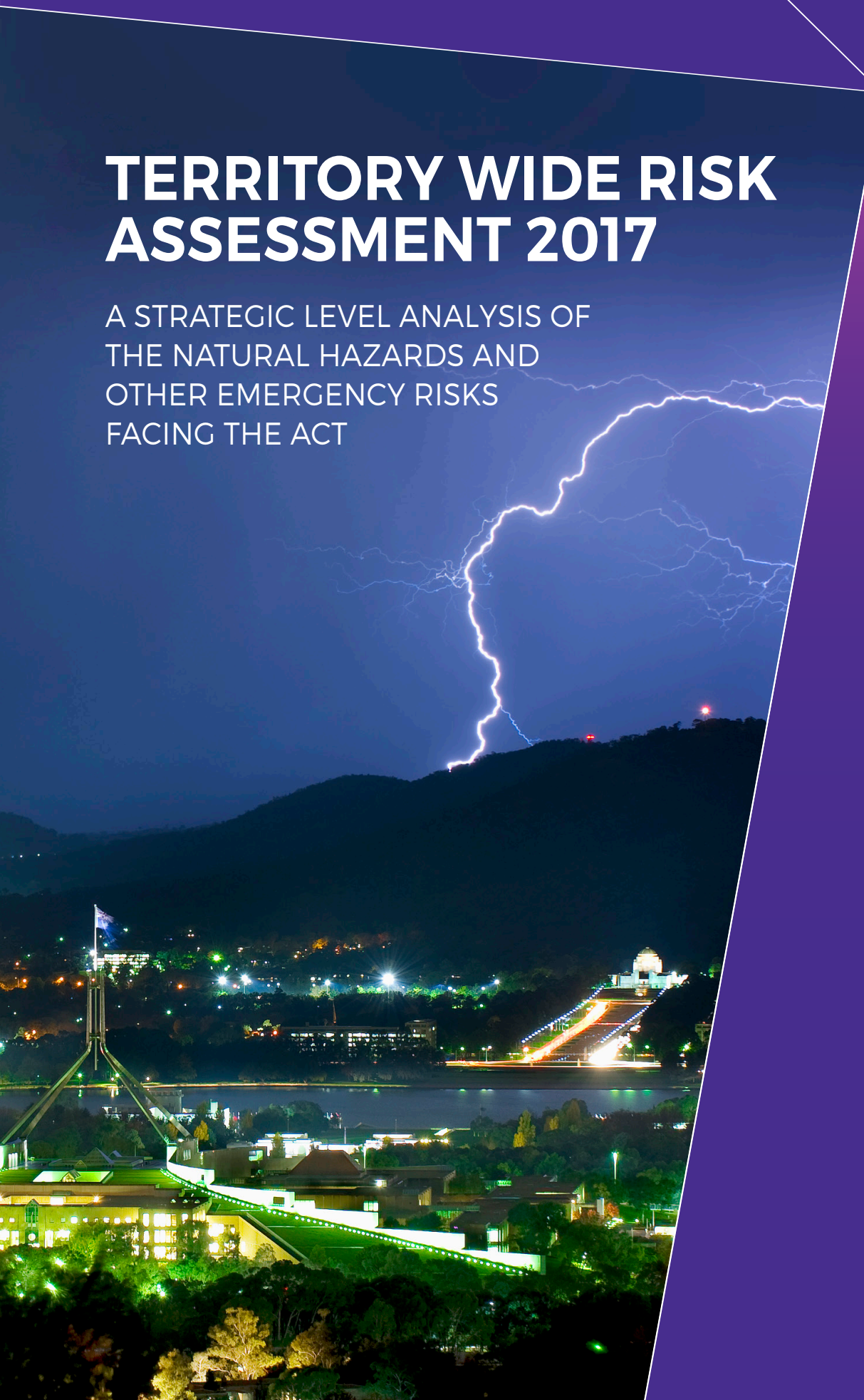
ACT Government

TERRITORY WIDE RISK ASSESSMENT 2017

A STRATEGIC LEVEL ANALYSIS OF THE NATURAL HAZARDS AND OTHER EMERGENCY RISKS FACING THE ACT



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Lightning strike over Parliament House
Owen Wilson photography

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ACT State Emergency Service Majura Unit volunteers undertake temporary storm repairs

ACT Fire & Rescue unveils its "Reconcillitation Action Plan Fire Pumper"

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ACT Fire & Rescue firefighter inspects damage after extinguishing a house fire

FOREWORD

I am pleased to present the *Territory Wide Risk Assessment 2017* (TWRA) for the Australian Capital Territory (ACT).

The ACT remains a safe and attractive place to live where the frequency of severe natural disasters and other major emergency incidents is low in comparison to other States and Territories. However, the growing ACT population, changing urban landscape and impacts of climate change all contribute to an evolving risk environment in the ACT. It is therefore essential that we regularly reassess the likelihood and consequence of the natural and other hazards we face as a community.

The TWRA builds on the findings of the risk assessment undertaken in 2012 and published in 2014. It adopts a new approach by specifically considering the impacts of natural disasters on the various impact categories from the *National Emergency Risk Management Guidelines 2015*. The TWRA will help inform government agencies, emergency services and the community when making decisions on priorities for emergency risk preparedness and mitigation.

The TWRA was developed in partnership with a wide range of ACT Government and non-government stakeholders. It acknowledges the technical expertise of ACT Government officers and partners in responding to natural disasters and emergencies that have occurred in the ACT. The development of the TWRA is a requirement of the *National Partnership Agreement - Natural Disaster Resilience*.

The TWRA aligns with the seven priorities set out in the *National Strategy for Disaster Resilience* (the Strategy). The Strategy recognises that preparing for disasters is a shared responsibility between Governments, businesses, non-government agencies and individuals. The Strategy recognises that resilient communities work together to understand and manage risks from natural hazards.

I thank all contributors to the TWRA for helping to ensure our collective understanding of the ACT's risk environment is current and accurate. I encourage all organisations with a role in emergency management to use the TWRA to inform their decision making on risk mitigation relevant to their roles and responsibilities.

Alison Playford
Director General
Justice and Community Safety Directorate

Chair,
Security & Emergency Management Senior Officials Group

November 2017

EXECUTIVE SUMMARY

The *Territory Wide Risk Assessment 2017* is the second revision of the ACT's strategic level analysis of the natural hazards and emergency risks facing the ACT. It builds on the TWRA completed in 2012 and the 2014 published version. The TWRA 2017 places a greater emphasis on understanding the way emergencies may impact on the community.

The need to update the TWRA was driven by a National agreement that States and Territories will review and update their State-wide risk assessments by mid 2017. These risk assessments are designed to underpin future financial partnerships between the Australian and State and Territory Governments for the mitigation of natural hazard risks.

In 2011, the Australian Government promoted change in relation to emergency risk planning by releasing the Strategy. The Strategy aims to promote a shared responsibility between Governments, business, not-for-profit, communities and individuals. The Strategy recognises that Australia needs to focus more on action-based resilience planning to strengthen local capacity and capability. In particular, emergency management planning should be based on risk and be integrated with strategic planning of government and communities. It should consider risks and risk treatments across the social, built, economic and natural environments.

Natural disasters have an enormous impact on people, the environment and communities. Research conducted in 2015 indicates that the total economic cost of natural disasters in Australia for that year was in excess of $9 billion dollars[1]. This is expected to almost double by 2030 and to average $33 billion per year by 2050, even before the potential impacts of climate change are considered. It is therefore essential that the ACT, like all other jurisdictions, understands the emergency risks that exist and the extent to which expenditure on mitigation and resilience measures is effective.

The process to develop TWRA 2017 included an analysis of how the Canberra region was changing and the impact that this may have on emergency risks. The TWRA working group identified a wide range of influences that are likely to impact on emergency risk likelihood and consequence. These included:

> Climate change;

> Population growth, both locally and across the Canberra region;

> Urban development on rural fringes;

> Increasing urban density;

> Increased stress on the electricity grid;

> Greater cooperation between States and Territories; and

> International flights.

TWRA adopted a new approach to the elements at risk in the ACT. These include people, economy, social setting, environment, public administration and infrastructure.

1 *Deloitte Access Economics. The economic cost of the social impact of natural disasters.*

In preparing the TWRA, the opportunity was taken to consolidate a number of the 23 risks identified in TWRA 2012 to eliminate areas of duplication. This resulted in a reduction of the number of natural hazard and other risks to 16:

- **Bushfire**
- **Heatwave**
- **Severe Storm**
- **Infrastructure Failure - Dam Flood**
- **Flash Flood**
- **Human Epidemic Infectious Disease**
- **Bio-Security Emergency**
- **Energy Supply Emergency**
- **Hazardous Materials Emergency**
- **Riverine Flood**
- **Communication Infrastructure Emergency**
- **Fire - Industrial and Structural**
- **Earthquake**
- **Aviation Emergency**
- **Transport Infrastructure Failure**
- **Water or Sewerage Emergency**

Despite the changes in the ACT since TWRA 2014, there have only been isolated shifts in the risk rating of several hazards. Bushfire and heatwave continue to be rated as the ACT's extreme risks. Severe storm was revised downward to a high risk rating. The risk of an earthquake was lowered to moderate. The risk of all other natural hazards and other risks did not change as shown in Table One.

Participants acting in "Excercise Red Card" at Bruce Stadium in 2014. Particpants are "triaged" in the ACT Ambulance Service Field Hospital

LIKELIHOOD	CONSEQUENCE				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain			Severe Storm	Heatwave	
Likely			Hazardous Materials Emergency Flash Flood	Bio-Security Emergency	Bushfire
Possible			Fire – Industrial and Structural Transport Infrastructure Failure	Human Epidemic Infectious Disease Energy Supply Emergency	
Unlikely				Riverine Flood Water or Sewerage Emergency Communications Infrastructure Failure	
Rare				Aviation Emergency Earthquake	Infrastructure Failure – Dam Flood
RISK LEVEL		Low	Medium	High	Extreme

TABLE ONE. THE RISK RATING FOR EACH OF THE ACT'S IDENTIFIED NATURAL AND OTHER HAZARDS.

ACT Ambulance Field Hospital set up for "Exercise Red Card" in 2014.
Exercises are funded by Commonwealth to maintain the capability of our Emergency Services

The ACT Government, through the ACT emergency services and other agencies continues to implement strategies to reduce risks and strengthen community resilience. The development of the *ACT Climate Change Adaptation Strategy* and an ongoing focus on preventing bushfires through the *Strategic Bushfire Management Plan* are just two examples of work being undertaken. A detailed analysis of the other risk mitigation strategies is included in the Risk Mitigation chapter of this report.

