more senior-friendly amenities, such as ramps, handrails, shelters, and senior-friendly exercise corners. NParks and the National Council of Social Services (NCSS) have also been building inclusive playgrounds, to create play spaces that consider children with special needs at Bishan-Ang Mo Kio Park and West Coast Park.
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		<ul style="list-style-type: none"> ○ Efforts to improve barrier-free access and age-friendly transportation have also enabled seniors to move around safely in the community. <ul style="list-style-type: none"> ▪ There are currently 26 Silver Zones across residential estates in Singapore. Silver Zones have a reduced speed limit of 40km/h or 30km/h, and will have gateway treatment such as signs, road markings and rumble strips on the road to inform motorists that they are entering a special zone with reduced speed limits. Depending on the roads' geometry and residents' travel needs, LTA will also implement additional traffic-calming road safety features. These include additional 2-stage crossing and rest points, chicanes (gentle curves along sections of roads), and lanes with reduced width to slow down traffic. LTA targets to complete a total of 50 Silver Zones by 2025. ▪ LTA is also putting in more wheelchair and pram accessible features such as lifts and ramps in public transport facilities. ▪ LTA is also progressively implementing pedestrian-friendly schemes including signalised mid-block crossings, zebra crossings and kerb-cut barrier free ramps to enhance walkability. ● We will continue to collaborate with relevant stakeholders to co-create places that are more accessible to seniors, persons with disabilities, children and other groups. <ul style="list-style-type: none"> ○ Such inclusive environments can create a more caring and inclusive society, where residents of all ages and abilities have active and independent lives and can participate in the community. ○ Such efforts are in line with the recently launched Enabling Masterplan 2030 (EMP2030). <ul style="list-style-type: none"> ▪ The Enabling Masterplan 2030 was developed by, for, and with persons with disabilities and their caregivers. ▪ One of the strategic themes of EMP2030 is to create physical and social environments that are inclusive to all members of society, including persons with disabilities. ▪ The full EMP2030 report can be found at https://go.gov.sg/emp2030 . ○ There is also the Accessible City Network (ACN), which takes a community-driven, 3P (people, public, private) approach to identifying accessibility and inter-connectivity challenges and co-developing solutions to address these gaps in specific localities.
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Responses to feedback and suggestions raised during the Long-Term Plan Review (LTPR) Public Engagement

		<ul style="list-style-type: none"> ▪ The pilot partnerships under the ACN include Our Accessible City @ CBD (Raffles Place), co-led by BCA and Ar. Michael Ngu (CEO of Architects 61); and two in the heartland, Our Accessible City @ Boon Lay Neighbourhood and Our Accessible City @ Nee Soon Central Neighbourhood, which are co-led by HDB and Ms Judy Wee (Executive Director of the Muscular Dystrophy Association). ▪ Our Accessible City @ CBD (Raffles Place) is a community partnership between public and private sector organisations, such as URA, LTA, REDAS, as well as Social Service Agencies partners (DPA, HWA, SPD, SAVH). It was formed to address the accessibility gaps in CBD (Raffles Place). Improvements in accessibility within the CBD would allow persons with disabilities (PwDs) to navigate freely, open up new opportunities for employment and create an inclusive environment. ▪ Enhancement works are progressively implemented.
5.	<p>We should have more water-based transportation, such as ferries and water taxis.</p>	<ul style="list-style-type: none"> • Our waterways and canals are designed for stormwater management, and would not have sufficient volumes of water during most days to support water-based transportation. • Even in locations where conditions allow such operations, it can be challenging for such services to be viable as a transport service, as: <ul style="list-style-type: none"> ○ Water vessels tend to be slower than using land transport. ○ The landing points and routes for water-based transportation are also limited, compared to the more comprehensive land-based public transport network.
6.	<p>We should prepare for the popularisation of upcoming mobility technologies, such as autonomous vehicles and drones.</p> <p>We should plan sufficient space for their implementation, and design our infrastructure to be easily adaptable to them.</p>	<ul style="list-style-type: none"> • We recognise the potential that mobility technologies such as autonomous vehicles and drones can bring us, in creating a more liveable urban environment. While there are opportunities, the adoption of these technologies will need to be contextualised within our local circumstances, to ensure that they can be used in a safe and secure manner. To facilitate this, we are working with the relevant government agencies and industry, to put in the necessary R&D and regulatory frameworks, to support the development of the local eco-system. Ultimately, technological readiness, public safety and acceptance are key determinants of the extent, and speed to which such new mobility technologies can be deployed in Singapore. • For example, drones are being used for commercial purposes, such as delivering small parcels to offshore vessels, monitoring our reservoirs, and inspecting our buildings. This has helped many companies reduce cost and improve productivity and safety of their workers. This is in addition to their use for education, recreation, filming and

<p>For example, we could design our HDB carpark rooftops to be drone landing points.</p> <p>These technologies can help to improve point-to-point transport / first- and last-mile connections, free up road space for community uses, and pave the way towards a better street environment. They could make transport more sustainable, and more inclusive towards those with mobility challenges.</p>	<p>photography purposes. However, given our high-rise, high-density urban environment, we need to make sure that safety is not compromised.</p> <ul style="list-style-type: none"> ○ CAAS has developed a regulatory framework covering unmanned aircraft registration, permit application, pilot licensing, and other safeguards on permitted flying areas. ○ CAAS has developed a Centralised Flight Management System to better track unmanned aircraft and to alert users on possible infringements in a timely manner. ○ MPA has launched the Maritime Drone Estate in April 2021 to provide a safe space for companies to test-bed drone technologies for maritime applications, such as shore-to-ship deliveries. ○ CAAS has also launched the pilot Unmanned Aircraft Flying Area at Pandan Reservoir in July 2022 for the public to fly their drones safely without compromising on aviation safety. ○ CAAS is supporting EDB in exploring the safety and feasibility of piloted electric take-off and landing (eVTOL) aircraft trials, possibly along the Greater Southern Waterfront, to develop use cases and operating frameworks. <ul style="list-style-type: none"> ● Separately, autonomous vehicles have the longer-term potential to reduce accidents due to human errors, optimise use of road space, and help to address manpower challenges while creating new job roles such as fleet controllers and data scientists. <ul style="list-style-type: none"> ○ In this regard, we have been conducting autonomous vehicle trials on public roads since 2015. ○ LTA and EDB also launched a Call-for-Collaboration in 2019 for the pilot deployment of autonomous vehicles. If successful, the consortia will develop the technology and prepare for the pilot deployment whilst ensuring public safety. ● We will continue to work with companies and stakeholders to co-create an enabling ecosystem.
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CHERISH

7. Strengthen sense of ownership, belonging, community, continuity and memory

S/N	Feedback from Public Engagement	Our Response
1.	<p>We want to have more ground-up, citizen-initiated opportunities to shape our everyday spaces. This will help build a sense of ownership, community and identity amongst residents. For example,</p> <p>a) Residents can spruce up void decks with furniture and art / murals, run community gardens.</p> <p>b) Residents can design facilities / placement of facilities within the estate, residents decide what should be unique about a neighbourhood.</p> <p>c) Residents form their own volunteer committees to maintain and manage spaces, or voluntarily serve as community managers.</p>	<ul style="list-style-type: none"> • A greater sense of community ownership and place identity can be instilled amongst residents when they have a say or play a personal hand in shaping their everyday spaces, or initiate and take part in community projects and events. • We have some programmes in place to support such initiatives: <ul style="list-style-type: none"> ○ The Lively Places Programme is a joint initiative by HDB and URA to support community-led efforts in organising activities or creating installations that enliven our public spaces and bring communities together. ○ Under HDB’s “Build-A-Playground” initiative, residents have a say in designing their playgrounds, selecting the playground components and installing them with HDB. ○ HDB also plans to safeguard some common areas in new residential development projects as ‘White Spaces’, so that residents may come together to co-create social spaces and facilities that meet their community’s needs. These spaces and facilities could range from thematic community gardens and sports courts to flexible workshop spaces. • In the spirit of sustainable community ownership, projects implemented under some of these initiatives would also need to be maintained or operated by community stakeholders such as non-profit organisations and grassroots organisations. Buy-in and participation from residents is critical for such community-run spaces to thrive. • When rejuvenating existing HDB towns, HDB also actively engages residents through surveys and focus group discussions. <ul style="list-style-type: none"> ○ For example, for the Remaking Our Heartland programme, HDB conducts online surveys and workshops to crowd source ideas for improvements, and gather feedback on residents’ impressions and aspirations for their towns.

	<p>d) Residents can share and loan household items amongst the community.</p>	<ul style="list-style-type: none"> • On the suggestion for residents to organise themselves to manage these community spaces, one possible model is the Residents' Committees (RCs) / Residents' Networks (RNs), which are run by residents on a volunteer basis. <ul style="list-style-type: none"> ○ Their objective is to promote neighbourliness, racial harmony and community cohesiveness amongst residents in HDB estates. ○ RCs/RNs work closely with other grassroots organisations and government agencies to improve the physical environment and safety of their respective precincts. ○ Residents may volunteer or nominate other residents to be part of the RC. ○ RCs/RNs help residents know one another better, seek to understand local needs, concerns, aspirations and help communicate government messages. Residents can gather at RC/RN centres located at the void decks. These community focal points promote residents' interaction through their participation in RC/RN courses and activities, forming interest groups and volunteering their expertise and experiences. • Under PA's Resource Centre @ RC initiative, residents will be able to borrow items such as wheelchairs, stools, and step ladders from selected RC/RNs. • PA has rolled out the Community Volunteer (CV) Scheme in 2022 to encourage civic participation among members of the community. <ul style="list-style-type: none"> ○ Through community volunteering, PA aims to provide more flexible and informal volunteering opportunities for like-minded individuals and groups, to come together and volunteer their time and efforts to do good, as well as to work with the community and co-create meaningful cause-based projects. ○ Individuals and groups can volunteer based on their aspirations, the causes/interests they care about, and at their preferred level of commitment. ○ Interested individuals or groups may approach a Community Centre/Club (CC) if they wish to find out more about the CV Scheme.
<p>2.</p>	<p>We should have longer leases/tenures for uses. When uses are around for longer, they can become</p>	<ul style="list-style-type: none"> • The lease system gives us flexibility to respond to changing needs and facilitates urban rejuvenation. <ul style="list-style-type: none"> ○ For example, golf courses were given 30-year leases, allowing the low-density land use to be converted to other possibly higher-density uses that are needed once the leases expire. New industrial land is










	<p>part of the place, and strengthen the sense of memory and attachment to places.</p> <p>For the same reason, we should discourage en-bloc / redevelopment.</p>	<p>currently typically offered on 30-year leases, to ensure that the economic activities continue to be relevant.</p> <ul style="list-style-type: none"> ○ Even if the use is not changed after lease expiry, new leases present opportunities to adjust the plans for the area, for example to incorporate more people-centric features into developments for the public good, such as by giving up a small plot of land to create a park connector or public walkway). <ul style="list-style-type: none"> ● We are studying how to vary the length of leases/tenure for different uses. <ul style="list-style-type: none"> ○ In particular, for uses that are subject to evolving trends (such as retail and office), we are exploring shorter leases for selected sites, so that the use of the land can adapt to the needs faster. ● There are also limitations to how much tenure can have an impact on retaining the use. <ul style="list-style-type: none"> ○ While a retail land use zone and tenure might remain, the lessee or shop owner may change over time. ○ Market forces are important signals that need to be considered as well, for businesses to remain viable and relevant. ● Given our limited land, en-bloc redevelopment is an opportunity to make better use of the land through intensification, and respond dynamically to development needs. Intensifying on brownfield areas can also help reduce the need to develop on greenfield sites so that we can keep more areas green. Having said that, we are also studying ways to encourage more adaptive reuse of buildings, especially where there is limited potential for intensification, and the buildings are of good quality.
<p>3.</p>	<p>We should keep familiar buildings, as they help to foster a sense of collective belonging, memory, continuity and permanence.</p> <p>These should not only be based on age and architecture, but also social memory, and include “generic” everyday</p>	<ul style="list-style-type: none"> ● We will continue to engage communities, interest groups and other stakeholders to ensure that a variety of views and perspectives are considered, when planning for sites that are rich in heritage and identity. ● Given our limited land, we will adopt various strategies to sensitively integrate built heritage and identity into our urban environment. <ul style="list-style-type: none"> ○ Agencies such as NHB and URA have been working with stakeholders to conserve buildings and structures of the highest significance in terms of architectural, cultural, social, religious and historical merits.

