Bayside Council

Environment and Resilience Strategy 2024-2032

The Journey to Resilient Bayside

Acknowledgment of Country

Bayside Council acknowledges the Traditional Custodians, the Gadigal/Bidjigal people of the Eora Nation, and pays respect to Elders past, present and emerging.

The people of the Eora Nation, their spirit and ancestors will always remain with our waterways and the land, our Mother Earth.

Artwork: Denise Simon

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Abbreviations

Term	Definition
BC Act	Biodiversity Conservation Act 2016
Commission	The Greater Cities Commission
Council	Bayside Council
COVID-19	Coronavirus disease 2019
CSP	Community Strategic Plan
DCP	Development Control Plan
Discussion Paper	Bayside Environmental Issues Discussion Paper
District Plan	Eastern City District Plan
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
DPHI	NSW Department of Planning, Housing and Infrastructure
DRA	Disaster Recovery Arrangements
EEC	Endangered Ecological Community
EMP	Emergency Management Plan
EP&A Act	Environmental Planning & Assessment Act 1979 (Where other statutes are referenced in this document, they are spelled out in full)
EPA	Environmental Protection Agency
EV	Electric Vehicle
LEP	Local Environmental Plan
LGA	Local Government Area
LSPS	Local Strategic Planning Statement
NSW	New South Wales
RC	Resilient Cities
Region Plan	A Metropolis of Three Cities – the Greater Sydney Region Plan
SDG	Sustainable Development Goal
SEED	Sharing and Enabling Environmental Data
UN	United Nations
UNSW	The University of New South Wales
WSUD	Water Sensitive Urban Design

1 Introduction

Image: Green and Golden Bell Frog

1.1 What is the purpose of this strategy?

The Bayside Environment and Resilience Strategy 2024-2032 identifies and addresses the key environmental and resilience issues facing Bayside Council in order to deliver on the Community Strategic Plan theme of a "green, resilient and sustainable" Bayside. In doing so, it reviews federal, state and regional policies and objectives to inform planning implications for Council moving forward, considers best practice case studies and incorporates community feedback on how these matters apply to Bayside.

Council has the opportunity to engage with and empower the community to appreciate that they are part of the environment, and not separate from it. Humans require a healthy environment to be able to survive and thrive, and healthy land and water contributes to optimum human health. Council and the Bayside community in partnership, can protect and improve the environmental health of Bayside, enabling humans and all other species to thrive and be resilient against chronic stressors and sudden shocks.

This Environment and Resilience Strategy:

- proposes an environmental and resilience vision for Bayside, and
- identifies priority environmental and resilience issues for Council to address.

The intent of the Strategy is to identify priority actions to support Bayside Council in delivering on environmental sustainability, and resilience against chronic and sudden shocks, and improving the health and quality of the natural environment for the benefit of the community. Given that Council has limited control and influence on the local environment, it is essential that Environment and Resilience 'strategies' work effectively for all tiers of government and the community.

1.2 How was this strategy developed?

This Strategy, including environmental vision and guiding principles, was developed through:

- reviewing federal, state and regional plans and policies
- aligning with best practice guidelines from the NSW Department of Planning, Housing and Infrastructure (DPHI) for preparation of Local Strategic Planning Statements (LSPS) and LEP Roadmap by the Greater Sydney Commission
- reviewing environmental plans and policies from Bayside and, former Rockdale and Botany Councils
- undertaking preliminary stakeholder and community engagement including adjoining councils, relevant agencies, major local industries, community environmental organisations and council staff
- analysing Bayside's characteristics and reviewing existing environmental assets and constraints mapping

The inputs into the Environment and Resilience Strategy and Action Plan are illustrated in Figure 1.

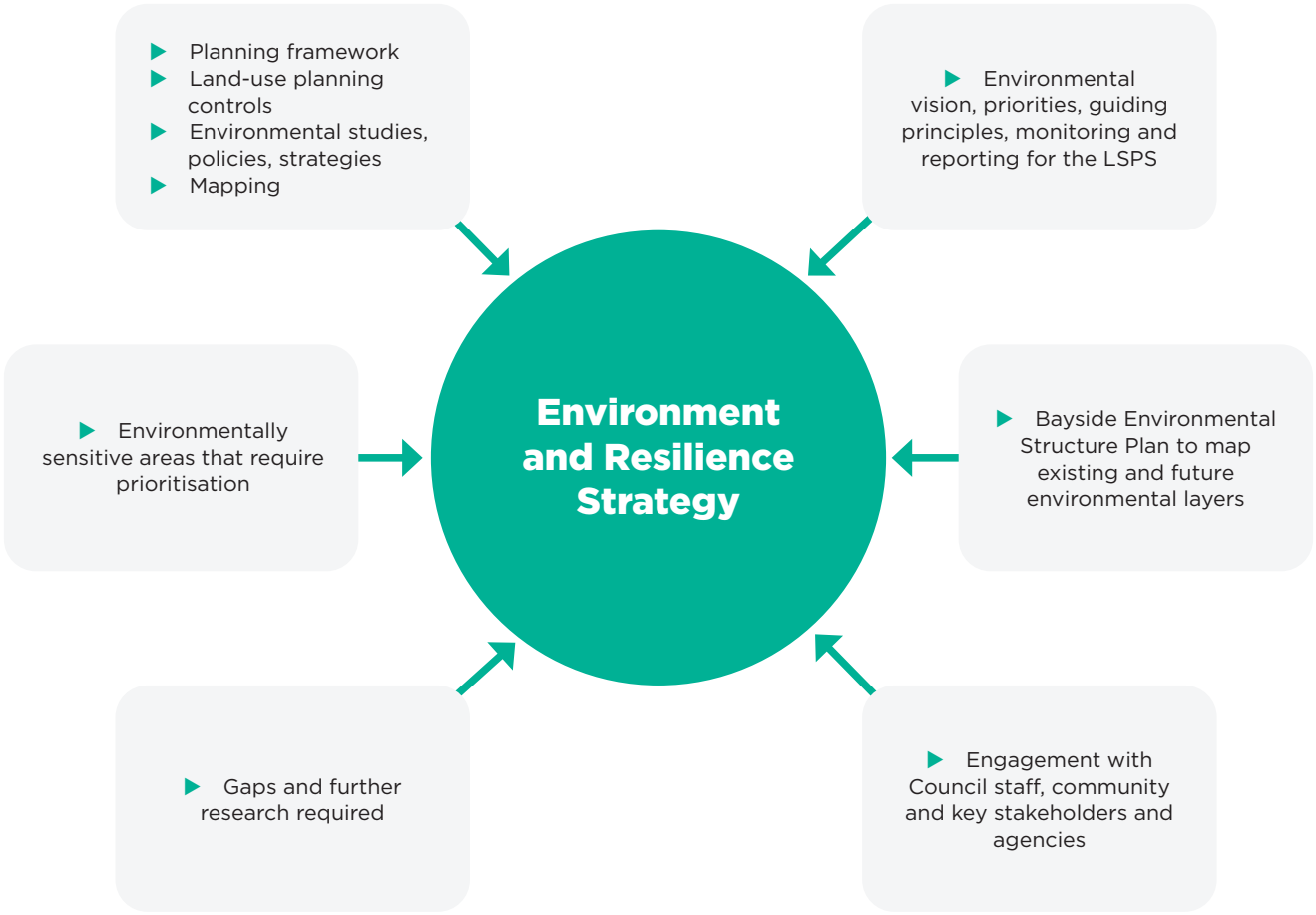


Figure 1: Development of the Bayside Environment and Resilience Strategy

2 Our Bayside

2.1 Bayside Council

Bayside Council was formed in September 2016 following the amalgamation of Botany Bay City Council and Rockdale City Council. Bayside extends from Bexley, Kingsgrove, and Carlton in the west to Banksmeadow, Hillsdale, Eastgardens and Daceyville in the east. It also encompasses Wolli Creek and Turrella in the north, Rockdale, Mascot, Botany, Sydney Airport and Port Botany down to the coastal communities of Brighton Le Sands, Ramsgate, Dolls Point and Sandringham in the south. Bayside consists of five wards (Figure 2).

Bayside is an established part of Sydney's urban fabric and contains nationally significant infrastructure (Sydney International Airport and Port Botany) as well as large areas of industrial land in Mascot, Botany and Banksmeadow. Major industries provide opportunities as well as challenges for the LGA in regard to environmental issues.

Bayside surrounds Botany Bay with eight kilometres of beach and parkland for passive recreation to locals and visitors. Bayside is well served with public transport with two main train lines and several busy bus routes.

Significant wetlands provide important corridors for native flora and fauna, as well as places for our community to engage with natural surroundings.

Council relies on a range of funding sources to manage and improve the performance of Bayside's environmental assets. Funding includes rates, developer contributions and State and Federal government funding.

The traditional custodians of the area are the Gadigal and Bidjigal people of the Eora Nation, and they have had an intimate spiritual and cultural connection to the land and waters for many thousands of years.

Figure 2: Bayside Council LGA (Source: Bayside 2032)

2.2 Community Socio-economics and Resilience Capacity

Bayside community socio-economics and resilience capacity

Median age: 35
Greater Sydney: 37
NSW: 39

Medium and high-density housing: 66%
Greater Sydney: 46%
NSW: 35%

Lone person households: 24%
Greater Sydney: 22%
NSW: 24%

Language at home other than English: 51%
Greater Sydney: 37%
NSW: 27%

Source: ABS, 2049.0.