TWRA 2017 is intended to guide decision making by Government, businesses, community and individuals for risk mitigation and enhancing resilience activities. It will be reviewed in 2020 to ensure that it remains an accurate reflection of the emergency risks faced by the ACT.

ACT Policing enforce road blocks in Duffy during the 2003 Canberra bushfires

ACT Policing Traffic Operations assisting with the 2003 Canberra bushfire response in Canberra's south

INTRODUCTION

Natural disasters are common occurrences in Australia. Each year incidents such as bushfires, storms, heatwaves and floods cause devastating losses. They have significant impacts on communities, the economy, infrastructure and the environment.

The ACT is not immune from the effects of natural disasters. In January 1971, a severe storm in Canberra resulted in a flash flood that swept through Woden Valley resulting in the deaths of seven people. In 2003, bushfires that started to the west of Canberra caused the deaths of four people, burnt 70% of the ACT's natural environment and damaged or destroyed 488 homes. The total cost of the 2003 bushfires in Canberra is estimated at $300 million.[2]

Assessing the Territory's emergency risks is part of the national initiative to which all States and Territories are signatory. *The National Partnership Agreement* (NPA) *on Natural Disaster Resilience* (NDR) *2015 - 17* requires all jurisdictions to undertake risk assessments. This process was supported by the National Emergency Risk Assessment Guidelines (NERAG) and the Strategy. Both of these documents are referred to in later chapters of this assessment.

TWRA 2017 represents the second update to the ACT's obligation under the second NPA-NDR. The TWRA is a strategic risk assessment of the emergency risks facing the Territory. The risks are based on a review and consolidation of those published in TWRA 2014. A working group, comprised of representatives from across the ACT's planning, regulatory, policy, public safety and utility providers reviewed the emergency risks, their respective likelihood and consequence levels.

The review of the emergency risks identified in TWRA 2017 combines the principles of NERAG and those already used across the ACT Government as part of the risk management framework.

TWRA 2017 goes a step further to examine the specific impacts on the ACT's people, economy, environment, social setting and infrastructure areas if a natural disaster were to occur. Finally, it provides a summary of the key risk mitigation measures in place for the ACT.

The manner in which TWRA 2017 is written presents a shift from previous TWRA reports. Its presentation in a simpler and more focused document is intended to enable greater use across all levels of Government, business, community and individuals. TWRA 2017 aims to link key local and national natural disaster strategy documents and guide the current thinking and actions on natural disaster resilience within the ACT.

One key aim of the TWRA 2017 is to create an understanding that prevention, mitigation and planning for a natural disaster is not the sole responsibility of Government or the single domain of emergency services. Any current and future effort to reduce the severity of potential risks requires a collaborative approach where the community and businesses together with Government are part of the solution.

The measure of success for TWRA 2017 is to empower government, businesses, communities and individual decision makers to consider, plan for and mitigate the emergency risks that apply to them. TWRA is a document that promotes resilient communities at a time when climate change is expected to generate a greater frequency and severity of natural disasters. It is only through a shared responsibility that the losses incurred through these natural disasters can be mitigated as far as reasonably practicable.

2 *McLeod, Ron AM. Inquiry into the Operational Response to the January 2003 Bushfires in the ACT.*

Volunteer ACT Rural Fire Service firefighters undertake training at the Emergency Services Agency training centre Hume

RISKS AT A GLANCE AND THEIR IMPACTS

RISKS	PEOPLE	ECONOMY	ENVIRONMENT	PUBLIC ADMINISTRATION	SOCIAL SETTING	INFRASTRUCTURE
Bushfire	✓	✓	✓	✓	✓	✓
Heatwave	✓	✓	✓	✓	✓	✓
Severe Storm	✓	✓	✓	✓	✓	✓
Infrastructure Failure – Dam Flood	✓	✓	✓	✓	✓	✓
Bio-Security Emergency	✓	✓	✓	✓	✓	
Energy Supply Emergency	✓	✓		✓	✓	✓
Human Epidemic Infectious Disease	✓	✓	✓	✓	✓	
Flash Flood	✓	✓	✓	✓		✓
Hazardous Materials Emergency	✓	✓	✓			✓
Riverine Flood	✓		✓		✓	
Communications Infrastructure Failure	✓	✓		✓		✓
Water or Sewerage Emergency	✓	✓	✓			✓
Earthquake	✓	✓	✓	✓	✓	✓
Aviation Emergency	✓	✓	✓			
Transport Infrastructure Failure	✓	✓		✓	✓	✓
Fire – Industrial and Structural	✓	✓	✓		✓	✓

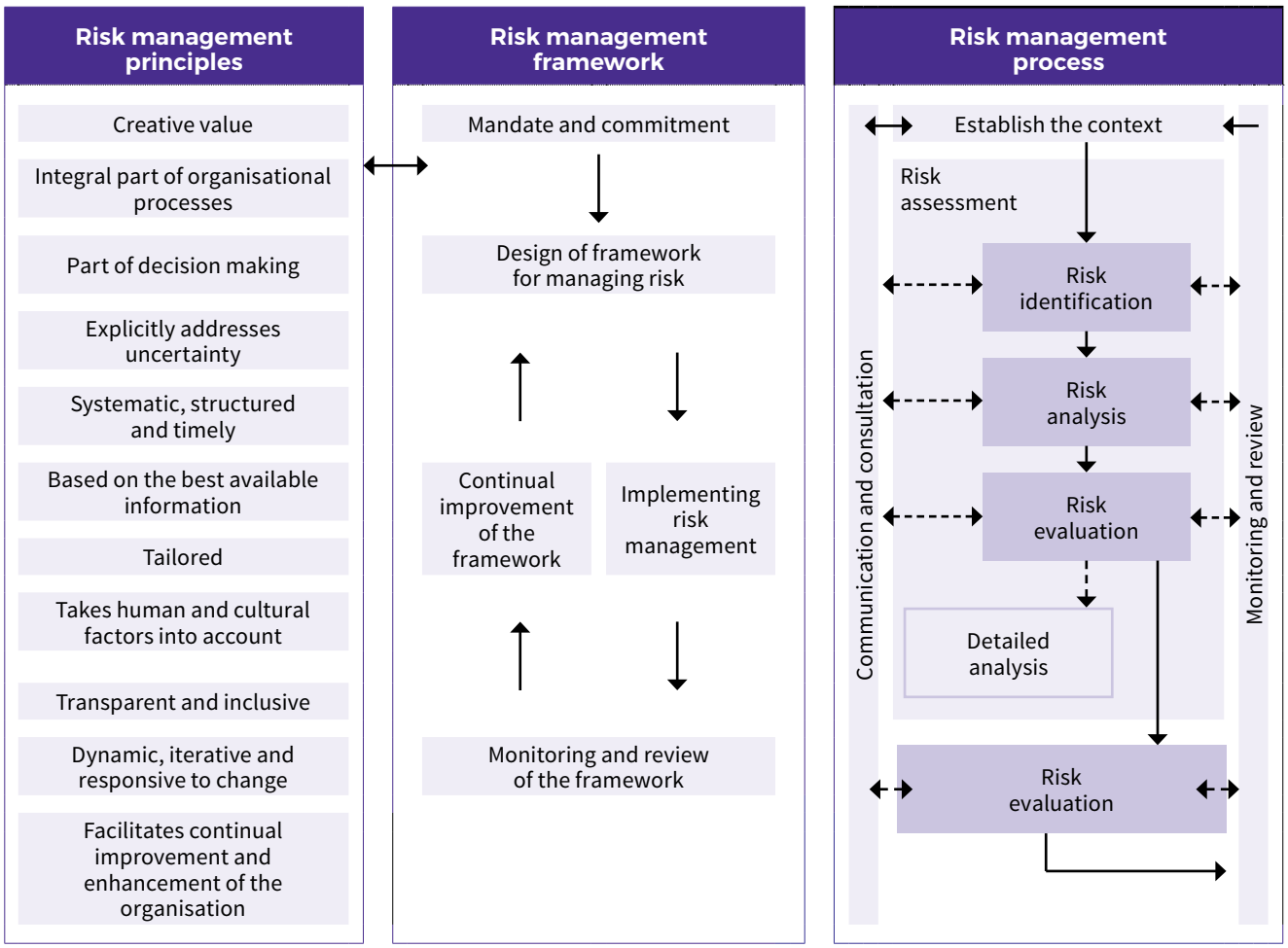
Enlarged Cotter Dam image provided by Icon Water

RISK ASSESSMENT PROCESS

RISK ASSESSMENT PRINCIPLES

The primary objective of TWRA 2017 is to provide an updated assessment of the emergency risks that the ACT faces both now and into the future. Understanding the current emergency risk profile in the ACT is essential before the priorities for treatment can be determined.

The risk assessment process used to develop the TWRA is underpinned by the principles outlined in NERAG. NERAG is based on the AS/NZS ISO 31000: 2009 for risk assessment but is contextualised for the emergency services. NERAG provides a risk assessment framework based on risk management principles and a risk management process. These are shown in the following diagram:



Source: Australian Institute for Disaster Resilience. National Emergency Risk Assessment Guidelines. 2015, 2nd ed.

LIKELIHOOD	CONSEQUENCE				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	Medium
Risk Level		Low	Medium	High	Extreme

Source: TWRA 2012.

HAZARD AND RISK STATEMENT UPDATE

TWRA 2017 utilises the significant work completed in the 2012 version of the TWRA to identify emergency risks and provide risk statements. Instead of undertaking a new risk identification process, the working group reviewed the accuracy and currency of the emergency risks identified in TWRA 2012. This review was undertaken by working groups comprised of ACT Government, Policing and utility provider officials representing significant subject matter and technical expertise.

