GOVERNMENT OF
WESTERN AUSTRALIA

EMERGENCY PREPAREDNESS REPORT 2017

State Emergency Management Committee
Western Australia

Image credits:
Cover photo – View of Perth CBD from Kings Park – Image: Kevin Mitchell Chasing Stars

Images on the divider pages represent the SEMC's six state core objectives: people, economy, infrastructure, social setting, government and environment.

Page 5 ***PEOPLE*** – Rottnest Island Channel Swim finish line – Image: Rottnest Island Authority
Page 15 ***PEOPLE*** – Kings Park – Image: Grant Wilson
Page 23 ***ECONOMY*** – Elizabeth Quay, Perth WA – Image: Kevin Mitchell Chasing Stars
Page 41 ***INFRASTRUCTURE*** – Shire of Jerramungup, Manager of Works Murray Flett – Image: Shire of Jerramungup
Page 121 ***SOCIAL SETTING*** – St John Ambulance WA
Page 131 ***GOVERNMENT*** – WA Government Coat of Arms
Page 135 ***ENVIRONMENT*** – Ophthalmia Dam, Newman WA – Image: Kevin Mitchell Chasing Stars
Page 141 ***ENVIRONMENT*** – Princess Royal Harbour, Albany WA – Image: Grant Wilson

CONTENTS

FOREWORD

I am pleased to present, on behalf of the State Emergency Management Committee, the 2017 *Emergency Preparedness Report*.

The sixth of its kind, this year's report represents yet another significant step up in both quality and incisiveness. From humble beginnings the *Emergency Preparedness Report* has evolved into a vital tool to guide the future direction of the Western Australian EM sector.

The theme of this year's report is the need for a communal commitment to preparing for emergencies. This theme becomes evident throughout as the data shows that emergency management agencies continue to do their best, as do those in support roles. Encouragingly an already mature and cooperative sector has further consolidated and enhanced service delivery. But their reach and influence can only go so far.

However an enduring limitation highlights that the path to a more resilient WA is the community. It is incumbent upon all Western Australians to do our part in a world of increasing threat and accelerating social and technological change. The readiness, resilience and preparedness of our people will strengthen us in both response and recovery. We must instil a culture of intervening to prevent problems rather than simply reacting to them. Community-based action will fortify us as a state.

Oversight of EM in Western Australia has changed substantially during the year. Firstly, two key long-serving leaders – the Police Commissioner (the State Emergency Coordinator) and the Fire and Emergency Services Commissioner – have stepped down. Both have been instrumental in leading responses to major emergencies during their service and both have contributed significantly to the preparedness of the state. We respectfully acknowledge their contributions.

Secondly, changes to government departments with new faces and new responsibilities present an opportunity for renewal, fresh views and continued improvement.

As EM exists to protect the community and people of WA, the ongoing commitment to safety and preparedness is hardly surprising. In fact, some of the recent changes – particularly in land management – have brought EM-related agencies together under one banner, reducing fragmentation and increasing opportunities for collaboration. Work to improve mitigation and risk treatments will continue on a new footing.

After recent tragedies – loss of life in floods and fire – we know that people rally and come together in times of crisis. But we also know that preparedness must be more than a byword. Our aim should be to bring the community to the centre of the preparedness approach.

The Australian Institute for Disaster Resilience aptly says that 'disaster resilience must be more than a concept or theory – it needs to be the way we approach our future; for ourselves, our families, our communities and the country in which we live'.

But at present there is an imbalance between the commitment of EM agencies and that of the community. Our strategies, programs and initiatives need to recognise the inherent skills, capacities and connections within the community and find a way to better harness them.

Emergency services will be there in times of crisis. So too should we be able to rely upon industry, business, communities and individuals to do their part in mitigating known problems and preparing for the next emergency. This is the only practical path to catalyse change if we are to achieve our vision of a safer and more resilient state.

Dr Ron Edwards
Chair
State Emergency Management Committee
31 October 2017

Executive summary

01

01 EXECUTIVE SUMMARY

The Emergency Management (EM) sector in WA is highly functioning, collaborative and cooperative. There is a widely held understanding about the risks that will be faced and realism about the capabilities that can be mobilised to confront them. The sector is well equipped to deal with most emergencies and there is a greater acceptance and understanding of the need to better recover from them.

But these capabilities only go so far. Major and catastrophic events cannot be fully managed with existing resources. While surge plans and resource sharing arrangements have been developed to lessen anticipated (inevitable) shortfalls, these shortfalls do exist. Depending upon the location of the emergency, the shortfalls may be further exacerbated by time delays in reaching affected communities.

Agencies are actively preparing for the onset of major emergencies. This is not to say that things are perfect, far from it, but agencies are at or approaching their limit of influence. This limitation is where this year's theme of communal commitment has emerged. There is a gap between where we are and where we need to be and agencies cannot bridge this alone. It will only be through community acknowledgement of the issue and action that the gap can be narrowed in any meaningful way. This acceptance and action will be the critical piece that enhances preparedness and bridges the divide during an emergency.

Agencies aim to identify and seek to solve EM problems as they arise. The intent and commitment of those involved in the EM sector is resolute and the primary aim is to protect the people of WA, a goal endorsed by the SEMC ('Primacy of Life' across all Hazards).

Most agencies report having improved internal procedures and processes while also strengthening and broadening interagency cooperation and sharing. Almost 170 separate agencies have contributed to the 2017 *Emergency Preparedness Report* and for the most part the story being told is of a sector that is actively seeking and pursuing innovation and best practice.

The other story that has emerged is that the threat environment is changing. As highlighted in the previous (2016) *Emergency Preparedness Report* changing weather, migration and settlement patterns, demographics and heightened exposure to hazards is altering the EM threat landscape. Emergencies are becoming more frequent and larger while many communities are becoming less resilient and increasingly reliant upon the EM sector.

The confluence of these factors means that the most effective way forward for WA to be prepared for the next emergency is for everyone to play their part. Time, personnel and budgets will always limit response capabilities but the threat does not diminish. EM agencies are constantly seeking to use their available resources more effectively and have been for many years. But this attitude must now extend more broadly and reach into the community to build resilience.

The lack of engagement by the community is not universal. In fact, EM relies upon the dedication of around 40,000 volunteers. Further, in many rural and remote communities, resilience and risk awareness is high, as it is in high risk areas or those that have recently been impacted by hazards. But these areas are the exception. For many people, emergencies happen '***somewhere else***' and '***someone else will sort it out***'.

This must change. Being resilient is at the heart of maintaining our way of life. The EM sector already has a wide range of mechanisms to engage with the community. There is a wealth of readiness and preparedness information available. Much of it is delivered through regular media and information campaigns (push) while more can be downloaded freely (pull). The issue is lack of uptake not lack of information.

Just as the introduction of seatbelt laws in the 1970s was initially viewed as an unnecessary impost, so too is EM in some quarters. Over time, the obvious safety benefits that seatbelts delivered outweighed the additional costs and time required to comply. This is the type of mindset shift needed in the EM arena. The community needs to accept that they can (and likely will) be impacted by an emergency. Hopefully, a new mindset will galvanise people to protect themselves better.
Community preparedness will:

- strengthen individual and community resilience
- increase the effectiveness of emergency responders
- ease and possibly lessen the impacts
- shorten the recovery required.

Collection for the 2017 *Emergency Preparedness Report* was based upon the State Capability Framework. This framework outlines and articulates the elements that are needed for the state to be capable in the face of an emergency. This year the questions were tailored to capture capabilities for specific hazards and further refined to capture specific consequence levels ('Moderate', 'Major' and 'Catastrophic').

This year's report identifies many positive aspects of the EM sector as well as things that require further development, engagement or creation. The report provides a snapshot of existing capabilities while seeking to capture and guide where more work is needed.

Major findings

Following extensive and ongoing emergency risk assessments, the state of WA is in possession of a comprehensive evidence base on which to inform and drive future mitigation strategies. This is further strengthened by strong levels of engagement by the EM sector whose agencies are:

- horizon scanning for possible threats
- mostly cooperating well
- learning the lessons of the past
- well trained, equipped and supported to manage moderate level events (however major and catastrophic events stretch and exceed capabilities)
- highly committed.

Organisations mostly have internal and interagency arrangements and plans that align with state policies. They also have structures in place that support effective operations. Plans for emergencies are current, reviewed, exercised and tested.

Public messaging for both emergency and preparedness information is functional and widespread. However, there is a perception among many of the EM agencies that community and individual uptake of this information is less than ideal and particularly that there are:

- low levels of risk awareness, and
- lower levels of action.

Agencies report they are capable of dealing with most events; however, as magnitude and scale increases, the effectiveness of the response diminishes. Moderate-level events can generally be managed well; however, major events will stretch existing resources and catastrophic events have the potential to eclipse existing capabilities. Storm is the hazard with the highest perceived capabilities while earthquakes and tsunamis are more likely to quickly stretch agencies.

Recovery is an issue that has been receiving increased attention and focus since the incidents of 2016. People are starting to recognise the importance of planning to recover but there is still much to be done. The Comprehensive Impact Assessment is evolving to better support communities to recover.

Land-use planning is a cost-effective mitigation tool; however, it is only really used for bushfire and flood.

Matters in need of further attention

Funding and resourcing for EM is the primary issue that has been raised by local governments and to a lesser degree by some agencies. Many local governments cite a heavy reliance on OEM District Advisors and Community Emergency Services Managers to keep up with EM policies, procedures and best practice. Respondents have commented that both proactive (mitigation) and post-incident (recovery) funding is either insufficient or difficult to access.

Competitive grant schemes (such as NDRP and AWARE) are providing funds to support EM initiatives while others are being progressed through supplementary schemes such as Royalties for Regions.

The Commonwealth NDRRA Determination supports the state's funding arrangements for disaster relief. This is presently undergoing review.

There has been a drop-off in EM engagement by some within the EM sector. Tightening fiscal circumstances has in some cases limited activities to only those that are required by legislation. This withdrawal by some agencies is troubling as the relationships, trust and coordination gained between events are often relied upon during emergencies.

In 2017 there was a drop in local government response rate to the capability survey (from 96% to 89%). This represents the withdrawal of an additional six local governments from the previous year's submission numbers. Two local governments have failed to submit on both occasions. In addition to a reduced response rate, several local governments have responded that they do not see EM as their business.

During the collection for the 2016 *Emergency Preparedness Report* there was a concerted effort to encourage local government compliance and submission that did not occur in 2017. As such the response rate more accurately reflects the commitment being shown to EM by the local government sector.

Most agencies recognise the importance of EM initiatives and are working together cooperatively to address them. However, they comment that progress on many projects has historically been slow. Some examples include:

- Legislation review
- Webfusion
- Westplan rationalisation.

Similarly, a range of initiatives is underway to resolve long-term and enduring issues. An example of this is agency interoperability. This is a matter that comes to light during most, if not all, post-incident reviews. The interoperability of personnel, processes and systems are subject to any number of improvement projects however seamless interaction remains elusive. Initially some of these issues were caused by cultural barriers and the attitudes of personnel. At an agency level this has largely dissolved however personal clashes cannot be discounted.

Modern society has high levels of interdependence and inter-reliance of both people and systems. This greater connectivity has enabled an interoperability that was previously unimaginable; however, this inter-reliance creates the risk of concurrent and cascading failures. A tangible example of this was seen in the Waroona bushfires where the loss of the power system impacted the water supply, hindering response efforts.

In some areas there is a need for a change in mindset by EM agencies who are attempting to do it all themselves. There must be an acceptance of agency limitations and a move towards more and better partnerships across the whole of government and among not-for-profit agencies and the private sector. A problem shared is a problem halved.

It is clear that the state will be stretched by major or concurrent events and improvements are required to better manage a catastrophic-level event. There are well established, cooperative national emergency management arrangements in place. What is required is a collective responsibility for resilience. Broader engagement with community and private industry is expected to build resilience and share the responsibility for readiness and mitigation. This will enable the co-design of solutions that can be tailored to individual communities that will yield enhanced EM outcomes.

INSIGHTS	OPPORTUNITIES
1 While not universal, in some areas EM is seen as a burden that imposes extra responsibilities without any resourcing to assist in discharging those duties.	a. This mindset must change if we are to progress towards a safer and more resilient future for the people of WA. • EM must be considered as a business as usual activity rather than an additional burden. • The broadening of cooperation and resource sharing arrangements may reduce capability gaps and enhance coordination, thereby increasing effectiveness. • Co-design of mitigation projects will likely improve preparedness and share some of the perceived burden.
2 Much EM and preparedness information is already available. Public campaigns and engagements are underway however uptake appears sporadic at best.	a. Community engagement strategies must be reconceived to better target local communities and specific interest groups to increase uptake.
3 The EM message is widely available and not hidden. The key issue is 'how do we get people to engage'?	a. Consideration given to other successful community and industry engagement programs. Agencies to share their effective strategies to help EM maximise penetration and uptake. b. Consideration given to the creation of a public knowledge hub to deliver readiness and preparedness messages and tools. • This already partially exists on the Emergency WA website; this could be expanded to include more hazards and additional inputs from a wider variety of EM sources. • Other delivery platforms may also increase penetration.
4 Technology and personal mobility has changed the way that modern society obtains and digests information. There has been significant movement towards social media usage and new delivery mechanisms.	a. Consideration given to maximising technology in delivering readiness / preparedness information as well as emergency messages and alerts. b. Youth-led initiatives could provide opportunities for young people who may not know how or where they can contribute. c. Agencies to monitor effectiveness of message delivery and uptake and factor the findings into community engagement strategies. • Data analytics through metadata. • Capture of social media traffic and feedback.

INSIGHTS	OPPORTUNITIES
5 The EM environment is constantly evolving; as such the sector will never be a finished product.	a. As the risk and threat environment evolves so too must the understanding of the sector and the capabilities and tools that are deployed in preventing, preparing, responding and recovering from emergencies. b. Regular review, revision and maintenance is required to ensure that legislation, policy and plans remain contemporary and relevant.
6 There is enhanced knowledge of large scale hazard risks that can affect WA and a developing awareness of capabilities and capability gaps. Local governments are becoming more aware of the risks but have varying capabilities and often limited resources to manage competing demands.	a. There is an opportunity to use grants (such as NDRP and AWARE) and business as usual funds to mitigate and address capability gaps. b. A review is in progress to more closely align LEMA with the State Risk Project outcomes and the State Capability Framework to enhance and focus local level EM delivery. c. WALGA, OEM and consultants are options to bridge risk assessment skill gaps in local government. d. Clustering of local governments and enhanced sharing arrangements (such as MOUs) may ease resourcing concerns and provide extra skills and surge capacities. e. Engagement with NGOs, community groups and industry may spread the perceived burden.
7 OEM risk scenarios have been proven as credible.	a. Risk scenarios can be more broadly used as the basis of multi-agency exercises to improve readiness, preparedness and inform mitigation.
8 Catastrophic emergencies are inevitable and available resources, knowledge and experiences will be outstripped. Emergencies will identify deficiencies in a range of areas that may include: skills, staff, speed, rebuilding, coordination, communication etc. (Effective) exercising will also find issues without needing to experience impacts and losses.	a. There is a need to exercise for catastrophic level events i.e. large scale multi agency exercises. b. Learnings from emergency events and exercises must continue to be captured, assessed and implemented. These learnings can be used to inform: • where capability gaps exist. • mitigation priorities. • treatment strategies.

INSIGHTS	OPPORTUNITIES
9 There is a challenge to convert the breadth of EM knowledge to action.	a. There is a need to develop an enhanced and targeted preparedness strategy (eg. SEMC to pursue WA Mitigation Imperative). • Concept of interagency approach to mitigation and building back better (betterment) should disaster strike. b. ANZEMC has reaffirmed the strategic imperative of ethical leadership. There is an opportunity for WA to build upon existing momentum to ensure that "decisions are based upon values such as care, justice, integrity and respect." c. Must include better consideration of preparation for recovery.
10 Situational awareness and interoperability are integral to providing effective response and recovery.	a. There are many projects that have and continue to focus on improving this issue. Reviews of exercises and emergencies provide a constant source of learnings and improvement opportunities. Some of the ongoing activities include: • lessons and exercise management frameworks. • interagency communication technologies and methods. • cross boundary exercising.
11 Communications and coordination can benefit greatly from familiarity.	a. Familiarity can be gained through initiatives such as: • preformed teams. • cooperation through exercising. • joint training.
12 Recovery after an emergency is a matter that can potentially affect all Western Australians; nobody is immune to the potential impacts.	a. There is a significant need to streamline existing post disaster funding arrangements and improve service times to impacted communities. b. Disaster funding arrangements between the State and Commonwealth governments are currently under review, with new arrangements scheduled for mid-2018. c. An enhanced focus upon mitigation and treatment can improve responder safety and lower recovery impacts. d. Enhanced engagement with business and industry to improve preparedness and lessen impacts.

INSIGHTS	OPPORTUNITIES
13 Funding and rebuilding are arguably the simplest parts of recovery. The mental impact of disasters has the potential to create long term social harm.	a. There are opportunities for the EM sector to enhance engagement with NGO sector in order to address psychosocial wellbeing.
14 Comprehensive Impact Assessments are proving useful but are not currently appropriate for all hazards.	a. The utility and importance of the CIA is becoming more broadly recognised however it is vital that agencies embrace this fully and: • engage early and broadly. • obtain input from across the sector and community. • allow community to have a lead role in how they want to recover. • expand its use and adjust suitability for all hazards.

PEOPLE – TO PROTECT THE LIVES AND WELLBEING OF PEOPLE

Overview

02

02 OVERVIEW

2.1 Emergency management

Australia is impacted by emergencies and disasters every year. Across the nation, EM focuses on ensuring focuses upon ensuring that plans and arrangements are in place to respond to – and recover from – emergencies. At a national level, this involves working closely with state and territory governments and the international EM community to deliver critical programs, policies and services that strengthen and maintain Australia's national security and EM capability.

While the ability to respond to specified emergencies is important, it is arguably more important to strengthen resilience so that communities may be better prepared for disaster events and the ensuing recovery. The Australian Institute for Disaster Resilience states that being resilient is at the heart of maintaining our way of life, our communities and our environment for future generations (Australian Institute for Disaster Resilience 2017). But it maintains that this attitude must be more than a concept or theory. 'It needs to be the way we approach our future; for ourselves, our families, our communities and the country in which we live.'

Disaster resilience is broadly recognised as the collective responsibility of all sections of society. The National Strategy for Disaster Resilience (NSDR) outlines seven priorities:

- leading change and coordinating effort
- understanding risks
- communicating with and educating people about risks
- partnering with those who effect change
- empowering individuals and communities to exercise choice and take responsibility
- reducing risks in the built environment
- supporting capabilities for disaster resilience.

2.2 EM in Western Australia

Reflecting national and international principles, the EM sector in WA seeks to deliver the best possible outcomes for WA communities. Made up of almost 170 separate organisations, the EM sector works together to prevent, prepare, respond and recover from emergencies that will inevitably occur. Sharing knowledge, including lessons learned nationally and internationally, is important in promoting innovation and best practice to achieve a safer and more resilient community.

Structure

The *Emergency Management Act 2005* (EM Act) has listed 27 hazards of particular concern within the state context. Each of these hazards is managed by a Hazard Management Agency (HMA), which in turn is supported by EM agencies (EMA) as defined under the Act. The role of local governments is also highlighted under the Act. Few of these agencies, however, have EM as their core function or business. Rather, they have assets, skills or responsibilities that can be called upon in a crisis. While their involvement is not legislated, other service providers and partner agencies regularly contribute to the delivery of positive outcomes in EM. Indeed, without their involvement, effective response or recovery would be hindered.

Each of these agencies has been identified as having a role to play **before**, **during** or **after** an emergency. By and large, they consistently display a high level of commitment to EM.

EM Framework

The State EM Framework outlines the rules that govern the activities of EM agencies during an emergency. It articulates roles and responsibilities, both individual and shared.

The EM Act establishes overarching EM arrangements for emergency services while the Emergency Management Regulations 2006 (EM Regulations) detail roles and responsibilities. The next layer is the State EM policy and EM plans, which comprise the State EM Plan and Hazard Specific Plans (Westplans), along with support plans and an outline of the state's role in national plans.

2.3 Changes to the EM environment

Major changes have impacted the EM environment during 2016–17 and more are expected in the near future.

The Machinery of Government (MoG) changes as outlined in the Government's election commitments created a number of new amalgamated departments. These structural changes were aimed at creating collaborative departments focused on whole-of-government objectives and delivering services in a more efficient and effective way.

New Directors General coupled with the retirement of the Commissioner of Police and the Fire and Emergency Services Commissioner have changed some of the leaders in the EM environment.

The MoG changes represent an opportunity for the EM and preparedness message to reach a broader audience. At the time of writing, structural changes are still underway.

In a report to Government following the Waroona bushfires, changes were recommended to the EM environment. Primarily, the special inquiry report sought to reframe rural fire management identifying 17 recommendations for strategic change and 23 opportunities for improvement including options for the creation of a WA rural fire service and review of the Emergency Services Levy (ESL). Many of these recommendations have been (or are being) addressed.

2.4 WA Emergency Preparedness Report

The Office of Emergency Management (OEM) prepares the annual *Emergency Preparedness Report* – this being the sixth iteration – on behalf of the State Emergency Management Committee (SEMC). The report provides a snapshot of the state's preparedness in the event of an emergency. It highlights strengths, weaknesses and areas for improvement. The insights developed through this report can inform capability development, mitigation priorities and future resource allocation.

Method

To complete the report, the OEM relies on the input of almost 170 individual agencies who report on their activities, using criteria set out in the state Capability Framework. The agencies include Hazard and EM agencies, along with a range of organisations that partner with government to perform functions in the public Interest. This includes service providers, critical infrastructure owners and operators, non-government organisations (NGOs), community organisations and local government.

The state Capability Framework outlines the elements needed to be capable in the face of an emergency. Over the past five years, the information sought has been continually refocused to better capture EM performance by agencies in WA.

For example, last year's data collection was expanded to include key informant interviews with senior representatives of selected contributing agencies. The interviews examined strategic issues within participating agencies and broader themes across the EM sector. This process was further expanded in 2017.

In 2016 the Department of Fire and Emergency Services (DFES) noted that the existing survey documentation required 'yes/no' answers to complex questions. In reality, assessment of capability varies depending on the hazard faced as well as the locality and thus the 'yes/no' format may not produce optimal results. Additionally, the capabilities 'would be different for a fire than they were for a flood'.

The scale of emergencies raised a similar concern. DFES noted that routine incidents could be managed simply; however, large, complex emergencies stretched resources and true capability could be determined only when an agency was facing a complex emergency. The outgoing FES Commissioner also argued strongly that weaknesses ('what makes us not cope') should be identified and exercised to reduce surprises when the inevitable occurs.

In the past, the collection focus had been on gathering vital information while attempting to reduce the impost upon contributing agencies. However, the FES Commissioner sought to focus attention on capabilities as they applied to individual hazards, even though that would increase the administrative burden on his agency. He felt that the extra work would provide good value through an enhanced preparedness picture for the state.

Accordingly, the OEM redesigned the collection tool, allowing for more detailed responses. This year, responses could be tailored to specific hazards and in some cases to specific consequence levels ('Moderate', 'Major' and 'Catastrophic'). This level of analysis was best suited to natural hazards for which DFES is the HMA.

The result was that DFES completed nine individual capability surveys – one generic and eight hazard-specific. The generic survey captured capabilities that exist regardless of the particular incident involved (e.g. the ability to effectively communicate emergency information to the public); the rest reflected capabilities specific to particular hazards.

Responses

The *'Respondents overview'* table shows the number and type of agencies that were sent and responded to the 2017 *Emergency Preparedness Report* collection survey.

Respondents overview

	Hazard management agencies	Emergency management agencies	Service providers (SVP)	Local governments (LG)
Sent	16*	16	8	138
Received	16*	16	7	127

* Note: Total includes the additional eight hazard-specific surveys completed by DFES.

Collection for the 2017 *Emergency Preparedness Report* had been completed prior to the Premier announcing the first round of MoG changes in the public sector. These MoG changes have slightly altered the responsibilities of contributing agencies.

By way of example, the newly formed Department of Communities has combined two former departments (Department for Child Protection and Family Support (CPFS), Department of Housing) and a commission (Disability Services Commission) while also incorporating certain functions from another department (Department of Local Government and Communities). Details of changes can be found here.

Only two of these former departments (CPFS and Housing) were surveyed for the 2017 *Emergency Preparedness Report*. As such, responses relate to those sections of the newly formed departments and may not be reflective of the overall department.

Similarly, the Department of Biodiversity Conservation and Attractions (DBCA) was formed by combining the Department of Parks and Wildlife with three other Authorities (Botanical Gardens and Parks Authority, Zoological Parks Authority, Rottnest Island Authority). DBCA responses solely relate to the activity of the Parks and Wildlife Service (P&W) of DBCA and may not reflect the wider responsibilities of the new department.

For the purposes of the 2017 *Emergency Preparedness Report,* agencies will be referred to by their former titles to more accurately reflect the stated capabilities. This matter will be resolved in future reporting.

2.5 2016–17 wet season

WA experienced an unusually long and wet summer season (see also 'North-West wet season'). Seven tropical cyclones and 13 significant tropical lows either impacted or threatened the state (see Figure 2). The tropical lows were closely monitored for potential cyclone development.

Tropical cyclones produce destructive winds, heavy rainfall with flooding and damaging storm surges that can cause inundation of low-lying coastal areas. The tropical cyclone season in WA runs from 1 November to 30 April.

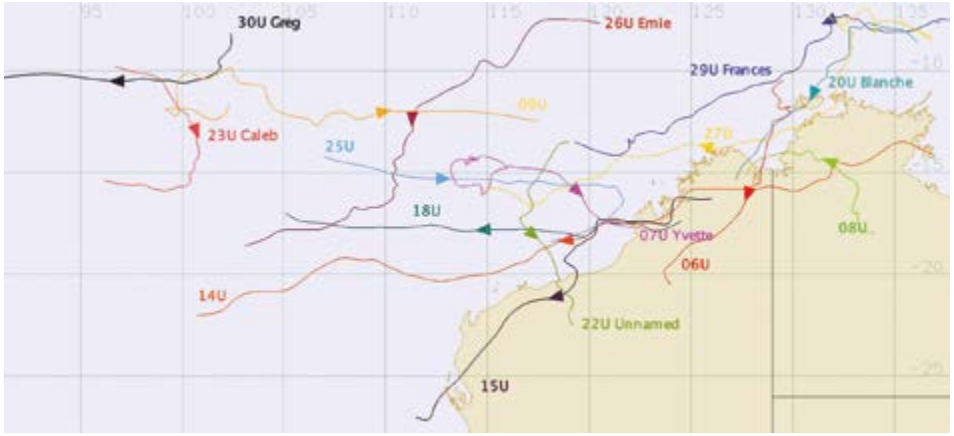


Figure 1. Tropical cyclones and significant tropical lows tracked in WA, 2016–17 wet season

Two tropical cyclones – Blanche (CAT 2) and *22U-unnamed* (CAT 1) – crossed the coast (see Figure 2). While the number of cyclones was normal, the season commenced late, with only one cyclone occurring before the end of February and the remainder in March and April.

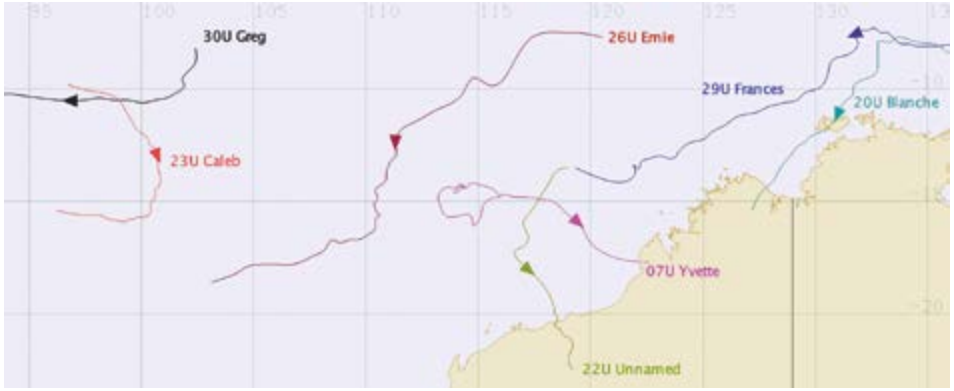


Figure 2. Tropical cyclones tracked in WA, 2016–17 wet season

The active season brought record high December to February rainfall.

- Broome Airport recorded its wettest December day in 77 years of recordkeeping and the third highest daily rainfall for any month (247 mm) on 23 December as a tropical low moved east.
- In late January, record high daily rainfalls (150–200 mm) were reported in parts of the East Kimberley, with minor to moderate flooding reported for rivers in the East Kimberley and for the Fitzroy River in the West Kimberley.
- In early February, very heavy rainfall fell in parts of the Kimberley, Pilbara and Gascoyne, with sites in Dampier and Karratha reporting record daily totals over 200 mm.
- In the second half of March, heavy rainfall, flooding and severe wind gusts battered the east Pilbara as tropical cyclone *22U-unnamed* crossed the coast.
- On 28 March, very heavy rainfall (over 96 mm in one hour) fell in Broome during a slow-moving thunderstorm.

While the northern wet season saw record highs, southern parts of the state also were deluged. Most notably, two cloud bands brought unusually high rainfall to parts of the South West Land Division in late January and early to mid-February.

In January, the Avon River overflowed its banks, causing flooding along the Avon and upper parts of the Swan River. Over 200 mm of rainfall was recorded in the south-west of the Central Wheat Belt.

In February, another thunderstorm brought widespread heavy rainfall (up to 200 mm) to the south-west. Major flooding was reported in the Avon River catchment with flooding downstream in the Swan River. These events impacted the agriculture and viticulture industries in the Swan Valley.