<p>buildings like schools, markets, hawker centres, and libraries.</p> <p>We want to be consulted more on what merits conservation; what constitutes “heritage”.</p>	<ul style="list-style-type: none"> ○ More than 7,200 buildings have been conserved to date, including prominent buildings with modern architecture, such as the Subordinate Courts, Science Tower of the Bukit Timah Campus and the former Jurong Town Hall (now a National Monument). ○ In preserving National Monuments, NHB identifies and carries out comprehensive research on potential buildings, structures and sites that have historic, cultural, traditional, archaeological, architectural, artistic or symbolic significance, highlighting their national significance which justifies their preservation. <ul style="list-style-type: none"> ▪ In 2021, amendments to the Preservation of Monuments Act expanded the definition of “monument” to allow for the preservation of not just buildings or structures, but any site which has national significance. The expanded definition will enable such sites of national significance to be preserved as National Monuments, such as the Padang, which was gazetted as Singapore’s 75th National Monument on 9 August 2022. ▪ NHB is guided by the Preservation of Sites and Monuments Advisory Board to provide multidisciplinary perspectives and input on gazette decisions. Before initiating the gazette process, NHB will also engage key stakeholders, including owners and occupiers of the proposed National Monument, heritage groups and other community stakeholders. As a follow up to the amendment of the Act, NHB will also publish information on the proposed National Monument on NHB’s heritage portal Roots before the gazette, so that members of the public can provide their comments. ▪ In addition, NHB has marked 100 historic sites across the island, which are places of historical significance where important events or personalities are commemorated to serve as reminders of our history. Though the original buildings may not always be retained at these sites, their stories are told through their Historic Site Markers, which contain interesting nuggets of information on the history of the site. ● Where appropriate, we put contemporary uses in these conserved buildings, to give them a new lease of life, and give a chance for the current generation to form their own relationship with these places. <ul style="list-style-type: none"> ○ While it would be ideal for the original heritage uses to continue, it may not always be operationally viable for the owner of the site. ● In some cases, we may not be able to retain the heritage buildings of interest. Considerations include: <ul style="list-style-type: none"> ○ Weighing the heritage significance against the need for the land to meet development needs.
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- The cost of retrofitting and maintaining conservation buildings, which can be higher than those of the average building, due to the need to comply with conservation guidelines and current building codes, and the wear and tear of the property.
- Technical considerations such as structural safety.
- In such cases, we may find other ways to retain or remember key identity elements.
- As we plan for the long term, a consultative approach is key, to sensitively integrate elements of our built heritage in our plans. We will continue to engage communities, interest groups, and other stakeholders to ensure that a variety of views and perspectives are considered.
 - The Heritage and Identity Partnership (HIP) has been formed to support public-private-people collaboration in shaping and promoting our built heritage and identity. Comprising members with diverse backgrounds—including representatives from heritage groups, developers and academia—the HIP contributes ideas to sustain and manage the built heritage and memories of places as we develop and rejuvenate our city. The inputs of the panel have helped to enrich and shape the discussion for places like the Pasir Panjang Power Station and Farrer Park.
 - As part of ongoing efforts to consult widely to strengthen the heritage assessment process, we also work with the Heritage Advisory Panel (HAP), which comprises experts across different disciplines, to seek their advice on heritage matters.
 - On top of the existing pre-development studies of heritage areas, a more detailed examination may be carried out for large-scale public projects on sites with special significance.
 - In 2018, a pilot detailed heritage study was conducted at the former Police Academy at Mount Pleasant, and the findings were published for public feedback. The police community and heritage stakeholders were also engaged on the conceptual development plans, as we identified key heritage elements that could be meaningfully incorporated in the future residential estate.
 - Subsequently, in Mar 2022, we formally implemented a structured heritage impact assessment, or HIA framework. Heritage Impact Assessments (HIAs), which are independently conducted, will help us identify key heritage elements that should be kept and ways to redevelop the site sensitively. Agencies have commissioned a HIA for the future developments at the former Bukit Timah Turf Club. Details of the HIA findings would be shared when ready.

4.	<p>We should create towns with more unique and distinctive architecture, while retaining the area's heritage and history.</p>	<ul style="list-style-type: none"> • As we continue to redevelop and rejuvenate existing HDB towns, we will do so sensitively and imbue them with distinguishing architecture and design to strengthen residents' sense of belonging and identity. <ul style="list-style-type: none"> ○ HDB's Remaking Our Heartland (ROH) initiative provides a comprehensive rejuvenation blueprint to renew existing towns. <ul style="list-style-type: none"> ▪ When rejuvenating existing HDB towns, HDB also actively engages residents through surveys and focus group discussions, to crowd source ideas for improvements, and gather feedback on residents' impressions and aspirations for their towns. ○ New Towns can also be designed to take reference from the area's history to establish an identity for the future residents through HDB's town design guides, which provide an aesthetic and spatial guide for towns. <ul style="list-style-type: none"> ▪ For example, design elements in the new estates can take reference from the past through street naming, landscapes, built form and gathering spaces for the community. • Key building typologies also play an important part in building a cohesive community, such as schools, hawker centres, places of worship and other institutional buildings. We will explore ways that the memory and identity of these familiar places can be retained, whether through building conservation, adaptive reuse, or other means such as markers, storyboards and urban design. • We are strengthening the heritage assessment process, to make it more robust and to allow us to consider heritage more upstream, and better integrate development with heritage. <ul style="list-style-type: none"> ○ In Mar 2022, we formally implemented a structured heritage impact assessment, or HIA framework. Under this new framework, agencies managing public projects likely to cause major impact to significant heritage sites will need to undergo an additional in-depth consultation with URA and NHB, to determine if a heritage study or other measures are required to mitigate the development's impact to heritage. ○ A new public housing estate will be built in the Mount Pleasant area, largely on the site of the Old Police Academy, which has been around since the 1920s. This Old Police Academy site was the pilot project to

		<p>undergo a large-scale detailed heritage study which paved the way to apply the recently announced Heritage Impact Assessment framework.</p>
<p>5.</p>	<p>Towns can feel “cookie-cutter” and generic, possibly influenced by prefab / precast construction methods.</p>	<ul style="list-style-type: none"> • Prefab / precast construction methods are beneficial in the Singapore context, due to the shorter construction period, improved workmanship, and higher productivity, as well as reduction in disamenities such as noise as most of the construction work is carried out offsite in a controlled environment. <ul style="list-style-type: none"> ○ Such methods span a continuum of technologies and methodologies, from 2-dimensional prefab / precast components to fully integrated assemblies of 3-dimensional modules complete with internal finishes, fixtures and fittings. • While prefab / precast construction methods would reap maximum benefits if building components are standardised, it need not necessarily mean that the overall building or town design constructed using prefab construction methods are boring or “cookie-cutter”. Some examples of projects which utilised prefab/precast construction and had unique and outstanding designs include: <ul style="list-style-type: none"> ○ For HDB projects, both The Pinnacle@Duxton and SkyTerrace@Dawson have been awarded the President’s Design Award Singapore, which is administered by URA and the Design Singapore Council. <ul style="list-style-type: none"> ▪ Pinnacle@Duxton – almost the entire building, including the façade, as well as components such as household shelters and staircases, was modularised and pre-fabricated. ▪ SkyTerrace@Dawson – comprised almost entirely of precast-concrete modules. ○ For private projects, some examples of projects incorporating precast and prefabricated elements include: <ul style="list-style-type: none"> ▪ New Futura condo which won BCA’s Construction Productivity Awards (CPA) 2019 - Gold. This project adopted precast components such as balconies, bay windows, and prefabricated bathroom units (PBUs). ▪ Amber Skye project which won the Platinum Award under CPA 2018, and which adopted extensive precast construction. ▪ EDEN is another distinctive project which adopted precast balconies, PBUs and precast walls etc.

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<p>New Futura</p> 	<p>Amber Skye</p> 	<p>EDEN</p> 			
<p>6.</p>	<p>We should have more strata-titled malls and HDB shops, as they tend to have more character than REIT-owned malls.</p>	<ul style="list-style-type: none"> • We recognise that strata-titled developments currently form a part of the wide range of commercial spaces available in Singapore and have their upsides, in terms of providing different types of spaces and experiences. • Having said that, there are also challenges in upkeeping them. <ul style="list-style-type: none"> ○ Existing strata subdivided developments tend to face challenges in maintenance and upkeep, due to their fragmented ownership. For example, difficulties in obtaining consensus to maintain or upgrade the building can result in deteriorating physical condition and a poor tenant mix. ○ As a result, URA no longer allows the strata subdivision of the commercial component of properties in the CBD and Orchard Road, and other areas near key landmarks of national significance, into individual units. This restriction will also apply to redevelopment proposals under the CBD Incentive Scheme and Strategic Development Incentive (SDI) Scheme. 			

