



A RESILIENT SINGAPORE

CENTRE for
LiveableCities
SINGAPORE

POWERED BY THE
ROCKEFELLER FOUNDATION

100 RESILIENT CITIES

A RESILIENT SINGAPORE

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Set up in 2008 by the Ministry of National Development and the Ministry of the Environment and Water Resources, the Centre for Liveable Cities' mission is to distil, create and share knowledge on liveable and sustainable cities. The Centre for Liveable Cities' work spans four main areas—Research, Capability Development, Knowledge Platforms and Advisory. Through these activities, the Centre hopes to provide urban leaders and practitioners with the knowledge and support needed to make our cities better. For more information, please visit www.clc.gov.sg.

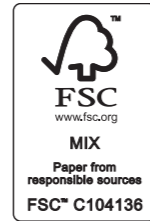
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Cover Image: Aerial shot of the Marina Bay Area, including the Marina Barrage, Marina Reservoir and Bay East Garden, Singapore, Credit: PUB, Singapore's National Water Agency.

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FOREWORD

LAWRENCE WONG, MINISTER FOR NATIONAL DEVELOPMENT AND SECOND MINISTER FOR FINANCE, SINGAPORE

Singapore has come a long way in transforming into a liveable and resilient city. In the 1960s, living conditions were far from ideal. We were subjected to multiple urban challenges including poor public health conditions, lack of quality housing, low connectivity across the island and employment insecurity.

The situation is very different today. The quality of life in Singapore has significantly improved—everyone has access to a clean and green environment, and to live in an inclusive society with opportunities for all.

As a small city-state with limited natural resources, we were keenly aware of the need to adapt and evolve to our constantly changing circumstances. Hence, we focus on long-term urban planning, and develop contingency plans for different scenarios. We do all this in a holistic, integrated manner, working across different sectors and more importantly, involving different stakeholders to create a sustainable and liveable Singapore.

Beyond robust physical infrastructure, resilience is also about working closely with our communities and stakeholders. For example, in providing affordable and quality public housing in Singapore, we not only build the flats, but also develop programmes to bring residents closer together and foster strong community bonds. Through this process, neighbours can forge deeper support networks which can be counted on during times of need.



Similarly, our approach to managing water is more than just a supply issue. We saw an opportunity to innovate and grow our water industries, and create beautiful blue-green recreational spaces through efforts such as the Active, Beautiful, Clean (ABC) Waters Programme and the Park Connector Network (PCN).

We have achieved much, but there is still more that needs to be done. Building an increasingly resilient Singapore is an ongoing journey, where the results hinge on the combined efforts of the government, our communities and stakeholders.

MESSAGE FROM CENTRE FOR LIVEABLE CITIES (CLC)

KHOO TENG CHYE, EXECUTIVE DIRECTOR, CLC

It would have been hard to imagine that Singapore, a basket case of urbanisation back in the 1960s—with urban slums, poor infrastructure and lack of sanitation—would make the leap to a thriving city-state in the space of 50 years, let alone be considered a highly liveable city.

Indeed, our transformation into a highly sustainable and liveable city-state while being one of the most densely populated cities with limited natural resources is a story of resilience. We built strong communities and overcame racial riots in the early years; fostered strong social cohesion through the way we plan and build our housing estates; established a clean and green Singapore; overcame our water scarcity by establishing 4 National Taps; and built multi-functional infrastructure such as the Marina Barrage. All these and the rest of the case studies outlined in this publication are examples of how resilience is embodied in the Singapore journey.

Singapore's development model of high density and high liveability has been a subject of interest for many. Even so, we are also continuously learning from other cities and how Singapore can do better to further build our resilience, sustainability and liveability. This is why the Centre for Liveable Cities was inspired to join the 100 Resilient Cities Network to learn from other cities in the network, as well as share Singapore's experience.

As cities continue to grow and urbanise in the face of global uncertainties and complex challenges, resilience is key. In Singapore's experience, resilience is not just about being able to recover after times of crisis. Resilience is continuously built through integrated and long-term planning and good urban governance. This has allowed us to build a Singapore that can survive, adapt and thrive regardless of the stresses and shocks we face.



This publication has utilised the Singapore Liveability Framework, which distils the key principles of Singapore's urban transformation, and 100 Resilient Cities' City Resilience Framework, to capture how Singapore has gone about building resilience. The publication has focused on two pertinent resilience challenges of climate change and changing demographics and the ongoing efforts and future actions to address them.

The Centre for Liveable Cities looks forward to continue working with 100 Resilient Cities to learn from its network of cities and share Singapore's experience with others. The collective knowledge and experience will most definitely go towards helping Singapore and other cities better understand resilience challenges and find innovative urban solutions to tackle them.

MESSAGE FROM 100 RESILIENT CITIES (100RC)

MICHAEL BERKOWITZ, PRESIDENT, 100RC

Singapore's story is one that demonstrates the importance of resilience thinking for cities. Singapore's transformation over the past five decades has been remarkable—from a fledgling nation state plagued by pollution, corruption, social unrest, and other urban challenges to a clean, safe, liveable and sustainable city today. That transformation towards resilience was achieved through a rigorous commitment to integrated planning and to constantly reimagining the city as it could be and as it should be in the near and far term. What is just as important is the commitment that Singapore has put in place to ensure that plans come to fruition and stakeholders are engaged in the process.

Since it gained independence, Singapore has taken an integrated, and strategic approach to creating and implementing its plans. By developing plans with both 50-year and 10-year time horizons and designing multiple benefits into every intervention, Singapore has become a living lab for the value of resilience thinking. Projects like Marina Barrage and Bishan-Ang Mo Kio Park could have focused on singular goals—to increase fresh water reserves and improve storm drainage—but delivered multiple benefits including improving biodiversity, reducing flooding, creating recreational space, reducing urban heat island effect and improving community cohesion.

In this Resilience Narrative, Singapore has documented how it has been successful in implementing its resilience plans and overcoming its challenges. But it has also asked some difficult questions and recognised continued challenges that will shape Singapore's future. The two challenges of climate change and changing demographics that Singapore has identified resonate with many cities around the world. This publication outlines what Singapore can and needs to do to further its resilience when dealing with such challenges.



Resilience is an ongoing process of reflection, engagement and innovation. Nowhere is this stated more clearly than in the final call to action of this document—a shift towards a values-based society, a call for the whole city to come together in good times and bad. Singapore holds a special place as the only nation state in the 100RC network. But in many ways here again, Singapore is tackling challenges that many cities will eventually have to face—how to survive and thrive as a city in an increasingly connected global context. I look forward to continuing our work with Singapore through the Centre for Liveable Cities on these challenges. Singapore has the potential to be a valuable contributor not only to our network but to all cities around the world on building resilience, planning for uncertainty and optimising resources. I hope this document can be instructive and a starting point for deeper global collaboration on important issues impacting cities today.



ABOUT CENTRE FOR LIVEABLE CITIES (CLC)

Set up in 2008 by the Ministry of National Development and the Ministry of the Environment and Water Resources, the Centre for Liveable Cities' mission is to distil, create, and share knowledge on liveable and sustainable cities.

The Centre for Liveable Cities' work spans four main areas—Research, Capability Development, Knowledge Platforms, and Advisory. Through these activities, the Centre hopes to provide urban leaders and practitioners with the knowledge and support needed to make our cities better.



ABOUT 100 RESILIENT CITIES (100RC)

100 Resilient Cities—Pioneered by the Rockefeller Foundation is dedicated to helping cities around the world become more resilient to the physical, social and economic challenges of the 21st century.

100 Resilient Cities supports the adoption and incorporation of a view of resilience that includes not just shocks such as floods, fires, riots, but also stresses such as growing diversity and aging population that could threaten and weaken the fabric of the city on a day-to-day or cyclical basis.



ABOUT THE 100 RESILIENT CITIES (100RC) NETWORK

100RC possesses a unique vantage point for understanding the changing landscape of cities in the 21st century. The holistic lens urban resilience offers decision makers is uniquely suited to meet the needs of the modern city and regions of which they are critical members. Cities in the 100RC network are provided with the resources necessary to develop a roadmap to resilience along four main pathways:

- Financial and logistical guidance for establishing an innovative new position in city government—a Chief Resilience Officer—who will lead the city's resilience efforts
- Expert support for the development of a robust Resilience Strategy
- Access to solutions, service providers and partners from the private, public and NGO sectors who can help them to develop and implement their Resilience Strategies
- Membership in a global network of cities who can learn from and help each other

EXECUTIVE SUMMARY

Singapore's journey is as much a story of sustainable urban development as it is of resilience. Just barely 50 years ago, a newly independent Singapore had to grapple with serious urban challenges—overcrowded slums, poor sanitation and public health conditions as well as inadequate infrastructure to meet a growing population. Then, we were less than two million people. Today, our population is more than 5.6 million without significant increases in our land area. Even as our population tripled, we have become more liveable as a city.

Resilience has been embedded in our efforts to develop Singapore into a liveable and sustainable city. In taking a long-term and integrated approach to planning and developing our city, we have been building up our resilience and capacity to manage and adapt to stresses and putting in place different measures to handle potential shocks. Given our context as a globally connected, high-density city-state with limited land and resources, our perennial stresses can easily spiral into larger problems or become amplified in times of crises if not well-managed.

In our early years, we provided basic necessities and infrastructure, such as public housing and clean water, and

built our economy, without compromising our sustainability and liveability. We worked with different stakeholders to build inclusive public spaces, conserve our nature reserves and protect our greenery, while reserving spaces for the arts and many more.

With increasing globalisation and urbanisation, Singapore, as with many other cities around the world today, continues to face increasingly complex urban challenges. Resilience thinking is not a luxury but a necessity for cities. It is about putting in place holistic and integrated measures to enable cities to adapt, survive, and thrive regardless of the stresses or shocks they face.

The Centre for Liveable Cities (CLC) and 100 Resilient Cities (100RC)—Pioneered by Rockefeller Foundation, have put together this publication to share Singapore's resilience story of building a highly liveable and sustainable city, and how we are continuing to build resilience in an increasingly complex environment. Through research and a series of engagements with various stakeholders from the public, private, and people sectors, we have identified key case studies and insights on Singapore's efforts to build resilience, focusing in particular on two key cross-cutting challenges: Climate Change and Changing Demographics.

Building resilience is an ongoing process. What matters is to learn from what we have done and achieved and to learn from others. More importantly, it is about how the whole city can come together, both in the day-to-day and during times of crises. We need to move from awareness to action. Everyone has a part to play in this continued commitment to building a resilient Singapore.

SINGAPORE: A JOURNEY OF RESILIENCE

OUR URBAN TRANSFORMATION

In 1947, the British Housing Committee Report proclaimed that Singapore “had one of the world’s worst slums—a disgrace to a civilised community”.¹

The British colony then had a population of less than one million people, more than half of which lived in dirty, overcrowded slums. Singapore was plagued by various urban challenges, and there was a dire lack of basic infrastructure with poor drainage and sanitation, polluted rivers, and a lack of clean, piped water. As a result, malnutrition and disease were rife, as was the prevalence of water and food borne diseases such as tuberculosis and cholera. Life expectancy was short, and infant mortality was high.

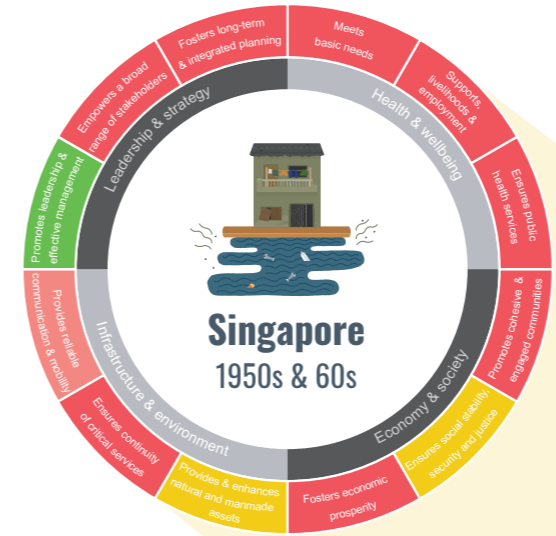
Today, Singapore ranks 25th on the Mercer Liveability Index. We have the third highest Gross Domestic Product (GDP) per capita and one of the lowest unemployment rates in the world. As our population tripled over the past 50 years, we have become a highly dense but liveable and sustainable city-state that offers our residents a high quality of life.²

This transformation of Singapore since our independence from 1965 is very much a story of resilience.

We have come a long way, but we cannot afford to be complacent or remain stagnant. Our journey forward builds upon our past as we continuously strive to further our resilience.

A city that fails to plan, plans to fail. With the emergence and continued existence of challenges that are increasingly global and complex, continuing the resilience journey in Singapore is critical.

01 - An officer from Flood Relief Survey Team taking particulars of dwellers at Potong Pasir, Credit: Ministry of Information and the Arts Collection, Courtesy of National Archives of Singapore
 02 - Street hawker stalls at the old Glutton’s Square at Orchard Road, Credit: Ministry of Information and the Arts Collection, Courtesy of National Archives of Singapore
 03 - Street hawker operating from a “five-foot way” by the street, Credit: Ministry of Information and the Arts Collection, Courtesy of National Archives of Singapore
 04 - Flooding in the 1960s, Credit: Ministry of Information and the Arts Collection, Courtesy of National Archives of Singapore
 05 - A bird-eye view of the Bishan-Ang Mo Kio Park, Credit: Jimmy Tan (Flickr)
 06 - Singapore’s skyline at night, Credit: Joan Campderros-i-Canas
 07 - Commuters exiting the Mass Rapid Transit (MRT), Credit: Centre for Liveable Cities (CLC)



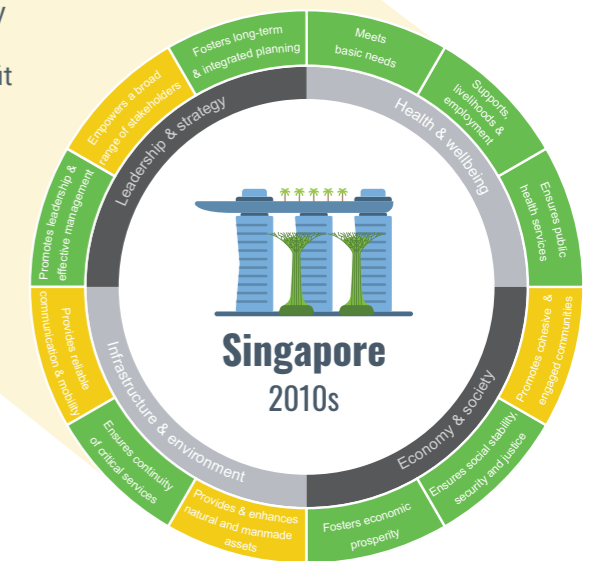
WE ADAPT

Putting in place robust infrastructure and systems that not only protect us against crises but also benefit us in times of peace

WE THRIVE

Creating a liveable and sustainable city-state despite our perennial stresses of limited land, lack of natural resources, and a diverse society

- Need to do better
- Doing well but can be improved
- Good



WE SURVIVE

Overcoming incidents and crises that threaten the stability of our city-state



SNAPSHOT OF SINGAPORE³

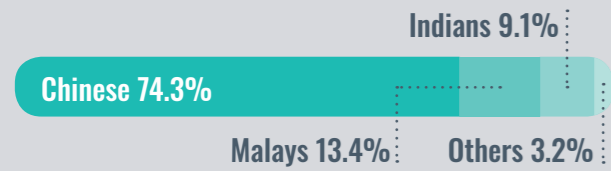
Land Area: **719.9 sq km**

Population: **5,612,300**

GDP/K: **S\$79,697**

Population density: **7796 per sq km**

Life Expectancy: **83.1 Years**



SOCIAL

Literacy rate of residents aged over 15: **97%**

Doctors / 10,000 population: **24**

Crimes / 10,000 population: **584**

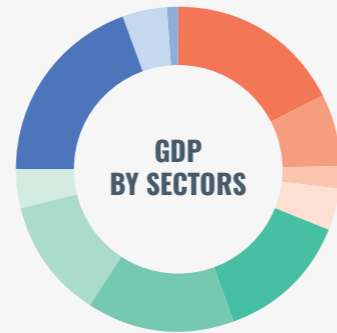
Home ownership rate: **90.7%**

Volunteerism: **35%**

Donations to charitable organisations: **S\$2.18 billion**

Volunteering hours: **121 million hours**

ECONOMIC



- UNEMPLOYMENT RATE: 2.1%**
- TOURISTS: 17.4 mil**
- EXTERNAL DEBT: \$0**
- | SERVICES PRODUCING INDUSTRIES | | GOODS PRODUCING INDUSTRIES | |
|----------------------------------|-------|----------------------------|-------|
| Wholesale and retail trade: | 17.6% | Manufacturing: | 19.2% |
| Transportation and storage: | 7.2% | Construction: | 4.3% |
| Accommodation and food services: | 2.1% | Utilities: | 1.3% |
| Information and communication: | 4.2% | | |
| Finance and insurance: | 13.3% | | |
| Business and services: | 14.8% | | |
| Other services industries: | 12.0% | | |
| Ownership and dwellings: | 3.9% | | |

ENVIRONMENTAL

Days with good and moderate air quality: **99%**

Area of skysrise greenery: **100ha**

Green cover: **47%**

Green view index (urban tree canopy density): **29.3%**

Flood prone area: **30.5ha**

Access to clean water: **100%**

Domestic recycling rate: **21%**

Non-domestic recycling rate: **76%**

Fuel mix: **95.2%** natural gas and **2.9%** other energy products

CHRONIC STRESSES ACUTE SHOCKS

Our Perennial Stresses

As a small city-state, Singapore's plans are often dealt with at the national level. We have to fit in the needs of a nation, including catering for military training grounds, defence airbases, sea ports, airports, water catchment areas, industrial zones and more while ensuring the well-being of a highly dense population. These are not typically expected of a city and they constantly add additional pressure on us.