When considering the currency of the hazard and risk statements identified in TWRA 2012, the working groups considered how the ACT was changing and the impact that this may have on influencing emergency risks. The working groups identified a wide range of influences that could potentially impact on emergency risk likelihood and consequence. These included:

> Climate change;

> Population growth, both locally and across the Canberra region;

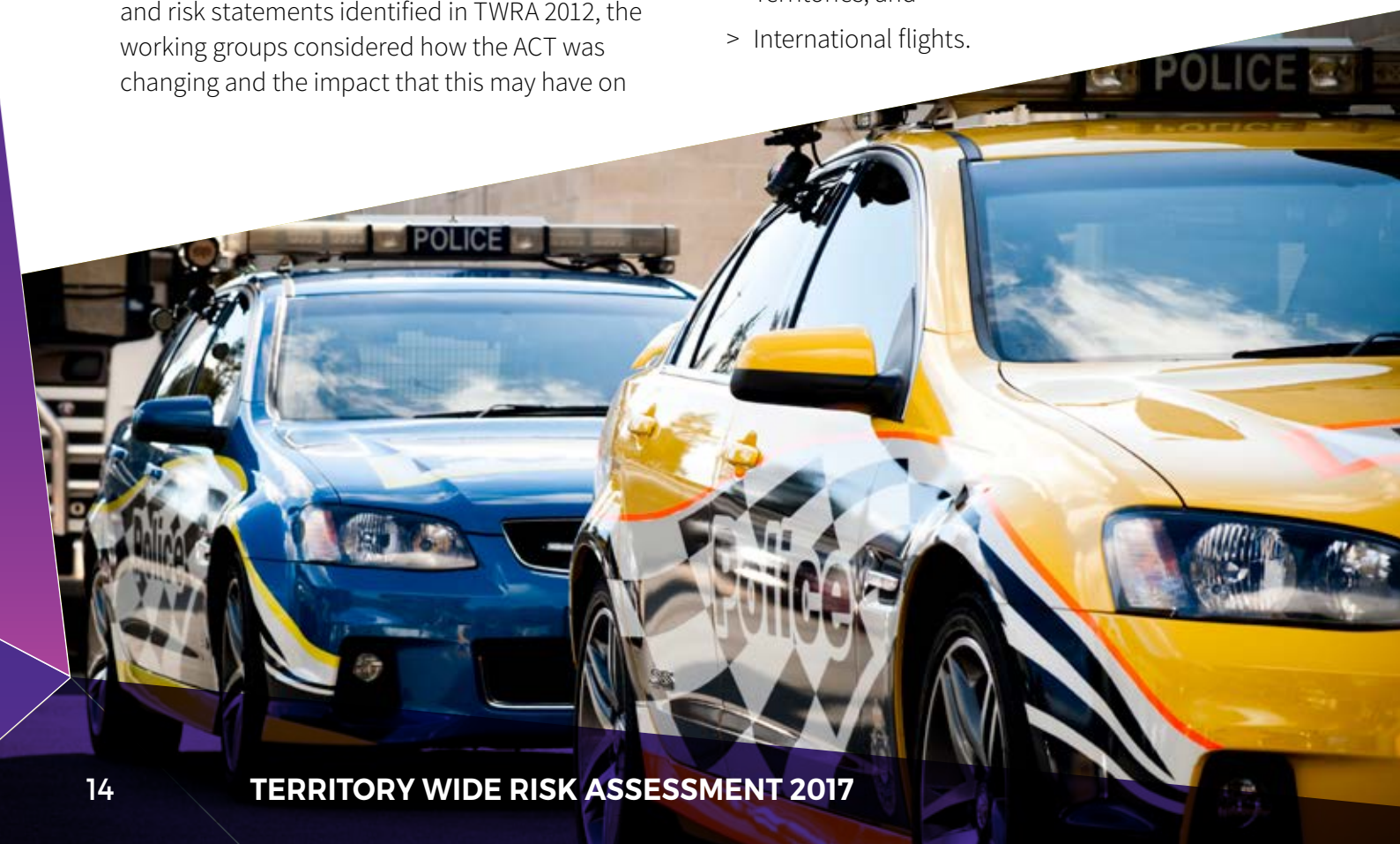
> Urban development on rural fringes;

> Increasing urban density;

> Increased stress on the electricity grid;

> Greater cooperation between States and Territories; and

> International flights.



The working group identified the opportunity to consolidate the 23 hazards identified in TWRA 2014 down to 16. A number of hazards identified in TWRA 2014 were considered not to have ACT-wide implications or were 'business as usual'. The following table provides a comparison of the hazards identified between the TWRA 2014 and the TWRA 2017:

TWRA 2014 Hazards	TWRA 2017 Hazards
Transport	
Transport Emergency - Aviation	Aviation Emergency
Transport Emergency – Road	*Risk consequences unlikely to have ACT-wide implications*
Transport Emergency – Railway	*Risk consequences unlikely to have ACT-wide implications*
Energy Infrastructure	
Fuel Supply Emergency (excl. energy infrastructure failure)	Energy Supply Emergency
Infrastructure Failure – Roads and Bridges	Transport Infrastructure Failure
Infrastructure Failure – Building Collapse (incl. major structure collapse)	*Hazard considered unlikely to be a hazard in itself but rather a consequence of another hazard*
Infrastructure Failure – Dam Flood	Infrastructure Failure - Dam Flood
Infrastructure Failure/ Supply – Gas	Energy Supply Emergency
Infrastructure Failure – Power	Energy Supply Emergency
Infrastructure Failure – Communications	Communications Infrastructure Failure
Infrastructure Failure – Water	Water or Sewerage Emergency
Infrastructure Failure – Sewerage	Water or Sewerage Emergency
Fire	
Fire – Industrial	Fire - Industrial and Structural
Fire – Bush	Bushfire
Health and Environmental	
Human Infectious Disease of epidemic potential	Human Epidemic Infectious Disease
Water Supply Contamination	*Consolidated into - Water or Sewerage Emergency*
Bio-Security Emergencies (incl. exotic/endemic animal, plant and pest emergencies)	Bio-Security Emergency
Hazardous Material – (unintentional release onsite)	Hazardous Materials Emergency
Natural	
Extreme Heat	Heatwave
Flash Floods	Flash Flood
Flood - Rivers	Riverine Flood
Severe Storm	Severe Storm
Earthquake	Earthquake

The working group updated the 2014 risk statements, and reviewed the likelihood and consequence for each risk type using the NERAG definitions. The outcomes of this risk assessment are discussed in the following chapters.

The TWRA does not deal with security challenges such as terrorism, cyber threats or mass gatherings. There are separate risk assessments and specialised mitigation arrangements that work in line with the Australian Government National Terrorism threat level. More information about these risks and what is being done to reduce their impact can be found at the National Security Website.

PEOPLE

'To protect the health and wellbeing of the people living and working in the ACT.'

Canberra is a dynamic and vibrant city that is unique when compared to the capitals of the States and the Northern Territory. It has a single tier of Government and combined city-state responsibilities. In 2014, the Organisation for Economic Cooperation and Development rated Canberra as the most livable city in the world.

Whilst living in a comparatively young and small jurisdiction, the people of Canberra are proud of their city. Values such as diversity, sustainability, the protection of the environment and community participation are common amongst the people of Canberra.

The ACT has the second lowest population of the capitals in Australia. As of December 2016, the population of the ACT was 406,400[3] which is approximately 1.7% of the total Australian population. The median age of the ACT population is 34 years which is three years less than the national average. From the 2011 Census, over 36%[4] of the people of the ACT identified themselves as having been born overseas.

The ACT has the most highly educated population of any jurisdiction. Some 72% have completed year 12 and 25% hold a Bachelors Degree. Canberrans are also twice as likely to possess a PhD as the broader Australian population. The ACT Government is capitalising on this high standard of education by evolving Canberra into a smart and digitally connected city. The ACT also has the highest mean annual salary in comparison to other jurisdictions.[5]

Whilst regarded as an active population, 63%[6] or two out of three Canberrans are considered overweight or obese. Whilst the number of healthy weight adults has remained relatively static since 2007-08, those Canberrans affected by obesity were becoming more obese. ACT residents (16%)[7] were more likely to report being diagnosed with a mental and behavioural disorder than their national counterparts (14%).

The exposure of Canberrans to natural disasters is relatively infrequent. However, injuries and deaths have occurred in Canberra as a result of natural and man-made disasters. These include flash flooding in Woden in 1971, the implosion of the former Canberra Hospital in 1997 and the bushfires that impacted on Canberra in 2003. These incidents serve as a reminder that the people of the ACT may be impacted by natural and other disasters.

2017 POPULATION

406,400

2020 POPULATION

421,829

3 *Australian Bureau of Statistics - Census 2016.*
4 *Ibid.*
5 *ACT Government. Healthy Canberra. Australian Capital Territory Chief Health Officer's Health Report 2016.*
6 *Ibid.*
7 *Ibid.*

ACT Fire & Rescue demonstrate their Hazard Material response capability and decontamination unit

72% COMPLETED HIGH SCHOOL

25% HOLD BACHELORS DEGREE

Population projections for the ACT have Canberra's total population expected to reach 421,829 by 2020.[8] Of this growth, 62% is projected to be from natural increase (births minus deaths) with net migration from interstate and overseas contributing the remaining 38%. The 20 to 34 age cohort represents the largest proportion of the ACT's population. The number of persons in the 65 and over cohort will experience substantial growth in the same period.

Over the next four years the ACT Government plans to add another eight suburbs to Canberra with the 2016 Census identifying the south-west of Canberra as the fastest growing area in Australia.

Natural disasters have a significant and lengthy impact on people. Natural disasters will often cause injuries, deaths and leave deep psychological scars. All 16 hazards identified in TWRA 2017 may have an impact on people.

The hazards in TWRA 2017 that are likely to have the most severe impact on people in terms of injuries or deaths are bushfires, heatwaves, human pandemics and flash flooding. However, all hazards will have a psychological impact on the local and regional ACT community that is difficult to quantify.

The protection and preservation of life is the first priority of governments and the emergency services during an emergency. Canberra's growth, high migrant population and increasing population and housing density present challenges for the emergency services in the future. However, these challenges are not unique to the ACT. The Strategy recognises that all Australian Governments must improve the resilience of communities.

Resilient communities are measured through a number of means. These include:

> They possess an understanding of the likelihood and consequence of natural disasters;

> They take steps to prepare for and mitigate the effects of natural disasters;

> They are self reliant;

> They are adaptable to a changing situation;

> They integrate with the emergency services when a disaster occurs;

> They restore a range of functions immediately after a disaster occurs; and

> They work together as a community to assist each other in the recovery process.

An ongoing focus for the ACT Emergency Services Agency (ESA) is to educate the ACT community about natural disasters. This will better prepare the ACT population for the natural disasters identified in TWRA 2017 and promote resilience. A more resilient ACT community reduces the impact of economic and social costs from natural disasters and aids in recovery.

2014 ACT HIGHEST RATING **AMONG OECD COUNTRIES FOR REGIONAL WELLBEING**

8 *ACT Government. Treasury. ACT Population Projections: 2017-2020.*


5
578
ACTION
TRANSPORT OFFICER


Emergency
Emergency Ambulance
DOCTOR

ECONOMY

'To protect economic activity, asset value and important industry.'

The ACT's Economic Context

The ACT's economy plays a major role in driving economic growth across the region. Canberra is a regional hub that services a population of over 800,000 people[9]. Natural disasters can negatively impact on the ACT's economy and the growth of the region.

