VICTORIA'S CRITICAL INFRASTRUCTURE

ALL SECTORS RESILIENCE REPORT 2019

VICTORIA
State Government

Acknowledgement to Country

The Victorian Government acknowledges Aboriginal and Torres Strait Islander people as the Traditional Custodians of the land. The Victorian Government also acknowledges and pays respect to the Elders, past and present.

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Ministerial foreword

As the Minister for Police and Emergency Services, I am delighted to present *Victoria's Critical Infrastructure All Sectors Resilience Report 2019*.

The health, safety and prosperity of all Victorians is dependent upon the services that critical infrastructure provide. Each day, we enjoy the benefits of access to water, food supply, health services, energy, transport, communications, banking, finance and government services. The uninterrupted provision of these services is important to our way of life.

Emergencies can have wide ranging impacts upon communities, and many Victorians have experienced isolation from basic lifelines and needs during emergency events. In order to reduce the impact and associated consequences of these emergencies, the Victorian Government introduced comprehensive arrangements to enhance the resilience of Victoria's critical infrastructure. Resilient critical infrastructure is more likely to endure changes or challenges to social, economic and environmental circumstances, and allow for the continuous supply of essential services to the community.

Collaboration between industry and government is the cornerstone of Victoria's critical infrastructure arrangements. In an increasingly interconnected world, where critical infrastructure crosses state, national and global supply chains, the range of potential disruptions has become broader. As critical infrastructure systems become more advanced and interconnected, it is essential that we all are invited to discuss emergency risks and mitigation strategies that have the potential to impact our most important critical infrastructure. By working together, we elevate the overall resilience of the assets that we all depend on.

This report provides an overview of Victoria's eight critical infrastructure sectors, and details the measures undertaken by both industry and government to enhance the resilience of Victoria's critical infrastructure.

I would like to take this opportunity to thank the owners and operators of critical infrastructure for the work that they have undertaken to enhance the resilience of Victoria's critical infrastructure, and for their commitment to implementing best practice across Victoria's critical infrastructure. We are better placed to meet the challenges and opportunities of the future because of it.

The Hon. Lisa Neville MP
Minister for Police and Emergency Services

Executive summary

The resilience of Victoria's critical infrastructure underpins our community's health, safety and prosperity. Critical infrastructure provides the water we drink, the energy that powers our homes, and the public transport that moves us. It's the banking and finance services that grow our businesses, the supply of food and groceries to our supermarkets, our hospitals, our doctors, our government and emergency services, and the communication networks that connect us.

These services, and the critical infrastructure that support them, are essential to our way of life. If they were ever degraded or disrupted for a prolonged period, the community would be significantly impacted. But not all emergencies can be prevented, so industry and government work hard to bolster the resilience of our critical infrastructure – ensuring Victoria is better prepared to respond and adapt to new and evolving challenges as they arise.

Primary responsibility to strengthen the resilience of critical infrastructure and limit the impacts of serious disruption as a result of emergencies rests with owners and operators of these assets. To help facilitate this, Victoria introduced new arrangements in July 2015 to enhance the resilience of critical infrastructure. The arrangements, set out by the *Victorian Critical Infrastructure Framework*, are designed to provide assurance to both the public and government that key emergency risks facing critical infrastructure are considered and, where possible, minimised.

This is the fourth *All Sectors Resilience Report* published under these arrangements. The report provides an overview of the eight Victorian critical infrastructure sectors, detailing the most prominent emergency risks likely to disrupt their operation. The report also summarises the resilience improvement initiatives conducted by the eight sectors from mid-2018 to mid-2019, while also articulating the scope of next year's intended work program.

Victorians continue to benefit from the ongoing commitment and contribution made by industry and government to strengthening the resilience of our critical infrastructure. The proactive and collaborative approach by owners and operators, and government helps to prepare for the impact of emergency events and limit disruption to essential service delivery.

Critical infrastructure in Victoria

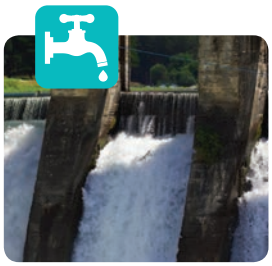
Critical infrastructure is the conduit through which essential services are provided to the community. It's the physical facilities, supply chains, systems, assets, information technologies and communication networks that deliver services to Victorians. The continued operation of critical infrastructure is key to maintaining safe and cohesive communities, protecting livelihoods, and driving productivity and business growth.

There are eight critical infrastructure sectors delivering these essential services to Victorians.

Most of Victoria's critical infrastructure is operated by private industry, with just a small number provided by government. In recognition of the important role that the sectors play in delivering essential services to the community, the Victorian Government operates a framework that brings together industry, government and emergency service representatives to explore means of strengthening critical infrastructure resilience.

Our approach must reflect our constantly changing world. A growing population heightens pressure on public transport, while urban expansion increases bushfire risk to bushland communities. Extreme weather events will continue to impact our essential services – like energy supply and roads – while human-induced events such as the recent Bourke St attacks and cyber incidents, can have very real consequences for our community and critical infrastructure.

Our experience of emergencies continues to change. Private and public sector collaboration enables us to meet challenges and future opportunities, and allows the government to assure itself and the community that industry continues to consider, and where possible, mitigate key emergency risks.



Water

Food and Grocery

Transport

Health

Energy

Banking and Finance

Government

Communications

The Victorian *Critical Infrastructure Resilience Framework*

The *Critical Infrastructure Resilience Framework* came into effect in July 2015 as a key component of Victoria's critical infrastructure arrangements. The *Critical Infrastructure Resilience Strategy* (the Strategy) is the cornerstone of the framework and is led and operated by Emergency Management Victoria (EMV) and associated portfolio departments. The Strategy is supported by the *Ministerial Guidelines for Critical Infrastructure Resilience*, Part 7A of the *Emergency Management Act 2013* ('the Act') and relevant regulations. Collaboration between industry and government is a key component of these arrangements.

The common Victorian Government definition of resilience is 'the capacity of individuals, communities, institutions, business and systems to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience'.[1] Building this requires collaboration across all levels of government, industry and the community. The Strategy outlines industry and government's approach to giving practical effect to the Act and the policy direction of the Victorian Government. Strong partnerships between government and industry underpin Victoria's ability to meet the challenges and opportunities impacting critical infrastructure.

There are four key parts to the Victorian *Critical Infrastructure Resilience Framework* (Figure 1).

As both natural and human-induced (deliberate or accidental) incidents have the potential to harm, damage, incapacitate or destroy critical infrastructure, the Framework takes an 'all hazards, all emergencies' approach to building resilience. Rather than focusing on one type of threat or hazard at a time, like bushfire or terrorism. Industry members are provided with a forum in which they can come together to discuss shared risks and opportunities.

Figure 1: The four key parts to the Victorian Critical Infrastructure Resilience Framework.

CRITICAL INFRASTRUCTURE RESILIENCE STRATEGY	Policy outlining Victoria's critical infrastructure arrangements and the importance of continually building the resilience of these assets, systems and services.
PART 7A OF THE *EMERGENCY MANAGEMENT ACT 2013*	Legislation to help identify and assess what Victoria's critical infrastructure assets are and record them on a register. EMV operates this register and uses it to enhance the security and resilience of identified critical infrastructure assets. Owners and operators of the most important infrastructure – assessed as 'vital' – must complete emergency risk management planning.
CRITICAL INFRASTRUCTURE REGULATIONS	Regulations to support the implementation of legislation and establish standards for the assessment process and emergency risk management exercises.
CRITICAL INFRASTRUCTURE MINISTERIAL GUIDELINES	Guidelines to assist industry and government to meet their obligations, and to promote consistency, by detailing requirements and processes.