As a small island constrained by limited natural resources, we have to constantly find innovative ways to balance competing land requirements to meet our different economic, social, and environmental needs.

Learning from Shocks

Oftentimes, stresses that are not managed well can spiral into larger incidents such as riots, financial crises or infrastructural accidents. When facing incidents beyond our control, what we have done to prepare ourselves will also impact on how well we can cope.

While Singapore has fortunately avoided major natural disasters, we have had our fair share of shocks over the years. Every incident is an opportunity to learn and adapt, ensuring that systems are in place for us to prevent or mitigate and recover better when faced with recurring or new shocks.

STRESSES IN SINGAPORE



LIMITED RESOURCES

Limited land area; Limited resources: food, energy, and water



CHANGING DEMOGRAPHICS

Increasing diversity; Decreasing total fertility rate; Rapidly ageing population



GLOBAL CHALLENGES

Climate change; Global economic uncertainties; Terrorism threats

ACUTE SHOCKS

1965 SUDDEN INDEPENDENCE —Separation from Malaysia

In 1965, Singapore suddenly found itself an independent nation with the separation from Malaysia. Without a hinterland, we had to deal with issues of sovereignty, defence and economic survival. This was compounded in 1967 when the British administration announced the withdrawal of its military bases here, which accounted for a significant proportion of Singapore's economy then.

One of the most pressing issues we faced was ensuring the security of our border. A new Ministry of Foreign Affairs was formed, as well as a People's Defence Force. This was followed by the expansion of the Singapore Armed Forces through mandatory conscription of male citizens through National Service in 1967. The same year, a Bases Economic Conversion Department was also set up to convert British bases for commercial uses to avoid large-scale unemployment.



01

Racial Riots
1964

MacDonald House Bombing
1965

Major Floods
60s/70s

Laju Incident
1974

Spyro Disaster
1978

Cable Car Tragedy
1983

Hotel New World Collapse
1986

Asian Financial Crisis
1998

Singapore Airlines Flight 117 Hijack
1991

2003 CONTAINING A PANDEMIC —Severe Acute Respiratory Syndrome (SARS) Outbreak in Singapore

By the time the World Health Organisation (WHO) termed the previously unknown virus as SARS on 15 March 2003, some 82 people in Singapore had already been infected. The city's economy also suffered as fears of the virus impacted tourism and streets were emptied as people stayed indoors.

Within two and a half months, the outbreak was successfully contained and Singapore was declared free of SARS on 30 May 2003. However, in that short period, the city had a total of 238 reported cases, including 33 deaths.

We were able to quickly contain the pandemic because of strong measures that addressed the issues on multiple fronts, including:

- Integrated and coordinated national-level responses that were led by the high-level Executive Group formed to lead government-wide responses to contain the virus and address the socio-economic impacts.
- Rapid and effective mobilisation of different groups from various sectors, including the military, healthcare and grassroots, to work tirelessly and closely together to contain the virus. This included contact tracing; monitoring and screening; campaigning to keep hygiene standard high in public spaces; and boosting public confidence.
- Ground-level initiatives among the public and community, e.g. neighbours sending food and groceries to those under quarantine.



02

Jemaah Islamiyah Terrorist Attempt
2001

Nicoll Highway Collapse
2004

Economic Recession
2008

H1N1 Outbreak
2009



03

Orchard Road Flash Floods
2013

Little India Riot
2013

MRT Breakdown
2015

Batam Bomb Plot
2016

2013 CATCHING A BREATHER —Dealing with the Haze Episode

In 2013, Singapore was hit by one of our worst haze incidents since 1997. The haze, which enveloped the city in mid-July, was caused by forest fires from neighbouring Indonesia. Haze levels reached Pollution Standards Index (PSI) of 400 on 21 July, a critical level deemed to be "potentially life threatening to the ill and elderly" by the National Environment Agency (NEA).

Some of the measures that were rapidly adapted in Singapore to deal with the haze included:

- Integrated national level coordination: A Crisis Management Group (Haze) meeting was convened by the Permanent Secretary of the Ministry of the Environment and Water Resources (MEWR) to lead and coordinate government responses.

- Rapid integrated crisis management responses: The Ministry of Health subsidised treatment of haze-related ailment for needy patients at private clinics, while the Singapore Armed Forces, together with grassroots volunteers, were mobilised by the People's Association to distribute N95 masks to 200,000 vulnerable households.
- Community level responses: The wider community also stepped up and reached out to vulnerable groups. Members of the public bought masks to distribute to needy families, and some even offered to house neighbours in their air-conditioned rooms.

01 - Registration exercise of first batch of National Service recruits, Credit: Ministry of Information and the Arts Collection, Courtesy of National Archives of Singapore
02 - Poster to raise awareness during SARS, Credit: Ministry of Community Development and Sports Collection, Courtesy of National Archives of Singapore
03 - Haze in Singapore, Credit: TH Tan

SUSTAINING AN OPEN ECONOMY

Singapore's strategic location in Asia has made us a gateway for multinational companies to enter the region's emerging markets. This is supported by our pro-business, world-class financial infrastructure, and a well-developed transportation hub that is home to one of the world's busiest sea and air ports. Singapore also has a skilled workforce, a result of efforts to develop people, our best and only resource.

Without a hinterland, Singapore has strived to keep an open and well-connected economy over the past five decades. While strong trading ties with other countries have helped us prosper, this strength also makes us vulnerable to global economic, political, and social stressors and uncertainties. It is critical that we remain highly flexible and nimble in the global economy, providing a safe, conducive, and liveable space to attract continued investments and talent.



Maintaining an open economy



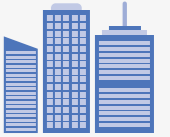
Forging strong trading ties with other countries



Developing a world class transportation hub



Developing strong financial infrastructure



Creating a safe and stable environment to attract investors

OVERCOMING LIMITATIONS TO CREATE A SUSTAINABLE ENVIRONMENT

With limited land and resources, Singapore has placed great emphasis on sustainable development since our formative years, rejecting the "develop first, clean up later" approach. Rather than treating environmental protection as being at odds with economic development, we see both as an integral part of city planning and development. In our early days, having a clean and green city demonstrated to foreign investors that we were well-run and safe—key factors that distinguished us from other cities and countries in the region.

Although surrounded by water, we are one of the world's most water-stressed countries. In our earlier years, water rationing had to be imposed during periods of drought. Monsoon periods led to flooding due to intense rainfall. Despite these perennial stresses, since 1979, Singapore had provided 100% access to clean, portable water to all its people and has reduced our flood prone areas to a mere 32 ha in 2015. Beyond the provision of clean water, we have also bolstered our water capacity with "4 National Taps": water from local water catchments, imported water from Malaysia, NEWater (high-grade reclaimed water); and desalinated water.



Avoiding a "Develop first, clean up later" approach



Cleaning up Singapore River



Improving sanitation and public health



Greening the city



Enhancing water security

MAINTAINING A MULTI-CULTURAL AND DIVERSE CITY

As a small city-state with no natural resources, bringing together Singapore's multi-ethnic, multi-religious society has been fundamental to our development. Founding Prime Minister Lee Kuan Yew once shared that the biggest challenge for Singapore was "how to build a nation out of a disparate collection of immigrants from China, British India and the Dutch East Indies"⁴. Today, diversity continues to be a hallmark of Singapore, with an ever growing foreign population attracted to live, work, and study here.

Our evolving demographic is going to challenge and stress the capacity of the city-state. In addition, an ageing population will impact the workforce and the economic dynamism of the city-state. It is critical that Singapore continues to engage our population and adapt to changes to ensure a healthy and happy populace. This means not just engaging and mitigating potential fault lines within the society, but also fostering a more cohesive community to play a key role in social support and rapport in times of troubles.



Maintaining racial and religious harmony



Providing quality and affordable public housing



Developing inclusive shared spaces



Working with communities



Four official languages: English, Mandarin, Malay and Tamil

DEVELOPING OUR LIVEABLE AND RESILIENT CITY

Resilience is the capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.

For Singapore, resilience is embedded in our pursuit of a liveable and sustainable city, ensuring that we can continue and better our path of development regardless of the shocks and stresses we face. We have done so by constantly balancing competing demands of developing a competitive economy, building a sustainable environment, and ensuring a high quality of life for our population.

This is expressed in the Singapore Liveability Framework, which captures the liveable city outcomes of a competitive economy, a high quality of life and a sustainable environment; and the approach to achieving these outcomes through integrated master planning and dynamic urban governance.

Integrated Master Planning

Singapore’s integrated master planning system has enabled the government to create and manage urban systems that balances the different priorities of the city. Integrated master planning goes beyond the drafting of physical plans. We look at optimising planning decisions such that policies and plans can meet both short-term and long-term needs, and respond to the changes of a dynamic political, economic, and social environment.

Dynamic Urban Governance

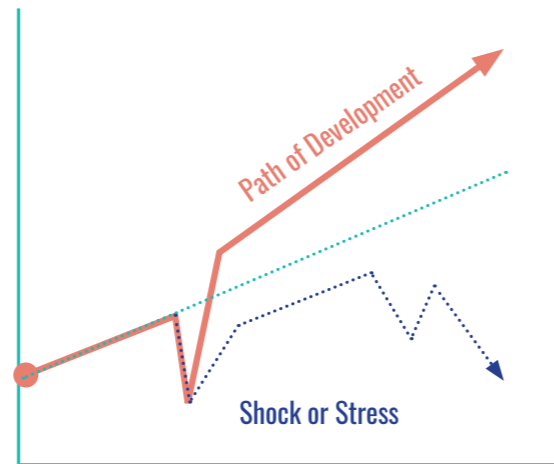
The challenge for most cities is in translating plans and strategies effectively and efficiently into reality. Singapore does this by having the necessary systems and processes in place based on accountability, transparency, and incorruptibility.

Oftentimes, the political leadership in Singapore sets a clear direction and rallies people from the public, private, and people sectors. With the proper systems and sound institutions in place, different government agencies cooperate and work with stakeholders from multiple sectors to implement and execute policies and programmes that foster growth and improve lives.

Singapore’s Concept and Master Plans embody the key principles of the Singapore Liveability Framework. Strategic and long-term in nature, the Concept Plan establishes the vision for land-use and transport for the next 40

The capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.

- Definition of Urban Resilience by 100RC

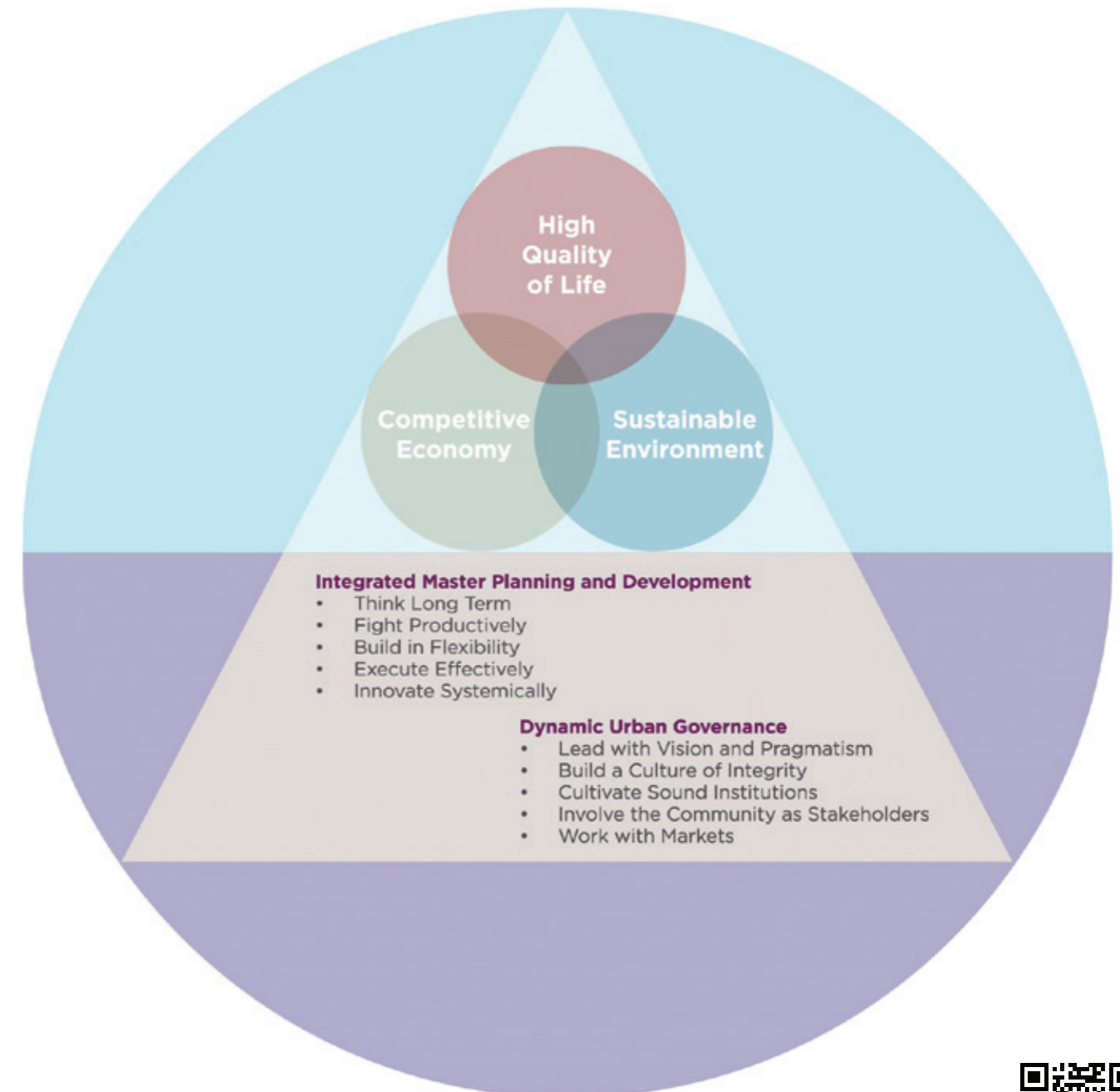


to 50 years of development, and these are translated into the Master Plan—a detailed and granular statutory plan that is used to guide development over the next 10 to 15 years.

As a city-state that has to factor in considerations at both the city and national levels, a comprehensive governance approach involving different stakeholders is in place to coordinate policy, planning, and implementations.

Singapore Liveability Framework

Credit: Centre for Liveable Cities (CLC)



Concept Plan

Singapore's first Concept Plan, completed in 1971, guided development of new towns, transport infrastructure and other aspects of urban development while safeguarding long-term land-use needs. The Concept Plan is reviewed every 10 years to address changes in social and economic needs, with mid-term reviews being carried out when necessary. Embedded within the Concept Plan process is a consultative process where feedback from the public are sought through detailed focus groups as well as platforms such as surveys, public forums, and exhibitions. This is coordinated by the Ministry of National Development (MND) and the Urban Redevelopment Authority (URA), the national authority for land-use planning.

Such long-term integrated planning builds resilience as planners consider how decisions deemed convenient now

might not lead to results beneficial to us in the long-term. This means embarking on projects that do not seem pressing at the moment but would be important in the future. Such a long-term view also enables planners to identify possible problems in the future and take steps earlier to pre-empt them.

The involvement of multiple agencies through inter-agency efforts also ensures that all key land-use requirements of the city are met and individual systems such as transport, water or public housing are not decided in isolation. This integrated approach involving more than 20 government ministries and agencies in drafting Concept Plans is an important element in building resilience.

Urban Governance

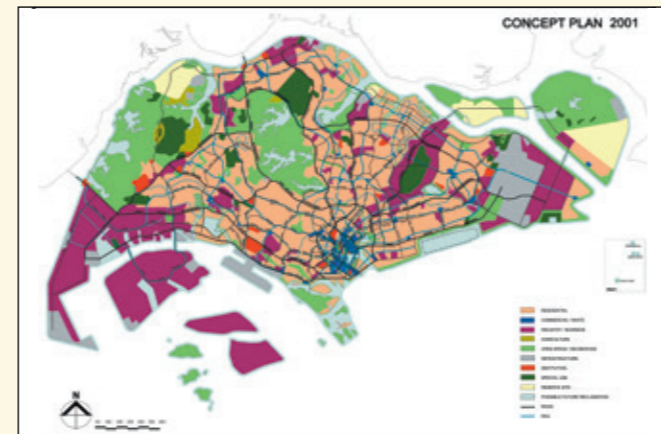
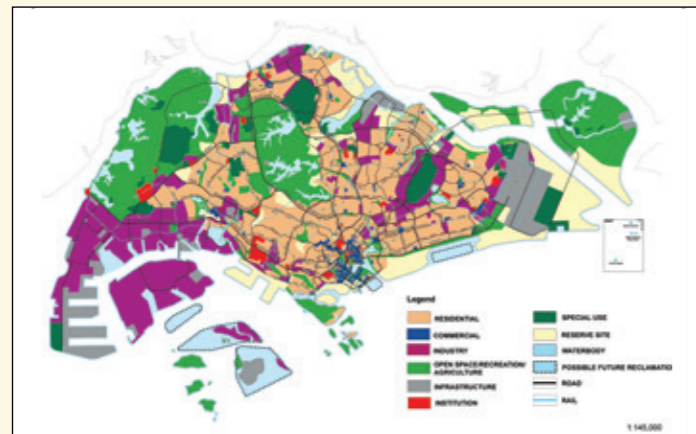
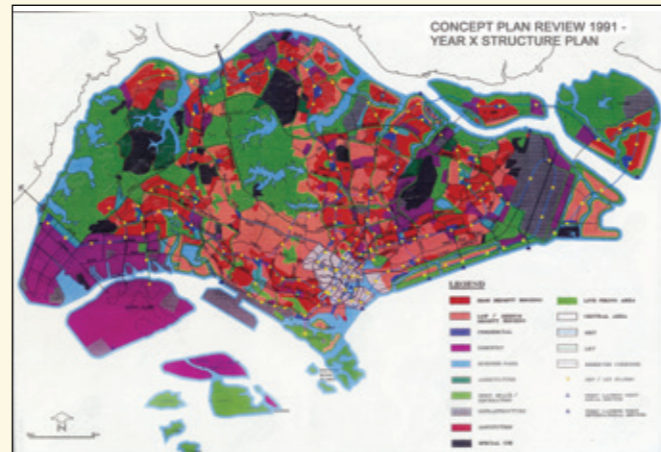
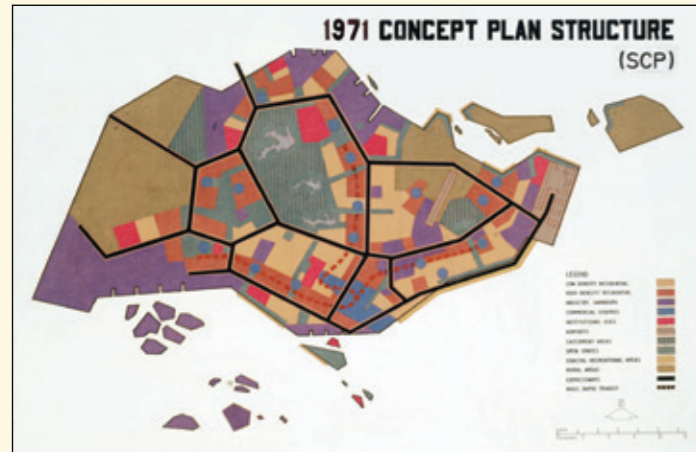
Acutely aware of our limited land and resources, we understand the need for coordination and integration across the different agencies involved in developing Singapore.