Aboriginal and Torres Strait Islander: 1.1%
Greater Sydney: 1.7%
NSW: 3.4%

Older couples without children: 7%
Greater Sydney: 9%
NSW: 10%

Overseas born: 48%
Greater Sydney: 39%
NSW: 29%

Unemployment rate: 5.5%
Greater Sydney: 5.1%
NSW: 4.9%

SEIFA index of disadvantage (2016): 1002
Greater Sydney: 1018
NSW: 1001

Bayside's future population in 2036

13,446 children (**0–4 years**), an increase of 3,327 (6.3%)

15,300 primary school aged children (**5–11 years**), an increase of 2,954 (7.2%)

12,003 secondary school age students (**12–17 years**), an increase of 2,766 (5.6%)

40,147 people in the young workforce (**25–34 years**), an increase of 9,484 (18.9%)

45,846 parents and homebuilders (**35–40 years**), an increase of 12,202 (21.5%)

23,238 older workers and pre-retirees (**50–59 years**), an increase of 4,958 (10.9%)

18,726 empty nesters and retirees (**60–69 years**), an increase of 4,036 (8.8%)

19,379 seniors (**70–84 years**), an increase of 5871 (9.1%)

4,740 elderly people (**85 and over**), an increase of 1,067 (2.2%)

24,289 couple families with dependants, an increase of 4,947 (29.8%)

21,104 couples without dependants, an increase of 6,463 (25.8%)

4,566 group households, an increase of 1,429 (5.6%)

21,009 lone person households, an increase of 7,045 (25.7%)

Source: Bayside Community Strategic Plan 2018-2032.

2.3 Community Engagement on Environment and Resilience

What the community wants:

- Preservation of green corridors;
- More community gardens;
- Protection of existing open space, beach and bushland;
- Improved health of Bayside's waterways, wetlands and Botany Bay;
- Consideration of impacts of air quality and noise on residential living;
- A climate change policy to look at sea level rise and provide flood level advice;
- Regular maintenance of stormwater network to improve water quality and mitigate flooding;
- Reduction of the impact on biodiversity and enhance native fauna and flora in Bayside; and
- More trees planted.

2.4 Bayside Environment – an overview

Bayside is home to open space, bushland, wetlands and coastal environments. The LGA is surrounded and intersected by some of Sydney's most important waterways including Botany Bay, Cooks River, Alexandra Canal and Georges River. The federally recognised Botany Sands Aquifer is located in the eastern part of the LGA. These significant wetland and bushland areas provide important corridors for native flora and fauna, as well as places for the community to engage with the natural environment.

A number of Bayside's natural sites contain Endangered Ecological Communities (EECs) including Eastern Suburbs Banksia Scrub, Coastal Saltmarsh, Kurnell Dune Forest and Swamp Oak Floodplain Forest. These natural areas are interspersed with a

variety of non-threatened remnant vegetation communities. Over 24 threatened fauna species and five threatened flora species have been recorded in the LGA.

Bayside features low lying coastal environments which are impacted by flooding and groundwater inundation. These impacts are likely to worsen with future sea level rise and extreme weather events brought about by the effects of climate change. These issues are exacerbated by the equal and pressing concern of historical contamination of ground water and land from previous industrial uses.

Bayside is also experiencing significant population growth and its population is forecast to increase by 65,000 people over the next 20 years (from 2016 – 2036) (Source: NSW Department of Planning, Industry and Environment). This population growth places increasing pressure on the local and regional environment through increased development and use of natural resources. Major concerns include the impact of stormwater quantity and quality on local waterways as well as degradation of remaining natural areas.

As a result, the Greater Cities Commission has identified a number of priority natural areas within the Bayside LGA (Figure 3) in the Eastern City District Plan 2018 including:

- Botany Bay, Cooks River, Alexandra Canal and Georges River
- Bardwell Valley Parklands
- Cooks River Open Space
- Mill Stream and Botany Wetlands Open Space
- Rockdale Wetlands Open Space and corridor

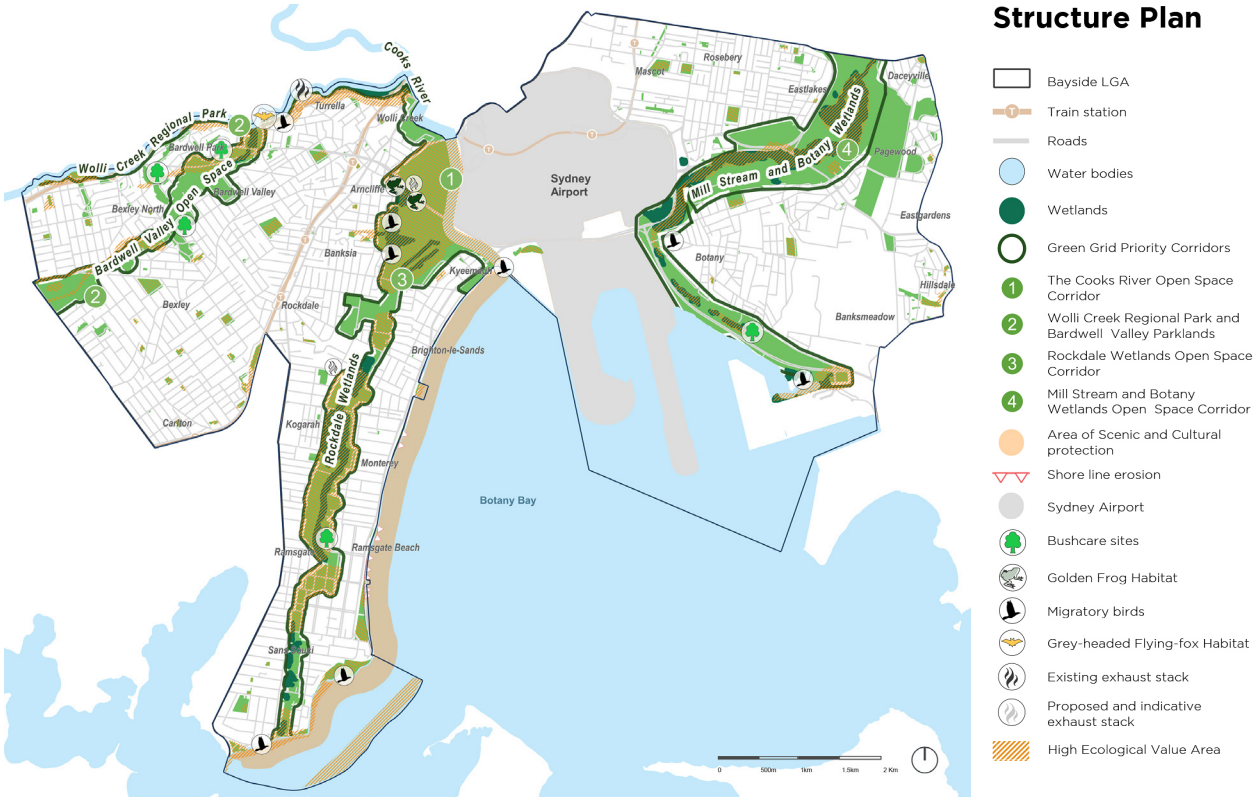


Figure 3: Environmental Structure Plan for Bayside
(Source: Bayside Local Planning Strategic Statement 2020)
Note: This structure plan is a high level strategic representation of environmental areas and corridors only and further investigation work will be undertaken to further define their context

3 What is resilience?

3.1 Resilience Context

Resilience requires cities to be better prepared for and able to withstand acute shocks and chronic stresses. The definition of a resilient city by Resilient Sydney states as:

> **"City resilience is the capacity of individuals, communities, businesses and systems within a city to survive, adapt and thrive no matter what kinds of chronic stresses and acute shocks they experience"**
>
> *Resilient Sydney, 2018*

There is a strong connection between resilience and sustainable development, as resilience enables us to learn from past experiences and prepare for future risks, leading to a more sustainable and equitable future (Melbourne Sustainable Society Institute, 2021).

Acute shocks are sudden events such as extreme weather conditions, bushfires, epidemics, terrorism, and cyber-attacks (Figure 4). Chronic stresses typically affect a large area, while acute shocks usually have a more localised impact.

Chronic stresses are long-term problems such as sea-level rise, urban heat islands, lack of accessibility, social isolation, and chronic food and water shortages. (Figure 4).

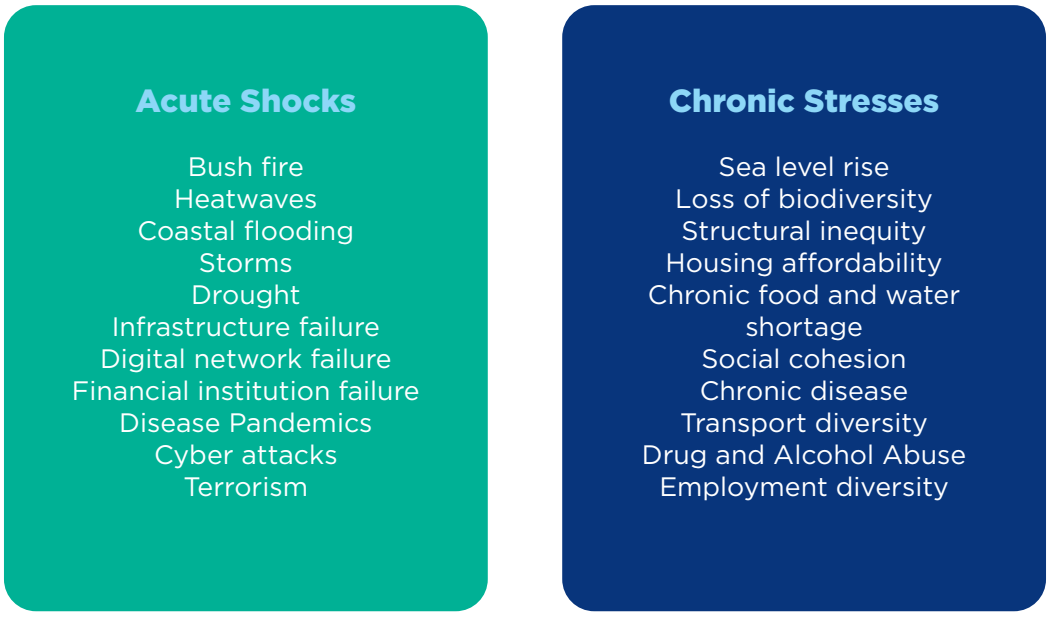


Figure 4: Major acute shocks and chronic stresses

Figure 5 shows a framework for the development of policy and outcomes for a resilient city where the nature of the problem and the timeframe over which the policy response is intending to address.