The ACT Budget 2017-18 found that the ACT's economy was on a stronger growth footing than expected. Continued expansion of dwelling construction and service exports such as education, business services and tourism along with household consumption expenditure is expected to contribute to the positive economic outlook. The ACT's Gross State Product is expected to grow by 3¼ % in 2016-17. Above trend growth is also forecast to continue into 2017-18.

3,000
JOB GROWTH PER YEAR

The ACT Government continues to invest in Canberra's infrastructure. This infrastructure serves Canberra needs, diversifies the economy and improves the regulatory environment for businesses. This is whilst creating a liveable, sustainable and inclusive city.

The ongoing growth of the ACT economy is supporting new jobs. Around 3,000 jobs are expected to be created on average each year over the forward estimates across a wide range of industries. This is further evidence of the diversification of the Territory's economy.

2017 saw the commencement of international flights into and out of The Canberra Airport. This has presented significant opportunity for the ACT economy, particularly in the Asia-Pacific region. This is expected to increase with Qatar Airways to commence direct services between Canberra and Doha in 2017-18.

Australians visiting the nation's capital have injected $1.572 billion into the ACT's economy - a 16.3 % increase on the previous year and a new Territory record[10].

Key economic risks to the ACT include policy decisions impacting on the public service staff currently based in Canberra. In addition any housing shock at the national level, while not expected, would likely have flow-on effects within the ACT. Conversely, a relatively weak dollar may provide a stronger than expected boost to ACT service exports, such as education and tourism, which are already growing strongly.

$440 MILLION
TOTAL COST OF BUSHFIRES TO THE ACT

9 *Chief Minister, Economic Development Directorate.*
10 *ACT Government. Chief Minister Media Release.*

An ACT Fire & Rescue firefighter extinguishes a training fire at Pearce

The cost of natural disasters in Australia is significant. In 2015, the total estimated cost of natural disasters in an average year was estimated to exceed $9 billion[11]. This is equivalent to approximately 0.6% of gross domestic product (GDP) for the same year. This cost is expected to double by 2030, and to average $33 billion by the year 2050[12]. This is before the potential impacts of climate change are calculated.

Of the 16 identified risks in the TWRA, 15 have the potential to impact on the economy. The catastrophic risk category describes a loss of asset value greater than 4%, or a failure of significant industry or sector as a direct result of an emergency event. Calculating the direct and indirect costs of natural disasters is difficult. For the ACT, however, the total insurance costs of natural disasters between 1970 and 2013 is estimated at $440 million. All of these costs are attributable to bushfires.

11 *Deloittee Access Economics, The Economic Cost of the Social Impact*
12 *Ibid.*

ENVIRONMENT

'The protection of species, landscapes and environmental value at local, regional, state and national level.'

The natural environment is integral to Canberra and its status as the nation's 'bush capital'. The intrinsic value of biodiversity and natural ecosystems has been recognised and considered in the ACT's planning from its inception in 1908. Areas were set aside for their natural beauty and intrinsic values with limits placed on grazing and the removal of timber and vegetation. Today, Canberra's ecosystems and biodiversity are protected through a comprehensive network of reserves and protected areas which make up 57% of the Territory's total land area. This is a significantly higher percentage than other Australian jurisdictions.

The biophysical assets of the ACT include land, air, water, heritage and biodiversity. The *ACT State of the Environment Report 2015*[13] describes the state and condition of these assets over time. The report also analyses the physical and socioeconomic impacts on these assets and the effectiveness of ACT Government policy and management in addressing these impacts.

The 2015 State of the Environment Report found that the ACT has:

> Excellent ambient air quality and continued compliance with National Environment Protection (Ambient Air Quality) Standards[14];

> 170,076 hectares contained in areas permanently designated as either nature reserve or national park;

> An increasing number of species listed as vulnerable or endangered under the *Nature Conservation Act 2014.* As at 2015 the Act listed 16 species as vulnerable and 18 as endangered. A further 13 species are considered to be rare or are unable to be categorised due to insufficient data;

> Heritage objects and areas which are protected through the ACT Heritage Register. The number of historic and natural heritage places have been increasing since 2011 although the condition of these places is unclear due to monitoring limitations; and

> Overall high levels of surface water, quality especially in conservation land use areas, and very high quality drinking water, consistently within the standards prescribed by the Australian Drinking Water Guidelines[15].

13 *Office for the Commissioner for Sustainability and the Environment. ACT State of the Environment Report 2015.*
14 *ACT Government Environment Protection Authority. June 201. ACT Air Quality Report 2015.*
15 *Australian Drinking Water Guidelines 2011 (updated 2016) https://www.nhmrc.gov.au/guidelines-publications/eh52 accessed 22 June 2017*

How the ACT Environment is Changing

The *ACT State of the Environment Report 2015* described the ACT environment as being in good condition and well managed. The key pressures on land in the ACT are changes to land use. This is particularly so in greenfield development which places greater pressure on the land and the environment due to the likelihood of vegetation clearance and other permanent changes within the development area.

Climate change represents a significant threat to the ACT's environment. The ACT is already seeing the influences of climate change and further impacts are predicted. These influences are having an effect on the environment and increase the likelihood and the consequence of natural disasters. These include:

> lower rainfall, which will affect water availability and quality, water-dependent ecosystems, agriculture and recreational amenity;

> higher temperatures and increased fire risk, which will affect human health and property, and vulnerable ecosystems; and

> more extreme weather events, which will affect property and ecosystems.

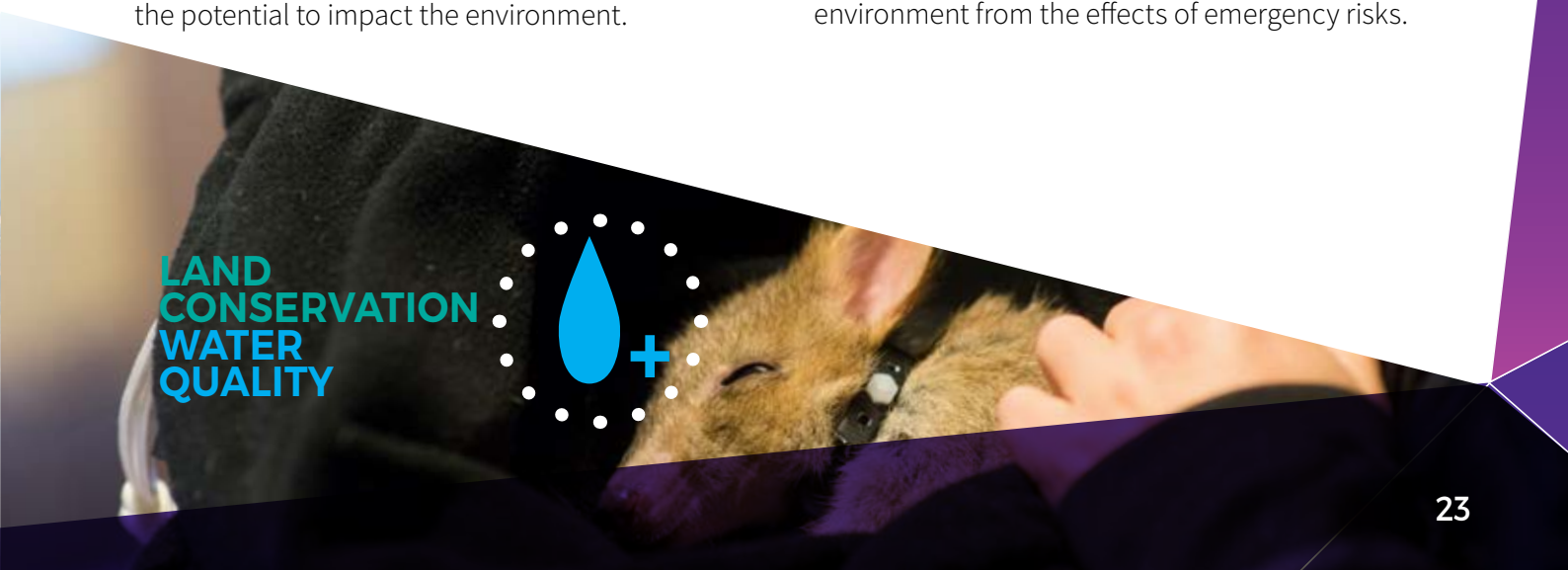
The ACT and surrounding region is projected to experience longer, hotter summers and increased frequency and severity of storm events. This increases the level of threat from bushfires, heatwaves and violent storms to lives, property, economic activities and the natural environment.

Natural disasters typically have a major impact on the natural environment. The catastrophic description of impact is a permanent destruction of an ecosystem or species or the permanent destruction of environmental values of interest. Of the 16 risks identified in TWRA 2017, 12 have the potential to impact the environment.

The bushfires that occurred in the ACT in December 2001 and January 2003 were the most significant natural disaster events in recent times and had a major impact on the ACT environment. The 2003 bushfires burnt 70% of the ACT with an intensity that caused severe impacts to ecological communities in the western part.

In the month after the 2003 bushfires, intense rainfall is estimated to have washed 27 years' worth of sediment, burnt organic and mineral material into the ACT's water supply dams. These dams, which provided high quality water to the ACT prior to the bushfires, were so polluted they were closed in April 2003.

The protection of the environment from emergency risks remains a priority for the ACT. The mitigation strategies outlined in the Risk Mitigation chapter of this report describe the key strategies and activities undertaken to protect the ACT environment from the effects of emergency risks.



PUBLIC ADMINISTRATION

'To ensure and protect the ACT Government's ability to deliver core services.'

The ACT Public Service (ACTPS) is established under the *Public Sector Management Act 2004* and delivers core services including health, law enforcement, education, planning and urban renewal, transport and maintenance of infrastructure. As of October 2017, the ACTPS consisted of seven directorates and seven ACT Public Sector entities. In June 2015 the ACTPS employed just over 21,000 permanent, temporary and casual employees representing almost 10% of the ACT's labour market[16].

The responsibility for natural disaster risk management, preparedness, response and recovery is devolved across all directorates:

> Justice and Community Safety;
> ACT Health;
> Transport Canberra and City Services;
> Environment, Planning and Sustainable Development;
> Education;
> Chief Minister, Treasury and Economic Development; and,
> Community Services.

Separately, ACT Policing services are provided by the Australian Federal Police.

Within these directorates, various agencies and organisations deliver the emergency planning, response and recovery services to the community through the provisions of the *Emergencies Act 2004*. Underneath the *Emergencies ACT 2004* sits the ACT Emergency Plan and wide-ranging hazard specific and supporting sub-plans.

The Security and Emergency Management Senior Officials Group (SEMSOG) is established under the *Emergencies Act 2004* and provides for the strategic coordination of security and emergency management matters across the ACTPS. SEMSOG is comprised of each Director-General, the Emergency Services Commissioner, the Chief Police Officer, the Chief Health Officer and other high office holders.