1. Community Resilience Framework for Emergency Management *(2017), 'Understanding Community Resilience', page 12.. <https://files-em.em.vic.gov.au/public/EMV-web Community_Reslience%20_Framework.pdf>*

What makes infrastructure critical?

Victoria's critical infrastructure legislation identifies three essential sectors – Energy, Water and Transport. Disruption or loss in one sector can often impact the resilience of critical infrastructure within and across others. For example, energy owners and operators provide essential power and fuels to owners and operators in the Transport, Communication and Water sectors, while the Energy Sector relies on them to deliver fuel (transportation) and electricity (water for production and cooling).

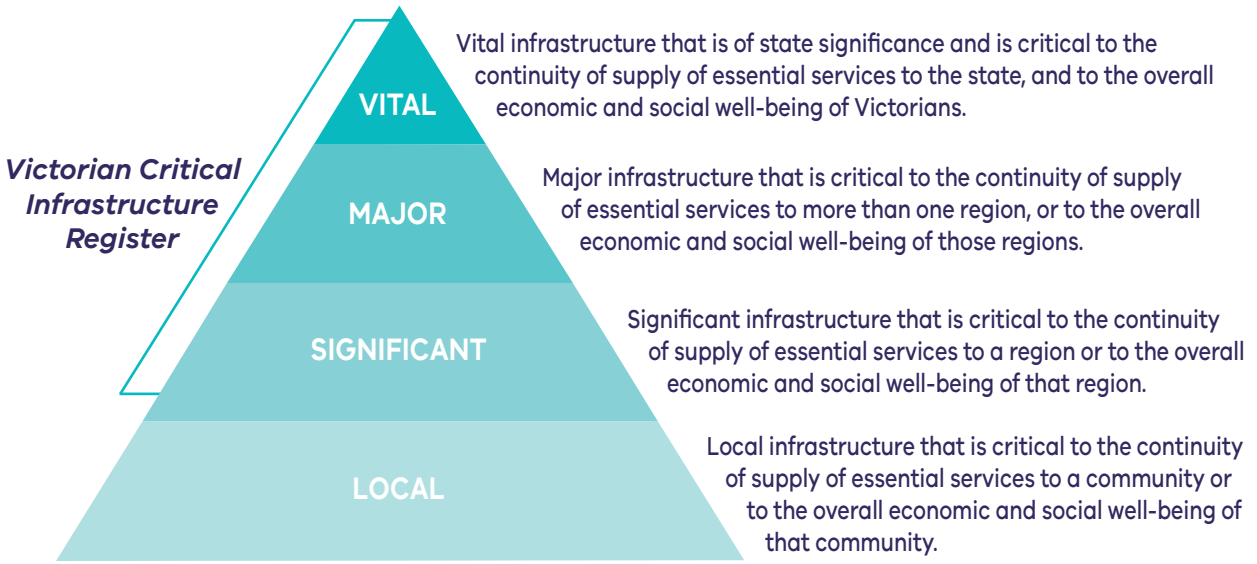
As a result, the government assesses infrastructure within these three sectors to determine which assets are the most critical. Because not all infrastructure within these sectors is equally critical, assets are assessed as being of either 'vital', 'major' or 'significant' or local importance to Victoria's economic and social wellbeing (Figure 2).

The owners and operators of 'vital' critical infrastructure must undertake an annual resilience improvement cycle and provide assurance to government on the asset's overall resilience. Our ever-changing risk environment can mean new assets are added during the year.

Victoria is the only state that has legislated for critical infrastructure resilience. In addition to the mandatory requirements, the voluntary contribution of critical infrastructure owners and operators allows us to better understand key emergency risks and provide new avenues for building sector resilience.

Assessments also help owners and operators, and government to understand potential incidents and their impact. Each year vital critical infrastructure owners and operators must undertake an exercise to test their emergency preparedness for a key risk.

Figure 2: The Victorian Critical Infrastructure Model.



Victoria's Sector Resilience Networks

Each of Victoria's eight critical infrastructure sectors operate a Sector Resilience Network (SRN). These networks are a cornerstone of Victoria's critical infrastructure arrangements, and facilitate increased collaboration between critical infrastructure owners and operators, and government.

Each SRN is coordinated by a government department and comprises of critical infrastructure owners and operators and portfolio departments. Relevant emergency service members also attend these meetings as observers.

Coordinating departments for each of the critical infrastructure sectors are shown in Table 1.

Networks meet regularly during the year so owners and operators can share information about risks and interdependencies, while also working together to build the resilience of their sector to minimise the impact of emergencies. This is achieved through joint planning and resilience building activities, and by continuing to build on the close working relationships between industry and government.

Victoria's eight critical infrastructure sectors prepare annual Sector Resilience Plans (SRPs) for the State Crisis and Resilience Council (SCRC). SRPs detail overall sector resilience and identify their key emergency risks and areas of focus for resilience improvement activities. This report is based on the information from those plans.

Table 1: Coordinating departments for Victorian critical infrastructure sectors.

SECTOR	RESPONSIBLE DEPARTMENT
Banking and Finance	Department of Treasury and Finance (DTF)
Communications	Department of Jobs, Precincts and Regions (DJPR)
Energy	Department of Environment, Land, Water and Planning (DELWP)
Food and Grocery	Department of Jobs, Precincts and Regions (DJPR)
Government	Department of Premier and Cabinet (DPC)
Health	Department of Health and Human Services (DHHS)
Transport	Department of Transport (DoT)
Water	Department of Environment, Land, Water and Planning (DELWP)

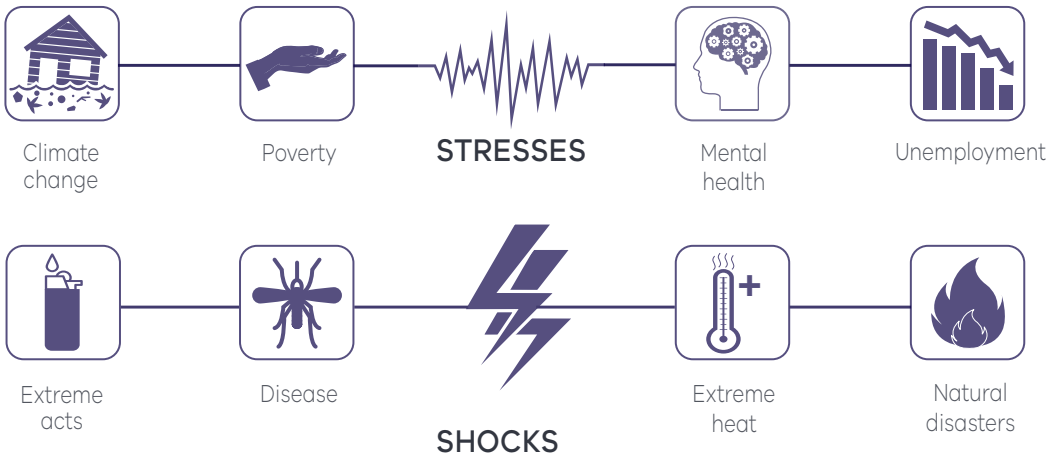
What does resilient critical infrastructure look like?