Emphasis has been on integrating and creating synergies across different urban systems and domain areas, and ensuring its integrity. Ultimately, incorruptibility and professionalism are key elements that we hold steadfast to and these have been key contributors to our rapid success and development.

Effective implementation is key to governance. For example, in the early days, given the urgency of combatting air pollution, the Anti-Pollution Unit was formed under the Prime Minister's Office in 1970 to combat the urgent issue of air pollution. When looking at cross-cutting issues such as climate change and

security, platforms for a whole-of-government approach such as the Inter-Ministerial Committee on Climate Change are in place today to ensure that we look at issues and approach them in a holistic manner.

On top of coordinating and delivering effective and efficient solutions and outcomes to meet the basic needs of the population and beyond, what has been critical is also the level of trust built with the people through both working for and with them. Most of Singapore's plans and initiatives actively engage the community and stakeholders. We have held nation-wide engagements such as Our Singapore Conversation (OSC) and strategic reviews such as the Committee for Future Economy which reviewed Singapore's economic strategies for the future.



(Clockwise from left) Concept Plan 1971, 1991, 2001 and 2011, Credit: Urban Redevelopment Authority (URA)

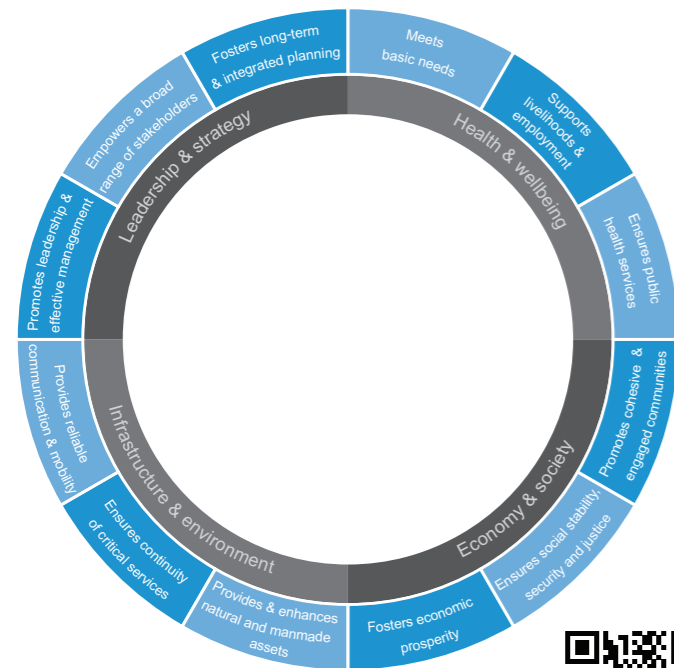
RESILIENCE MATTERS

Today, the Earth is getting hotter, the sea is rising, and the climate is changing. The scale of globalisation and urbanisation is impacting our economy and society. The pace of demographic change is impacting many aspects of city life. In short, Singapore and cities around the world are facing an ever-increasingly complex environment.

Many tend to think of resilience as building robust critical infrastructure or factoring redundancy into systems, such as having strategically located back-up power generators in the

City Resilience Framework

Credit: 100 Resilient Cities



www.100resilientcities.org/resources/

case of power outages or failures. But we need more than that. We need to understand and consider the interdependencies between the urban systems of our city.

We need to recognise that people and communities are also at the heart of resilience. This means fostering a whole-of-society approach: enabling and supporting our stakeholders to deal with the evolving challenges of today and tomorrow.

WHAT MAKES A CITY RESILIENT?

100 Resilient Cities (100RC) articulates the dimensions and drivers needed to build resilience via its City Resilience Framework (CRF). This framework outlines four dimensions of Health and Wellbeing; Economy and Society; Infrastructure and Environment; and Leadership and Strategy as well as twelve drivers that contribute to resilience and the multiple entry points for actions.

The CRF provides a lens to understand the complexity of cities and the drivers that contribute to its resilience. Cities can assess the extent of their resilience using the CRF and identify critical areas for improvements, interdependencies between systems, and potential actions to further the city's resilience.

Building a city's resilience means creating systems that are designed to withstand, respond to, and adapt more readily to shocks and stresses. 100RC has built on decades of research on resilient systems to identify seven qualities that various city systems need.

Resilience is not just about emergency preparedness or the ability to recover after disasters or crises. A key element of resilience, particularly for Singapore, is also about making the city better in good times to benefit all, and in the process, build capacity to deal with crises when they do happen.

Seven Qualities of Resilience

Credit: 100 Resilient Cities



Reflective

Using past experience to inform future decisions



Resourceful

Recognising alternative ways to use resources



Inclusive

Prioritise broad consultation to create a sense of shared ownership in decision making



Integrated

Bring together a range of distinct systems and institutions



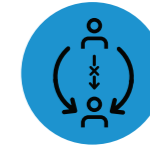
Robust

Well-conceived, constructed and managed systems



Redundant

Spare capacity purposely created to accommodate disruption

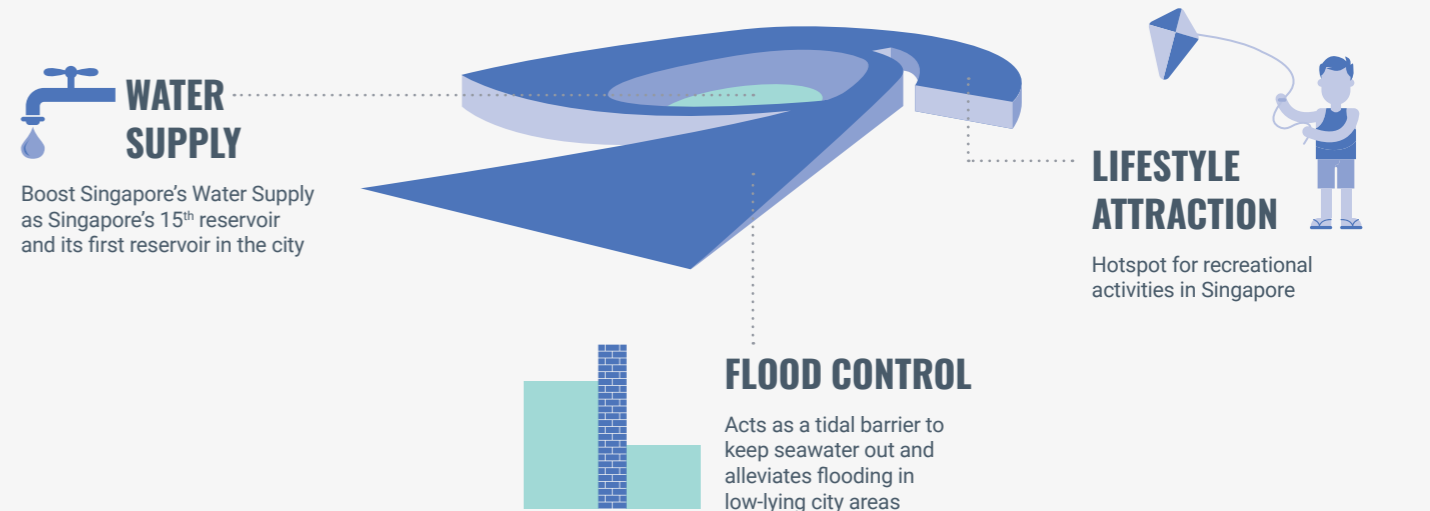


Flexible

Willingness and ability to adopt alternative strategies in response to changing circumstances

MORE THAN JUST A BARRAGE

The Marina Barrage in Singapore is one example of achieving multiple resilience dividends.⁵ It helps to alleviate flooding in the low-lying areas in the city and also serves as the first fresh-water reservoir in the heart of the city. Besides this water management function, the barrage has been designed as a recreational community space for all to enjoy. The reservoir's constant water level also makes it ideal for various water sports such as dragon-boating, kayaking, and sailing.



WRITING OUR RESILIENCE STORY

In developing this publication, the Centre for Liveable Cities (CLC) conducted a number of stakeholder interviews and stock-taking and analysis exercises to capture Singapore's past and current efforts in building resilience, and identify areas for further discussion and future action. These were done and facilitated by 100RC's City Resilience Framework (CRF).

Setting the Agenda and Learning from 100RC's Network

CLC kick-started the process with an Agenda-Setting Workshop to identify key resilience challenges and gaps in Singapore. The discussions with stakeholders from key government agencies and the people and private sectors concluded that while Singapore has done well in building resilience in many areas, more could be done to empower a broader range of stakeholders and foster stronger communities.

Leveraging on 100RC's Network, the Chief Resilience Officers (CROs) of Melbourne and Bangkok shared their experiences and efforts in developing their city's resilience strategies. Amy Chester, Managing Director from Rebuild by Design (RBD)⁶, also shared with the workshop about the RBD project and the value of applying a collaborative research and design process.



01

Taking Stock of Existing Work

Utilising 100RC's tools, such as the Action Inventory tool and the Perception Assessment tool, CLC also reviewed and captured the wide range of initiatives and programmes that are and have been in place to build resilience in Singapore.



Engaging the Wider Community

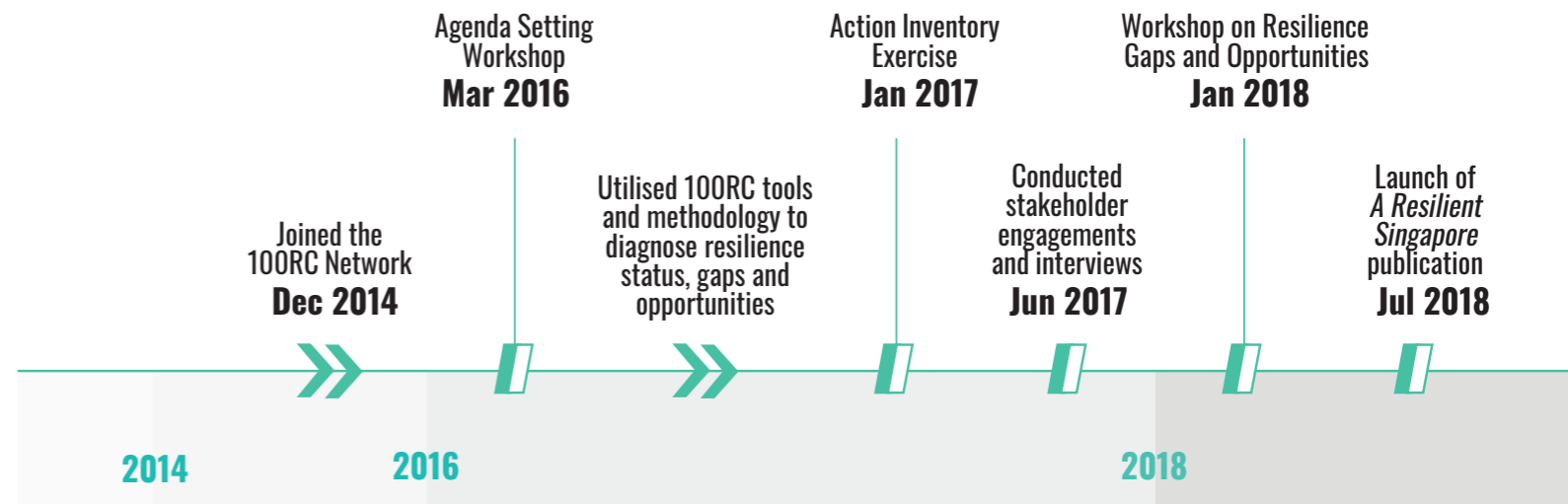
In a second workshop, CLC again brought together stakeholders from the public, people, and private sectors to identify gaps, opportunities, and actions, and agreed to focus on two key challenges of climate change and changing demographics.



04



05



01 - Table Exercise at the Agenda Setting Workshop, Credit: Centre for Liveable Cities
02 & 03 - Analysis using 100RC's tools on actions in Singapore that contributes to resilience; and stakeholder perceptions on the gaps and opportunities in Singapore
04 - Workshopping ideas on gaps and opportunities, Credit: Centre for Liveable Cities
05 - Sharing by Ms Sophianne Araib, Director/ CLC & Singapore's resilience officer to 100RC, Credit: Centre for Liveable Cities

OUR RESILIENCE CHALLENGES

As Singapore grew into a densely-populated city-state, the type of stresses and shocks we are exposed to have also evolved. We cannot assume Singapore to be sheltered from what is happening around the world, nor can we simply replicate solutions from the past for current and future challenges. Our approach to today's issues has to be integrated and holistic, based on a deeper understanding of the interdependencies between different sectors and domains.

TWO KEY CHALLENGES

A *Resilient Singapore* has identified two key resilience challenges: **Climate Change** and **Changing Demographics**. Both have significant impacts across different sectors, some of which—such as the occurrence of flash floods and the brewing undercurrents of social tensions—are already apparent today.

Surviving and Thriving in a World Where the Climate is Changing

By dint of our geographical location, Singapore is fortunate to have avoided the direct impacts of natural disasters, such as hurricanes and earthquakes. Nevertheless, we remain extremely vulnerable to climate change.

There are three main areas of concern: First, as a small, low-lying island-state, Singapore faces an existential threat from rising sea levels. Experts estimate that sea levels around Singapore could rise by up to 1m by the end of the century. If left unaddressed, low-lying coastal regions in Singapore could experience flooding during severe coastal storms, or even become permanently submerged over time.

Second, daily mean temperatures are projected to rise by 1.4 to 4.6°C towards the end of this century. This can aid the

proliferation of vector-borne diseases such as Dengue and Zika; cause crop failure in the countries from which we import food; and harm our biodiversity. For example, high sea surface temperatures were responsible for coral bleaching from 1998 to 2010. In 2015, hot weather caused a plankton bloom in the Johor Straits resulting in mass fish deaths.

Third, the contrast between the wet months (November to January) and dry months (February and June to September) are likely to become more pronounced. An increase in intense rainfall can lead to flash floods. Conversely, a lack of rainfall poses threats to our water supplies. In 2014, Singapore experienced a record dry spell of 27 days. The drier weather in 2015 and 2016 caused water levels at Linggiu Reservoir in Johor (which Singapore imports water from) to drop to a historic low (about 20% in October 2016). To remain resilient, Singapore's water security and flood prevention plans need to be able to cope with the impact of changing weather patterns.

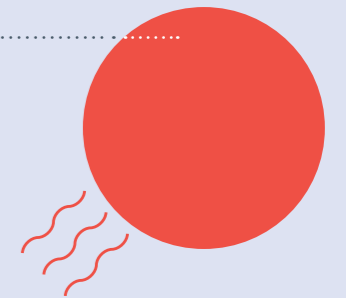
WATER RESOURCES AND DRAINAGE

- A persistent lack of rainfall or prolonged dry spell could place our water resources under pressure
- Intense rainfall could overwhelm our drainage system and lead to flash floods



PUBLIC HEALTH

- Warmer periods can increase the risk of vector-borne diseases
- Warmer weather may also lead to more occurrences of heat stress and heat-induced illnesses, particularly among the very young, elderly and infirm.



COASTAL PROTECTION

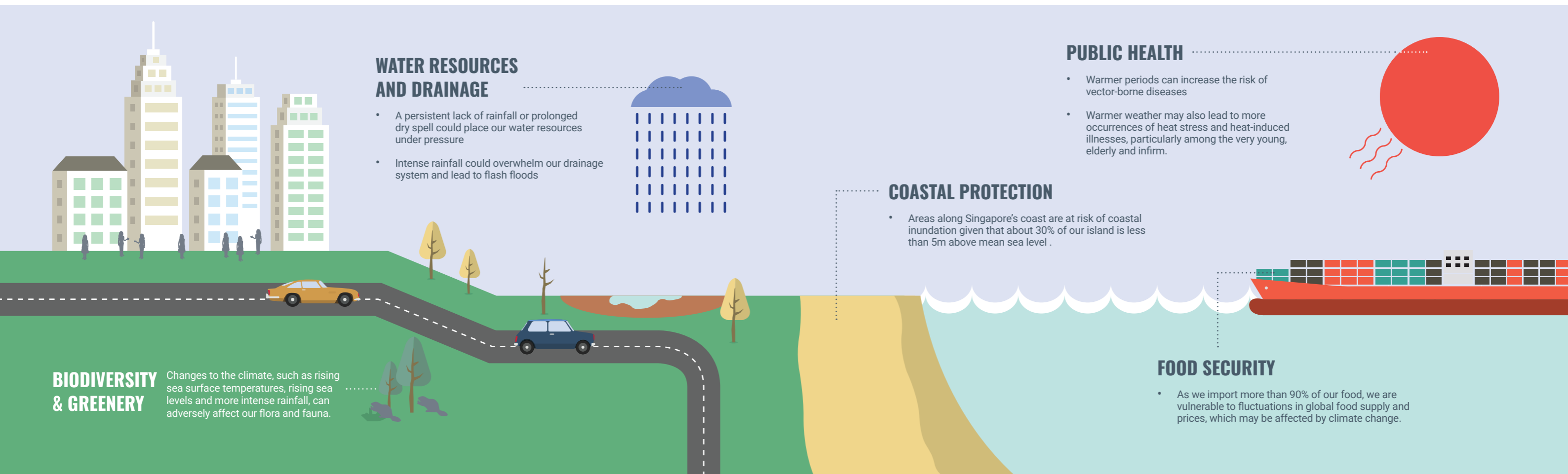
- Areas along Singapore's coast are at risk of coastal inundation given that about 30% of our island is less than 5m above mean sea level.