In times of emergency public administration officers staff the Emergency Coordination Centre in support of the Emergency Services Agency, with associated business continuity implications for the wider operations of the ACT Public Service.

The ACTPS continues to expand in response to a growing community and its demand for services. Since the TWRA 2014 the total number of employees has increased by 5%.

An ongoing focus for the ACT Government is to continue to reinforce the 'One Service' platform of collaboration and engagement between directorates and entities. This One Service approach has resulted in structural changes to the machinery of Government.

Public Administration consequences are concerned with the impact of emergency risks on core functions of governing bodies. Of the 16 risks in the TWRA 2017, 11 are assessed as having a potential impact on Public Administration.

7 DIRECTORATES
7 ACT PUBLIC SECTOR ENTITIES
+ ACT POLICING

16 *Ibid.*

ACT SES Tuggeranong Unit volunteers at the site of their new facility in Calwell

If a natural disaster or major incident impacts the ACT, resources will be drawn from across the ACTPS to staff the various roles at tactical, operational and strategic levels. To ensure the delivery of these services, the ACT is able to draw on cross-jurisdictional resources through established Memorandums of Understanding with other State and Territory governments and Federal Government entities. Business continuity arrangements are in place to ensure that business returns to normal as soon after an emergency event as possible.

As members of the wider ACT community, ACTPS employees are equally impacted by disasters. During the Mitchell Hazardous Materials Fire in 2011 and based on a direction from the lead agency Incident Controller, the Education Directorate closed all schools north of Lake Burley Griffin. ACTPS employees with children affected had to stay at home with them, reducing ACTPS capability. The transport network of north Canberra was affected with cancellations of bus services disrupting travel options for ACTPS staff travelling to work. During a significant natural disaster ACTPS employees would need to ensure the safety of their children, homes and loved ones, impacting their ability to attend work.

SOCIAL SETTING

'To protect community wellbeing and culturally important assets.'

The ACT comprises a diverse and vibrant community that is host to world class festivals, community celebrations and cultural events. ACT residents attend, participate and volunteer as part of arts and cultural activities more frequently than people in other parts of Australia.

The ACT's reputation as the 'bush capital' is central to the city's character, identity and livability. Access to shared open space and the ACT's natural environment improves the amenity of urban life, as well as individual health and wellbeing. Canberra is a planned city that prioritises people and their diverse needs as well as providing an engaging place to live, work and socialise. Public art and community facilities such as parks, playgrounds, swimming pools, community hubs, local ovals and recreation facilities bring Canberrans together.

Some Canberrans experience disadvantage and they can be isolated. A scattering of disadvantage across the suburbs of Canberra also reduces its visibility. Whilst the ACT does not have the range of regional poverty rates found in other parts of Australia, it does have small pockets of locational disadvantage.

The ongoing enhancement of Canberra's social setting is a priority for the ACT Government. *Canberra: A Statement of Ambition* describes the key activities that will continue to change and evolve the ACT's social setting. These include:

> Increasing the supply of higher-density, mixed-use housing, well connected by public transport.

> Focusing on high quality, well designed developments in the city and group centres while moving towards infill and medium-density development.

> Encouraging Canberrans to choose walking and cycling as their mode of transport and delivering the Light Rail Master Plan.

> Continuing to open and diversify the local economy, building on our position as a knowledge based city.

> Promoting dynamic and diverse business opportunities and promoting Canberra as a destination for visitors, investment and global talent.

> Building on distinctive assets where energy efficiency and policies to combat climate change are a part of our identity.

> Continuing to be a culturally diverse and welcoming community, symbolised by the annual three day Multicultural Festival.

> Guiding Canberra to be tech enabled, data driven and responsive.

ACT Fire & Rescue extinguish a building fire in Fyshwick

Emergency risks can impact the social setting of the ACT. Subject to the scale, damage or loss to public amenities, retail locations, schools and community locations may occur. This can lead to a disruption of community activities and a breakdown of community organisations and structures for a period of time. In worst cases, a permanent reduction in the community function can occur.

Natural disasters may also impact on the significant Aboriginal places in the ACT. The *Heritage Act 2004* formally recognises Representative Aboriginal Organisations (RAOs) who are to be consulted regarding any impacts of natural disasters on Aboriginal places. It is the preference of the RAOs that Aboriginal objects remain on or be 'returned to Country,' in circumstances where they are damaged or destroyed in the event of a natural disaster.

Of the 16 risks identified in the TWRA 2017, 11 are likely to have an impact on the ACT's social setting to various degrees. The ongoing focus by Australian governments to increase community resilience is one means to reduce the impacts of emergency risks on the social setting of a community.

INFRASTRUCTURE

'To protect and strengthen critical infrastructure asset value and ability to deliver uninterrupted service to the ACT and Region.'

Critical infrastructure underpins the functions of the ACT's population and economy. It enables the provision of essential services such as food, water, medical care, energy, communications, transportation and banking. Secure and resilient critical infrastructure supports productivity and helps to drive the business activity that underpins economic growth.

All Australian governments consider the definition[17] of critical infrastructure to be:

Those physical facilities, supply chains, information technologies and communication networks which, if destroyed, degraded or rendered unavailable for an extended period, would significantly impact the social or economic wellbeing of the nation or affect Australia's ability to conduct national defence and ensure national security.

Key items of critical infrastructure in the ACT that may be impacted by natural disasters include:

> Power, water and gas distribution networks;

> Hospitals:

> Data centres; and

> Communication networks.

It is the responsibility of owners of critical infrastructure to ensure the resilience of their infrastructure is in accordance with guidance material from the Australian and ACT Governments.

Each item of critical infrastructure may have one or more interdependencies that impact on their status and availability. The ACT is strengthening its strategies to ensure that the impacts of natural or other hazards on critical infrastructure are identified early. This will enable owners of critical infrastructure to implement protection measures earlier and ensure that business continuity plans are implemented if necessary.

17 *Australian Government, Attorney General's Department. 2017. Strengthening the Security of Australia's Critical Infrastructure – A Discussion Paper.*

The vulnerability of critical infrastructure to the risks identified in the TWRA is dependent on a wide range of factors. These include:

> Location;

> Age;

> Security;

> Number of inter-dependencies; and

> Resilience arrangements.

Critical infrastructure is vulnerable to most risks identified in the TWRA 2017 including bushfire, storm, heatwave and flood events.

A severe storm, flood or bushfire can destroy assets while a heatwave will place significant demand on resources, in turn affecting the community, particularly vulnerable people.

Energy supply is currently a national issue and policies that are developed at the national level may impact the outcome at Territory level. There is vulnerability when networks are down or compromised through network failure or congestion, affecting communications which can impact emergency services.

RISK MITIGATION

Risk mitigation is an essential part of the emergency management cycle. The ACT Government recognises a shared responsibility for mitigation between all levels of Government, businesses, organisations, and the broader community. Endorsing the continued participation and support from the Australian Government in aiding mitigation and recovery efforts is essential for the Territory.

Noting that disasters cross borders and impact wide sections of the community, industry and tourism, the Australian Government facilitates cross-jurisdictional agreements. This support allows for access to jurisdictional programs and tools, and the sharing of resources that adds to effective capacity without unnecessary duplication. The ACT Government supports the Strategy and undertakes a range of activities, programs and policies aligned with its strategic priorities. These strategic priorities, and key ACT activities and programs under them, are:

The National Strategy for Disaster Resilience - Seven Key Priorities and what we are doing to meet them

> Strategic Priority 1: Leading change and coordinating effort

ACT Implementation Plan for the Natural Disaster Resilience Program 2015-17 under the National Partnership Agreement on Natural Disaster Resilience (NPA-NDR)

> Strategic Priority 2: Understanding risk

Strategic Bushfire Management Plan (SBMP) v3 2014

Flood Risk Mapping projects and products

Territory Wide Risk Assessment 2017 developed under the NERAG

Climate Change Vulnerability Assessment framework for Infrastructure 2012; and

Review of Bushfire Prone Area map

> Strategic Priority 3: Communicating with and educating people about risk

'Living on the edge' – SBMP community consultation program - ACT community education and engagements campaigns – StormSafe and Bushfire Survival Plan

Canberra Bushfire Ready community awareness campaign

> Strategic Priority 4: Partnerships with those who effect change

Emergency Plan 2014 and associated sub-plans and hazard specific plans

Engagement with private sector through critical infrastructure providers and non government organisations

Cross-border emergency management arrangements

Linkages and participation in national committees and working groups to enhance national and jurisdictional arrangements

> Strategic Priority 5: Empowering individuals and communities

Community Fire Units

Emergency Guide and Grab and Go booklet -

Working with schools

> Strategic Priority 6: Reducing Risks in the built environment

Securing electricity supply – range of major infrastructure projects

> Strategic Priority 7: Capabilities to support disaster resilience

Emergency warnings – MOU's with local media outlets, ESA website and the use of Emergency Alert

Enhancing capability – drafting of Strategic Bushfire Management Plan version 4 2020 - 2025

Factors that create or increase emergency risks can be reduced to make an area safer. The ACT Government invests in research, prevention, preparedness, response, and recovery programs across a range of emergency risks in the Territory. The ACT Government has provided considerations for urban planning, land use policy and infrastructure investment that support cost effective risk mitigation through legislation and the planning system.