A resilience approach to managing risks to critical infrastructure builds capacity within organisations to not only respond to a crisis, but to learn and adapt from an event.[2] Not all emergencies can be prevented, so resilient infrastructure must be able to adapt and recover following emergency incidents.

Resilience differs from sector to sector, and across individual assets. The flexibility – and voluntary nature – of Victoria's critical infrastructure arrangements means they adapt as necessary to respond to new and evolving threats and stressors like climate change, population growth, aging infrastructure, increased automation and market uncertainty.

Building resilience can involve a number of different initiatives and structural measures. Resilient infrastructure is planned, designed, built and operated in a way that anticipates, prepares for and adapts to chronic stressors and changing conditions. It can also withstand, respond to and recover rapidly from acute shocks and disruptions caused by emergency events.

Shocks and stresses



New strategies and legislation have been brought in to help address the ever-evolving type of threats that challenge critical infrastructure. They include:

- *Victoria's Climate Change Adaptation Plan 2017–20* (DELWP)
- *Victorian Cyber Security Strategy* (DPC)
- *Security of Critical Infrastructure Act 2018* (federal legislation to help understand and manage national security risks for critical infrastructure in Australia).

2. Critical Infrastructure Resilience Strategy, *Commonwealth of Australia, page 13, <https://www.tisn.gov.au/Documents/Australian+Government+s+Critical+Infrastructure+Resilience+Strategy.pdf>*

Critical infrastructure operates in a dynamic environment

Victoria's risk profile continues to be altered by population growth, changing demographics, climate change and evolving use and reliance on technology and inter-connected systems. These changes alter operational threats and challenges to our critical infrastructure.

Average temperatures across Victoria have increased (Figure 3). There is less rain, more coastal erosion, rising sea levels and more extreme weather events. Additionally, higher average daily temperatures than in previous decades increase demand on our essential services systems and assets. This has the potential to impact communities, individuals, businesses and the environment.

The longer heatwaves accompanying climate change are becoming part of expected business operations – increasing demand across health care, energy, communications, and transport services that rely on infrastructure built for different conditions. Summers starting earlier and finishing later have also changed our approach to emergencies. Plus, the Australian and northern hemisphere fire seasons are now overlapping. Increasing overlap of fire seasons between states and territories, and with the USA and Canada, will impact coordination and support provision.

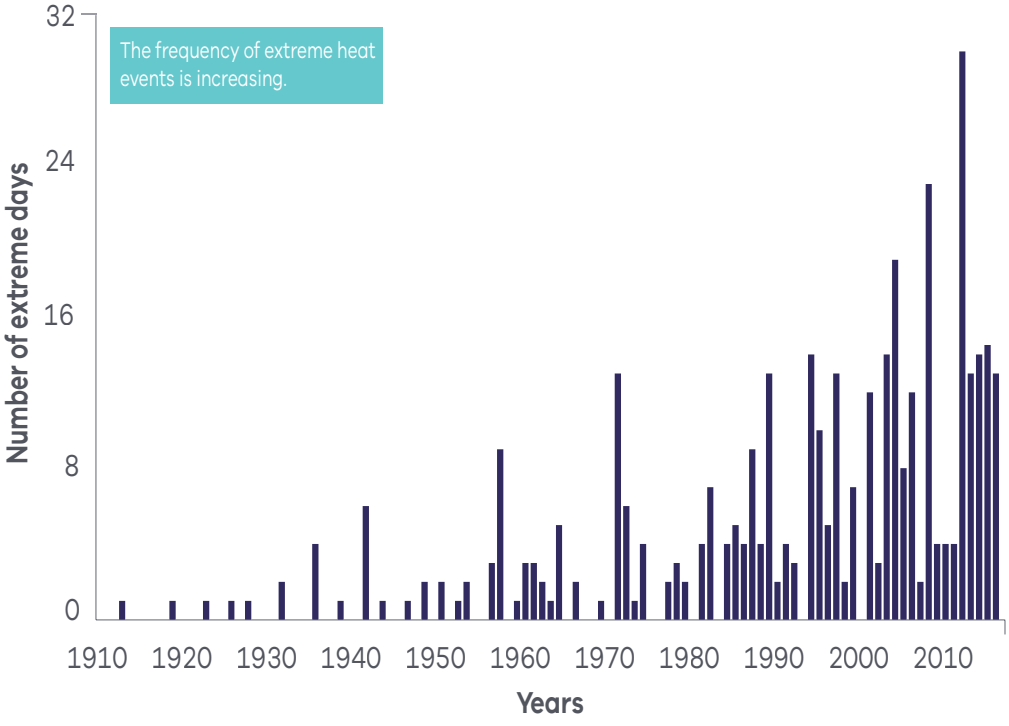
Sea levels are also expected to rise leading to:

- increased coastal flooding
- more damage to coastal properties
- higher impact from storm surges
- permanent inundation of coastal infrastructure and road assets
- reduced access to essential services and transport for Victorians.

In a globally connected environment, pandemics originating overseas can impact the Victorian public within days, demonstrating the need for continued collaboration between government, private industry and non-governmental organisations.

Increased automation and digitalisation of our infrastructure and government systems has elevated cyber security as a key concern across all eight sectors. Our increased reliance on technology exposes Victoria's critical infrastructure to new and evolving risks like the ever-present threat of cyber attacks on the computer systems managing Victoria's critical infrastructure.

Figure 3: Number of days each year where the Australian area-averaged daily mean temperature is extreme. Extreme days are those above the 99th percentile of each month from the years 1910–2017. (Sources: Bureau of Meteorology, CSIRO.)



The year in review

Victorians faced a number of emergency events in 2018–19

Every year, emergencies bring trauma and disruption to Victorian communities. Over the last year, these were a combination of both security based and natural threats (i.e. fire and extreme heat), demonstrating the impact of climate on critical infrastructure services.

Emergency events impacting critical infrastructure

Melbourne water supply catchment fires

(January–April 2019)

Fires started by dry lightning strikes burnt 6,411 hectares (13%) of the Thompson catchment and 2,629 hectares (1.3%) of the Upper Yarra catchment. Heavy rainfall washed ash and sediment into reservoirs, potentially impacting the quality of our drinking water. Close collaboration between industry and emergency services was essential to ensuring appropriate fire fighting resources were deployed to maintain Melbourne's drinking water quality. The bushfire emergency also caused Telstra machine-to-machine outages and localised network disruptions.

Multiple extreme heat periods

(December 2018–February 2019)

Victoria experienced multiple consecutive days of extreme heat. This increased health consequences for the community and demands on Ambulance Victoria. Public transport systems were also impacted as extreme heat affected railway lines.

West Footscray chemical fire

(30 August 2018)

In August 2018, a fire in a West Footscray warehouse housing toxic and highly flammable chemicals, polluted nearby waterways. This impacted local fishing and required prolonged decontamination and rehabilitation efforts.

Statewide Australia Day load-shedding event

(26–29 January 2019)

Load-shedding in the electricity network resulted in temporary loss of power to hundreds of thousands of Victorians. This was caused by very high demand due to extreme heat, less supply due to power generation issues, and localised disruptions.

Bourke Street attack

(9 November 2018)

Victoria's third act of extreme violence in Melbourne's CBD in three years resulted in the tragic death of one person. The disrupted road network impacted CBD tram and bus services.

Spencer Street gas leak

(1 May 2019)

A gas leak closed Spencer Street near Southern Cross Station, impacting traffic and trams in Melbourne's CBD. The way all parties worked as one was acknowledged by industry and government as having helped to reduce the leak's impact and prevent significant CBD service disruption.

