

Resilient Sydney

A strategy for city resilience 2018



SYDNEY

100



CITIES

Participating councils of metropolitan Sydney



Organisations facilitating flagship content



Resilient Sydney: A strategy for city resilience

Resilient Sydney 2018®

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Resilient Sydney is an initiative of 100 Resilient Cities, pioneered by the Rockefeller Foundation. The initiative is a collaboration of the metropolitan Councils of Sydney and has been governed by a metropolitan steering committee. The Resilient Sydney initiative is hosted by the City of Sydney.

Cover image Sydney Harbour Bridge.
Photo: iStock/Boyloso





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Above Bondi: Approaching storm off Sydney's coast.
Photo: iStock/lovro77

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An aerial photograph of a city, likely Sydney, showing a dense urban landscape with various buildings, streets, and a river at the bottom. The left side of the image is overlaid with a semi-transparent dark grey layer containing text and logos.

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Acknowledgement of Country



Resilient Sydney acknowledges Aboriginal and Torres Strait Islander peoples as the First People and traditional custodians of the land and waters of this place we now call Sydney.

Aboriginal peoples continue to show great resilience and generosity of spirit towards other peoples with whom they now share their land and waters. Resilient Sydney recognises that by acknowledging our shared past, we are paving the way for a future where all Australians are embraced.

To be resilient Sydney needs a future based on mutual respect and shared responsibility, where everyone and all living things can thrive.

Previous page Parramatta: the fastest growing Central Business District in Sydney.
Photo: Salty Dingo

Left Redfern: Aboriginal and Torres Strait Islander People performing traditional ceremony.
Photo: Katherine Griffiths



Lord Mayor's message



This strategy, developed with input from across Sydney, is such a breakthrough.

Resilient Sydney: a strategy for city resilience is the result of two years' hard work involving all levels of government, business, academia and our communities - an unprecedented level of collaboration across metropolitan Sydney.

The process highlighted our best qualities as Sydneysiders – generosity, inventiveness, a willingness to pull together, and a commitment to improving the lives of all our diverse communities.

It is these very qualities that we will need the most as we face the challenges of the future.

A rapid increase in density has put pressure on schools and early education and on open space, essential services and other infrastructure. Affordable housing is a critical issue and congestion is getting worse.

We're seeing rising inequality, more homelessness, mental illness and obesity. And we're experiencing increasingly extreme weather events with every year classed as another record breaking year in terms of rising temperatures.

All these issues are challenges in themselves and they aren't unique to Sydney - the effects of urbanisation, globalisation and climate change are seen right around the world. They aren't constrained by boundaries or different levels of governance.

It's why this strategy, developed with input from across Sydney, is such a breakthrough.

Resilient Sydney recognises no one organisation can solve our problems and instead looks at how we can work together, across boundaries to protect and champion the needs and interests of our communities.

Every organisation, and every individual, has a role to play. Our City is proud to be one of the 33 councils of metropolitan Sydney working together with action, investment and policies and sharing what we are learning with cities across the world.

Working together can only make us, and our communities, stronger and more resilient, whatever disruptions we may face.

A handwritten signature in black ink that reads "Clover Moore." The signature is fluid and cursive, with a long horizontal line extending from the end.

Lord Mayor
Clover Moore

Letter from 100 Resilient Cities

On behalf of the entire 100 Resilient Cities team I want to congratulate the Resilient Sydney team and Chief Resilience Officer Beck Dawson on the release of Sydney's Resilience Strategy, a major milestone for the city and our partnership. This document lays out an extraordinary vision of urban resilience that can serve as a model for all of us.

While all resilience strategies are created with an understanding that silos must be breached and sectors and conventional borders planned across, this strategy has conceived of this urban ecosystem at a metropolitan scale, with a commitment by stakeholders to "work beyond our boundaries."

Governance matters in every city, and Sydney is no exception. Three layers of government, 33 metropolitan councils and separate investment strategies and policy making makes change difficult. Sydney's resilience depends on collective leadership.

It is a true testament to the vision and effort of the Resilient Sydney Steering Committee and team that this metro-wide strategy has been forged in lieu of an existing governance structure that could give rise to it. As many cities now realise, they must plan across their metropolitan regions, together. Sydney is truly a leader, setting an important precedent that will be looked at for inspiration in our network and beyond.

At every level of the city: as an individual, a neighbourhood, a business or a government, we invite you to use this work to connect and collaborate.

We are excited to continue this next stage of our partnership in the implementation of this ground-breaking strategy, which will help build a resilient future for Sydney and propel the resilience effort worldwide.

Michael Berkowitz

President 100 Resilient Cities

About 100 Resilient Cities

Resilient Sydney is a member of the 100 Resilient Cities initiative - pioneered by the Rockefeller Foundation.

The 100 Resilient Cities initiative helps cities around the world become more resilient to the physical, social and economic challenges that are a growing part of the 21st century. Cities in the network are provided with resources to develop a roadmap to resilience over two years.

Support from 100 Resilient Cities includes financial and practical support to employ a Chief Resilience Officer, expertise and tools to develop a resilience strategy, and access to local and global partners with an interest and experience in resilience.

Sydney joins Melbourne, Wellington and Christchurch in implementing resilience strategies in Oceania.



Letter from the Steering Committee



Our capacity to plan to reduce the impacts of disruption, and to realise opportunities in recovery is a measure of our resilience. The scale of disasters and disruptions affecting major cities elsewhere regularly overwhelms their capacity to respond. The only way to understand and address these challenges at a metropolitan scale in Sydney is by making a clear decision to work beyond our boundaries.

Our metropolis is governed by many organisations. More than 100 business and government entities, agencies and departments have some level of policy or operational control. This makes building resilience a challenge every major organisation must address.

From inception in 2015, we've listened to our communities and representatives from government, business and academia. We've taken an honest look at our city and discussed new ways of

solving things together. We will continue to harness this dynamic energy as we manage growth and the challenges it brings.

Resilience is an approach all organisations must adopt to improve the safety and quality of life of everyone in metropolitan Sydney. Our organisations are already making a commitment to do so.

We invite you to join us.

Committee members

100 Resilient Cities

Associate Director Asia Pacific,
Sam Kernaghan

Bayside Council

General Manager, Meredith Wallace

Campbelltown City Council

General Manager, Lindy Deitz

City of Sydney Council

CEO, Monica Barone

Deloitte

Managing Partner - Western Sydney,
Danny Rezek

Greater Sydney Commission

Environment Commissioner, Rod
Simpson

IAG

Group Executive, Jacki Johnson

Independent Ambassador,

Robert Tickner AO

Northern Beaches Council

General Manager, Mark Ferguson

NSW Office of Emergency Management

Executive Director, Feargus O'Connor

Parramatta City Council

General Manager, Greg Dyer

Penrith City Council

General Manager, Alan Stoneham

Resilient Sydney

Chief Resilience Officer, Beck Dawson

Above Circular Quay: Working groups of Resilient Sydney. Photo: Katherine Griffiths

Left President of 100 Resilient Cities, Michael Berkowitz and Resilient Sydney Chief Resilience Officer, Beck Dawson. Photo: Damian Shaw

Executive Summary

Resilient Sydney, is the first resilience strategy for metropolitan Sydney.