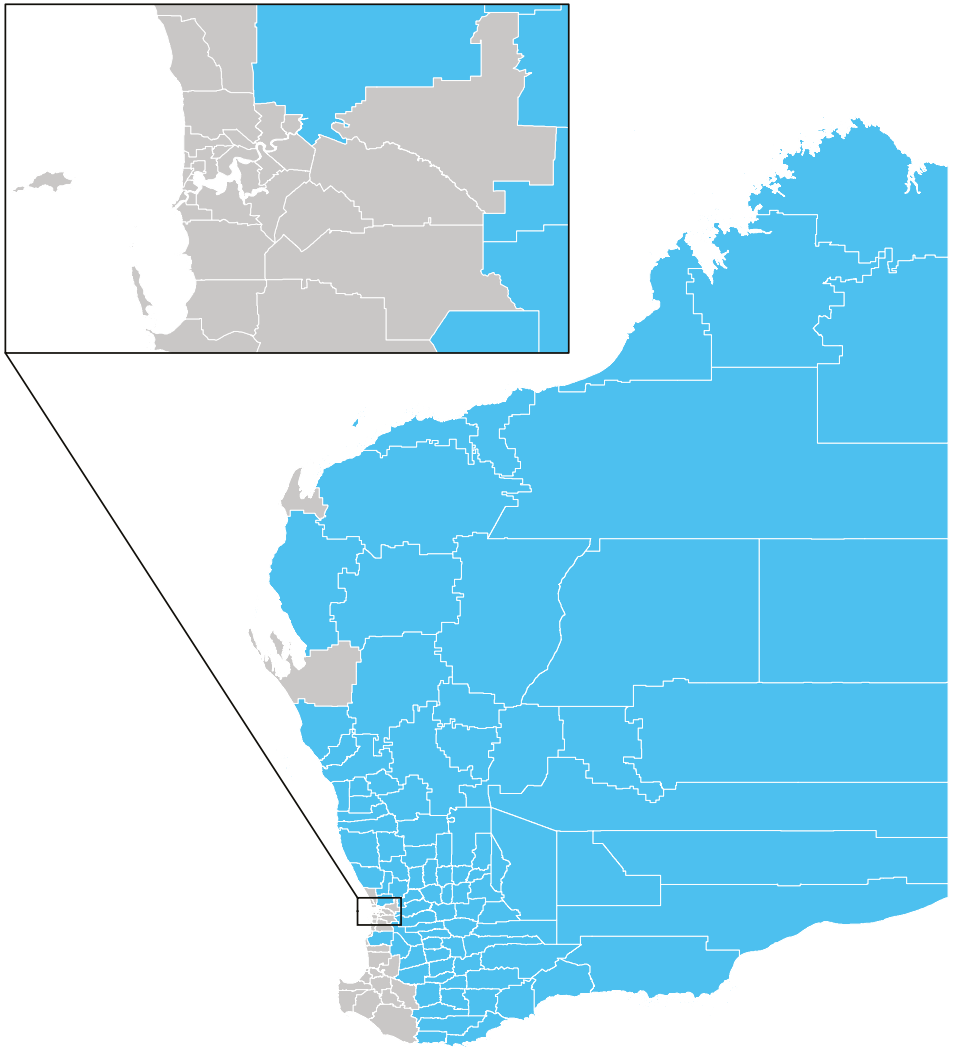
Figure 3. Flood damage to Phillips River Bridge near Ravensthorpe

The Esperance Coast Basin and Blackwood River catchment also experienced major flooding. This flooding caused significant road damage, particularly in the Esperance Coast Basin, with the Phillips River Bridge on the South Coast Highway destroyed. Floodwaters damaged bridges and roads and cut off the town of Ravensthorpe, driving away tourists and limiting supplies.

Despite widely broadcast messaging advising people to stay out of flood waters, two fatalities were reported as a result of two separate incidents where motor vehicles were washed off roads as drivers tried to cross flooded rivers.

With so many local governments impacted, the State Government declared a natural disaster, which meant funds were available to those in need.

Local governments that were subject to WANDRRA flood proclamation



ECONOMY – TO MAINTAIN AND GROW THE STATE'S PRODUCTIVE CAPABILITY

Risk 03

03 RISK

3.1 Assessment of risk

Four years have passed since the State Government began a concerted effort to understand its emergency risk profile. Coordinated by the OEM, the State Risk Project achieved two milestones in 2017:

- the release of district-level risk profiles (*District Risk Assessment Reports*)
- the revised state-level assessments of natural hazards (*WA Natural Hazards Risk Profile 2017*).

The district risk assessment reports provide a comprehensive view of the priority risks across each of the state's eight EM districts. The profiles identify the diversity of hazards, vulnerabilities and capabilities of each region. The assessment criteria are tailored to each region (by population and gross area product). This provides consistency and allows for comparisons across and between regions.

The revision of state risk assessments for seven sudden-onset natural hazards (initially conducted in 2013) highlights how much the collective understanding of risk has improved over time due to:

- changes in format and methodology providing a more balanced view of risk
- greater appreciation of the scale of natural hazards, which change how impacts are perceived
- the occurrence of relatively large emergency events over the past four years, which show that worst-case scenarios are in fact credible.

The attention of the EM sector is now turning to what to do about the risks identified. Some risks cannot practically be treated in any other way than being aware of them and responding the best you can. Others however can be partially mitigated (increased building standards for a cyclone) or fully mitigated (not building in a flood plain).

It should be noted that many of the agencies involved did not wait for the project to be complete to examine the reported findings. Rather, they began the process of treating and mitigating the risks immediately, both improving resilience and lowering the risk. As risks were identified within the workshop settings, representatives went back to their home agencies, examined issues, developed treatments and implemented them. Because of this the state of WA has been more resilient almost from the outset of the State Risk Project.

At an early risk workshop in 2013, the Water Corporation identified that certain hazards potentially impacted their uninterrupted power supply in certain critical facilities. This reconfirmed the interdependency priority which prompted a review of backup energy supplies. This resulted in the ongoing projects for the quick connection and installation of backup energy and self-starting generators. Attention then turned to establishing more systemic and strategic treatments to mitigate the residual risks including enhanced:

- interagency briefings for the summer bushfire season
- asset protection against bushfires in line with the new priorities
- incident management training programs
- contingency planning for high-priority assets and schemes
- infrastructure engineering design (e.g. Mundaring water treatment plant)

The Water Corporation also enhanced its focus on activity-based planning and operations delivery.

In general, mitigation of risk aims to lessen the impact of an emergency event. In the case of natural hazards (storm, flood, fire, etc.), the occurrence of the event can rarely be stopped; however, how seriously the event affects people and property can be anticipated. The range of mitigation options available to us is diverse, spanning structural, educational and social measures.

Traditionally, the mitigation argument has hinged on economic factors ('cost'). Economists have argued that for every dollar spent on prevention, various amounts (typically between $2 and $50, depending upon the type of mitigation) are saved on response and recovery costs. While such arguments have some validity, they do not tell the full story. The true benefits of effective mitigation are not so much financial as human – the safety of emergency responders and the community as a whole. Other benefits include the protection of property, infrastructure, the environment and the social fabric of the community. Mitigation investment can also assist with maintaining public order, housing, supplies of food and clean water, sanitation, education, health services and objects of cultural importance.

WA is now in possession of a comprehensive evidence base on which to inform and drive future mitigation strategies. The OEM has developed and the SEMC endorsed the 'Mitigation Imperative'. This is a strategy to leverage the enhanced risk and capability knowledge to inform and guide mitigation in order to build a more resilient WA.

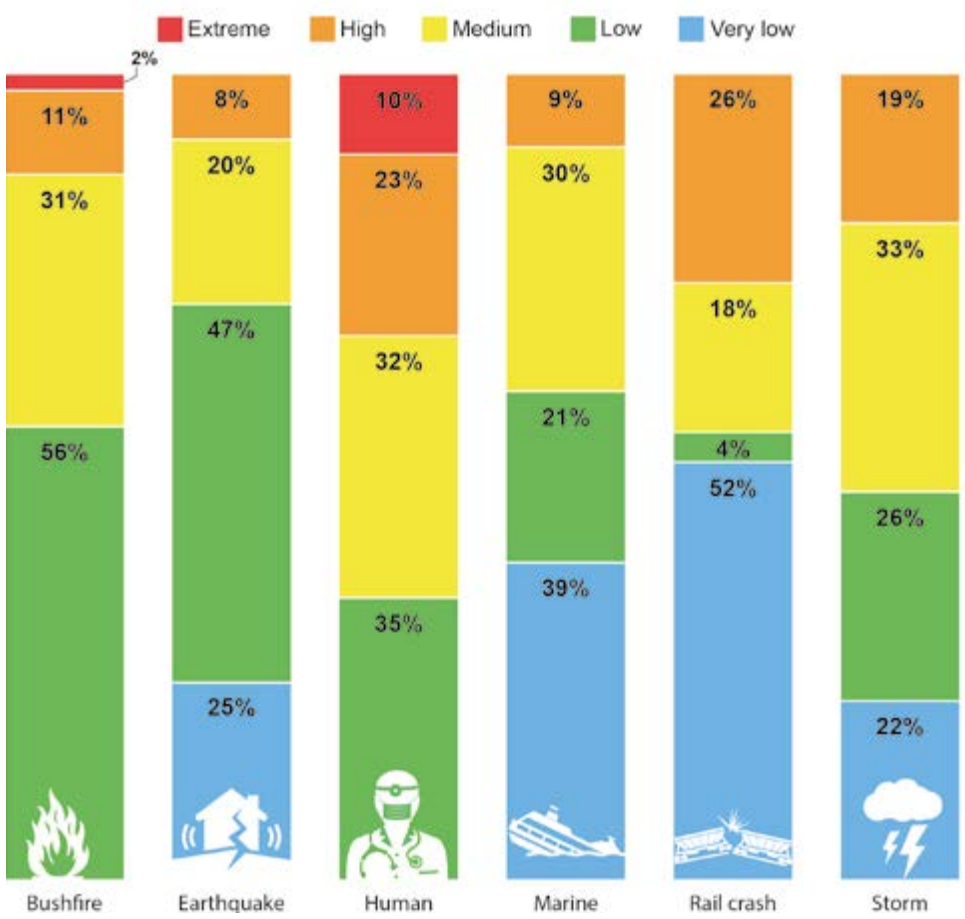
3.2 District risk profiles

The level of EM risk is established through an assessment process where the sources and elements at risk are identified and analysed. Last year the *Emergency Preparedness Report* summarised the risk profiles of three districts that had completed the emergency risk assessment process. This section summarises the profiles of the remaining five. They are Goldfields–Esperance, Metropolitan, Midwest–Gascoyne, Pilbara and South West.

A series of workshops held in each district followed the procedures and criteria outlined in the *WA Emergency Risk Management Guidelines*. The workshops examined the likely impacts of credible worst-case hazard scenarios. An abridged version of the scenarios used is included in Appendix C. The detailed risk assessment reports for each EM district are available at: www.oem.wa.gov.au/Pages/DistrictReports.aspx.

Goldfields–Esperance EM District

Goldfields–Esperance EM District risk profile



Note: Scenarios examined can be found at Appendix C.

Of all scenarios assessed, Human Epidemic presents the greatest risk to the Goldfields–Esperance EM district, with 33% of its risk statements assessed at 'extreme' or 'high'. The primary cause for the elevated ratings was the strain that such an outbreak would place on health and community service providers in the region. An outbreak would affect the functionality of facilities and potentially delay or limit the provision of services, therefore reducing quality of life.

Deaths would be expected from the scenario (avian influenza outbreak) but also from delays caused in accessing services for those with existing health concerns. The other hazards that were assessed also posed the risk of multiple fatalities. The Rail Crash, Bushfire, Earthquake and Storm scenarios had the potential to create catastrophic impacts for the district.

In the scenarios for Bushfire, Human Epidemic, Rail Crash and Storm, further loss of life directly attributable to the hazard event could be caused by over-extended emergency and health services.

The Storm scenario was assessed to have the most significant impact on the regional economy. Severe winds and flooding could be expected to disrupt major road and rail freight routes, resulting in financial losses of over $54.4 million. Disruptions included the Great Eastern Highway, Eyre Highway, Goldfields Highway and the main east–west railway line.

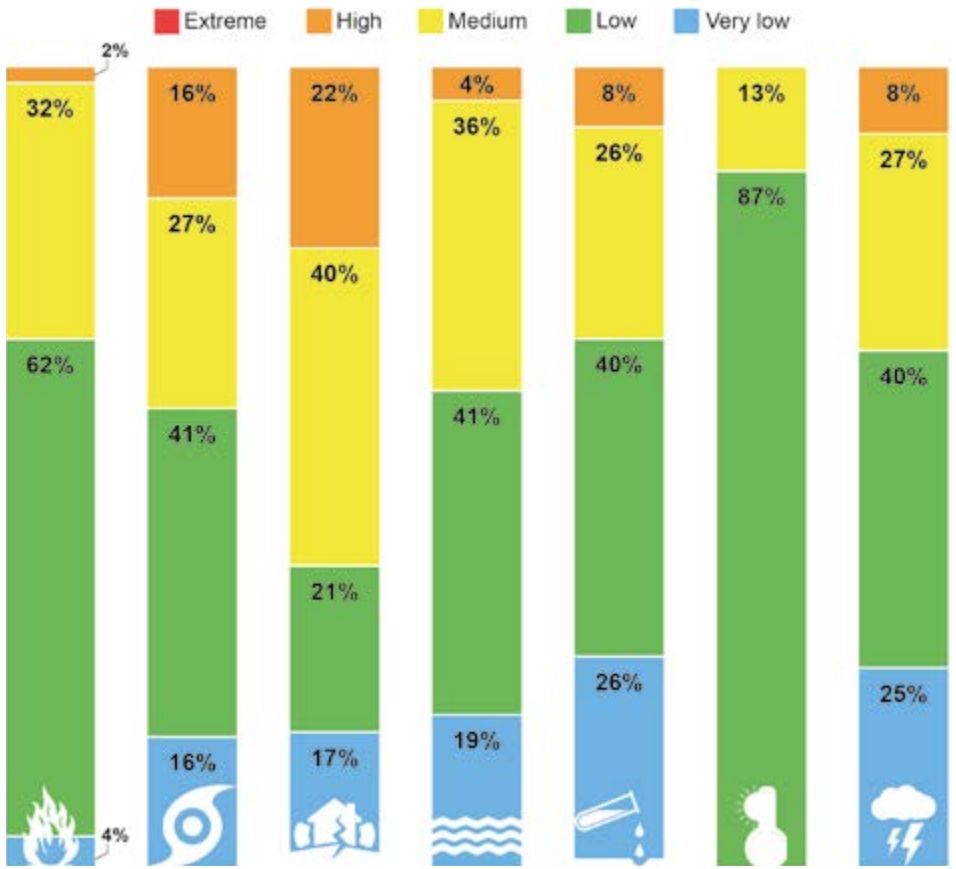
The biggest concern arising from the Rail Crash assessment was the lack of a hazard management agency (HMA) for the track east of Kalgoorlie to the border. Consequently, the designation of responsibilities and cost-bearing was uncertain. WA Police do have a contingency plan to respond to incidents. With Kalgoorlie the closest city to any likely crash site along this section of the track, agencies from Kalgoorlie would be most likely to respond. This response would involve considerable travel delays in accessing the crash site.

A magnitude 5.6 earthquake in Kalgoorlie could be expected to result in death or injury, economic loss from damage to private buildings and the permanent loss of buildings of cultural significance. Under-insurance of private dwellings would likely impede timely recovery and redevelopment.

Marine Transport emergencies were assessed as posing a relatively low risk to the district. However, they had the greatest potential impact on the environment, primarily due to oil spill and its impact on wildlife and coastal ecosystems.

Metropolitan EM Districts

Metropolitan EM District risk profile



Note: Scenarios examined can be found at Appendix C.

The four EM districts in the metropolitan area were combined to provide an understanding of the seven chosen priority hazards across the entire metropolitan Perth.

A significant hazard is Earthquake, with 22% of risk statements evaluated as 'high' due to likely large-scale damage and disruption. An estimated 22 deaths and 508 serious injuries could occur. Damage to buildings was expected to be significant, with 30% of the building stock sustaining moderate to complete damage. In addition, damage to heritage buildings could result in the permanent loss of objects of identified cultural significance.

It should be noted that if an earthquake were to damage a hospital (most likely Fremantle or Rockingham hospitals due to their proximity to the scenario epicentre), there is no capacity for existing patients to be moved. This would immediately stretch the health system. Redundancy options would be greatly limited.

The highest risks to the environment in the metropolitan area are Earthquake and Cyclone. Potential contamination from chemical spillage, raw sewerage release and disturbed asbestos are highest for Earthquake. Significant erosion along beaches impacting ecosystems and causing a loss of aesthetic value is highest for Cyclone. In both cases, intervention programs would be required to restore environmental value.

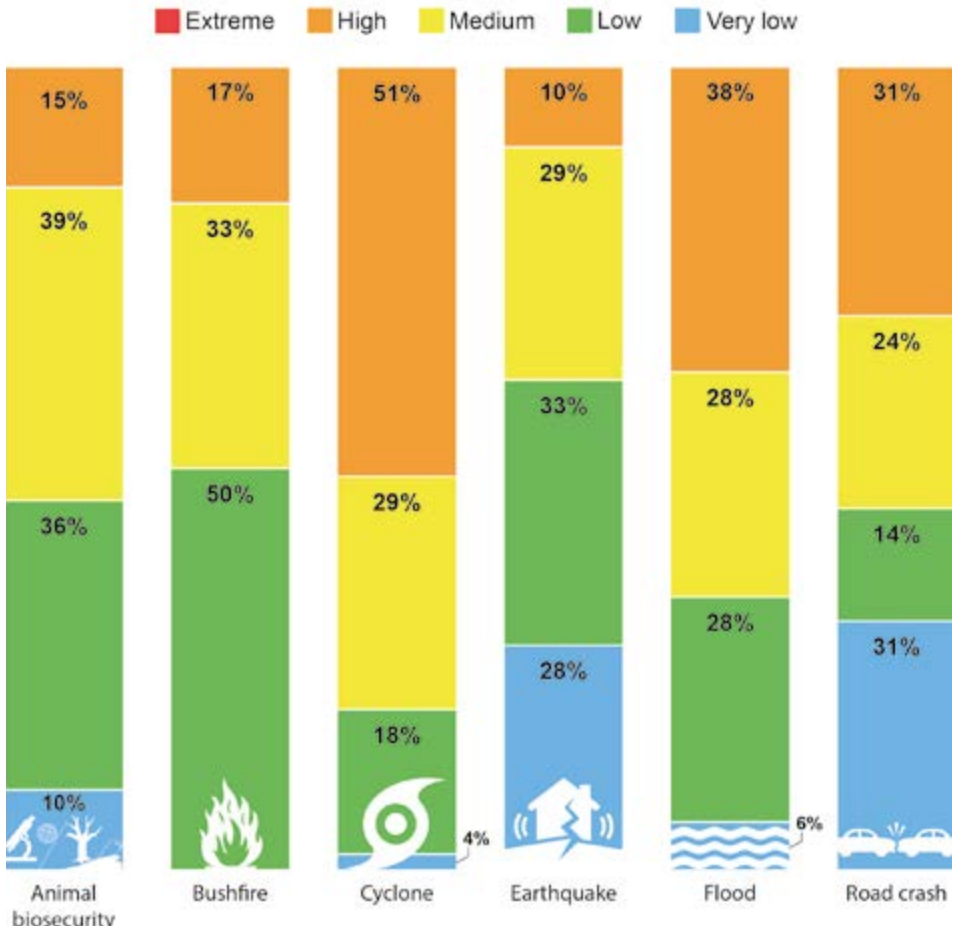
The scale of these events exceeds normal planning measures. During the Cyclone, Earthquake, Flood, HAZMAT and Storm scenarios, response and recovery agencies would be impacted. Some agencies anticipated they would be unable to provide core services at their normal level; in particular, the Department for Child Protection and Family Support (CPFS), DFES, WA Police, ambulance services, the Department of Health and local governments.

A critical issue raised – particularly under the Earthquake scenario – was that many members of the public may not receive immediate help from emergency services and would need to be prepared to rely upon themselves.

Of the utilities affected, electricity supply would be most impacted. Both the Storm and Cyclone scenarios were evaluated as posing a 'high' risk to infrastructure. High winds and lightning can damage overhead power infrastructure in particular. Disruption of electricity supplies would also flow on to services such as communications, water supply and waste water, further impacting delivery.

Midwest–Gascoyne EM District

Midwest–Gascoyne EM District risk profile



Note: Scenarios examined can be found at Appendix C.

Cyclone (51%) and Flood (38%) stand out as having the most risk statements assessed as 'high'. Such hazards are widespread and likely to impact many communities. The Cyclone scenario, in particular, tracks along the length of the Midwest–Gascoyne coastline, affecting several communities.

Road Crash also has numerous 'high' risk statements due to the potential for death, injury and an increased demand on emergency services such as DFES. Other risks, albeit 'very low', relate to limited disruptions to transportation routes.

All six hazards assessed potentially threaten human life, with Earthquake and Road Crash capable of causing catastrophic impacts for the district. For Bushfire, Cyclone and Flood, the consequences are likely to be lower, although these hazards could still cause fatalities and stretch the health system. The Animal and Plant Biosecurity scenario (foot-and-mouth disease) does not affect people's health directly; however, the potential loss of industries and subsequent employment may trigger mental health issues and suicides.

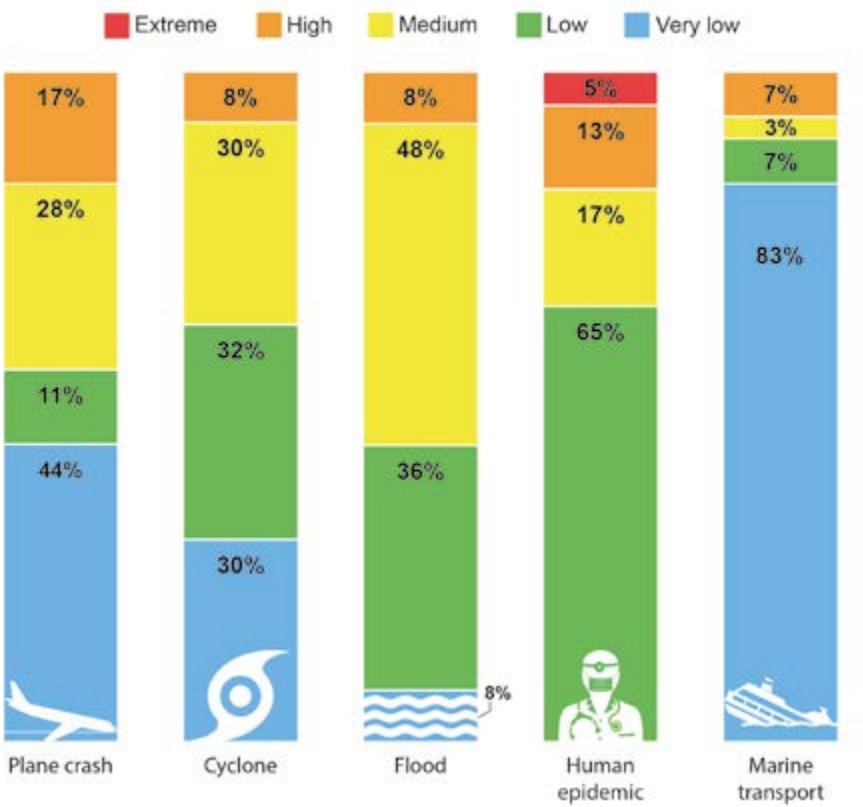
Overall economic risk stems from damage to transport and marine infrastructure, buildings and water supplies. This is exacerbated by disruption to tourism and agricultural activities. The single greatest economic loss to the Midwest–Gascoyne District is likely to be from the Animal and Plant Biosecurity hazard, which could destroy export markets for a number of years. This event would have national and international implications and would affect a broad range of associated industries.

The highest risk for government activities related to the potential surge on emergency services (DFES, WA Police, ambulance) and health services (hospitals). For all hazards, response agencies would require additional resources from outside the EM district to manage events. The Animal and Plant Biosecurity scenario would immediately escalate to state and national response protocols; however, additional resources would still be required. In terms of health services, acute or intensive-care patients may need to be transferred to Perth due to limited capacity within the district.

Overall, most social setting risks were assessed as 'low'. These hazard scenarios did not affect the whole district and in some cases, existing district resources were sufficient to return the affected community to normal. It is important to note, however, that the social impact on individual communities directly affected could be significant.

Pilbara EM District

Pilbara EM District risk profile



Note: Scenarios examined can be found at Appendix C.

All assessed hazards in the Pilbara EM District pose risks to human life, with Human Epidemic, Cyclone and Air Crash assessed as having the potential for being 'catastrophic'. The Human Epidemic scenario (avian influenza) posed 'extreme' risks due to the scenario's high likelihood of occurrence.

Death, injury and illness caused by the Human Epidemic and Air Crash scenarios would stretch the health system and overwhelm local emergency services. This was particularly evident for the Royal Flying Doctor Service (RFDS) in transporting burns and critical patients to Perth for treatment.

Unique to Air Crash was the high risk of subsequent mental health issues. The district relies heavily on fly-in, fly-out workers in sectors such as mining. An air crash would shake the community fabric as people would either personally know someone who was involved in the crash or know someone that similarly commutes. This impact could be exacerbated as the mental health of medical staff attending the scene may also be affected.

The Flood scenario produced many 'high' and 'medium' risks across all categories, illustrating its widespread nature. It is notable that Flood poses the greatest risk to the social fabric of the district. Other flood risks include the potential for death, negative impacts upon remote Aboriginal communities and financial loss to the mining industry.

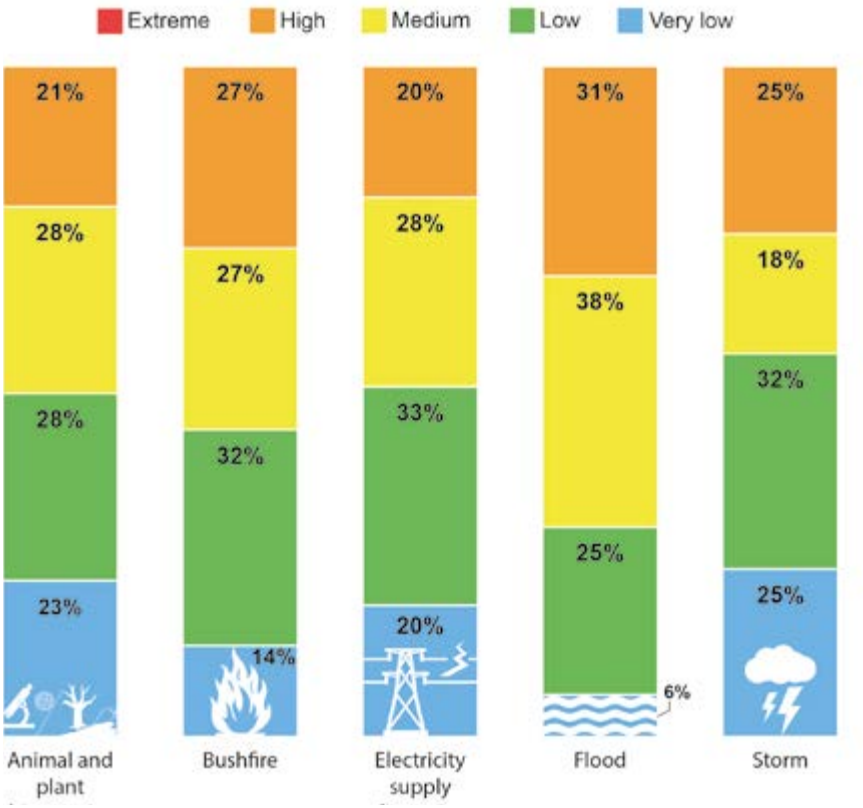
The Cyclone and Flood scenarios have the greatest potential impact on physical structures such as critical infrastructure and housing. Human Epidemic and Air Crash have a greater influence on public administration, particularly health services. Natural hazards affect more of the region due to the broadness of their influence when compared to more localised hazards (Air Crash and Marine Transport Emergency).

The greatest economic loss to the district resulted from scenarios that required port closure (Marine Transport Emergency and Cyclone). The Marine Transport scenario could block the channel at Port Hedland for up to 10 days, while cyclonic winds may damage port infrastructure, significantly disrupting mining exports. This could potentially result in losses of greater than $227 million. Cyclone (and the resultant severe flooding) would likely damage mine sites and rail infrastructure, temporarily halting mining production.

The most notable impact to the environment was from Flood causing soil erosion ('medium'). Environmental matters for all other hazards were assessed as 'low' or 'very low'.

South West EM District

South West EM District risk profile



Note: Scenarios examined can be found at Appendix C.

Of the five hazards assessed in the South West, Flood had the most 'high' and 'medium' risks. The effects of the Flood scenario were far reaching and included damage to infrastructure, increased demand on public services, inundation of agricultural land and disruptions to industry (tourism). Flood would produce demands on public facilities for evacuation and shelter while limiting movement through damage and disruption to roads, bridges and freight routes. It is thought that most bridges in the district would stand; however, abutments may be eroded. Although repairs could be carried out relatively quickly, the damage may result in financial losses of over $60 million. Disruption to travel on the South Western and Forrest highways was of particular concern.

The Animal and Plant Biosecurity scenario poses catastrophic consequences to the economy. A potential outbreak of foot-and-mouth disease would impact farm revenues, meat exports and the meat processing industry, cause business failure and result in significant costs associated with the destruction and disposal of livestock. A key factor influencing the risk is the duration of the event, which could extend for several years. This event would have national and international implications and would affect a broad range of associated industries.

All hazards would pose a risk to human life and the majority (60%) were assessed as 'high' risk. Bushfire, Storm and the Animal and Plant Biosecurity scenarios have the potential to create catastrophic consequences (greater than 19 fatalities or 181 serious injuries). Foot-and-mouth disease would not cause direct human fatalities but might trigger mental health issues and suicides. The Storm scenario could cause extensive damage (> $625 million) to ports and marinas, including vessels, reducing business operations.

Multiple scenarios impact Electricity Supply (bushfire, storm, flood and electricity supply disruption). The bushfire scenario is expected to significantly damage the power station and enter the coal mine that supplies the power station, disrupting generation. This scenario would require recovery activities resulting in considerable costs (> $625 million). Wind damage from storm and damaged assets (including underground assets) from flood would disrupt supply and result in high costs
(> $62.5 million). Accessing damaged sites for evaluation and repair work would also be an issue.

The general reliance of modern society on a steady source of power creates significant interdependencies. Ensuing power outages from many assessed hazards would affect a broad range of public services and impede the effective dissemination of emergency information to the public.

IN FOCUS

National mobile black spot program

The Mobile Black Spot Program aims to improve mobile phone coverage, particularly in regional and remote locations that may be prone to natural disasters.