Examples of ACT Government legislation that supports these realistic, risk-compliant building and land use planning principles are:

1. *Building (General) Regulation 2008*;
2. *Building Act 2004*;
3. *Planning and Development Act 2007* - main object of the planning strategy is to promote the orderly and sustainable development of the ACT, consistent with the social, environmental and economic aspirations of the people of the ACT in accordance with sound financial principles;
4. *Planning and Building Amendment Act 2011*; and
5. *Planning, Building, Environment Legislation Amendment Act 2012.*

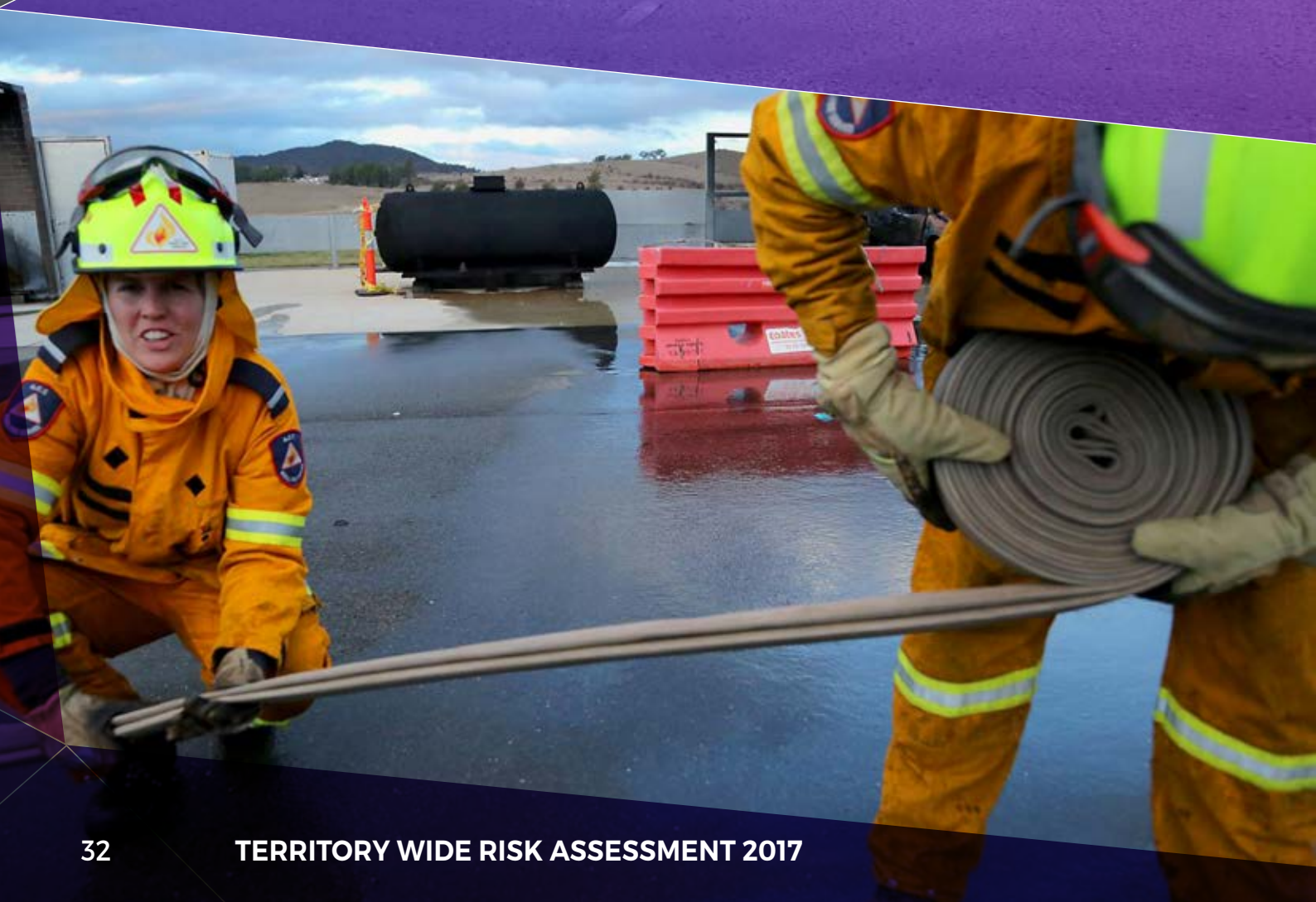
Significant effort is invested in learning from previous disasters in order to improve prevention and preparation. The ACT ESA continually reviews and enhances its mitigation and response strategies, procedures and general arrangements to remain ready at all times to respond.

Across ACT Government there are multiple response plans, operational plans and practices in place to reduce the chance and severity of an emergency risk. The treatment tables at pages 33 - 35 address how we treat these emergency risks. Government directorates and agencies work closely together to assist mitigation activities and utilise all available resources to be aware of conditions and participate in regular single and multi-agency exercises. Support agencies are part of the arrangements and included in all planning and preparation strategies, having their own protocols to respond in the recovery phase as required.

The ACT Government actively educates the community about their emergency risks through awareness campaigns encouraging individuals to implement appropriate actions to significantly reduce the impacts of a major disaster. Risk mitigation includes those actions and decisions taken by individuals that effectively avoid, reduce, share or accept a risk. Decisions and actions that can be taken by households include insurance as a way of sharing the financial risk and household planning for what each member will do in a severe storm, bushfire or other emergency.

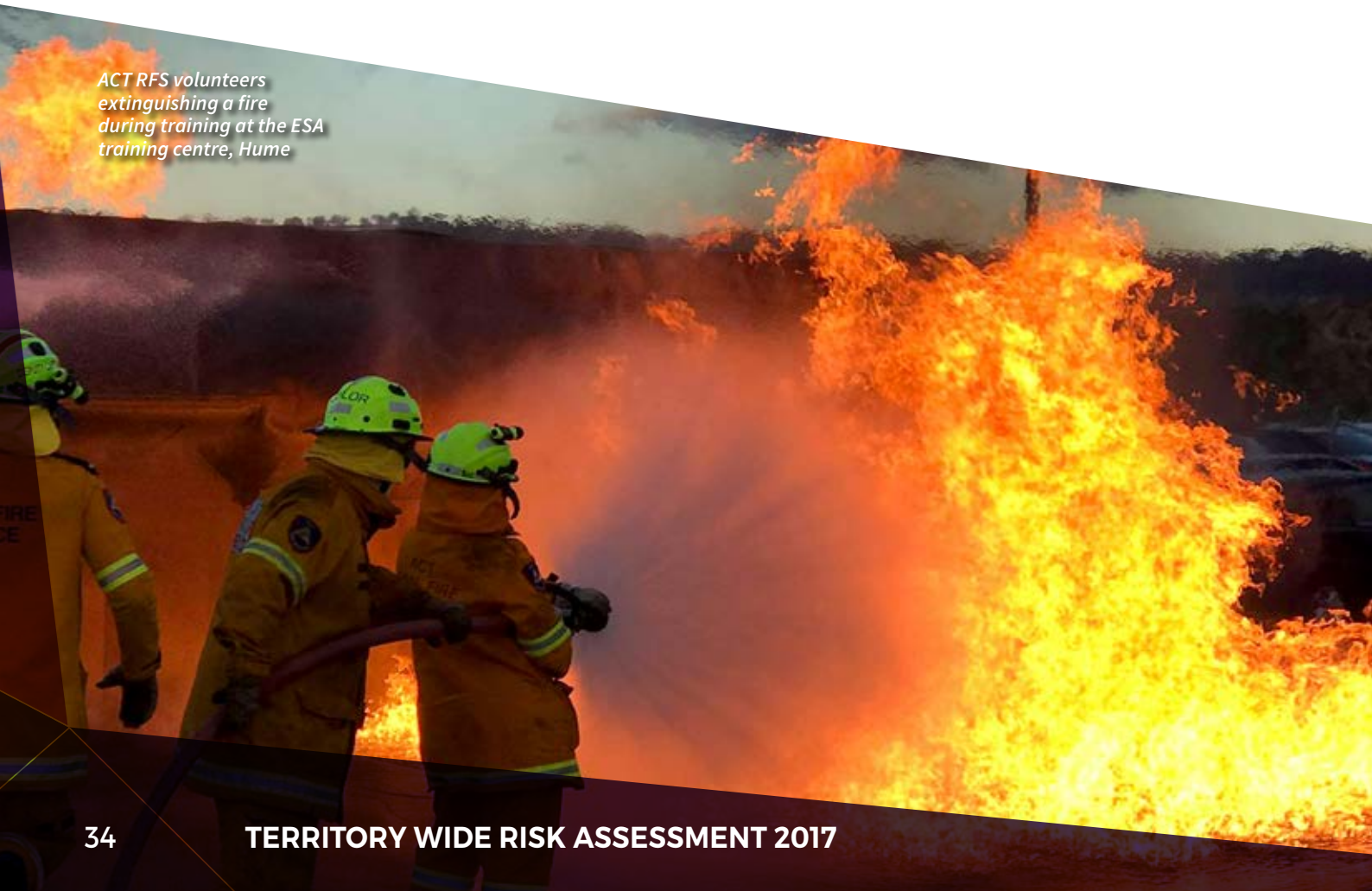
TWRA 2017 considered those risks rated High and Extreme and outlined the strategies or actions in place to reduce the impact of a natural disaster including preparedness and response measures. For each identified emergency risk there are strategies being implemented to reduce the severity of the impact on the community.

ACT SES volunteers from the Majura Unit responding to a storm job



Hazard Name	Reviewed Risk Statement	Risk Rating	What are we doing to prevent/mitigate this?
Bushfire	A significant bushfire would have a major impact on people (public health), critical infrastructure, the environment, economy, government services and the social fabric of the ACT as well as potentially destroying culturally significant assets	Extreme	A planned and measured approach to the risk of bushfire in the Territory is provided for in the Strategic Bushfire Management Plan. Hazard reduction burning, the preparation, approval and execution of bushfire operational plans which identify further bushfire mitigation measures, and strong engagement with our community all contribute to mitigating the risk to our rural capital city. During a response to a bushfire emergency, or in preparation for days of total fire ban, the ACT Rural Fire Service (ACTRFS), ACT Fire & Rescue (ACTF&R) and whole-of-government partners work together to ensure that bushfire emergencies are well managed and the community is kept informed of developments. An informed community is able to work with their emergency services. Public messaging for incidents occurring within our community and partnerships with local media to provide updates on extreme weather and fire behaviour, which are also immediately available via social media, website content and roadside displays are employed in emergency situations.
Heatwave	A heatwave event in the ACT will have a significant impact on the community, particularly those in the vulnerable groups with possible serious illness and deaths and will also impact on the economy the environment and critical infrastructure and increased demand for government services	Extreme	ACT Ambulance Service (ACTAS) and ACT Health work closely together to ensure a coordinated approach to extreme heat events through the Extreme Heat Plan and Extreme Heat Stakeholders working group. The ACT Emergency Services Agency and ACT Health both provide health messaging to the ACT community on how to prepare for and respond to extreme heat conditions. ACT Health uses the principles of prevention in its heat messaging while ACTAS conducts education and awareness programs to assist the community recognise the symptoms of heat stroke, how to apply first aid and when to call for assistance. The ACT Government has developed proactive strategies to mitigate the impact of extreme heat incidents, these include strategies that use green infrastructure to mitigate the effects of heat on the urban environment and adaptation to climate change through use of evidence based best practices.
Severe Storm	A severe storm including flash flooding could result in significant losses to the community and have a major impact on the economy, critical infrastructure and the environment as well as increased demand on government services including health services. The impact would be of a regional scale.	High	Planning to mitigate the impact of severe storms within our community is provided through the ACT State Emergency Service (ACTSES) in consultation with the EPSDD. Mitigation measures focus on environmental and behavioural changes within our community to ensure that our homes and premises are better prepared to withstand the impact of a severe storm activity event. When a storm is approaching, the ACTSES promotes and distributes via social media storm warnings issued by the Bureau of Meteorology to inform the community of the potential severe weather. Training undertaken by the ACTSES provides its members with the necessary skills to respond to damage created by severe storms within our community, supported by operational front line resources from the ACTRFS, ACTF&R and Transport Canberra and City Services. The ACTSES also maintains strong cross-border coordination arrangements with NSW counterparts who can be called upon at short notice if required.