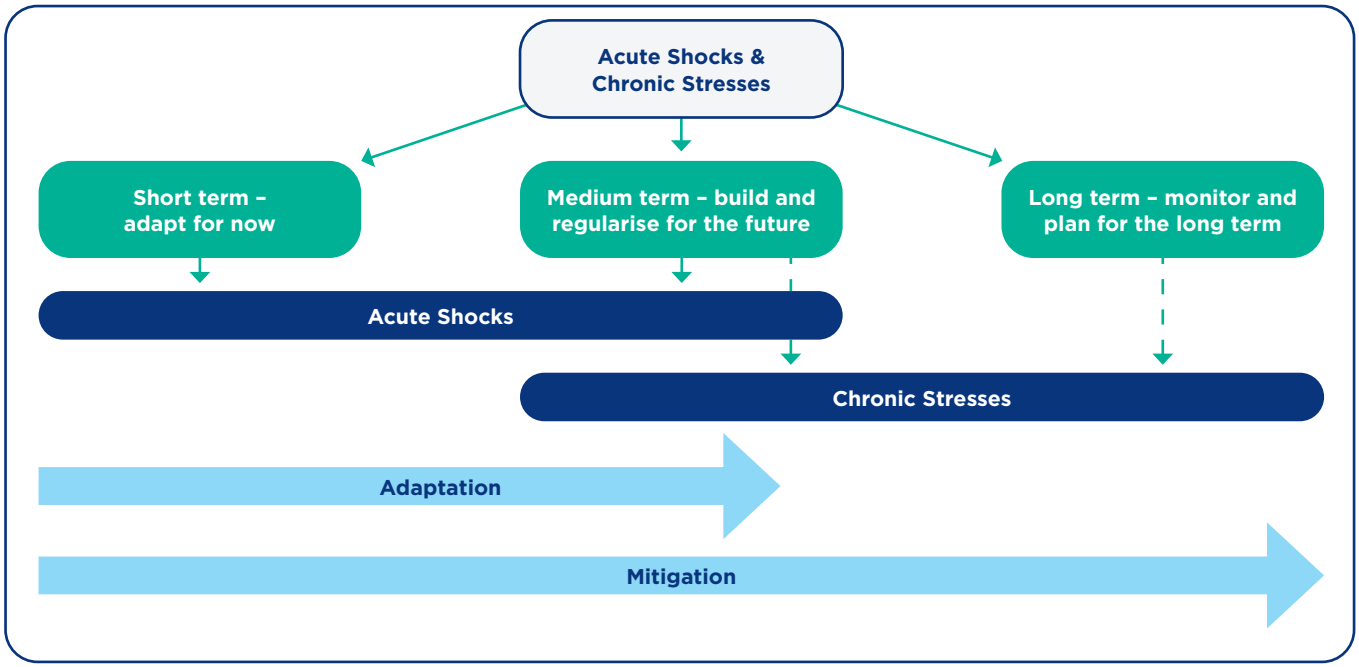


Figure 5: Short, medium and long-term policy outcomes for a resilient City.

Image: Jarrod Underwood, Ceramic Market

3.2 Physical Climate Risks to Greater Sydney and NSW

The physical impacts of climate change can result in the destruction of natural and built assets as well as the disruption of business operations, trade routes, supply chains, and markets. There are two types of physical climate risks: chronic physical climate risks related to slowly changing phenomena like sea-level rise and gradual shifts in temperature and rainfall patterns, and acute physical climate risks related to extreme events like floods, drought, heat waves, and storms. These events and disruptions can have severe consequences, including loss of life, adverse impacts on mental health, financial losses due to infrastructure damage and recovery costs.

According to a report by the NSW Treasury in 2021 (Table 1), the total economic costs of natural disasters are expected to increase from $5.1 billion in 2020-2021 to between $15.8 billion and $17.2 billion per year by 2061 (in real 2019-2020 dollars) (Wood, 2021). This highlights the need for action to mitigate the effects of physical climate risks in Greater Sydney and NSW.

Sea level rise and heatwaves are expected to have significant impacts on the economy as well. By 2061, over 40,000 properties are estimated to be exposed to coastal erosion or inundation, resulting in nearly $1 billion in annual costs from property damage and loss of land (Wood, 2021). Heatwaves could result in the loss of 700,000 to 2.7 million working days per year, impacting human health and mortality, and causing additional costs for infrastructure construction and maintenance (Wood, 2021). A report by the Adrienne Arsht-Rockefeller Foundation estimated that extreme heat exposure could result in $432 million in lost productivity every year (Adrienne Arsht, 2023).

Table 1: Expected Annual Natural Disaster Cost by 2060-61 (real 2019-20 dollars).

Fiscal year	Total economic costs	Direct economic costs	Direct fical costs*
2020-21	$5.1b	$870m	$200m
2060-61 (reference case)	$16.5B	$2.8b	$670m

Source: (Wood, 2021), p.26

**: Direct fiscal cost under the Disaster Recovery Arrangement (DRA)*

3.3 Why does resilience matter?

Resilience helps cities like Bayside to become more prepared and equipped to handle and recover from extreme events and disruptions, such as those caused by climate change. By taking proactive measures, Bayside can increase its ability to cope with changes, adapt to new challenges, and bounce back from adversity. This not only minimizes the negative impacts on human and society, but it also opens up opportunities for financial, social, and environmental benefits.

3.4 Resilience challenges and community priorities

A recent report (Our Future World) by CSIRO, Australia's national science agency, in July 2022 identified that adapting to climate change and leaner, cleaner and greener are the first two of the seven megatrends that will impact the way we live in the next 20 years (Figure 6).

Adapting to climate change: with natural disasters expected to cost the Australian economy almost three times more in 2050 than in 2017, we can expect to be living in a more volatile climate, characterised by unprecedented weather events.

Leaner, cleaner and greener: an increased focus on potential solutions to our resource constraints through synthetic biology, alternative proteins, advanced recycling and the net-zero energy transition. By 2025, renewables are expected to surpass coal as the primary energy source.

The escalating health imperative: the post-pandemic world has exacerbated existing health challenges posed by an ageing population and growing burden of chronic disease. One in five Australians report high or very high levels of psychological distress and there is heightened risk of infectious diseases and pathogens resistant to modern antibiotics. There is now a burning platform to also respond to our health risks and improve health outcomes.

Geopolitical shifts: an uncertain future, characterised by disrupted patterns of global trade, geopolitical tensions and growing investment in defence. While the global economy shrunk by 3.2% in 2020, global military spend reached an all-time high of $2.9 trillion and Australia saw a 13% increase in cybercrime reported relative to the previous year.

Diving into digital: the pandemic-fuelled a boom in digitisation, with teleworking, telehealth, online shopping and digital currencies becoming mainstream. Forty percent of Australians now work remotely on a regular basis and the future demand for digital workers expected to increase by 79% from 2020 to 2025.

Increasingly autonomous: there has been an explosion in artificial intelligence (AI) discoveries and applications across practically all industry sectors over the past several years. Within the science domain the use of AI is rising with the number of peer-reviewed AI publications increasing nearly 12 times from 2000 to 2019.

Unlocking the human dimension: a strong consumer and citizen push for decision makers to consider trust, transparency, fairness and environmental and social governance. While Australia saw a record level increase in public trust in institutions during the pandemic, this 'trust bubble' has since burst, with societal trust in business dropping by 7.9% and trust in government declining by 14.8% from 2020-21.