		<ul style="list-style-type: none"> ○ The restriction will ensure the upkeep and quality of developments in these prominent areas in the Central Area, and ensure that redevelopment proposals under the CBD Incentive Scheme and SDI Scheme are aligned with the objectives of rejuvenation for the various districts. ● Strata-titled developments can still be developed in other areas, and they will contribute to the diversity of commercial spaces and experiences island-wide. ● HDB typically plans for a Town Centre at the heart of every HDB Town, to serve as the key commercial hub and provide a broad range of goods and services such as supermarkets, F&B outlets and retail shops. The Town Centre is complemented by neighbourhood centres that are distributed across the town. In selected precincts located further away from the Town Centre and neighbourhood centres, HDB will also build precinct shops which generally include an eating house, supermarket or minimart, and a few shops for the convenience of residents. ● HDB shops continue to be relevant and cherished by residents. HDB is studying the social and economic value of heartland shops and have engaged over 2,800 stakeholders to gather feedback and ideas on how to increase vibrancy, inclusiveness, and heritage in our heartland shops. The study is completing and the findings will be released in the coming months.
7.	<p>We should safeguard the intangible aspects of our cultural heritage, such as traditional trades, through the built environment.</p> <p>We should consider subsidising rentals for traditional trades, for example, have trade centres for traditional trades, similar to how we have hawker centres for hawkers.</p>	<ul style="list-style-type: none"> ● Besides conserving the physical form of buildings and places, it is important to keep alive the meaning and memories of old areas and activities to which people have formed attachments. At the same time, we want to ensure that the heritage space remains relevant and viable, into the future. It enriches the appreciation of what has been conserved and nurtures a collective sense of ownership, especially with the next generation. ● We adopt various strategies to recollect and celebrate them, while also balancing the need for rejuvenation. For example: <ul style="list-style-type: none"> ○ Events and activities can help to keep the spirit of a historical district alive. <ul style="list-style-type: none"> ▪ Heritage Institutions – such as the Indian Heritage Centre, Malay Heritage Centre and Sun Yat Sen Nanyang Memorial Hall – showcase the intangible cultural heritage of the diverse communities through various ethnic festivals and signature programmes, engendering a greater appreciation of the festivals, practices and art forms of the communities. ▪ In Kampong Gelam, for example, a voluntary partnership of stakeholders has been formed to develop a Place Plan which proposes a set of strategies and initiatives that leverages the precinct attributes and celebrates its past and present to ensure it remains relevant.

		<ul style="list-style-type: none"> ○ NHB's heritage trails, Street Corner Heritage Galleries and community galleries such as Kreta Ayer Heritage Gallery help to capture the history and social memories of places and neighbourhoods, including the intangible cultural heritage of the areas. <ul style="list-style-type: none"> ▪ NHB's self-guided trails allow people to embark on the journey of discovery at their own time and pace. There are currently 22 such trails, including in heartland areas such as Hougang, Pasir Ris, Tampines, Bedok, Jurong, Toa Payoh, Queenstown, Tiong Bahru, Bukit Timah, Balestier, Ang Mo Kio, and Sembawang. ▪ Under Street Corner Heritage Galleries, NHB works closely with local shop owners with at least 30 years of history in selected precincts to co-create "mini museums" that showcase the history and heritage of their businesses and trades. Through the scheme, NHB hopes to raise awareness of and foster deeper appreciation for heritage in everyday spaces, and generate greater support for heritage businesses. The pilot scheme has been launched in Balestier, Kampong Gelam, Little India and Chinatown, and will be rolled out to the Geylang Serai precinct in 2023. ▪ Kreta Ayer Heritage Gallery showcases the rich cultural heritage of the Chinese community in Chinatown and highlights the area's rich and diverse intangible cultural heritage. These include cultural art forms such as Chinese opera, Chinese puppetry, nanyin music, calligraphy and tea appreciation. It is NHB's first community gallery that focuses on intangible cultural heritage. ● To safeguard our intangible cultural heritage (ICH) and encourage their sustainability and transmission to future generations, NHB has introduced schemes and grants such as the following: <ul style="list-style-type: none"> ○ Craft X Design, which aims to raise the profile of local traditional craftsmanship, and increase access of local traditional craft practitioners to new markets, networks and designs. By matching local designers who are able to capture and capitalise on current design trends with traditional craft practitioners who are willing to impart their skills and techniques, the initiative hopes to enhance the long-term sustainability and commercial viability of our traditional crafts, which are an important part of our intangible cultural heritage. ○ The Stewards of Intangible Cultural Heritage Award, a recognition scheme launched by NHB in 2019 to recognise the dedication of ICH practitioners and encourage practitioners to transmit their skills and knowledge to the next generation. ○ Organisation Transformation Grant (OTG) – a grant that aims to encourage and support heritage businesses and organisations to carry out transformative and/or innovative projects that will contribute to
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		<p>the sustainability and long-term viability of their business.</p> <ul style="list-style-type: none"> • NHB is in the process of identifying the second intangible cultural heritage (ICH) element to be nominated for the UNESCO Representative List of ICH, following the success of the inscription of Hawker Culture in Singapore. The inscription of Hawker Culture has instilled a sense of pride in Singaporeans and it also shows Singapore’s commitment to safeguard our ICH for future generations.
8.	<p>We should leverage technology to share social memories across generations.</p> <p>For example, we could use QR codes, Augmented Reality, and Virtual Reality to enhance the experience and appreciation of heritage sites.</p>	<ul style="list-style-type: none"> • We will continue to tap on technology to gather social memories through crowd sourcing, to deepen and expand the memories of our heritage sites. • Digital platforms have helped us explore new ways of storytelling, for example, by combining archival material with user-submitted contributions, in intuitive and exciting formats, such as story maps and virtual reality. <ul style="list-style-type: none"> ○ URA’s recent collaboration on CityStories with NTU is an example of how we are working on bringing a range of content, sourced from both official archives and the ground. ○ NHB’s Roots is a one-stop portal that houses Singapore’s National Collection, heritage trails, National Monuments, historic sites, intangible cultural heritage (developed with the community), and other heritage resources including multimedia assets under one roof, making it easy for Singaporeans to access, explore and learn about our heritage and history. ○ Our Grandfather Stories (OGS) is another initiative driven by the community and private sector. ○ HDB put together a list of Heartland Spots that were identified together with members of the community. Through Heartland Spots, people can learn more about heartland spaces in their town, such as thematic playgrounds, murals, and historic sites. They can also take a 360-degree virtual tour of selected towns.

STEWARD

8. Nature, greenery and water

*S/N	Feedback from Public Engagement	Our Response
1.	<p>We should avoid further development and deforestation, and keep as much of the greenery and nature we have.</p> <p>Replanting after development and new planting (for example, through the One Million Trees movement), does not achieve the same effect as retaining original greenery, for example, in terms of carbon sequestration, biodiversity.</p>	<ul style="list-style-type: none"> ● Given our limited land, we must be judicious in stewarding our land resources to support Singapore’s development, as well as in our transformation into a City in Nature. <ul style="list-style-type: none"> ○ This includes balancing demands and trade-offs across a wide variety of needs, including housing, green spaces, infrastructure, community facilities and workplaces, amongst others. ○ We have adopted, and will continue to adopt, various strategies that enable us to recycle and reuse our limited land. These include redeveloping brownfield sites such as golf courses as leases expire and undertaking major long-term redevelopment moves to free up land. ● Over the decades, we have safeguarded and enhanced our natural capital even as we developed the city. We have set aside 7,800 hectares of green spaces including four Nature Reserves, Nature Parks, and identified Nature Areas to be kept for as long as possible. ● In balancing our competing land use needs, we prioritise key sites of ecological value for conservation. <ul style="list-style-type: none"> ○ NParks has completed an island-wide Ecological Profiling Exercise (EPE), in partnership with experts and members of the nature community, to build a more comprehensive picture of Singapore’s ecosystem and ecological connectivity. ○ As part of the EPE, NParks developed a combination of least-resistance pathway and agent-based modelling as ecological profiling tools, to formulate conservation strategies that support our natural ecosystems. Findings from the EPE allow us to sensitively plan and integrate nature into the planning process. ○ The EPE helps guide urban planners in balancing development and the retention of greenery, by considering ecological connectivity upstream in the planning process. It also provides a more robust scientific basis to inform our land-use planning. URA and NParks will continue to work closely to ensure that key biodiversity areas, as well as ecological connectivity will be maintained when development takes place within identified ecological corridors.

		<ul style="list-style-type: none"> • We are committed to stewarding and protecting our green spaces. However, given our physical constraints, there will be some greenfield sites that we have to develop to meet our land use needs. <ul style="list-style-type: none"> ○ If a proposed development is in or near an ecologically sensitive area, as part of the planning approval process, studies will be conducted to consider the relative significance of the site, weigh the trade-offs, and consider how the potential impact may be mitigated as much as possible, such that the new development may be sensitively integrated with its surroundings.
2.	<p>With a low birth rate, there is no need for so much new housing development. We should intensify on existing land and brownfield sites instead of affecting green areas.</p>	<ul style="list-style-type: none"> • Housing demand is driven by a variety of factors including population growth, population ageing, household growth due to marriage and family formation, and changing social structures and housing preferences. • While Singapore’s population growth has slowed down over the past decade, housing stock has grown by 2.8% on average per year in the past decade to cater to the increase in housing demand. • Even if our population remains unchanged in the future, the land we need for housing may change in line with the following: <ul style="list-style-type: none"> ○ Ageing population and specific requirements for senior-friendly housing, ○ Changing household sizes, for example, increase in single-person or single-generation households would increase land needed for housing, and ○ Families’ flat size preferences. • Our living spaces and environment must also cater to other future trends, such as: <ul style="list-style-type: none"> ○ Flexible working arrangements, ○ E-commerce, ○ Smart technologies, and ○ Climate change. • In addition, we continue to set aside land for future potential housing beyond present needs, in order to preserve optionality for future generations, so that they have options and land resources to meet the needs and land demands that they may face in future. <ul style="list-style-type: none"> ○ For instance, although the Total Fertility Rate has been declining, in the longer term, the number of births may be higher or lower depending on factors such as sentiments towards marriage and having children.

		<ul style="list-style-type: none"> • While we have safeguarded the capacity for future housing growth, this does not mean that all of the land will be put to residential use, or that the land will be developed in the near term. <ul style="list-style-type: none"> ○ A proportion of land that is zoned for residential use will also be set aside for supporting amenities (for example, schools, community facilities, neighbourhood/town centres, parks) or left undeveloped as reserve sites to retain flexibility to cater to unanticipated needs. ○ Many factors are considered in deciding when to develop a particular site, such as the need for the development, infrastructure readiness, availability and suitability of other sites, and market conditions.
3.	<p>We should ensure that our buildings and urban environment have as much greenery in them as possible, for example, by encouraging high-rise greenery, sky terraces, planting on rooftops and covered linkways, connecting buildings at various levels with green, and tree-planting/re-planting.</p> <p>Such “urban greenery” is aesthetically pleasing (especially when flowers and other colourful plants are included), while also encouraging biodiversity and co-existing with / serving as extensions of natural habitats (for example, by playing host to animals and insects).</p>	<ul style="list-style-type: none"> • We will step up efforts to integrate greenery into our urban environment through various strategies, such as introducing more parks and green spaces, as well as by leveraging development schemes and incentives. <ul style="list-style-type: none"> ○ The Landscaping for Urban Spaces and High-Rises (LUSH) scheme stipulates a range of Landscape Replacement Areas (LRA) requirements and incentives. The scheme incentivises developments to replace greenery lost due to development with greenery integrated with the urban environment. ○ Under LUSH 3.0, urban farms and vertical facades now count towards the LRA requirements. We have also expanded the geographical area of the scheme. ○ In addition, we have introduced the Green Plot Ratio (GnPR), a quantum measuring the density or total leaf area of greenery planted. Simply put, areas with higher Green Plot Ratio must provide more and denser greenery in their developments. ○ To date, the scheme has contributed almost 300 hectares of greenery, equivalent to about 470 football fields. Two in three new residential developments and one in two new offices, shopping centres and hotels have taken up the LUSH scheme. • We will continue to review our policies to ensure that we can replace and even enhance the greenery lost as we develop, allowing nature and the built environment to co-exist. • Beyond simply replacing greenery, we will add greenery to our urban structures and settings, to create mini habitats for wildlife. Skyrise gardens and parks can serve as connections between key habitats and help contribute to quality living environments.