FOOD SECURITY

- As we import more than 90% of our food, we are vulnerable to fluctuations in global food supply and prices, which may be affected by climate change.

BIODIVERSITY & GREENERY

Changes to the climate, such as rising sea surface temperatures, rising sea levels and more intense rainfall, can adversely affect our flora and fauna.



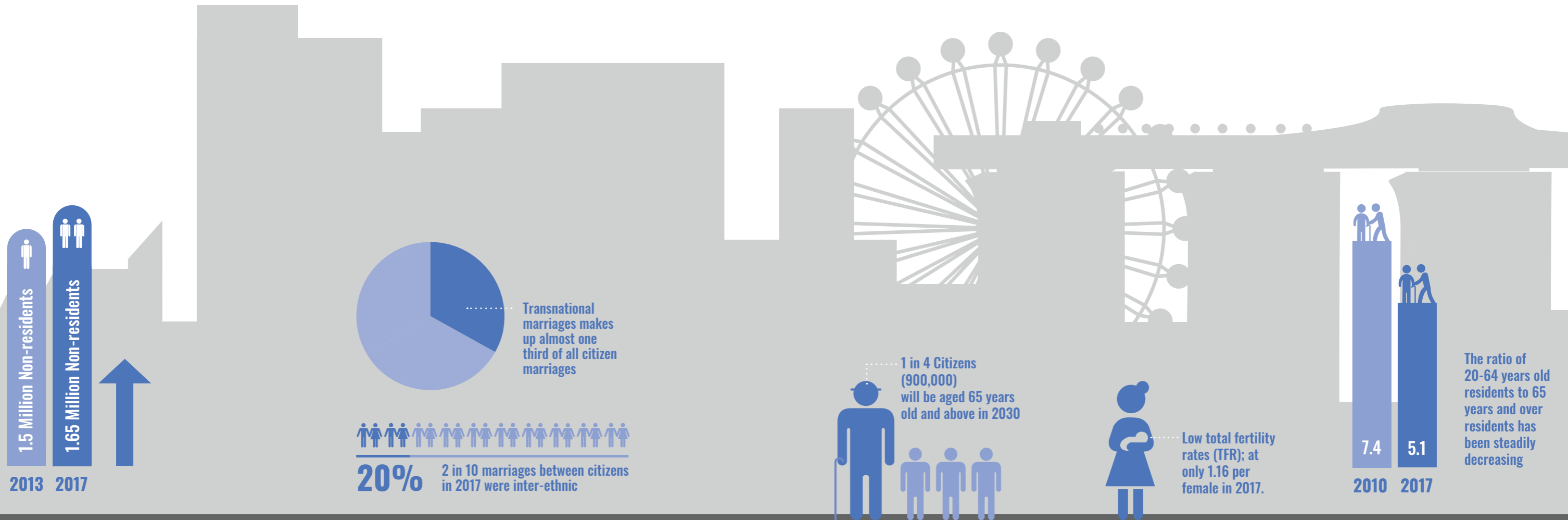
Adapting to Changing Demographics

As a nation of immigrants, Singapore has a strong commitment to multiculturalism borne from hard lessons in the lead up to our independence. A series of racial riots in 1964 remind us of the need to build a socially cohesive city and we have supported the integration of diverse groups of people through a variety of approaches, such as developing common shared spaces.

We know the future holds even more changes. As an open and global hub, Singapore will continue to attract people from all over the world, making the city-state even more cosmopolitan and diverse. We also have a rapidly ageing population. By 2030, Singapore will have around 900,000 citizens aged 65 years and

above, a demographic shift that will impact both our economy and society. With the projected decline of the population of working-age citizens (aged 20-64), we need to maintain a balanced inflow of immigrants and foreign workers, and keep raising productivity in order to maintain our economic dynamism and growth.

These changing demographics—a sizeable non-resident population and a growing elderly population with increasing social and eldercare needs—will test Singapore’s social resilience. We will need to continue our work in building communities and trust in this multicultural, multiracial, and multi-religious city-state.



SIZABLE PROPORTION OF NON-RESIDENTS

TRANSNATIONAL MARRIAGES

RAPIDLY AGEING POPULATION

LOW FERTILITY RATES

DECREASING OLD-AGE SUPPORT RATIO

LEARNING FROM THE PAST, LOOKING TO THE FUTURE

To better prepare ourselves for the future, we need to reflect on past efforts and programmes that have contributed significantly to our resilience. Through a collection of case studies, we distil and share our efforts in building resilience which future actions can continue to build upon.

- 01 Spaces and platforms for fostering community interactions and building social cohesion amidst diversity.
- 02 Flexible and inclusive infrastructure with multiple functions, including managing water supply, flood control, and recreational space.
- 03 Promoting greater awareness and action in Singapore to fight climate change.
- 04 Providing opportunities for lifelong learning and strengthening economic resilience.
- 05 Building capacity amongst the community to respond and stay united in times of crises.
- 06 Building a caring and inclusive society through acts of kindness and volunteerism.
- 07 Building a strong community-based support system for our seniors.
- 08 Unlocking the potential of streets as temporary public spaces to enhance vibrancy and engage with the community.
- 09 Spaces for community gardening and urban farming.
- 10 Creating "an inspired and extraordinary community space" along the rail corridor with the people, for the people.
- 11 A robust, diversified, and sustainable water supply.
- 12 Ground-up initiative to bring people together to learn how to repair broken items and create sense of ownership of the environment.
- 13 More than just a flat—creating affordable and high quality homes for all.
- 14 Providing access to affordable and clean food where different groups can also mingle.
- 15 Fostering ownership and social cohesion through participatory planning and design.
- 16 Inclusive blue-green spaces to improve quality of life, and better connect people to the environment.





MORE THAN JUST THE ENVIRONMENT

From early on, we understood the importance of having a clean and green city to be more than just aesthetics. We saw it as being key to convincing foreign investors that Singapore was well-planned and sustainable. It was also important for the physical and mental well-being of the population.

These are some examples of how Singapore has built its resilience by taking care of fundamentals. Today's development should not come at the expense of our current and future generations' living environment.



CLEANING & GREENING SINGAPORE

Cleaning Up the City

Creating a clean and healthy living environment were key priorities for Singapore in the 1960s. Living conditions and public hygiene then were deplorable, and vector diseases were common occurrences. Any shocks—be it manmade or natural—often had a severe impact on the people.

This was why the government placed significant emphasis on cleaning and greening Singapore. The first nationwide public education programme—“Keep Singapore Clean”—was launched in 1968 to change public’s perception and behaviour with regard to cleanliness. Fines were imposed on individuals who littered, and competitions were held to rate schools, markets, community centres and government offices on their cleanliness. To lead by example, Member of Parliaments (MPs) and community leaders worked with residents to clean up common areas.

Singapore became one of the first countries in the world to have a ministry dedicated to the environment when it established the Ministry of Environment (ENV) in 1972. The ministry took a systematic and integrated approach to managing the environment by setting up an Environmental Public Health Division to look after public hygiene, while the Engineering Services Division provided and managed infrastructure such as sewerage, drainage and solid waste management systems to safeguard and sustain the environment.



Greening the City

Since our independence, the government recognised the value of providing people with access to greenery, as well as creating a pleasant and liveable environment for all. The pervasive green spaces in Singapore today was not by chance as greenery was put in place with infrastructure development. In 1963, then-Prime Minister Lee Kuan Yew launched the first tree planting campaign and set a target of planting 10,000 trees every year, with half of them along new roads, housing estates, school grounds, and car parks.

Since then, Singapore has taken an integrated approach towards greening the city. In the 1970s, the Garden City Action Committee was formed to oversee greening efforts across various governmental agencies. The Parks and Trees Act was enacted in 1975, mandating road codes that guarantee planting verges for trees along all roads, and requiring developers to set aside green buffers. More recently, the Master Plan of 2003 was released with the Parks and Water Bodies Plan and Identity Plan, which look to create an island-wide network of green and blue spaces. Between 23 July and 22 October 2002, public feedback was sought and incorporated in these plans.

Despite intense urbanisation, green cover in Singapore has increased from 36% in 1986 to 47% in 2007. Moving beyond making greenery prevalent, Singapore also focused on bringing the community closer to it. To expand the network of greenery and enhance the use of these spaces, the Park Connector Network was created to connect discrete pockets of parks, open spaces and waterways with tree-lined walking and biking paths for the community.

01 - Kite-flying on the garden roof at Marina Barrage, Credit: Ricard O'Rorke
 02 - Residents participating in the street cleaning campaign (1967), Credit: Ministry of Information and the Arts Collection, Courtesy of National Archives of Singapore
 03 - Grassroots leader planting a sapling at the plot between Blocks 25 and 26 in Toa Payoh East on Tree Planting Day (1983), Credit: Ministry of Information and the Arts Collection, Courtesy of National Archives of Singapore

RESILIENCE VALUE:

- Systematic, integrated, and long-term approach
- Access to a clean, green, and healthy living environment to improve public health, economic competitiveness, and social well-being

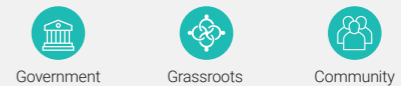
RESILIENCE QUALITIES:



CITY RESILIENCE FRAMEWORK (CRF):



STAKEHOLDERS:



STATUS: ONGOING

- As at 2015, we have
- 4,100 ha of park spaces
 - 61 km of Nature Ways
 - 300 km of park connectors



FROM RESOURCE TO ASSET

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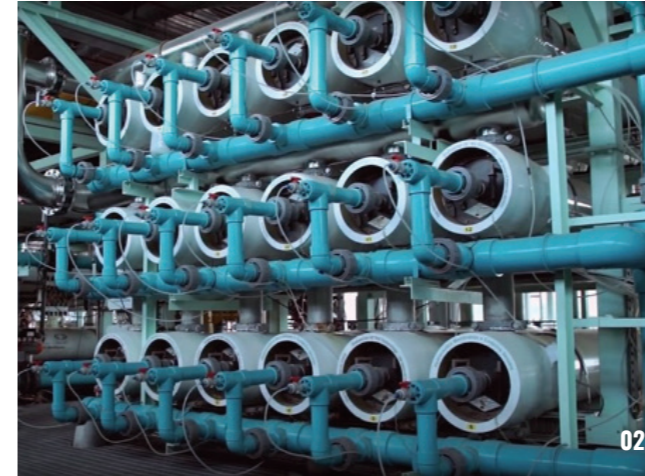
The Singapore water story is one of an integrated urban systems approach, in which a well-coordinated public-private partnership, engaging its various stakeholders, has allowed a water-stressed city-state to manage its ongoing water challenges in an integrated and holistic manner. ”⁷

Providing Clean Water

Another key aspect of resilience for Singapore is ensuring adequate access to clean water for the population. This is crucial for the city-state's survival and well-being. Despite being located in a tropical region, the lack of land to store water means Singapore is one of the countries with the greatest scarcity of freshwater in the world. In 2015, the World Resources Institute (WRI) ranked Singapore as one of the most water-stressed country in the world.

PUB, Singapore's National Water Agency, has put in place an integrated water management system that ensures a robust and diversified water supply through the Four National Taps: local catchment water; imported water; NEWater (high-grade reclaimed water); and desalinated water.

By 2060, Singapore's water use is expected to more than double. To meet increasing demand and strengthen water security, especially in the face of climate change, Singapore will continue to invest in key water infrastructure. A third desalination plant at Tuas will be completed in 2018, and two more desalination plants at Marina East and Jurong Island are being developed.



Integral to the large-scale collection of used water for recycling into NEWater is the Deep Tunnel Sewerage System (DTSS). A superhighway for used water management, the DTSS provides a cost-effective and sustainable solution to meet Singapore's long-term needs for used water collection, treatment, reclamation, and disposal. The DTSS conveys used water entirely by gravity to centralised Water Reclamation Plants located at the coastal areas. The used water is then treated and purified into ultra-clean, high-grade reclaimed water called NEWater. Excess treated effluent is discharged to the sea. DTSS Phase 1, covering the northern and eastern parts of Singapore, was completed in 2008. DTSS Phase 2 will extend the deep tunnel system to cover the western part of Singapore and is expected to be completed by 2025.

A new Tuas NEWater factory will be built as part of the Deep Tunnel Sewerage System Phase 2. This will be Singapore's sixth NEWater factory. NEWater and desalinated water are expected to meet up to 85% of Singapore's water needs by 2060.

Research and technology has allowed PUB to systematically close our water loop and this continues to be key in developing a more resilient and sustainable water supply in the longer run. NEWater and desalinated water, which are weather-resilient sources, are more energy-intensive compared to conventional water treatment. When reclaiming and recycling used water, PUB constantly seeks ways to maximise energy efficiency and lower energy use in the whole process. The agency is also exploring technologies to halve its energy consumption in desalination.

Managing demand is equally essential to ensuring a sustainable water supply. PUB adopts a multi-pronged approach in managing water demand: pricing water to reflect its scarcity value; mandating water efficiency standards; and public education on water conservation practices.

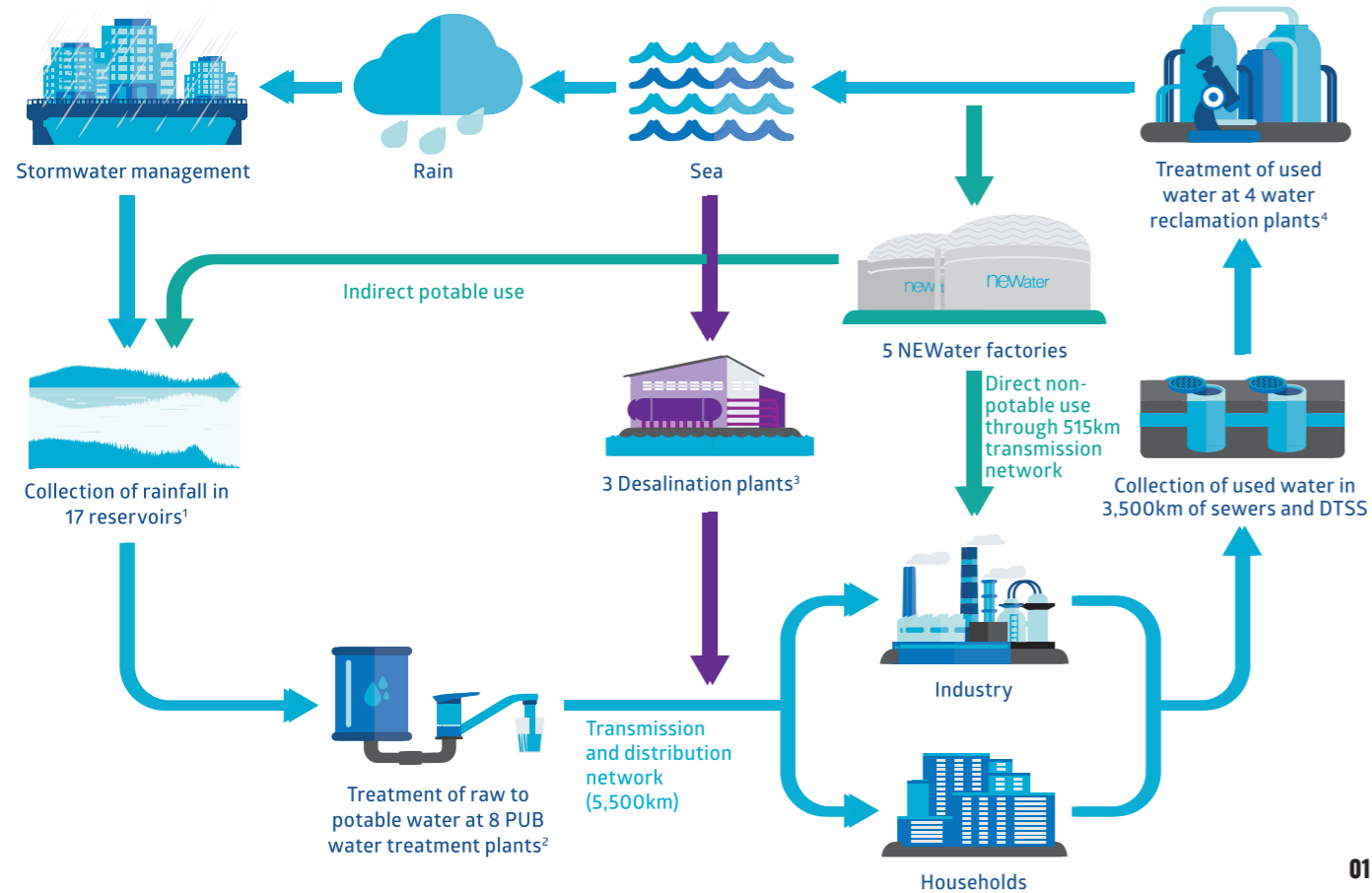


More Than Just a Barrage

The Marina Barrage is a prime example of how Singapore has reaped and enjoyed multiple benefits through an integrated development. What could have been just an ugly pump house was instead designed and built—in close cooperation with engineers and urban planners—as a multi-purpose and beautiful recreational space. The Marina Reservoir is also one of Singapore's 17 reservoirs, and the first in the heart of the city. The Barrage brings about resilience in three ways:

- I. Boosts water supply
- II. Acts as a flood control scheme to alleviate flooding in low-lying areas of the city
- III. Raises awareness of the value and importance of water by offering a space where the public can get close to water. This is supplemented by integrating the barrage with the surrounding environment, including Gardens by the Bay, Marina Bay and Bay East Garden. Different groups of people can access, share, and utilise the space for various recreational activities, such as cycling and water sports.