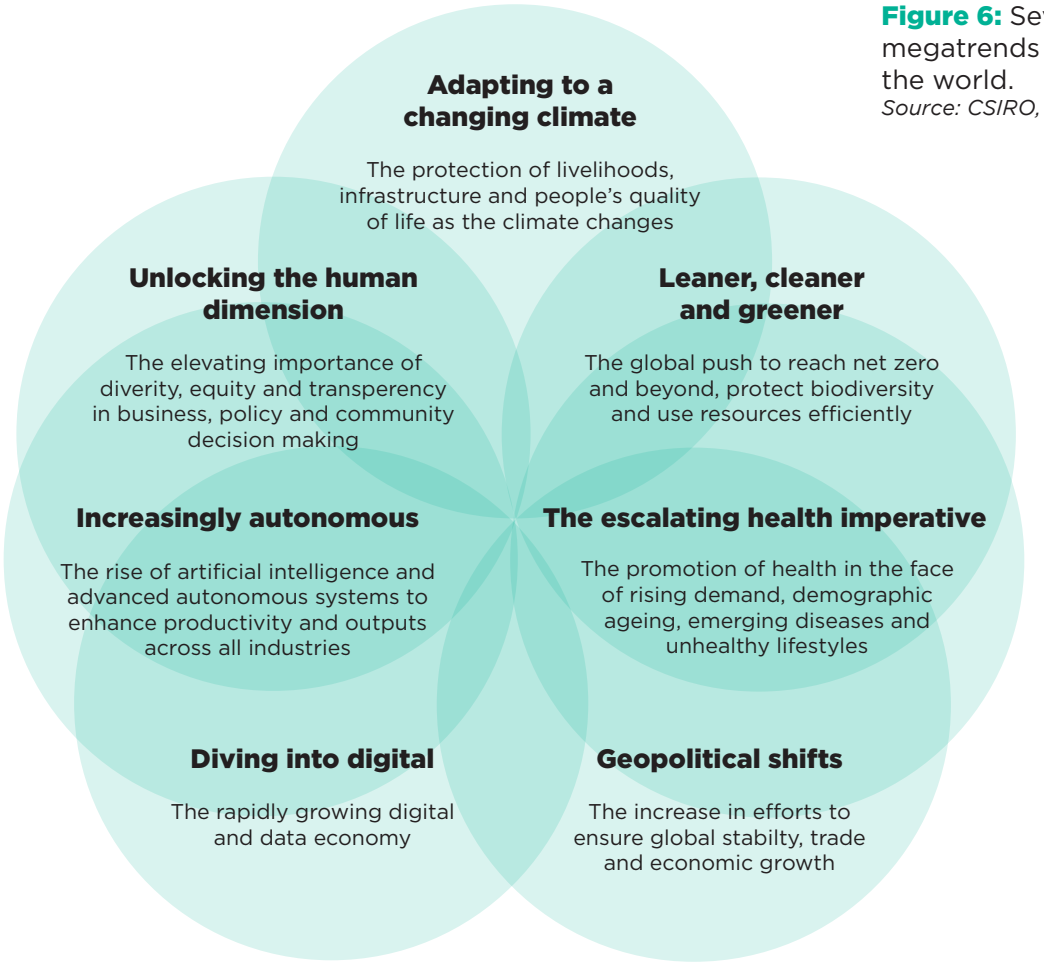


Figure 6: Seven global megatrends that will shape the world.
Source: CSIRO, 2022

4 Regional and local context for resilience

4.1 Greater Cities Commission – Eastern District

In March 2022, the Greater Cities Commission Act was passed which changed the Greater Sydney Commission to the Greater Cities Commission and moved from a metropolis of three Greater Sydney cities to a city region of six. The Greater Cities Commission has a significant impact on the delivery key infrastructure in the Eastern Harbour Sydney. It is recognised that Bayside Council will experience significant and unprecedented infrastructure development as part of the Eastern Harbour Sydney region.

Drawing upon the 17 UN Sustainable Development Goals, the Greater Cities Commission proposed 6 Region Shapers as a set of proprieties that will frame the 2023 Region Plan. A 20-year vision for each shaper has been developed within the discussion paper to set strategic direction (Figure 7).

An Embedded First Nation Voice	▶ More than 65,000 years of continuous culture is central to our shared identity ▶ The wisdom and aspirations of First Nations peoples are recognised and embedded in planning for our future.
A connected Six Cities Region	▶ A connected Six Cities Region delivers universal high speed digital access for all residents in the short-term. In the medium term, three sea ports and three international airports operate as a system of global economic gateways.
Housing supply, diversity and afforadability	▶ Everyone in the Six Cities Region has access to a quality home that connected, resilient, affordable, and which meets their needs. ▶ Resilient housing is provided through more green and adaptable homes and not building in climate vulnerable areas
Inclusive places connected to infrastructure	▶ Everyone lives in an inclusive and vibrant community that connects them to quality housing, services, jobs and amenities. ▶ Active transport supports ageing in place, accessibility, mobility and health
Powering local jobs and economies	▶ New job in high-performing industries that are resilient to future shocks.
Climate-resilient green Cities	▶ Our sustainable and climate-proofed cities, transport, homes and businesses run on clean, renewable energy. ▶ A circular economy has transformed our urban systems and how we use resources. ▶ Our emissions have more than halved, and we play a leadership role in the global region in the transition to a net zero economy. ▶ We are actively and effectively managing climate vulnerability, proactive climate proofing, urban heat and planning, and designing our built environments to withstand flooding, bushfires and coastal erosion.

Figure 7: Six Region Shapers for the Six Cities Regions proposed by Greater Cities Commission.
Source: (Greater Cities Commission, 2022)

4.2 Resilient Sydney

Resilient Sydney was established in 2015 with 33 metropolitan councils of Greater Sydney to develop and implement a city-wide resilience Strategy, which was published in 2018 (Resilient Sydney, 2018). The Resilient Sydney Strategy identified 5 key directions and 35 actions to address the city resilience challenges (Figure 8).

1 **People-centred:** addressing the challenge of inequitable growth.

2 **Live with our Climate:** addressing the challenge of pressure on our health, environment and economy.

3 **Connect for Strength:** addressing the challenge of declining social cohesion.

4 **Get Ready:** addressing the challenge of a lack of understanding of risks and interdependencies.

5 **One City:** addressing challenge of disjointed governance.

Figure 8: Five key directions of the Resilient Sydney Strategy.
Source: (Clear Horizon, 2011)

4.3 Bayside Local Strategic Planning Statement

Bayside Council has developed a Local Strategic Planning Statement setting out the 20-year vision for land use in the LGA. Below are the planning priorities relevant to this Stategy.

A city in its landscape: valuing green spaces and landscape

- Bayside Planning Priority 19 – Protect and improve the health of Bayside's waterways and biodiversity.
- Bayside Planning Priority 20 – Increase urban tree canopy cover and enhance green grid connections.
- Bayside Planning Priority 21 – Deliver high quality open space.
- Bayside Planning Priority 22 – Protect and enhance scenic and cultural landscapes.

An efficient city –

- Bayside Planning Priority 23 – Reducing carbon emissions through improved management of energy, water and waste.

A resilient city – Adapting to a changing world

- Bayside Planning Priority 24 – Reduce community risk to urban and natural hazards and improve the community's resilience to social, environmental and economic shocks and stressors.

4.4 Bayside 2032 Community Strategic Plan

Council's Community Strategic Plan (CSP), Bayside 2032, identifies Bayside's priorities and aspirations for the future and a number of strategies to achieve the community's goals. The CSP sets the strategic direction for Council's Delivery Program and Operational Plans – it guides projects and programs for Council and the community. This Strategy fits within Theme 3 – Green, resilient and sustainable.

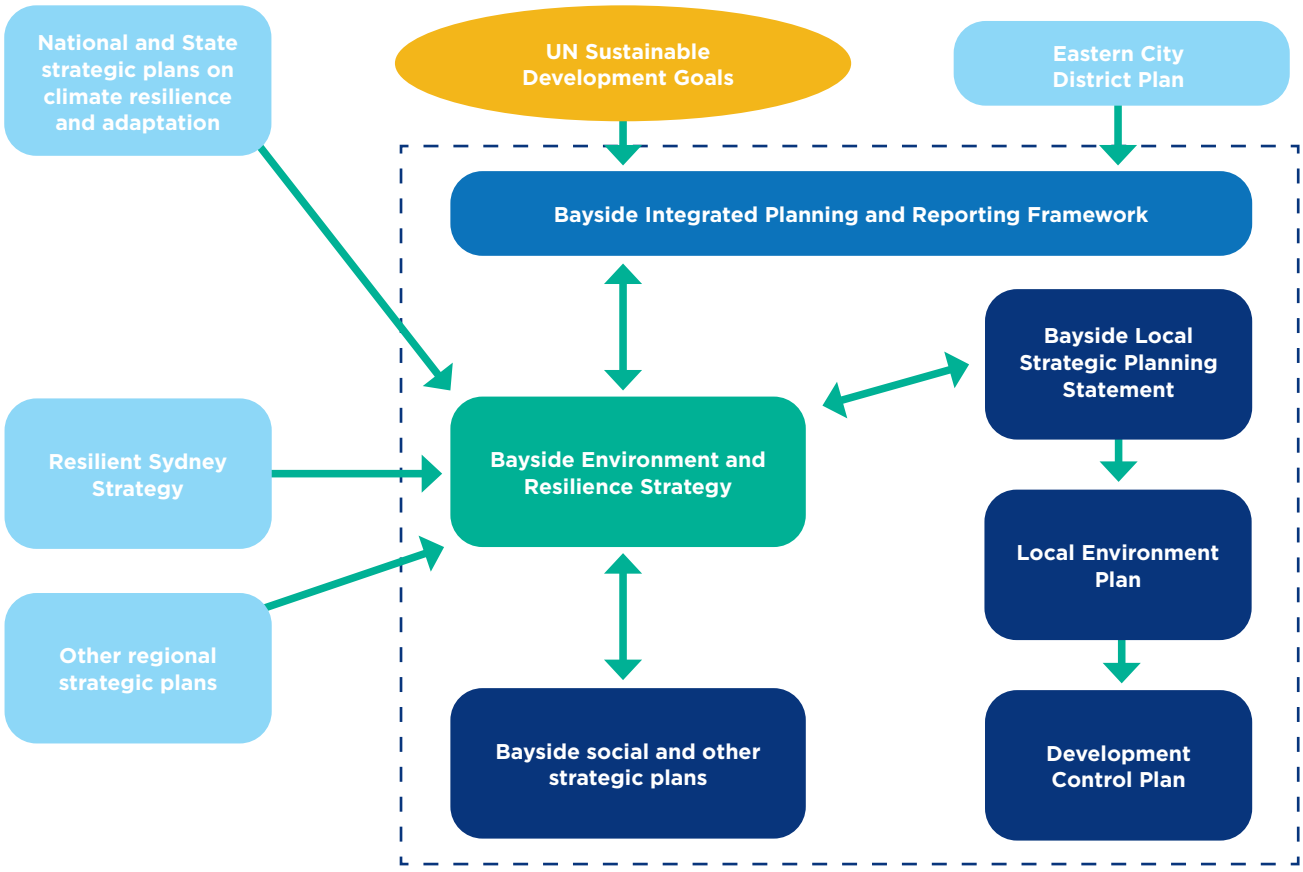
In 2032, Bayside will be green, resilient, and sustainable.