This strategy sets the direction we must take to strengthen our ability to survive, adapt and thrive in the face of increasing global uncertainty and local shocks and stresses. This strategy calls for business, government, academia, communities and individuals to lead and work as one city.

This strategy marks a new spirit of collaboration and connection in our city and is the result of two years of effort across Sydney. It responds to the results of engagement with over 1,000 people and over one hundred organisations. The document sets out a five-year strategy on the path to build our resilience. This approach has been developed with all of Sydney's metropolitan councils and contributors from the NSW Government, business and community organisations.


This strategy sets the direction we must take to strengthen our ability to survive, adapt and thrive in the face of increasing global uncertainty and local shocks and stresses.

Sydney is a beautiful, prosperous and multicultural city, but it is struggling to maintain its liveability and equity during a time of rapid growth. As our city grows it is experiencing a range of chronic stresses such as a lack of housing affordability, transport congestion and chronic illness that are impacting people's everyday lives. The city regularly responds to a range of shock events such as extreme heat, storms and flooding or bushfires and cyber attacks. Sydney has the opportunity to use its growth to address vulnerabilities to our economy and environment and create a place of opportunity and wellbeing for everyone.

Sydney will be a thriving and prosperous city of connected and cohesive communities with resilience at its heart. Connections and collaborations will be strong within and between governments, businesses and communities.



Above Parramatta: riverside festival. Photo: Will Perez Ronderos



It is time for Sydney to act as one city. To become connected, inclusive and resilient is a challenge every major organisation in Sydney must address, together.

Our vision for Sydney is a metropolis that is connected, inclusive and resilient. We are one city.

The directions in this strategy reflect the priorities people want for Sydney's future – providing a greater say in decisions that affect them, better collaboration in leadership, stronger community connections and transport connections, more focus on protecting our environment, better emergency preparedness, and acknowledgement and respect for Aboriginal and Torres Strait Islander peoples as one of the world's most resilient cultures.

This strategy supports organisations and communities to participate and collaborate in building connections and developing their resilience plans. You are invited to make your own Sydney resilience commitment and take part in the actions in this plan. We will monitor and report on progress to encourage further action and show change.

It is time for Sydney to act as one city. To become connected, inclusive and resilient is a challenge every organisation and resident in Sydney must address, together.

Resilient Sydney

A strategy for city resilience 2018

Our Vision

Metropolitan Sydney is connected, inclusive and resilient

Our Mission

Sydney will understand and be prepared to manage our resilience challenges



DIRECTION

1

p 62–71

People centred city

We include communities in decision making for growth and equity.

- Inclusion
- Resilient growth
- A more equitable city

Challenge

Inequitable growth

Outcomes

People are connected to where they live and able to access transport, affordable housing, education and employment opportunities



Actions

Flagship Action

Resilient inclusive growth target

Risk criteria and resilience in local community plans

1. Shocks and stresses managed through planning for growth

Consider economic and social risks through community plans

Supporting Actions

2. Network metropolitan practitioners for community agency

Collective leadership to champion inclusion of the community within strategic decision making across metropolitan Sydney

3. Collaborate for cross-city active transport

Improve health, wellbeing and connections, and provide transport options during times of crisis

Aligned Actions

4. Support people to work closer to home
5. Improve access to health precincts
6. Build community capacity through co-design
7. Advocate for affordable housing for everyone
8. Develop skills for equity

Live with our climate

We adapt to sustain our quality of life and our environment.

- Local adaptation
- Global performance
- A diverse economy

Challenge

Pressure on our health, environment and economy

Outcomes

People have access to clean air and water, natural environments and adaptive technology throughout the city for climate comfort and safety, health and city connections.



Actions

Flagship Action

Cool Suburbs - turn down the heat target

2 degrees Celsius reduction in heat in urban areas

- 9. Policy and action to cool homes and streets**
Collaboration to address our biggest shock in the hottest parts of our city

Supporting Actions

- 10. Develop investment in resilient buildings, assets, precincts and cities**
Develop investment in resilient infrastructure, buildings, assets, precincts and cities with tools, decision making frameworks and standards
- 11. Enable affordable access to renewable and resilient energy**
Council led programs to support low income households to use solar

Aligned Actions

12. Adopt urban resilience in research and teaching curricula
13. Measure metropolitan carbon emissions and report on progress
14. Support a more flexible and resilient water cycle
15. Reduce reliance on liquid fuel

Connect for strength

Every Sydneysider will feel they belong in our community and city.

- A welcoming city
- Resilient cultures
- Strength in diversity

Challenge

Declining social cohesion

Outcomes

People have equal access to engage in society, the economy and all the city has to offer.



Actions

Flagship Action

City cohesion and wellbeing target

5% improvement in 5 years in community cohesion

- 16. Monitor metropolitan social cohesion and wellbeing**
Measure city-wide and local connections and relationships

Supporting Actions

- 17. Learning from First Nations Elders and community leaders**
Acknowledging the expertise of Aboriginal and Torres Strait Islander communities in Sydney as experts in resilience and survival and supporting their ongoing resilience

Aligned Actions

18. Support communities to know their neighbours
19. Encourage cross-city visitation and understanding
20. Promote safety and tolerance in everyday interactions
21. Promote broad adoption of Welcome to Country protocols
22. Support diversity in leadership

Get ready

We know how to prepare, respond and recover.

- Understanding risks
- Understanding interdependencies
- A prepared community

Challenge

Lack of understanding of risks and interdependencies

Outcomes

Sydneysiders and organisations understand the risks they face and how to work together to respond to them, now and in the future.



Actions

Flagship Action

Preparedness target

100,000 ready Sydneysiders

23. Get prepared – 100,000 ready Sydneysiders

Improve preparedness with the Red Cross, IAG, Australian Business Roundtable for Disaster Resilience and Safer Communities

Supporting Actions

24. Pilot disaster preparedness program for councils

Training, support and processes for councils to improve local preparedness plans and engage their communities

25. Mapping vulnerabilities at a District planning level

Assess the shocks and stresses at District level to identify mitigation projects and inform community preparedness

Aligned Actions

26. Develop a Critical Infrastructure Resilience Strategy
27. Evaluate the community impacts of disasters
28. Support small businesses to manage cybersecurity
29. Help communities to train and volunteer to prepare for disasters
30. Inform risks and ratings with open source data

Photo: iStock/Andrey Pol

One city

We are one city.

- Collective leadership
- Collaboration
- Sharing knowledge

Challenge

Disjointed governance

Outcomes

Key governing organisations across Sydney pledge to build their capacity and cooperate to understand and manage shock and stresses for everyone in a resilient metropolitan Sydney.