		<ul style="list-style-type: none"> ○ As part of the review of the current LUSH scheme, we are developing ecologically-sensitive development guidelines so that landscaping for buildings can also help to improve ecological connectivity between key habitats. ● Skyrise greenery is a key strategy to restore nature into urban landscapes under NParks' City in Nature vision, which is a key pillar of Singapore Green Plan 2030. <ul style="list-style-type: none"> ○ NParks' skyrise greenery programme has a comprehensive suite of initiatives comprising a Skyrise Greenery Incentive Scheme (SGIS) for existing building owners to retrofit their building with green roofs and vertical green walls, a research programme to build a science-based approach to greening built environments, competency and capacity developing programmes to develop industry to ensure these greening efforts remain sustainable in the long term. ○ Skyrise greening efforts help to cool our urban environments, bring therapeutic effects of greenery directly to homes and workplaces and support ecological biodiversity.
4.	<p>We want to have an even more green environment, and be able to access greenery and nature wherever our homes might be. This is important because:</p> <p>a) Nature and greenery are key to our emotional and physical well-being. This was especially evident during the pandemic, when people worked / studied from home and were not able to travel. Greenery and nature aid socialising,</p>	<ul style="list-style-type: none"> ● We will provide even more green spaces in the coming decades: <ul style="list-style-type: none"> ○ We have safeguarded 7,800ha of green spaces today, which include Nature Reserves, Nature Parks, Nature areas, parks and park connectors. We will set aside another 1,000 hectares of green spaces over the next 10 to 15 years. ○ Today, our park connector network extends over 370km, and by 2030, it will be expanded to 500km. With this, we aim for every household to be within a 10-minute walk from a park by 2030. ○ We have also curated island-wide recreational routes and Nature Park Networks to provide more opportunities to explore our island and enhance accessibility to our green spaces. ● We will continue to green our heartlands by planning for more Biophilic towns. <ul style="list-style-type: none"> ○ To promote a greater sense of place, better well-being and enhanced quality of life for residents, HDB has developed a Biophilic Town Framework to guide the enhancement of existing natural assets and the development of neighbourhood and precinct landscapes. ○ The framework outlines the principles and strategies in the planning and design of neighbourhood and precinct landscapes to optimise urban ecosystem services for greater environmental health and human

	<p>exercise, and learning about nature.</p> <p>b) Nature and greenery alleviate the impact of climate change – for example, by providing natural cooling and flood protection.</p> <p>Not all parks need to be big; pocket parks are enough for urban relief. Areas served by / near to large parks also do not need access to small ones.</p> <p>Good examples of planning with greenery are: Khoo Teck Puat hospital, Rail Corridor.</p>	<p>well-being. It entails a comprehensive set of considerations in the five key aspects of People, Flora and Fauna, Outdoor Comfort, Water and Soil.</p> <ul style="list-style-type: none"> ○ Since 2019, the Biophilic Town Framework has been adopted for all new public housing developments nationwide. Residents can look forward to more nature-centric neighbourhoods, which offer plenty of opportunities to reconnect with nature and enjoy its intrinsic benefits. ○ More greenery has been integrated in urban spaces such as rooftops. Since 2009, all new multi-storey carparks come with roof gardens. In existing HDB estates, we will also introduce more greenery in the form of urban farms, extensive greenery, or community/ allotment gardens to the top decks of selected multi-storey car parks, under the HDB Green Towns programme. ○ Since 2016, all new HDB developments have had to meet the minimum Green Plot Ratio (GnPR) of 4.5, meaning that the total leaf area of the greenery, including skyrise greenery, will have to be at least 4.5 times the size of the housing development. <ul style="list-style-type: none"> ● We will step up efforts to integrate greenery into private developments, by leveraging development schemes and incentives. <ul style="list-style-type: none"> ○ The Landscaping for Urban Spaces and High-Rises (LUSH) scheme is a comprehensive urban and skyrise greening programme comprising both Landscape Replacement Areas (LRA) requirements and incentives to encourage developers to provide greenery and communal spaces in buildings. Greenery lost due to development is replaced with at least the same area of greenery or more, integrated with the urban environment. ○ NParks' Skyrise Greenery Incentive Scheme (SGIS) also encourages the proliferation of more rooftop and vertical greenery across our built environment to support climate, ecological, and social resilience efforts. Funding support of up to 50% of installation costs of rooftop greenery and vertical greenery, including green roofs, rooftop gardens and green walls, is available to existing building owners and developers under the Scheme. ● We will continue to green our industrial estates, by incorporating green and blue networks in industrial estates. <ul style="list-style-type: none"> ○ As part of masterplanning for industrial estates, JTC plans for parks and green corridors within new industrial estates and existing estates. These green areas will be integrated with new waterbodies like ponds where possible. These green/blue areas are for both the talent who work in the industrial estate
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and the general public to enjoy. At the individual development scale, JTC integrates skyrise and rooftop greenery into industrial buildings.

- NParks is intensifying greenery in Singapore’s industrial estates, which are currently among the hotter areas on the island, by planting more trees in these areas. These efforts are part of NParks’ wider OneMillionTrees movement, where we aim to plant one million more trees island-wide between 2020 and 2030, in partnership with the community.
- We will find suitable opportunities to integrate canals with the surrounding landscape to create multi-functional blue-green spaces for the public to enjoy.
 - The widening and deepening of a section of the Sungei Tampines canal has enhanced flood protection of the surrounding area, in the event of intense rainstorms. It has also incorporated a naturalised bank on one side of the canal, to seamlessly integrate with the adjacent Tampines Eco-Green. This creates additional communal/recreational spaces and enhances the overall liveability of the environment.
 - Alkaff Lake, which will be integrated with the new Bidadari Park, serves as a stormwater retention pond to slow down and reduce stormwater runoff into the drainage system during heavy storms, thereby reducing flood risks. It is also designed with terrace wetlands and a cascading creek to help channel and cleanse stormwater run-off from the park before it discharges into the Alkaff Lake. During dry weather, the banks of the lake and viewing decks will serve as a communal space for the public.
- In an effort to extend physical and mental wellbeing benefits of interacting with nature through gardening, we will continue to support gardening interests of people by working with various land owners to activate more gardening spaces.
 - NParks actively works with agencies (e.g. HDB, SLA), Town Councils and grassroots to activate garden spaces along common green spaces, multi-storey carparks and under-utilised spaces. These efforts have allowed more people to have touch points with nature near where they live. There are more than 1,800 community gardens across the island with more than half of them located in residential estates. These community gardens have engaged over 45,000 gardening enthusiasts of all ages.
 - NParks’ Allotment Garden Scheme has also provided more opportunities for people to take up gardening, in parks near their homes. Currently, close to 2,200 plots have been made available in 25 parks.

<p>5.</p>	<p>We want variety in our green spaces – not just manicured and managed parks, but rustic, wild nature areas as well.</p> <p>Parks and greens can be multi-use, to draw more visitors and to optimise land: for example, parks can double up as community/urban farms, and host arts and cultural events.</p> <p>We should also allow more commercial uses in parks (for example, eateries and shops), to help generate revenue for maintenance.</p>	<ul style="list-style-type: none"> • As part of the City in Nature vision, NParks is intensifying nature in our gardens and parks. <ul style="list-style-type: none"> ○ NParks will curate landscapes in gardens and parks to make them more natural. For example, NParks will incorporate natural designs and planting in new and redeveloped parks and gardens, to re-create the lush look and feel of Singapore’s natural forests. ○ In addition, where space permits, the waterbodies within our gardens and parks will be naturalised. • We will plan for green spaces to cater to different interests, and serve multiple purposes. <ul style="list-style-type: none"> ○ Our network of nature parks and nature corridors is planned to be multi-functional. Beyond safeguarding our natural capital, many of our green spaces and corridors also allow us to enjoy outdoor activities such as running, hiking, and mountain biking. We will continue to expand this network and add another 200ha of nature parks by 2030. ○ Our parks and gardens are multi-functional green spaces, and we will add more of these in the coming decades. They are planned as inclusive, communal spaces, and provide a range of natural, semi-natural to more urban settings, to cater to the diverse interests of park users. These spaces double up as ecological stepping-stone habitats for some fauna species like birds, encouraging activities such as birdwatching and wildlife photography. ○ NParks’ Allotment Garden Scheme launched in 2016 also provides for more gardening spaces within our parklands to residents who live in nearby HDB residential estates. <ul style="list-style-type: none"> ○ The scheme has grown from 80 plots in a pilot at HortPark to now close to 2,200 allotment plots in twenty-five parks across the island. ○ These allotment gardens encourage more residents to garden in our parklands as a means for community participation and bonding and to bring people closer to nature for health and well-being. ○ NParks also introduced the Social Enterprise Community Urban Farms (SECUF) grants in 2021 to facilitate the creation and running of community gardening hubs in parklands. <ul style="list-style-type: none"> ○ SECUF aims to bring community together through curated edible gardening programmes to reap wellbeing benefits. They can also help provide micro-employment and volunteering
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		<p>opportunities to residents especially seniors and less privileged. The first SECUF site is planned at West Coast Park.</p> <ul style="list-style-type: none"> ○ NParks organises events and activities related to Sports & Wellness, Arts & Culture, Concerts & Performances, Gardening, Nature, Pets and Animal Welfare, etc. The list of upcoming activities in our parks, park connectors and nature reserves can be found on NParks' website at https://www.nparks.gov.sg/activities. Besides these, our parks are also serve as venues to events organised by other agencies, industry partners and the community. ○ Commercial facilities such as F&B, recreation and retail in our parks and gardens are meant to provide services and value-add to park users' experiences. They are scaled according to the size of the parks and gardens, and sensitively managed for synergy with the theme of each park/garden. We will continue to identify and meet service gaps, where required.
6.	<p>Where we do develop, we should be sensitive to nature. We should minimise opportunities for human-wildlife conflict to arise.</p> <p>For example, we could have more eco-bridges and nature ways for animals to move safely. Buildings could also be designed to be biodiversity-friendly, for example, to reduce frequency of bird collisions.</p> <p>Education, nature guides and walks can help improve awareness and appreciation for nature.</p>	<ul style="list-style-type: none"> ● Developing in a way that is sensitive to ecological connections can reduce human-wildlife conflict. <ul style="list-style-type: none"> ○ Unlike other countries with large hinterlands outside their city centres, Singapore's core habitats are fragmented within our city-state. ○ It is thus vital for our urban fabric to support and foster ecological connections between core habitats. This requires a deeper understanding of how both greenfield and brownfield sites can contribute to ecological connectivity across the island. ● NParks has enhanced its wildlife management framework to manage Singapore's wildlife population more effectively, and in doing so, better protect public health and safety. <ul style="list-style-type: none"> ○ NParks adopts a community- and science-based approach to wildlife management. This is underpinned by four thrusts: (i) understanding population ecology, (ii) population management, (iii) public education, and (iv) promoting community stewardship. ○ Altogether, this enhanced framework will help to cultivate public understanding of our native biodiversity, as well as our overall approach towards wildlife management. In doing so, it will promote harmonious human-wildlife coexistence to better manage the community's encounters with nature. ○ This will facilitate our transformation into a City in Nature, where our urban infrastructure is integrated with our green spaces.