THE WATER LOOP



01

Water—An Asset that Binds Us Together

In the 1970s and 1980s, concrete, utilitarian drains and canals were rapidly constructed alongside Singapore’s then fast-paced development to alleviate and pre-empt flooding. The completion of the clean-up of the highly polluted Singapore River and Kallang Basin in 1987 also set in motion a process to realise the vision of creating a reservoir in the city. As Singapore progressively increased its water catchment, there was an increasing recognition of our water bodies not just as catchment areas but as lifestyle and community spaces to be enjoyed. In 2006, PUB launched the Active, Beautiful, Clean Waters (ABC Waters) Programme to transform ugly functional drains and canals into clean and beautiful streams and rivers, integrated with green spaces, for the community to get closer to water. With 17 reservoirs and about 8,000 km of waterways, there is a rich opportunity to create spaces to draw people closer to water so that they can better cherish our waters and keep our drains and canals clean.

Around the same time, PUB set up the 3P (People, Public, Private) network. This tri-sector approach brings together stakeholders from the different sectors in an aim to engage, educate, and involve them so that they will take stewardship of our water resources.



02

¹ Refers to waterbodies in Singapore

² Includes one water treatment plant in Johor

³ Two more desalination plants will be built by 2020.

⁴ It is envisaged that there will only be 3 water reclamation plants in the long term, with the completion of the Deep Tunnel Sewerage System Phase 2

RESILIENCE VALUE:

- Constant innovation to overcome limitations
- Reaping multiple benefits through integration
- Generating greater awareness about the value of water by working with stakeholders and communities

RESILIENCE QUALITIES:



CITY RESILIENCE FRAMEWORK (CRF):



STAKEHOLDERS:



STATUS: ONGOING

- 100% access to clean water and sanitation
- 3 desalination plants, with 2 more upcoming desalination plants at Jurong Island and Marina East
- 5 NEWater plants supplying up to 40% of our current water needs
- Two-thirds of Singapore’s land surface acts as water catchment
- 8,000 km of waterways and 17 reservoirs across the island
- 36 ABC Waters projects opened to public
- 70 projects by other agencies and private developers have received the ABC Waters Certification



FEEDING A NATION

01

Ensuring Food Security

Singapore was partially self-sufficient in food when it gained independence in 1965. However, as part of an industrialisation drive, land for farming was reduced to meet other needs, such as housing, industry, roads, and other infrastructure. This led to a reliance on food imports as demand increased together with Singapore's population growth.

To manage the ever-increasing volume and variety of imported food, the Primary Production Department (PPD), which looked after agriculture in Singapore, grew its capabilities in food safety assurance, compliance, and enforcement. In 2000, PPD became the Agri-food and Veterinary Authority (AVA) to further develop its mandate of ensuring everyone in Singapore has access to safe and nutritious food at affordable prices in the short and long-term. AVA reviewed and reaffirmed its food supply resilience and food safety strategies after wide consultations with the industry and other government agencies. The Singapore Food Security Roadmap was launched in 2013 to outline core strategies of food source diversification and optimising local food production.

| Core strategies | | Supporting strategies |
|--|--|---------------------------|
| Diversify sources of imports | Invest abroad | R&D |
| Industry development | Strategies offsetting limitations in diversification | Food waste reduction |
| Local production | Stockpiling | Strengthen infrastructure |
| | | Financial instruments |
| | | Welfare / Affordability |
| Enabling strategies | | |
| Cross-government coordination | | |
| Emergency planning | | |
| Communication | | |
| Market monitoring | | |
| Fiscal, legal and regulatory framework | | |

02



03

Bringing People Together with Affordable Food

Street hawking was thriving in Singapore during the late 1960s, but many hawkers did not have good hygiene practices and food-borne diseases, such as cholera and typhoid, were very common. In 1970, we embarked on a hawker resettlement programme to license and relocate 18,000 hawkers from the streets to newly built hawker centres by February 1986.

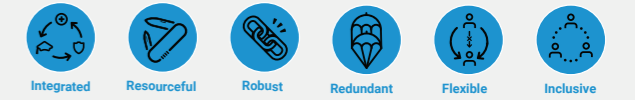
While hawker centres started as a means of environmental and public health management, they have developed and evolved into a way of life and contributed to building resilience in Singapore. On top of offering people affordable and clean food, hawker centres have become community spaces where people of different races, and cultures mingle.

To ensure that future hawker centres continue to play these vital roles, a Hawker Centre 3.0 Committee was formed to consult the different stakeholders. In February 2017, the committee released a report with recommendations covering four key areas: sustaining the hawker trade, improving productivity, enhancing hawker centres as social spaces, and promoting graciousness.

RESILIENCE VALUE:

- Providing affordable and adequate food for the population
- Creating a hive of community activities and spaces where people of different races, religions and cultures can gather

RESILIENCE QUALITIES:



CITY RESILIENCE FRAMEWORK (CRF):



STAKEHOLDERS:



STATUS: ONGOING

- Diversifying food supply from multiple sources both internationally and locally
- 114 markets and hawker centres across Singapore

01 - Patrons having lunch at a Hawker Centre in Singapore, Credit: olli0815
 02 - Singapore's Food Security Roadmap, Credit: Agri-Food and Veterinary Authority of Singapore (AVA)
 03 - Sky Greens' patented technology enables farming methods suited to Singapore's Climate, Credit: Sky Greens



EMPOWERING COMMUNITIES

01

Building Our Green Corridor

After the Keretapi Tanah Melayu (KTM) Berhad (Malaysian Railways Limited) station was relocated from Tanjong Pagar to Woodlands on 1 July 2011, the Urban Redevelopment Authority (URA) embarked on one of its most extensive public engagement exercises to explore ways to develop the disused railway and its surrounding land, which became known as the Rail Corridor.

Various interest groups, residents, students, the general public and professionals were consulted via multiple means. To foster a stronger collaboration between public sector agencies and interest groups, a working group (Rail Corridor Consultant Group—RCCG, which was later renamed the Rail Corridor Partnership) comprising officers from the URA and the National Parks Board (NParks) as well as representatives from interest groups was created to programme and promote community activities and events along the Rail Corridor.

Design workshops and competitions were also held to generate interest among students and design professionals. More than 2,000 secondary and polytechnic students participated in workshops to reimagine how the Rail Corridor could foster a



02

sense of place and memory for youths in urbanised Singapore. These proposals then travelled around the nearby constituencies to gather feedback from the residents.

These residents—including seniors, children, and the physically challenged—also got to become ‘planners’ for a day when they were invited to draw up master plans to illustrate how stretches of the Rail Corridor near where they lived could be relevant to their needs.

The output of these consultations were distilled into planning and design goals to guide the conceptualisation and design of the Rail Corridor. As part of the request for proposal, “Rail Corridor—An Inspired and Extraordinary Community Space”, a competition was held for design professionals to develop a Concept Master Plan and Concept Proposals for the Corridor. These proposals, informed by the extensive public consultation, produced designs that were better attuned to the needs of the communities living along the Rail Corridor.

Nurturing Communities Through Gardening

Community in Bloom is a programme by NParks to encourage and allow residents to participate in community gardening and urban farming. This nationwide gardening movement was launched in May 2005 at Mayfair Park Estate to foster community cohesion and neighbourliness. Today, Community in Bloom has created close to 1,000 community gardens across Singapore and engaged over 20,000 residents.

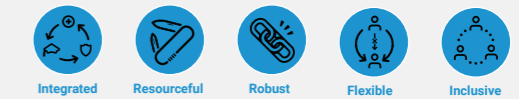


03

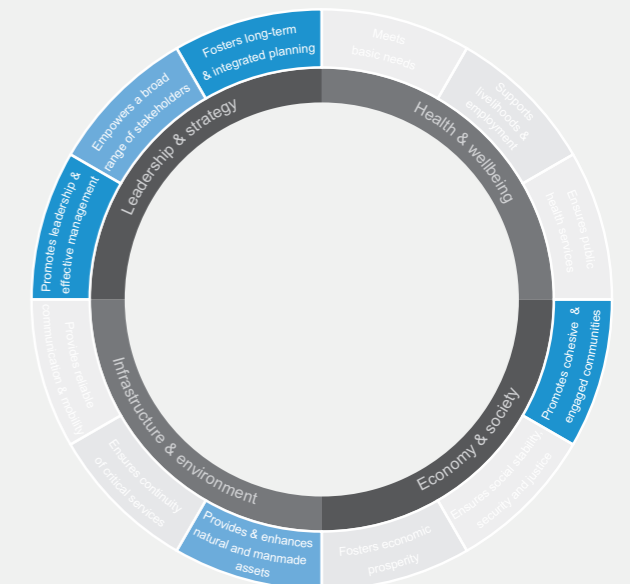
RESILIENCE VALUE:

- Inclusive planning through working with different stakeholders
- Generating greater awareness about the built and natural environment
- Fostering social cohesion and empowering communities

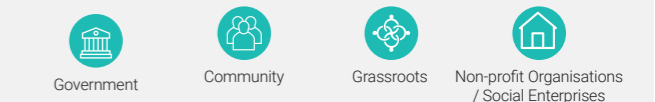
RESILIENCE QUALITIES:



CITY RESILIENCE FRAMEWORK (CRF):



STAKEHOLDERS:



STATUS: ONGOING

- Rail Corridor Partnership formed
- Public engagement for Rail Corridor from 2011 to 2014, with feedback and suggestions distilled into design briefs for Request for Proposal (RFP)
- Completion of RFP and exhibition launch
- Close to 1,000 Community Gardens set up across Singapore



01

FROM THE GROUND UP



02

Spreading a Culture of Repair

To combat the pervasive buy-and-throw-away culture, social enterprise Sustainable Living Lab (SL2) launched Repair Kopitiam in November 2014 to share the skills needed to repair everyday items. This ground-up initiative, supported by South-West Community Development Council (South-West CDC) and the National Environment Agency (NEA), is in line with the Sustainable Singapore Blueprint's aim of creating a zero-waste nation.

The group meets on the last Sunday of every month at community centres or public housing void decks to repair once broken items brought in by anyone. The group also promotes responsible e-waste disposal and fosters community bonding. During the sessions, SL2 also teaches others how to repair things. The group also promotes their movement on social media and a website (repairkopitiam.sg), encouraging people to volunteer at their sessions.



03

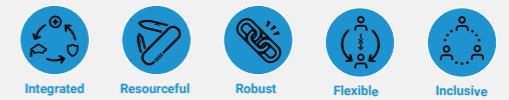
Repair Kopitiam is divided into four different departments: electrical appliances, fabric repair, home improvement, and responsible dismantling. Each is led by Repair Coaches—a group of experts that assess the condition of the item and guide participants to diagnose and, explore methods to rectify the problem before repairing it. The aim is to share skills and knowledge with the participants instead of offering a repair service so that they can pay it forward to their own communities.

What started as a small meetup session has now doubled in size. Repair Kopitiam has helped foster a sense of responsibility among users, encouraging them to think about the lifecycle of a product before purchasing it. This creates a community that takes ownership of the environment through small steps, such as extending the shelf life of their consumer products and discouraging a buy-and-throw-away culture. The meetup sessions also build up a social network by bringing people out of their houses.

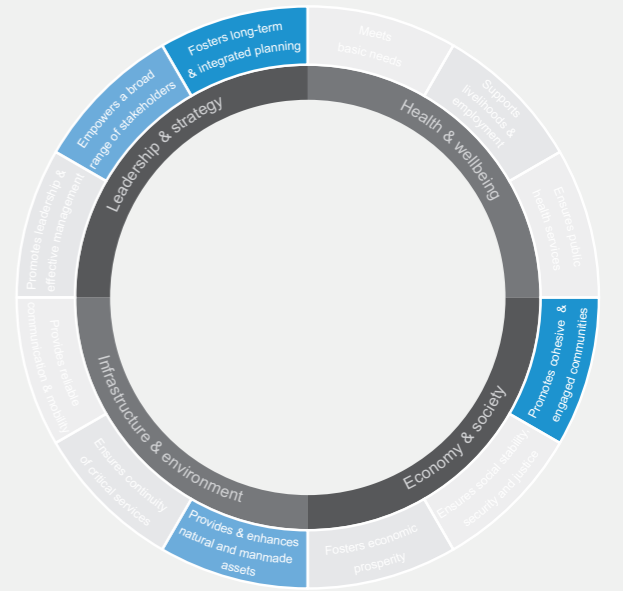
RESILIENCE VALUE:

- Community-led initiative to bring the community together to share skills and knowledge
- Encourage sustainability through repairing and recycling products

RESILIENCE QUALITIES:



CITY RESILIENCE FRAMEWORK (CRF):



STAKEHOLDERS:



STATUS: ONGOING

- Regular Repair Kopitiam Repair Session on last Sunday of every month

UNITY AMIDST DIVERSITY

Ever since our independence, we have been bringing together different groups of people not rooted in a common historical experience to establish a nation. This need to build unity amidst diversity remains relevant especially as our population ages and becomes increasingly diverse.

The examples that follow share how we have gone about forging common ground and building bridges. The trust and networks built will continue to be critical for Singapore in the face of new and ever-evolving challenges ahead.





HOUSING A NATION

01

Providing Affordable and Quality Housing

Our vision to unite people from different backgrounds began through developing a society of home owners. This would “give every citizen a stake in the country and its future”, as Singapore’s founding Prime Minister Lee proposed. He believed it was not just desirable but imperative for Singapore’s survival as citizens who served as soldiers would see they were defending their own home and properties.

Thus, public housing in Singapore is not just about putting a roof over people’s heads but provides them with a tangible stake in the country. Today, over 80% of the population lives in high-rise, high-density Housing and Development Board (HDB) flats and about 90% of these are owned by the residents. Every public housing estate also integrates people across social classes and ethnicities as they go to the same schools and share common public spaces.

The vision of building a home-owning society could not have been possible without good governance and long-term planning. By conceptualising and planning whole neighbourhoods, towns, and communities, Singapore’s public housing programme creates a common ground for people of different backgrounds to live, work, and play together.

“
My primary preoccupation was to give every citizen a stake in the country and its future. I wanted a home-owning society. I had seen the contrast between the blocks of low-cost rental flats, badly misused and poorly maintained, and those of house-proud owners, and was convinced that if every family owned its home, the country would be more stable.”

- Lee Kuan Yew, Founding Prime Minister of Singapore⁸

Resilience is achieved not only when people invest personal attachments to their public housing flats, neighbourhoods, and towns; but also through developing relationships with each other. The neighbourliness and social networks built within the public housing communities have become the social infrastructure⁹ for a city to survive and adapt to shocks and stresses.

The most innovative policy within the public housing programme is the Ethnic Integration Policy (EIP). It insists, from the beginning, that all estates—right down to each neighbourhood and block—would house a mix of ethnic groups. This is achieved by instituting limits on the number of residents from each race, reflecting the ethnic population composition at the national level.

Besides integrating the different races, HDB also builds different flat types to ensure a mix of different socio-economic groups. One can find different flat types (e.g. 2-room, 3-room, 4-room, 5-room flats) within a public housing block and estate. There are also public and private residences within neighbourhoods.

Design also plays a part in bringing residents together. The ground floor void deck, introduced in 1970, offers an informal space for residents to meet and serves as shelter from the tropical heat for residents passing through it. Another common space is the shared corridor on every level. Beyond just a means for residents to reach their flats, these “courtyards in the sky” have become communal spaces shared by families living on the same floors.



02

RESILIENCE VALUE:

- Systematic, integrated, and long-term planning to provide affordable and good quality public housing for the masses
- Building communities and fostering social cohesion through design
- Creating open and inclusive public and community spaces

RESILIENCE QUALITIES:



CITY RESILIENCE FRAMEWORK (CRF):



STAKEHOLDERS:



STATUS: ONGOING

- Providing affordable, quality homes
- More than 1 million flats spread across 23 towns and 3 estates
- Houses over 80% of Singapore’s resident population
- Over 90% home ownership rates
- Ensuring vibrant towns through renewal and upgrading programmes
- Building cohesive communities through community spaces in HDB towns

01 - Panorama view of HDB flats at Bukit Panjang, Credit: Erwin Soo
 02 - Residents at Tanjong Pagar HDB estate, Credit: Centre for Liveable Cities



BRIDGING COMMUNITIES

Working with the Grassroots

On 1 July 1960, the People's Association (PA) was formed as a grassroots movement to help forge social cohesion and racial harmony. When PA first started, 28 Community Centres (CCs) were set up as meeting grounds for various ethnic, language, and religious groups and community leaders were appointed to serve in the newly-formed Community Centre Management Committees. Today, the role and value of the CCs go beyond just being a community infrastructure. It is a focal point where we build and strengthen social capital in the community and facilitate active citizenry.

As resettlements to HDB flats expanded, the Residents' Committees (RCs) were formed in 1978 to address the needs of residents living within a zone rather than the whole estate. Given their familiarity with the needs of the residents living in the area, RCs are an important touchpoint for residents to raise issues and concerns to the government, and promote neighbourly

interaction, good communal relations among residents staying in the HDB estates. Through organised activities, RCs brought residents together and helped forge closer bonds between neighbours. This role was also extended to Neighbourhood Committees (NCs) for private estates in 1998.