Actions

Flagship Action

Collaborative commitment target

100 resilient organisations

31. Engage 100 organisations in the Sydney Resilience Commitment

Support organisations to understand and manage their exposure to shocks and stresses

Supporting Actions

32. Maintain and support the Resilient Sydney Office

Invest in facilitation, collaboration expertise and reporting to support delivery of this strategy

Aligned Actions

33. Measure resilience and wellbeing to monitor and evaluate our goals
34. Harness digital collaboration and networking tools
35. Learn and share with other cities through the 100 Resilient Cities network

Photo: Nathanael Hughes

Our invitation

City resilience commitment

We invite all government, business, academic and community sector organisations in metropolitan Sydney to pledge to build their capacity to understand and manage vulnerabilities, interdependencies and risks for everyone in metropolitan Sydney.

By taking this commitment you will ensure continuity and safety for local communities as well as customers and employees during disruptions. You will demonstrate innovation and leadership, and improve the wellbeing and prosperity of our community. You will reduce potential revenue and continuity impacts to your organisation arising from the key shocks and stresses of Sydney.

Resilient Sydney invites you to lead these changes by taking our 'city resilience commitment'. By adopting these directions your organisation will manage risks and potential impacts arising from the key shocks and stresses of Sydney.

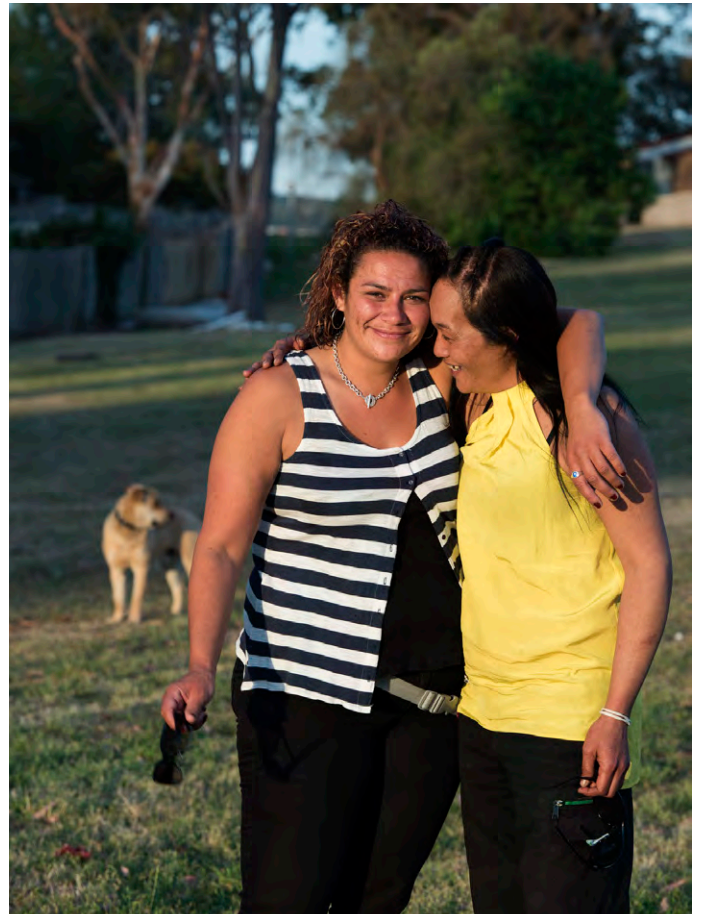
You will also contribute to building Sydney's resilience when your organisation acts to:

- investigate and understand how the shocks and stresses create metropolitan scale community risks and local place-based risks for your organisation
- engage with the people in the city who are most impacted by your decisions
- clarify your role in building Sydney's resilience
- engage in training and capacity building across your organisation
- develop an action plan for your organisation and adopt the directions for resilience
- undertake action and investment.

Resilient Sydneysiders

We invite all residents of Sydney to actively participate in this strategy by taking simple actions to build Sydney's resilience. Everyone can understand and reduce their exposure to the risks arising from the shocks and stresses of Sydney. You will contribute to building Sydney's resilience when you:

- establish a quick and easy network of support with 3 key contacts and neighbours
- review the risks relevant to where you live or work
- use checklists of actions to make an emergency plan
- save the emergency plan as a PDF to be printed and shared with others
- volunteer to support your community, though joining a local group or undertaking first aid training and
- use tools to support these actions such as the Get Prepared app and the NSW Government Get Ready NSW and local council websites.



Left Metropolitan Sydney: from the beaches to the Blue Mountains. Photo: Hamilton Lund
Right Campbelltown: leisure time in the park. Photo: Sarah Rhodes



Our resilience

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What is city resilience?

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.

Chronic stresses weaken the fabric of a city on a day-to-day or cyclical basis. Examples include: homelessness and housing affordability, lack of access to public transportation systems, family violence, climate change, structural inequity, and chronic food or water shortages.

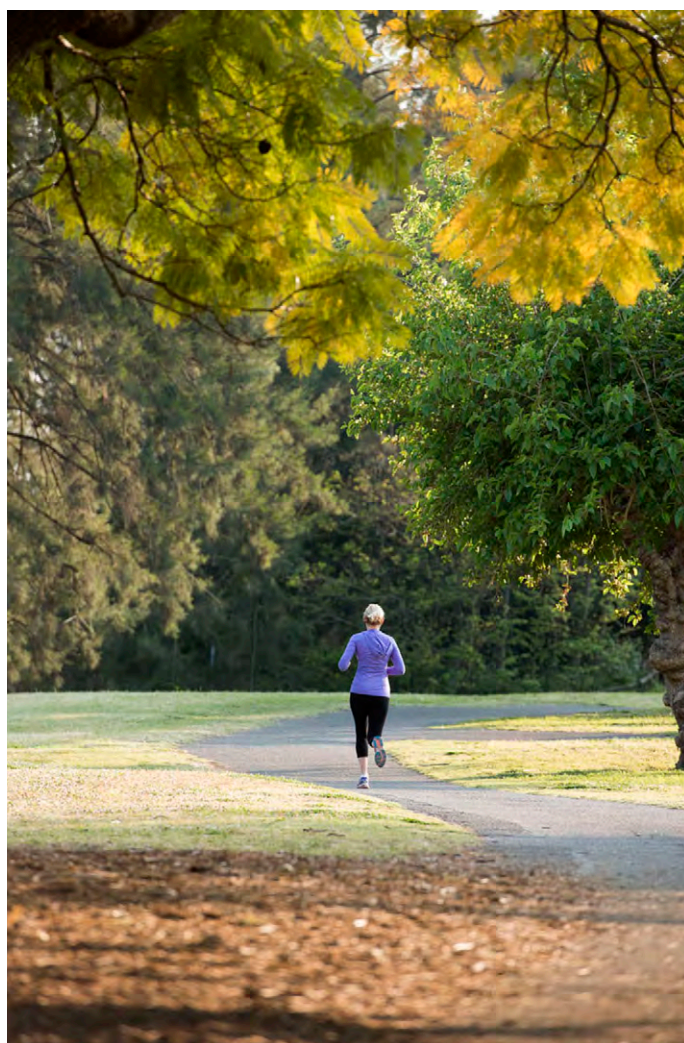
Acute shocks are sudden, short-term events that threaten a city. Examples include: major storms, floods, bushfires, heatwaves, disease outbreaks, terrorism and cyber-attacks.