		<ul style="list-style-type: none"> • We can also enhance appreciation for nature by creating opportunities for people to be closer to nature, without infringing into ecologically sensitive habitats. <ul style="list-style-type: none"> ○ Singaporeans can now immerse themselves in nature by visiting our 4 Nature Reserves and 12 Nature Parks. These spaces allow visitors to appreciate nature with minimal disturbance to flora and fauna. • Moving forward, we will sustain our efforts to steward our natural green and blue spaces. We will continue using our community- and science-based approach to strengthen the conservation of our native biodiversity, as well as balance conservation and development. We will also continue to provide opportunities for Singaporeans to appreciate and co-exist with nature.
7.	<p>We should have a greater emphasis on planning for our water assets, for example, connectivity between inland waterbodies and providing more opportunities for water recreational activities.</p> <p>Good examples are: Bishan-Ang Mo Kio Park, and Punggol Waterway.</p> <p>It would also be good to differentiate our waterways based on whether they are more urban or more natural.</p>	<ul style="list-style-type: none"> • The green and blue spaces that house Singapore's natural habitats also support our recreational needs. • Our green and blue spaces will be better integrated to provide leisure spaces during dry weather, while managing stormwater during wet weather. <ul style="list-style-type: none"> ○ Beyond storing and channelling water, we have opened up some of our reservoirs and waterways for water sports and other recreational activities. For instance, we can dragon-boat race, wakeboard and canoe at Marina, Bedok and Pandan reservoirs respectively. More of such blue spaces can be integrated with adjoining land uses and activated for leisure. ○ Many of our concrete canals and waterbodies have been transformed into recreational sites for all to enjoy and protect under the Active, Beautiful, Clean Waters (ABC Waters) programme to foster community stewardship and ownership among citizens towards our water resources. • However, we also need to factor in other important considerations for these waterbodies to safeguard our water security. Recreational activities must not impact reservoirs' primary function as a source of raw water for treatment into potable water. Other important considerations include potential impacts on ecosystems within the freshwater bodies that could affect biodiversity and water quality, and the available space for other important uses, such as the deployment of floating solar photovoltaic systems as part of our sustainability efforts, in land-scarce Singapore. <ul style="list-style-type: none"> ○ Singapore's first large-scale floating solar photovoltaic system at Tengeh Reservoir opened last year. Following this, PUB has identified Lower Seletar Reservoir and Pandan Reservoir for further solar deployment. These will contribute towards our solar target of at least 2 GWp by 2030.

Responses to feedback and suggestions raised during the Long-Term Plan Review (LTPR) Public Engagement

		<ul style="list-style-type: none">• Through sensitive planning and creative design, we will continue to enhance the quality and connectivity of our green and blue spaces, and allow more people to appreciate and enjoy them.
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SUSTAIN

9. Sustainability and Climate Change

S/N	Feedback from Public Engagement	Our Response
1.	<p>Buildings should be environmentally-friendly throughout their life cycle, from construction, operations, to end-of-life.</p> <p>We should consider sustainable construction materials, such as wood, instead of concrete and steel, and integrate solar panels on building façades and on windows.</p> <p>We should encourage circular economy concepts in the building life cycle, for example, by having a platform that would facilitate the reuse and recycling of unwanted construction materials between developers and contractors.</p> <p>We should design buildings to be modular, so they can be resilient to changing needs, without wasting.</p>	<ul style="list-style-type: none"> • We aim to make sustainability a key consideration in the entire building life cycle. • Upstream at the design stage, private developers and consultants are encouraged to incorporate environment sustainability and maintainability considerations in their building designs and construction, and engage downstream users (such as facility managers) for their inputs. Doing so will help ensure efficient use of resources in construction as well as reduce the use of resources and maintenance workload during building operations and maintenance. <ul style="list-style-type: none"> ○ The Government is taking the lead on this by requiring all public sector buildings (new and existing buildings upon major retrofit) to demonstrate exemplary performance in design for sustainability and maintainability by achieving BCA's Green Mark Platinum Super Low Energy (SLE) standard and the Maintainability badge. • At the construction stage, it is already a requirement to adopt sustainable construction practices, such as the use of low carbon concrete and environmentally-friendly products. • Beyond the design and construction of green buildings, the sustainability of a building during the operations phase is also important. <ul style="list-style-type: none"> ○ BCA's Green Mark scheme promotes the reduction of a building's carbon footprint over its entire lifecycle. The scheme encourages developers to assess the embodied and operational carbon of their building projects. ○ PUB's Water Efficient Building (WEB) programme encourages building owners to adopt water-efficient measures (e.g. installation of water-efficient cooling systems and adoption of water-efficient flush volumes) in their premises and processes to achieve WEB certification. ○ Smart Facilities Management (FM) is integral to ensure that buildings continue to operate and perform at the optimal level throughout their useful lifespan as the bulk of a building's energy footprint arises from the downstream operations phase. Through Smart FM technologies, data from sensors installed in

<p>Redevelopment and en-bloc can be wasteful, while also destroying social memories. We should incentivise re-using and retrofitting existing buildings instead. Currently, refurbishment is deemed more expensive than building new, but it might not be once we factor in the impact on environment.</p> <p>One good example cited was Golden Mile Complex, which demonstrated a balance between incentivising stakeholders to adopt adaptive reuse while embracing market forces to make the option financially sustainable.</p>	<p>building systems and their environment can be collected and analysed to improve energy efficiency and avoid excessive cooling.</p> <ul style="list-style-type: none"> ○ We are also encouraging the adoption of Integrated FM (IFM) and Aggregated FM (AFM) through a stronger partnership between the service buyers and the FM companies, together with their solution providers. This involves harnessing synergies from managing different FM services on an integrated platform, and aggregating FM services across buildings. IFM and AFM can yield up to 20% in productivity improvements and propagate scalable solutions that unlock synergies across disciplines to build a professional, skilled and adaptable FM workforce. <ul style="list-style-type: none"> ● At the same time, we are accelerating the greening of our existing building stock, to achieve our target of greening 80% of our buildings (by Gross Floor Area) by 2030. <ul style="list-style-type: none"> ○ We recognise that retrofitting an existing building for better energy performance can be more challenging and costly than adopting green building designs upfront in a new building. Hence, BCA has launched the \$63 million Green Mark Incentive Scheme for Existing Buildings 2.0 to co-fund retrofitting works to improve a building’s energy efficiency to achieve at least Green Mark Platinum standards. ○ A Green Mark Platinum building will achieve at least 50% improvement in energy efficiency above 2005 levels, along with other sustainability outcomes such as designing for maintainability, reducing embodied carbon across a building’s life cycle, using smart technologies, enhancing a building’s resilience to climate change and creating a healthier environment for building users. ● Finally, when buildings are demolished, we will recycle as much building material as we can. <ul style="list-style-type: none"> ○ Through the efforts of NEA, BCA and the private sector, our recycling rates for construction and demolition waste have been consistently near 100% since 2016. Demolition Protocol was introduced to maximise materials recovery and facilitate upcycling into Recycled Concrete Aggregates (RCA) through processes involving screening, crushing and removal of ferrous metals. RCA is used in structural and non-structural concrete applications including road constructions. For example, Samwoh Eco-Green Building was constructed with up to 100% RCA. ○ NEA and BCA are also exploring how other waste material can be used for construction. For example, ash from incinerated waste could potentially be recycled for use in concrete mixes.
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		<ul style="list-style-type: none"> The decision on whether to redevelop a building or adaptively reuse it is a complex one, especially in land-scarce Singapore. While adaptive reuse reduces the need for demolition and reconstruction, redevelopment may still make sense if the building is no longer fit for purpose or if it will enable more optimal use of the land and result in a more energy-efficient development.
2.	<p>We should design and place our buildings such that they capitalise on natural cooling. This will help to manage the Urban Heat Island (UHI) effect, and be more sustainable as it saves energy usage on air-conditioning. For example, we should:</p> <p>a) Design external building elements and place buildings so that they enjoy natural sea breezes, channel wind corridors over cooling waterbodies, plan for spacing between buildings, use cooling paints on buildings, and use building materials that don't trap heat.</p> <p>b) Design for tropical architecture internally, such as by using architectural</p>	<ul style="list-style-type: none"> We will design our urban environment to mitigate urban heat, especially since it will be compounded by rising global temperatures. To do this better, we are intensifying efforts to better understand urban heat. <ul style="list-style-type: none"> Since January 2017, we have partnered with researchers in the Cooling Singapore project to map temperatures across Singapore. <ul style="list-style-type: none"> We are developing modelling tools that can be used to map wind flow and heat profile at various scales. From such models, we can determine where to introduce new parks and open spaces, plan for wind corridors through directing coastal winds inland to cool the environment, plan for the energy efficient buildings, and use urban design to minimise Urban Heat Island (UHI) effect and maximise outdoor thermal comfort (OTC). One example is the Integrated Environmental Modeller (IEM) by the Agency of Science Technology and Research (A*STAR) and HDB. It is a first-of-its-kind tool to simulate the combined effects of environmental factors on the design of open spaces and building layouts. The tool enables urban planners and developers to test their heat mitigation plans in advance, so that they can design housing and infrastructure that brings about maximum thermal comfort, creating a more pleasant living environment for residents. We are also implementing measures to mitigate urban heat. <ul style="list-style-type: none"> We will incorporate localised solutions at the district or site level. One such solution is cool paint, where past trials have shown its effectiveness in reducing ambient temperatures by up to two degrees Celsius. HDB has already launched a pilot project involving 130 blocks in Tampines. We will intensify green spaces within our city, especially skyrise greenery in dense urban areas such as residential blocks. HDB will introduce more greenery in the form of urban farms, extensive greenery, or community gardens to the top decks of selected multi-storey car parks (MSCPs) under its Green Towns programme. These small green pockets soften the urban environment by acting as visual relief and mitigate heat gain by helping to reduce surface and ambient temperature.