Today, PA is able to reach out to a wide-range of participants across its activities and programmes, which are organised by its 1800 Grassroots Organisations (GROs) and 38,000 Grassroots Leaders.

Strengthening Inter-Faith Networks of Trust

The National Steering Committee (NSC) on Racial and Religious Harmony was formed in 2006 to build close relationships between the apex leaders of the major ethnic and faith communities and Government. Together with the Inter-Racial and Religious Confidence Circles (IRCCs) at the community level, these platforms have allowed community and religious leaders to have regular interactions to deepen friendships and build trust. This has built a foundation for the different ethnic and faith groups to co-create opportunities for all Singaporeans to build social bonds and trust to enlarge the social commons.

The work of the IRCCs has evolved over the years. Apart from facilitating regular interaction between community and



religious leaders, it is now also helping to build capacity in the community to uphold social cohesion times of a crisis under the SGSecure movement.

Fostering Inter-Faith Understanding

Fostering inter-faith understanding involves forging community partnerships and encouraging community-led initiatives to deepen racial and religious appreciation.

In 2017, BRIDGE (Broadening Religious/Racial Interaction through Dialogue and General Education) was launched to deepen understanding of the diversity of racial and religious practices in Singapore. Through dialogue and developed content, participants build confidence in engaging respectfully through safe spaces, and develop expertise and capabilities to lead on sensitive intercultural issues.

An example of a BRIDGE project organised with community partners is the Ask Me Anything (AMA) series on different faiths. This is a platform that provides a safe space for honest and open conversations where participants are encouraged to ask difficult and inconvenient questions on matters of faith. While each AMA session focuses on a particular faith, it serves as a starting point to discuss both topical faith issues and common threads with other faiths.

Strengthening Social Cohesion in Multicultural Singapore

The National Integration Council (NIC) was set up in April 2009 to coordinate and drive social integration efforts through partnership of the public, people, and private (3P) sectors. The NIC provides strategic direction to four National Integration Working Groups (NIWGs) in the areas of community, workplace, education, and media. The NIWGs implement programmes that bring together Singaporeans, immigrants, and foreigners through shared interests, such as sports, arts and volunteerism. In addition, they engage various partners in the industries and media to raise awareness of the importance of integration and to promote greater appreciation of cultural diversity. The NIC also facilitates efforts by community groups and private sector organisations to encourage greater interaction and mutual understanding.

RESILIENCE VALUE:

- Fostering greater inter-faith understanding between different groups through activities and shared spaces
- Bridging communities by creating opportunities and spaces for interaction

RESILIENCE QUALITIES:



CITY RESILIENCE FRAMEWORK (CRF):



STAKEHOLDERS:



STATUS: ONGOING

- 108 Community Centres and Community Clubs (CC), each serving about 15,000 households or an average of 50,000 people
- 89 IRCCs in Singapore, one in each constituency
- To date, BRIDGE has reached out to more than 5,000 participants with over 20 programmes

01 - Singapore heritage fest 2016, Credit: Choo Yut Shing

02 - Republic Poly's One Heart Programme, Credit: Prime Minister's Office - Strategy Group



MOBILISING COMMUNITIES



Total Defence

Total defence is a framework for an all-round response to threats and challenges involving all Singaporeans. It emphasises that all Singaporeans play a part, individually and collectively, in building a strong, secure, and cohesive nation—whether it is by fulfilling National Service duties; volunteering in Civil Defence activities; working hard and contributing to a strong economy; strengthening community ties with one another regardless of race and religion; or staying committed to defending the country.

| ASPECTS OF TOTAL DEFENCE | PUTTING IT TO ACTION |
|--|--|
|  Military Defence: Keeping Singapore Secure | <ul style="list-style-type: none"> Commitment by and support for our soldiers, sailors, and airmen to be operationally ready |
|  Civil Defence: Taking care of our family, friends, and people around us in times of crisis | <ul style="list-style-type: none"> Be vigilant and participate in Civil Defence exercises and be aware of what to do in an emergency |
|  Economic Defence: Having a strong and resilient economy | <ul style="list-style-type: none"> Adapt to the changing needs of the economy by embracing lifelong learning and continual skills upgrading |
|  Social Defence: Living harmoniously and looking out for one another | <ul style="list-style-type: none"> Be respectful and sensitive to the diversity of people and culture in Singapore and looking out for one another especially the less fortunate and underprivileged among us |
|  Psychological Defence: Being a resilient people | <ul style="list-style-type: none"> Having a strong resolve to stay united when crises or challenges hit |

01 - Participating in Car-Free Sunday, Credit: Urban Redevelopment Authority (URA)

02 - SGSecure: The information panels and learning life-saving skills at The Kallang Wave, Singapore Sports Hub during Home Team Show and Festival, Credit: Choo Yut Shing

SG Secure

To counter the rise in terrorism threats, the Community Engagement Programme (CEP) was launched in 2006 to strengthen inter-communal bonds and create response plans to deal with potential communal tensions after an incident, such as a terrorist attack. This is a long-term effort to ensure that we are better equipped to maintain our social cohesion and stay united in a crisis.

Building upon the efforts of the CEP, SG Secure was rolled out in 2016 to sensitise, train, and mobilise the community to play a part in preventing and dealing with terrorist attacks. Our police and civil defence forces work closely with grassroots volunteers and Community Emergency Response Teams to raise residents' awareness by providing tips on how they should respond in a terrorist attack and be better prepared for crises and emergencies. There is also an Emergency Preparedness (EP) Day where residents learn skills such as first-aid and CPR, as well as participate in a scenario drill to familiarise themselves with what to do in the event of an attack.

As part of the SGSecure Movement, the Ministry of Culture, Community and Youth (MCCY) established the SGSecure Community Network (SGCN) to connect community and religious organisations so that they are prepared to respond effectively in the face of crisis.



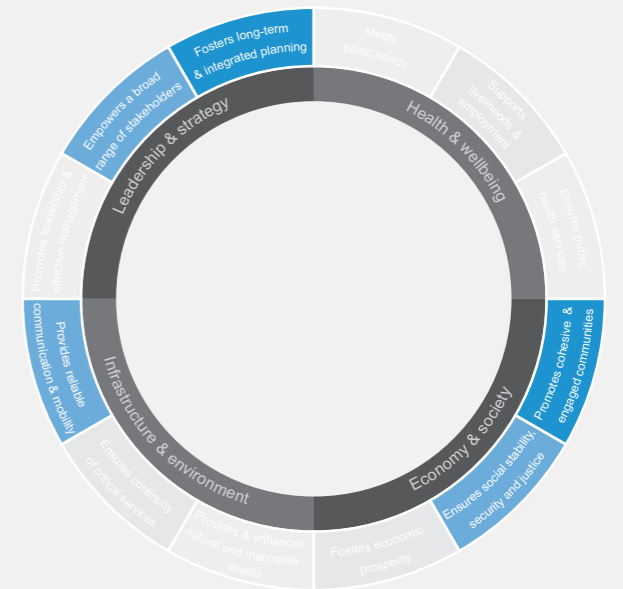
RESILIENCE VALUE:

- Mobilising and preparing the community to play a part in preventing and responding to terrorist attacks
- Raising awareness across communities about terrorism related risks

RESILIENCE QUALITIES:



CITY RESILIENCE FRAMEWORK (CRF):



STAKEHOLDERS:



STATUS: ONGOING

- SGSecure mobile app rolled out nationwide
- Community Emergency Preparedness Programme (CEPP)
- Safety and Security Watch Group (SSWG) scheme and Industry Safety and Security Watch Group (ISSWG) scheme
- Harmony in Diversity Gallery (HDG) established to promote an appreciation of Singapore's rich religious diversity



A CULTURE OF ENGAGEMENT

01

12 key areas of concern of the population were identified, ranging from the wellbeing of individuals, communities and society, to maintaining economic prosperity and greater engagement across different sectors.

Our Singapore Conversation (OSC)

To better understand and engage Singaporeans, 'Our Singapore Conversation' was started in 2012. The national conversation involved more than 47,000 residents in over 660 dialogue sessions.

The Conversation revolved around the following questions: "What is the Singapore we want to see in the future? What are our priorities as a nation? Where do we want to go as a country, as a people?"

A national survey was also conducted by the Institute of Policy Studies (IPS) with 4000 Singaporeans to discuss the Singapore that they hope to see in 2030 and their key priorities for today. The survey also asked Singaporeans about the values they feel are important for achieving the 2030 vision as well as their preferences on key issues. Job security, healthcare, and housing were identified as the top three priorities.

SGFuture Engagements

From November 2015 to July 2016, more than 8,300 Singaporeans of diverse ages and from various communities—including youths and seniors, persons with disabilities, and families—were involved in 121 engagement sessions as part of SGFuture. This provided many Singaporeans a springboard to participate in national movements, volunteer with non-profit organisations for causes close to their hearts or initiate their very own ground-up projects to benefit the community.

Founders' Memorial

The conceptualisation of the Founders' Memorial was a chance to engage the wider public in the ideation process and to educate future generations on the values and principles of the founding generation of leaders.

Public engagements, consultations and outreach took place across three phases between 2015 and 2017 to develop a concept of the Memorial that would not only honour the past, but also inspire the future. Over 400 people shared their views through 13 dialogue sessions, 1300 individuals were interviewed, over 200 responses received via an online portal and more than 700 participants took part in 15 workshops that were conducted across different age and ethnic groups. Key stakeholder groups including architects, planners, and designers; historians and the heritage community; educators and academics; public servants; pioneer generation; grassroots leaders; union leaders; uniformed groups; youths and students; business leaders were also engaged.

02

Singaporeans would like to see...

| | | |
|---|--|---|
| <p>A Society with Diverse Definitions of Success beyond academic and material success, and a review of the practice of meritocracy.</p> <p>Page 1</p> | <p>A Singapore with a More Fulfilling Pace of Life where we have the space to pursue other goals outside of work.</p> <p>Page 3</p> | <p>A Singapore with a Strong and Vibrant Economy that provides opportunities for Singaporeans while ensuring social well-being.</p> <p>Page 5</p> |
| <p>A Society with Strong Families but some had differing views about what is defined as a "family".</p> <p>Page 7</p> | <p>A Singapore that is Affordable to Live In though some also felt that we should be contented with what we have.</p> <p>Page 9</p> | <p>A Society where Everyone Can Age with Dignity in the company of loved ones, and where we honour the contributions of our elders.</p> <p>Page 11</p> |
| <p>A Society That Takes Care of the Disadvantaged where strong social safety nets are complemented with a culture of volunteerism.</p> <p>Page 13</p> | <p>A Society with a Greater Sense of Togetherness expressed through a revival of our Kampong Spirit.</p> <p>Page 15</p> | <p>A Singapore for Singaporeans where we retain a strong sense of national identity, in spite of demographic shifts in our society.</p> <p>Page 17</p> |
| <p>A Society where Government and the People Have a More Collaborative Relationship characterised by mutual respect, sincerity and empathy.</p> <p>Page 19</p> | <p>A Society Anchored on Values that underpin our attitudes, actions and aspirations.</p> <p>Page 21</p> | <p>A Singapore with a Competent and Trustworthy Government that is accountable to its citizens.</p> <p>Page 23</p> |



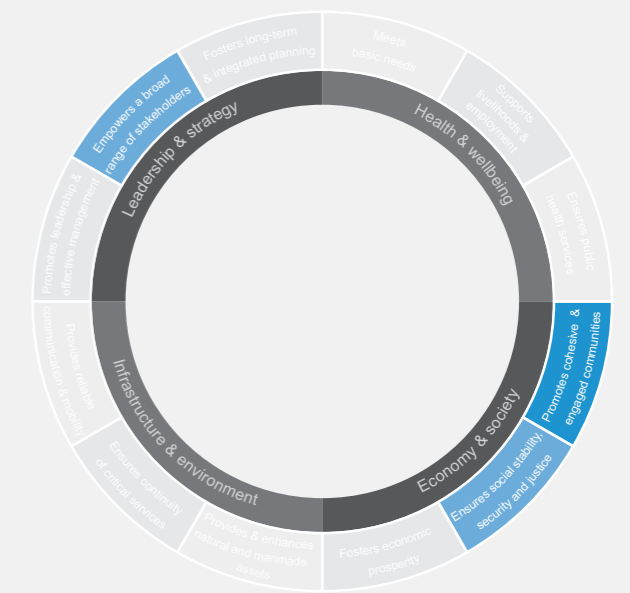
RESILIENCE VALUE:

- Inclusive engagements to create a more caring and cohesive society
- Supporting ground-up, community-led initiatives
- Strengthening existing networks

RESILIENCE QUALITIES:



CITY RESILIENCE FRAMEWORK (CRF):



STAKEHOLDERS:



STATUS: ONGOING

- Year-long national conversation
- More than 47,000 Singaporeans engaged in over 660 dialogue sessions
- Nationally-representative survey with 4,000 respondents

01 - Participants at a workshop for Founders' Memorial Project, Credit: Ministry of Culture, Community and Youth (MCCY)
02 - The 12 key areas of concern distilled from Our Singapore Conversation engagements, Credit: REACH



BRINGING PEOPLE TOGETHER THROUGH SHARED SPACES

Build-A-Playground

Playgrounds bring people together. Not only do children of different backgrounds come together in these shared spaces, parents get to meet and make friends there too. This builds up the networks necessary for maintaining our social resilience. In 2018, Singapore completed its first community-built play space, Adventure Playground @ Canberra. This was the result of a Build-A-Playground (BAP) pilot initiative by the Housing and Development Board (HDB) to conceptualise, design, and build a space in partnership with residents.

This project involved about 1,800 people, from residents living in neighbouring blocks of flats to the surrounding community, such as students from nearby schools. Between mid-2015 to 2017,

a series of design workshops, roadshows, and surveys were conducted with the community to hear their views on what makes an enjoyable playground and the kind of playground they would like to have. The result is a unique 185 m² treehouse-and-kelong inspired design.

This initiative will be extended to another four HDB towns, namely Toa Payoh, Pasir Ris, Woodlands, and Choa Chu Kang, where five new community-built playgrounds will be completed in the coming years. Involving the community in such a small but integral infrastructure helps establish a greater sense of community ownership.



Streets for the People

Under the Streets for the People initiative by the Urban Redevelopment Authority (URA), communities are provided with the resources to transform their streets into temporary public spaces. This contributes vibrancy and cohesiveness and supports the overall national objective of going car-lite. When communities initiate such a project, streets are turned into car-free zones at regular intervals over an extended period of time. For instance, the Little India Shopkeepers and Heritage Association has chosen to pedestrianise some streets in Little India. Similarly, the Singapore River One business association has also done the same for Circular Road, near the Singapore River.



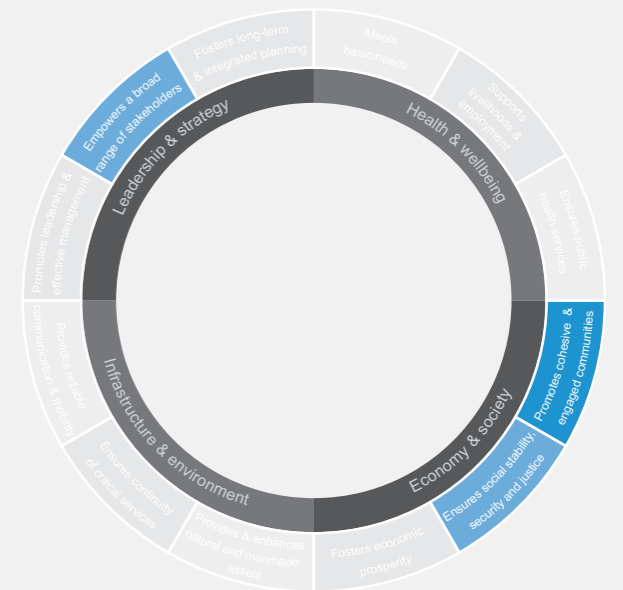
RESILIENCE VALUE:

- Participatory planning; empowering communities and individuals in local initiatives to build community ownership
- Supporting ground-up, community-led initiatives
- Fostering social cohesion

RESILIENCE QUALITIES:



CITY RESILIENCE FRAMEWORK (CRF):



STAKEHOLDERS:



STATUS: ONGOING

- First of five Build-A-Playground pilot projects completed
- Regular Car-Free Sundays
- Regular Car-Free Zones

01 - Design workshop session with the community as part of the Build-A-Playground initiative, Credit: Housing and Development Board (HDB)

02 - Car-free Sunday in the city centre, Credit: Urban Redevelopment Authority (URA)

03 - Pilot Build-A-Playground Project at Canberra, Credit: Housing and Development Board (HDB)



DEVELOPING POTENTIAL THROUGHOUT LIFE

01

02

SkillsFuture For You!

FOR ALL SINGAPOREANS

- SkillsFuture Study Awards**: Enjoy support while developing and deepening your skills to future economic growth sectors and areas of demand. You can get a monetary award of \$200 to offset part of course expenses associated with your choice.
- SkillsFuture Credit**: Singaporeans aged 25 and above are given an initial credit of \$500 which will be topped up periodically. This credit does not expire. You can use them for a broad range of courses.
- P-Max**: Explore career opportunities with small and medium-size enterprises (SMEs) with good progression opportunities for Professionals, Managers, Executives, and Technicians (PMETs).
- SkillsFuture Career Advisers Programme**: Open to industry veterans who will provide career advice and help you expand your understanding of the skills jobs that are in demand in specific sectors.
- SkillsFuture Advice**: Understand the importance of career planning, skills upgrading and find more about the various government initiatives available to support you in your skills and career development.