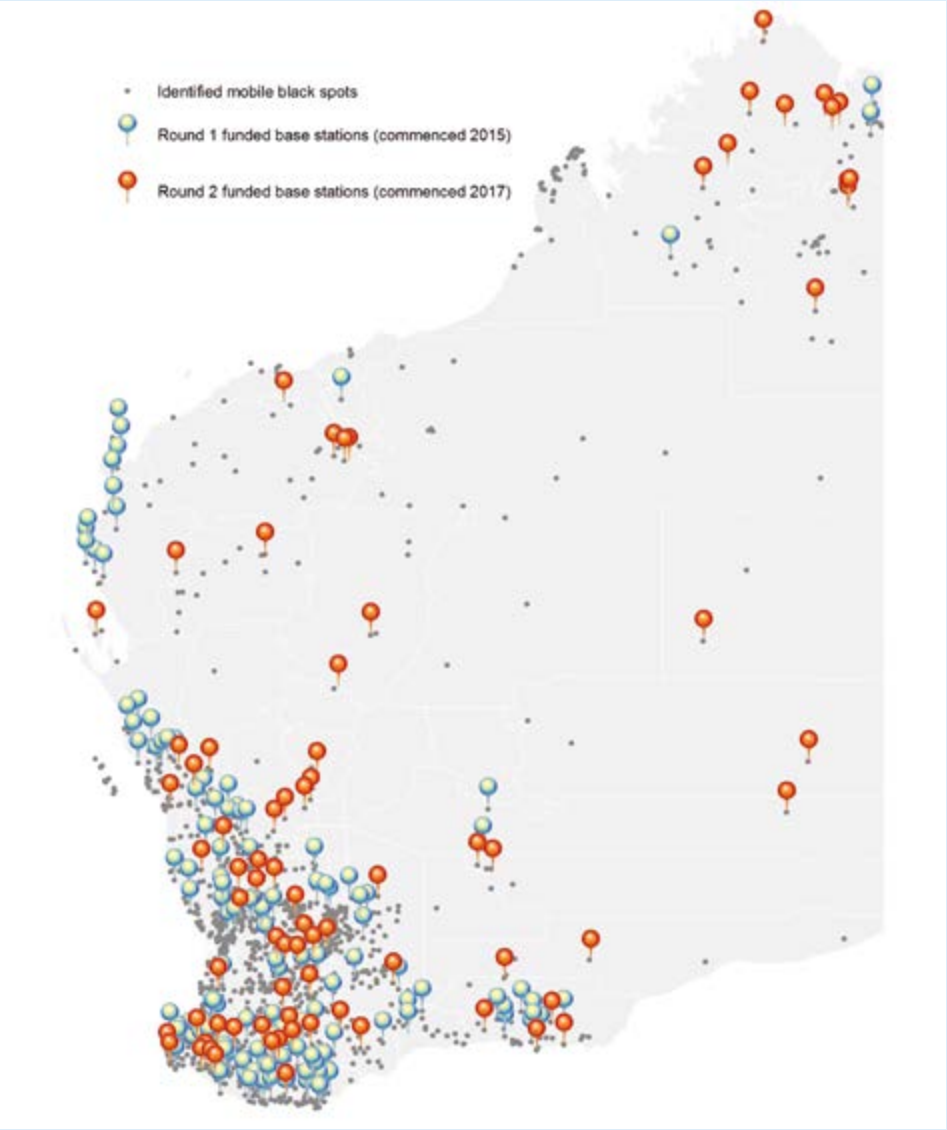
Round 1 (2015–18) is delivering 499 new or upgraded mobile base stations across Australia (including 130 in WA) covering 3000 black spots. The Commonwealth committed $220 million to round 1 and the State Government's co-contribution was $32 million. Australia-wide, local governments and business and community groups contributed an additional $1.7 million.

Round 2 (which commenced in 2017) will result in 266 new or upgraded base stations (including 78 in WA) resolving a further 1400 black spot issues. The funding mix for round 2 is: $213 million from the Commonwealth, with co-contributions from six states (including $21.8 million from WA); co-contributions of $101 million combined from Telstra, Optus and Vodafone; and an additional $475,000 from local governments and business and community groups.

The public have reported 10,600 black spot locations, including about 1300 in WA. These locations have been entered into the black spots database. The combined impact of rounds 1 and 2 means that 4400 (41%) of the 10,600 identified black spots will be resolved.

As part of the initiative, the Commonwealth has also allocated $60 million to target 125 specific priority locations around the country. Note that some of these locations may receive coverage from mobile base stations funded under round 2. These locations in WA are Bickley, Bullsbrook, Chidlow, Lake Clifton, Parkerville, Swan Valley and Serpentine–Keysbrook.

Mobile Black Spot Program



3.3 Office of Bushfire Risk Management

All recent inquiries into major bushfires in WA (including Keelty 2011 and Ferguson 2016) have noted that bushfire reform requires a multifaceted approach and cultural change, both within agencies and the community.

The Office of Bushfire Risk Management (OBRM), which was established in 2012, continues to employ a collaborative approach to accomplish cultural change and realise benefits for the community.

Over the past five years, there has been a noticeable increase in the level of understanding and engagement of stakeholders in this reform. This demonstrates that responsibility is shared across the government, business and community sectors.

A key achievement of OBRM in 2017 was the design and delivery of a three-day forum on prescribed burning: 'The Burning Question: Now & Beyond'. The forum, held in Busselton in August, brought together leading practitioners from across WA and featured interstate and international guests. It strengthened collaboration and coordination within and between participating agencies while building enduring confidence in the capability of local practitioners.

The reform agenda of OBRM has five key elements:

- an interactive map of bushfire-prone areas
- guidelines for preparing a Bushfire Risk Management Plan (BRMP)
- support for the State Bushfire Coordinating Committee
- assurance over prescribed burning activities
- hosting the inaugural WA Prescribed Burning Forum.

Figure 4. Expert panel at the prescribed burning forum

The map of bushfire-prone areas, launched in December 2015, has become a key component of planning and building reform measures required under State Planning Policy 3.7 – Planning in Bushfire Prone Areas. The map shows where new homes and developments are required to adhere to improved building standards to reduce their likelihood to burn from flames, radiant heat and ember attack.

OBRM published the first statewide standard for bushfire risk management planning in December 2015 and DFES is currently supporting 16 local governments to develop and integrate BRMP frameworks in their local areas. This initiative was further bolstered in September 2017 with an additional $3.7 million in funding allocated to enable another 11 local governments to begin working on their management plans (Busselton, Coorow, Dandaragan, Denmark, Gingin, Harvey, Manjimup, Northam, Toodyay, Wagin and York).

To enhance cooperation, OBRM plays a key role in ensuring that local government plans conform to the state standard. So far, 15 plans align with the standard and have been endorsed by their respective councils. The local governments involved are now developing treatment strategies to mitigate risks identified in the planning process.

An additional subcommittee now operates within the SEMC framework. The State Bushfire Coordinating Committee (SBCC) was formed in early 2017 as a direct recommendation of the Ferguson Inquiry. The committee has broad membership from land management agencies – the new Department of Planning, Lands and Heritage; the Department of Biodiversity, Conservation and Attractions (including P&W); the Forest Products Commission; and the Department of Local Government, Sport and Cultural Issues. It also has representatives from the WA Local Government Association (WALGA), the Pastoralists and Graziers Association, the OEM, the Bureau of Meteorology (BOM), DFES and the WA Farmers Federation (WAFarmers). The committee meets quarterly and reports to the SEMC. It is developing the State Bushfire Management Policy and a framework for the allocation of funding for bushfire mitigation.

Through its assurance program, OBRM continues oversight of prescribed burns and their alignment to risk management standard ISO 31000. Currently, P&W remains the sole agency with an OBRM-endorsed ISO 31000 compliant program. Progress is being made by other agencies and NGOs that recognise the benefits of an OBRM-endorsed framework, system and processes for their prescribed burns.

INFRASTRUCTURE – TO MAINTAIN KEY INFRASTRUCTURE SUCH AS TRANSPORT AND UTILITIES

Capability 04

04 CAPABILITY

This year's *Emergency Preparedness Report* is again based upon the state's EM Capability Framework, which reflects the best thinking on what it means to be 'capable' in the face of emergencies. Collection of data for the report was tailored around the achievement objectives of the framework.

During 2017 the Capability Framework underwent some minor adjustments to better reflect those things that are important to have to be capable. By way of example the 2016 iteration combined all forms of EM information under the category of Public Information. This was changed in 2017 as it was noted that there are distinct differences in providing:

- emergency alerts in times of crisis and
- general readiness and preparedness information.

Acknowledging this important distinction the Capability Framework was amended. This is in line with the overarching theme of the Capability Framework (and more broadly the EM environment), which is Analysis and Continuous Improvement. This minor change is reflective of the broad ethos of the EM sector in WA. Agencies examine the effectiveness of the systems that are in place and, if required, they change them so that they deliver the best possible outcomes for the state and individuals alike.

Every year we aim to be better than the year before.

The full Capability Framework can be found here.

4.1 Legislation

Achievement objective

- Comprehensive emergency management legislation exists that is current, appropriate and congruent with supporting legislation.

Key findings

- The EM Act is the cornerstone of the State EM Framework.
- Barriers to compliance with legislation have been identified during the statutory review of the EM Act.
- The majority of EMAs report that internal measures to monitor compliance to legislation are in place.

The foundation of EM is a legislative framework that encourages all practitioners to work together and follow best practice. The cornerstone is the EM Act, which provides EM agencies with the powers and protections necessary to prevent, prepare for, respond to and recover from emergencies requiring a significant, coordinated response.

The Act may be thought of as 'threshold legislation' in that specific provisions become available when an incident reaches a required level. It functions alongside other legislation. For example, the early response to a bushfire would be managed by local government, P&W or DFES under the *Bush Fires Act 1954*. If the situation worsened, the additional powers of the EM Act could be accessed through the declaration of an emergency situation, which activates state-level arrangements.

Major incidents involving fatalities provide another example of the complexity involved as EM action also needs to comply with the *Coroners Act 1996*. In addition, the management of major incidents can be covered by separate legislation such as the *Environmental Protection Act 1986*, the *Local Government Act 1995*, the *Main Roads Act 1930* and the *Occupational Safety and Health Act 1984*.

Half of all HMAs reported they had encountered no issues or barriers within the current EM legislation. The other half noted a range of issues that have largely been captured and fed into proposed amendments to the Act. For example, WA Health noted that the hazard of 'Heatwave' was not explicitly prescribed in the legislation. Further, position titles such as State Health Coordinator and State Human Epidemic Controller require amendment to reflect recent changes to the *Health Service Act 2016* and *Public Health Act 2016*. In another example, WA Police noted ambiguity around the hazard definition for 'lost persons' in the marine environment.

A quarter of EMAs reported issues with legislation but noted they were already being addressed in proposed amendments. WALGA (representing the views of a number of local governments) noted that HMAs were yet to establish clear guidelines for declaration of emergency situations and states of emergency (particularly when and under what circumstances these will be invoked). No service providers reported issues or barriers within the current legislation.

A majority of local governments (69%) reported issues or barriers within the current EM legislation but these mostly related to resourcing implications. For example, one local government said the legislation 'requires significant resources, which is problematic for small organisations'.

Ensuring compliance is another critical factor for effective EM. Organisations must ensure they have internal measures in place to monitor compliance with relevant EM legislation and policies. Most HMAs and EMAs are satisfied they have such measures. DFES, for example, has established a dedicated DFES Regulation and Compliance Framework, which identifies and ensures compliance.

A little over half of local governments (57%) reported having internal measures in place. A number commented that they relied on regular communication from the OEM to monitor compliance. For example, the Shire of Carnarvon 'monitors communiqués from the OEM to ensure the compliance of its policies and legislation'.

4.2 Policies

Achievement objective

- State-level policies are appropriate, useful, usable and used and the intent of these policies flow consistently through individual supporting agencies.

Key findings

- Most respondents report their EM arrangements are consistent with the State EM Policy and have measures in place to monitor compliance.
- Most local governments report their EM arrangements align with the State EM Policy.
- Some local governments cite resourcing constraints as an issue that increases their exposure.
- Local governments report relying on the assistance from CESMs and OEM District Advisors to maintain currency.

Identifying enhancements to EM arrangements is an important task for the SEMC. In 2013 the SEMC commenced a seven-phase policy and governance review of EM policies to ensure they were useful, usable and used.

In May 2016, phase 3 of the review project was completed, when the SEMC approved a revised package of EM documents. The documents amalgamated previous policies and established the current contemporary EM arrangements for WA. Policy revision under phase 4, which started in June 2016, addresses 16 broad topic areas:

State EM Framework	Recovery
Volunteers	Training
Community engagement and resilience	Traffic management
Exercising	Local EM arrangements
Emergency public information	SEMC consultation mechanisms
Local government and local/ district/regional issues	Funding for emergencies
Hazard review	SEMC suite of documents
Exchange of information	Evacuation

Agencies reported minimal issues with the overarching State EM Policy. They noted that their participation in the review project provided ample scope to address issues and identify enhancements.

Most EM agencies and service providers reported their EM arrangements were consistent with state policy and about 60% have internal measures to monitor compliance. For example, DFES has established a Regulation and Compliance Framework, WA Police undertakes governance audits and P&W doctrine is monitored to ensure it aligns with state EM arrangements. Various EMAs, including the Public Transport Authority (PTA) and WA Police have staff performing advisory, monitoring and compliance roles.

Local governments reported high levels of compliance with state policies (over 80%); however, arrangements in reality are highly variable. Many report a heavy reliance on support provided by OEM District Advisors along with the structure of existing local emergency management committees (LEMC) and district emergency management committees (DEMC). Examples of local government comments follow:

- The City of Stirling (788 staff) reports having a '*dedicated EM Coordinator who is supported by a proper management structure that monitors compliance with legislation*' (My Council 2017).
- The Shire of Kalamunda (254 staff) reports '*consistently speaking with surrounding local governments to see how they are dealing with EM issues*'.
- The Town of Mosman Park (46 staff) reports being '*under-resourced in the EM area and [we] meet basic legislative requirements, although more extensive requirements are unachievable due to staffing levels*'.
- The Shire of Wyalkatchem (11 staff) reports conducting '*a biannual review of legislative compliance, risk management and internal control. The CEO prepares a comprehensive written report for council and this is shared with an external auditor; the report is published publicly and any comments are incorporated into process and policy development*'.

While some local governments cited resourcing difficulties, they managed to undertake an annual review or annual audit to ensure their existing arrangements aligned with the state's EM arrangements. Individual local governments also have various activities underway to ensure their local EM arrangements align with state EM documentation. However, some reported resourcing constraints were affecting their ability to ensure their EM arrangements were up to date and hence increasing their exposure.

4.3 EM plans

Achievement objectives

- Emergency Management plans (Westplans) are comprehensive, documented and predetermined processes and procedures are in place.
- Emergency Management plans are regularly reviewed, exercised and tested.

Key findings

- Westplans are regularly reviewed, monitored and exercised.
- Most local governments continually assess and amend their plans, processes and procedures.
- Some local governments report inadequate resourcing as an impediment to their ability to review, monitor and exercise local plans.

The State EM Plan and state hazard plans (Westplans) are established under s. 8 of the EM Act. Collectively, they document the roles and responsibilities of agencies and support services in the event of an emergency. Westplans provide strategic arrangements for managing the particular hazard at a state level.

A major component of 2017 was the ongoing project to rationalise the existing 27 Westplans into 13 plans for hazards with similar consequences (phase 7 of the SEMC Policy and Governance Review Project). This rationalisation will create a series of state hazard plans to support the overarching State EM Plan. This will lessen the number of hazard-specific plans and enhance efficiency by reducing duplication and impost upon HMAs.

HMAs unanimously reported that their EM plans were comprehensive and documented and that predetermined processes were in place to review, monitor and exercise them. During the reporting period, numerous exercises were held covering 14 individual hazards while response arrangements were tested[1] in reply to five emergencies.

Agencies overwhelmingly reported that following an incident, emergency or exercise they reviewed their performance and, if required, amended their plans, processes and procedures. This cycle of assessment and review ensures new information and changes to the risk and threat environments are continually addressed.

For example, procedures were reviewed after a container ship broke its mooring and struck the Fremantle Rail Bridge in 2014. As a result, CCTV surveillance, a laser early-warning system and a higher level of monitoring and notification between the Fremantle Port Authority and the PTA were implemented. And in 2016, the Department of Education launched a principal's guide to bush fire. Principals have primary responsibility for the day-to-day management of a school, including the safety of students and staff on the premises.

Other positive examples of plans being amended following incidents and exercises follow:

- The shires of Beverley, Cunderdin and York reviewed flood response planning following the identification of deficiencies during the 2017 flood events.
- The Shire of Chittering following an incident saw the need to increase communication through social media.
- The Shire of Wyalkatchem reviewed processes following a land and air search for a missing person in October 2016. The search highlighted the importance of exercising for rare incidents.
- After a major storm, the City of Stirling identified the need for a communications system that did not rely on mobile phones.
- The City of Fremantle amended its LEMA to include asbestos clean-up contractors when the city's lack of suitably trained staff was highlighted following a fire in September 2016.

Most local governments reported they continually assessed and amended their plans, processes and procedures. However, some maintained they were under-resourced and did not have the capacity to update them regularly. Meanwhile, WALGA reported it hosted the Local Government EM Advisory Group, which included representatives from all regions. The group provides access to a statewide network of local government officers.

1 The Westplans were Animal and Plant Biosecurity, Flood, Gas Supply Disruption, Land Search and Marine Search.

4.4 Risk assessment

Achievement objective

- Agencies have the ability to and regularly conduct relevant risk assessments and the findings are implemented and shared with relevant stakeholders.

Key findings

- Agencies and local governments conduct risk assessments and use the findings to make improvements.
- Local governments have varying abilities to conduct risk assessments based on limitations in capacity, resources, funding and training.
- Local governments' knowledge of risks has been greatly improved through involvement in the State Risk Project.
- Service providers have substantial skills to conduct risk assessments and use the outcomes to inform processes and treatments.

The State Risk Project continued to foster risk assessment across the state and encourage agencies and service providers to face the risks together. Information gained from emergency risk assessments can be used to allocate resources and inform prevention and preparedness activities.

HMAs, EMAs and service providers reported having substantial skills to conduct EM risk assessments within their organisations. Risk assessments are undertaken internally from a corporate risk perspective and externally from an emergency risk perspective. Most agencies reported having dedicated risk management positions with appropriate supporting policy and guidelines.

Service providers reported the greatest ability to conduct EM risk assessments, with all reporting at least 'substantial' skills in the area. They also reported the highest use of risk assessment outcomes, from 'some' use (Western Power & NBN Co) to 'comprehensive' use (ATCO Gas Australia).

Next is HMAs, which report substantial skills, with the exception of the Department of Transport Marine Safety, which uses external consultants to undertake the risk assessment process. WA Health reported having a limited number of personnel formally trained and experienced in the application of ISO 31000. However, their risk assessments tend to relate to clinical risks rather than EM risks.

The Water Corporation reported that its findings from risk assessments were rolled into business continuity planning, becoming 'business as usual' and ensuring maximum safety. The risk process was used to underpin all significant organisational investment and operational decisions.

DFES reported that it employed a risk manager and that its risk management framework was based on ISO 31000. District and station officers were given EM risk assessment training within development programs. The agency also had discrete pockets of expertise; for example, governance and strategy; advisory services; and bushfire risk management planning.

Local governments reported highly variable skills with respect to conducting risk assessments. EM in local government did not generally have dedicated resources and emergency risk assessments were often a function attached to a disparate role and therefore given a low priority. The barriers to higher adoption were cited as:

- lack of funding
- limited training available to build staff capacity
- lack of staff to conduct the process.

15% of local governments reported having substantial or comprehensive skills in this area. They attributed their level of skills to:

- assigning a position dedicated to EM
- funding a position in risk assessment (noting that if funding were not available their skills may be limited)
- developing a supportive relationship with the LEMC
- experiencing the process during the OEM's local-level rollout of the State Risk Project.

The skill gap between local governments is wide. Some with greater capacity used the assessments as a framework to drive EM business. Others have not yet undertaken the risk management process and so were unable to describe how processes could be improved or treatments implemented.

The City of Stirling reported substantial skills and used the findings to develop and update their LEMA, the city's recovery plan and guideline documents for employees.

The Shire of Broomehill–Tambellup reported that the risk review project was beneficial for the LEMC. It was a means to '*explore the risks that may impact this community aside from fire, flood and storm*'. The shire had not previously considered biosecurity in particular to be a significant risk. However, a biosecurity risk workshop organised by the OEM and a subsequent regional workshop convinced the LEMC of its importance.

WALGA has designed and launched of a sector-specific platform known as 'LG Risk Vision', which complied with ISO 31000, NERAG 2015 and the State Risk Project. This tool is made available to WALGA members to facilitate the process of emergency risk management. While WALGA has substantial in-house skills, many local governments do not. Consequently, there is a significant gap in expertise for assessing and managing risk. There is also minimal funding available for local governments wishing to undertake comprehensive risk management projects.

Almost all agencies reported conducting EM risk assessments, including HMAs (88%), EMAs (69%), service providers (100%) and local governments (69%). The main hazard analysed was Bushfire, followed by Flood and Storm. Where relevant and where resources allowed, the findings of these risk assessments were broadly used to improve processes or implement treatments.

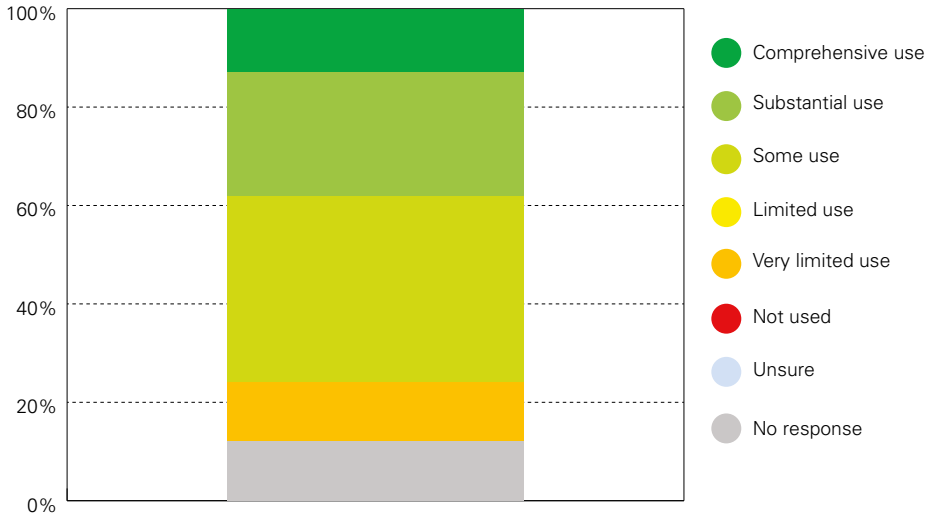
Service providers featured strongly in conducting risk assessments for supply disruption hazards (electricity, gas, fuel). This likely reflects a strong appreciation of interdependencies and the economic imperatives of operating essential services.

Road Crash is not a major concern for state-level agencies and is generally treated as business as usual. However, it was flagged consistently by local governments with over 40% conducting risk assessments for Road Crash. This is a strong indicator that the perception of risk is highly dependent upon perspective.

DFES reported using the findings of the risk assessments to improve processes and implement treatments. Further, they collaborated with partner agencies on specific projects across the range of hazards including:

- **Collapse** – reviewed WESTPLAN Collapse; established Urban Search and Rescue (USAR) capability at the local level; and established state-level USAR Taskforce capabilities from multi-agency and multi-disciplinary perspectives.
- **Flood** – reviewed flood risk status with the Department of Water and BOM.
- **Earthquake** – worked with Geoscience Australia and the Global Earthquake Modelling Foundation on a project related to earthquake impact and risk assessment for Greater Perth and supporting infrastructure. Main Roads WA, Western Power and the Water Corporation also made significant contributions.

To what extent are the findings of DFES risk assessments used (e.g. to improve processes or implement treatments)?



Additionally, DFES, Geoscience Australia, the Bushfire and Natural Hazards CRC and the Shire of York are due to commence the York Earthquake Mitigation Case Study project in January 2018. DFES is currently working on district earthquake concept plans mainly focused on response and short-term recovery operations.

The LEMC and DEMC structures were viewed as important forums for conducting risk assessments. The LEMA were also reported as being useful for engagement, but less so if stakeholders were not directly involved or perceived to be impacted, in which case they took little interest.

4.5 Horizon scanning

Achievement objectives

- Organisations examine existing and ongoing hazard research.
- Pre-emergency situational awareness occurs through examination of international and interstate events that may impact locally.
- Implement best practice identified through hazard research and pre-emergency situational awareness.

Key finding

- Most agencies and half of local governments in WA report keeping abreast of international and interstate incidents.

The fact that every year WA will be impacted by hazards is widely accepted and agencies have plans in place to manage and address emergencies when they occur. After each emergency, agencies review and adjust their performance to ensure they are delivering the best possible service and outcomes to the community.

Systematic examination of potential threats and opportunities is known as 'horizon scanning', where lessons are identified from incidents that happen elsewhere. Combined with hazard research and the adoption of best practice techniques, agencies using horizon scanning can better prepare for incidents that may arise.

Most agencies and half of local governments reported keeping abreast of international and interstate incidents that could similarly occur in WA. A key mechanism used by most agencies was representation on state or national bodies. For example, DFES and P&W are members or associates of organisations such as the Bushfire and Natural Hazards CRC, the Australasian Fire and Emergency Service Authorities Council and the Forest Fire Management Group. These bodies disseminate hazard research and reviews of international and national events.

DFES also reported that membership on various official bodies raised their awareness of current and emerging HAZMAT threats. Staff had joined national and international specialist groups and attended professional development sessions with state science experts, such as ChemCentre.

The Department of Agriculture and Food, Western Australia (DAFWA – now part of the Department of Primary Industries and Regional Development) reported that staff routinely monitor national and international research and participate in international conferences related to biosecurity and emergency disease preparedness and response.

WA Health reported maintaining oversight of best practice (national and international), paying significant attention to emerging disease threats and contributing to national monitoring.

Many agencies reported participation in cross-jurisdictional study tours and assisted in incident response operations. P&W has a formal mechanism for scanning new research, operational procedures, equipment and other developments and conveying them to practitioners or including them in doctrine as appropriate.

Reviews of state incident reports are another mechanism of horizon scanning. Many agencies use the reports to amend their plans, processes and procedures as needed. WALGA stated that it researches the outcomes of all major incidents in the state from the perspective of local government. Just over 40% of local governments reported they comprehensively monitored external incidents.

IN FOCUS

Thunderstorm asthma

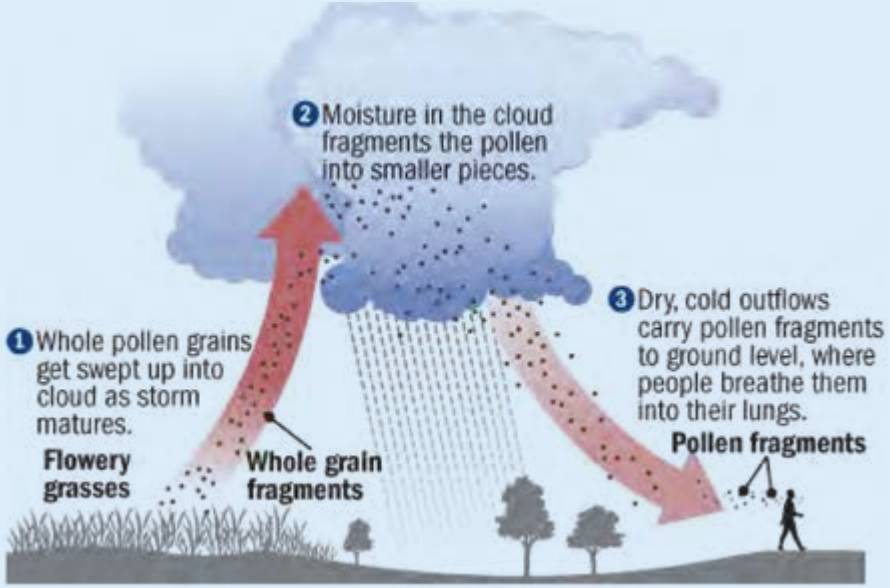


Figure 5. Thunderstorm Asthma event

In late November 2016, Victoria experienced a major emergency event known as thunderstorm asthma (TA). The incident was widespread, occurred suddenly and the immediate cause was not easily identifiable. It affected the lives of thousands of people, greatly stressed and stretched the health system and is thought to have contributed to nine deaths.

What is it?

TA is an epidemic asthma that results from an environmental trigger (e.g. rye grass pollen) in combination with a particular weather system (the thunderstorm). It is caused when pollen absorbs moisture from thunderstorm clouds, bursting them into nanoparticles. This then makes allergenic particles small enough to be inhaled into the lungs and triggering acute asthma symptoms.

This is particularly concerning as it affects the usual asthma sufferers as well as people normally affected only by hay fever.

Many affected individuals were hay fever sufferers and had never before experienced acute asthma. This meant that they were ill equipped to manage the symptoms. It was also found that many existing asthma sufferers did not have up-to-date asthma action plans and were therefore poorly prepared.

The TA event occurred after a particularly wet winter when grasses were flourishing and there was a high pollen count. A comprehensive review of the Victorian incident identified a number of areas in WA requiring attention and improvement.

Forecasting

It was found that there was a lack of a widely publicised, specific and sensitive prediction method for TA. Previous prediction models failed to provide adequate warning and produced a high false positive rate. Deakin University published a warning for TA on its website on the day of the event; however, this warning was not disseminated to the public.

Health system response

While there were several real time indicators, there was a delay in recognising that the TA event was actually occurring. While individual health services noted a spike in demand for services, there was no way to communicate this centrally, or to identify that the surge in demand was widespread.

For example, triple zero (000) calls to Ambulance Victoria experienced a fivefold increase within that hour and an eightfold surge within one 15-minute period. For most health emergencies, there is an easily identifiable cause (car accident); however, this was not the case for TA.

The rarity of the event, coupled with the large area affected and the absence of an identifiable trigger, meant that health systems responded locally. This delayed escalation to state level and the support that escalation brings.

Public health messaging

Lastly, public health messaging was identified as largely inadequate on the evening that the TA occurred. This prompted a review to ensure that adequate and timely public health messaging was available to empower and enable those affected to make informed decisions about their healthcare.

Victorian response

Following this incident, Victorian health authorities have extensively reviewed their response and are actively implementing possible solutions and treatments that include:

- development of a real-time surveillance system
- recognition of the importance of community-wide education
- acute asthma first aid
- investing in research to better predict TA events.

The Victorian event highlighted the issues inherent in responding to an incident that was both unimaginable and unforeseen.

WA relevance

In 2016, following the destructive Waroona fire, the Ferguson Review noted that '*planning should be driven by imagination and foresight, identifying the potential for a future that is different, unseen and unimaginable*'.

As part of its ongoing monitoring, WA Health has proactively examined this issue and identified the areas in the state that are potentially susceptible. They have determined that thunderstorm asthma is most likely to occur in late spring or early summer and that the south-west is considered to be at highest risk, as it has the highest concentration of temperate grasses (predominantly rye grass).

While rye grass pollen was responsible for the Victorian event, WA Health has identified that fungal spores and soya beans are known causes internationally. It was noted, however, that storms in the south-west of WA are more likely to involve maritime air currents and are therefore deemed to be a lower risk than those experienced in Victoria.