	<p>features that encourage natural ventilation and airflow within buildings, reintroducing balconies into HDB flats, and implementing district or building-level cooling systems.</p>	<ul style="list-style-type: none"> ▪ We will incorporate multi-tiered planting in streetscapes to cool our streets, enhancing pedestrian experience. ▪ We will increase porosity at coastal areas and waterfront sites, to take advantage of sea and land breezes. ▪ Our plans for buildings and neighbourhoods will include climate-sensitive urban designs. These include optimising street and building alignment, varying building heights, and increasing the permeability of buildings. By optimising natural ventilation, we can cut back on waste heat from air-conditioner compressors. ▪ We will also employ district cooling systems (DCS) where appropriate, to save on energy, cost, and greatly reduce waste heat. DCSes have been deployed in the Marina Bay financial district, as well as at various business parks. At the new Tengah town, residents will also have the option of subscribing to a Centralised Cooling System (CCS) which is a more energy-efficient solution to keep their homes cool than conventional air-conditioning system.
<p>3.</p>	<p>We should protect ourselves from rising sea levels and floods with innovative infrastructure that has multiple uses, such as modular seawalls and nature-based solutions.</p> <p>While the naturalised canal at Bishan-Ang Mo Kio park is a good example of multi-purpose flood protection, it may not be possible to implement this everywhere. We should be open to intermediate solutions too (for example, partial naturalisation of canals coupled with widening</p>	<ul style="list-style-type: none"> • In developing coastal protection plans, we will search for innovative solutions to better integrate our land use, sea space needs and the natural environment. For example, we can co-locate coastal protection measures with recreational spaces. • PUB will work with other government agencies such as National Parks Board (NParks) to explore the potential of implementing hybrid solutions that combine existing natural elements with hard engineering measures. • To protect against more frequent and intensive floods: <ul style="list-style-type: none"> ○ We will find suitable opportunities to integrate canals with the surrounding landscape to create multi-functional blue-green spaces for the public to enjoy. ○ The widening and deepening of a section of Sungei Tampines has enhanced the flood protection in the surrounding area in the event of intense rainstorms. The drainage upgrading works also incorporated a naturalised bank on one side of the canal to seamlessly integrate with the adjacent Tampines Eco-Green Park, to create additional communal/recreational spaces and enhance the overall liveability of the environment.

	<p>could help to slow down runoff).</p>	<ul style="list-style-type: none"> ○ Alkaff Lake, which will be integrated within the new Bidadari Park, serves as a stormwater retention pond to detain the stormwater runoff from nearby Bidadari Estate, thus reducing flood risks to the surrounding areas. It is also designed with terrace wetlands and a cascading creek to help channel and cleanse storm water run-off from the park before it discharges into Alkaff Lake. During dry weather, the banks of the lake and viewing decks will serve as a communal space for the public.
<p>4.</p>	<p>We want more urban farms and community farms, to boost local food resilience and self-sufficiency.</p> <p>Farms can make use of less utilised spaces, such as carpark rooftops, and be indoors or underground.</p> <p>Agricultural uses can double up as green spaces (for example, parts of our parks could be farming allotments for retirees; our roadside tree-planting verges could be used to plant fruit trees).</p> <p>We should educate the young to enhance appreciation of local food resilience, and to teach practical skills like growing your own plants.</p>	<ul style="list-style-type: none"> ● Singapore’s farms play an important role in strengthening our food security as local production mitigates our reliance on imports. We are working towards our “30 by 30” goal to build our agri-food industry’s capability and capacity to produce 30 percent of our nutritional needs sustainably by 2030. ● We have safeguarded land for agriculture in Lim Chu Kang. <ul style="list-style-type: none"> ○ We are master planning Lim Chu Kang into a high-tech agri-food zone that can raise food production in a sustainable and resource-efficient manner. ○ Given our limited land with competing needs, we encourage the adoption of productive and sustainable technology and farming systems to maximise yield per hectare at such sites. Through the Agri-food Cluster Transformation Fund, SFA provides co-funding for local farms to innovate and testbed novel farming technologies, and adopt automated and advanced farming technology solutions. ● To support high-tech agriculture and aquaculture, we will also consider developing farms in industrial buildings on a case-by-case basis. <ul style="list-style-type: none"> ○ We adopt a selective approach as sufficient industrial space needs to be kept for manufacturing and manufacturing-related uses, and not all industrial buildings are suitable (e.g. insufficient floor loading capacity). We will also need to ensure that the agriculture and aquaculture uses are compatible with the surrounding environment. ● In addition, URA, HDB, SLA and SFA are exploring alternative spaces for urban farming. <ul style="list-style-type: none"> ○ We have introduced new urban farming sites on the rooftops of suitable HDB multi-storey car parks around Singapore, such as at Bukit Panjang, Sembawang and Woodlands. To date, 16 multi-storey carpark sites have been tendered out for commercial urban farming pilots since 2020. ○ Separately, we have also introduced urban farming in other alternative spaces. For example, the former Henderson Secondary School was converted into an integrated space comprising an urban farm, a nursing home and kidney dialysis centre, a childcare centre and space for recreation. The licensed

		<p>urban farm operator was able to make use of the school’s existing facilities and land area to grow vegetables as well as run educational programmes.</p> <ul style="list-style-type: none"> ○ However, farms in alternative spaces are generally small in scale, and operations could be challenging, due to considerations such as availability of a suitable site, and ensuring that the resultant activities such as goods traffic, transport of fertiliser, etc. do not adversely affect surrounding uses. ○ While production volume may not be significant, these alternative spaces help to bring food production closer to the community to raise awareness and foster community spirit.
5.	<p>We should find spaces for alternative and renewable energy infrastructure, such as hydrogen, nuclear, carbon capture, and tidal. These sources will be useful as energy demands increase because of technology, automation, and the internet-of-things.</p> <p>We should further improve the uptake of solar power, for example by incentivising private developers; constructing solar roads, footpaths, and covered walkways / sheltered linkways; and putting solar on more rooftops (such as bus depots, even when interspersed with other rooftop uses like gardens).</p>	<ul style="list-style-type: none"> ● To support our low-carbon transition, we will green our grid and improve our energy and carbon efficiency. ● Solar energy is the most promising renewable energy source for us. <ul style="list-style-type: none"> ○ Grid-connected installed solar PV capacity in Singapore has grown exponentially over the last decade, from 6MWp in 2011, to 120MWp in 2016, to 670MWp as at Q1 2022. ○ Agencies and private solar companies are working towards achieving a solar target of at least 1.5 gigawatt-peak (GWp) by 2025 and at least 2GWp by 2030. We are also deploying 200MW/200MWh of energy storage systems to address solar intermittency and enhance grid resilience. ○ To meet our future energy demands, selected HDB rooftops are installed with solar panels under HDB’s SolarNova programme. Thus far, HDB has committed a total solar capacity of around 440 MWp. This is part of a larger goal to generate 540MWp of solar energy by 2030 – enough to power 135,000 4-room HDB flats. ○ JTC now requires solar panels to be installed for new land and land-based facility allocations, lease renewals, land launches and tenders in all its estates, as long as they have at least 800sqm of rooftop space. ○ We plan to deploy solar panels across all viable spaces such as our rooftops, waterbodies, and building facades. In exploring the use of reservoirs for deploying floating solar panels, a key consideration is to ensure minimal impact on water quality and the environment.

		<ul style="list-style-type: none">• We will continue to explore emerging alternative energy supply options to determine their suitability for Singapore.<ul style="list-style-type: none">○ EMA has launched a Request For Proposal to import 4GW of low carbon electricity from the region by 2035.<ul style="list-style-type: none">▪ Importing Low-carbon hydrogen is another such option, which we will have to adapt our existing infrastructure and/or invest in new infrastructure to support.○ Other alternatives that are being explored include geothermal and nuclear energy.<ul style="list-style-type: none">▪ Conventional geothermal systems are not viable in Singapore due to the lack of adequate hot water and steam resources at shallow depths. However, due to recent advances in geothermal technology, we could possibly harness geothermal heat from deep underground.▪ The Nanyang Technological University (NTU) is conducting exploratory studies to estimate the geothermal resource potential in various parts of Singapore. In order to ensure a more comprehensive assessment of resource potential, there are also plans to conduct a wider geophysical investigation project across Singapore. If found feasible, geothermal energy could be a new source of indigenous clean energy for us.○ As for nuclear energy, new designs being developed have the potential to be much safer than many of the plants in operation today. These include Small Modular Reactors (SMRs) and “Generation IV” nuclear technologies, which incorporate enhanced safety systems that may not be possible for older generation technologies.<ul style="list-style-type: none">▪ Besides nuclear fission, there have also been significant interest and advances in nuclear fusion development. However, many of these advanced nuclear technologies are still in research and development phase, and have not begun commercial operations. Given the technical complexity of nuclear energy technologies, we will need to continue building our ability to better understand and assess their safety, security and environmental implications before we consider them for deployment in Singapore.▪ The Government, through the Nuclear Safety Research and Education Programme, is supporting research in relevant areas of nuclear policy, science and engineering, as well as efforts to train a pool of scientists and experts in local and overseas universities.
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<p>6.</p>	<p>We want our economy to be greener. We should do more to promote the circular economy.</p> <p>Even if we don't have the space for green energy (for example, wind), we can be part of the value chain to produce the energy. We could strengthen our advantage in battery technology and hydrogen, and become an energy node for the region.</p>	<ul style="list-style-type: none"> • We will strive for Singapore to be a global exemplar of the green transition. • We will grow Singapore's green economy, and support Singapore's positioning as a green living laboratory for the test-bedding of sustainability solutions. • We will facilitate the adoption of circular economy concepts, by co-locating industries that share common resource loops. <ul style="list-style-type: none"> ○ Our future industrial estates will leverage opportunities to adopt circular economy concepts and co-locate synergistic industries that can share common resource loops. <ul style="list-style-type: none"> ▪ This concept will be piloted at the future Sungei Kadut Eco-district ("SKED"), where we will strategically site Agri-tech Farming, Food Manufacturing and Processing, Environmental Tech, Biosciences and Lifestyle industries. ▪ Within SKED, there will be an integrated urban agriculture and aquaculture technology hub that will optimise space, reap economies of scale, and contribute towards Singapore's food security goal. ○ In the planning for the future Lim Chu Kang agri-food zone, we will also explore having common facilities for agri-production to improve resource efficiency, such as wastewater and waste management, packing, distribution and logistics. Where possible, circular economy principles to encourage the by-products of farms to be reused as inputs for other parts of the agri-food ecosystem will be incorporated. ○ The upcoming Tuas Nexus is Singapore's first integrated water and solid waste treatment facility. By employing the latest technologies, Tuas Nexus will harness the synergies of the water-energy-waste nexus from used water and solid waste. The by-product of one facility becomes a resource for the other facility.
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PLANNING APPROACH

10. Be flexible about use of space

S/N	Feedback from Public Engagement	Our Response
1.	<p>Flats should be designed in a way that allows us to reconfigure the layout easily, to suit changes in our lifestyles over time.</p>	<ul style="list-style-type: none"> • For new flats, HDB has moved towards pushing columns to the outer edges of the unit. <ul style="list-style-type: none"> ○ This offers homeowners the flexibility to reconfigure the internal walls of their homes more easily, to suit their evolving needs – for example, they can combine or create more rooms as they need. ○ Under the Construction Transformation Project (CTP), a hybrid precast system will enable HDB to design and build flats using a beamless flat plate system, which results in consistently higher headroom compared to flats in typical BTO projects which have beams. As a result, residents will have greater flexibility in configuring the layout of their flat. This construction method will be piloted at the upcoming Garden Waterfront I & II @ Tengah BTO project, which will be launched in November 2022.. • The 2-room flexi typology is also designed to support an elderly person: depending on their needs, the extra room can accommodate a caregiver or serve as an additional study area. • HDB is also exploring providing a wider choice of internal layouts that support different lifestyles and work-from-home arrangements. For example, homes can be designed with more open floor plans so that owners can configure the spaces according to their needs.
2	<p>We should leave more spaces empty within towns, so they can be activated for uses when needed.</p> <p>For example, void decks and other common spaces can be used as work corners for remote working, pop-up libraries, community herb gardens, and coffee spots.</p>	<ul style="list-style-type: none"> • We will continue to plan for and inject buffer spaces within towns. This will give flexibility to cater to the different amenities that a town may need as its demographics shift over time. • Buffer spaces could take the form of spaces within developments, or empty plots of land. • Within developments: <ul style="list-style-type: none"> ○ HDB void decks serve as buffer spaces, for potential conversion to social communal facilities that serve the community, such as preschools and active ageing centres. ○ Besides void decks, many newer developments also include buffer space for future uses, such as in community buildings.