Bundoora homicide

(16 January 2019)

The assault and murder of a young woman after leaving a tram in Bundoora saw transport operators, local government and police considering how to improve whole-of-trip safety on public transport.

PageUp cyber security incident

(1 June 2018)

PageUp Limited, an online recruitment services organisation, notified their customers about a data incident in relation to the integrity of their systems proactively informing of a possible breach. Many major companies who used this service undertook appropriate response actions.

Resilience improvement measures in 2018–19

Because different emergencies can have similar consequences, Victoria takes an all hazards, all emergencies approach to its critical infrastructure strategy. For example, storms and heatwaves can both lead to power outages, so planning for one can also inform sector resilience in the event of the other.

SRN resilience improvement initiatives during the year aligned with identified emergency risk areas, and focused on collaboration around risk and building resilience. Some examples are included in Table 2.

Table 2: SRN resilience improvement initiatives in 2018–19.

FOCUS	CASE STUDY
Collaboration	– A joint exercise with the Health, Communications, Transport and Government SRNs explored the impact of interdependencies in a major pandemic on Victoria's critical infrastructure assets and systems. – An exercise by Melbourne's metropolitan water corporations (City West Water, Melbourne Water, South East Water, Western Water and Yarra Valley Water) tested the *Metropolitan Industry Response Plan*. It involved over 200 participants and observers from 10 agencies, participating from five sites across Melbourne, resulting in improved understanding of an emergency that involves many organisations in the sector.
Cyber security	– A joint exercise between Victoria and South Australia explored cyber security risks for the Communications Sector. It examined response arrangements for cyber security emergencies that could compromise Victoria's critical communications infrastructure. – SRN industry members participated in information sharing, training opportunities and exercises organised by the networks and the Australian Cyber Security Centre (ACSC), increasing awareness of cyber risk and mitigation opportunities.
Energy disruption	– A joint exercise tested communications protocols by the energy industry, the Australian Energy Market Operator (AEMO) and state and federal governments during a multi-fuel emergency event. – The Energy Sector also continued to implement recommendations arising out of the independent review of the 28 and 29 January 2018 heat event.
Climate change	– The pilot *Water Sector Climate Change Adaptation Action Plan* was released in October 2018, including 20 priority actions to address the effects of climate change and build a resilient water future. Proactive emergency risk management initiatives such as this help sectors adapt to climate change and improve resilience. – The Industry Accountable Officer Forum explored the financial and legal consequences of considering climate change responsibilities.
Security	– The Victorian Government continues to actively enhance the security of Victorians in public places, e.g. bollards across Melbourne's CBD. Both industry and government stakeholders across all critical infrastructure sectors continue to work with international, federal and state governments to share good practices and lessons learned and to advance a global culture of security. – The Transport SRN hosted a cross-sector integrity workshop in May 2019, which included all sectors, as well as the Trusted Information Sharing Network (TISN), and Food and Grocery Sector members. Attendees were asked to reflect on their organisation's key security vulnerabilities and mitigation strategies.

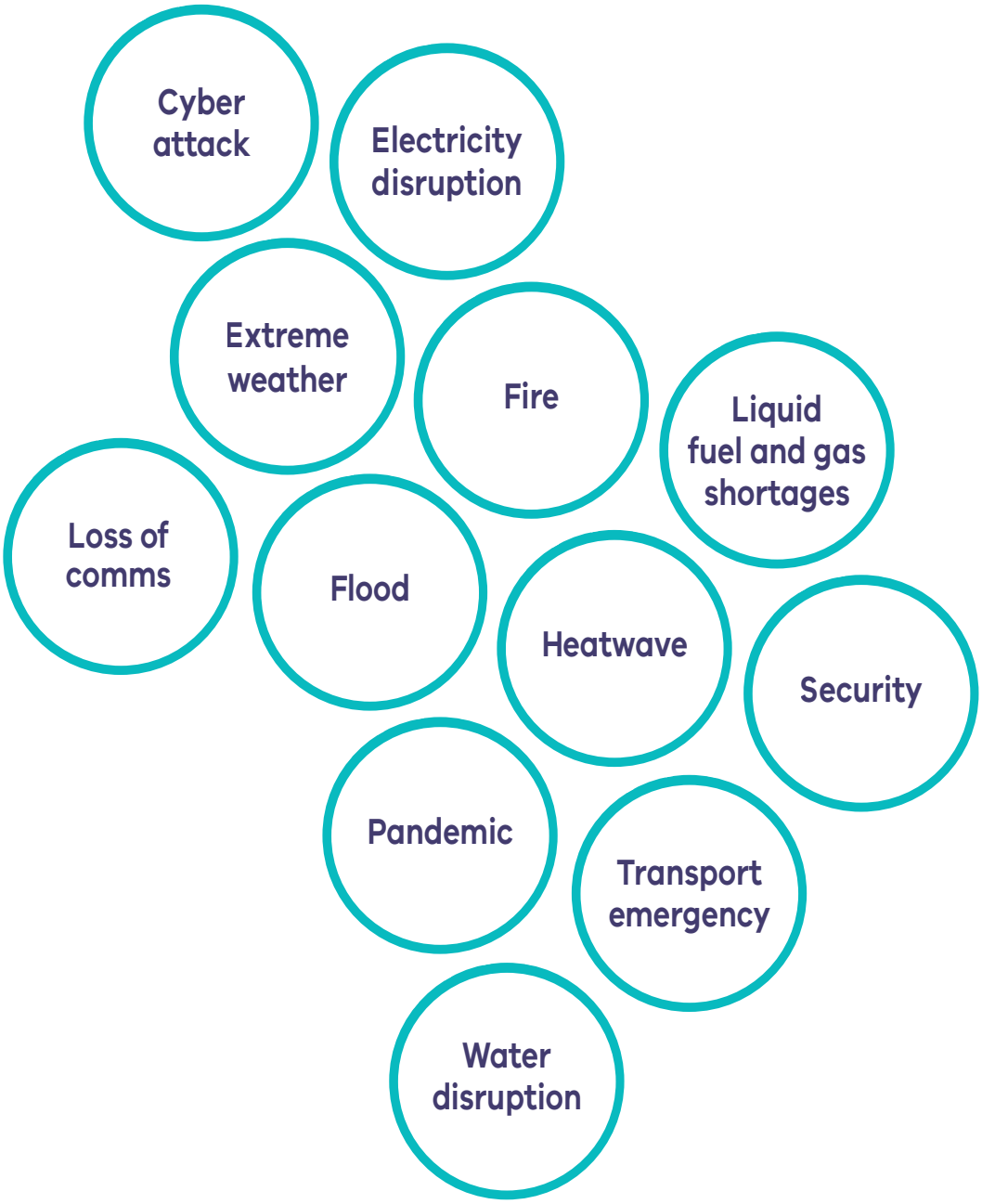
Looking forward

Priority emergency risks for 2019–20 and beyond

Understanding Victoria's critical infrastructure risk profile helps industry and government with emergency management planning.

This report summarises the wide range of emergency risks with the potential to compromise the operations of one or more sectors. The physical impacts of climate change – rising temperatures, shifting precipitation patterns, more intense and reccurring extreme weather events and rising sea levels – affect all types of infrastructure, and are consistently identified as a major emergency risk by owners and operators.