Our natural assets and biodiversity are protected and enhanced through collaborative partnerships, to benefit a healthy environment now and in the future. The community is resilient, and confident in its ability to work together to thrive, adapt and recover from risks and climate events. Energy, resources, and waste are managed sustainably.

4.5 Relationship of key initiatives, strategies and plans from global to local

The Bayside Environment and Resilience Strategy has been developed through reviewing and incorporating a number of strategic plans from global (UN Sustainable Development Goals) to national, state and regional (Figure 9).

Figure 9: Inputs into the Bayside Resilience Strategy from global to local.



4.6 Resilience and Sustainable Development

In 2015, the United Nations adopted the 17 Sustainable Development Goals (SDGs) which are an urgent call for action by all countries in a global partnership (Figure 10).

Figure 10: UN 17 Sustainable Development Goals (SDGs)
Source: (United Nations - Department of Economics and Social Affairs, 2023)

Having a resilient city involves balancing sustainability and resilience. By aligning policies and actions that support both objectives, it is possible to address challenges and mitigate impacts caused by climate change and other disturbances. By using social and natural resources sustainably, cities can become more adaptable and able to cope with changes, ultimately allowing them to thrive in the face of adversity. Integrating resilience into sustainable development efforts helps to ensure that cities can withstand and recover from disruptions, while also working towards a more sustainable future (Melbourne Sustainable Society Institute, 2021).

5 Bayside stresses and shocks

As part of Greater Sydney and as an Eastern Coastal city, Bayside experiences similar acute shocks and chronic stresses as identified in Figure 4 (page 12).

5.1 Bayside's Acute Shocks

Climate change risk assessment studies for former Botany Bay and Rockdale Councils evaluated that heatwaves, increased storms, and flooding were three key climate acute shocks for Bayside (Rockdale City Council, 2008) (City of Botany Bay Council, 2013). Extreme weather events can also easily trigger other acute shocks such as power and communication shortages, water network and infrastructure failures.

In addition to the physical climate shocks, disease pandemics, cyber-attack and terrorism are identified as other potential acute shocks for Bayside.

Heatwaves:

Bayside will be particularly impacted by rising temperature as its urban areas tend to concentrate and maintain heat, reducing the cooling effects of vegetation and air flow. Like other cities within Greater Sydney, Bayside will experience longer and more intense heatwaves. The urban heat island effect* is becoming a severe issue, especially around Mascot, Banksia, Monterey, Ramsgate Beach, Sandringham, Dolls Point and San Souci (Figure 11).

Figure 11: Urban Heat Island in Bayside
Source: DPHI, 2023

**Urban heat island refers to the effect of development on ambient temperature leading to urban areas being significantly hotter than adjacent vegetated areas. The effect is most evident at night.*

Image: Mark Colins, Sunrise at Pine Park

Tree canopy plays a vital role in mitigating the urban heat island impact. The latest tree canopy data from the Department of Planning and Environment (DPE) in 2022 shows low tree canopy cover in Mascot (5.02%), Banksmeadow (8.20%), and Kyeemagh (9.45%) (Figure 12) (NSW DPE, 2023).

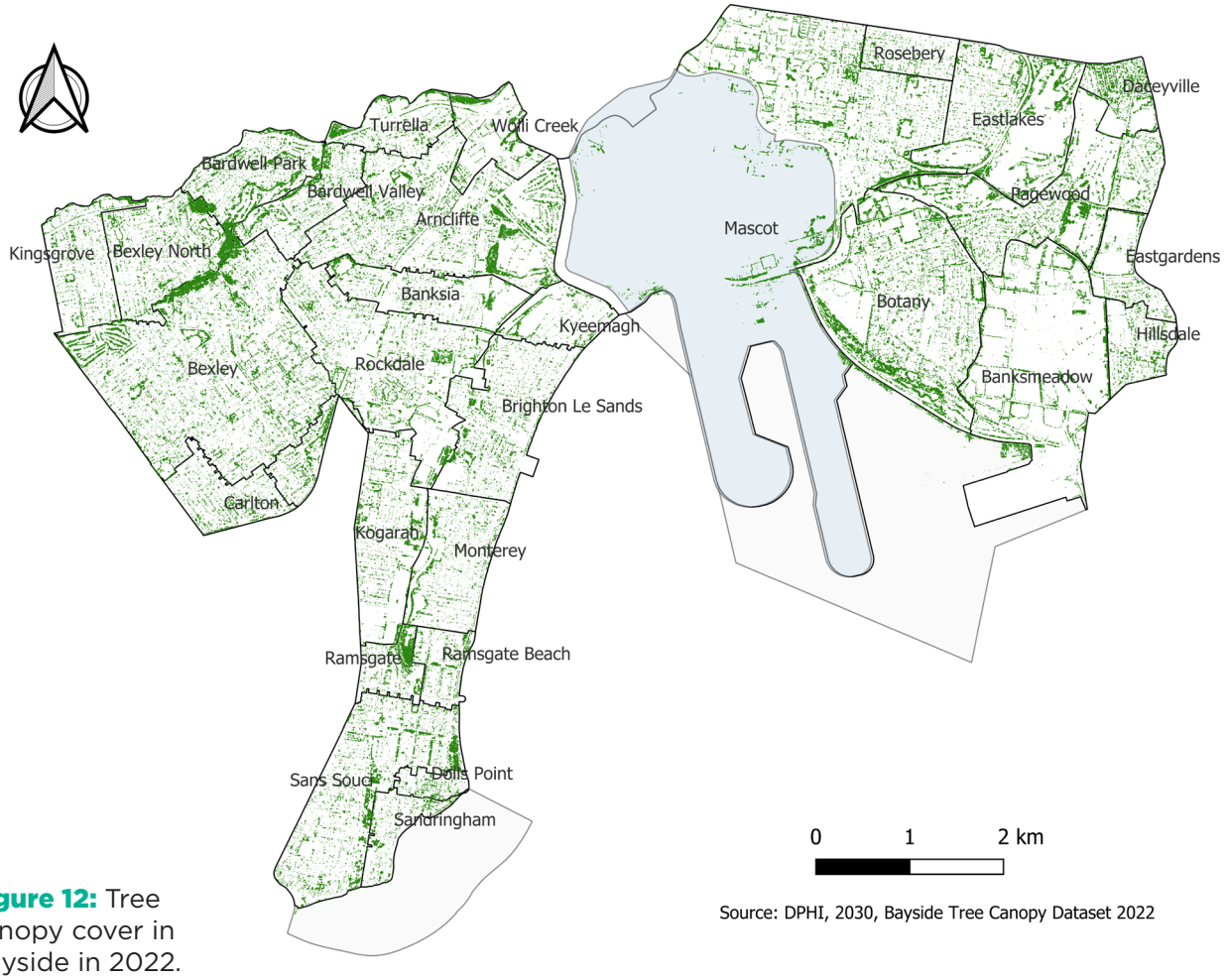


Figure 12: Tree canopy cover in Bayside in 2022.

Storm and flooding:

Bayside has experienced severe floods in the last 50 years including in 1975, 1984, 1986, 1988, 1991, 1992, 1993, 1996, 1998, 2005, 2014, 2015, 2018, 2020 and most recently 2022. Flood events frequently result in inundation causing damage to both residential and commercial properties.

Flash flood occurs when intense local rainfall generates runoff exceeding the capacity of both the stormwater system producing overland flooding, and the channels and creeks resulting in overbank flow. Flooding in some areas may be exacerbated by the blockage of hydraulic structures and the presence of obstructions to overland flow paths. On some occasions, flooding is caused by an astronomical high tide or elevated oceanic levels in low lying areas with the catments. A recent floodplain management study by Bayside Council for Bayside West indicates that the total annual damage cost for the entire Bayside West could amount to $10.6m, and over 8,000 properties could be affected by floods (Bayside Council, 2022).

Image: Flooding in Bayside

Bushfire:

Bayside may not experience major bushfire within its local government area due to the small area of natural bushland within the city. However, a major bushfire in other parts of Greater Sydney will likely have negative impacts on human health, especially people with underlying respiratory issues.

Disease pandemics:

Recent COVID-19 pandemic has placed great pressure on health systems, businesses and humans. Like other urban cities, Bayside experienced disruptions in the health care systems and business operations, an economic recession, and social isolation. These impacts disproportionally affected vulnerable populations such as the elderly, people with underlying health conditions and those with low incomes.

Cyber-attacks:

The impacts of a cyber-attack can vary widely depending on the type of attack and the target. They can include financial losses, disruptions to business operations, reputational damage, and the theft of sensitive information. These impacts can be particularly severe for organisations that rely heavily on technology, such as those in the financial, healthcare, or critical infrastructure sectors.

Terrorism:

Bayside has Sydney international airport and ports which are vulnerable to terrorism. The impacts of a terrorist attacks can be both physical and psychological. They can include loss of life, property damage, fear, trauma, and economic disruption.

5.2 Bayside's Chronic Stresses

Bayside is experiencing loss of housing affordability, especially in the western area. There is a significant lack of transport diversity and employment diversity Bayside. These contribute to increasing geographic and social inequality and financial vulnerability of communities to shock events.