WA Health did note that there is currently no available measured pollen count for WA endorsed by the BOM. There is a theoretical count published on a commercial news station; however, this method was yet to be validated.

WA Health is continuing to closely monitor Victorian progress on this matter with a particular focus upon the prediction systems and approaches to identify health emergencies in real time to allow for a swift, coordinated response.

This identification of potential new threats and the proactive attempts to mitigate them reflects well on the maturity of the EM sector here in WA. The principles of the lessons learned in Victoria can be extrapolated for WA to consider our ability to respond to the unknown.

4.6 Lessons management

Achievement objective

- Organisations examine existing and ongoing hazard research.

Key findings

- Lessons management is already firmly embedded within much of the EM sector.
- Significant projects are underway to improve the state's capability in lessons management.
- Collaboration and coordination are likely to be valuable in solution identification and implementation.
- Resourcing constraints hinder agencies, especially local governments, from doing all they would like.

Managing lessons is integral to the continuous improvement of capability, as well as to the preparation of personnel to carry out their functions during actual events. The safety of communities in WA depends on the sector's ability to be able to learn from experience, manage the knowledge gained and develop learning organisations that can adapt to deal with current, emerging and unexpected threats.

The 2016 Ferguson Report identified room for improvement in the capacity to learn from past incident reviews, and opportunities for reform that were not followed through. As a result, the OEM is developing a 'lessons management' framework to capture and manage these lessons.

The framework will measure overall progress while providing the SEMC with an overview of EM. It will define outcome-based performance measures and provide key performance indicators to gauge how well change is implemented. Lastly, the lessons may be validated through exercises or examined during post-incident reports where appropriate.

Meanwhile, the SEMC Response Capability Subcommittee is guiding a concurrent project to develop an exercise management framework. The frameworks will be complementary, ensuring that good practices identified through exercising or incident response will be repeatable.

It is important to highlight that lessons management is already firmly embedded in parts of the sector. The vast majority of respondents reported that they reviewed their performance following incidents, emergencies and exercises and made the necessary changes to improve performance. They all indicated a robust process of engaging with best-practice models, with some publishing literature and driving best practice.

For example, St John Ambulance (SJA) attended an incident at Perth Airport in September 2016 when an airborne plane, with 102 people on board, reported a mechanical fault. After the plane had landed safely, smoke was reported in the aircraft and the passengers disembarked via inflatable slides. Passengers and crew were unhurt. Following the incident, SJA reviewed and amended their *Response Plan for Ambulance Commanders for the Perth Airport*. The changes enhanced SJA capabilities at the airport.

In addition to reviewing their own activities, HMAs, EMAs, service providers and partner organisations are contributing members of a wide range of national and international knowledge-sharing groups. Examples are the AFAC Rescue Technical group, Australian Tsunami Advisory Group, Council of Australian Ambulances and the Australasian Environmental Law Enforcement and Regulators Network. The majority are specialist groups designed to allow members to share expert knowledge and experiences.

Many agencies were able to provide concrete illustrations of interagency support and cooperation. For example, not only does WA Health scan current national and international best practice for the hazard of Heatwave, but they conduct their own research. To help with planning and preparing, WA Health and the BOM have jointly published on heatwave-related health impacts.

Some research undertaken or reviewed by organisations is not specifically 'hazard' related, but rather related to aspects of PPRR (prevention, preparedness, response and recovery). For example, Red Cross incorporates and contributes to research related to the psychosocial impacts of emergencies.

While most EM agencies have dedicated resources and staff with a wide range of tools and techniques at their disposal, local governments reported a different picture.

Many local governments have commented that to keep abreast of EM current trends and best practice they heavily rely upon OEM District Advisors or the jointly funded (DFES and LG) Community Emergency Services Manager (CESM) positions.

Some reported that, due to limited budgets and resourcing, they lacked a dedicated EM officer and they noted that current staff already had a very high workload related to the non-EM aspects of their job. For example, one large local government reported that the manager who looks after EM also looks after an additional two portfolios. This lack of EM resources limits the ability of officers to dedicate time to reviewing information. This finding is reflected by the following comments from local governments:

- *'[We are] time poor, so don't generally go searching for information.'*
- *'Some information is available; however, it is more about the time to read it.'*
- *'We rely on information being provided through the LEMC.'*
- *'The shire … has no capacity to carry out "pre-emptive" reviews/ searching for information.'*
- *'[We] attempt to review reports of inquiries into incidents that are relevant to our immediate region and for risks applicable to the shire.'*
- *'[We] can undertake this type of research only because [we] have a CESM.'*

This is not to downplay the good work being done by many local governments in EM, but rather to highlight the significant work being undertaken with constrained resources.

Local governments do take steps to learn from previous incidents and exercises, but with more time, funding and support, they would like to be more active in the lessons management area.

4.7 Alerts and warnings

Achievement objectives

- Messages to communities at all stages of emergency management are planned, coordinated, prompt, reliable and actionable.
- The messages are clear, consistent, accessible, culturally and linguistically appropriate.

Key findings

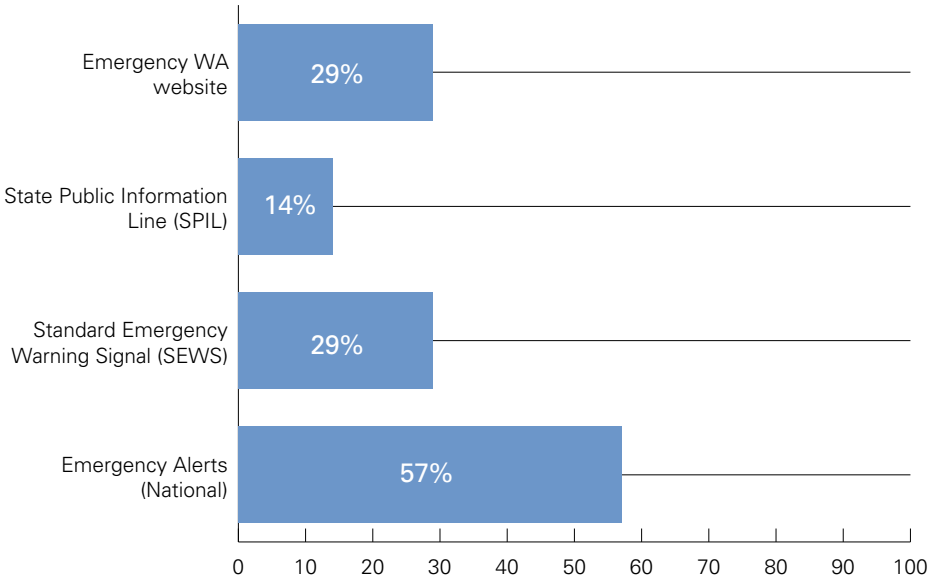
- A range of specific mechanisms exists to alert the public to impending or current emergencies.
- Using a variety of systems to deliver warnings and alerts increases community coverage.
- The fundamental priority of EM is the protection and preservation of life.

During an emergency, alerts and warnings provide the public with life-saving information quickly. There is a range of specific mechanisms, in addition to traditional and social media, to alert the public to impending or current threats. The aim is to broadcast emergency information as rapidly and comprehensively as possible. The mechanisms are:

- The Emergency WA website, which was launched in October 2016. Hosted by DFES, it provides current information about fires, storms, cyclones, floods, prescribed burns and hazardous material incidents. It uses a live feed of triple zero (000) calls to keep information as up-to-date as possible.
- The State Public Information Line (SPIL), which comprises a large-scale telephone call centre for distributing general emergency information. It is established and maintained only when required.
- The Standard Emergency Warning Signal (SEWS), which is a distinctive tone to alert the community to the broadcast of an urgent safety message. It is intended for use as an alert signal to be played on public media such as radio, television, public address systems and mobile sirens to draw listeners' attention to the warning that follows.
- Emergency Alert, which is the national telephone warning system to send voice messages to landlines and text messages to mobile phones within a defined area about likely or actual emergencies. Emergency Alert is managed by the controlling agencies and can send text messages based on both the registered service address of a mobile phone and the last known location of the handset at the time of the emergency. This has enabled a clearer target area for the location-based system to recognise all mobiles currently in the area, whereas the 2G was limited to billing address.

Emergency Alert relies on telecommunications networks to send messages; however, delivery cannot be guaranteed. By simultaneously using a variety of systems to deliver warnings and alerts, agencies maximise their coverage of affected communities.

How do HMAs deliver alerts and warnings?



This combination of alert mechanisms, coupled with traditional and social media, seeks to avoid any single points of failure, so people potentially in peril can make informed decisions about their actions.

During the Avon flood, local governments in the Wheatbelt region referred people to the Emergency WA website for critical information. The shires provided extra information, such as road closures, which was updated every three hours. The updates, along with evacuation information, were available through the website.

The PTA reported effective communications with the public; however, they do not currently use any of the listed alert and warning mechanisms. Their response highlighted that they may use the arrangements in the future. DAFWA also reported that to date they have not used the Emergency Alerts (National) or the Emergency WA website during a biosecurity emergency, although they would if necessary. WA Health reported they have not had an emergency where they needed to issue a specific warning as most of their public communication was 'information' rather than 'alerts and warnings'.

Notices to Mariners are issued by the DoT to advise mariners of emergencies or other events, works, activities and operations that may affect navigational safety. The *MarineSafetyWA* Twitter feed provides regular updates on Temporary Notices to Mariners and anyone undertaking boating activities is encouraged to subscribe.

Alerts and warnings contribute to the focus of the EM sector on saving lives.

On 4 October 2016, the SEMC approved Strategic Control Priorities for the hazard of Fire. This document states that the protection and preservation of life is the overarching priority for the state. Following the 2016–17 southern bushfire season, the OEM, in consultation with stakeholders, assessed the Strategic Control Priorities for their applicability to all hazards and a final endorsement is pending.

4.8 Public information

Achievement objectives

- Messages to communities at all stages of emergency management are planned, coordinated, prompt, reliable and actionable.
- The messages are clear, consistent, accessible, culturally and linguistically appropriate.

Key findings

- Agencies report high levels of planning for (and coordination of) public information.
- Agencies carefully consider communication mediums to ensure messages are appropriate to the urgency, content and audience.
- Despite significant improvements, more can be done to ensure EM information is accessible and culturally and linguistically appropriate.
- Facebook continues to dominate social media usage by EM agencies.
- There was a 50% increase in Instagram usage among EMAs.

Public information refers to general information, preparedness messages and EM communication activities and specifically excludes Alerts and Warnings. Effective and accurate communication can save lives and property and helps ensure credibility and public trust.

Agencies typically tailor the communication methods they use to the suddenness and predictability of the relevant hazard. Most public information, as opposed to specific warnings and alerts, relates to community preparedness, recovery and resilience. Agencies carefully consider which communication medium to use for which target audience to enhance the penetration of their message.

For example, Western Power reported they have preparedness and prevention media messaging that goes out in the form of billboards and flyers. However, at the time of an emergency, more instant communication such as social media is used to share outages and other public information.

Similarly, WA Health reported that signage, pamphlets and brochures were used extensively to inform the public about Human Epidemic. While WA Health's use of social media to provide information to the public is limited, it has been used in recent heatwave events.

Nearly all respondents regarded websites as an essential delivery vehicle. Many local governments reported good engagement with HMAs in the development and distribution of public information, with information sheets created by the HMAs made widely available from local government websites.

While the use of traditional media is relatively static, use of social media is growing. Instagram in particular saw large increases in usage since 2016 with 50% of EMAs and 28% of HMAs now using it. Facebook continues to dominate social media usage by all EM agencies with HMAs (85%), EMAs (70%), local governments (70%) and service providers (50%) using it to deliver public information.

Not reported on last year but widely used is the mechanism of public meetings. All service providers and 50–60% of HMAs, EMAs and local governments reported using public meetings as a vehicle to disseminate EM information. Agencies said they frequently convened meetings in the recovery phase of an emergency and for a variety of prevention and preparedness activities:

- Horizon Power reported regional community managers engaged with remote communities and Elders to ensure remote communities were prepared for hazards.

- DFES and BOM conduct public briefings ahead of the cyclone season each year.
- The Town of Claremont reports holding public meetings when hazard reduction for bushfires is proposed in sensitive areas.
- The Shire of Broomehill–Tambellup coordinated a number of community meetings relating to fire awareness and home safety; however, the shire reported disappointment in the minimal interest shown by the community.

Many agencies reported that while they may not currently use a given technology, under the right circumstances, they were prepared with appropriate communication methods. For instance, DAFWA reported that while to date they have not had a plant or animal biosecurity emergency requiring the use of SMS/Text messaging, there are potential emergencies where this technology may be adopted. In the normal course of animal and plant biosecurity matters, DAFWA updates its external webpage with appropriate information and fact sheets to support response outcomes.

When the damaging insect pest, the tomato potato psyllid (TPP), was detected in WA for the first time in February 2017, DAFWA monitored social media for related posts and replied to them with a 'call to action'. The 'call to action' referred people to the DAFWA website and an incident response landing page with advice on control measures and links to alerts, notices, industry updates and FAQs. A 'call to action' telephone hotline was also set up.

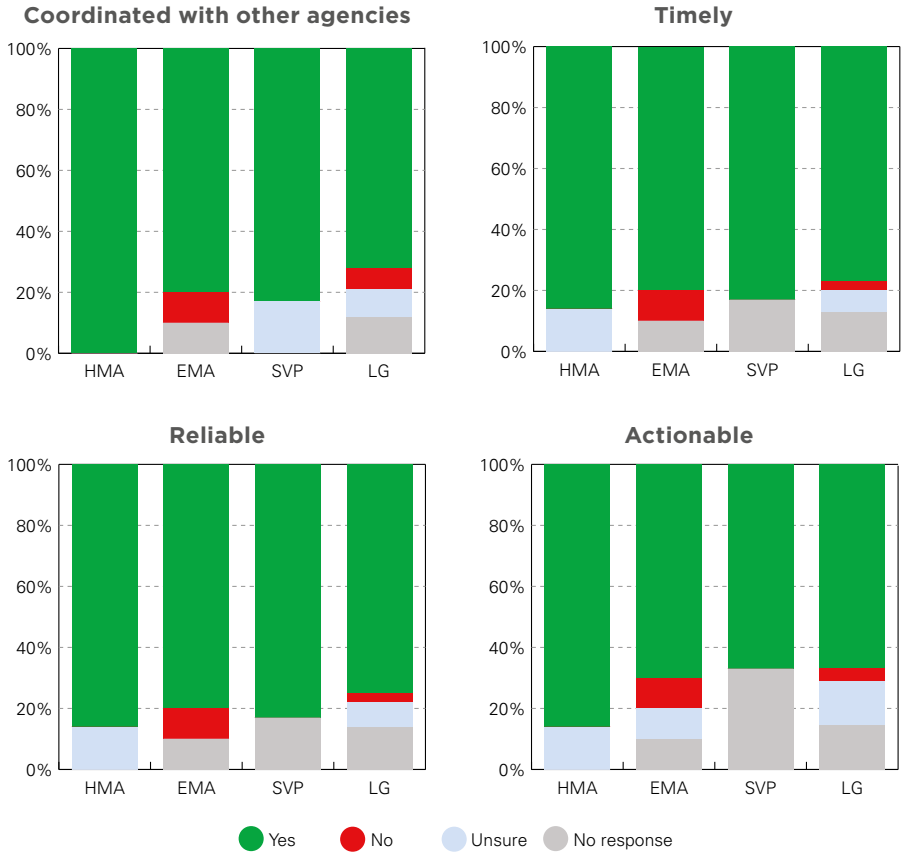
Local governments reported a wide variety of engagement methods, for example:

- The Shire of Laverton issued fridge magnets containing evacuation information.
- In high fire danger areas, some shires saw roadside signage as a very effective medium.
- The Shire of Cranbrook acquired a solar-powered emergency message sign for Albany Highway to alert the community and travellers to potential risks and hazards in the area.
- The Shire of Augusta – Margaret River purchased two new electronic fire-danger rating signs that will be linked to the BOM to provide current and up-to-date fire warning information.
- The City of Wanneroo prepares a showbag, which contains a range of emergency preparedness and readiness information and tools, for distribution at their annual show.

Figure 6. City of Wanneroo's emergency showbag

As shown in the graph below, the coordination of public information is generally very good across all organisations. Most HMAs (85%) reported that procedures were in place to ensure that public information was timely, actionable and accessible.

Are procedures in place to ensure that the emergency and/or hazard information provided to the public is:



The coordination of public information is well established. DFES reported that, depending on the severity of the incident, information is coordinated by the Public Information Officer (PIO). The PIO is provided with local knowledge through the Incident Support Group (ISG) and under the approval of the Incident Controller. Information is provided, where possible, in advance of a threat so the community can make informed decisions. Many local governments reported that they rely on and relay information provided by the HMA.

Generally, emergency liaison arrangements are detailed in the LEMA and information is sourced through interaction with representatives on the ISG or operational area support group (OASG). The City of Bunbury reported that, through their business continuity planning arrangements, they provided a civic PIO to work with the HMA to improve local effectiveness of warnings, using local networks and media.

SJA also reported that they liaised closely with the HMA and other stakeholders to ensure any message was accurate and that the SJA had the authority to release information. SJA only released information that was specific to their organisational role or provided through the HMA.

Agencies reported a range of capability relating to public information. Many agencies and larger local governments reported having specific EM communications plans. The cities of Canning, Joondalup and Cockburn all reported they had a Crisis Communication Plan. The City of Perth said they routinely develop specific EM communication plans and have good cross-agency relationships. This was demonstrated in the light plane crash incident on the afternoon of the January 2017 Skyworks, when all agencies adhered to the Skyworks communication plan.

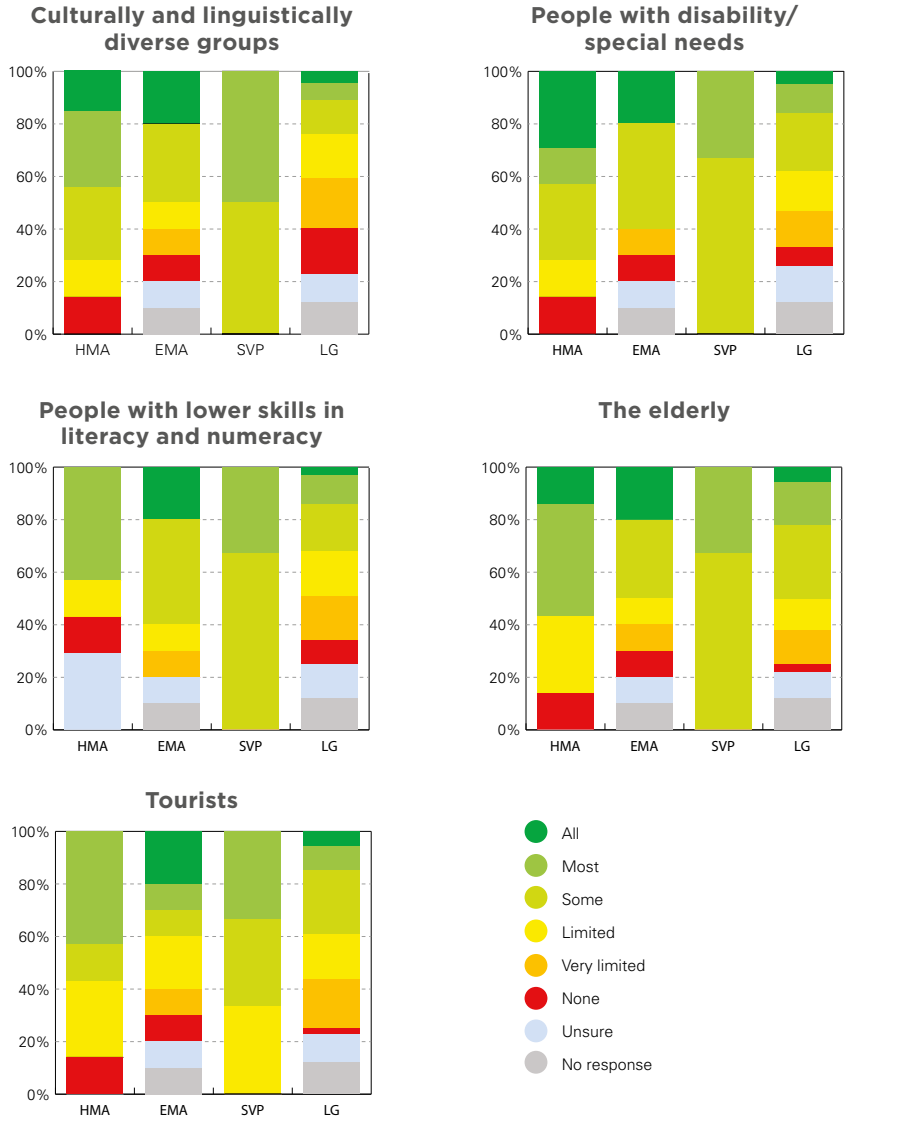
The PTA has a dedicated Manager Corporate Communications and media team to ensure any information is prepared, vetted and then released through a designated spokesperson.

WA Health works with local government in relation to environmental health hazards; with general practitioners in disease control; and with the BOM in heatwaves. While they did not have written procedures in place, their business practices were long-standing.

The Capability Survey also asked whether public information catered for key groups (see graph). While the 2016 report provided information about how well organisations target groups with specific needs, this year's report is able to give a more nuanced picture.

In summary, many organisations provided some level of targeting towards specific groups; however, it was far from business as usual. Some offered to organise a translation service or provide more accessible documents only on request.

Does the public information cater for:



Some local governments reported that it was unrealistic to cater to all language, literacy and numeracy levels, or disabilities given limited resources and the diversity of population. However, 'at risk' groups were usually noted in the LEMA and community representatives were consulted to ensure public information documents were comprehensible. Horizon Power reported maintaining a register of customers with difficulties who were then registered as life support customers. These customers were personally contacted in the event of a hazard such as a cyclone.

DFES reported they used a wide variety of methods to increase the accessibility of their information materials:

- A number of community engagement resources (including bushfire factsheets, cyclone and storm publications) had been translated and were available in different languages.
- An AUSLAN (Australian Sign Language) video had been produced on warnings.
- All community engagement publications were compliant with their 'Disability Access and Inclusion Plan' (DAIP) and alerts were issued visually and via audio messages.

DFES also delivered a training program aimed at increasing the understanding of alerts, warnings and preparedness to at-risk and vulnerable members of the community, including the elderly and people with a disability. Information for tourists, such as the bushfire travellers' checklist, was distributed via community resource centres and visitor/tourist centres in each region.

4.9 Risk awareness and understanding

Achievement objective

- The community is aware of the hazards that may affect them, the vulnerable elements and understands the role they should play during an emergency.

Key findings

- The EM sector believes there are low levels of community knowledge about hazards that may affect them, vulnerable elements and actions they should take in an emergency.
- People who have been exposed to (or who have experienced) emergencies are more likely to access information and are better prepared.
- Local governments report that complacency and apathy are at the root of low community knowledge. '*It'll never happen here*', '*Emergencies happen*', *'somewhere else'* and *'Someone else will sort it out*.'

This year's Capability Survey reaffirms the findings of the previous year with a consensus that community knowledge about hazards is low. This is despite emergency information being very visible across WA. Alerts, warnings, media campaigns, preparedness and readiness information are all widely publicised and readily available.

WA Police noted that community knowledge was highly variable, depending upon the hazard and the community. Many agencies supported this view noting that community uptake was limited unless they perceived a direct risk or threat to themselves, or if they have been historically directly impacted by the risk event.

WALGA and SJA reported that people who have been exposed to or who have experienced emergencies were seemingly more likely to access information and were better prepared. 'Exposure' in this instance could include those emergencies that had received high media coverage. It appeared that media coverage of highly publicised events prompted more of the public to prepare.

P&W pointed to research that showed a significant number of people who did develop action plans, departed from them when hazards occurred. SJA also noted there were always some elements of the community that did not prepare and who expected that emergency services would always be there to help.

Many local governments noted that, in addition to individuals relying on organised response, there was a significant element with an attitude of *'It'll never happen here',* leading to a lack of engagement. Many local governments reported that complacency and apathy were at the root of low community knowledge.

The Shire of Broome said people in the Kimberley did not appear to have the same respect for hazards, such as cyclones, as those in the Pilbara. This was likely due to a number of factors such as a lack of recent impacts on the Kimberley and numerous alerts that did not eventuate.

The shires of Karratha and Exmouth reported that cyclone awareness was high among long-term residents; however, the Shire of Ashburton was concerned that new community members are sometimes unaware of the hazards of living in the Pilbara while some long-term residents can become complacent.

Some parts of the community had a better understanding of hazards than others, particularly when the hazard was more relevant to them. DAFWA, for example, targets most of its attention to industry participants that may be affected by plant or animal pests or diseases. DAFWA conceded that the public's low understanding of these hazards was understandable given that many biosecurity responses generally affected industry, with limited or minimal impact on the public.

They reported that livestock industry stakeholders typically have good knowledge about all aspects of biosecurity hazards that may impact product integrity. This includes preventing incursions, recognising disease and the actions taken by government and industry in response. In general, there was greater variability in the level of understanding of plant industry participants, reflecting the less well coordinated industry.

Where public involvement was necessary or where there is a level of public interest, DAFWA developed appropriate material.

Many regional and rural local governments believed that their communities had substantial knowledge about the hazards that may affect them, the vulnerable elements and the actions to take in an emergency. The Shire of Murchison stated that '*most of the community are self-reliant multi-generational pastoralists or Indigenous families with a long association with the area and have sound knowledge of the hazards that may impact their daily lives*'.

DFES provided more detailed information about knowledge levels regarding each of their hazards. The data supported the consensus that community understanding was variable and that more frequent and more publicised hazards have better awareness.

DFES reported that there was a substantial understanding about cyclones, but qualify this by limiting this assessment to the high-risk areas of the north-west. Seasonal cyclone tours by BOM and DFES in these high-risk regions reinforce the community safety messages and deliver a call to action to the community. It is likely that infrequently impacted areas, such as the metropolitan area, have lower understanding of cyclones and what to do.

What level of understanding do you estimate community members have of:

	The hazard	Vulnerable elements	Actions they should take in the event of the emergency
Bushfire	Some	Some	Some
Collapse	Some	Limited	Limited
Cyclone	Substantial	Substantial	Substantial
Earthquake	Very limited	Limited	Limited
Flood	Limited	Limited	Limited
Hazmat	Very limited	Limited	Very limited
Storm	Substantial	Substantial	Some
Tsunami	Limited	Very limited	Limited

One local government suggested that '***the community largely thinks that emergencies happen somewhere else***' and that '***someone else will sort it out'***.

4.10 Shared ownership

Achievement objective

- Individuals take responsibility to minimise the impacts of emergencies through the preparation and adoption of appropriate mitigation measures. This includes individuals who understand the nature of the hazard, have emergency action plans and who monitor and respond to emergency messaging and alerts.

Key findings

- Emergency action plans appear to have very low uptake across the community.
- The EM sector believes that people will generally understand and respond to emergency messaging, even where no preparation actions have taken place.

DFES launched the Emergency WA website on 23 October 2016 as part of the Are You Ready? campaign. This will be followed by a smartphone app. The website provides a real-time feed of incidents direct from the DFES triple zero (000) dispatch system, providing the public with the earliest indication of incidents. It enables people to get safety warnings and includes total fire bans, fire danger ratings and preparedness and recovery information.

In the 10 months (until 15 August 2017) since its launch, the website has been visited by over 912,000 unique visitors, generating 3.1 million individual sessions and over 7.2 million page views.

The 2016–17 bushfire season was uncharacteristically cool with no bushfires of significant size in comparison to the 2015–16 bushfire season, which was one of the worst in recent history, with two significant bushfires in Esperance and the Waroona district, plus lesser fires.

While Emergency WA was set up as a whole-of-government solution, so far only P&W have successfully joined up. WA Police, Main Roads and others, all use different methods for distributing emergency information.

The new process has yet to be evaluated but the objective is that as government and community awareness of the all-hazard site increases, it will become embedded in community consciousness.

The agencies' reports of low public awareness of EM were based on anecdotal evidence. The agencies have not conducted their own research or directly canvassed the community to confirm this perceived low level of knowledge. An exception is the Shire of Cranbrook, which conducted an emergency preparedness survey in 2015-16. The survey showed:

- 93% of local respondents did not have a family fire/emergency plan written down.
- 75% did not have an emergency kit.
- 64% knew the correct location of local evacuation centres.
- 68.5% said they would take their pets to an evacuation centre
- 42% of pet owners had not considered alternate arrangements for their pet
- 27% said they would not go to an evacuation centre if they could not take their pet.

The Shire of Capel conducted preparedness sessions that revealed most residents did not have any form of emergency plan.

Several small inner metropolitan local governments reported that, due to their location and topography, they had not experienced any recent severe emergencies. As such, they reported that their communities may not feel it is necessary to have plans in place.

What proportion of the community do you estimate:

On the other hand, some local governments that have endured regular large incidents have found the public to be similarly disengaged. The City of Wanneroo, for example, covers a large area – 685 square kilometres, including 32km of coastline – with substantial areas of bushland and forest reserves as well as rural and semi-rural areas. Officials have undertaken a range of initiatives aimed at informing the community:

- Hazards, vulnerable elements and community actions are documented within the LEMA.
- Bushfire advice is provided on the city's website which refers people to DFES for further information.
- Community EM awareness events are held annually at various locations (including Volunteer Bushfire Brigade events) to engage with the whole community. Information is disseminated about the bushfire warning system how to prepare your property and survival plans.
- EM survival kits for the community have been developed, to assist with preparing and protecting the family during emergencies. A USB with EM survival information, including a public copy of the city's LEMA, is included.
- The city is currently seeking a grant to assist CaLD (culturally and linguistically diverse) residents to fully understand the city's EM arrangements. This project will filter across to other vulnerable groups.

The city expressed concerns that, despite the wide range of community information available and active efforts to connect, residents and landowners appeared to remain unaware and/or unwilling to take the necessary precautions to remain safe. This is not to say that improvements have not been made since last year to help the community understand that they share responsibility in an emergency.

The Shire of Cranbrook advised that their policy of notifying the whole community by SMS about emergency events as they occurred had lessened community confusion. The SMS system has also reduced the number of phone calls to the shire office during an event, freeing up staff to assist in other areas.

Last year, it was reported that emergency warnings were ignored as 'white noise'. This year's findings reflect similar attitudes, with the added perception that the community believed warnings are issued needlessly. Respondents reported that repeated emergency warnings seem to lull people into feeling that '*It is the same warning again*' and it does not affect them.