Common areas of concern for sectors in 2019–20



Projected dependencies for critical infrastructure in 2019–20

No single essential service is delivered in isolation from another. Critical infrastructure owners and operators rely on a series of automated and interconnected technologies and systems. These interdependencies often mean failure in one sector creates failure in others. For 2019–20, high dependency was identified in identified in the following critical infrastructure:

- Energy
- Water
- Communications
- Transport.

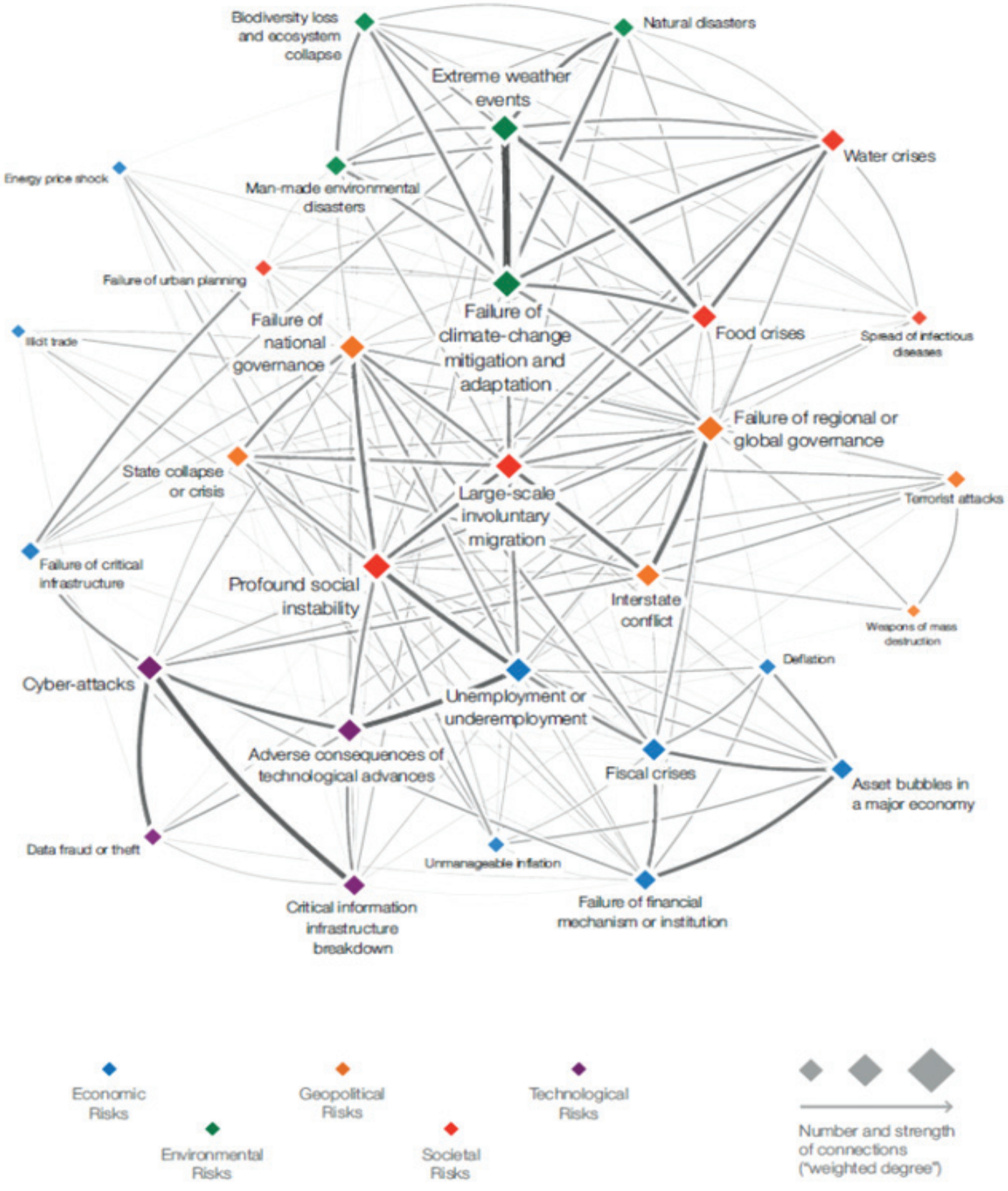
As Figure 4 shows, if any of these sectors are disrupted or degraded, the impact of that damage or disruption can cascade, impacting the operation of another. Identifying and understanding dependencies and interdependencies between sectors and specific assets is important in assessing risks and vulnerabilities, and for determining best strategies to increase resilience.

This year, the networks explored a number of cross-sector interdependencies through desktop exercises. Facilitated by EMV, the 2019 SRN All Sectors Resilience Network Forum explored the implications of load-shedding and energy disruption during a heatwave. The AEMO briefed industry members on practical implications and participants considered how reduced services from other critical infrastructure sectors would disrupt their operations.

Additionally, members of the Transport, Health, Communications and Government sectors came together to participate in 'Exercise Petunia', a multi-sector discussion exercise on the impact of a major pandemic.

Participants developed a deeper understanding of cross-sector impacts and vulnerabilities, and the potential impact of these within their own organisations.

Figure 4: The Global Risks Interconnections Map 2019. (Source: Global Risks Landscape 2019, World Economic Forum. http://reports.weforum.org/global-risks-2019/survey-results/global-risks-landscape-2019/.)



Victoria's critical infrastructure sectors

Banking and Finance

This sector provides financial deposit and loan services and facilitates associated financial transactions across service providers and customers. Services also include protection from financial loss through insurance arrangements and leveraging of assets to manage and create wealth. These services are delivered by multiple global, national, regional and community based financial institutions that are highly interconnected and operate on international platforms. As services are delivered from, and reach far beyond Victorian borders, the sector is regulated by the Commonwealth and coordinates its sector resilience building initiatives at the national level.

The Banking and Finance SRN meets through Victoria's participation at the national Banking and Finance Sector Group, established under the Commonwealth's TISN, which is led by the sector and supported by the Commonwealth Department of Home Affairs.

SECTOR OVERVIEW

- Over 40 financial sites identified as operationally important in Victoria, with two of Australia's major four banks hosting headquarters in the state.
- Services include payments, settlements, foreign exchange, equities and derivatives trading, money market and debt securities, cash supply management, call centres, consumer electronic payment systems, claims processing, core risk management, general ledger and insurance.

KEY STAKEHOLDERS

- Financial institutions, insurance providers, wealth management service providers, financial regulators.

KEY ASSETS AND INFRASTRUCTURE

- Primary data centres, back-up data centres, call centres, corporate headquarters, operations/processing centres and trading centres.

KEY RISKS

- Cyber security
- Energy and Communications sectors interdependencies
- Climate change and extreme weather impacts
- Issues-motivated individuals or groups, indirectly or directly targeting the sector
- Reliance upon data-related infrastructure (e.g. data centres, cloud providers, supporting networks).

KEY DEPENDENCIES

- Electricity, gas and telecommunications.

KEY RESILIENCE IMPROVEMENT INITIATIVES COMPLETED IN 2018–19

- Further engagement with Victorian financial agencies and formalise intra-Victorian Government arrangements.
- Assessment of the cross-sectoral interdependencies associated with exposure to cyber risks.
- Continued focus on whole-of-sector risks, and implications for the sectors critical infrastructure and cross-sector resilience.