Hazard Name	Reviewed Risk Statement	Risk Rating	What are we doing to prevent/mitigate this?
Bio-Security Emergency: (includes exotic/endemic animal, plant and pest emergencies)	A significant biosecurity incident would result in significant impact on people, the economy, the environment and government services with consequential impacts on primary industry, trade, public amenity and biodiversity and be of a regional scale. *If a release occurs on or near a transport route, the impact would extend regionally and potentially interstate if the transport network was affected.*	High	The key mitigation strategy for plant and animal biosecurity incidents in the ACT is the ACT Biosecurity Strategy, underpinned by a legislative framework, risk management framework, business systems and training. The ACT implements emergency preparedness and response training, surveillance and monitoring for biosecurity identified risks and it has procedures to investigate, identify and report on biosecurity issues and appropriate skills and resources according to nationally recognised standards and protocols. A new Biosecurity Bill to more effectively manage plant and animal biosecurity threats to the ACT is currently being drafted to replace the Animal Diseases Act 2005, the *Plant Diseases Act 2002* and the *Pest Plants and Animals Act 2005*.
Energy Supply Emergency	A disruption of the energy supply–electricity, gas and liquid fuels–to the ACT presents a number of scenarios including interruption to government services, potential for energy rationing and impact on the community and economy.	High	Energy supply emergencies are mitigated by industry and engineering standards, ongoing review of capacity of network, FailSafe equipment installation, high risk area reviews and Transgrid maintenance and security. In the event of an energy supply emergency, the EPSDD would activate the ACT Energy Emergency (Coordination) Plan, a sub plan of the ACT Emergency Plan. The ActewAGL Emergency Response Procedure and the ActewAGL Emergency Management Plan would also be activated.



ACT RFS volunteers extinguishing a fire during training at the ESA training centre, Hume

Hazard Name	Reviewed Risk Statement	Risk Rating	What are we doing to prevent/mitigate this?
Human Epidemic Infectious Disease	An epidemic, pandemic or major outbreak in the ACT or region would impact on people, the community, the economy and disrupt workplaces and business, as well as government services.	High	ACT Health works in close partnership with international and national surveillance and reporting partners for rapid detection of outbreaks of infectious disease. Through early detection from existing and responsive disease surveillance systems, ACT Health is ready to respond quickly and effectively. This readiness is enhanced through partnerships with hospitals, the Capital Health Network, pharmacies, general practitioners and other private health providers. Public health strategies are used to increase community resilience through education, infection control and vaccination programs. Prior to winter each year, ACT Health conducts a review of public health arrangements to ensure the ACT, including vulnerable persons, is adequately prepared for seasonal disease threats. These arrangements can be found at http://www.health.act.gov.au/healthy-living/winter-plan. Well-established response plans underpin the emergency management arrangements should a coordinated response to an infectious disease be needed. ACT Health can call on the resources of the Australian Government using national health arrangements. During an outbreak of an infectious disease people may be asked to observe infection control techniques, stay away from other people if unwell and care for family members at home to minimise disruption to essential health and community services. ACT Health has a number of infectious disease fact sheets for consumers and health professionals available on its website http://www.health.act.gov.au/research-data-and-publications/fact-sheets.
Flash Flood	A flash flood could result in fatalities, property damage, damage to infrastructure, environmental impact and impact on Government services.	High	The mitigation of flooding is provided for in the ACT Flood Plan and through operational plans, overseen by the ACTSES. The plans focus on urban design of suburbs, storm water systems and transport infrastructure. Community engagement focuses on households preparing for flash flood events by maintaining and insuring their properties and highlighting the danger presented by stormwater drains, rivers and level crossings. Flash flood warnings are transmitted by the Bureau of Meteorology and the ACTSES immediately informs the community through the ACTSES website and social media platforms. Through the utilisation of rain gauges specific areas may be identified for flash flood warnings through telephone based warning systems. The ACTSES may pre-emptively close some low lying roads and crossings. The ACTSES responds to flash flooding events and if rescuing people in fast flowing flood waters is required ACT Policing and ACTF&R may undertake rescue operations. The ACTSES has cross-border coordination arrangements with NSW SES and supporting plans.
Hazardous Materials Emergency	A significant hazardous materials event or incident due to unintentional release on site could result in significant impacts on the community and the environment with potential impact on people health and increased demand on government services. *If a release occurs on or near a transport route, the impact would extend regionally and potentially interstate if the network was affected.*	High	Measures to minimise the risk of an unintentional hazardous materials release include regulations on storage, planning and development approvals, construction standards, fire safety standards and work safety training. Other preventative measures include Worksafe legislation and reactive safety inspections alongside insurance industry requirements. ACTF&R oversees the Hazardous Materials Plan and multiple other operational plans to respond to an unintentional release of a hazardous material. In the unlikely event that preventative measures fail, ACTF&R, the ESA and ACT Policing have a 24/7 capability which is supported by the Emergency Coordination Centre arrangements to ensure a whole-of-government response. These arrangements can reach out to industry experts, interstate and Commonwealth support should the scale of the unintentional release require additional resources to contain the impacts.

LOOKING FORWARD...

Risk assessment information provides the ACT with useful insights into the risks we face and informs mitigation measures.

We must ask ourselves, what will the next version of the TWRA look like? We know that 'Canberra is growing with firm global connections'[18]. Our increasing population, the demand for transport services, ageing infrastructure, emerging technologies, climate change and severe weather events will all contribute to the changing risk profile of the Territory. As systems develop and become more complex they may generate new risks which increases the difficulty of effective risk and problem definition. In looking forward, the ACT must also be cognisant of the risks within and also appreciate external influences and policy boundaries.

"By 2030 Australian communities will be reshaped by forces such as continued exponential growth in technology capabilities; strong population increases; an increasing aged population and greater life expectancies; more frequent extreme weather patterns; and increasing wealth divides. Australian communities will be fundamentally different. How can governments ensure community resilience in the face of these changes?"[19]

In most cases we cannot tame natural hazards. What we need to do is change the way in which we live with the hazards on the Australian continent. The Australian Government's Productivity Commission in its 2015 inquiry into disaster funding arrangements made strong recommendations that the focus for emergency management has to switch to mitigation.

18 *Canberra: A Statement of ambition report, 2017*

19 Excerpt taken from AGD Garran Strategy Series 2017 – Resilient Communities in 2030 – Rethinking Policy Boundaries

The Strategy stresses that communities need to become more resilient and understand the need for shared responsibility. The Sendai Framework for Disaster Risk Reduction 2015-30 guides engagement and ownership of action by stakeholders and strengthens accountability in disaster risk reduction. The four priorities of the Sendai framework provide the emerging policy challenges of:

> Understanding Risk: preparedness and vulnerability; public communications; and knowledge and risk management

> Strengthen disaster risk governance: inclusive governance

> Invest in disaster risk reduction: efficient use of resources; community resilience and capability

> Enhanced disaster preparedness: crisis leadership and long-term recovery.

"Building the capacity of the community means they become an active participant in the solution" [20]

ACT Government continues to participate on the Australia New Zealand Emergency Management Committee to better understand the measures needed to create an environment that enables the management of shared risks, the reduction of suffering and upholding public trust and confidence.

20 The Disaster Resilience Policy Innovation Roundtable – 21 March 2017

ATTACHMENT A – TWRA 2017 RISK REGISTER

Hazard Name	Reviewed Risk Statement	Element most at Risk	Consequence	Likelihood Rating	Risk Rating
Bushfire	A significant bush fire would have a major impact on people (public health), critical infrastructure, the environment, economy, government services and the social fabric of the ACT as well as potentially destroying culturally significant assets.	**People** **Economy** **Public Administration** **Social** **Environment** **Infrastructure**	Catastrophic	Likely	Extreme
Heatwave	A heatwave event in the ACT will have a significant impact on the community, particularly those in the vulnerable groups with possible serious illness and deaths and will also impact on the economy, the environment and critical infrastructure, resulting in increased demand for government services.	**People** **Economy** **Public Administration** **Social** **Environment** **Infrastructure**	Major	Almost Certain	Extreme
Severe Storm	A severe storm could result in significant losses to the community and major impact on the economy, critical infrastructure and the environment as well as increased demand on government services including health services. The impact would be of a regional scale.	**People** **Economy** **Public Administration** **Social** **Environment** **Infrastructure**	Moderate	Almost Certain	High
Bio-Security Emergency: (includes exotic/ endemic animal, plant and pest emergencies)	A significant biosecurity incident would result in significant impact on people, the economy, the environment and government services with consequential impacts on primary industry, trade, public amenity and biodiversity and be of a regional scale. *If a release occurs on or near a transport route, the impact would extend regionally and potentially interstate if the network was affected.*	**People** **Economy** **Social** **Public Administration** **Environment**	Major	Likely	High
Energy Supply Emergency	A disruption of the energy supply – electricity, gas and liquid fuels – to the ACT presents a number of scenarios including interruption to government services, potential for energy rationing and impact on the community and economy.	**People** **Economy** **Public Administration** **Social** **Infrastructure**	Major	Possible	High
Human Epidemic Infectious Disease	An epidemic, pandemic or major outbreak in the ACT or region would impact on people, the community and the economy and disrupt workplaces, business as well as government services.	**People** **Economy** **Public Administration** **Social** **Environment**	Major	Possible	High
Flash Flood	A flash flood could result in fatalities, property damage, damage to infrastructure, environmental impact and impact on Government services.	**People** **Economy** **Public Administration** **Environment** **Infrastructure**	Moderate	Likely	High