HMAs believe that they traverse a tightrope in relation to public warnings: they are criticised for not giving warnings early enough, yet if they give a warning and an emergency situation does not eventuate, they are also criticised. It seems that community risk awareness is limited to response. Planning and preparing get little attention despite most agencies having a wealth of readiness and preparedness information on their websites and have highly publicised campaigns to spread this knowledge widely. Based upon agency perceptions, it appears as though these messages are not getting through.

4.11 Sector information sharing

Achievement objective

- Engagement occurs between government, industry and communities to inform resilience through the sharing of emergency management information including risks, vulnerabilities and treatment options.

Key findings

- LEMCs, DEMCs and other multi-agency groups share information on a range of topics including risks, vulnerabilities and treatment options.
- While information sharing is generally satisfactory, it tends to be passive.
- Engagement should be improved, especially with industry and communities.

Agencies regularly assess the risks from various hazards. This activity provides considerable information about vulnerabilities, which can then be shared and lead to treatments. Agencies reported that information sharing along formal channels was well established. Many groups, such as LEMCs and DEMCs, discussed issues specific to a local area; others, such as bushfire advisory committees and the SBCC, discussed specific hazards. The LEMA were widely reported as useful mechanisms for recording and sharing information.

Risks

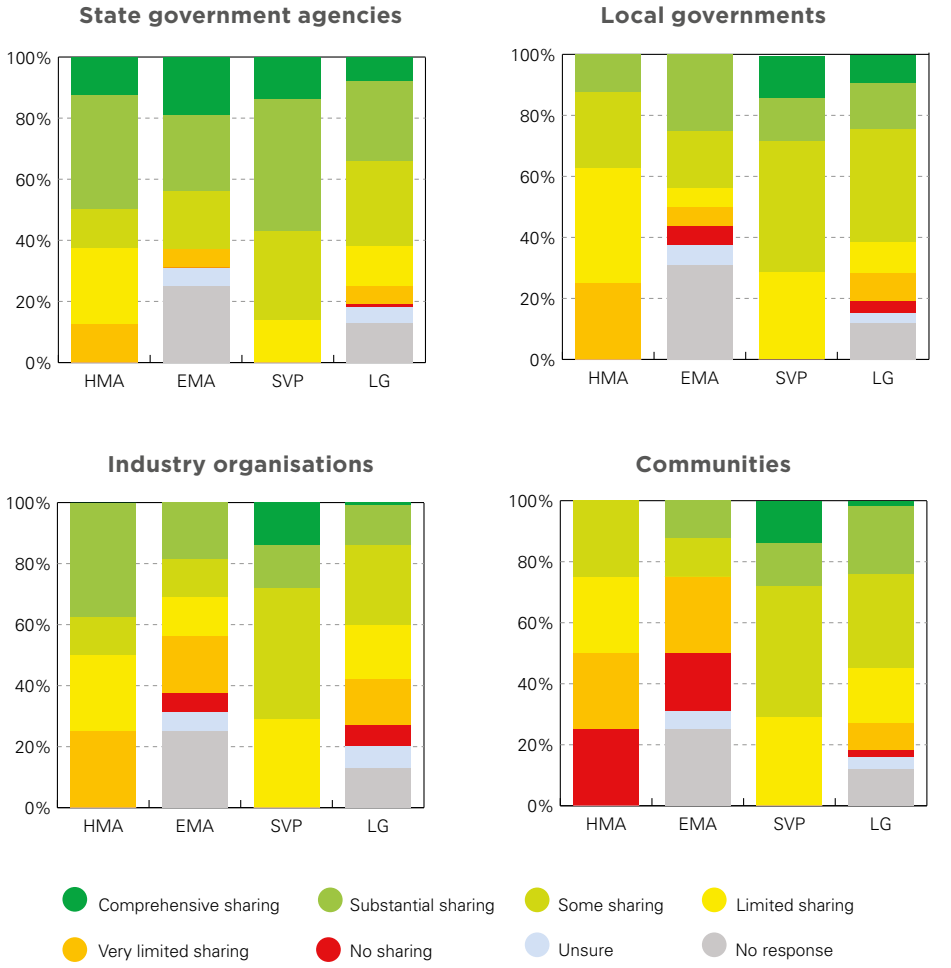
Service providers and HMAs reported good information networks across the board (grey indicates no response). Service providers also proactively engaged with other service providers (e.g. the Essential Services Network Operators Reference Group (ESNORG)).

P&W reported that findings of risk assessments may be shared via existing stakeholder consultation mechanisms such as the SBCC or the SEMC and local and regional bushfire advisory committees. The actual process of planning for bushfire risk management also helped.

WA Police reported that their information sharing was specific and the groups they shared with varied according to the issue concerned:

- Search and rescue (SAR) issues may be referred to the SAR Advisory Group.
- Industry sharing occurred most noticeably through critical infrastructure security and through LEMCs.
- Hazard-specific groups participated in exercises and scenarios.
- Public safety information was shared with the community.

Sharing information about the individual risks with:



Sharing information about risks with the community was generally poor, with local governments engaging the most. On the other hand, the Shire of Cranbrook had liaised continually with the community about local risks (bushfire, flood and storm) over the past 12 months via print and social media and through the shire website.

Far fewer local governments reported active engagement with community groups about risks. The Shire of Broome was an exception. They liaised closely with private organisations (such as native title groups) about potential hazards. While talks focused largely on cyclones and bushfires (due to these being the most serious identified risks), other matters were discussed on a case-by-case basis. The shire reported being committed to working with all stakeholders to reduce the overall risks from any hazard.

For other organisations, direct sharing of individual risks with the community only occurred where organisations had a direct responsibility to do so.

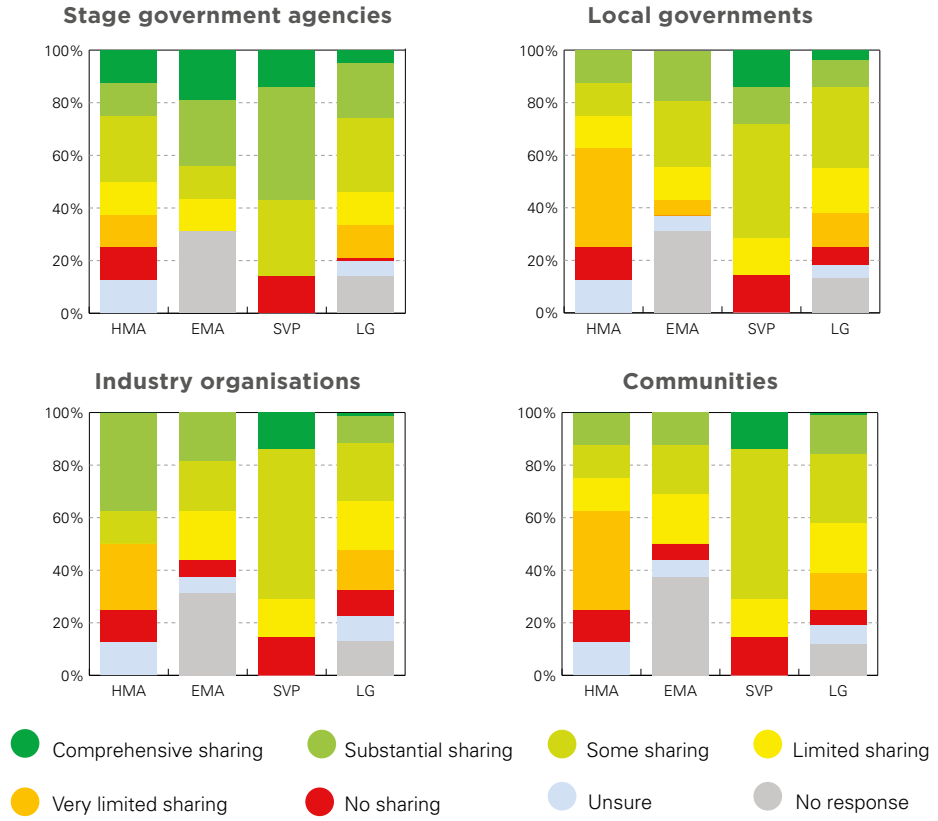
Engagement with industry appears to be sporadic and effort needs to be made to integrate them into information sharing with the EM sector. Some local governments reasonably cited the absence of industry, especially in small rural locations, to account for the lack of information sharing. However, where industry played a significant role in the community, engagement was better.

- The Shire of Leonora reported good interaction with BHP, mainly due to the presence of a major mining centre at Leinster.
- The Shire of Cranbrook reported a range of engagement tactics with the plantation and viticulture industries that were important to the region.

Vulnerable elements

As a policy agency, the Department of the Premier and Cabinet (DPC) holds information about the state's critical infrastructure. They play a key role in sharing information about vulnerable elements in strategic policy discussions with other agencies and the Commonwealth government.

Sharing information about vulnerable elements (e.g. social groups, infrastructure, economy, natural environment) with:



The Bushfire Risk Management Planning project, run by DFES, is currently working with 16 priority high-risk local governments to develop tenure-blind BRMPs. Treatment plans are expected to follow.

Local governments reported a range of key vulnerabilities about which they shared information:

- The Shire of Irwin developed a coastal hazard risk management and adaptation plan.
- The City of Joondalup analysed vulnerable elements while they developed a risk register, engaging agencies, local government, industry and, to a lesser extent, the community in consultations.
- The Shire of Murray sought to identify damaged assets and services of value; however, not all vulnerable elements were shared.
- The Shire of Gnowangerup shared information about vulnerable elements in terms of roads subject to flooding and property in the path of bushfires.

Once again, while the result showed that local governments shared information about vulnerable elements, the process was largely through the LEMA and often passive.

Further, there is an indication of some confusion over exactly what constitutes 'vulnerable elements'. Local government EM planning must consider any groups within the community whose circumstances may require special arrangements and include this information in the LEMA; these groups are usually referred to as 'vulnerable people'. It appears that many local government respondents have interpreted the question narrowly and responded only in reference to the 'people' element.

Vulnerable elements can cover a wide range of both tangible and intangible factors, some examples include:

- critical services (e.g. health, water and telecommunications)
- infrastructure (roads and bridges)
- economic production facilities and livelihoods (industry, banking, factories and livestock)
- public assembly sites (schools and offices)
- cultural artefacts (buildings of architectural importance).

Intangibles include social cohesion, community structures and destruction of the environment. Several local governments referred to a more specific and optional Vulnerable Communities Plan. For example, as a third of Canning's population comes from a CaLD background, the city is working on a Vulnerable Communities Plan. The plan aims to identify all relevant community groups and will be based on extensive consultation with local communities, state agencies and local organisations. This will, in turn, create opportunities for sharing information.

So while this focus on vulnerable communities is recognised and worthwhile, it is unclear in some instances what other vulnerable elements are being investigated and, consequently, what information is being a shared.

Treatment options

Risk treatment involves developing a range of options for mitigating risk, assessing those options and then preparing and implementing action plans. The highest rated risks should be addressed as a matter of urgency.

Broadly speaking, organisations reported that a substantial amount of information on risk treatment options was shared. For example, DFES conducted and documented risk assessments undertaken on behalf of the Department of Education for primary schools in bushfire prone areas. In their advisory role under the State Planning Guidelines, DFES provides treatment option advice to the decision makers.

WALGA noted that risk treatment options was a relatively new field which required further clarification by the OEM to establish clear guidelines, particularly in the area of shared responsibility and managing residual risk between agencies. They argued that risk must be managed from local through to district levels to enable properly identified and quantified projects to be established with considered cost arrangements to get the required results.

Comments in the Capability Survey largely supported WALGA's view that the OEM needed to describe risk treatment options more thoroughly. In the meantime, the rollout of the local emergency risk management process by the OEM is having a positive effect. Local governments have indicated that the process will provide an opportunity to improve in this area.

- The Shire of Busselton advised that treatment options would be discussed in priority order within the LEMC.
- The City of Stirling advised that while sharing was currently limited, a planned review would allow the city to substantially increase its sharing regime with stakeholders.
- The City of Canning reported that compliance orders (e.g. annual hazard reduction inspections) constituted treatment for fire and environmental health hazards. Further, they anticipated greater sharing outcomes through the risk assessment process and in determining appropriate or additional mitigation treatments.

LEMCs and DEMCs are once again seen as a very powerful tool for sharing risk treatment options. For example, Horizon Power advised that through their attendance at DEMC exercises and risk workshops in regional areas, they were able to offer insights into treatment options related to electrical infrastructure. In addition, Horizon Power contributes to the development of treatment plans / options relating to infrastructure supporting its operations (e.g. loss of roads or bridges).

The City of Belmont noted that, in addition to treatment options being included in the LEMA, city officers also shared information with peer groups, professional bodies, the regional council and specific project working groups.

IN FOCUS

Cancellation of Australia Day Skyshow

For the past 32 years, up to 300,000 people have gathered annually to attend the City of Perth Australia Day fireworks celebration. Activities run all day with most taking place around the Swan River on the Langley Park foreshore, South Perth, Crawley Bay, Kings Park and Melville Waters.

Preparations for an event of this magnitude and importance involve a huge array of contributors and planning activities throughout the year. Nothing is left to chance; numerous government and non-government entities unite to consider, plan, test and exercise every likely aspect of the day's activities, including unforeseen events.

The first step is assessing the previous year's event. This post-operational assessment is a vital component that looks at what worked, what didn't and what could have worked better. This allows all involved to fine-tune and hone every element of the day. There is a detailed analysis of the event that runs for around 14 hours, with a peak six-hour window between 3pm and 9pm. During this window of time, activities culminate in the Skyshow itself. From this point, the logistics of safely clearing the 300,000 spectators come to the fore.

On the day, the management of this event is coordinated at many levels. Each agency sets up or activates operational control rooms. This allows for the monitoring of activities and direction of staff to meet peak surges of demand. In addition, centralised coordination points are established so that a complete multi-agency coordinated response can occur.

For example, WA Police established and activated their Major Incident Control Centre (MICC) in Maylands on 26 January this year, primarily to manage public safety and good order at the event. In addition to normal frontline business, there was an additional contingent of about 440 staff.

Beyond the police component, the MICC command team included representatives from:

City of Perth	City of South Perth	DFES
PTA	St John Ambulance	Main Roads WA
Western Power	AEP Security	

Figure 7. The Australia Day MICC command team

The MICC is equipped with state-of-the-art technology, full-sized video screens across the walls and CCTV footage from fixed and mobile devices throughout Perth. Each representative from the agencies in the MICC performed the role of liaison officer for their agency.

As part of the festivities, an air show is held over the Swan River entertaining crowds in the afternoon as they begin to gather for the show. This annual aerial display required a representative from the Civil Aviation Safety Authority and the Australian Transport Safety Bureau to be on standby.

On 26 January this year, the temperatures in Perth were high resulting in a later-than-normal intake of crowds to Perth's Langley Park foreshore and CBD surroundings. Shortly after 5 pm, an aircraft participating in the air show plunged into the river and broke into two large pieces. Crowds and families were stunned as police, marine rescuers and spectators on boats and jet skis rushed to the wreckage. The pilot and passenger were fatally injured.

The City of Perth Lord Mayor and the Acting WA Police Commissioner were participating in a live television interview from the South Perth foreshore when the incident occurred. Immediate discussions led to the cancellation of the event as a mark of dignity and respect.

With the decision to cancel the event made, a number of things needed to be done. In particular, the large number of people in the city needed to leave (safely) as an even larger contingent was still headed in to watch the now-cancelled event.

While a plane crash was not specifically planned for, all of the pre-planning was done and structures established to effectively deal with any eventuality. Once the decision was made and communicated to the MICC, the presence and co-location of key agencies allowed for this message to be relayed quickly, clearly, consistently and simultaneously across agencies.

The PTA and frontline police officers received the message and communicated directly to the crowds both at the event and en route. The PTA has a number of effective systems in place to relay information to the public during an emergency such as:

- evacuation warning information systems installed at the Perth Underground, Esplanade and Perth stations
- PA systems installed in trains

- Long-line PA systems installed on stations that can all be used in support of an extensive CCTV monitoring system
- SMS messages that can be sent to subscribers to Travel Easy
- the Transperth Call Centre.

The PTA's messaging was prompt and effective as PTA transit officers across the network notified passengers seeking to board trains and buses even before the news had reached the media outlets. The Acting Police Commissioner conveyed the same message publicly via media outlets, complemented by social media, with WA Police using their extensive audience of Facebook and Twitter followers.

Figure 8. WA Water Police

A multi-agency response and an operational area support group (OASG) were established. WA Police, who are the HMA for the hazard of Air Crash, consulted the State EM Westplan (Air Crash). In an EM sense, this was not a major emergency; it was handled cooperatively as part of business as usual. The structures and planning of the day's events and the Air Crash Westplan, coupled with the co-location of relevant agency liaison officers, enabled this incident to be managed as well as it was.

As part of Australia Day 2017 planning, a range of teams and agencies were on standby ready to respond:

- WA Water Police were located on the river with divers ready and were able to reach the site of the incident immediately. They also maintained the integrity of the crash site for further investigations.
- P&W deployed a portable barrier around the site to minimise the impact of liquid contaminates spreading.
- DFES rendered the plane's fuel tank safe by removing the remaining aviation gasoline.
- The pyrotechnics company secured all barges containing unused fireworks until they could be safely deactivated.

While the main fireworks display was cancelled, there were many people still seeking to see fireworks. Planned fireworks displays were already scheduled to take place in Fremantle and at the Ashfield Reserve in the Town of Bassendean. As crowds were diverted from the CBD, many people chose to redirect to the nearest location holding a fireworks display. This saw greater than expected numbers of people attending these locations.

The movement of crowds was able was able to be monitored from the MICC and messages communicated effectively and quickly. This allowed agencies to redeploy personnel from the CBD to the locations where the crowds would now be congregating. Crowd management was then coordinated efficiently, avoiding any public disorder.

As an aside, the year 2017 marked '100 Years of Women in Policing'. Coincidentally, the police officers who led and coordinated the police contingent on Australia Day (Police Commander and Deputy Police Commander) were both senior police women. They were in charge throughout the incident, skilfully coordinating the multi-agency responses.

The decisive response and cancellation of the event received overwhelming support from the community. The timely and consistent messaging setting the tone of public empathy and support contributed greatly to the successful management of the incident. It was a cooperative multi-agency approach and an excellent example of collaboration between agencies.

4.12 Land-use planning

Achievement objective

- Land use planning is in place to manage and minimise the impact of known risks.

Key findings

- Land-use planning is an effective tool to proactively mitigate the impact of hazards on communities.
- While land-use plans are widely used for bushfire (80%) and flood (67%), they are not commonly used for other hazards.

The primary aim of land-use planning is to provide for the sustainable use and development of land; however, if used appropriately it can be a powerful tool to limit exposure to hazards.

The Western Australian Planning Commission (WAPC) has responsibility for land-use planning in WA, support by the Department of Planning. The State Planning Policy (SPP) and associated policies guide proposed development. Some of these relate directly to hazards, including:

- State Coastal Planning (SPP 2.6)
- Flooding Mitigation (SPP 2.9)
- Natural Hazards and Disasters (SPP 3.4)
- Planning in Bushfire Prone Areas (SPP 3.7).

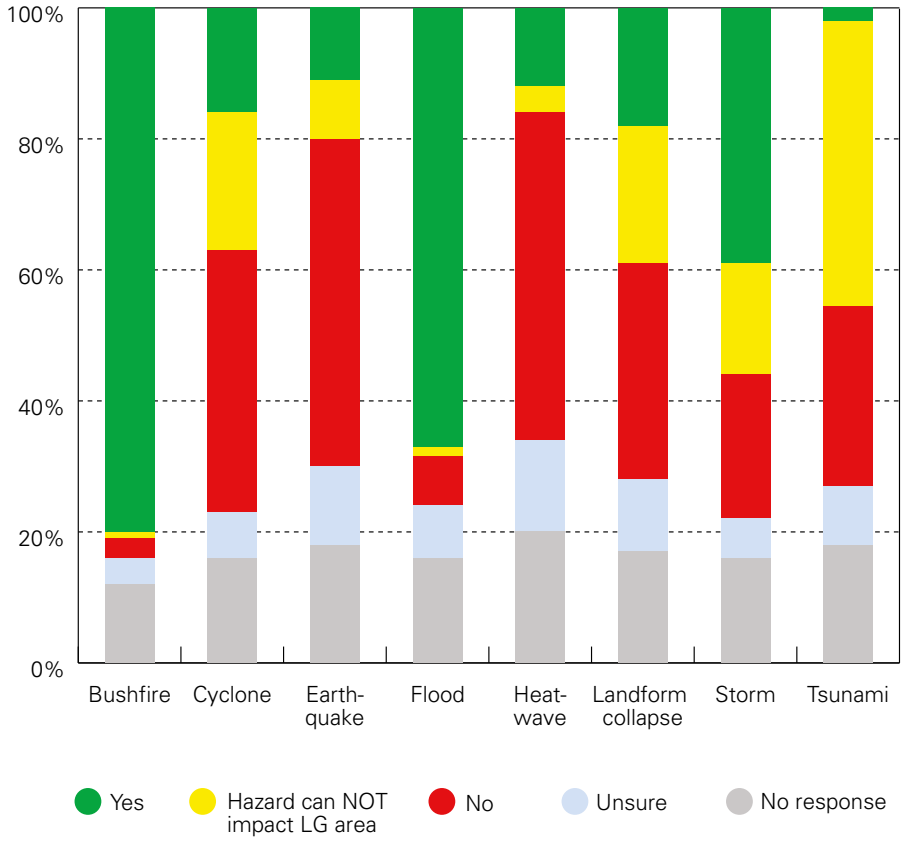
Few agencies (other than the Department of Planning) reported any involvement in land-use planning. Where they did, the focus was Bushfire. As the HMA for Bushfire, DFES advises decision makers in accordance with state policy. P&W and DAFWA also contribute, but their contribution applies mainly to state-managed land.

Agencies with significant assets or infrastructure that may be at risk also contribute – especially the Housing Authority, PTA and Main Roads. These agencies look beyond Bushfire alone.

Main Roads and the Water Corporation focus on the safe design and construction of infrastructure. The Department of Water and Environmental Regulation (DWER) provides advice in non-emergency situations, such as control of industrial emissions.

In response to heightened awareness of Bushfire, planning approvals in the City of Canning are subject to risk assessment and require new developments to provide more than one point of vehicle access and egress for emergencies. Building Protection Zones and changes to building codes and regulations help reinforce emergency preparedness.

LGs use of land use planning to manage and minimise the impact from:



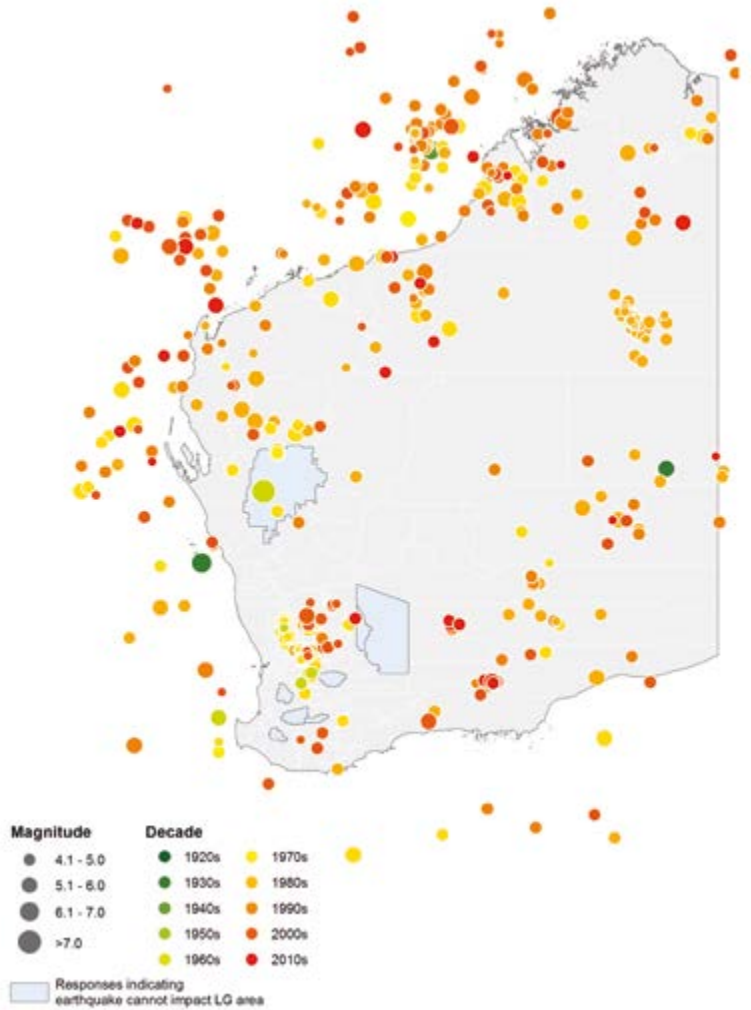
Most local governments (84%) reported involvement in land-use planning, including statutory obligations under town planning schemes. The survey asked if they used land-use planning to minimise the risk from natural hazards. The responses showed that most used it to plan for Bushfire (80%) and Flood (67%). Other hazards — Cyclone, Earthquake, Heatwave and Landform Collapse — were less prominent.

Some local governments rightfully reported that particular hazards did not apply to them. For example, Tsunami was expected to directly affect only coastal areas and is therefore not relevant for inland shires. However, the responses to this question do indicate that the level of awareness of natural hazards is low among local governments. Many local governments have reported being **unable** to be impacted by common events such as storm.

By way of example, the *'Earthquakes in WA 1920-2017'* map shows the location of earthquakes recorded in WA between 1920 and 2017 and the local governments that report that they do not expect to be affected by Earthquake. Five earthquakes have occurred in the Shire of Murchison since 1940. These include one of Australia's largest known onshore earthquakes, the Meeberrie Earthquake (magnitude 6.8), in 1941. Yet the shire's response was that Earthquake cannot affect their local government area.

While the map depicts historical earthquakes, future earthquakes may occur almost anywhere. The 2003 Earthquake Hazard Map for Australia, which is included in building codes, shows where local governments are known to be at risk.

Earthquakes in WA 1920–2017



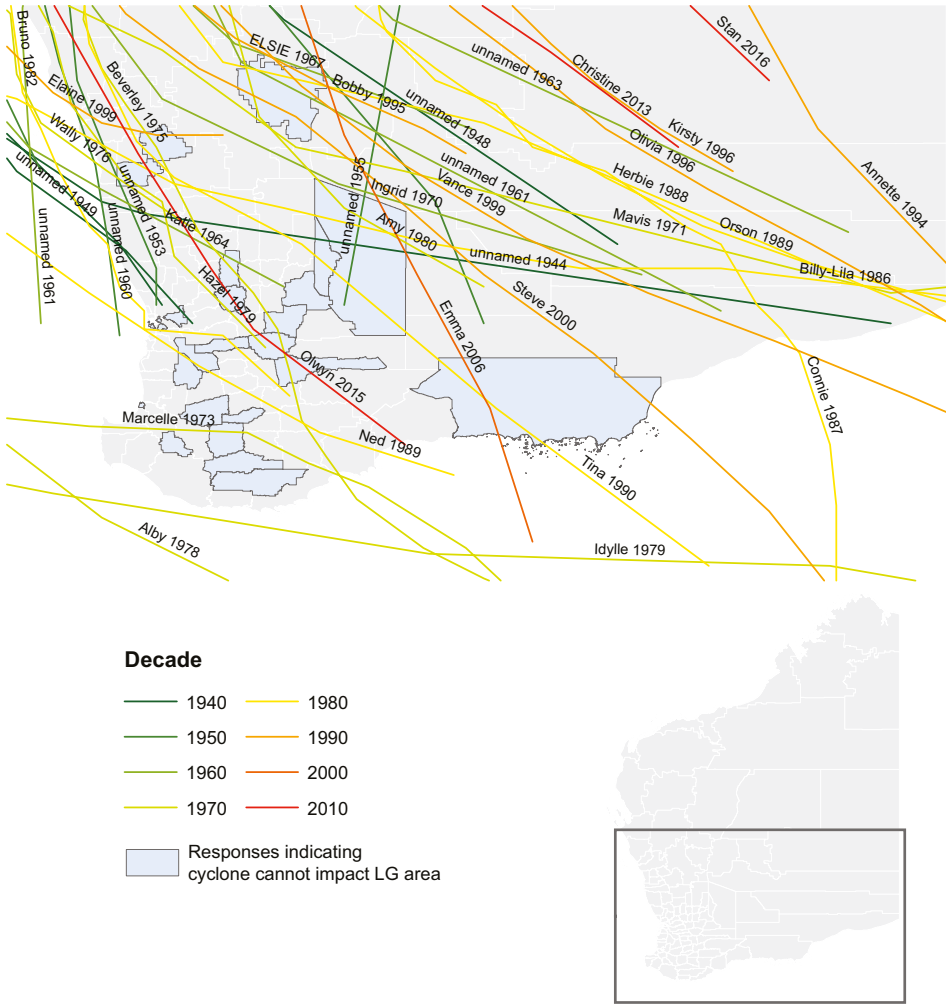
Source: Geoscience Australia Earthquake Database 2017 used under Creative Commons Attribution 4.0 International licence

Similarly, 29 local governments in the south-west reported that Cyclone could not impact their area. The map (right) shows the track of cyclones crossing the south-west between 1940 and 2017. While infrequent, cyclones have crossed most of these local government areas in the past 70 years.

Human beings are often known for having short memories, highly susceptible to bias and seemingly predisposed to underestimate the likelihood of dramatic change.

The overall aim must be to traverse from problem identification to action and on to providing a sustained effective solution. Land-use planning is a cost-effective tool for reducing risk but only if there is an acceptance that hazards exist.

Cyclones crossing the south-west of WA 1940-2017



Source: BOM Tropical Cyclone Database 2017. Copyright Commonwealth of Australia 2010 BOM

4.13 Ecosystem management

Achievement objective

- The natural buffers that aid community protection are identified, protected, monitored, maintained and/or enhanced.

Key findings

- Natural ecosystems can be the first line of defence against natural disaster.
- Management of natural buffers is more prevalent along the coast because of coastal management, dune preservation activities and the work of coastal care groups.

Natural ecosystems can be the first line of defence against natural disaster — local wetlands reduce flooding, vegetation stabilises slopes, sand dunes prevent coastal erosion. Concerted action is needed to identify, protect, monitor, restore, maintain and enhance these natural buffers.

P&W is responsible for the environment on land they manage. Three in every four local governments reported having a role in managing the natural environment. However, few rated natural buffers highly. Of the 21% who identified natural buffers that may aid community protection, less than half (47%) had attempted to protect the buffers and only 17% actively sought to maintain or enhance them to a meaningful level.

Many of the local governments that do manage natural buffers are located on the coast. They use coastal management and hazard plans to preserve ecosystems and work alongside coastal care groups to preserve dunes.