Why resilience matters

Disasters and disruptions can be expensive and impactful – whether they are caused by short term shocks or chronic stresses in cities. People can lose their lives. Livelihoods and mental health can be affected. Governments, businesses and the community are required to fund losses and recovery costs when infrastructure fails, markets change or the environment is damaged.

Taking action to proactively manage city challenges and interdependencies offers access to multiple benefits, or a 'resilience dividend'. When disruptions are expected, planned for and turned into opportunities, they offer financial, social and environmental benefits. These opportunities can be understood through the City Resilience Framework and achieved through:

- preventing or mitigating stresses and shocks
- adapting to unexpected shocks and stresses
- rapidly returning to normal and revitalising after disruptions
- accessing benefits when there are no disruptions
- productive, peaceful prosperity and improved equity in times of stability.



Previous page Sydney: Traffic congestion on arterial roads. Photo: iStock/Beyond Images

Left Penrith: Napean River. Photo: Sarah Rhodes

Right Pyrmont: Sydney fish markets. Photo: Adam Hollingworth

When disruptions are expected, planned for and turned into opportunities, they offer financial, social and environmental benefits.



Resilience in global cities

As a member of the 100 Resilient Cities Network, Sydney is exchanging ideas with cities worldwide about the most effective ways to build resilience. The cities listed have a resilience strategy and are taking actions relevant to the challenges we face in Sydney.

1

Mexico City, Mexico Mobility hierarchy for transport and urban planning decision making

Mexico has made significant investment in mobility and acknowledgement of mobility as a fundamental right. Bus rapid transit and policy favouring pedestrians and bikes has created a more robust and equitable transportation system.

2

Norfolk, Virginia, USA Long Horizon Planning

Norfolk undertook long horizon land use planning efforts that considered both at-risk and secure areas of the city in a holistic planning effort and included increasing density in protected or high ground areas as a resilience strategy.

3

Medellin, Columbia Resilience Think Tank

The Medellin Office of Resilience created a separate Think Tank for engaging a wider audience in evaluating and innovating on resilience initiatives and quantitatively assessing effectiveness of programs and projects government and the private sector implement.

4

New York City, New York, USA Heat wave programs

New York created an initiative to mitigate urban heat island across the city and petitioned successfully for the expansion of a federal program for low income residents to be applicable for air conditioning purchase, installation, and energy costs.

Digital accessibility

New York is supporting access to affordable broadband for business and offering free Wi-Fi through the LinkNYC program in the city's public spaces.

5

San Juan, Puerto Rico Renewable Energy

San Juan aims to create redundancies in the energy supply and reduced dependence on imported liquid fuel through development of solar farms and residential incentive programs for smaller scale installations.

6

Los Angeles, California, USA Housing affordability

City initiatives will double the pace of affordable housing production and preservation, and triple production of new permanent supportive housing by changing regulations, adopting new financing mechanisms, and exploring adaptive re-use of publicly-owned sites.

7

Thessaloniki, Greece Community engagement

Youth empowerment was achieved through outreach and the convening of a Youth Council for city government to foster the country's next generation of leaders.

8

Boston, Massachusetts, USA Inequity

Resilience planned through the lens of racial equity and social justice, including access to employment and community education.

9

Rotterdam, Netherlands Threat of Cyber attack

Rotterdam created a Cyber Resilience Platform for education and knowledge sharing to promote investment in cyber security.

Funding and adopting climate adaption initiatives

Rotterdam promoted small scale, citizen-led climate adaptation projects to support community learning, placemaking, and to increase the reach of the planning process.

10

Bangkok, Thailand Economic Empowerment

Bangkok is supporting small scale urban agriculture for food production value and economic empowerment of urban communities as well as maintaining land for open space and water storage in extreme rain events.

11

Melbourne Urban Heat Island, need for cooling spaces for the community

The Urban Forest program seeks to enable strong natural assets and ecosystems as well as to create environments for social cohesion and cooling

Metro Cycle Plan

The metropolitan cycling network initiative proposes connection of key hubs in the city to increase bicycle participation and set an example for local councils to invest in bike infrastructure as well.

12

Singapore Heat Advisory

Singapore created a comprehensive heat index and public advisory system to keep people safe and healthy in a heat wave.

13

Wellington, New Zealand Citizen Disaster Preparedness and Education

A series of online maps and blue lines physically drawn on roads in Wellington indicate evacuation and safe zones for tsunamis after earthquakes. This strategy provides both digital and analogue information for citizens and to integrate emergency preparedness into everyday life.

14

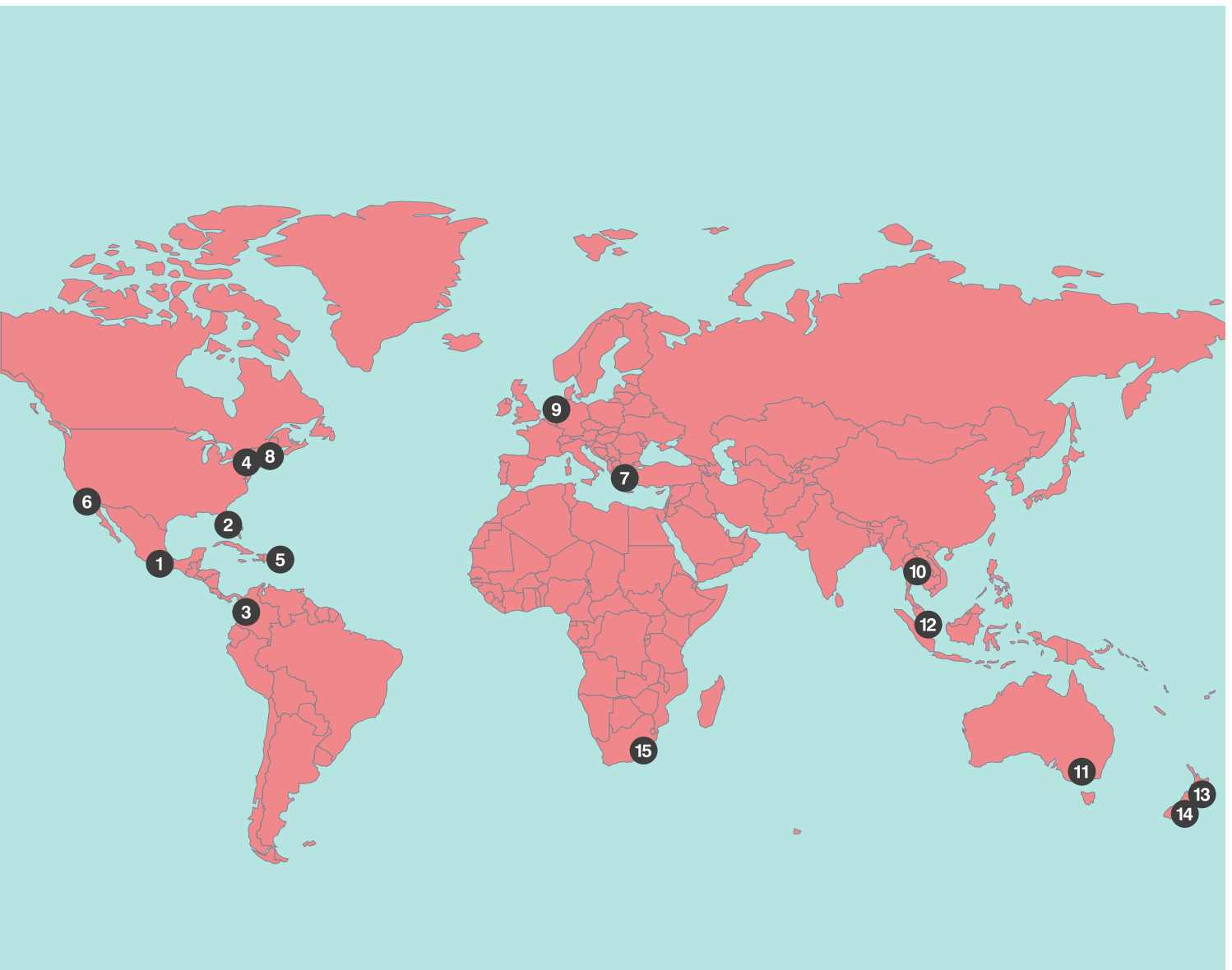
Christchurch, New Zealand Engagement of Indigenous Peoples