STUDENTS

- Education and Career Guidance (ECG)**: Most ECG counsellors to be based at the range of education institutions, including secondary schools, polytechnics, junior colleges and universities will be expanded to a range of career choices. Adults may obtain career and training advice through career centres.
- MySkillsFuture**: Singaporeans can access resources and tools to help them plan their career path. MySkillsFuture, a one-stop online portal which incorporates the national Career Space. You can track change of your skills and career development throughout life and make informed learning and career choices.
- Skills Framework**: The Skills Framework provides up-to-date skills, occupation and skills needs information, occupation, job roles, existing and emerging skills, and is used to inform education and training programmes. It is developed for the workforce by the government together with employers, unions and professional bodies.

WORKING ADULT

- SkillsFuture Qualification Award**: If you have attained a WQS Diploma/Special Diploma/ Diploma Certificate or Graduate Diploma, you are eligible for a cash award of \$2,000. You have attained a WQS Certificate/Higher Certificate/Advanced Certificate, you are eligible for a cash award of \$1,000.
- SkillsFuture Fellowship**: Gain recognition for demonstrating skills mastery, advancing lifelong learning, and mentoring others. Award recipients will receive a monetary award of \$8,000 to support their ongoing learning mastery in their respective fields.
- SkillsFuture Mid-Career Enhanced Subsidy**: Singaporeans aged 40 years and above can receive up to 50% subsidy for up to 10% funding for courses for their certificate/diploma/degree courses supported by SkillsFuture Singapore.
- SkillsFuture Series**: These short courses cater to learners with different needs and interests. These short courses cater to learners with different needs and interests. These short courses cater to learners with different needs and interests.
- TechSkills Accelerator (TeSA)**: Fresh ICT graduates, and both ICT and non-ICT professionals, can receive up to 50% subsidy to receive the domain knowledge to stay competitive and meet the challenges of their rising digital economy through TeSA, a framework of activities for participants.
- SkillsFuture Work-Study Degree Programmes**: You can receive up to 50% subsidy for up to 10% funding for courses for their certificate/diploma/degree courses supported by SkillsFuture Singapore.
- SkillsFuture Earn and Learn Programme**: Digital polytechnic and ITE graduates will be placed in jobs and receive a salary while undergoing structured on-the-job training and learning highly sought-after skills. They will receive a stipend of \$1,000.
- Young Talent Programme**: ITE, polytechnic and university students can take up overseas internships and work-study programmes, to prepare for international assignments in their careers.
- Enhanced Internships**: ITE and polytechnic students can take up Enhanced Internships to gain hands-on experience. They can deepen and apply their technical and soft skills while gaining industry experience.

SkillsFuture

Disruptions need not always take the form of shocks. The changing nature of work and skills can disrupt Singapore's knowledge-based economy, which is highly dependent on its people. In 2015, SkillsFuture was launched as a national movement to provide Singaporeans with the opportunities to develop their fullest potential throughout life regardless of their starting points.

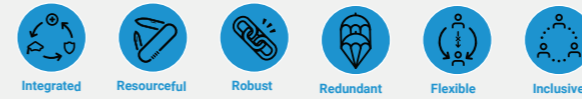
The aim is to help individuals make well-informed choices in education, training, and careers. This is achieved by developing an integrated high-quality system of education and training that responds to constantly evolving needs; promoting employer recognition and career development based on skills and mastery; and fostering a culture that supports and celebrates lifelong learning.

The movement recognises the importance of skills and the need to change mindsets around lifelong learning and skills mastery. By providing tailored courses and benefits, SkillsFuture plays a part in Singapore's development towards an advanced economy and inclusive society.

RESILIENCE VALUE:

- Opportunities for Singaporeans from all walks of life to learn and take advantage of different learning opportunities no matter their starting points
- Ensuring citizens remain economically relevant and maintaining Singapore's economic competitiveness

RESILIENCE QUALITIES:



CITY RESILIENCE FRAMEWORK (CRF):



STAKEHOLDERS:



STATUS: ONGOING

As at 2017:

- SkillsFuture Credit has benefited over 285,000 Singaporeans
- 76 programmes under SkillsFuture Earn and Learn Programme
- 10 SkillsFuture Work-Study Programme launched
- Over 4,600 Singaporeans attended SkillsFuture Advice Workshops

01 - Activities at the green rooftop of Marina Barrage, Credit: anahtiris
02 - Infographics on "SkillsFuture For You!", Credit: SkillsFuture Singapore

AN ONGOING JOURNEY: OUR RESILIENCE EFFORTS

Singapore has several national strategies and initiatives that go towards addressing the various long-term challenges that we face. The following featured strategies demonstrate how resilience thinking has been imbued in the charting of their recommendations and actions. The strategies, which involved the engagement and consultation of a broad range of stakeholders, take a long-term and systems approach to tackling the challenges identified, including that of climate change and changing demographics.

Sustainable Singapore Blueprint (SSB)

www.mewr.gov.sg/ssb/home

This national vision for a more liveable and sustainable Singapore arises from an Inter-Ministerial Committee on Sustainable Development chaired by the Ministry of Environment and Water Resource and the Ministry of National Development. Launched in 2009, and updated in 2015, the blueprint provides all of us an opportunity to work together to create a better home, environment, and future for all through the following visions:

- A Liveable and Endearing Home
- A Vibrant and Sustainable City
- An Active and Gracious Community

The SSB took in the views of more than 130,000 people via consultation on land transport and urban development master plans, public dialogues, and surveys. To demonstrate Singapore's ambition in practising sustainable development, the plan sets out a variety of targets to be achieved by 2030, including: creating more quality green and blue spaces for the population; furthering mobility and connectivity; fostering resource sustainability; improving air quality and drainage systems; and expanding community stewardship among the people.



RESILIENCE ACTION:

- **“Eco-Smart” Endearing Towns**
 - Embedding smart technologies and eco-friendly features into towns and homes
- **Green and Blue Spaces**
 - Creating accessible green and blue spaces for people to live, work, and play
 - Extending length of nature ways and park connector network
- **A “Car-lite” Singapore**
 - Improving our public transport network and connectivity
 - Promoting cycling as a complement to public transport through expanding cycling network
 - Encouraging walking as a healthy and convenient way to get around and experimenting with more pedestrian friendly streets
- **Towards a Zero Waste Nation**
 - Working with different sectors across the population to raise recycling rate and reduce wastage
 - Forming national voluntary partnership to develop and promote e-waste recycling programmes
- **A Leading Green Economy**
 - Leading the way for Green Buildings in the tropics and sub-tropics through the Building and Construction Authority (BCA) Green Mark Award
 - Testing and developing energy-efficient building technologies
 - Raising adoption of solar power

RESILIENCE VALUE:

- Long-term vision for a liveable and sustainable Singapore
- Approaching and addressing climate change challenges on multiple fronts

Committee on the Future Economy (CFE)

www.gov.sg/microsites/future-economy

Some 30 representatives from different industries that operate in both global and domestic markets as well as from large and small enterprises convened in 2016 to review Singapore's economic strategies and propose ways to further a sustainable and inclusive economic growth.

After engaging over 9,000 stakeholders, the Committee on the Future Economy (CFE) released a report in February 2017 that identified seven mutually reinforcing strategies to further Singapore's economic growth and to build resilience in our economy.

The vision for the future economy is for people to develop deep skills and be inspired to learn throughout their lives; businesses to be innovative and nimble; the city to be vibrant, connected to the world, and continually renewing itself; and the government to be coordinated, inclusive and responsive.

Despite the challenging global environment we face today, there are many opportunities for Singapore. The Committee on the Future Economy report outlines how Singapore is in a good position to tap into several growth sectors, and the importance to continue to be well connected externally, while ensuring sufficient space to grow and to rejuvenate internally. The report also identified key future actions, such as the need to build up strong digital and cybersecurity capabilities and implementing tailored Industry Transformation Maps for each industry.

RESILIENCE ACTION:

FOLLOWING UP ON FIVE AREAS:

- **Future Corporate Capabilities and Innovation**
 - To enable companies and industry clusters across different scales to develop innovative capacities and use technology as well as new business models and partnership to create value
- **Future Growth Industries and Markets**
 - Consider macroeconomic and technological trends, and Singapore's comparative advantage in industries and markets that will drive the global economy of the future
- **Future of Connectivity**
 - Study how Singapore can remain well-connected as a competitive key hub in the future economy, taking into account trends that will affect how the global economy is configured
- **Future City**
 - Study how Singapore can continue to sustain new growth opportunities as a leading global city and endearing home; enhances its infrastructure, overcome resource constraints and ensure a highly liveable environment.
- **Future Jobs and Skills**
 - Examine trends, including demographic and technological ones that will affect the landscape for jobs and the requirements for workers, and recommend ways to prepare workers for the future.

RESILIENCE VALUE:

- Long-term, systemic approach to build up Singapore's economic resilience
- Developing mutually reinforcing strategies that create impact across different sectors and groups of people



Smart Nation Singapore

www.smartnation.sg

This whole-of-nation movement harnesses digital technologies to build a future Singapore. The vision includes improving living and building a closer community, empowering citizens to achieve their aspirations through good jobs and opportunities, as well as encouraging businesses to innovate and grow.

A key aspect of becoming a smart nation is not just adopting technology for technology's sake but improving the lives of the population in more effective and meaningful ways. Singapore has put in place appropriate policies and legislation to create the ecosystem that facilitate innovation by the public and the private sectors, and encourage adoption of new ideas.



01

RESILIENCE ACTION:

- **Open Data**
 - Making data sets collected by public agencies available and accessible to the public through online portals so they can also participate and co-create citizen-centric solutions.
- **Living Laboratory**
 - Remaining committed to investing in research and innovation to catalyse emerging breakthroughs and drive new areas of economic growth. We are also an ideal location for companies and researchers to develop, prototype, and pilot their technological solutions.
- **Cybersecurity and Data Privacy**
 - Recognising cybersecurity as a key enabler of our Smart Nation. There are possible risks, and we have to prioritise privacy of data and safeguarding of critical systems and networks even as we make them smart.

- **Computational Capabilities and Digital Inclusion**
 - Re-skilling and promoting the learning of coding and computational thinking skills to ensure that all segments of the population benefit regardless of age or digital literacy. Resources are also in place to assist companies and SMEs as they seek opportunities in the digital economy.

RESILIENCE VALUE:

- Facilitating and creating spaces for innovation
- Building capacity for different groups to be involved in the digital economy
- Enabling greater transparency while ensuring security

Action Plan for Successful Ageing

www.moh.gov.sg/content/moh_web/ifeelyoungsg/about-the-action-plan/what-is-the-plan-about.html

This blueprint to prepare Singapore for rapid population ageing in the next decade was jointly developed by government agencies, voluntary welfare and non-profit organisations, academia, businesses, as well as community and union leaders.

Over 4,000 Singaporeans were engaged through focus group discussions, online consultation and “listening points” at public spaces like libraries, shopping malls, and universities. Union members and different ethnic communities were also consulted.

The plan outlines more than 70 initiatives in 12 areas, including: health and wellness, learning, volunteerism, employment, housing, transport, public spaces, respect and social inclusion, retirement adequacy, healthcare and aged care, protection for vulnerable seniors, and research.



02

RESILIENCE ACTION:

KEY INITIATIVES AND TARGETS:

- **Lifelong Employability**
 - The re-employment age has been raised from 65 to 67 in 2017, to enable workers to work longer if they are willing and able to.
- **Health and Wellness**
 - A National Seniors' Health Programme that will reach over 400,000 older adults.
 - A new workplace health programme that will target 120,000 mature workers aged 40 and above.

- **Senior Learning**
 - A National Silver Academy that will eventually provide some 30,000 learning places for seniors to pursue their interests.
 - Target of 100 schools and Voluntary Welfare Organisations/community organisations to come on board the Intergenerational Learning Programme.
- **Senior Volunteerism**
 - Recruit an additional 50,000 senior volunteers.
- **Community Befriending and Inter-generational Harmony**
 - Expand home visitation programmes in at least 50 neighbourhoods to keep social isolation and poor health at bay among vulnerable seniors
 - Co-locate eldercare and childcare facilities in some 10 new Housing & Development Board housing developments.
- **Aged Care**
 - Between 2015 and 2020:
 - More than double the number of Community Hospital beds.
 - Increase nursing home capacity by more than 50%.
 - Increase home and community care places by 50% and 100% respectively.
 - planned another 40 day centres for seniors by 2020. About a quarter of these centres will be large Active Ageing Hubs in housing developments, providing active ageing and assisted living services to seniors.
- **Transport**
 - Implement 35 Silver Zones by 2020.
 - Double the number of Green Man Plus traffic lights from the current 500 to 1,000 by end-2018.
 - Install lifts at an additional 41 pedestrian overhead bridges by 2018.
 - Replace all buses with wheelchair-accessible ones by 2020.

RESILIENCE VALUE:

- Holistic approach to managing an ageing population
- Working across different sectors to plan for an ageing population

GOALS AND OPPORTUNITIES

Building resilience is an ongoing process. Through engagements with stakeholders, this publication has identified some goals and opportunities—some underway and some new—that can further our resilience and bring everyone along this journey.

The complex and interconnected challenges of climate change and changing demographics require more open and non-conventional solutions. Traditional approaches, such as rules-based ones, have brought us to where we are today, and enabled the necessary changes for our rapid development, but they may not necessarily be suitable for today's and tomorrow's challenges. During a CLC-100RC workshop to identify key resilience challenges and gaps in Singapore, stakeholders from different parts of society discussed how new challenges need to be addressed with a different approach—one that is less

straightforward of rules and answers, but nevertheless adheres to some of the core values and beliefs that Singapore ascribes to as a nation.

This may mean a more values-based approach to our challenges and opportunities, one that looks and frames the issue and solutions with a set of values that residents and citizens of Singapore believe in and can ascribe to. This could include values such as being caring, confident, inclusive and resilient. So one would take action and play their part in building up Singapore's resilience because they care about the environment, their neighbours and the city.

A resilient city can be many things. Essentially, it is about how a whole city can come together, both in the everyday and during times of crisis. As we anticipate new and ever-evolving challenges, we have to face them with the same willingness to learn and innovate so as to better meet future problems that come our way. We need continued effort, commitment, and the will to take us into the future. We have done it before, and can do it again.

FROM AWARENESS TO ACTION

There is still much room to enable awareness and foster actions. For example, many Singaporeans may find it difficult to understand the urgent need to take action on climate change as we do not experience major natural disasters. Even when extreme events are felt, such as flash floods or heat waves, many feel climate change as something beyond them or it is the "government's responsibility" to do something about it.

There is scope for the community, be it individuals or businesses, to be better educated and engaged on the risks and challenges

arising from climate change and be encouraged to be part of the action. **We must start a conversation across the community about the impacts of climate change, and conduct it in a manner that is accessible and facilitates different stakeholders' participation in coming up with solutions.**

Some actions are underway or planned to support the push from awareness to action:

Singapore's Climate Action Plan

<https://www.nccs.gov.sg/resources/publications/plans-reports>

As part of the Paris Agreement, Singapore pledged to reduce our emissions intensity (emissions per dollar of GDP) by 36% from 2005 levels by 2030, and stabilise our emissions with the aim of peaking around 2030. Singapore's Climate Action Plan released in 2016 outlines our strategies for climate change adaptation and mitigation.

2018: Year of Climate Action

<https://www.mewr.gov.sg/climateaction>

To encourage greater awareness and action, the Ministry of the Environment and Water Resources (MEWR) has designated 2018 as the "Year of Climate Action". The tagline, "Take Action Today, For A Sustainable Future; Reduce Our Carbon Footprint" conveys the key message that tackling climate change cannot be the work of the government alone.

Besides reaching out to the private companies and public to engage and educate them on how they can contribute, a Climate Action Pledge was launched to get individuals and companies to publicly declare their readiness to deal with climate change.



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HOW CAN YOU GET INVOLVED?

Pledge now to take action for Climate Change

<https://www.mewr.gov.sg/climateaction>



Supporting Climate Action

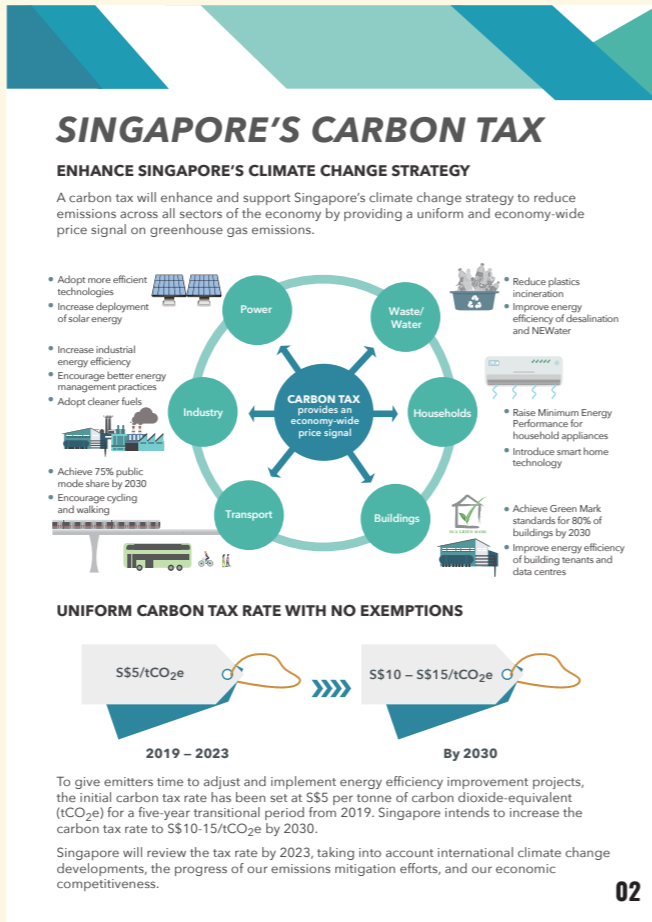
www.google.com/amp/s/climateaction.sg/2018/05/09/climate-action-grant-for-ngos-and-interest-groups/amp/

A Climate Action Grant was launched by MEWR for Non-Governmental Organisations (NGOs) and interest groups to support projects that promote the climate action messages, including the 3Rs (Reduce, Reuse, Recycle) as well as energy conservation.