	<p>Void-decks and common areas can be multi-level, so there is more space for residents to use.</p> <p>State lands can be left to re-wild and serve as nature areas until they need to be used again.</p>	<ul style="list-style-type: none"> ○ There are some trade-offs to consider when it comes to setting aside buffer spaces. <ul style="list-style-type: none"> ▪ The introduction of uses into this “buffer” can come at the expense of the openness and porosity of our void decks, and affect our housing environment. ▪ While creating multi-level void decks to cater for additional buffer space is a novel idea, we must consider that every space we leave void for a potential use tomorrow, is one space less for a keen user today. We may also have to consider the impact of bringing in more of these community uses, in terms of, for example, noise nuisance. ▪ Buffer spaces could also add to construction and maintenance costs. ● Empty plots of buffer land also help us maintain flexibility: <ul style="list-style-type: none"> ○ In every town, we have always planned for pockets of empty land (known as “reserve sites”), that allow us to cater space for injection of new developments or unanticipated amenities within towns. Over time, some of these sites have been developed to meet new needs. ○ Going ahead, we plan to set aside buffer land in an intentional way as we redevelop, so that we will continue to have some room to cater for future uncertainties. Such sites can also be put to suitable interim uses until they are needed for development.
3	<p>We want more spaces to be available for short-term use – for recreation, and for shops and businesses. These will make better use of space and be more affordable for start-ups to kick off their businesses.</p> <p>For example, we should allow container units on State land, so people can run small businesses at low rent.</p>	<ul style="list-style-type: none"> ● State land that is not needed for immediate development is often put to short-term use such as interim hard courts, or simply as green spaces for community events and sports. <ul style="list-style-type: none"> ○ Since 2003, SLA has been opening up State land to the public for community use. Today, 266 State fields are open for this purpose. ○ The field spaces are open to the public free of charge for non-exclusive community use. If the community would like to have exclusive use of a field, they can take up a Temporary Occupation License (TOL) and pay a license fee according to usage. ● We will continue to let out State properties that are not earmarked for immediate development to support a range of interim uses. <ul style="list-style-type: none"> ○ An interesting recent example is the former Henderson Secondary school, which was put to use as a childcare centre, nursing home, dialysis centre, and urban farm, all in one.

		<ul style="list-style-type: none"> ○ The shorter interim tenures of such sites give us the flexibility to activate them for other uses when necessary. ● There are certain drawbacks to shorter interim uses. <ul style="list-style-type: none"> ○ The short tenures can affect business viability and certainty. ○ There is also often a sense of loss when the use is ultimately phased out for development into the permanent use as originally intended, both for the user, and the community using it.
4.	<p>We should make better use of our public facilities through time-sharing.</p> <p>For example, school facilities could be used after hours for community classes or night classes, and childcare centres could be used as study areas on the weekends.</p> <p>This can help free up space supply and reduce competition for space.</p>	<ul style="list-style-type: none"> ● Today, under MOE’s and SportSG’s Dual Use Scheme, the community can make use of school sports facilities during weekends. <ul style="list-style-type: none"> ○ All government school fenced fields and Indoor Sports Halls have been committed for community sharing under the Dual Use Scheme, and today, more than 400 school sports facilities are available for public use. ● The Dual Use Scheme also helps optimise the use of our land, through shared usage over time. ● MOE is exploring how some new schools, or schools undergoing major upgrading works, could be planned and designed upfront to share more facilities with the community, so as to encourage social interaction and community bonding within the neighbourhood. <ul style="list-style-type: none"> ○ For example, lecture theatres can double up as venues for community events, while suitable green spaces in schools can be optimised for community gardening. ○ We will explore ways for such places to be designed to be more open and welcoming to the public, while remaining safe and secure for students. New amenities can also cater for more flexible and diverse uses. ● In general, we will consider how to design buildings and facilities so that they can accommodate multiple uses throughout the day – increasing flexibility of existing spaces, while encouraging social interaction. ● We will also study how under-utilised spaces can be creatively repurposed. <ul style="list-style-type: none"> ○ We are working with partner agencies and companies on a courier hub pilot project, where designated areas within public carparks can be used for unloading, sorting and storage of parcels. The first phase

Responses to feedback and suggestions raised during the Long-Term Plan Review (LTPR) Public Engagement

		ran from Oct 2021 to Apr 2022. In the future, this pilot could be expanded to other commercial and residential car parks.
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11. Make good use of above, underground, and sea space

S/N	Feedback from Public Engagement	Our Response
1.	<p>We should make better use of building rooftops and facades. Many are currently inaccessible or under-utilised. For example, we could use rooftops as community spaces, gardens, farms, solar panels, coffee shops, running tracks, and basketball courts.</p> <p>We can raise awareness of such spaces using technology, such as apps.</p> <p>We should also consider making linkages between buildings at higher levels to improve connectivity and accessibility, while creating more space.</p>	<ul style="list-style-type: none"> • We will continue to find ways to make better use of our rooftops and facades. • We have been putting otherwise under-utilised roofs of HDB blocks and multi-storey carparks to use. <ul style="list-style-type: none"> ○ The top decks of selected multi-storey car parks located within HDB estates have rooftop gardens, and even urban farms. <ul style="list-style-type: none"> ▪ Since 2009, all new HDB multi-storey carparks come with roof gardens. ▪ We have introduced new urban farming sites on the rooftops of multi-storey carparks around Singapore, such as at Bukit Panjang, Sembawang and Woodlands. To date, 16 multi-storey carpark sites have been tendered out for urban farming since 2020. • Many of our building rooftops are also being used for solar panels to generate energy. • Building owners' buy-in is important for rooftops or facades to be put to use, as there might be concerns about safety or liability issues, as well as the cost involved to fit out the rooftop space for the new use. It also takes a sustained effort by community users for the use to thrive. • Elevated linkages between existing, occupied buildings can be difficult to implement due to engineering and safety considerations. Cost also needs to be considered. It may be more cost-effective to plan for these upfront, in new developments.
2.	<p>We should maximise the use of our air space and vertical space, by building developments as high as we can.</p> <p>This can reduce the need to develop on greenfield sites / sites with greenery.</p>	<ul style="list-style-type: none"> • Singapore is no stranger to building high, given our land area constraints. <ul style="list-style-type: none"> ○ We have residential developments, such as the 50-storey The Pinnacle@Duxton (160m), the tallest public housing complex in the world, as well as commercial skyscrapers such as Guoco Tower (290m). • We will continue intensifying developments where suitable, considering that: <ul style="list-style-type: none"> ○ We cannot build too high around airports and airbases, due to height controls for safe aircraft navigation.

		<ul style="list-style-type: none"> ○ Taller developments also tend to have more infrastructure requirements and higher maintenance costs (such as for lifts and fire safety requirements). ○ We also manage development height in some areas, to shape our built environment and ensure a good quality living environment. For example, development heights may be “stepped down” towards the waterfront to enable more developments to enjoy the waterfront.
3.	<p>To make more space, we should consider building over existing infrastructure (such as roads, expressways, and even existing low-rise buildings) – for example, cantilevered parks, elevated cycling tracks, or even new houses and residential buildings. We could double- / triple deck our expressways.</p> <p>There are some benefits to doing so, such as: shading the use underneath from sun, and blocking out noise from the use underneath. However, there could also be drawbacks, such as making the use/road below feel dark, and possibly trapping any pollution generated from the use beneath.</p>	<ul style="list-style-type: none"> ● We will explore elevated infrastructure where appropriate. <ul style="list-style-type: none"> ○ At Jurong Innovation District, an 11km long car-free “Sky Corridor” is being planned to run above ground-level vehicular roads. <ul style="list-style-type: none"> ▪ It will serve workers, as well as residents of the nearby Jurong West and Tengah towns, and allow pedestrians, cyclists, and possibly in the future, autonomous vehicles to move seamlessly within the precinct to nearby transport hubs and exciting lifestyle options. ○ The Bukit Timah-Rochor Green Corridor will be a new linear park running along the Bukit Timah Canal, likely to be elevated at some sections and at-grade at others. <ul style="list-style-type: none"> ▪ The first phase between the Rail Corridor and Jalan Kampong Chantek consists of an elevated sky park above the canal. It will connect to the Rail Corridor near the Bukit Timah Railway Station community node, and the existing pedestrian overhead bridges across the roads. These areas will act as access points for visitors on both sides of the canal. ● Even as elevated infrastructure makes use of our air space, it still takes up land at-grade, because of the ramps needed to access it, and the support columns for the elevated infrastructures. ● In other countries, there are examples of road flyovers running through buildings, and developments being built over roads and expressways. <ul style="list-style-type: none"> ○ We understand that this has typically been done with some compromise to noise and safety, which are important factors we need to consider.
4.	<p>Make better use of spaces under expressway viaducts and elevated MRT tracks,</p>	<ul style="list-style-type: none"> ● Currently, some spaces under viaducts and flyovers have been put to creative uses that serve the community.

	<p>for example: for sports, pop-up shops, and community/farming purposes.</p>	<ul style="list-style-type: none"> ○ The land under Toa Payoh South Flyover has been transformed into a 1,911sqm community space comprising a dog run park and two hard courts, now known as “Our Space @ Tai Gin”. ○ Singapore’s first sheltered archery range is located under West Coast Flyover. ● Moving ahead, we will continue to explore innovative ways to activate such spaces for the benefit of the community. <ul style="list-style-type: none"> ○ URA, LTA and other stakeholders, such as Public Transport Operators, are embarking on a pilot project to reimagine MRT stations as community hubs. Adjacent under-viaduct spaces could be activated to introduce more commercial and community services, and better integrate MRT stations to the rest of the precinct. ● However, not all spaces under viaducts may be suitable to be put to use. <ul style="list-style-type: none"> ○ We need to consider issues, such as vehicular and pedestrian access, safety, potential disamenities (such as noise and traffic), availability of infrastructure (such as utilities connection), etc.
<p>5.</p>	<p>We should make better use of our underground space, at various levels, to optimise the use of our limited land.</p> <p>Underground space can be put to infrastructural uses, for example, electrical substations, expressways and rail, utilities, carparks, farms, and storage.</p> <p>We can even consider putting residential uses underground, as a way of avoiding deforestation and use of greenfield sites at-grade / above ground.</p>	<ul style="list-style-type: none"> ● We intend to site infrastructural uses underground, so that the surface will be freed up for uses that people can enjoy, such as homes, green areas, and recreational spaces. ● We already use many layers of underground space. <ul style="list-style-type: none"> ○ Near the surface, using underground space for building basements, underground pedestrian networks, and laying of utility lines is common practice. ○ Further below, we tunnel for our infrastructure networks, such as rail lines, expressways, utilities like water, sewage and gas, and even create deep caverns for storage facilities. ● There are trade-offs and considerations in going underground: <ul style="list-style-type: none"> ○ High cost of underground construction, especially in Singapore’s densely built urban environment: For example, the cost per kilometre of underground MRT construction is more than double than that of an elevated line. ○ Technical feasibility: Unsuitable soil conditions could limit the places in Singapore where we can build underground. We must also consider whether the underground infrastructure will affect the uses above.