A good example of the importance of maintaining natural buffers is in Carnarvon. The coastal wetlands, mangroves and clay pans provide natural barriers against Bushfire. The shire reported that it regularly monitors and maintains the wetlands and mangroves. This proactive environmental custodianship provides a low cost measure to help protect the local community and increase resilience.

P&W reported they use natural buffers to suppress Bushfire wherever possible. However, the reality is that WA has few natural buffers that can help control the spread of fire.

Biosecurity is designed to protect the state from the entry and spread of pests and diseases that may affect the economy (agriculture, industry) and human health. As the HMA for the prescribed hazard 'Animal or Plant: Pests or Diseases', DAFWA is responsible for emergency preparedness in case of pest or disease outbreaks. The department leads response and recovery operations, in conjunction with the Commonwealth Department of Agriculture and Water Resources.

4.14 Infrastructure protection

Achievement objectives

- Plans are in place to identify and protect critical infrastructure, community assets and individual housing.
- Effective use of building codes is in place to mitigate potential hazards and insurance is considered as a treatment option.

Key findings

- All applicable HMAs, EMAs and service providers report having plans in place for the protection of critical infrastructure.
- The quality of these plans varies from poor to modern and fit-for-purpose.

Modern society is increasingly dependent upon infrastructure (roads and bridges) and services (power, water and sewerage) for wellbeing.

In the EM context, however, 'infrastructure' extends beyond these physical structures and services to include supply chains (food), information technologies (systems and banking) and communications networks. A serious breakdown in such infrastructure would leave communities unable to maintain the deliveries of goods and services on which the population depends.

The EM sector has identified the state's critical infrastructure and documented plans to maintain continuity (as far as possible) or at least rapidly restore service following an interruption.

DFES reported plans to protect infrastructure from most hazards (with the exception of Tsunami and Earthquake, which have low likelihoods but the consequences of likely impacts may be extreme). The DFES plan for Bushfire is high quality but the plan for Storm is reported as untested or outdated.

Brookfield Rail reported their formalised plans were tested, effective, reliable and embedded within the organisation. Other HMAs said they had informal plans to protect infrastructure but that more work was needed.

The Public Utilities Office did not have their own plans but reported working closely with private industry in support of their plans. Relevant service providers all reported having plans in place, with most organisations reporting their plans were of 'high quality'.

Local governments play an important role in infrastructure protection, both as owners of assets and as custodians for the wellbeing of the local community.

However, their response to infrastructure protection was variable. Most (72%) reported having at least some plan in place to protect critical infrastructure. Some without a plan nevertheless reported undertaking physical works to protect infrastructure. Still others considered the protection of infrastructure was a job for response organisations.

The value of an asset or service within a community is subjective. For example, a local feed store in a rural community will not rate highly from a state perspective. However, the continued operation or rapid restoration, of such a store is likely to be a critical element in the recovery of that community, providing the opportunity to return to business as usual after an emergency.

4.15 Essential service protection

Achievement objective

- Planning for the continuity or rapid restoration of essential services are in place including: water, food distribution, power, sewerage, telecommunications, fuel and local government services.

Key findings

- Protecting essential services is predominantly viewed as the responsibility of the asset owner.
- Few agencies have considered the broader impacts or interdependencies.
- There is room to improve awareness within the EM sector of the interdependency of services.

Essential services, such as power, water and shelter, are vital in maintaining the health and welfare of the community. Their disruption in emergencies directly affects society. Yet there remains little recognition of the high degree of interdependency between services. For example, many respondents believed that responsibility for the continuity of essential services rested solely with the service provider.

Most respondents tended to consider the question of service protection narrowly; they had protection plans in place for only the services that they relied upon (power, water, shelter). Individual agencies reported they had contingency plans based on the services they provided – Public Utilities Office (electricity), CPFS (shelter and accommodation for displaced people) and local governments (services). But few had considered the broader impacts or interdependencies.

An exception was evacuation centres. These have been extensively assessed and plans are in place to maintain the continuity of food, water, shelter and power for those people directed to emergency centres during an emergency.

Service providers have the greatest proportion of plans in place to protect essential services. This reflects not only their ownership of the utilities and a commercial imperative to maintain service but also a deep understanding of the interdependence of supplies. Agencies with commercial linkages have developed a mature approach to EM, accepting that if an event has the potential to impact upon service delivery, then it should be planned for.

HMAs reported having plans in place for the protection of most essential services. However, few covered sewerage and road networks. Continuity planning for road networks was limited across all agencies — with the exception of Main Roads and local governments that considered road networks as part of their core business.

Specific continuity plans for fuel (i.e. fuel stockpiles) were rare. However, state plans provide for critical services (power, water, communications and medical services) to be resupplied as a priority.

WA Health reported that contingency plans varied across sites depending on their age. Newer facilities had comprehensive water and power redundancies and most acute care facilities had their own power generation capability, provided fuel could be resupplied.

The Shire of Augusta – Margaret River has purchased a generator trailer to provide power to the administration building or depot in the event of an emergency. They also intend to upgrade an existing bulk water tank for emergency use and are planning alternate evacuation routes in their LEMA.

Similarly, the City of Belmont has repair crews trained and available for recovery, fuel storage, business continuity plans (for local government services), prescribed evacuation centres and auxiliary generators for some civic buildings and evacuation centres.

IN FOCUS

WA Police surge planning

In an emergency, organisations need to gain rapid access to their staff and resources. Moreover, they have to do this while maintaining core functions. Bearing this in mind, WA Police developed the '100–500 Plan'. This plan delivers a 'surge' capacity that can quickly provide 100 or 500 officers and equipment to an emergency, while still maintaining their core operations.

Figure 9. WA Police State Operations Division staff

The plan outlines four response levels:

- **Initial response** – deployment of 100 operational officers and equipment to the scene within one hour.
- **Progressive deployment** – mobilisation of a further 400 officers and equipment within 24 hours to support those first up – a progressive but scalable response.
- **Specialist deployment** – replaces *progressive deployment*, if WA Police requires specialist services. In this case, an additional 400 officers with specialist skills are made available to support those already deployed under the *initial response* level.
- **Stand down** – officers return to normal duties.

Each of the metropolitan WA Police districts support the '100–500 Plan' by providing a range of officers across the ranks.

Not only do WA Police have the surge plan, but they exercise it regularly. The existence of the plan ensures that WA Police are able to rapidly access staff in an emergency. Regular exercises provide the assurance that it will work when required.

Figure 10. WA Police Tactical Response Group

The plan is not 'hazard specific'. Any emergency could qualify. For instance, in the event of an earthquake, large numbers of police could be rapidly deployed to support DFES, who would be the responsible HMA. They may:

- support evacuations
- ensure the security of impacted areas
- identify disaster victims
- conduct regular operations.

WA Police recognise that some emergencies are inevitable. So too is the need for agencies to respond to them.

The '100–500 Plan' reflects the mature approach that WA Police has shown towards its roles within EM. Possibly most impressive is that this maturity first came into being with the initial development of the plan in 2001.

4.16 Minimise single points of failure

Achievement objective

- Exposure to hazards is limited through the minimisation of single points of failure and that mitigation options or redundancy planning are in place.

Key findings

- Agencies report identifying and where possible minimising or building redundancies for single points of failure.
- Road networks represent a common challenge in many parts of the state with single road access reported in many shires.
- Other key areas of failure are identified as ICT and key personnel or expertise.
- Information technology, critical assets and key personnel and expertise were other challenges.

A single point of failure is a part of a system that, if it fails, will stop the entire system from working. These are those areas where no backup (redundancy) exists.

In an emergency context, single points of failure reflect critical interdependencies and have the potential to cause cascading failure of other systems. For example, a power failure has the potential to affect potable (drinkable) water, wastewater and telecommunications.

The failure of communications has the cascading effect of shutting down systems that rely upon it (such as banking). Identifying single points of failure is important to:

- increase resilience
- understand interdependencies
- improve contingency planning.

The 2017 Capability Survey asked EM agencies and local governments to report on the identification of single points of failure with a particular focus upon their impact on power, telecommunications, water, sewerage, road networks, critical assets, ICT and key personnel and expertise.

With the exception of the DoT (Marine Safety), all HMAs reported they had identified single points of failure for their hazards and/or area of operation. DFES noted that while operational plans were in place for most hazards, this was not yet the case for Tsunami. Several HMAs said the work of identification was ongoing and shortfalls were being addressed.

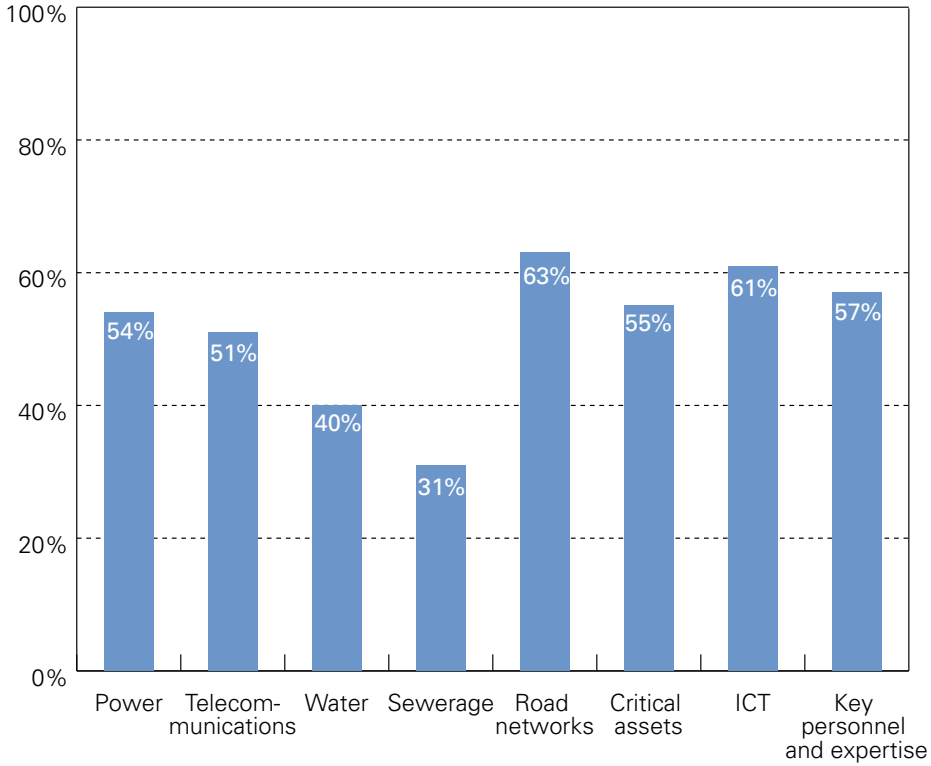
Most EMAs were using risk-based planning to identify areas of weakness. The Department of Housing identified that power and water represented a significant failing for about 81 very small Remote Essential and Municipal Services (REMS). While Housing operated a 24-hour emergency response service to these remote communities, access was hampered during the wet season.

All companies with direct control over infrastructure such as Western Power, Horizon Power, ATCO Gas and the Water Corporation reported having plans in place to identify single points of failure for their assets. Many also reported having or developing redundancy systems to maintain service provision throughout emergencies.

Just under half of local governments (49%) reported identifying potential single points of failure, with many citing road networks.

- The Shire of Broome reported that the loss of the highway or airport would severely limit the ability to supply Broome, which was located on a peninsula.
- The Shire of Ashburton reported that the town of Onslow was serviced entirely by a single road in and out. Other local governments reporting single road access included the shires of Wyndham – East Kimberley, Carnarvon, Shark Bay, Gingin, Waroona, Serpentine–Jarrahdale, Capel and Dardanup.
- The Shire of Denmark identified the Denmark River Bridge as a significant potential choke point.
- The Shire of Wandering identified a number of choke points for the community that would result in a heavy reliance on neighbouring shires.
- The City of Canning reported developing disaster recovery capabilities for their ICT infrastructure. Coupled with business continuity plans, this recovery capability would enable them to maintain core services in the event of a major emergency.
- The shires of Dandaragan and Serpentine–Jarrahdale cited unreliable telecommunications as a problem.

Identification of single points of failure by LGs



Other areas of concern for local governments related to the inability to have redundancy systems in place. This was particularly evident in the areas of ICT, critical assets and key personnel and expertise. There was also a strong reliance on the continuity of the power grid.

An effective mitigation action for single points of failure is communicating them to those that may be affected so that they know to plan. While the level of information sharing was generally good among state agencies, it dropped off considerably for communities and industry organisations, where it is generally limited. The exceptions were DAFWA (from the HMAs) and BOM, P&W, WALGA and SJA (from the EMAs), who reported strong links with industry and communities but less developed arrangements with state agencies.

Service providers all reported at least some sharing with most groups. The notable exception was Telstra who reported either limited or no sharing across state agencies, local governments, industry organisations and communities.

Lessons from past events are also essential to identify and reduce single points of failure. All HMAs and service providers reported drawing upon past events and exercises to evaluate their performance. 80% of EMAs and 81% of local governments reported the same.

4.17 Remoteness planning

Achievement objective

- Emergency management planning takes account of emergencies occurring in remote areas of the state.

Key findings

- ABS classifies 80% of WA as remote or very remote.
- Potentially hundreds of kilometres can separate the site of an emergency from the nearest HMA or volunteer unit.
- Reaching remote locations in a timely manner during an emergency is an enduring issue.
- Agencies report having plans in place to address this.

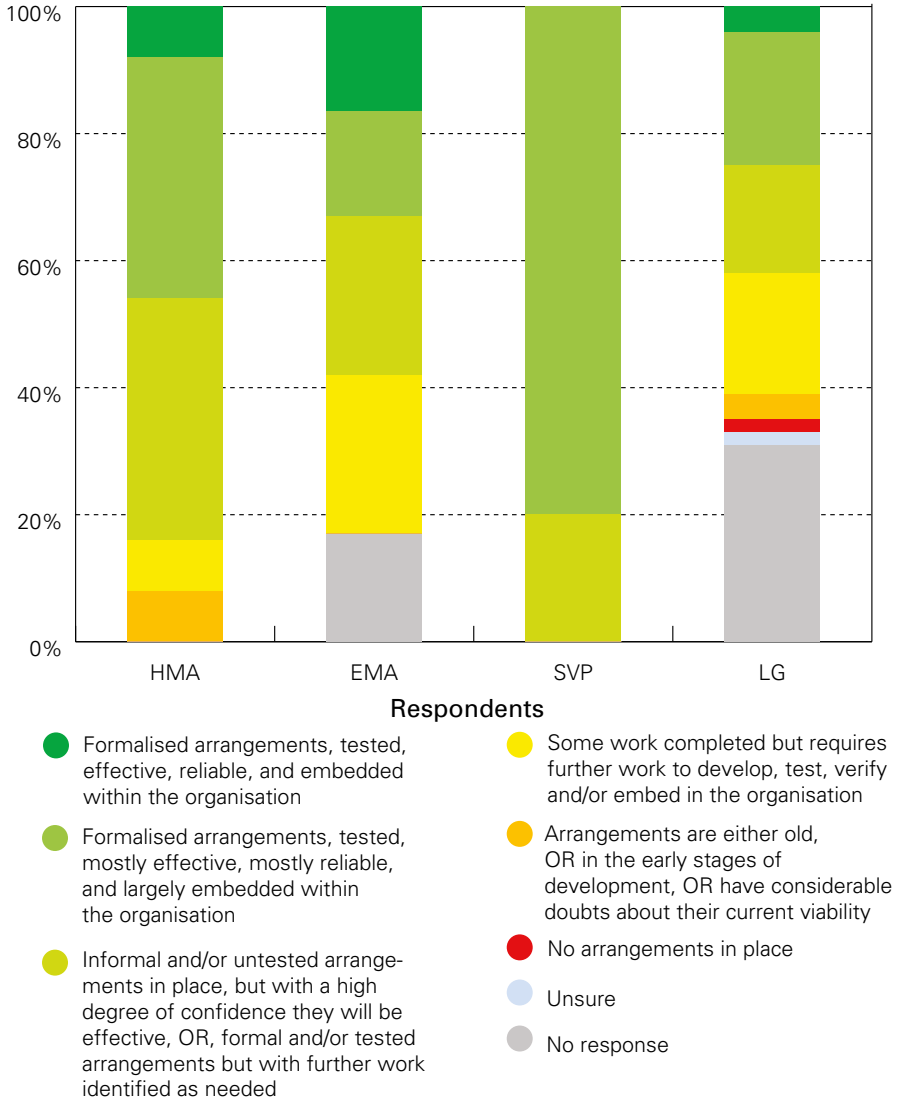
While isolation can be an impediment to emergency response in WA, remote communities are also renowned for their resilience.

The Australian Bureau of Statistics classifies 80% of WA as 'remote' or 'very remote'. Defined as places that are difficult to access, they hold 6% of the state's population areas (typically Aboriginal communities, pastoral stations and offshore communities). In the event of an emergency, potentially hundreds of kilometres can separate the site of the emergency and the nearest HMA or volunteer unit that is able to respond. Reaching remote locations (in a timely manner) is an enduring issue.

Most HMAs (84%), EMAs (59%) and all service providers (100%) reported considering remote areas in planning. While responses varied, there was a high degree of confidence that these plans would be effective. Some agencies reported their arrangements were formalised, tested, effective, reliable and embedded within the organisation.

- DFES reported working with local governments on Bushfire in areas of pre-planning through LEMCs, other committees and pastoral preparedness meetings. For hazards such as HAZMAT and Collapse, DFES had plans to access remote sites through its network of stations and use of DFES Air Operations.
- WA Health reported that each WA Country Health Service region was required to have local and district EM plans.
- WA Police provided support at a local level through their roles as Local Emergency Coordinators and at the district level as District Emergency Coordinators.
- Defence reported it has the capability to support remote communities in emergencies should the state not be able do so.

Plans for emergencies that occur in remote areas



Local governments with remote communities within their boundaries generally have LEMA that consider remote location emergencies and liaise with HMAs (through LEMCs) for high-risk hazards that may impact these areas.

The northern boundary of the Western Power network is Kalbarri, 500km from Perth. In April 2016, customers between Geraldton and Kalbarri lost power in a storm (Perth Now 2017). Western Power realised they needed a specific north country EM plan. While there is an overall Western Power plan, more consideration was needed to account for distance, new employees and the nature of the events that tend to occur to the north of their network.

The OEM has continued the review of 'Keeping Our Mob Safe: a national EM strategy for remote Indigenous communities'. This seeks to deliver a practical approach to address EM priorities relating to remote Indigenous communities. During 2016–17, OEM undertook a targeted survey and led a national workshop. A draft report will be finalised before the project is closed.

4.18 Business continuity planning

Achievement objective

- Business continuity plans are in place across government, industry and business and consider hazard specific risks.

Key findings

- Response agencies overwhelmingly have business continuity plans in the case of emergencies.
- All agencies should engage more with businesses and industries on business continuity plans to enhance resilience.
- Some local governments treat EM as an opportunity to engage with their local community and businesses to enhance resilience.

Business continuity plans assist organisations to achieve high-level resilience to serious business disruption. They detail critical business activities so they can continue to be delivered through and beyond the disruption and ultimately resume normal business practices.

All HMAs, 75% of EMAs and 86% of service providers reported they have a business continuity plan in case of emergency. WA Police reported their EM and business continuity plans were informal and/or untested, but they had a high degree of confidence they would be effective. Their plans incorporated preparedness and response capabilities and considered impacts on both critical infrastructure and important community assets. The plans are set to maintain the agency's approximate 60 critical functions at a minimum level of service delivery through an emergency.

Compared to 2016, fewer local governments reported having a business continuity plan (62% compared to 73%). Several local governments said their business continuity plans were in draft form.

Last year's *Emergency Preparedness Report* highlighted the importance of local businesses and industries having business continuity plans so they are less likely to fail and are able to reopen more quickly after an incident. This maintenance of service (or minimisation of outage) will reduce community feelings of displacement and allow impacted communities to return to normal more quickly.

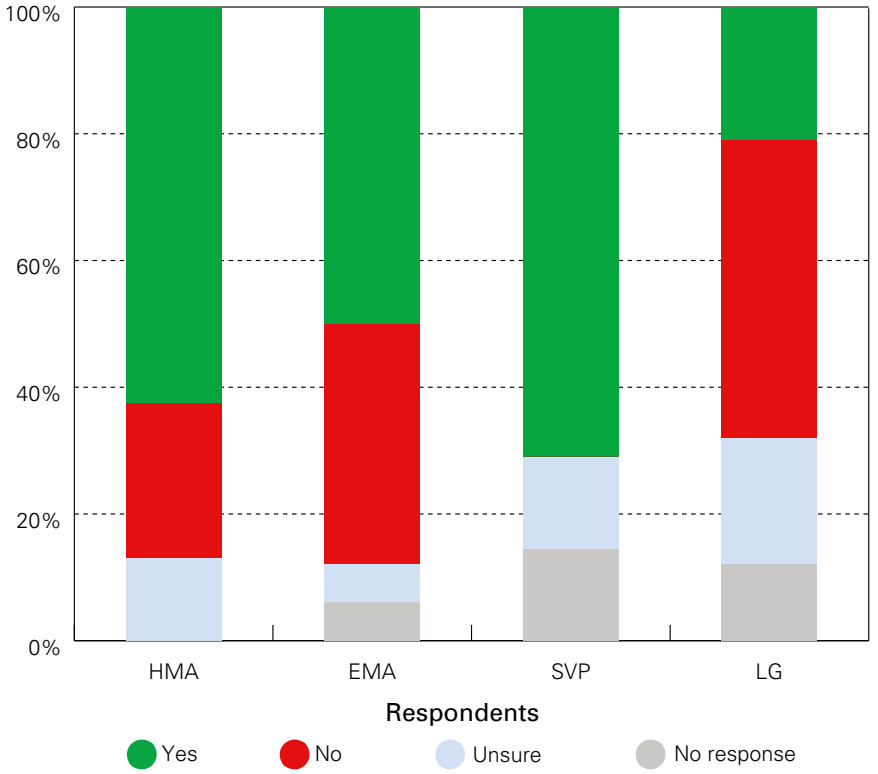
While some improvement occurred in encouraging local businesses and industries to make plans (16–22%), it is clear much room for improvement remains.

A common complaint from local governments is that EM is an unfunded expectation placed upon them and they have insufficient resources to fully discharge their responsibilities. Despite this lack of resources, there still seems to be reluctance by local governments to share the responsibility for emergency preparedness.

Being prepared for an emergency is the responsibility of everyone in society. Some local governments appear to be viewing their EM responsibilities as a burden imposed upon them by the state agencies rather than a shared responsibility. This mindset is not universal and has already changed (or has always been there) within some local governments where EM is treated as an opportunity to engage with their local community and businesses to enhance resilience.

Service providers stand out as having the most comprehensive business continuity plans. All service providers with plans (6 out of the 7 respondents) stated that their plans take into account the risks that arise from different hazards and incorporate strategies for fatigue management.

Engagement with business/industry to encourage business continuity plans



This maturity of planning is likely to be driven by commercial imperatives but regardless high levels of readiness and contingency planning has been reported. Service providers are also the leaders in engaging with business and industry in encouraging them to have business continuity plans.

4.19 Community activities

Achievement objective

- Consideration is given to the protection and rapid reestablishment of community activities. This may include cultural and community events, sporting activities and schools.

Key findings

- The return to normal routines and activities after an emergency is widely acknowledged as being an important part of a community's healing process.
- The EM sector has a good understanding of how community assets may be impacted by relevant hazards.
- The knowledge of what assets are important to individual communities can guide responders on protection priorities during an emergency.

Following an emergency, the rapid reestablishment of community activities is widely acknowledged as being an important part of a community's healing process. As affected communities return to their normal routines and activities, feelings of displacement and upheaval begin to dissipate.

The protection or reestablishment of things such as cultural and community events, sporting activities and schools is a critical component of EM and recovery. This will often involve the reestablishment of infrastructure and community assets (road access, electricity) so that people can recommence normal activities.

Half of local governments (50%) reported having some type of plan in place to reestablish community activities. However, only 10% had been formalised and tested. Thirteen out of 138 local governments noted that plans to reestablish community activities were embedded in their local recovery plans:

- The City of Joondalup reported having 'a comprehensive local emergency recovery plan that is focused on the reestablishment of a social, economic and cultural environment following an emergency event'.
- The Shire of Carnarvon commented it has 'established plans within the recovery plan to restore the community within the scope of emotional, social, economic and physical wellbeing needs'.

Almost one-third of local governments reported having no plans in place for community activities.

About three-quarters (74%) of local governments reported they have measures in place to identify the likely impact that hazards might have on important community assets. Many said these measures included risk-assessment workshops (i.e. the recently commenced local-level phase of the State Risk Project). Other measures are the LEMA (which identify critical infrastructure and important assets), LEMC exercises and business continuity planning. For example, the Shire of Chapman Valley reported that:

> '*The likely impact that hazards might have on critical infrastructure and community assets is evaluated at the LEMC. Appropriate strategies and actions have been implemented.*'

More than half of EMAs and service providers (60% and 57% respectively) and about one in three (29%) of HMAs reported having measures in place to identify the likely impact hazards might have on important community assets. The knowledge of what assets are important to individual communities can guide responders on protection priorities during an emergency.

DFES reported assisting 16 identified high-priority local governments to establish bushfire risk management plans in 2016–17. During this process, community assets and critical infrastructure are identified and risks assessed against the potential impact of a bushfire. This provides a risk rating from which treatment plans are established to mitigate the risk to the assets.

WA Police reported that as part of their role to contribute to community safety and security, they have in place EM plans and business continuity plans that incorporate preparedness and response capabilities. The plans consider impacts on community assets and critical infrastructure. They are designed to ensure the agency's approximately 60 critical functions can continue at a minimum level of service delivery during an emergency.

IN FOCUS

Save the App that could save your life – Emergency+ App

Emergency+ is Australia's national emergency app. An app (application) is a piece of computer software that allows you to customise your smartphone or tablet. Jointly developed by Australia's emergency services, the Commonwealth government and industry partners, ***Emergency+*** helps people in an emergency call the right number at the right time.

The app uses in-built GPS functionality in smart phones to help triple zero (000) callers provide critical location details required to mobilise an emergency service response.

Figure 11. Screenshots of GPS coordinates and contact details for emergency services

The app relies upon having a mobile data network available and provides the triple zero (000) caller information to assist operators, such as:

- when to call triple zero (000)
- who to call in various non-emergency situations
  - State Emergency Service (SES) (132 500)
  - Police Assistance Line (131 444)
  - Crime Stoppers (1800 333 000)
  - Health Direct Australia (1800 022 222)
- GPS coordinates of the phone's location that the caller can read out to the emergency operator.

The app also links to the National Relay Service (www.relayservice.gov.au) to cater for people who are deaf or have a hearing or speech impairment.

WA Police encourage everyone to install ***Emergency+*** on their phone to ensure that help can be sent to the right location as soon as possible in an emergency. It can be downloaded free from the Windows Store, Google Play and Apple App Store and is available in English, Chinese (traditional and simplified) and Japanese.

Downloads by operating system:

Figure 12. Since its launch in 2013, the app has been downloaded over 812,000 times

(Data sourced from the Triple Zero Awareness Work group as at 16 August 2017)

4.20 People

Achievement objective

- Agencies have appropriate levels of trained, capable and supported people to effectively undertake all aspects of emergency management.

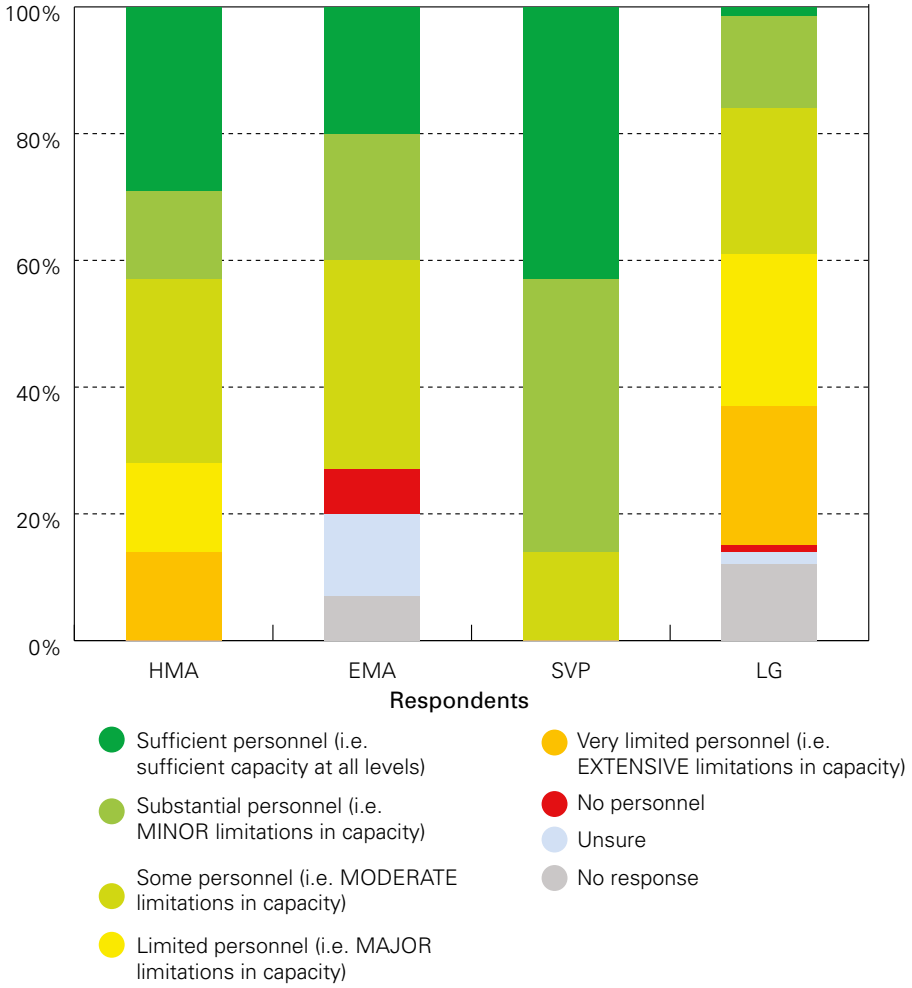
Key findings

- EM personnel are generally highly trained and capable.
- Local governments, particularly small ones, have limited resources to devote to EM.
- Some regional and remote local governments find it difficult to attend training located in metropolitan centres.

Agencies generally have highly trained staff who are capable and supported in dealing with emergencies. Personnel are well supported through internal policies, internal and external training and joint exercises. Smaller agencies reported that EM competency and training was concentrated in a limited number of personnel. Agencies noted that even where there was a high level of managerial support, training and development was subject to resourcing constraints and agency priorities.