The Treaty Partnership began in 1940 as a pact between the Maori people and the Crown. Today, it fosters a truly collaborative, bi-cultural model of governance regarding resilience and day to day governance.

15

Durban, South Africa Adaptation in Resource Scarce Environment

Durban is tackling its climate adaptation efforts with limited resources, adapting existing systems and integrating information and decision-making centres to do more with less. Partnership with higher education institutions to supplement government research capacity has been particularly effective.





Developing this Strategy

Sydney used the 100 Resilient Cities process to develop this Resilient Sydney strategy.

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Decision making for urban resilience in Sydney

The complexity and connectedness of modern, dynamic cities and city systems makes applying resilience thinking to urban governance a challenge.

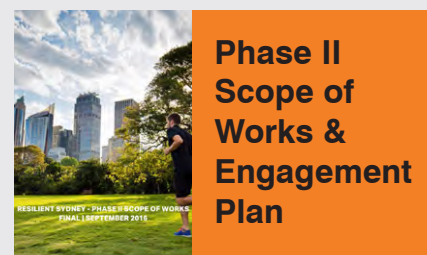
Resilient Sydney consulted with 100 Resilient Cities as well as Australian and global academics researching resilience in: ecosystems and climate, emergency management and counter terrorism, infrastructure planning and property management, insurance and finance, communities and personal resilience, and economies and the governance of cities.

This has shaped our understanding of resilience theory, informed our consultation process and is reflected in our resilience framework for Sydney. Technical processes used include: the City Resilience Framework, the key shocks and stresses of Sydney, the resilience lens and resilience behaviours. Community and stakeholder research processes used include: resident surveys, semi structured interviews, in depth workshops exploring disaster scenarios, collaborative design of opportunities for potential projects and deliberative democracy for decision making.

The methodology we used is detailed in the Diagnostic Report (2017), and the Engagement Report (2017), and is summarised below. The summary shows how resilience theory has influenced the strategy development process and outputs.

Previous page Green Square: Construction site.
Photo: Katherine Griffiths

PHASE I



PHASE I

Inputs:

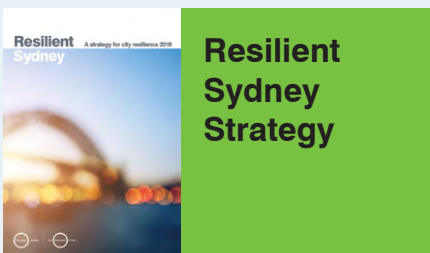
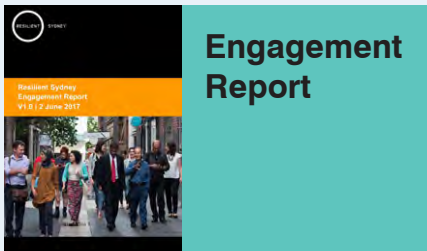
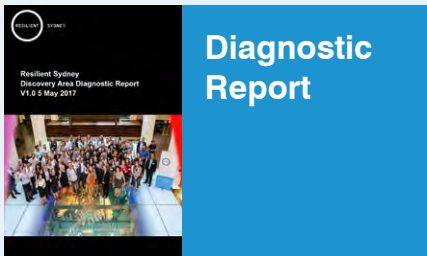
- 150 person stakeholder workshop
- 381 community surveys
- 121 stakeholder surveys
- 100 stakeholder interviews

Preliminary Resilience Assessment

Key activities:

- Initial stakeholder and community engagement
- Assess current city resilience
- Identify and prioritise discovery areas
- Establish engagement strategy

PHASE II



IMPLEMENTATION and ACTION

PHASE II

Inputs:

- 91 technical experts and influencers in working groups
- 74 stakeholders at workshops
- 223 community members, randomly selected across metropolitan Sydney

Community resilience priorities

Key activities:

- Development and testing of Discovery Areas
- Stakeholder and Community research and prioritisation of the resilience challenges and opportunities for Sydney.

PHASE III

Implementation

Key activities:

- Pilot projects
- Policy advocacy
- Practical collaborative processes
- Network and share resources - Evaluate process