Groundwater contamination:

The Botany Bay area has been home to industries such as tanneries, metal plating, service stations and depots, landfills, dry cleaning, and wool scouring for over a century. The Botany sand aquifer is particularly vulnerable to contamination that has escaped or spilled onto the ground and leached into the groundwater. As a result, chemicals such as chlorinated hydrocarbons and other solvents, petroleum hydrocarbons (petrol and diesel) and some heavy metals (chromium, nickel, lead and arsenic) have polluted groundwater in parts of the aquifer. A ban on ground water use for domestic purposes within the Botany Bay area has been applied since 2006 (NSW DPE, 2023). So far, more than 1,300 tonnes of contaminants have been removed from the water and destroyed.

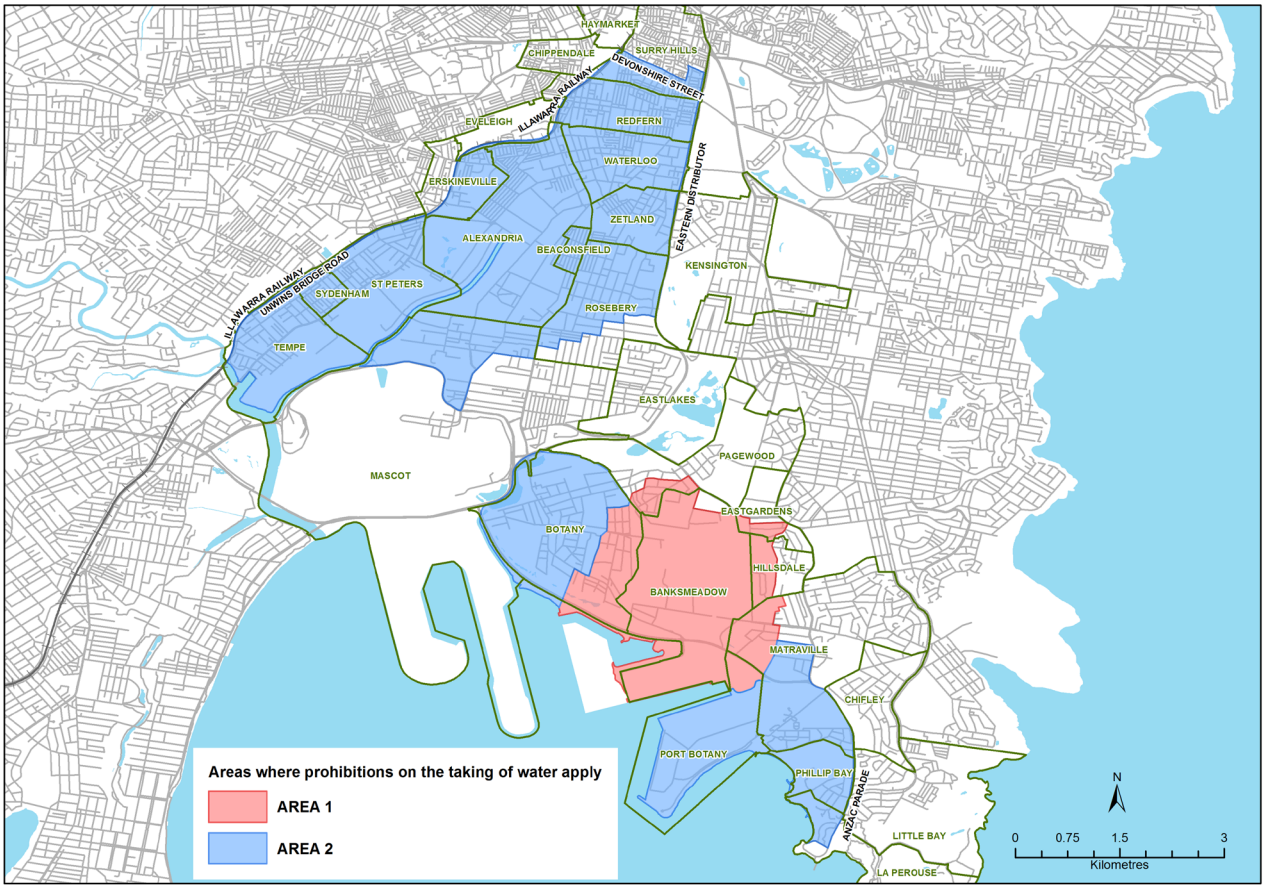


Figure 13: Map of restricted areas for Botany Sand groundwater
Source: NSW DPE, 2023 https://water.dpie.nsw.gov.au/allocations-availability/temporary-water-restrictions/current/botany-sands-groundwater-source

Image: Grey-headed Flying Fox

Biodiversity loss:

Urbanisation and climate change are causing a critical decline in biodiversity, globally and locally. Urbanisation comes with a complex mix of changes including land-use modification and environmental disturbances which increase the pressure on local remnant species diversity and induce the assembly of novel ecological communities. Similarly, human-induced climate change is listed as a key threatening process under the Biodiversity Conservation Act 2016 (BC Act). Changing weather patterns disrupt the life cycles of flora and fauna, expose species to new pathogens and predators and reduces important habitat.

Bayside has a number of natural sites containing Endangered Ecological Communities (EECs) including Eastern Suburbs Banksia Scrub, Coastal Saltmarsh, Kurnell Dune Forest and Swamp Oak Floodplain Forest. These natural areas are interspersed with a variety of non-threatened remnant vegetation communities. Over 24 threatened fauna species and five threatened flora species have been recorded in the local government area (LGA) (Bayside Council, 2020). Threatened flora (plant) species listed under State and Commonwealth legislation that can be found in our area include the Downy Wattle (Acacia Pubescens), Sunshine Wattle (Acacia terminalis), and Magenta Lilly Pilly (Syzygium paniculatum).

Green and Golden Bell Frog (Litoria aurea), Grey-headed Flying Fox (Pteropuspolio cephalus), shorebirds (such as Regent Honey eater, Australasian Bittern, Curlew Sandpiper, Pied Oystercatcher, and Little Tern) and microbats (Eastern Bent-wing Batt and Southern Myotis, Large-footed Myotis) are fauna listed as either critically endangered, endangered or vulnerable under State and Commonwealth legislation (Rockdale City Council, 2015).

Biodiversity corridors are connections between habitats allowing for species movement, their protection is necessary for ecosystem function. The Rockdale wetland corridor, coastal corridor, Bardwell and Wolli creek corridors, and the Mill Stream and Botany wetland corridor are identified in the Green Grid for Bayside (Figure 14).

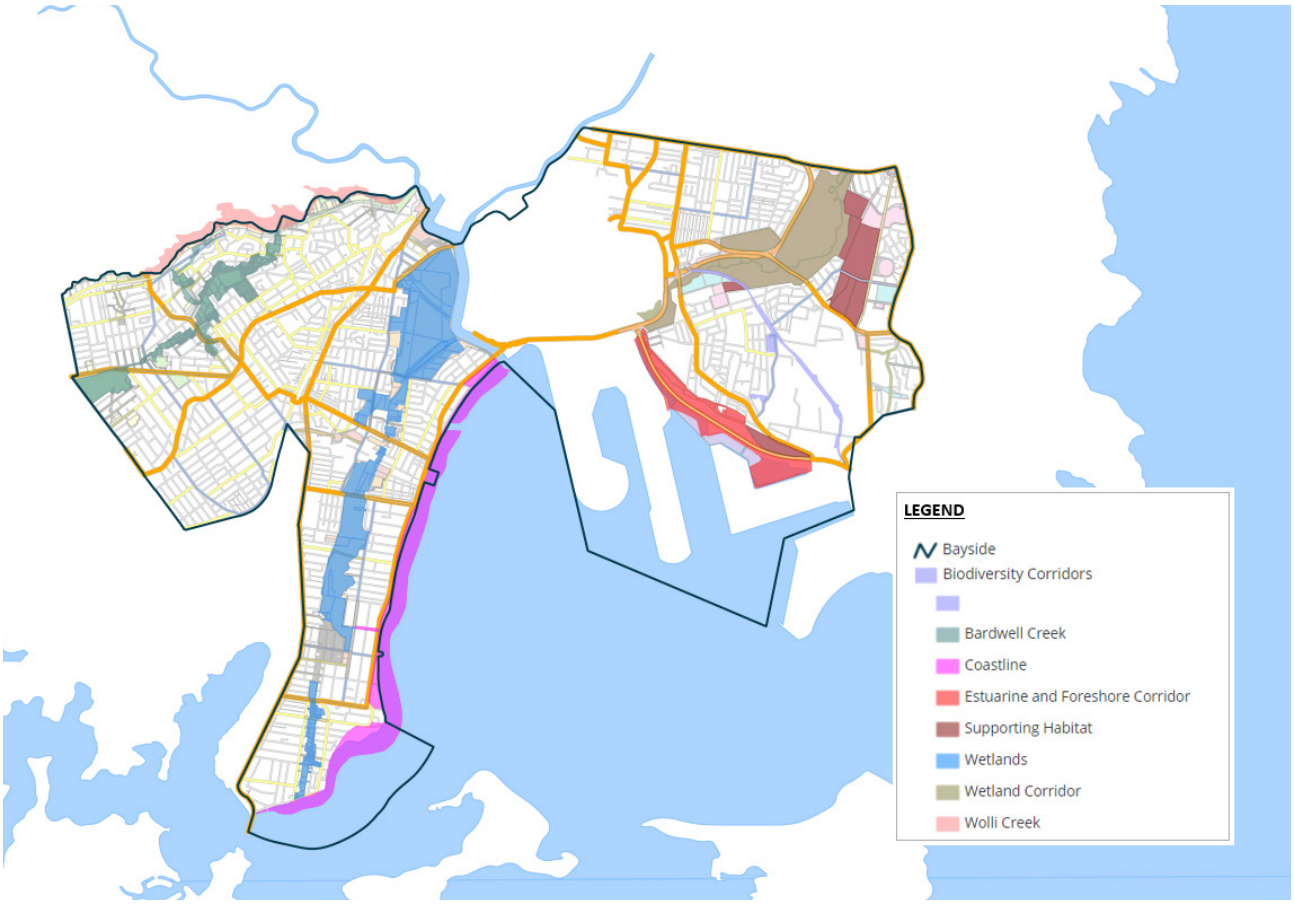


Figure 14: Bayside Biodiversity Corridors

Sea-level rise:

Bayside features low lying coastal environments which are impacted by flooding and groundwater inundation. These impacts are likely to worsen with future sea level rise and extreme weather events brought about by the effects of climate change. Sans Souci, Sandringham, Wolli Creek, and areas of Mascot and Botany are at risk of the impacts of sea-level rise. In addition, flood levels will increase in some parts of Bayside, including Mascot, Botany, Wolli Creek, Kyeemagh, Kogarah, Monterey, Ramsgate, Dolls Points, Sandringham and Sans Souci.