RESILIENCE IMPROVEMENT INITIATIVES PROPOSED FOR 2019–20

- Explore a cross-sector exercise coordinated with other TISNs within the National Critical Infrastructure Centre.
- Continue working on the sector's interface with emergency services responding to natural and human-induced events.
- Review and update the sector's identified essential functions.

Communications

The Communications Sector enables all internet, phone, radio, television and online transactions that involve the exchange of data and information through interconnected telecommunications networks. The sector comprises a variety of infrastructure owners and service providers operating at the wholesale and retail levels that aim to meet the growing demands of residential and business consumers for fixed-line and mobile services.

Communications policy and regulation is primarily set at the national level and the Victorian Communications SRN actively participates in meetings of the Commonwealth's TISN Communications Sector Group.

SECTOR OVERVIEW

- Voice and data services over fixed and mobile networks, infrastructure for fixed and mobile customer access networks, backhaul and transmission networks.
- Provision of different technologies and infrastructure in an area driven by characteristics of the market (for example, population density, terrain and customer demand).

KEY STAKEHOLDERS

- Carriers, particularly NBN Co, Optus, Telstra, Vodafone and VicTrack
- Carriage service providers
- Content providers
- Application developers.

KEY ASSETS AND INFRASTRUCTURE

- Copper networks
- Hybrid fibre-coaxial networks
- Fibre-optic cable networks
- 3G and 4G technology (particularly mobile telephone and wireless internet towers)
- 5G technology
- Satellite and base stations
- Exchanges, or points of interconnection, and data centres
- Intercontinental submarine cables.

KEY RISKS

- Cyber security
- Fire
- Storm
- Extreme weather
- Pandemic
- Heatwave
- Security
- Electricity disruption
- Redundancy asset failure
- Disruption of underground cables.

KEY DEPENDENCIES

- Electricity supply
- Transport (particularly road access)
- Human resources.

KEY RESILIENCE IMPROVEMENT INITIATIVES COMPLETED IN 2018–19

- Coordinating and participating in exercises to build resilience to key risks including:

  – Exercise Titania, a cross-jurisdiction telecommunications cyber security exercise jointly convened by Victoria and South Australia

  – Exercise Petunia, a multi-sector discussion exercise exploring the impact of a major pandemic on critical infrastructure, along with the Health, Transport and Government SRNs.
- Attending cross-sector forums, such as a workshop on trusted insiders hosted by the Transport SRN where participants reflected on their organisation's key security vulnerabilities and mitigation strategies.

RESILIENCE IMPROVEMENT INITIATIVES PROPOSED FOR 2019–20

- Continuing engagement and collaboration at a national level, and minimising overlap of national and state activities.
- Observing or participating in exercises, with a focus on multi-sector exercising to explore interdependencies.

Energy

A variety of energy sources power Victoria's workplaces, businesses, transport, essential services (e.g. water supply) and community facilities. Victoria's Energy Sector comprises three privately owned and operated sub-sectors – electricity, gas and liquid fuels – which form part of national networks that import and export energy between states and internationally.

SECTOR OVERVIEW

- Raw materials
- Processing plants
- Energy production
- Generation facilities
- Storage facilities
- Transmission and distribution networks.

Victoria's energy assets are owned and operated by multiple privately-owned organisations.

KEY STAKEHOLDERS

- Producers and distributors of electricity, gas and liquid fuel products and services.
- Energy markets, the AEMO, government regulators and the Victorian and federal governments.
- Storage import and export infrastructure owners and operators.

KEY ASSETS AND INFRASTRUCTURE

- Electricity: generators, high and low voltage transmission and distribution systems.
- Gas: production, receiving, processing and storage facilities; transmission and distribution systems.
- Liquid fuels: production and import facilities, fuel refineries, storage, distribution system (pipelines and transport) and retail outlets.

KEY RISKS

- Cyber security and trusted insider access to internal systems (which could be disrupted).
- Extended loss of energy production or transmission infrastructure due to fire and extreme temperatures.
- Severe weather (including wind, lightning, flood and storm surge).
- Workforce issues (including pandemic, heat stress, industrial issues, aging workforce and limited experience).

KEY DEPENDENCIES

- Trained specialist staff
- Energy supply for operations
- Water for operation of power stations
- Transport to move liquid fuels
- Mobile phone towers
- Transmission and distribution networks plants and equipment.

Interdependencies include electricity and gas markets across the south east coast, while the liquid fuels sector is part of a national and global supply chain.

All sectors, including Water, Transport, Health and Communications are heavily reliant on energy.

RESILIENCE IMPROVEMENT INITIATIVES COMPLETED IN 2018–19

- Coordinated and participated in emergency exercises such as:

  – Exercise Darwin, with the energy industry, the AEMO, and state and federal governments in August 2018, helped all parties better understand communication protocols during a multi-fuel event

  – DELWP and the former Department of Economic Development, Jobs, Transport and Resources hosted 'Exercise Nightshade' to measure the implications of an extended heat event, with the final days classed as Code Red.
- DELWP-led exercise on cyber security for industry members on technical and communications issues for organisations during a cyber incident which included an ACSC presentation.
- The Victorian Energy Emergency Committee facilitated an exercise to explore communication arrangements and improve understanding of the Energy Emergency Management Liaison Officer's role.
- DELWP-led exercise to explore using the VicEmergency app to communicate with the public during a significant gas emergency.

RESILIENCE IMPROVEMENT INITIATIVES PROPOSED FOR 2019–20

- Conducting and participating in exercises and training focused on the sector.
- Work with the Transport Sector on an exercise exploring the impacts of a prolonged port closure which would result in disruption to liquid fuel supply.
- Sharing information relevant to the sector and emergency resilience more generally through discussions, case studies and presentations.
- SRN to focus on emerging issues including cyber security:

  – energy providers to present on cyber resilience

  – Energy Sector to participate in the ACSC's national cyber security exercise.
- In parallel with the DELWP water group, undertake a strategic review of Energy Sector interdependencies.
- Continue to prepare for summer electricity peaks and heat events.

Food and Grocery

The supply of food and essential groceries to Victorians relies on a network of production, manufacturing/processing and packaging, distribution and retail outlets. Thousands of local and national businesses support this supply chain and the sector has multiple dependencies on other critical infrastructure sectors and on imported goods.

Large food and grocery companies operate at the national level and the Victorian Food and Grocery SRN actively participates in meetings of the Commonwealth's TISN Food and Grocery Sector Group.

SECTOR OVERVIEW

- Complexity and diversity of the Food and Grocery Sector allows for various redundancies within the system that enable resilience.
- Supply chain moves low margin, high volume products using a 'just in time' business model, so stocks of food (particularly perishables) and essential grocery items are limited.
- Subject to national competition laws and the Australia New Zealand Food Standards Code.

KEY STAKEHOLDERS

- Major supermarkets/distributors, particularly Coles, Woolworths, Aldi and Metcash
- Logistics companies
- Wholesale markets
- Manufacturing/processing and packaging companies
- Industry associations
- Regulators.

KEY ASSETS AND INFRASTRUCTURE

- Manufacturing/processing plants
- Refrigeration systems
- Freight and logistics operations including heavy vehicle fleets and last-mile transport
- Wholesale markets
- Storage and warehousing
- Distribution centres
- Retail outlets.

KEY RISKS

- Supply chain disruptions, particularly due to natural events such as fire and flood.
- Disruption to transport, energy and communications infrastructure.

KEY DEPENDENCIES

- Electricity supply
- Liquid fuels
- Gas
- Water
- Communications networks
- Transport networks
- Banking and finance
- Human resources.