The DoT reported that members of the Maritime Incident Management Team, State Response Team and National Response Team received extensive training, including nationally accredited response training. Additionally, PTA had a project underway to improve EM training across specific areas of the agency. This included renewal training based on the level of risk an activity presented to PTA operations.

Sufficient numbers of EM personnel



EM personnel (Bushfire) at P&W were developed through a combination of relevant training and operational experience and were accredited for specific EM roles that reflected their skills and experience. They were supported by a comprehensive doctrine associated with bushfire management and occupational health and safety. Counselling and support services were also available.

Service providers reported the highest level of training, capability and support. For example, Dampier Bunbury Pipeline reported that all field emergency personnel were trained and competent in senior first aid, remote area first aid, fire-fighting and defensive driving. The performance of EM procedures was a component of daily work practices associated with essential infrastructure. Personnel were therefore trained on a regular basis to perform emergency responses.

Agencies were asked to report on the extent to which the organisation has sufficient numbers of EM personnel to manage during an emergency. This was further focused in the case of DFES with a concentration upon both individual hazards and the expected consequence that may eventuate.

Thresholds	Moderate	Major	Catastrophic
Economic	$960 million	$9.6 billion	$96 billion
Deaths	26	262	2623
Critical injuries	26*	262*	2623*
People displaced	262	2623	26,232

*Note: A ‘critical injury’ may be fatal if not dealt with urgently.

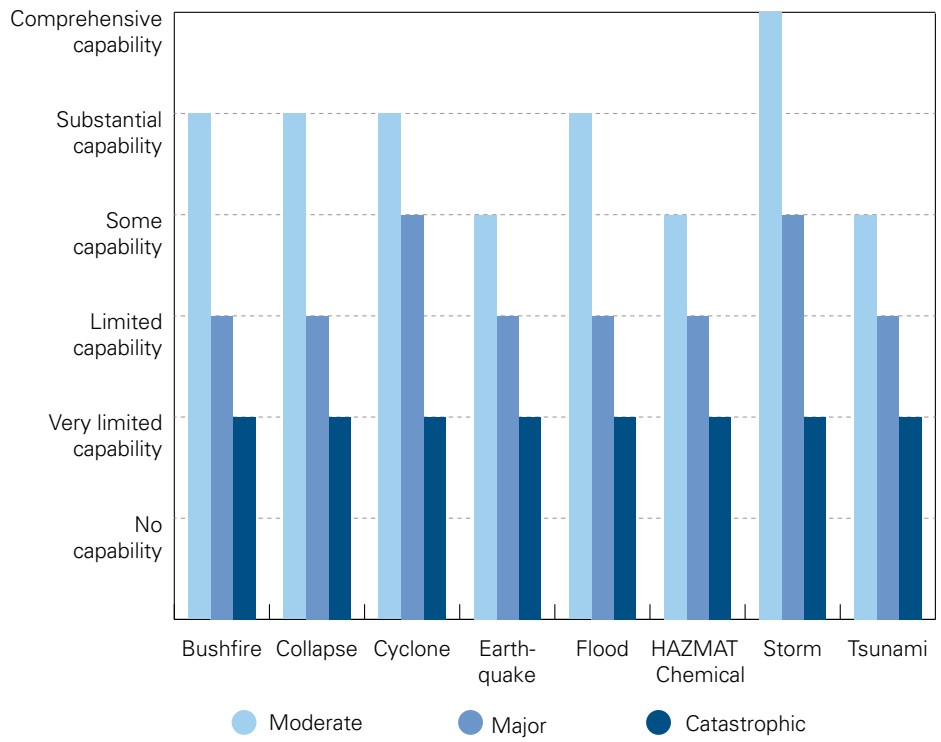
To provide a level of context, the wild storms that struck Perth in March 2010 (considered to be one of the worst storms in the city’s history) was classified as approximately three-quarters of a moderate-level event. The assessment of these thresholds is based upon the NERAG (National Emergency Risk Assessment Guidelines) and reflects a percentage of the economy and population of the state.

Results show that EM personnel are substantially capable across most hazards to respond to a hazard with moderate consequences. Storm was the hazard with the greatest perceived capability to respond while Earthquake was expected to most quickly stretch available resources.

Most agencies reported being staffed to reasonable levels to manage emergencies. Local governments, however, reported significant shortfalls and some commented that accessing training to increase the numbers of trained EM personnel could be difficult as training opportunities were restricted to metropolitan centres.

As expected, agencies reported that no ‘catastrophic’ event could be effectively managed with existing personnel. Events of such magnitude would require a significant coordinated nationwide response. National arrangements were in place for resource sharing and support; however, agencies would be significantly stretched.

DFES personnel capability of managing an emergency resulting in these consequences:



4.21 Volunteering

Achievement objectives

- A clear strategy exists for the recruitment, retention and ongoing training of volunteers that addresses motivation and barriers.
- A strategy exists to manage Good Samaritans and spontaneous volunteers.

Key findings

- Volunteers provide an invaluable contribution to EM.
- Regional areas are heavily reliant upon volunteers.
- Strategies and policies are required to promote the uptake of volunteering to address demographic shifts and generational change.

Volunteers perform a variety of important operational, administrative and functional support roles and provide an invaluable contribution in the EM domain.

DFES, in conjunction with local government, draws on a large volunteer workforce. Over 22,000 volunteers contribute to nearly 580 local government bushfire brigades. These are primarily trained in fire suppression by volunteers and DFES staff. In addition, DFES directly manages a limited number of volunteer bushfire brigades in the Kimberley and the Pilbara.

While there are currently 26,000 volunteers under the DFES remit, the average volunteer age is 48. Membership numbers continue to fall by more than 300 a year (DFES 2017). In response to this, DFES launched its Volunteer Sustainability Strategy 2016–2024. This is aimed at diversifying volunteer roles, being more flexible with time commitments and engaging people through digital and social media. The strategy brings a change in approach to deal with the values and lifestyle commitments of volunteers through a range of initiatives.

WA Police primarily make use of DFES volunteers for searches on land or in a marine environment. CPFS also reported using volunteers. However, wherever possible, this is restricted to those affiliated with recognised organisations, such as the Country Women's Association of WA and the Salvation Army.

SJA reported limited operations in regional areas and a reliance upon volunteers in most locations with some areas having career/volunteer crews. The Australian Red Cross provided support to CPFS during emergencies using their network of 500 volunteers throughout the state.

Figure 13. Emergency Services Minister Fran Logan with the crew from the Fitzroy Crossing Volunteer Fire and Emergency Services

Local governments reported significant volunteer involvement. For example, the Shire of Mundaring had nine local government volunteer bushfire brigades and Busselton had 15.

However, with demographic shifts and generational change, strategies and policies promoting the uptake of volunteering are critical to ensuring WA communities are capable of responding to and recovering from emergencies.

DFES, SJA and the Australian Red Cross reported having comprehensive volunteer strategies that addressed recruitment, retention, training, motivation and barriers. DAFWA had identified volunteers as a priority work area for the agency.

WA Police reported relying upon DFES volunteers; however, they included volunteers in their training for marine search and rescue (64 Volunteer Marine Rescue and 8 Surf Lifesaving WA volunteers in 2016–17).

Many local governments appear to have a fragmented approach to volunteer management, with strategies tending to address only certain aspects, such as training. The City of Wanneroo reported providing training to ensure personnel and volunteer bushfire brigade members were capable and fully trained in all aspects of response and recovery. EM staff undertook AIIMS (Australasian Inter-service Incident Management System) training and task-specific training relevant to their role. Tests and exercises were conducted regularly to ensure EM skills were maintained and current.

The City of Mandurah reported adapting its corporate induction to cater for bushfire brigade volunteers, ensuring they received essential training.

During large-scale emergencies, it is common for people to spontaneously volunteer out of a desire to help. This necessitates a targeted strategy in order to manage what could become an uncoordinated response.

Many local governments incorporated arrangements for spontaneous volunteers within their LEMA or recovery plans. DFES was addressing spontaneous volunteering by engaging with the not-for-profit sector as part of its Volunteer Sustainability Strategy.

WA Police were addressing the issue of spontaneous volunteers in their review of hazard-specific Westplans. Screening for suitability, registration, supervision during tasking and welfare were important considerations. Volunteering WA had agreed to assist with volunteer registration for WA Police for a specific emergency.

The donation of goods is a common community trait in response to a major emergency. Unsolicited donation of goods, while well intentioned, can create logistical issues for response agencies, requiring operational staff to divert their attention towards managing these items. The preferred mode of helping is the donation of money to a recognised emergency relief fund, such as the Lord Mayor's Distress Relief Fund.

Both CPFS and the Australian Red Cross have had to develop policies and strategies to address donated goods. Similarly, many local governments address donated goods in their local recovery plans.

IN FOCUS

WA – relying on volunteers

Volunteers provide more than 300 million hours of community service each year in support of 5000 volunteer organisations across the state (DFES 2017). Around 40,000 people volunteer their time and expertise to actively assist our various emergency services streams.

From helping to raise awareness, to responding to an emergency, WA relies on a large volunteer force. In 2015, Volunteering WA estimated the economic, social and cultural value of volunteering to be greater than $39 billion (Figure 14), with that number expected to increase (Volunteering WA 2015).

Figure 14. Volunteering information adapted from Volunteering WA and the Institute of Project Management (2015) and DFES (2016)

The EM sector relies on volunteers for critical help during fire, flood, storm, cyclone and various searches and rescues. The proportion of paid full-time staff to volunteers is substantial. DFES estimates that volunteers provide more than 95% of emergency services personnel and attend more than 7500 incidents a year (DFES, 2016).

Figure 15 compares the number of paid staff and volunteers for four emergency service providers. In total, almost 40,000 staff provide services and just over 3000 (7%) of these are paid. Increasing community involvement in local emergency services volunteering will help build community resilience.

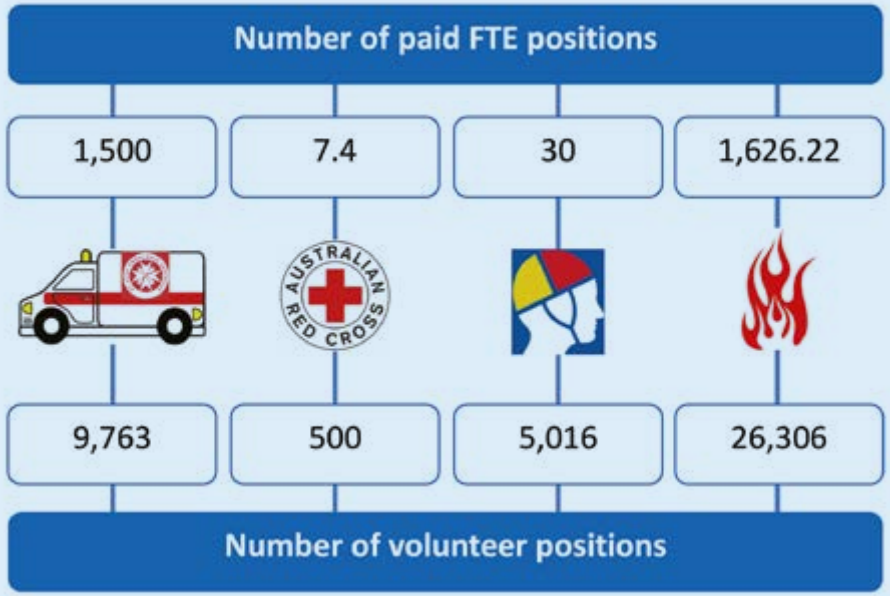


Figure 15. Number of paid v. volunteer positions for (left to right) St John Ambulance, Red Cross WA – Emergency Services, Surf Life Savers WA and DFES

Often, volunteers fill multiple roles within multiple organisations and are involved with all aspects from response to post-emergency support. For example, at DFES 25,404 people currently hold 26,306 volunteer positions. In addition, many Ambulance volunteers are known to also be in the SES of local bushfire brigades.

Common reasons people choose to volunteer their time include:

- to give something back to their community
- to learn and develop new skills in a supportive environment
- to complete certifications and develop skills for their career path
- to belong to a group of like-minded people.

While the state is well serviced by a range of professional EM practitioners, it is clear that in times of crisis most people who respond are volunteers.

The link between paid and volunteer services is generally strong with considerable collaboration (training and equipment) within and between services.

For example, on 23 July 2016, Surf Life Savers WA collaborated in an exercise with Volunteer Marine Rescue (VMR), Water Police and Peel Support Operations. The exercise was to search for a missing fisher in the area of Seal Island. It employed a VMR vessel, the radio room and six jet skis. The SLSWA Operations Coordinator explained:

> *'We continue to train and conduct joint exercises with other agencies to ensure we understand each other's capabilities and are ready to respond to marine-based emergencies. On top of this, we continue to train with the Water Police through Marine Search and Rescue Training in the format of training camps.'*

Such collaboration is vital. From urban and marine search-and-rescue and bushfires to welfare support post-emergency, volunteers play a vital role in preparedness and response across WA.

Figure 16. Breakdown of DFES and local government volunteer positions

4.22 Finance and administration

Achievement objectives

- Robust financial and administrative processes exist to capture and track emergency management expenditure.
- Funding for proactive measures and mitigation is available, sufficient and accessible.
- Adequate funding arrangements are in place to manage the response and recovery of a large-scale emergency.

Key findings

- Agencies expect and have responsibility for delivering EM outcomes but this is largely an unfunded mandate.
- Nearly 50% of respondents advised that response funding was insufficient.
- 35% stated that recovery funding (primarily WANDRRA) was inadequate.

The funding of EM activities is a matter of constant discussion. Agencies have the expectation and responsibility for delivering EM outcomes but this is largely an unfunded mandate. While some (minor) grant funding exists for individual projects, most EM responsibilities do not come with dedicated or allocated funding.

The Commonwealth Productivity Commission has for several years argued 'that increased investment in mitigation and betterment would deliver significant benefits including reduced spend on response and recovery'.

At the state level, the Emergency Services Levy (ESL) was reviewed by the Economic Regulation Authority in 2017. At the time of publication, the findings of this review were unknown.

Collected by local governments as part of council rates, the ESL supports emergency service groups comprising 1400 career firefighters, support staff and over 29,000 volunteers. On a sliding scale, the levy collects between $75 and $395 from individual property owners. Commercial and industrial properties (such as inner city hotels and high-rises) can potentially pay up to $225,000.

Funding for bush fire brigades and State Emergency Service (SES) units is allocated via the Local Government Grant Scheme. Under the scheme, local governments apply for a grant for each service. This concerns local governments who consider they are being asked to apply for money they had initially collected to fund units they do not control (e.g. SES).

Comments on finance and administration from local governments for the Capability Survey range widely. Some wished all responsibilities to be transferred to the HMAs, releasing them of the burden; others wished to have sole ownership of the issue so that a '*dynamic, proactive, local, area-specific response*' can be mounted. Many fell between these views but most reported needing additional funding, resources and support. One respondent said:

> '*EM is another responsibility that has landed on LG [local government] laps with the expectation that it would be managed with existing (and diminishing) resources. Therefore, it gets done as well as resourcing and interest permits.*'

Some proactive funds for mitigation and prevention are made available through the Natural Disaster Resilience Program (NDRP), All West Australians Reducing Emergencies (AWARE) and the National Bushfire Mitigation Program (NBMP). NDRP funds are provided by the Commonwealth while AWARE is directly financed as part of the OEM budget. Both competitive grants funding mechanisms are managed by the OEM. The NBMP is a jointly funded Commonwealth/State initiative managed by DFES, using competitive grants that aim to reduce long-term bushfire risks.

At an agency level, half (50%) of respondents stated that response funding was insufficient and 35% said recovery funding (primarily through WANDRRA) was inadequate. Of the 152 agencies that responded, 93% reported they were able to track expenditure for particular individual emergencies, ensuring that accurate accounting could be captured.

IN FOCUS

All West Australians Reducing Emergencies

The AWARE Program was initiated in 2001 by Emergency Management Australia and the former Fire and Emergency Services Authority. Funding under the program was initially only available to local governments and focused on risk assessment and training. As capabilities improved, grants were redirected to planning for emergencies.

In 2005 the Commonwealth component was discontinued; however, the state component ($200,000–250,000 a year) was maintained. Since then, AWARE has worked consistently to build EM capacity and capability at a local or district level.

In 2007 some local governments began using AWARE to employ consultants to deliver EM outcomes. While this delivered EM outcomes, it did not assist in building local capacity, prompting concern. Funding has since been refocused to more closely align with the original intent.

As EM evolves, so too do the needs of the sector and its stakeholders. AWARE is continuously reviewed to reflect these changes. In 2011–12, the program became solely a competitive grant scheme financed and managed by the OEM. Eligibility was also expanded beyond local governments with DEMCs included in the assessment process in 2015–16.

AWARE grant proposals are now referred to DEMCs for them to assess the relevance, value and priority of proposed projects. This decentralised decision-making avoids a metro-centric 'one size fits all' approach and supports an understanding of district EM risks, treatments and mitigation. It also allows individual districts to determine both the validity and the priority of competing projects.

Since its inception in 2001, AWARE has funded almost 200 individual grants totalling $2.8 million to over 110 local governments or agencies.

The Shire of Katanning received an AWARE grant for an event titled '***Migrant Communities – the Risk in Emergency Situations***'. With around 40 nationalities represented in the shire (including significant Aboriginal, Malay, Chinese, Burmese and Afghan communities), the project focused on Culturally and Linguistically Diverse (CaLD) communities. The event explored relationships between migrant communities and authorities and summarised emergency legislation. Workshops examined:

- safety in CaLD communities
- 25 strategies to enhance safety
- strategic priorities
- treatment options
- activities, resources, critical partnerships and outcomes.

The project reflected the values of co-design and delivered outcomes that were tailored appropriately and location specific.

The City of Albany received an AWARE grant for a '***Recovery Exercise and Workshop***'. The exercise tested local government recovery plans, raised awareness of recovery responsibilities and prepared staff and agency personnel for their role in recovery functions.

Aligned to the theme of the city's Community Strategic Plan, '*Plan for and monitor community safety and security*', the event helped create networks and build relationships between staff. Fifty-six delegates covering 16 local governments attended. Delegates included councillors, CEOs, recovery coordinators, environmental health officers, building surveyors and EM officers.

The State Recovery Coordinator, Esperance Fires Recovery Coordinator, Parkerville-Stoneville-Mt Helena Fires Recovery Coordinator and a P&W Level Three Incident Controller all gave presentations.

The City of Mandurah received an AWARE grant for the ***Equi-Evac Centre Network*** to assist with the welfare and management of large animals in an emergency. After the January 2016 Waroona fire, many public equestrian facilities made their grounds available as a relocation point for horses. The network was established to help members of the Peel and South West horse communities who may be displaced during disasters.

The network identified public equestrian facilities that were suitable to use as short-term relocation points for horses in an emergency and developed guidelines for their use. Each facility and respective local government received a template guideline and sample activation kit.

The AWARE grant funded a toolkit that is now available for other local governments and public equestrian facilities, improving capability throughout the state.

The WA Chamber of Commerce and Industry (CCI) received an AWARE grant to develop a '***Business Continuity and Disaster Recovery Workbook***' subtitled '*Planning for the bad so your business can get back to the good*'.

The more prepared and equipped businesses are, the less likely they are to fail and the quicker they will be able to reopen after an incident. The continuation of services (or the minimisation of outage) is important not only from an economic perspective, but also a social perspective, by reducing community feelings of displacement and allowing impacted communities to return to normal more quickly.

The free CCI workbook presents a step-by-step guide, checklists and editable sections designed to help WA businesses develop a business continuity plan.

While the principle applies to all businesses and industries regardless of size, the workbook was mainly developed for small and medium businesses, many of whom do not have proper protection for their data and systems.

4.23 Equipment – critical resources

Achievement objectives

- Organisations have or can readily access appropriate infrastructure and equipment during an emergency.
- Equipment can be mobilised during an emergency and plans are in place to address predeployment, peak surges and redundancies for outages.

Key findings

- Existing operations centres run by HMAs have the infrastructure capacity to manage multiple concurrent emergencies for most hazards.
- HMAs report improvements in planning to address mobilisation, predeployment of assets, peak surges and redundancies for outages.
- Planning for equipment required during emergencies has improved.

All HMAs reported that funding of response activities requiring multi-agency coordinated responses was available and accessible. DAFWA commented that national cost-sharing arrangements were in place for pest and disease emergencies of national significance.

Across all 27 hazards, agencies reported they were capable of managing multiple concurrent emergencies with existing operations centre infrastructure (80% of HMAs, 53% of EMAs and 47% of local governments).

P&W reported they had a well-planned and resourced, self-contained, mobile incident control centre available for deployment in the south of the state. Such control centres work well for a single large incident; however, concurrent major incidents or emergencies require more resources (trained personnel). P&W, DFES and local governments have all reported limitations on resources available to staff operation centres during major emergencies in regional WA.

The biggest limiting factor was the availability and expertise of personnel. The Town of Bassendean commented: *'The number of facilities that can be deployed for operation(s) is adequate for multiple concurrent emergencies but personnel provides functionality limitation.'*

In support of predeployment planning, the DFES (SES) took delivery of eight buses in 2016, expanding their fleet to 14. The buses have been adapted to enable the transport of a driver, nine volunteers and equipment to the site of an emergency.

The buses can be deployed for numerous tasks, including evacuation and return of community members and transporting responders to and from major incidents. Six of the new buses are based across the metropolitan area; the remaining two are in Karratha and Newman.

The ability of agencies to manage emergencies with existing equipment depends on location, the type of hazard involved and whether specialised equipment is required.

For instance, the DoT advised that WA has only limited response equipment available for maritime environmental emergencies. While arrangements were in place to gain access to national, industry and some international stockpiles, this comes with delays. DFES reported that a significant collapse emergency would require interstate support.

P&W reported that in addition to their own resources they have contracts in place for seasonal availability of extra earthmoving equipment and fixed-wing water bombers. However, concurrent emergencies may still result in shortages of appropriate heavy earth-moving equipment and trained operators.

Local governments (38%) reported limited capacity to manage multiple concurrent emergencies. Many either contracted or shared equipment. One local government stated they have a *'lack of in-house machinery', a 'reliance on contractors' and* a *'lack of redundancy in communication equipment'.*

Communication capability depends highly on equipment and infrastructure and is compounded by inadequate mobile phone coverage in regional areas. The DFES Major Incident Review of the 2015 Esperance district fires found that *'while (Esperance) shire staff generally felt well-informed by the incident management team and able to fulfil their communication role, they reported some challenges'.* And further: '*It was difficult at times to maintain the accuracy and consistency of information … this was due to … interruption to mobile phone services.'*

The issue is complex. For instance, one local government reported a reliance on mobile phones in their region, due to incompatible radio communications between WA Police and SJA. The mobile communications blackspot program is addressing mobile coverage; however, this will not solve incompatibility issues.

DFES has announced that Motorola Solutions will deliver a new computer-aided dispatch (CAD) system, worth $7.1 million, to improve service delivery to the community. The arrangement complements an $11 million investment by WA Police in 2015 into the same CAD system, paving the way for greater collaboration during events between the two critical state emergency services (The Australian 2017).

As reported in 2016, seasonal preparedness is common among local governments. Taking a risk-based approach means they can make the most of limited resources, such as having generators and support equipment on standby hire during the cyclone season. In addition, many local governments reported having MOUs covering equipment sharing and have agreements with multiple organisations to provide assets to affected areas.

Survey responses in 2017 are consistent with last year's. Most HMAs reported that formalised and tested plans were in place to address mobilisation, predeployment, peak surges and redundancies for outages. In particular, the data shows that HMAs have improved planning for equipment requirements during peak surges and in relation to redundancies for outages.

4.24 Command, control and coordination

Achievement objective

- Pre-established and well understood protocols and structures exist that define the interrelationships between stakeholders during an event and facilitate effective command, control and coordination

Key findings

- Structures and protocols are generally well understood for C3 across EM agencies.
- Structures exist that define interrelationships and facilitate communication.
- Some aspects of interoperability are untested.

The command, control and coordination (C3) system establishes predefined protocols that are used broadly but flexibly during an emergency. C3 articulates the roles and responsibilities of those who may be involved and facilitates the orderly giving of directions, setting priorities and provides arrangements for reporting and briefing.

All HMAs, 75% of EMAs and 73% of local governments reported having effective C3 in place. Most said existing protocols and structures were understood and all HMAs and most EMAs, service providers and local governments made use of an incident management system.

Two primary incident management systems are used in WA – AIIMS and ICCS (Incident Command and Control System) Plus. WA Police reported they were continuing their transition from AIIMS to ICCS Plus for all relevant hazards.

C3 is primarily conducted by HMAs (principally WA Police and DFES) and is reported to be broadly understood and followed by supporting agencies. In 2017 respondents were asked if the communication structures were effective, interoperable with other agencies, functional and manageable/serviceable. These structures include:

- incident management teams (IMTs)
- incident support groups (ISGs)
- operational area support groups (OASGs).

All HMAs and most service providers responded positively. However, under 60% of EMAs and local governments answered 'yes'. While functional communications generally were in place, individual relationships often determined their effectiveness. The CPFS commented that functional communication:

> *'tends to vary depending on the event and the IC (incident controller). (It) can be difficult at times for non-HMA agencies to get visibility of the IMT and ISG. (The) sense is that it works better in country areas due to all the key players knowing each other.'*

The Shire of Kent commented that effectiveness was:

> *'… due to building stakeholders' relationships throughout the area, not just during emergencies but all (of the) time.'*

The Bushfire and Natural Hazard CRC conducts research to build a disaster-resilient Australia. In 2016 BNHCRC research showed that pre-formed IMTs performed better than those established for the first time on the day of an incident. This was based in part on the expectation that greater familiarity and member knowledge enabled superior team performance. The timeliness of decision making and level of team awareness were both found to be superior in pre-formed teams.

The Ferguson review into the January 2016 Waroona fire recommended that integrated and preformed IMTs be formed for all Level 3 (significant) incidents in the Perth Hills and the South West.

In response, pre-formed IMTs were established for natural hazard incidents, including multi-agency and volunteer representation. The establishment of pre-formed teams provides the opportunity to develop the relationships that support effective communications and interoperability.

Responses from local governments indicated limited testing of interoperability between local governments. The City of Stirling was due to exercise C3 structures in September 2017, at which time the extent of their understanding would be known.

The Shire of Northam commented that the pre-formed protocols and structures were '*discussed at LEMC and DEMC meetings but rarely acted on or tested',* indicating an opportunity for improvement.

Analysis of the data provided builds a picture that a regime of regular and rigorous team exercise not only reinforces the understanding of C3 protocols and structures, but also helps establish the interpersonal relationships needed for effective communications.

4.25 Situational assessments

Achievement objective

- Situational assessments are undertaken to accurately inform decision makers about the nature and extent of the hazard, vulnerable elements and what resources are required.

Key findings

- Most HMAs, EMAs and service providers report carrying out effective situational assessments.
- 57% of local governments report carrying out situational assessments.

Situational awareness is the ability to identify, process and comprehend the critical elements of information about what is happening during an emergency. More simply, it is everyone knowing what is going on so that the right decisions can be made. Lack of situational awareness during an emergency increases the potential for human error, risking personnel and the community.

Most HMAs and relevant EMAs and service providers reported carrying out effective situational assessments, covering the nature and extent of relevant hazards and vulnerable elements. They also reported using situational assessments to determine resource requirements, allocation and deployment.

DFES has established a Joint Intelligence Capability to improve situational awareness and evidence-based EM decision-making. The aim of this developing capability is to assemble and distribute risk-based intelligence. The project incorporates management, system and analysis improvements with enhanced integration with 'business as usual' activities such as scenario analysis, hazard modelling and forecasting.

At the same time, only 57% of local governments reported carrying out situational assessments, down from 70% last year. Many local governments who reported not carrying out situational assessments commented that such assessments were the sole responsibility of response agencies.

During an emergency event, sharing of information is key to an effective response. Respondents were asked which organisations they would find most difficult to maintain effective communications with during an emergency. The majority reported that essential services owned by private companies would be most challenging. Brookfield Rail, NBN Co and Telstra were among the most frequently cited organisations. In general, local governments found it more challenging to obtain situational assessments from other organisations compared with HMAs, EMAs or other service providers.

Organisations were also asked about other impediments to the sharing of information during an emergency. Respondents frequently commented on inadequate communication systems and lack of mobile coverage. They also raised concerns about restrictions on the sharing of information due to commercial sensitivity.

Most organisations that reported impediments also reported efforts to reduce those same impediments though improved communication, training and MOUs.

IN FOCUS

DFES mobile hot spot

In July 2017, DFES formally launched a new incident management support vehicle, complete with the latest communications and satellite technology.

Known as the Communication Support Vehicle (CSV), the van works like a giant 'hot spot' allowing all emergency services staff to remain connected during an incident. The van is a failsafe that ensures mobile phone and internet connectivity, even if mobile towers and local infrastructure have been destroyed or overrun by demand.

Figure 17. Launch of the CSV, Communication Support Vehicle

The CSV is a long-wheel based van that contains internal office space, two workstations, each with two screens, and real-time mapping and incident management systems. It has an independent power supply and is interoperable with WA Police and other response agencies.

A key feature of the vehicle is satellite communications capability. This provides the required bandwidth for real-time streaming of vision from the incident site (live video streaming from helicopters above or body cameras worn by firefighters) to multiple operations centres across the state.

The van ensures primary communications equipment can work independently of land-based telecommunications infrastructure. It will keep the lines of communications open for fire chiefs and fire fighters and volunteers in the field. Its main objective is to provide communications:

- to emergency services staff
- to communities in isolated locations
- to staff and the community where mobile networks are congested or not available.

Keeping the lines of communication open for emergency services during an incident is vital. It gives incident controllers the information they need to make the right decisions in times of crisis. This can include requesting additional resources, directing combat or aerial support units, exchanging situation reports or communicating road closures to keep the community safe.

The CSV has already been successfully deployed at many incidents across WA and is primed for deployment for the upcoming fire season.

4.26 Evacuation

Achievement objectives

- Agencies have the resources and skills to undertake both directed and voluntary evacuation of both people and animals.
- Suitable sites have been identified and are available that maintain the provision of critical goods and services (e.g. food, potable water, shelter).

Key findings

- Local governments have a good understanding of their role in evacuations and maintain operational links with the CPFS.
- 70% of local governments have some form of pre-evacuation emergency plan in place.

Evacuation involves the movement of people to a safer location during an emergency and their return afterwards. For an evacuation to be effective, it must be appropriately planned and implemented.

The relevant controlling agency has the responsibility to order and manage the evacuation of impacted areas. WA Police, DFES and the PTA are the only agencies that reported being involved in evacuations. Each reported having plans in place for evacuation and the ability to coordinate and support both compulsory and voluntary evacuations of people. DFES also reported it had the ability to coordinate and support the evacuation of animals.