	<p>Some benefits of underground spaces are that they are weather and sound-proofed, so they can be used for noise-generating uses (for example, basketball courts, and theatres). However, a drawback is safety and security issues.</p>	<ul style="list-style-type: none"> • We are actively conducting research on suitable uses that can be housed underground, so that we can better plan the use of our underground space for the future. <ul style="list-style-type: none"> ○ Some parts of Singapore with good rock may be suitable for creating underground cavern spaces. ○ We are exploring an underground drainage and reservoir system consisting of caverns and stormwater tunnels to mitigate increased flood risk. ○ Underground caverns could also be tapped on for storage, or to house underground logistics systems, which can move goods efficiently and reduce surface road traffic. ○ As technology advances, we should see a greater use of autonomous machines and off-site control and monitoring of production processes. Such automated production spaces that do not need workers to be physically present could be sited in underground caverns, while the manned control centres are sited in more accessible urban areas.
<p>6.</p>	<p>We should use floating facilities to create more space, for example for housing, commercial, industry, sports (the Float@Marina Bay), farms, airport and port uses, or even a “floating city”.</p> <p>We can leverage our existing expertise in offshore and marine industry to do so.</p> <p>As technology improves, and land prices on mainland get higher, floating spaces will be increasingly viable.</p>	<ul style="list-style-type: none"> • Today, we already have floating aquaculture farms and solar farms off the coast of Pulau Ubin and Woodlands respectively. • EMA has also partnered Keppel Offshore & Marine to test-bed Singapore’s first floating Energy Storage System. The project will explore a first-of-its-kind battery stacking solution to reduce land take by up to 40%. • While we can explore installing more floating platforms in the future, we will need to consider how to allocate available sea space for the installation of floating platforms without compromising the safety of navigation, efficient port operations, anchoring of vessels and long-term port development. • We must carefully assess the feasibility of large-scale floating structures for higher-density human-habitable uses. We need to: <ul style="list-style-type: none"> ○ Compare the installation of such floating platforms with current methods of land creation and reclamation, based on cost, reliability, durability, and effective lifespan. ○ Consider that while floating structures are possible viable options for resilience of new developments to rising sea levels, they are not able to protect the land behind them as traditional reclamation can.

		<ul style="list-style-type: none"> ○ Mitigate the environmental impact of floating structures, as floating platforms may discharge waste or heat into the surrounding waters and potentially cause ecology harm.
7.	<p>Our sea area is as much as our land area; we should make better use of and more purposefully plan for our sea spaces.</p>	<ul style="list-style-type: none"> ● Our sea space is well-utilised today. <ul style="list-style-type: none"> ○ As a global maritime hub, much of Singapore’s sea space is used for navigational fairways and anchorages. ○ With the seas around us being generally calm, we already enjoy a wide range of coastal activities such as sailing, windsurfing and stand-up paddling, especially in areas that are away from the main navigational fairways and anchorages that support our busy port and industries. ● As with our efforts to optimise the use of our land, we work with industry and researchers on ways to optimise the use of our sea space. <ul style="list-style-type: none"> ○ This will be done through co-locating uses, matching appropriate uses to suitable sites, and harnessing technology. <ul style="list-style-type: none"> ▪ We have co-located solar photovoltaic (PVs) systems with fish farms along the East Johor Strait. ▪ MPA is studying ways to optimise anchorage usage as our port continues to grow, such as rolling out a “just in time” platform to enhance ship turnaround time in port through coordinating the scheduling of services such as pilotage, towage and bunkering. ▪ Our sea spaces at the Straits of Johor and Southern Waters are also used for aquaculture. Farms are encouraged to employ more productive methods of fish farming as we ramp up local food production to strengthen Singapore’s food security. ○ We will also use our sea space in a manner that is sensitive to the marine environment. <ul style="list-style-type: none"> ▪ To deepen our understanding of our marine ecology, NParks conducted the ecological profiling exercise (EPE) for coastal and marine habitats in early 2022 using agent-based modelling. ▪ Results from the EPE showed that Singapore’s marine ecosystems are generally self-sustaining. NParks will explore how habitat enhancement and restoration can be applied to enhance the resilience of our coastal and marine habitats, and study how development can be undertaken sensitively.

		<ul style="list-style-type: none"> ▪ Futuremore, NParks is leading the Marine Climate Change Science research programme. This programme seeks to advance the core sciences of marine climate change, and to develop evidence-based solutions to address the challenges faced by our coastal and marine environment arising from climate change. ▪ We will also continue working with agencies to implement nature-based solutions to integrate coastal and marine habitats, such as mangroves, with robust engineering measures. One example is the coastal enhancement at Kranji Coastal Nature Park. This will ensure the continued survival of these habitats, which are threatened by rising sea levels.
8.	<p>Think regionally and internationally – for example, use, lease or buy land in neighbouring countries so we effectively have more land, and can have “satellite Singapores”.</p>	<ul style="list-style-type: none"> • Singapore adopts a multi-pronged approach to meet our needs, such as for energy, food, and essential medical supplies, including strategies such as source diversification, local production, and stockpiling. • Businesses can also expand overseas on their own, where it makes sense to do so. <ul style="list-style-type: none"> ○ Under an SG+ “twinning model”, businesses can leverage on the comparative advantages of Singapore, Malaysia and Indonesia, by setting up dual production locations in Singapore and locations in our neighbouring countries (for example, Johor, Batam, Bintan, Karimun island), to expand in Southeast Asia and diversify their supply chains. ○ For example, a global consumer goods brand can manufacture products in Singapore, assemble and test them in Johor, and ship them to global markets through Singapore’s airport and maritime ports. An automotive electronics manufacturer can develop global research and innovation in Singapore, assemble and package automotive semiconductors in Batam, Bintan and Karimun, and distribute chips to the EU from Singapore. ○ Support is also available to companies undertaking such SG+ projects, through the Southeast Asia Manufacturing Alliance (SMA). The SMA brings together the complementary advantages of several industrial parks in Southeast Asia and Singapore, to help businesses grow their manufacturing footprint and diversify their supply chain, as part of a holistic and integrated regional strategy.

12. Planning practices

S/N	Feedback from Public Engagement	Our Response
1.	<p>Planning should move from 2D to 3D, for example, “3D zoning”, and planning in a way that spans air, land, sea, and underground space. This could help us find more space and opportunities for co-location, synergy between uses, and novel new uses.</p>	<ul style="list-style-type: none"> • URA planners and architects do leverage 3D digital models and systems for planning and urban design studies. <ul style="list-style-type: none"> ○ For example, we use various 3D tools, including a 2D-3D Geographic Information System (GIS) platform (called 3D Urban Planner) that integrates diverse types of data – ranging from planning parameters for unique sites to detailed 3D building information models in Singapore. ○ By using this platform, we can quickly visualise important information to facilitate holistic and well-rounded design. This includes developing sensitive response strategies to the environment by safeguarding important view corridors and analysing the impact of sun-shading in public spaces. ○ As we move towards more vertically integrated mixed-use developments, 3D planning can also provide insights, for example, to determine appropriate connections between developments by coordinating uses and levels. ○ URA’s repository of 3D models is a useful medium for public engagement as plans are conveyed to stakeholders more efficiently when translated into 3D models. ○ In terms of space planning, we agree with the feedback that 3D technologies can help us take stock of and plan different uses and activities, to facilitate co-location and optimisation of our land and spaces. We are exploring different technologies to support this. ○ We are also taking steps to enhance planning of underground space by: <ul style="list-style-type: none"> ▪ Developing a 3D geological model (under BCA) that will be collated into a central database for underground space planning. We also plan to collect accurate data of underground structures and utilities as well. ▪ Developing a 3D underground master plan. ▪ Organising underground space into shallow, deep and cavern layers, with people-centric activities in the shallow layers, and infrastructure and utilities in the deeper layers.

		<ul style="list-style-type: none"> ▪ Identifying and safeguarding areas with potential for cavern development. • Other than planning for our land and underground, we also plan our sea space using geospatial tools. The Maritime and Port Authority of Singapore (MPA), in collaboration with 11 other government agencies and Institutes of Higher Learning, announced GeoSpace-Sea in 2019, a source for integrated knowledge-based planning and development, and instrument for the modelling and “virtual twins” of Singapore’s land and coastal waters. The GeoSpace-Sea portal was launched in 2020 for stakeholder agencies’ access and has been made available to the public from August 2022 to help meet growing interest for geospatial data in marine and maritime research. <ul style="list-style-type: none"> ○ It is the country’s national marine spatial data infrastructure that harnesses and integrates marine and coastal geospatial data from diverse sources, bridging the information gap between land and sea, and providing comprehensive and interoperable geospatial information which is used for various applications. This includes port, marine and coastal planning, and environmental management. ○ The web portal allows users to securely upload and download data and web services, discover and analyse data, and will facilitate collaboration among government, industry and academia in areas such as marine science research and development, marine conservation, climate change adaptation, and open up new possibilities • We see value in working together with agencies and institutes to more holistically visualise and plan for Singapore in 3D.
2.	<p>We should make use of technology, sensors, big data to plan better for a “smart city”.</p>	<ul style="list-style-type: none"> • Singapore’s approach to building a smart city is about using technology to enhance our people’s quality of life. we believe that a smart city needs to balance the needs of today with that of tomorrow. This is why we aim to build a city powered by smart infrastructure to sustainably and resiliently enhance people’s lives, with the following outcomes in mind: <ul style="list-style-type: none"> ○ People experience reliable services. ○ People’s lives are comfortable, convenient, safe and secure. ○ People are empowered and connected.

		<ul style="list-style-type: none">• As we work to transform Singapore into a smart city, we are looking at harnessing smart digital technologies such as Internet of Things (IoT), sensors, Artificial Intelligence (AI) and automation to improve our urban lived experience, by supporting the planning, building and maintenance of our city more effectively. For instance,<ul style="list-style-type: none">○ Data analytics, modelling and simulation tools can help us better understand the demographics of the people in the area, how they get around, and what services and amenities they need, allowing us to plan our city more efficiently, with greater responsiveness to residents' needs and habits.<ul style="list-style-type: none">▪ Digitalisation enabled URA to support the COVID-19 efforts, such as through the SPACE Out website, which provided the public with real-time updates on the crowd levels in malls, supermarkets, and attractions across Singapore.▪ URA will continue to work to improve data quality and access, as well as work with agencies to develop useful tools and models for land use planning so we can share a common vision for our future city.○ It has also enabled us to design and build buildings based on a common 3D plan using Building Information Modelling (BIM), to streamline the different stages of a building project, and improve productivity.○ We can use sensors in our buildings to track water and energy use, and encourage more sustainable practices. Sensors can also monitor critical facilities such as lifts, to enable predictive maintenance before breakdowns occur.
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