Resilience theory

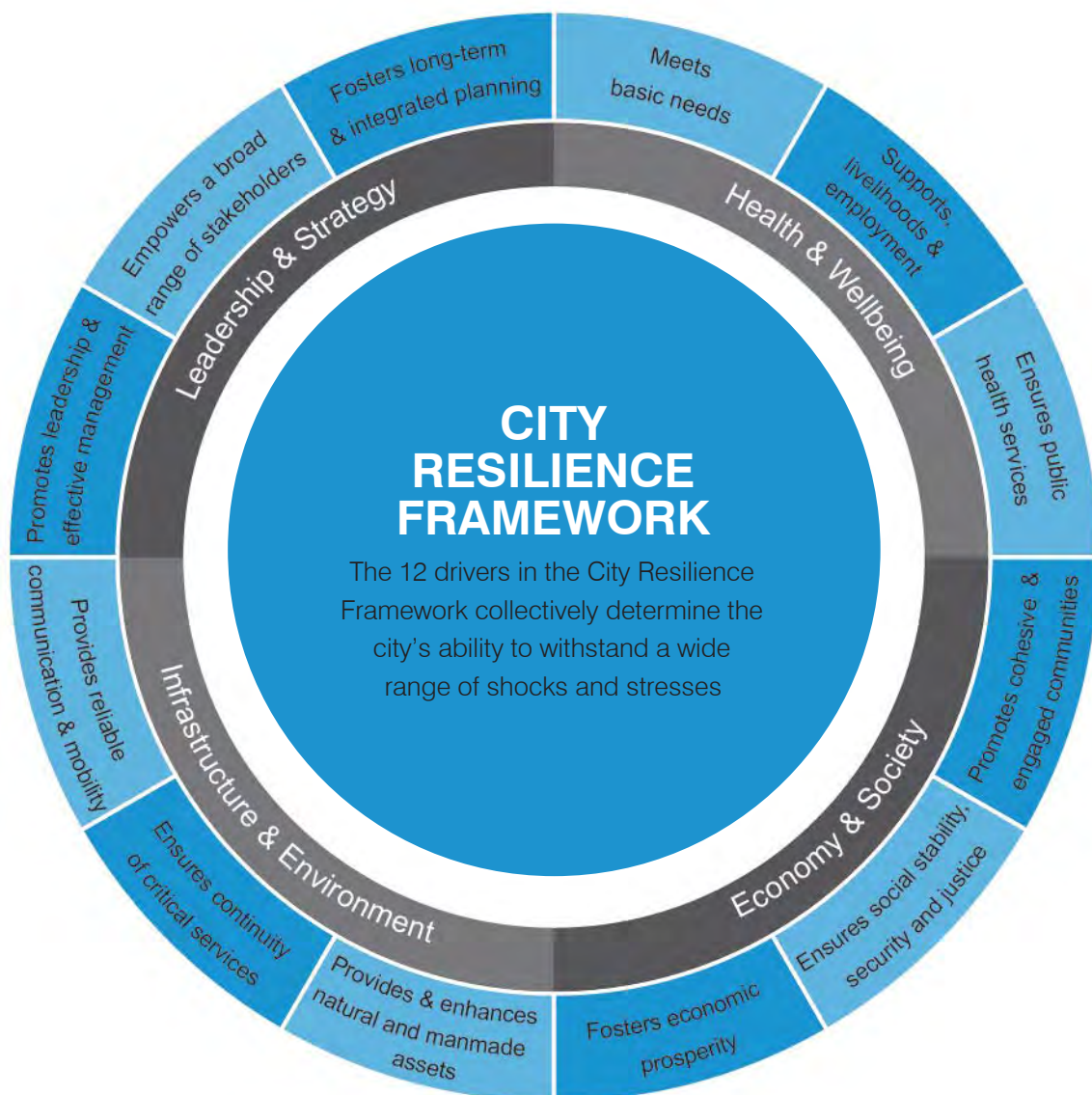
The City Resilience Framework

100 Resilient Cities uses the City Resilience Framework, developed by Arup and the Rockefeller Foundation, to assess the strengths and weaknesses of cities within four 'dimensions' and 12 'drivers'.

We have adopted this framework for metropolitan Sydney.

The four dimensions are:

- **health and wellbeing:** the essential city services that safeguard human health and diverse and secure livelihoods
- **economy and society:** the social and financial systems that enable urban populations to live peacefully, and act collectively
- **infrastructure and environment:** the way in which built and natural assets provide critical services and protect residents
- **leadership and strategy:** effective leadership and management, empowered stakeholders and integrated planning.



Resilience Behaviours

The resilience lens – 7 guiding principles

The resilience lens provides guiding principles at each phase to direct effective research, consultation, planning and action.

The lens helped us to:

- Approach the challenge in an integrated and holistic way that crosses silos, using the City Resilience Framework
- Consider impacts of multiple shocks and stresses identified through a broad risk and hazard assessment
- Aim for short, medium and long-term benefits
- Consider resilience behaviours and qualities when proposing solutions
- Strive for equitable outcomes
- Leverage actions across a broad group of stakeholders
- Consider cross-jurisdictional implications at intercity, regional, national, global levels.



Above Fairfield: Playground. Photo: Mark Bransdon

People, organisations, businesses, communities and cities that survive disasters all show resilient behaviours and decision making. Sydney can learn from these experiences. We have adapted the five key resilience behaviours identified in the work of 100 Resilient Cities and Professor Judith Rodin in *The Resilience Dividend* (2014). This approach has informed how we consider decision making in Sydney, in particular.

We asked all consultation participants to consider the below questions for resilience.

Integrated

Are we engaging widely to support decision making and connecting people, communities and organisations?

Aware

Do we understand how critical city systems work and how they rely on each other?

Adaptive

Are we flexible to respond to rapid changes and disruptions to maintain health and liveability?

Diverse

Do we value the role of different people, places and technologies in a cohesive and just city economy and society?

Self-regulation

Are we creating stable and flexible governance structures?

Asking Sydney about resilience

Since 2015, Resilient Sydney worked with more than 1,000 representatives from all levels of government, business, academia, community services, First Nations Peoples and our local communities. This group developed around 300 solutions, 70 per cent of which successfully addressed more than one aspect of the City Resilience Framework.

We used the core values and research principles set by the International Association for Public Participation (IAP2), in a comprehensive engagement process to build our understanding of Sydney's challenges, connections and capacity to integrate resilience into decision making. We recruited a robust, diverse sample of participants, provided consistent information and asked a uniform set of questions to enable participants to identify problems and develop solutions.

The outcome was a set of responses across a spectrum of political views, expertise, background, geography, experience and understanding of our metropolitan city.

Of all these responses, the community provided the clearest insight into the city as a system. The daily difficulties experienced by residents in many parts of Sydney highlighted the connections between housing, transport, jobs, education, health services and vulnerability to shock events such as extreme heat.

Who we consulted

- **Elders** - Aboriginal and Torres Strait Islander Elders from across metropolitan Sydney
- **Community** – groups of residents from the metropolitan planning districts of Sydney, with each group reflecting the demographic, socioeconomic and cultural profile of its district
- **Government and business representatives** – representatives from business, community sectors, local and state governments
- **Working groups** – experts from all sectors, including academia, and city leaders with influence and decision making authority.





Above Resilient Sydney workshop.
Photo: Katherine Griffiths
Bottom left and right Parramatta and
Chatswood: Participants at Resilient
Sydney workshops. Photo: Damian Shaw

Shocks and stresses

Urbanisation, globalisation and climate change mean Sydney's key systems such as health services, transport, utilities, telecommunications and social services are increasingly interdependent with other parts of the country, region and globe and therefore potentially more vulnerable to disruption.

Disruption may be due to a sudden, abrupt shock event that stops everything in our city, or a slow burning stress that makes life more difficult day to day. Chronic stresses can increase the likelihood of shock events, amplify the impacts, and increase recovery time and cost.

Resilience provides a view of how underlying vulnerabilities and stresses cause much bigger impacts during shock events. City systems are interdependent and work together. Cascading failures can occur when these interdependencies are not understood or managed.

Identifying the key shocks and stresses, as well as taking a systems view of how Sydney supports residents, communities, government and businesses helps us best manage community needs, risks and vulnerabilities.

We used the 100 Resilient Cities tools to identify the most impactful shocks and stresses facing metropolitan Sydney. The 2016 Preliminary Resilience Assessment and City Context Report detail these shocks, stresses, vulnerable assets and megatrends².

²Preliminary Resilience Assessment (2016), and City Context Report (2016). Resilient Sydney.