Economy-wide Price Signal to Support Singapore's Climate Action Plan

www.nccs.gov.sg/climate-change-and-singapore/reducing-emissions/carbon-tax

Singapore's carbon tax is an efficient method of maintaining a transparent and consistent carbon price signal across the economy to incentivise emissions reduction where cost is lowest. The Climate Action Plan, launched in 2016, sets out four strategies to achieve a carbon-efficient Singapore: improving energy and carbon efficiency reducing carbon emissions in power generation; developing and deploying low-carbon technology; and encouraging collective climate action. The carbon tax will enhance and support these climate change strategies.



Working with Companies for Change

www.fsb-tcfd.org

Many companies in Singapore currently lack the knowledge and/or capacity to think about how they will be impacted by climate change and how to build resilience within their businesses.

More can be done to facilitate greater knowledge sharing on this topic in the corporate sector. One example is the Task Force on Climate-related Financial Disclosures (TCFD). In 2017, the organisation issued a voluntary framework for disclosures by publicly listed companies and the financial sector. The Stock Exchange of Singapore (SGX) is also encouraging Singapore listed companies to shift towards such a reporting framework. This builds upon the mandatory sustainability reporting that was recently introduced.



Developing an Integrated Toolkit on Resilience Thinking for Cities

Drawing on Singapore's experience and the 100RC's network and resources, CLC will be working with 100RC to research and develop an integrated toolkit that seeks to help cities better understand and apply key principles and actions for building resilience, such as applying resilience thinking in planning and development. The toolkit will reference principles from the Singapore Liveability Framework and City Resilience Framework, and learn from best practices from CLC's and 100RC's networks.

HOW CAN YOU GET INVOLVED?

- Explore your role in reducing your carbon footprint

<https://mewr.gov.sg/get-involved-climate-action-sg>

HOW CAN YOU GET INVOLVED?

Get in touch with the Centre for Liveable Cities to find out more and share your ideas at

MND_CLC_Enquiries@mnd.gov.sg

CO-CREATING SOLUTIONS

Resilience needs to be built at all levels, right down to the individual. Everyone has a part to play to understand the challenges and work together to come up with solutions.

Collaborating on Impactful Solutions

<https://colabs.sg/>

Colabs is a philanthropic initiative by the Community Foundation of Singapore (CFS) and the National Volunteer and Philanthropy Centre (NVPC) that brings together the public, private and social sectors to tackle complex social issues. It enables philanthropists, businesses, and non-profits sector experts with a common focus to build insights and co-create solutions together.

The collaborative process typically comprises three stages. First, stakeholders go on a learning journey to gain in-depth knowledge of social causes. With new insights, members with similar interests identify opportunities to work together on a problem and get behind a common agenda. Lastly, they share resources and expertise, working together to achieve their shared vision for social change.

In 2017, Colabs focused on children and youth. In 2018, Colabs will examine issues around two other communities—persons with disabilities, and seniors.



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HOW CAN YOU GET INVOLVED?

- Find out more about Colabs and share your ideas

<https://colabs.sg/contact-us/>



Singapore has embarked on and will continue with the many ongoing and pipeline efforts to reach out and co-create solutions with various stakeholders to address our resilience challenges.

Our Singapore Fund (OSF)

www.sg/oursingaporefund

Our Singapore Fund (OSF) supports meaningful projects by passionate Singaporeans—projects that build national identity or meet social and community needs. This umbrella fund is made up of supporting funds from the Ministry of Culture, Community and Youth (MCCY), Tote Board (Singapore Totalisator Board), and the Singapore Centre for Social Enterprise (raiSE).

Some examples of OSF projects:

Community Living Room at Block 52

This project brings together residents and stakeholders from Block 52 Cassia Crescent, in the planning and design of a community space at the level 2 void deck.

The team from Participate in Design (PiD) has been engaging the block's residents through a series of intensive house-to-house interviews conducted with some 50 households to understand the needs and opportunities of the community. Pop-up community design workshops were then held to suss out ideas on how residents envision the void deck space. Based on their collective insights, aspirations, and ideas, the void deck at level 2 was eventually chosen as the site of intervention for the team to design and activate in collaboration with the community.

By applying a participatory design process with a community-driven approach, PiD hopes to renew a sense of belief that everyone has something positive to contribute towards the design and planning of an inclusive community space that residents can proudly call their own.

More than Just

With a firm belief that proper civic discourse on race and racism is important in multiracial Singapore, Lewis Liu and Chen Li Yi, started this series of closed-door conversations.

Over three dinner conversations, they created safe spaces for people from diverse backgrounds to explore their differences together. Putting his experience as a facilitator to good use, Lewis guided participants through touchy and uncomfortable topics such as race and racism in Singapore.

Through these discussions, participants were invited to share their views and personal stories in a safe and constructive environment. Participants were able to see beyond labels and build trust with people from other ethnicities, with some even continuing their conversations long after the event had ended.



03



HOW CAN YOU GET INVOLVED?

- Tap on Our Singapore Fund and start your own community project

<https://www.sg/oursingaporefund>



04




Creating Friendly and Lively Estates


www.hdb.gov.sg/cs/infoweb/community/hdb-community-week/hdb-friendly-faces-lively-places-fund-page

To enliven our common spaces and forge community spirit in our estates, the Housing and Development Board (HDB) came up with the Friendly Faces, Lively Places Fund in 2016. The fund supports residents' ground up activities and has been well-received, with some 50 projects island-wide. Some of the projects involve physical works like converting a grass patch to a play and gardening yard, while others include handicraft and gardening workshops.

All of these initiatives are created by the community, for the community. The funding cap for the programme has since been increased from \$10,000 to \$20,000 so that residents can plan larger-scale and more impactful community projects. The fund has also been extended to the Merchants' Associations within the HDB heartlands, so they too, can make use of this resource to enliven HDB spaces near their businesses.



HOW CAN YOU GET INVOLVED?
Tap on the Creating Friendly and Lively Estates Fund to enliven your community spaces today



www.hdb.gov.sg/cs/infoweb/community/hdb-community-week/hdb-friendly-faces-lively-places-fund-page

01 - Welcome to our Backyard Co-creation Workshop: The Upcycled Play Yard, Credit: Housing and Development Board (HDB)
02 - Phase 3 of the engagement process for Founders' Memorial, Credit: Ministry of Culture, Community and Youth (MCCY)



Continuing Conversations

The Singapore government will continue to reach out to Singaporeans in different stages of life and across various occupations. This will allow us to harness the diverse strengths of our society, and work together with them to achieve something greater than the sum of the different parts.



HOW CAN YOU GET INVOLVED?
Be part of the conversations



<https://www.nyc.gov.sg/youthconversations>

Empowering Our Youth

<https://www.nyc.gov.sg/youthconversations>

Engaging youth is a key priority for the Ministry of Culture, Community, and Youth (MCCY). Building on past efforts, such as the National Youth Forum and YouthSPEAK, the Youth Conversations was launched in April 2018 to provide a sustained platform for the government to engage youth, and gather their views, concerns and aspirations.

The Youth Conversations aims to strengthen our social compact with youths, and build strong national identity by giving them a stake in the country. Youth will be able to meet peers with diverse perspectives, have a say in key policy issues that affect them, as well as co-create and co-deliver solutions with the government.

Looking Out for Our Seniors

As Singapore ages rapidly in the coming years, we need to build a strong community-based support system to help our seniors stay healthy for as long as possible, and provide seniors with needs with the necessary help quickly.

The Community Networks for Seniors (CNS) brings together different stakeholders on the ground to promote the ABCs of ageing well:

- (i) Active Ageing for seniors to keep active, healthy and engaged
- (ii) Befriending seniors who live alone or at-risk of social isolation
- (iii) Care coordination for seniors with health and social needs

The key idea in CNS is to draw on the energies of community partners to jointly engage and support our seniors for maximum impact, rather than to centralise or replace their efforts. CNS partners include voluntary welfare organisations, grassroots organisations, regional health systems and government agencies such as the Health Promotion Board and Social Service Offices.

► The Community Networks for Seniors (CNS) brings together different people in the community to help our seniors age well in place. Here's what they - and their volunteers - do.

In 15 years, we will have... **1 MILLION SENIORS**

HOW CNS HELPS OUR AGEING POPULATION

Plan

- Identify areas in which seniors need more support
- Identify the types of seniors in each community
- Develop an action plan

Build

- Pooling together health and social care resources to better serve the seniors
- Develop new services to meet needs & gaps
- Set up systems & infrastructure

Connect

- Encouraging residents to help their elderly neighbours
- Building a Kampung to help our seniors grow old gracefully

01 - Details about Community Networks for Seniors, Credit: Agency for Integrated Care
 02 - Pop-up engagement with residents on preferred themes of urban intervention, Credit: Centre for Liveable Cities

CNS has shown the potential of synergising the efforts of different stakeholders to engage more seniors to build a more proactive community care system for seniors. Between January to April 2018 alone, 55,000 seniors have been engaged on CNS outreach. Over 7,000 seniors have attended functional screening comprising basic eye, oral and vision checks at community nodes in the heartlands such as senior activity centres, Residents' Committee centres and Community Clubs.

HOW CAN YOU GET INVOLVED?

- Be a community volunteer and befriend a senior

<https://www.giving.sg/community/cns>



Furthering the Resilience Agenda Together

Drawing on participatory design approaches from best practices, such as Rebuild by Design in New York City and the Rail Corridor in Singapore, CLC will be working with relevant stakeholders to bring together communities, government officials, and experts from different disciplines to better understand the challenges brought about by climate change and empower communities to be more involved in coming up with solutions for challenges and issues such as flash floods. This will not only help raise awareness about the resilience challenge, but go a step further to work with the community, for the community, in building up our resilience.

HOW CAN YOU GET INVOLVED?

Get in touch with the Centre for Liveable Cities to find out more and share your ideas at MND_CLC_Enquiries@mnd.gov.sg

Three Types of Seniors and the Help They Get

| Healthy Seniors | Lonely Seniors | Frail Seniors |
|--|---|---|
| A | B | C |
| <p>Action Plan</p> <p>Active Ageing: Keeping them active through social activities</p> <p>Who's involved:</p> <ul style="list-style-type: none"> People's Association Health Promotion Board Silver Generation Office | <p>Action Plan</p> <p>Befriending: Provide emotional and psychological support</p> <p>Who's involved:</p> <ul style="list-style-type: none"> People's Association Voluntary Welfare Organisations | <p>Action Plan</p> <p>Care & Support: Providing targeted care and welfare</p> <p>Who's involved:</p> <ul style="list-style-type: none"> AIC's Community Case Management Service AIC's Community Care Assessment Team Voluntary Welfare Organisations |

01

LEARNING FROM THE 100RC NETWORK

As part of the 100RC Network, Singapore is inspired by the initiatives and efforts of member cities in building resilience. We look forward to learning from each other and strengthening our partnerships through the sharing of best practices and collaborations. Here are a few examples from various cities:



San Francisco, Berkeley and Oakland are piloting the Bay Area Resilient by Design Challenge, a public-private partnership that seeks to pool the talents of the best minds in the region—experts in ecology, technology, design and social activism—to translate advances in research into specific, place-based solutions to flood risk and sea level rise. These innovative ideas address long-term threats, in addition to current challenges, including the essential infrastructure needs of communities on the frontline of sea level rise. More about the Challenge, including the final team presentations, can be found at <http://www.resilientbayarea.org/>.



Los Angeles is increasing preparedness and building social cohesion by connecting community organisations with experts and resources to guide and efficiently support the development of neighbourhood resilience hubs. Hubs will be fortified with the most up-to-date electricity, water, communications, and seismic technologies to ensure that critical services are maintained during and after a disaster. On an everyday basis, Hubs will also foster social cohesion while addressing chronic community stressors through outreach, education, and connections to existing social and environmental stewardship programs and services.



Medellin has committed to integrating and coordinating the city's information in a single system so that public and private entities and communities can obtain up-to-date information. To achieve its goal of an equitable Medellin, one of the flagship initiatives is to set up A Colaboratorio, a citizens' meeting place to share knowledge and learn, especially for the youth.

New York is working to ensure that its neighbourhoods and public services are ready to withstand and emerge stronger from the impacts of climate change by strengthening community-based organisations. The city will develop a comprehensive, interactive web-based platform to map both small and large community organisations and activities, as well as local government services and initiatives, across the city. This will encourage more effective coordination, collaboration, and decision-making in these efforts. The city will also enhance volunteerism by enhancing the NYC Service platform, which connects programs in need of support with available volunteers, including in emergency response and recovery efforts.



Vejle is promoting collaboration between citizens and companies on the topic of flooding, encouraging citizens living in higher altitude areas of the valley, fjord and harbor to take action on storm water management on their own land.



Boston is driving innovation in community engagement to provide comprehensive and informed training and resources to city agencies and community members to help the city engage Bostonians more effectively. This includes hosting design lab workshops, developing a community resilience fellowship program for vulnerable residents to participate in the implementation of *Resilient Boston*, and launching a partnership with the creators of the popular game *Pokemon Go* to engage middle school students in exploring the city's neighborhoods and landmarks.



Surat is working on furthering social cohesion through awareness generation. A center for cultural resources and visual arts will be established in the city for building community resilience through activities like festivals and cultural conservation. The city will link this new institution to campaigns on resilience issues, which will bring community-level events like street plays and mock emergency drills to the city's neighborhoods. Citizens will also be encouraged to engage further in the city's development process via public debates and presentations, online and offline polls, and a new Citizen Collaboration Center.



Rotterdam is embedding climate adaptation into the urban fabric of the city through Water Sensitive Rotterdam (WSR). This action encompasses both a large number of small citizen- and business-led projects, as well as larger-scale efforts to deepen understanding and support research around climate action. The end goal is to promote a new way of thinking, in which rain water is seen not as a threat but a valuable raw material that should be locally utilised. The city's Zoho district is an example where climate adaptation projects like the multifunctional Bentheplein water square have acted as a catalyst for sustainable development and greater social cohesion.



Melbourne is kick-starting the Neighbourhood Project, which will provide 12 months of capacity building, resources and mentoring to participating communities on how to turn under-used land into green spaces. This will include training in design and project management. The Neighbourhood Project will also tackle barriers that impede community-led place-making projects, such as planning scheme requirements. It will work with councils to better understand and remove these barriers, while still ensuring that councils can fulfil their legal and public safety obligations. The action will transform 24 under-used spaces in 8 neighbourhoods into useful community public spaces, using a 'tactical urbanism' methodology.

Endnotes

¹Colony of Singapore (1947) Report of the Housing Committee, Singapore

²Refer to Mercer (2018) and Gray (2017).

³The statistics are updated as of January 2018 and retrieved from various sources quoted in the bibliography.

⁴The quote was retrieved from *Lee Kuan Yew, From Third World to First: The Singapore Story, 1965 – 2000* (Singapore: Times Media Publishing, 2000), p.116

⁵Resilience dividend is the idea that building resilience goes beyond withstanding a disruption more effectively to also enable individuals, communities, organisations to “build new relationships, take on new endeavours and initiatives, and reach out for new opportunities, one that may have never been imagined before”. Refer to Rodin (2014).

⁶Rebuild by Design (RBD) is a design competition that brought designers, researchers, government officials and local communities together in search of solutions to make flood-prone regions more resilient to future threats. Adopting a collaborative research and design approach, it was launched as part of Hurricane Sandy’s Rebuilding Task Force. See more at www.rebuildbydesign.org.

⁷The quote was retrieved from Centre for Liveable Cities, Singapore. (2016). *Transformative Partnerships: Case Studies on Urban Governance*. p.30

⁸The quote was retrieved from *Lee Kuan Yew, From Third World to First: The Singapore Story, 1965 – 2000* (Singapore: Times Media Publishing, 2000), p.19

⁹Professor Eric Klinenberg defines social infrastructure in the broad sense as facilities and conditions that allow connection between people. Refer to Klinenberg (2002).

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Cyclists at Car-free Sunday in the city centre, Credit: Tan Teck Siang

Jubilee walk event by URA, Credit: Urban Redevelopment Authority (URA)

Mobile library event for the community at Bishan-Ang Mo Kio Park, Credit: Lim Wei Da

Spiral ramp leading up to the roof top garden at Marina Barrage, Credit: PUB, Singapore's National Water Agency

Singapore's Central Business District, Credit: Ramir Borja

Night view of Gardens by the Bay, Credit: Kunchainub

Night view of Marina Bay area, Credit: Centre for Liveable Cities

View of Singapore during a haze episode in 2013, Credit: andrekusuma

Car-Free Sunday, Credit: Urban Redevelopment Authority (URA)

People at the stepping stones of Bishan-Ang Mo Kio Park, Credit: AtelierDreiseitl

Seniors playing chess at Chinatown, Credit: Nathan_Allen

Seniors participating in activity at a Senior Activity Centre, Credit: TOUCH Community Services

Pedestrianisation of Keong Siak Street, Credit: Urban Redevelopment Authority (URA)

Singapore National Game 2012 Opening Ceremony, Credit: Singapore Sports Council

A RESILIENT SINGAPORE

How can cities be better prepared in the face of impending stresses and shocks? What are the innovative solutions that cities can adopt to address cross-cutting challenges such as climate change and changing demographics? In a world where cities are facing increasingly complex challenges, resilience is critical for cities to not just survive, but adapt and thrive.

A Resilient Singapore maps out what Singapore has done and will continue to do to build its resilience. Through the sharing of case studies and actions, this publication captures Singapore's resilience story—An urban transformation into a highly liveable, sustainable yet high-dense city-state and its continued pursuit to maintain a competitive economy while ensuring a high quality of life for its residents.

Resilience requires us to take an integrated systems approach. It is as much about robust infrastructure and plans as it is about involving and engaging diverse stakeholders. Everyone has a part to play in this ongoing journey of building a resilient Singapore, to make the city better in times of peace and to work together to weather any crisis.