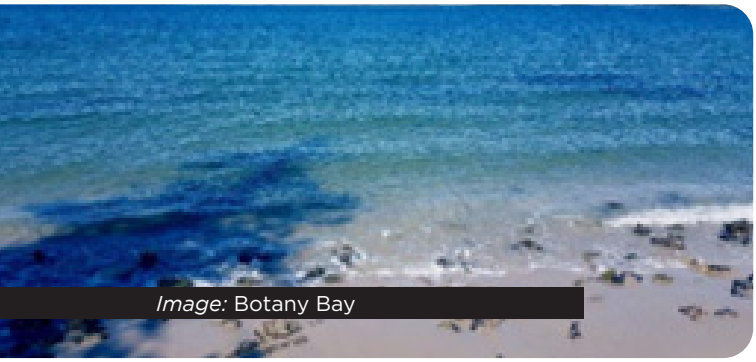


Image: Botany Bay

Coastal erosion is one of the major issues along the Bayside foreshore, including Lady Robinsons Beach and Ramsgate. Shoreline areas such as at Cahill Park are also potentially impacted by sea level rise.

Image: Shoreline erosion at Cahill Park

The stabilisation of the shoreline against erosion by sea currents and the protection of hinterlands from storms and floods are important ecosystem services that also protect built assets such as infrastructure, agricultural systems and built-up urban areas. Studies in NSW suggest that 70% of fish caught commercially and recreationally are associated with seagrasses or mangroves at some stage of their life cycle.

Housing affordability:

Like Greater Sydney, Bayside is facing a complex issue of housing affordability with the chronic undersupply of affordable housing.

The housing crisis has been further exacerbated by acute shocks like disease pandemic (COVID-19) and climate disasters (bushfires, heatwaves, and flooding). These external factors are driving internal displacement putting more stress on people who are homeless or lack access to resilient or secure housing.

Social cohesion:

Acute shocks like disease pandemic (the most recent COVID-19) and adverse climate change have placed critical pressure on social cohesion. Recent research by 100 Resilient Cities states that 'Cities associate the lack of social cohesion most closely with the shocks of flooding, earthquakes, economic crisis, and extreme heat, among others. Cities associate the lack of social cohesion most closely with the stresses of youth disenfranchisement, crime and violence, climate change, and economic inequality, among others (100 Resilient Cities, 2019).

Higher levels of social cohesion and positive social interactions serve to strengthen the overall fabric of the city, allowing communities to bounce back faster and rebuild more efficiently after experiencing major acute shocks.

Bayside is facing significant issues including vandalism and malicious damage, domestic and family violence, non-domestic assault, anti-social behaviour, and intimidation, stalking and harassment (Bayside Council, 2022).

Transport diversity:

Transport plays a crucial role within a resilient city. Resilient transportation is a key facet of building resilience in a city as a whole. A resilient transportation system should provide sustainable, integrated, flexible, and robust mobility options during normal times and in times of crisis (100 Resilient Cities, 2020). The goal of resilient transportation is to minimise the impacts of disruptions on travel and trade, and to ensure that essential goods and services can continue to be delivered in the event of an emergency.

Acute shocks such as storms and flooding, heatwaves, cyber-attacks, and terrorism could cause disruption to the transport systems. Bayside houses two important international and domestic gateways (Sydney Airport and Botany Port). In addition, the Princes Highway (A36), Rocky Point Rd, and General Holmes Drive (A1) provides gateway access from the south of Sydney through Sydney Airport to the City and to the East.

Bayside residents tend to live at greater densities (66.5% of the dwellings are medium or high density compared to 46% in Greater Sydney), own fewer cars (36% of household has access to two or more vehicles, compared to 46% in the Greater Sydney), and walk more. Use of buses and trains is relatively high for the journey to work.

The current challenges that Bayside and the Southeast Sydney area are facing are identified in the box below (Figure 15).

Current transport challenges

- The road network is under pressure, impacting freight and other economically important traffic.
- The public transport network and services do not cater well for south - east movements or meet the travel needs of shift workers and weekend recreational travel.
- Limited spare capacity on the public transport network and services at peak time.
- Links in the walking and cycling networks are missing
- There are opportunities for land use change, but this can only be achieved with significantly increased public transport capacity and utility.

Figure 15: Current transport challenges in Bayside and Eastern Harbour City.
Source: Transport for NSW, 2020.

Employment diversity:

A diverse economy is often considered to be more resilient because it is less reliant on any one industry or sector. Thus, it is less vulnerable to shocks such as economic downturns or natural disasters affecting a specific industry.

Bayside is the home of a diverse community with nearly 50% of the population born overseas and speaking a language other than English at home compared to the Greater Sydney.

Like Greater Sydney, the unemployment rate of Bayside increased following the COVID-19 pandemic (Figure 16). A higher unemployment rate can indicate a declining economy with closures of key industries, especially with a significant disadvantaged community.

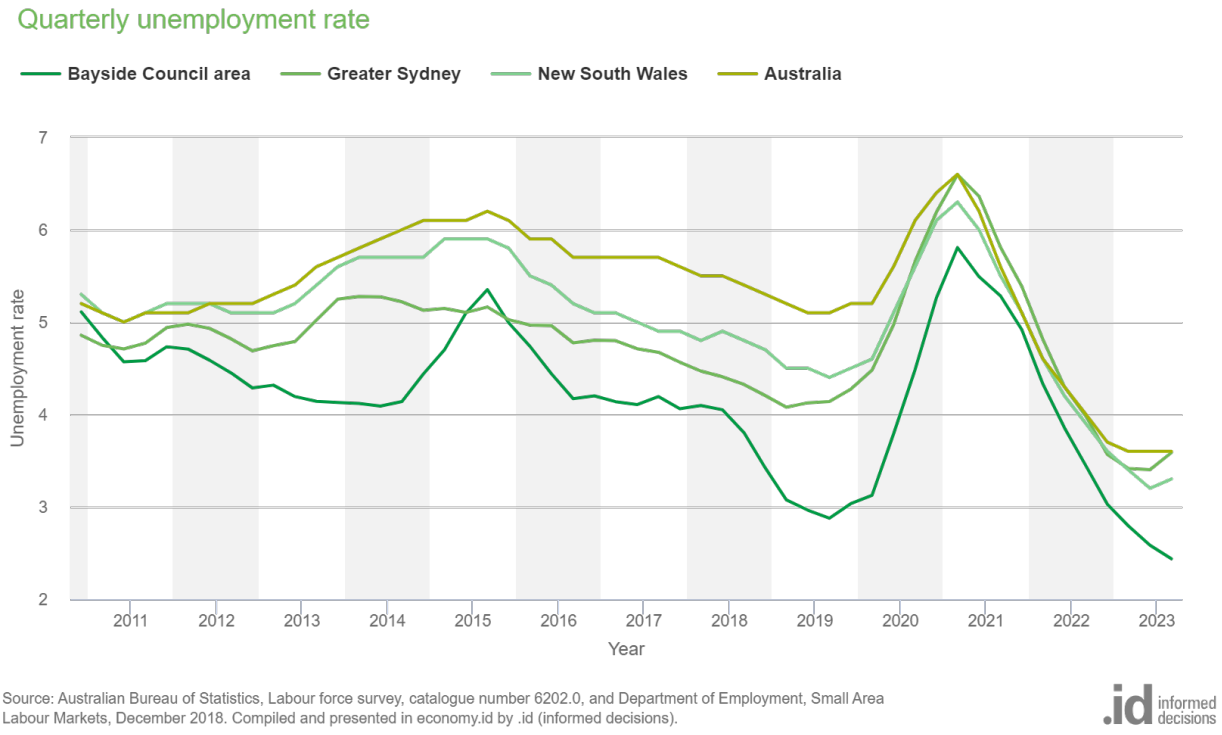


Figure 16: Quarterly unemployment rate of Bayside and Greater Sydney.
Source: https://economy.id.com.au/baysidensw/unemployment

“City resilience is the capacity of individuals, communities, businesses and systems within a city to survive, adapt and thrive no matter what kinds of chronic stresses and acute shocks they experience”

Resilient Sydney, 2018

6 Directions, outcomes and actions for a Resilient Bayside

6.1 Long-Term Resilience Objectives for Bayside

Bayside community has identified four (4) long-term visions as:

Bayside to be a vibrant place

Neighbours, visitors, and businesses interact in dynamic urban environments. People are proud of living and working in Bayside. Built forms are sympathetic to the natural landscape and make our area a great place to live.