Shocks

Sydney is highly vulnerable to extreme weather events, particularly heatwaves and storms and their impacts including bushfires and flooding. When energy demand increases during a heat wave, electrical infrastructure is more likely to overload and fail, causing air conditioners to stop working and outages to communication networks, reducing the ability of people to seek help. This shows how easily extreme weather events can trigger other shocks, such as power and communications outages, water network or infrastructure failures.

A financial crisis could degrade the ability of Sydney's economy to function due to our large finance, media and telecommunications sectors, and the high levels of household debt across Sydney. Sydney has demonstrated resilience to global financial crises such as the 2007 global financial crisis, but there is the potential for another event to occur.

Sydney's Major Acute Shocks



Extreme Weather



Infrastructure Failure



Financial Institution Failure



Water Crisis



Digital Network Failure



Terror Attack



Disease Pandemic



Cyber Attack



Stresses

Many of Sydney's most impactful stresses are associated with planning and investment to support the rapid growth and social changes of our population. The city is experiencing a loss of housing affordability and high rates of household debt. There is a lack of transport diversity and employment diversity, particularly in Western Sydney. These contribute to increasing geographic and social inequity and the financial vulnerability of communities to shock events. Communities are concerned about the decreasing social cohesion in our diverse population.

Chronic stresses can amplify the impacts of shock events. Rising temperatures make it difficult to exercise outdoors, exacerbating our already high rates of chronic illness and increasing pressure on our health services. These issues combine to affect how our health services are able to perform during a disaster.

Sydney has begun to collaborate for cooperative planning between land use and transport services to address some stresses, yet a more holistic systems approach to understanding interdependencies is required to reduce the impact of stresses on people's lives.

Sydney's Chronic Stesses



Health Services Demand



Housing Affordability



Social Cohesion



Employment Diversity



Inequity



Chronic Illness



Transport Diversity



Drug and Alcohol Abuse

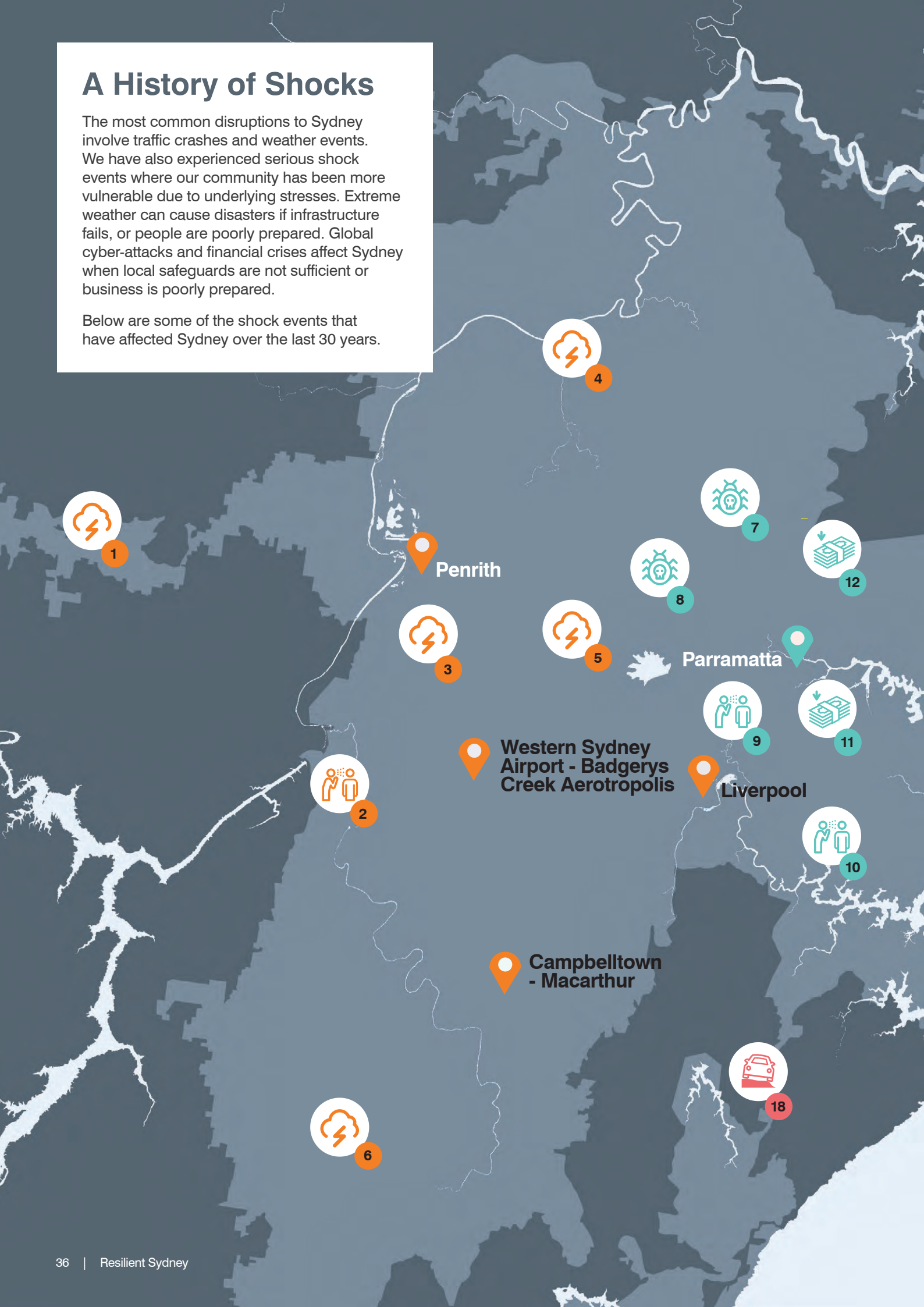
Left Bushfire is a common Sydney shock event. Photo: iStock/Skipro101

Right Health services are in high demand. Photo: Johnny Greig

A History of Shocks

The most common disruptions to Sydney involve traffic crashes and weather events. We have also experienced serious shock events where our community has been more vulnerable due to underlying stresses. Extreme weather can cause disasters if infrastructure fails, or people are poorly prepared. Global cyber-attacks and financial crises affect Sydney when local safeguards are not sufficient or business is poorly prepared.

Below are some of the shock events that have affected Sydney over the last 30 years.





Western City

1 Extreme weather – fire | Blue Mountains 2013

Bushfires caused the destruction of 196 homes, and significant damage to 132, totalling \$180 million in losses.

2 Disease pandemic | Warragamba Dam 1998

3 million residents were alerted to “boil water” due to a giardia outbreak.

3 Extreme weather – heat | Penrith 2013

In January 2013, during extreme heat of 46°C, 263 people required medical treatment, with 133 people falling unconscious. The extreme heat caused power outages and train delays on almost every Sydney Trains railway line.

4 Extreme weather – flood | Windsor 1990

The most recent greater than a 1 in 20 chance per year flood occurred in 1990, with flood waters reaching above 23.4m in Penrith and 13.5m in Windsor. More than 42,000 people would need evacuation if a 1 in 200 chance per year flood event occurred today.