RESILIENCE IMPROVEMENT INITIATIVES COMPLETED IN 2018–19

- Learning about other jurisdictions experiences of food and grocery supply chain disruptions, such as the sector's response to the February 2019 Queensland floods.
- Re-examining Victorian arrangements for food and grocery supply logistics continuity and prioritisation during emergencies.
- Attending cross-sector forums, such as a workshop on trusted insiders hosted by the Transport SRN where participants reflected on their organisation's key security vulnerabilities and mitigation strategies.

RESILIENCE IMPROVEMENT INITIATIVES PROPOSED FOR 2019–20

- Continuing engagement and collaboration at the national level through the TISN Food and Grocery Sector Group .
- Observing or participating in exercises, with a focus on multi-sector exercising to explore interdependencies.
- Continuing to develop a more sophisticated understanding of Victoria's critical food and grocery infrastructure.

Government

The Victorian Government Sector regulates, delivers and funds essential community services through departments and portfolio agencies. The Government Sector interacts with all other critical infrastructure sectors and has ultimate responsibility in ensuring government services are delivered to citizens. Maintaining continuous delivery of these services in the event of disruptions relies on assets and infrastructure owned and operated by government and non-government entities.

SECTOR OVERVIEW

- Seven government departments and one agency are members of the Government SRN (Department of Premier and Cabinet, the Department of Treasury and Finance, the Department of Environment, Land, Water and Planning, the Department of Transport, the Department of Justice and Community Safety, the Department of Education and Training, the Department of Health and Human Services and Victoria Police). All provide critical services to government and the community.

KEY STAKEHOLDERS

- The Victorian Government
- SCRC and associated sub-committees
- The Victorian Secretaries Board (VSB)
- State Significant Risk Inter-departmental Committee
- The Integrity and Corporate Reform Subcommittee of the VSB
- The Victorian community.

KEY ASSETS AND INFRASTRUCTURE

- Government institutions
- Staff and contractors (people)
- Information communication technology (ICT) systems
- Primary CBD departmental and Victoria Police office locations – including all essential services (power, water) supplied to these sites.

KEY RISKS

- The ability to surge workforce resources across multiple departments in an emergency, and reliance on and access to ICT systems.
- Disruptions arising from an emergency to the functions of government including decision making and delivery of services.
- Cyber-threat actors targeting governments to access official ICT systems and data holdings.

KEY DEPENDENCIES

- Availability of staff and contractors for maintaining continuity of services
- Energy for ICT networks
- Transport for workforce availability.

RESILIENCE IMPROVEMENT INITIATIVES COMPLETED IN 2018–19

- Implementing recommendations of an independent evaluation of whole-of-government critical services.
- Shared lessons learned from business continuity redundancy and other sector exercises.
- Developed and participated in a pandemic-focused multi-sector exercise.
- Presentations on cyber security and the work lead by the Victorian Government to enhance agencies' ability to identify, mitigate and respond to cyber security incidents.
- Shared lessons learned from August 2018 extended business continuity disruption to the State Control Centre and DELWP offices.
- Presentation by ACSC on recent changes to the Commonwealth Government's cyber security arrangements and the current threat environment.

RESILIENCE IMPROVEMENT INITIATIVES PROPOSED FOR 2019–20

- Develop a cyber security exercise with business continuity impacts for government.
- Implementation and deep-dive review report prepared for the VSB on whole-of-government community critical services.
- Presentation to the network by One Victorian Public Service to extend knowledge of how to leverage this as part of a whole-of-government continuity strategy.

Health

Victoria's health system is a complex and diverse network of services which provide high-quality treatment, care, education and disease prevention to meet the health needs of all Victorians.

SECTOR OVERVIEW

- Medical practitioners
- Nurses
- Midwives
- Allied and other health professionals
- Hospitals
- Ambulance services
- Mental health
- Community and dental health services
- Community pharmacies
- Public health
- Preventative health.

KEY STAKEHOLDERS

- Operators and providers of essential services from across the Victorian Health Sector, including major trauma health services
- Community-based health services
- Ambulance Victoria
- Private and regional health services
- The Australian Red Cross Blood Service.

KEY ASSETS AND INFRASTRUCTURE

- Public and private facilities such as hospitals, rural and regional health services
- Medical and specialist clinics
- Community centres
- Specialist rehabilitation facilities
- Psychiatric hospitals
- Specialist hospitals
- Private practices.

KEY RISKS

- Cyber security attacks and ICT outages
- Increasing health implications resulting from more frequent and extreme weather events (i.e. storms, floods and extreme heat)
- Power disruption
- Risks such as pandemic and communicable disease, anti-microbial resistance, and acts of extreme violence.

KEY DEPENDENCIES

- Power and energy
- Transport
- Water
- ICT
- Waste management
- Specialist staffing
- Consumables – including medicine and medical products.

RESILIENCE IMPROVEMENT INITIATIVES COMPLETED IN 2018–19

- Led the development of Victoria's first Class 2 emergency public information exercise:

  – focused on an Avian Flu outbreak and pandemic, aiming to test the state's strategic communications processes and agency roles, responsibilities and operational arrangements.
- Expanded network membership and meetings.
- Input into the development of the Critical Infrastructure Resilience Information System (CIRIS).
- Further defined Health Sector interdependencies, risks, resilience and maturity.

RESILIENCE IMPROVEMENT INITIATIVES PROPOSED FOR 2019–20

- Continue maturing of the networks' membership.
- Develop a multi-year strategic plan, to include resilience strategies and priority actions.
- Participate in multi-sector activities and an exercise.
- Continue to capture controls, preparedness and resilience building activities across the Health Sector.

Transport

Victoria's transport network is a geographically spread, complex system of road, rail, port and airport infrastructure; underpinning many of the state's economic and social functions. Our roads and public transport system allow people to travel to work and school, connect with family and friends, and access community services. Our extensive freight network supports business development and trade.

SECTOR OVERVIEW

- Local, state, national and privately owned and operated, assets and infrastructure.
- Transport network includes trams, passenger and freight trains, ships, cars, trucks, planes, buses, taxis and motorcycles; as well as the posts, airports, roads and rail lines they use.