Our people connected in a creative city

Knowledge sharing and collaboration ensure that we have the expertise and relationships to lead with integrity, adapt to change, connect vulnerable people to community, build resilience and effectively respond in times of adversity and stress. Our strong connections help our diverse community to feel equally valued.

A green, resilient and sustainable Bayside

Our natural assets and biodiversity are protected and enhanced through collaborative partnerships, to benefit a healthy environment now and in the future. The community is resilient, and confident in its ability to work together to thrive, adapt and recover from risks and climate events. Energy, resources, and waste are managed sustainably.

A prosperous community

Business innovation, technology, flourishing urban spaces and efficient transport attract diverse business, skilled employees and generate home-based business. Growth in services to the local community generates employment support, a thriving community, and livelihoods. Council is viable across its quadruple bottom line: social, environmental, economic, and civic leadership.

6.2 Guiding Principles

Bayside Council aspires to apply the Resilient Cities framework to all its medium and long-term plans.

1. Processes that promote effective leadership, inclusive decision-making, empowered stakeholders, and integrated planning.
2. Everyone living and working in Bayside has access to what they need to survive and thrive.
3. The social and financial systems that enable urban populations to live peacefully, and act collectively.
4. The man-made and natural systems that provide critical services, protect, and connect urban assets enabling the flow of goods, services, and knowledge.

6.3 Four Focus Areas

The following four focus areas will be actioned to achieve a Green, Resilient and Sustainable Bayside.

Survive:

withstand disruption and bounce back better than before.

Adapt:

reduce exposure to future acute shocks and chronic stresses.

Thrive:

significantly improve quality of all life.

Embed:

build resilient thinking and systems into our institutions and ways of working.

6.4 Bayside Resilience Focus Areas

Climate change and land use pressures mean there is a growing need for development in Bayside to be appropriately located and designed. By planning development that considers the impacts of climate change, Council promotes community wellbeing and resilience.

Adapting to climate changes requires an understanding of climate risk and implementing actions to address this risk. Adaptation actions reduce vulnerability and increase resilience to climate change impacts. To address the challenges and seize opportunities for Bayside we have the set the goals detailed in Table 2 below.

Table 2: Resilience goals for Bayside

Focus areas	Targets
Survive	1. Increase readiness of the community for extreme events. 2. Increase awareness and preparedness of the local businesses for emergency and extreme events.
Adapt	3. Increase tree canopy coverage in Bayside[1]. 4. Increase sustainable transport (walking, cycling and public transport) made by residents in Bayside while reducing or maintaining the personal vehicle trips[2]. 5. Reduce heat island impacts[3]. 6. Achieve Net Zero (greenhouse gas emission) for Council's operations 7. Advocate to achieve Net Zero City Wide[3].
Thrive	8. Maintain or increase community satisfaction on quality of life. 9. Maintain or increase community satisfaction with climate change preparedness. 10. Maintain or increase socio-economic advantage and disadvantage score.
Embed	11. Maintain or increase community satisfaction with Council's overall performance.

[1] Actual target will be derived from the Urban Forest Strategy
[2] This target is set by Bayside Transport Strategy.
[3] Actual target will be set once the Net Zero Emission Pathway is developed.

Image: Dan Brown, Tonbridge Ruck in the Rain

6.5 Types of Actions

Proposed actions will be categorized into three different types, flagship, supporting, and aligned actions.

Flagship actions:

Key initiatives with the potential for city-wide involvement and transformational outcomes. Flagship actions are either underway or have been identified as a priority for the first two years (short-term) of implementation of the Environment and Resilience Bayside Strategy.

Supporting actions:

Initiatives with the potential to improve Bayside resilience on a range of scales – some may affect only a few suburbs, while others could apply across the city area. Supporting actions are likely to be facilitated by one business unit or external organisations.

Aligned Actions:

Existing internal or external initiatives that align with Green, Resilient and Sustainable Bayside principles. The aligned actions are included to promote these initiatives that contribute to Resilient Bayside.

7 Implementation

The Bayside Environment and Resilience Strategy will articulate the full spectrum of projects and actions that Council will undertake to deliver the key priorities in this strategy. An Action Plan will be developed and implemented to achieve the targets outlined in this Strategy.

Bayside aims to deliver the Environment and Resilience Strategy within existing resources. An action plan outlining what can be delivered within the resources is in development. We will also seek opportunities to leverage external funding sources where possible.

8 Monitoring and reporting

A detailed assessment, report and review of the Bayside Environment and Resilience Plan 2024-2032 will be conducted every four years. This will allow Bayside to adapt the priorities and actions which meet changes in the community, knowledge, technology, science, and new policy settings from the commonwealth and state governments.

Evaluation and report on the progress against outcomes, priorities and actions will be undertaken on an annual basis in accordance with the Integrated Planning and Reporting Framework (IPR).

Glossary of terms

Active transportation	Active transportation refers to any mode of transportation that is powered by human energy, such as walking, cycling, and using a wheelchair. It is considered a sustainable and healthy form of transportation as it reduces dependence on fossil fuels and promotes physical activity.
Acute shock	Acute shock refers to the unexpected, severe and immediate impacts of climate change that can disrupt the functioning of societies and ecosystems. These extreme events can have serious consequences on human lives, infrastructure, economies, and natural systems.
Adaptation	Climate change adaptation helps individuals, communities, organisations, and natural systems to deal with those consequences of climate change that cannot be avoided. It involves taking practical actions and building the capacity to manage the risks from climate impacts, including the protection of infrastructure (economic and social) and strengthening resilience of the community. Adaptation can involve gradual transformation with many small steps over time, or major transformation with rapid change.
Biodiversity	Biodiversity refers to the variety of life on Earth, including the variety of species, ecosystems, and genetic diversity within species. It encompasses the diversity of living organisms, from microbes to mammals, and the diversity of ecosystems, from coral reefs to rainforests.
Chronic stress	Day to day events that negatively affect and decrease the efficient functioning of a community; such as climate change, housing affordability, global or national economic downturn, transport congestion, food security, social isolation, lack of connectedness, service shortages and mental health.
Climate change	Climate change refers to long-term changes in the Earth's climate, including changes in temperature, precipitation, and weather patterns over many decades or centuries, rather than variability evident from year to year. Climate change is considered to be a global threat, with potential impacts on human health, food security, water resources, coastal areas, and biodiversity.
Climate risk	Climate risk refers to the potential negative impacts of climate change on human and natural systems. It includes the likelihood and severity of these impacts, as well as the potential consequences for society and the economy.
Community Engagement	Community engagement refers to the process of involving community members in the design, implementation, and evaluation of programs and policies that affect their lives. It is a key component of community development and social change, as it helps to ensure that the perspectives and needs of community members are taken into account, and that they have a sense of ownership and commitment to the process.
Disaster	A disaster refers to a severe disruption of the functioning of a society, caused by a catastrophic event such as a natural or man-made hazard. Disasters can have a wide range of impacts, including loss of life, injuries, damage to property and infrastructure, and disruption of essential services such as power, water, and transportation.

Greenhouse gases	Gaseous compounds (particularly carbon dioxide and methane) that absorb infrared radiation, trap heat in the atmosphere, and contribute to the greenhouse effect.
Hazards	Hazards can be natural or human-made, and can include physical, biological, chemical, and social factors. Hazards can have a wide range of impacts, from minor inconvenience to major loss of life and property damage. The impact of a hazard depends on several factors, such as the hazard's magnitude, its location, and the vulnerability of the people and structures in its path.
Impacts	The consequences or outcomes of natural or human induced hazards include impacts.
Mitigation	Mitigation refers to actions taken to reduce or prevent the negative impacts of a hazard or threat. In the context of climate change, mitigation refers to actions taken to reduce greenhouse gas emissions, in order to slow down or stop the warming of the planet.
Renewable energy	Renewable energy is produced using natural resources that are constantly replaced and never run out. Solar is one of the most well-known, wind-power is one of the most widespread, and hydropower is one of the oldest. Other renewable technologies harness geothermal energy, bioenergy or ocean energy to produce heat or electricity.
Resilience	The capacity of individuals, communities, businesses, organisations and systems within a city to survive, adapt and thrive in the face of whatever kind of chronic stresses and acute shocks they experience.
Sustainable development	Sustainable development is a concept that aims to meet the needs of the present without compromising the ability of future generations to meet their own needs. It is a holistic approach that considers the economic, social, and environmental dimensions of development and aims to balance these competing demands.
Urban Heat Island	An urban heat island (UHI) is a phenomenon where the temperature in urban areas is significantly higher than the temperature in rural areas. This is caused by the presence of heat-absorbing surfaces such as asphalt and concrete, as well as the lack of vegetation, which can provide shade and cool the air through evapotranspiration.
Water Sensitive Urban Design (WSUD)	WSUD is a land planning and engineering design approach which integrates the urban water cycle, including stormwater, groundwater and wastewater management and water supply, into urban design to minimise environmental degradation and improve aesthetic and recreational appeal.

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Image: Stella Gray, Beach Yoga

Bayside Council
Serving Our Community

Bayside Customer Service Centres
Rockdale Library, 444-446 Princes Highway, Rockdale
Westfield Eastgardens, 152 Bunnerong Road, Eastgardens
Monday to Friday 8:30am – 4:30pm

Phone **1300 581 299 | 9562 1666**
Email **council@bayside.nsw.gov.au**
Web **www.bayside.nsw.gov.au**