5 Extreme weather – heat | Western Sydney 2017

The 2016-2017 summer was Sydney’s hottest on record with temperatures reaching 47 degrees. More than 1,100 people presented to Westmead Hospital’s emergency department with possible heat-related conditions in December and January.

6 Extreme weather – flood | Picton 2016

Flooding in Picton in 2016 was caused by 400mm of rainfall following the East Coast Low storm on June 5th, causing damage to 65% of businesses.

Central City

7 Cyber attack | Metropolitan-wide 2016

The 5 yearly Australian Bureau of Statistics census was interrupted by a cyber-attack which blocked Sydneysiders and Australians nationwide from completing the census for 40 hours.

8 Cyber attack | Metropolitan-wide 2015

The Australian Bureau of Meteorology was hacked, with a foreign agent installing malicious software to steal sensitive documents and compromise Federal Government networks.

9 Disease pandemic | Westmead 2017

Heavy demand associated with the flu season in August 2017 filled major hospitals to capacity and created significant delays in treatment.

10 Disease pandemic | Metropolitan-wide 2009

The Federal Government spent \$120 million on 21 million influenza vaccine doses. There were 2 deaths from swine flu recorded in Sydney.

11 Financial institution failure | Parramatta CBD 2007

The global financial crisis (GFC) caused cost increases and delays to the development of Parramatta Square.

12 Financial institution failure | Metropolitan-wide 2001

Collapse of the insurer HIH caused \$5.3bn losses due to debts, potential insurance claims and fraud. NSW was exposed to \$600 million dollars of losses in builders’ warranties and motor vehicle insurance.

Eastern City

13 Extreme weather – storm | Collaroy 2016

An East Coast Low 100 year storm combined with a king tide caused severe damage and coastal erosion of 50 metres causing damage to 10 homes in the Northern Beaches, leaving 30,000 homes without power across Sydney and causing \$304 million in damages across NSW.

14 Terror attack | Sydney CBD 2014

This lone gunman siege event caused 3 deaths including the attacker, closure of the financial district, 66 claims for losses and was declared a terrorism event.

15 Extreme weather – hail storm | Botany CBD 1999

The Insurance Council of Australia estimated this hailstorm caused \$387.5 million damage to retail and industrial buildings, and an additional \$25 million in the cost of business interruption to those industries.

16 Extreme weather – storm | Kurnell 2015

At least 25 homes were destroyed or severely damaged and the Sydney desalination plant significantly damaged when a tornado producing winds of 217 kilometres per hour tore through the Kurnell area.

17 Social unrest | Cronulla 2005

5,000 people were involved in the riots which resulted in arrests for malicious damage, assault, affray, arson, property damage and driving offences.

18 Infrastructure failure | Waterfall 2003

In 2003 a train departed Waterfall station and derailed causing 7 deaths and 40 injuries.

Sydney's resilience challenges and opportunities

The consultation process highlighted the following key priorities for metropolitan Sydney and provided the framework and direction for the Resilient Sydney strategy:

Community agency

From a community perspective, consultation on city changes are led by many separate government and private sector organisations operating at different scales and lacking coordination. There is an appetite for communities to act in collaboration and partnership with governments and businesses. Communities are willing to create solutions based on their needs and local knowledge of places and district communities. Solutions include encouraging best practice in inclusive engagement to ensure decision-making puts people first and the most impacted are the most included in decisions.

Adaptation to climate

There was strong and widespread concern about inaction in reducing carbon emissions and adapting to our changing climate. Solutions include: decentralised renewable energy for carbon emission reduction and energy security, changes to building codes and regulations, and city greening to promote healthy lifestyles and enhance comfort during extreme heat.

Social cohesion

Improving social cohesion, including increasing tolerance for cultural diversity, is fundamental to Sydney's ability to survive and thrive. Solutions include prioritising learning from First Nations Peoples, investing in community events, increasing awareness of and strengthening our responses to racism, and ensuring decision-making and leadership better reflects our diverse cultures.

Community preparedness

There is no broad understanding of our community preparedness for shocks across Sydney. Solutions include: improving connections between organisations that manage city systems, providing multiple methods of delivering essential services to communities, data sharing, and communication and collaboration to plan for disruption in organisations and communities.

Governance collaboration

Fragmented governance and distrust is one of Sydney's biggest challenges and collaboration is a priority. Community concerns related to how separate decisions are made that determine housing, infrastructure and services, transportation, education and employment. These issues are connected in people's lives. Suggested changes include connecting the many private and public sector organisations responsible for city plans to create new and improved collaborative decision making.

Collectively these outputs from the consultation and technical assessments of the city resulted in a set of five clear resilience challenges for Sydney to tackle:

- inequitable growth
- pressure on our health, environment and economy
- declining social cohesion
- lack of understanding of risks
- disjointed governance.

Our responses to these five challenges are outlined in the Strategy as five directions and 35 actions.



Above Redfern: Resilience workshop. Photo: Damian Shaw

Right Green Square: Community garden. Photo: Katherine Griffiths

² Preliminary Resilience Assessment (2016), and City Context Report (2016). Resilient Sydney.

There is an appetite for communities to act in collaboration and partnership with governments and businesses.







Our City and People

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SYDNEY

100



CITIES

Metropolitan Sydney today

Sydney is one of the most diverse cities in the world. The metropolis is home to the largest population of Aboriginal and Torres Strait Islander peoples in Australia. Around 5 million people from more than 200 different cultures also live here. Sydney is known for the beauty of its natural environment, outdoor lifestyle and liveability.

Sydney is a key driver of the Australian economy contributing almost 40% of GDP. It is home to strong financial, tertiary education, media and telecommunications sectors and a growing digital industry. The central business districts of Sydney and Parramatta are to the east of the geographic centre. They are the knowledge and financial hubs of our city.

Our city already covers over 12,000 square kilometres and is growing, particularly in the west and southwest, where a large portion of Sydney's young people live. The suburbs of the north and east are home to an older, ageing demographic.

Sydney sits in a broad sandstone bowl at the foot of the Blue Mountains. Ancient rivers and waterways have carved the hills, alluvial plains and deep harbour, eventually depositing golden sands on Sydney's beaches. Our city's waterways and topography constrain the development of infrastructure and spatially divide communities. There is a distinct economic, health and opportunity divide between communities in the southwest and northeast of Sydney.

Regional NSW and the semi-rural fringe of Sydney supply most of our city's food. Water, energy and much of our workforce also come from Sydney's growing edges.

Sydney's climate is changing. Our natural and urban environments are increasingly affected by warming temperatures, heatwaves, intense storms and bushfires.

Please see references on page 127

A snapshot of metropolitan Sydney – Australia's global city



Population of
5,005,358¹
growing to 8 million by 2056³



with
39.2%
born in another country
(ABS, 2016)



Contributed
38.6%
of Australia's GDP
growth in 2015–16



Unemployment rate
4.9%
is below the
Australian average⁴



Poverty rate
15.2%
the highest of Australia's
major cities⁶