KEY STAKEHOLDERS

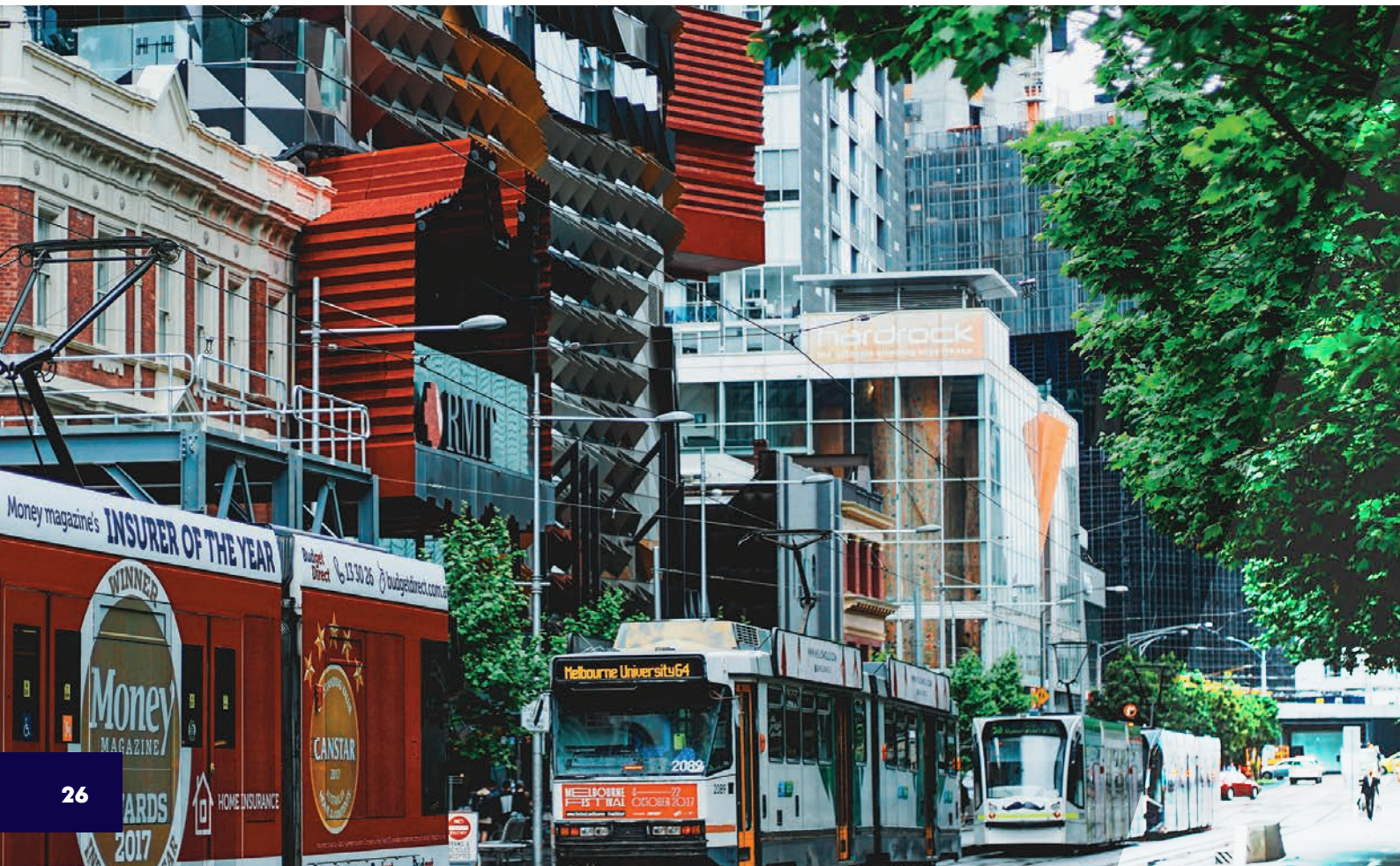
- Members of the Victorian community and business, including other critical infrastructure sectors dependent on the Transport Sector.
- The Victorian Government.

KEY ASSETS AND INFRASTRUCTURE

- Key bridges
- Tunnels
- Intermodal hubs
- Rail lines, stations and interchanges
- Telecommunication systems
- Buses and coaches
- Ferries
- Cycling and walking paths
- Roads
- Traffic management and control centres
- Airports
- Ports
- Boat ramps
- Freight and logistics –logistics infrastructure and service provider assets.

KEY RISKS

- Human resource disruption
- Electricity supply disruption
- Liquid fuel
- Transport infrastructure emergency.



KEY DEPENDENCIES

- Electricity supply
- Telecommunications
- Liquid fuels
- Transport operator control systems
- Water and sanitation
- Human resources
- Infrastructure supporting transport operations.

RESILIENCE IMPROVEMENT INITIATIVES COMPLETED IN 2018–19

- Hosted a cross-sector integrity workshop for Water, Energy and Transport Sector members:

  – Department of Defence and Australia Post staff presented case studies on threats including trusted insiders

  – members reflected on their organisation's key security vulnerabilities and mitigation strategies.

- Organised Exercise Petunia, a multi-sector discussion exercise on the impact of a major pandemic, along with the Health, Communications and Government SRNs.

RESILIENCE IMPROVEMENT INITIATIVES PROPOSED FOR 2019–20

- The SRN's theme for 2019–20 is 'energy' with a focus on electricity disruption and liquid fuel shortages – a cross sector-exercise based on prolonged ports closure and liquid fuels supply disruption is scheduled for the first half of 2020.
- Projects to further build sector resilience, including an updated sector-wide risk assessment, an analysis of common lessons learned from Part 7A exercises over the past three years and pursuing development of a framework for measuring the effectiveness of the Transport SRN.
- Information sharing as a standing agenda item at SRN meetings and encourage more presentations from SRN members on lessons learnt from exercises.
- Project to develop a simple, consistent approach to measuring the effectiveness of the Transport SRN in building resilience.

Water

A reliable and safe supply of water, resilient to an evolving emergency risk emergency risk environment as well as to hazards both natural and man-made is fundamental to communities. Primary activities in the Water Sector include the supply of water and wastewater services and management of the supporting catchments and infrastructure to deliver these services, which includes dams, pipelines, pumping stations, treatment plants, control facilities and a desalination plant.

SECTOR OVERVIEW

Water services provide a range of local services including:

- Water supply
- Sewage and trade waste disposal and treatment
- Rural water services
- Bulk water supply services
- Management of rivers, creeks and major drainage systems in the Melbourne, Port Phillip and Westernport region.

KEY STAKEHOLDERS

Victoria's water services are provided by 19 water corporations, the Victorian desalination plant and 10 catchment management authorities.

KEY ASSETS AND INFRASTRUCTURE

- Water supply catchments
- Dams
- Water treatment facilities
- Water transfer system
- Victorian desalination plant.

KEY RISKS

- Climate change
- Cyber attack
- Drought
- Electricity supply disruption
- Fire
- Liquid fuel shortage
- Severe weather (including floods or storms)
- Dam safety
- Loss of communications/ telecommunications.

KEY DEPENDENCIES

- Electricity
- Liquid fuel
- Treatment chemicals
- Telecommunications
- Transport.

RESILIENCE IMPROVEMENT INITIATIVES COMPLETED IN 2018–19

- Pilot *Water Sector Climate Change Adaptation Action Plan* released in October 2018, including 20 priority actions to tackle the effects of climate change and secure a resilient water future for Victoria.
- Emergency exercises conducted for all water corporations and the Victorian desalination plant.
- Metropolitan water corporations' exercise, using a cyber security scenario to test the Metropolitan Industry Response Plan. This exercise involved City West Water, Melbourne Water, South East Water, Western Water and Yarra Valley Water with over 200 participants and observers from 10 agencies across five Melbourne sites.
- Training and capacity building exercises held to improve the sector's capability for meeting responsibilities.
- Participated in multi-sector forums and activities to improve understanding of other sectors and Water Sector interdependencies.

RESILIENCE IMPROVEMENT INITIATIVES PROPOSED FOR 2019–20

- Build knowledge of how climate change will impact the Victorian Water Sector and develop policy, tools and guidance to enable successful adaption.
- Review state level water related emergency response plans and protocols to:

  – better reflect threats from climate change

  – align with DELWP emergency planning guidelines.
- Undertake emergency exercises to test Water Sector emergency response plans for their ability to be implemented effectively, identifying and acting upon opportunities for improvement.
- Continue to improve DELWP's ability to identify and manage sector risks and provide regulatory oversight of Water Sector compliance with legislative obligations.
- Continue to build sector emergency management capability through assessment of needs and targeted training.
- DELWP and the Water Sector will continue to lead, participate in, or observe at, a range of multi-sector forums and activities.

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