Hazard Name	Reviewed Risk Statement	Element most at Risk	Cons Rating	Likelihood Rating	Risk Rating
Hazardous Materials Emergency	A significant hazardous materials event or incident, due to unintentional release on site, could result in significant impacts on the community, the environment and with potential impact on people health and increased demand on government services. *If a release occurs on or near a transport route, the impact would extend regionally and potentially interstate if the network was affected.*	**People** **Economy** **Environment** **Infrastructure**	Moderate	Likely	High
Infrastructure Failure - Dam Flood	A dam flood involving Googong and all dams in the ACT would result in significant impact on the community (deaths), infrastructure damage, impact on the economy, the environment, loss of supply and increased demand on government services.	**People** **Economy** **Public Administration** **Environment** **Social** **Infrastructure**	Catastrophic	Rare	Medium
Riverine Flood	A riverine flood could result in fatalities and property damage and impact on the community, infrastructure and the environment.	**People** **Social** **Environment**	Major	Unlikley	Medium
Communications Infrastructure Failure	A significant communications infrastructure failure could result in significant disruption to the community, key government services (Australian and ACT) and impact on vulnerable communities and the economy.	**People** **Economy** **Public Administration** **Infrastructure**	Major	Unlikely	Medium
Water or Sewerage Emergency	A significant failure of water supply or sewerage services would significantly impact on the community (particularly the vulnerable) through shortages of services, public health, the economy, cause increased demand on government services and impact on the environment.	**People** **Economy** **Environment** **Infrastructure**	Major	Unlikely	Medium
Earthquake	A significant earthquake would result in significant losses to the community, major impacts on the economy and the environment and increased demand on government services. The impact would be of a regional scale.	**People** **Economy** **Public Administration** **Social** **Environment** **Infrastructure**	Major	Rare	Medium
Aviation Emergency	An aviation incident in a built-up area of the Territory and region may result in loss of life, damage to infrastructure and impact on the economy, environment and the community.	**People** **Economy** **Environment**	Major	Rare	Medium
Transport infrastructure Failure	A significant failure of or incident involving the ACT's roads, rail, light rail and bridges infrastructure would result in major disruption to the network operations, impacting on people (possible loss of life), the economy, community and Government.	**People** **Economy** **Public Administration** **Social** **Infrastructure**	Moderate	Possible	Medium
Fire – Industrial and Structural	A significant industrial or structural fire (including structural collapse) will have economic, transport, government resourcing, environmental, social and community impact.	**People** **Economy** **Environment** **Social** **Infrastructure**	Moderate	Possible	Medium

ATTACHMENT B – RISK MATRIX

		CONSEQUENCE				
		Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	LIKELIHOOD	Medium	High	High	Extreme	Extreme
Likely		Medium	Medium	High	High	Extreme
Possible		Low	Medium	Medium	High	High
Unlikely		Low	Low	Medium	Medium	High
Rare		Low	Low	Low	Medium	Medium

ATTACHMENT C – CONSEQUENCE DESCRIPTORS

	CONSEQUENCE DESCRIPTORS [NERAG]				
Elements at Risk	**Insignificant**	**Minor**	**Moderate**	**Major**	**Catastrophic**
PEOPLE – Death	Deaths directly from emergency **less than** 1 in 10,000,000 in population of interest	Deaths directly from emergency **greater than** 1 in 10,000,000 in population of interest	Deaths directly from emergency **greater than** 1 in 1,000,000 in population of interest	Deaths directly from emergency **greater than** 1 in 100,000 in population of interest	Deaths directly from emergency **greater than** 1 in 10,000 in population of interest
PEOPLE – Injury or Illness	- Critical injuries less than 1 in 10,000,000 people for population of interest. OR - Serious injuries less than 1 in 1,000,000 for population of interest. OR - Minor injuries to any number of people.	- Critical injuries with long-term or permanent incapacitation greater than 1 in 10,000,000 people for population of interest. OR - Serious injuries less than 1 in 1,000,000 for population of interest.	- Critical injuries with long-term or permanent incapacitation greater than 1 in 1,000,000 people for population of interest. OR - Serious injuries less than 1 in 100,000 for population of interest.	- Critical injuries with long-term or permanent incapacitation greater than 1 in 100,000 people for population of interest. OR - Serious injuries less than 1 in 10,000 for population of interest.	- Critical injuries with long-term or permanent incapacitation greater than 1 in 10,000 people for population of interest.
[INJURY SEVERITY DESCRIPTION]	**Minor** = injuries requiring basic medical aid that could be administered by paraprofessionals, which would require bandages or observation. Eg: include; a sprain, a severe cut requiring stitches; a minor burn (partial thickness on a small part of body) or a bump on the head without loss of consiousness. **Serious** = Injuries requiring a greater degree of medical care and use of medical technology such as X-rays or surgery, but not expected to progress to life-threatening status. Eg: include full thickness burns across a large part of the body or partial thickness burns to most of the body, loss of consiousness, fractured bones, dehydration or exposure. **Critical** = Injuries that pose immediate life-threatening condition if not treated adequately and expeditiously. Eg: include uncontrolled bleeding, a punctured organ, other internal injuries, spinal column injuries or crush syndrome. **Fatal** = Mortally injured, is certain to lead to death regardless of available treatments; counted among deaths, not injuries				
ECONOMIC - Loss in economic activity and or asset value	Decline of economic activity and/or Loss of asset value less than 0.004% of gross product produced by area of interest.	Decline of economic activity and/or Loss of asset value greater than 0.004% of gross product produced by area of interest.	Decline of economic activity and/or Loss of asset value greater than 0.04% of gross product produced by area of interest.	Decline of economic activity and/or Loss of asset value greater than 0.4% of gross product produced by area of interest.	Decline of economic activity and/or Loss of asset value greater than 4% of gross product produced by area of interest.
ECONOMIC - Impact on important industry	Inconsequential business sector disruption due to emergency event.	Significant industry or business sector impacted by the emergency event, resulting in short-term (i.e.: less than one year) profit reductions directly attributable to the event.	Significant industry or business sector impacted by the emergency event, resulting in medium-term (i.e.: more than one year) profit reductions directly attributable to the event.	Significant structural adjustment required by identified industry to respond and recover from emergency event.	Failure of a significant industry or sector in area of interest as a direct result of emergency event.

	CONSEQUENCE DESCRIPTORS [NERAG]				
Elements at Risk	**Insignificant**	**Minor**	**Moderate**	**Major**	**Catastrophic**
PUBLIC ADMINISTRATION	Governing bodies' delivery of core functions is unaffected or within normal parameters.	Governing bodies encounter limited reduction in delivery of core functions.	Governing bodies encounter significant reduction in the delivery of core functions. Governing bodies are required to divert some available resources to deliver core functions or seek external assistance to deliver some of their core functions.	Governing bodies encounter severe reduction in the delivery of core functions. Governing bodies are required to divert a significant amount of available resources to deliver core functions or seek external assistance to deliver the majority of their core functions.	Governing bodies are unable to deliver their core functions.
SOCIAL SETTING - Loss of Community Wellbeing	The community of interest's social connectedness is disrupted, such that the reprioritisation/ reallocation of existing resources is required to return the community to functioning effectively, with no permanent dispersal.	The community of interest's social connectedness is damaged, such that the community requires some external resources to return the community to functioning effectively, with no permanent dispersal.	The community of interest's social connectedness is broken, such that the community requires significant external resources to return the community to functioning effectively, with some permanent dispersal.	The community of interest's social connectedness is significantly broken, such that extraordinary external resources are required to return the community to functioning effectively, with significant permanent dispersal.	The community of interest's social connectedness is irreparably broken, such that the community ceases to function effectively, breaks down and disperses in its entirety.
SOCIAL SETTING - Loss of culturally important objects and activities	Minor damage to objects of identified cultural significance. Minor delay to a culturally important community event	Damage to objects of identified cultural significance. Delay to or reduced scope of a culturally important community event	Damage or localised widespread damage to objects of identified cultural significance. Delay to a major culturally important community event	Widespread damage or localised permanent loss of objects of identified cultural significance. Temporary cancellation or significant delay to a major culturally important community event.	Widespread and permanent loss of objects of identified cultural significance. Permanent cancellation of a major culturally important community event.
ENVIRONMENTAL - Loss of Species and/or landscapes: STATE or NATIONAL	No damage to ecosystem at any level.	Significant loss or impairment of an ecosystem or species recognised at the local and regional levels; and/or Minor damage to an ecosystem or species recognised at the state, local or regional level.	Minor damage to ecosystems and species recognised at the national level and/or Significant loss or impairment of an ecosystem or species recognised at the state level and/or Severe damage to or loss of ecosystems and species recognised at the local/regional level.	Permanent destruction of an ecosystem or species recognised at the local/regional level and/or Severe damage to or loss of an ecosystemor species recognised at the state level and/or Significant loss or impairment of an ecosystem or species recognised at the national level.	Permanent destruction of an ecosystem or species recognised at the national or state level and/or Severe damage to or loss of an ecosystem or species recognised at the national level

	CONSEQUENCE DESCRIPTORS [NERAG]				
Elements at Risk	**Insignificant**	**Minor**	**Moderate**	**Major**	**Catastrophic**
ENVIRONMENTAL - Loss of Species and/or landscapes: LOCAL	No damage to ecosystem at any level.	Minor damage to ecosystems and species recognised at the local or regional levels.	Minor damage to ecosystems and species recognised at the state level and/or Significant loss or impairment of an ecosystem or species recognised at the local or regional level.	Minor damage to ecosystems or species recognised at the national level and/or Significant loss or impairment of an ecosystem or species recognised at the state level and/or Severe damage to or loss of an ecosystem or species recognised at the local or regional level.	Permanent destruction of an ecosystem or species recognised at the local, regional, state or national level and/or Severe damage to or loss of an ecosystem or species recognised at the national or state level and/or Significant loss or impairment of an ecosystem or species recognised at the national level.
ENVIRONMENTAL - Loss of Environmental Value: STATE or NATIONAL	Inconsequential damage to environmental values of interest	Minor damage to environmental values of interest	Significant damage to environmental values of interest	Severe damage to environmental values of interest	Permanent destruction of environmental values of interest
ENVIRONMENTAL - Loss of Environmental Value: REGIONAL	Inconsequential damage to environmental values of interest	Minor damage to environmental values of interest	Significant damage to environmental values of interest	Severe damage to environmental values of interest	Permanent destruction of environmental values of interest
ENVIRONMENTAL Loss of Environmental Value: LOCAL	Inconsequential damage to environmental values of interest	Minor damage to environmental values of interest	Significant damage to environmental values of interest	Severe damage to environmental values of interest	Permanent destruction of environmental values of interest

	LIKELIHOOD [NERAG]		
Rating	**Annual exceedance probability [AEP]**	**Average Recurrence Interval [ARI] (indicative)**	**Frequency (indicative)**
Almost Certain	63% per year of more	Less than 1 year	Once or more per year
Likely	10% to < 63% per year	1 to < 10 years	Once per 10 years
Possible	1% to < 10% per year	10 to <100 years	Once per 100 years
Unlikely	0.1% to < 1% per year	100 to < 1000 years	Once per 1000 years
Rare	Less than 0.1% per year	1000 years or more	Once per 10,000 years

ACT Fire & Rescue Station Officer Peter Coble demonstrating smoke alarms specially designed for the deaf