WA Police emphasised that their role in leading evacuations only applied to hazards for which they were the designated HMA. They reported assisting other agencies with evacuation activities, including planning, but stressed that responsibility in such cases belonged to the relevant HMAs.

EMAs reported varied roles in supporting evacuations. Agencies such as BOM and the Department of Environment Regulation (DER) provided advice to the controlling agency on the need for evacuations by monitoring weather conditions or airborne and other emissions during emergencies. SJA supported the Department of Housing and care facilities to move patients, including people living at home with specific medical conditions.

The CPFS holds primary responsibility for establishing and running emergency evacuation centres once they are occupied. They receive considerable support from other agencies, most notably local governments and the Red Cross. For the most part, the buildings that have been identified as evacuation centres are owned by the local governments.

Once the controlling agency has decided to evacuate an area, an evacuation centre will be identified and the location relayed immediately to the affected community. Local government will usually be the closest and most efficient organisation to open and establish the centre, until the CPFS arrives. CPFS conducts considerable training with local governments for this eventuality.

Most local governments accept their role in evacuation, particularly in identifying welfare centres that can provide emergency accommodation. Bigger local governments reported having detailed welfare and evacuation plans prepared and practised. They also included full details of each evacuation or welfare centre (location, amenities, capacity) within the LEMA.

Over 70% of local governments reported having some form of pre-evacuation plan, while 23% had formalised plans that were tested, effective, reliable and largely embedded in the organisation. Others reported that their LEMA were under review and, when complete, would include evacuation plans and animal welfare plans.

As concern for pets had stopped some people from evacuating in past emergencies, some local governments were now developing policies to take that into consideration.

4.27 Public protection

Achievement objectives

- Necessary measures exist to control access and verify the identity of personnel or members of the public seeking entry to critical locations.
- Organisations have the ability to protect against unwanted activity within an impacted area.

Key findings

- Opportunities for improvement in public protection identified in the 2016 *Emergency Preparedness Report* have been actioned.
- Measures exist to control access and verify the identity of people seeking entry to restricted locations.

Public protection is an issue that becomes apparent during some emergencies. Whether it is media reports of people looting from evacuated areas or complaints over an inability to re-enter their homes before it is safe, it is clear that there is a need for agencies to ensure that steps are in place to ensure that the public remain protected.

WA Police have significant ability to protect affected areas from unwanted activity during or after an emergency. The EM Act provides authority to exclude people from impacted areas in an emergency.

Prompted by a Ferguson Report recommendation DFES developed and delivered (in collaboration with partner agencies) a Restricted Access Permit system ahead of the 2016–2017 fire season. This system aids the identification of those with a legitimate need to access restricted areas during DFES-related emergencies. This system will streamline processes and clarify previous confusion about who was allowed into restricted areas.

Under the new system, DFES will determine when it is safe to enter an affected area and can afford priority to utilities and service providers. This will allow agencies such as Western Power and the Water Corporation to render safe any fallen power lines, burst water mains or other hazards, reducing the risks so members of the public can safely return.

A specialist unit has been established that can be deployed to assist with issuing permits. SES volunteers also have been trained to assist DFES. Adhesive stickers for vehicle windscreens, paper permits and identification cards have been incorporated into standard operating procedures for emergency workers.

In late 2016, DFES implemented Volunteer ID cards in the Great Southern, Lower South West, South West and Goldfields and within the statewide operational response division. By 31 January 2017, 74% of local governments had agreed to participate in the identity scheme, with 3800 cards issued.

As there was no opportunity to evaluate the new systems in 2016–17, the first full test is expected to occur in the 2017–18 fire season.

These initiatives are expected to:

- provide an effective system of controlling access to impacted areas
- protect lives
- facilitate effective response and recovery
- limit unwanted activity in the public domain.

A multi-agency working group was established that produced an aide memoire to assist personnel at vehicle control points. Local government, the Pastoralists and Graziers Association, the Forest Industries Federation and WAFarmers were among the parties consulted. The aide memoire describes how to apply the existing traffic management policy, guidelines and restricted access permit system.

An independent review of WA traffic management policy is underway.

4.28 Agency interoperability

Achievement objectives

- Effective and interoperable communication systems (including incident management systems) exist to allow seamless communications during an emergency.
- Interagency cultural differences are identified and managed so as not to impede or inhibit effective response.

Key findings

- Agencies are largely helpful and willing to coordinate and communicate during emergencies.
- While existing structures provide for good 'command and control' in an emergency, work remains on the 'coordinating' aspect of C3.
- While coordination is improving, communication systems remain fragmented.
- Regional areas generally benefit from stronger interpersonal relationships.
- Interoperability issues need to be resolved in a holistic way across the state.

Poor communication and information exchange is one of the biggest risks when managing an emergency. A structured approach is key to effective coordination between and within agencies.

HMAs are generally very satisfied with their communication structures, describing them in the Capability Survey as effective, functional, interoperable with other agencies and manageable. DFES noted that while they were interoperable with all agencies, only in some cases did they rate themselves to be 'highly interoperable'.

Similarly, WA Health responded that established structures were generally effective, although minor differences in terminology between agencies had the potential to cause problems. Brookfield Rail acknowledged that some of their jargon (e.g. Line 2,301km peg) meant nothing to emergency services and may hinder coordination of location information during an emergency.

Many local governments considered that agency interoperability was working effectively. However, they noted some issues arose in practice, the main one being a lack of appropriate notifications. The Shire of Northam reported that all coordination groups were activated during flooding in 2017, when the Avon River threatened to break its banks and wash away homes; the only issue was that 'information regarding river levels was not being passed down from the State Operations Centre'.

It is evident that while 'response-related' communication structures are effective, interagency issues relating to the relationship between coordination and control needed to be fully resolved. For example, both SJA and CPFS noted that non-HMA agencies found it difficult at times to get the attention of incident management teams and ISGs. NBN Co also noted that while there were few technical impediments to communication, at times subject matter experts from non-emergency response areas were not always listened to.

Early involvement of support organisations provides the Incident Controller with assistance in forward planning for emergencies. EMAs, local governments and service providers provide this critical support. Similarly, recovery activities may be impeded without comprehensive impact assessments being an early priority. However, it must be noted that while there have been issues in the past, agencies are now focused on building good relationships to rectify the problems.

A high number of local governments and EMAs reported being unsure about many aspects of coordination structures. More than 12 said their arrangements had not been tested. For example, the Shire of Cranbrook stated that even though no large recent incidents have enabled testing, they believed the structures documented in their LEMA would be effective.

One inner metropolitan local government noted that '*we are not a response agency*' and thus had no concern with interoperability of communications.

While several agencies responded that all organisations were cooperative and available in emergency situations, the systems in place to facilitate cooperation (hardware, in particular) needed fixing. The following situations were reported:

- The Health radio network does not communicate directly with other agencies.
- While all organisations with WAERN (WA Emergency Radio Network) systems could communicate, WA Police were not part of the network.
- Communications depended on the telecommunications network, which was subject to disruption by some Hazards.
- In some parts of the state, there could be delays in establishing effective communications.
- Interoperability of radio communications equipment was currently limited to two channels.
- A small number of older volunteer brigade vehicles relied on mid-band VHF communication, which was not compatible with the standard high-band VHF.
- Until the State Crisis Information Management System (SCIMS) project was delivered (see page 127), WebEOC was not compatible across agencies.
- A number of agencies relied on landline and mobile phones, subject to network availability. Some areas had access to satellite phones.

The City of Greater Geraldton noted they had to use multiple communication systems: while the Fire & Rescue Services (FRS) and Bush Fire Brigades (BFB) operated on WAERN, WA Police did not; and in some regional locations, SJA operated on UHF because only some locations had WAERN functionality.

Limitations with State agencies incident management systems interoperability can lead to a lack of situation awareness. The use of a statewide information management system is essential to achieving a common operating platform and the timely sharing of intelligence and planning actions. The SCIMS project will help to address this issue with allied agencies.

4.29 Mass casualty management

Achievement objectives

- Pre-Hospital – mass casualty management services are available, timely and sufficient during an emergency event. This includes pre-hospital treatments of first aid (physiological and psychological), ambulance, aero-medical retrieval and medical teams.
- Hospital – mass casualty management is considered within workforce and surge planning including the provision and maintenance of specialist services, community health and early discharge programs.

Key findings

- Agencies require greater context to accurately assess mass casualty management capability.
- SJA reports that resourcing constraints challenge the provision of mass casualty management in regional WA.

Mass casualty management is the health sector's immediate priority in an emergency. WA Health and SJA are the key agencies involved in mass casualty management. WA Health coordinates mass casualty aero-medical retrieval (primarily through the Royal Flying Doctor Service), while also providing pre-hospital and hospital medical teams. SJA provides mass casualty advanced first aid and ambulance services.

DFES and WA Police reported that although first aid was not their primary role, their staff was trained in first aid. In addition, both agencies participated in aero-medical retrieval. DFES managed the State Emergency Rescue Helicopter Service. WA Police was only involved in aero-medical retrieval as the HMA for lost persons on land or in a marine environment.

Agency capability for mass casualty management was assessed against consequence criteria – moderate (26 people with critical injuries), major (262 people with critical injuries) and catastrophic (2623 people with critical injuries).

WA Health reported it was difficult to measure capability in the absence of context regarding location, severity, types of injuries, timing of the emergency and other factors affecting capacity.

SJA mirrored this view, stating that the circumstances and location of an emergency would dictate the challenge. Metropolitan emergencies would differ from regional ones, for example. SJA in the metropolitan area was well resourced to respond to a mass casualty emergency, but the challenge would depend on the scale of the emergency and access to patients. The situation in regional WA was more difficult. Resourcing was a challenge and again, the location and scale of any incident would be a factor. The more remote the emergency, the greater the impact and the fewer resources available.

In recognition of these challenges, the state has two Bell 412EP Huey helicopters that form the Emergency Rescue Helicopter Service, with the combined capacity to cover 95% of the state's population.

The helicopters operate from Jandakot and Bunbury, guaranteeing a critical-care paramedical response within 200km of their base. Each helicopter is crewed with one critical-care paramedic. Critical care includes all the medical response functions of an ambulance plus the ability to administer drugs, blood products and advanced airway management.

The rescue helicopters undertake three types of missions:

- flying critical care specialists directly to the scene of an incident, including car and motorcycle crashes and then transporting the injured to hospital
- search and rescue, including searching for missing people, maritime operations in support of the Australian Maritime Safety Authority and attending cliff or sea rescues
- providing essential hospital transfers.

Each helicopter can evacuate and provide in-flight patient care for up to two patients or assist in triage at a mass casualty event. The rescue helicopters are a medical retrieval service; however, they are without other rescue capabilities such as heavy rescue. Although the helicopters have all-weather 24/7 capability, they have limited redundancy.

4.30 Mass fatality management

Achievement objective

- Services are available to deal with a mass fatality incident. This includes: body recovery, disaster victim identification, mortuary, burial and cremation services and the management of information.

Key findings

- Mass fatality planning is in place for moderate, major and catastrophic emergencies.
- Interstate assistance and additional mortuary capacity would be required for catastrophic emergencies.
- WA has not been exposed to a mass fatality event and so plans are yet to be tested in real time.

Mass fatalities resulting from major incidents occur both nationally and internationally. Large, sudden events can result in numerous fatalities, overwhelming health, law enforcement, rescue and other services. Most vivid in the public imagination are natural disasters.

In January and February 2009, heatwaves in south-eastern Australia resulted in 406 deaths (AIDR 2009), while the H1N1 pandemic that commenced in April 2009 resulted in almost 200 Australian deaths and 284,500 deaths globally (AIDR 2009). While WA has not yet experienced an emergency with large-scale fatalities, the possibility cannot be discounted. WA has experienced lives being lost during major incidents. The most recent examples were the tragic loss of life in the 2015–16 southern bushfire season and 2017 floods.

Despite the grim nature of fatality management, mass fatalities can occur and it is prudent for authorities to plan for the eventuality. The impact of fatalities on a community is well recognised and is a key criterion when assessing risk using the National Emergency Risk Assessment Guidelines.

Analyses in the State Risk Project show that Earthquake and Air Crash pose the highest risk of mass fatalities for Perth. Other hazards (such as pandemics, rail crash, fire, storm, tsunami and heatwaves) pose equivalent risk to regional areas. These risks accord with the available global data.

WA Police and WA Health reported they have significant roles in fatality management, particularly in relation to the recovery of bodies, disaster victim identification (DVI), mortuary services and management of information.

SJA reported that paramedics and voluntary ambulance officers performed a role in certification of life extinct and special operations paramedics work closely with DFES urban search and rescue (USAR) teams.

USAR technicians had been trained in DVI by WA Police and in the logistics of hospital preparation and mortuary assistance. This DFES capability in body recovery would still need support from WA Police and WA Health for significant emergencies resulting in mass fatalities.

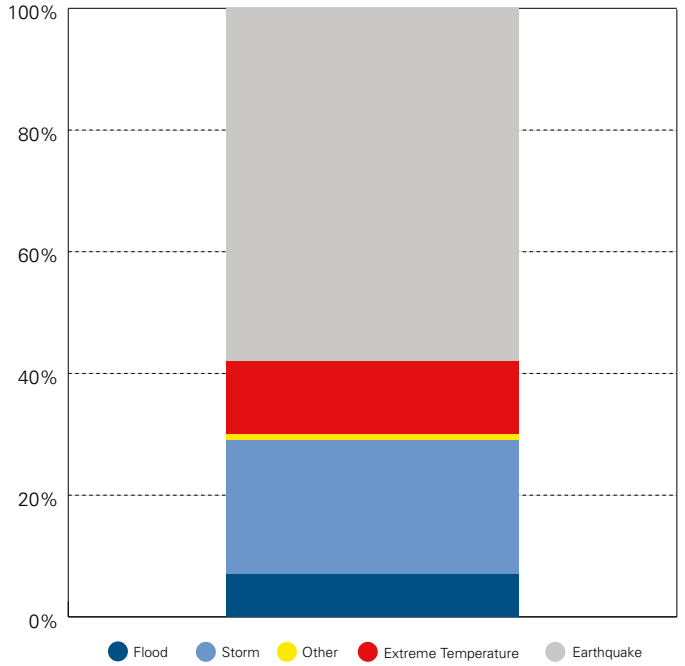
This year, agency capability for mass fatality management was assessed against moderate (26 deaths), major (262 deaths) and catastrophic (2623 deaths) criteria. WA Police reported that body recovery services, DVI and management of information services were available, timely[2] and could be managed for moderate and major emergencies. However, interstate assistance would be required (and is accommodated in existing plans) for catastrophic emergencies.

2 Timeliness of information would depend on circumstances of the situation (location, condition of bodies, nature of event).

In relation to mortuary services, both WA Police and WA Health reported that services were available for moderate and major emergencies; however, additional emergency mortuary capacity would be required for catastrophic emergencies.

WA Police also reported that WA had the benefit of the planning that was undertaken in the search for Malaysian airlines MH370, when it was thought that victims might be recovered off the WA coast. Planning for mass fatality management in this case was well thought out and documented, but had yet to be tested in a real incident.

Global mass fatality incidents – number of deaths by event type



Source: Disaster Risk Management for Health Fact Sheets http://who.int/hac/events/drm_fact_sheet_mass_fatalities.pdf

IN FOCUS

Outreach: community-led recovery

Outreach is designed to provide psychological first aid to survivors (both individual and communities) of major incidents. The program takes recovery services to the community – by providing independent, non-judgmental, all-inclusive support and timely access to information and services. Volunteer visitors reach people who:

- may not be able to access services
- may not think they are entitled to receive services
- have mobility constraints
- are socially isolated
- may otherwise slip through the cracks.

Trained Red Cross personnel call on disaster-affected people, visiting them in their homes, businesses or by phone. Sometimes, local government staff and local bushfire brigade volunteers call on residents on outreach visits with Red Cross volunteers.

The process is carried out throughout the recovery phase, starting immediately after an emergency event as well as in the weeks, months and potentially years following. The protracted period extends the psychosocial support, ensuring people feel cared about and acknowledged and have access to services that meet their changing needs, long after the surrounding community has returned to business as usual.

The outreach program has been delivered in WA for more than 10 years, including after the:

- Carnarvon floods (2010)
- Kelmscott/Roleystone bushfire (2011)
- Margaret River bushfire (2011)
- Parkerville, Stoneville, Mt Helena bushfire (2014)
- Northcliffe bushfire(2015)
- Waroona/Yarloop/Harvey bushfire (2016)
  - outreach support is ongoing
- statewide flood events (2017).

The program highlights the importance of planning visits well, taking into account the psychosocial needs of communities after emergencies and ensuring that information collected is used to inform the delivery of relevant, timely and appropriate relief and recovery services. In its latter stages, outreach becomes an important platform to understand the recovery needs of a community in the long term.

Red Cross works within the local recovery structure and prepares comprehensive outreach reports, capturing both qualitative and quantitative data. These inform recovery planning and outline the capacity of the community to participate in community-led recovery.

4.31 Welfare

Achievement objective

- Welfare and social services are available, timely and sufficient during or immediately after an emergency event. This includes critical support services and communication plans to inform affected people of impacts.

Key findings

- Most local governments have identified welfare centres.
- Local governments work in partnership with CPFS and HMAs to provide welfare services.

Welfare is defined as providing immediate and ongoing supportive services to alleviate, as far as practicable, the effects on people affected by an emergency. It involves six main areas:

- emergency accommodation
- emergency catering
- emergency clothing and personal requisites
- personal support services
- registration and reunification
- financial assistance.

The CPFS has the responsibility of coordinating welfare support both during an emergency and in recovery. To do this it is critical that they receive support from all relevant HMAs, EMAs and local governments and that they consider welfare services in their EM planning.

HMAs and EMAs that provide welfare services during or after a major emergency include DFES, CPFS, the Department of Education and Red Cross. DFES, CPFS and WA Police also reported identifying suitable welfare centres in preparedness planning.

Local governments overwhelming acknowledged their crucial role in welfare, with 75% acknowledging their role in providing services during or after an emergency and 85% reporting that welfare centres within their district had been identified and were ready to activate as needed.

Most local governments (75%) indicated that the welfare and community services they provided were available, timely and sufficient.

They also reported redundancies in place to maintain the provision of essential services (food, potable water, shelter and power) to identified welfare centres. Many local governments also acknowledged working in conjunction with CPFS operational staff for the provision of welfare services.

For example, the City of Karratha reported that city-owned facilities were used as welfare centres and that the city maintained a generator at the central facility, to power the welfare centre during an emergency. They commented that there had been '*no complaints from residents during last few years' (of) cyclones and major fires'.*

The City of Wanneroo reported they assisted with:

> *' … emergency accommodation, by utilising identified facilities as welfare/evacuation centres. The city also makes arrangements for the care of domestic pets, including managing and registering animals that are brought in or found. The city provides support to agencies (CPFS & Red Cross) working collaboratively to assist the community. The city offers Home and Community Care (HACC) services to residents. Programs have been developed to allow officers to quickly identify affected people. Database systems have been prepared to identify those clients who have requested contact in relation to weather and emergency alerts.'*

On 18 August 2017 DFES implemented a new system and process to manage natural hazard requests for assistance. Using the Web-based Emergency Operations Centre (WebEOC), the new system will extend the current use and provide an end-to-end solution for managing requests for assistance.

4.32 Impact assessment

Achievement objective

- Agencies have the ability to undertake and complete comprehensive impact assessments across the natural, built, social and economic environments. These findings inform recovery coordination and future emergency management planning.

Key findings

- Response agencies are responsible for coordinating the inputs for comprehensive impact assessments, preferably in conjunction with local governments and key stakeholders.
- Comprehensive impact assessments are key determinants for success in recovery. They should be thorough, inclusive and set directions and priorities for recovery.

The collection and management of loss and damage data after an emergency is known as impact assessment.

The National Impact Assessment Model (NIAM) has been designed to provide national consistency for impact assessment to inform relief and recovery interventions. The model focuses on the collection of data as soon as practicable after an event to inform recovery needs (for instance, the number of residential properties damaged may indicate a need for temporary accommodation assistance).

WA continues to work with the Commonwealth to develop the model, incorporating some NIAM indicators into the state's CIA process. A CIA is to be completed by the Controlling Agency for all Level 2 and Level 3 incidents. The draft is to be provided to all members of the ISG for comment and clarification prior to it being finalised.

A recent use of a CIA was after the January 2016 Waroona fire. It provided a detailed assessment of damage to Yarloop and surrounding districts and assisted in the transition from response to recovery.

While the CIA is an effective tool to capture the situation immediately after an event, much work remains to assist the transition to recovery. Specifically, there is a need to place a greater focus on assessing future impacts on the natural, built, social and economic aspects of an affected community.

Most HMAs reported that they have the 'capability' to undertake a CIA, with well over half the EMAs and local governments reporting the ability to contribute to the assessment. DFES reported having established Rapid Damage Assessment Teams to complete Initial Impact Assessments. These, along with other agency inputs, would feed into the development of a CIA. A greater emphasis on a 'joined-up' and collaborative process would produce a better product. WA Health noted that the CIA in its current form was not suitable for all hazards (such as Heatwave).

CIAs are vital in ensuring that communities can effectively recover after emergencies. They need to be completed collaboratively, openly and engage as many parts of the community as possible. The DoT commented that they would need external assistance in completing a CIA, particularly if significant environmental impact was involved.

The process of assessing impact should be viewed as an opportunity to engage and communicate with affected people and businesses, instilling confidence that there is a plan. The process needs to commence in the response phase and the CIA should be an evolving document that informs decision makers on planning and priorities in recovery.

4.33 Recovery coordination

Achievement objectives

- Agencies have the resources and skills to support impacted communities to manage their own recovery and achieve the best possible outcome. This includes reconstruction and restoration of natural, built, social and economic environments.
- Recovery arrangements are in place following a major emergency. This should include engagement between HMAs, local government, NGOs, industry and communities and should consider long-term impacts.

Key findings

- Emergencies have a major impact on people and communities, often on a scale that is disproportionate to the event itself.
- Focusing on recovery early in the response phase is critical.
- Managing recovery is complex and lengthy.
- Capacity varies greatly.
- Opportunities exist to better engage with local businesses and community groups.

The January/February 2017 flooding event in WA affected 92 local governments and covered 2.8 million square kilometres – an area the size of Western Europe. The scale of the impact is reflected in the data, with 38% of local governments reporting having experienced an emergency that required a multi-agency response, as opposed to only 11% in 2016.

Despite the sheer scale and widespread damage to roads and infrastructure, the floods produced a very different psychosocial profile than the major bushfires of the previous year. Bushfires are hot, dramatic, highly erratic, frighteningly visual and destructive. Floods generally evolve more slowly and are mostly predictable but are equally destructive. While it can be said that we are prepared for bushfires and have good response and recovery mechanisms in place, there is still much to learn from a large-scale flooding event.

Recovery activities after the floods centred upon the application of WANDRRA. But complexities emerged. The scale of destruction – both geographic and financial – stretched capability at all levels. The need for immediate expert WANDRRA advice to local governments was crucial.

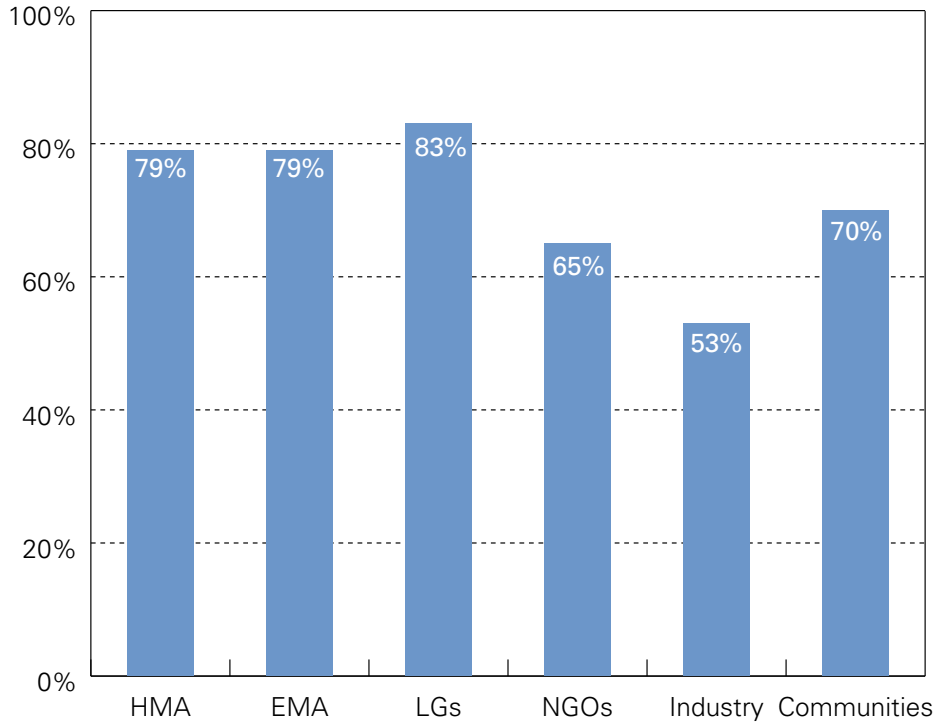
A temporary exemption from the Commonwealth allowed local governments to use their own labour, plant and equipment to repair damaged essential public infrastructure. The exemption increases flexibility but firm criteria is still required to ensure that value for money is achieved.

The scale of the event also triggered an application for Category C funding. These grants are designed to assist with clean-up, removal of debris, disposal of dead livestock, as well as the reinstatement and loss of items of cultural importance to the community.

Category C grants were available to the shires of Lake Grace and Ravensthorpe and the City of Swan. This was the first time the Commonwealth made Category C funding available since the Carnarvon floods of 2011.

Feedback about recovery coordination in 2017 validated previous concerns about whether there is sufficient resources and expertise at the local level to manage recovery projects while still maintaining business as usual.

Input to local government recovery plans by:



Analysis of responses about recovery planning by local governments reveals high levels of engagement with agencies involved in the EM sector. But it drops off considerably with respect to local businesses and industries, NGOs and community groups.

These groups represent a standing resource that may be highly beneficial in assisting recovery efforts. In an environment of high demands, short time frames and limited resources, this presents a significant opportunity for improvement.

More than half (52%) of local governments reported they had conducted exercises for their relevant Hazards during the year. In past years, exercising has focused solely upon response. Recovery planning and operations have now come to the fore. Implications arising from running recovery operations alongside business-as-usual activities should be further developed into the exercise regime.

Questions around sharing of information drew varying responses across the state. Less sharing was evident (understandably) from the more geographically remote local governments. In the future, better sharing between HMAs, local governments and communities around Hazards other than Bushfire may assist preparedness.

SOCIAL SETTING – TO MAINTAIN PUBLIC ORDER, SAFETY, SANITATION, EDUCATION, HEALTH AND CULTURE

Impact 05

05 IMPACT

5.1 WANDRRA

Emergencies often result in large-scale expenditure by federal and state governments in the form of disaster relief and recovery payments and infrastructure restoration. The Commonwealth underpins funding arrangements with the state under the Natural Disaster Relief and Recovery Arrangements (NDRAA) Determination.

Up until 30 June 2017, the current Commonwealth Determination was applied from 2012. However, the Determination has been under review, with a number of changes recently occurring or due to occur in the near future. These include:

- 5 May 2017 – a temporary exemption was granted to allow local governments in WA to use their labour, plant and equipment to recover essential public assets affected by a proclaimed natural disaster. While the exemption is available to all jurisdictions, only Queensland and WA have applied to date.
- 1 July 2017 – the 2017 Determination became effective, superseding the 2012 version. The revised 2017 Determination has been issued to the states but has not been part of ongoing consultation between the Commonwealth and all jurisdictions. Some changes appear in the new Determination but they are not deemed significant.
- 1 July 2018 – new funding arrangements become effective. The proposed arrangements incorporate significant changes. Consultation between the Commonwealth and jurisdictions has taken place since 2015. Consultation continues, as the final draft has not yet been provided to the jurisdictions.

Developing, implementing and communicating the new funding arrangements will require substantial work from all agencies involved in WANDRRA to ensure the state adheres to the new arrangements and maximises the disaster funding made available by the Commonwealth.

5.2 North West wet season resupply of isolated communities

The 2016–17 wet season in the North-West was one of the biggest on record in terms of both the number of weather events and the amount of rainfall. Three tropical cyclones and an above-average number of tropical lows impacted across the Kimberley and the Pilbara. These events resulted in damage to large sections of state and local roads which left many remote communities and a number of pastoral stations isolated.

DFES, as the HMA for natural hazards, is responsible for resupply to isolated communities.

Pre-wet season preparedness

Every year, towns and properties potentially come under threat of isolation from extreme weather events. Knowing this, DFES undertakes numerous pre-emptive initiatives prior to each wet season to prepare those at risk and to mitigate the need for resupply to isolated communities. These include:

- identifying communities at risk of becoming isolated
- encouraging them to stockpile supplies of food and fuel so they can sustain themselves for extended periods of time
- assisting in the development of local-level plans and procedures, staff training and stakeholder liaison.

Kimberley isolated communities: emergency resupply

The Kimberley wet season brought more rain than the region had seen for a number of decades, with some towns receiving their highest rainfall since records began. The first significant weather system to impact the Kimberley was a tropical low that developed on 20 December and brought rainfall of 200–300mm across the region, with some areas receiving between 400 and 500mm. Broome Airport recorded its wettest December day on record and widespread flooding occurred across the Kimberley. The final official wet season rainfall was from Tropical Cyclone Frances in late April.

The Kimberley's first emergency resupply was to the Djugerari community, south-east of Fitzroy Crossing, on 20 January. The last of the season was to Yakanarra, south-west of Fitzroy Crossing, on 24 May. Between these events, resupply missions took place to another 12 remote Aboriginal communities and two pastoral stations. The total number of missions was 22, with some communities receiving multiple resupplies. More than 23 tonnes of dry and frozen goods and fruit and vegetables were transported to communities that had been cut off. Two people were evacuated from the Muludja community near Fitzroy Crossing because of medical issues.

A Bell 412 helicopter was contracted from New South Wales to assist in the delivery of fuel. This allowed for up to 9000 litres of fuel to be transported per day over a two-week period.

DFES' well-established relationships with stakeholders across the region and pre-season preparedness activities assisted in the effective coordination and implementation of the resupply.

Figure 18. Bell 412 helicopter delivering fuel

Pilbara: Kiwirrkurra – Alternative Freight Transport Scheme

In the Pilbara, resupply was undertaken to the Parnngurr, Punmu and Kiwirrkurra Aboriginal communities.

Kiwirrkurra is a remote Aboriginal community located in the Western Desert. It is 800km east of Newman and 100km west of the WA and Northern Territory border. Its usual population is about 100 and 90 of those stayed in the community during the last wet season.

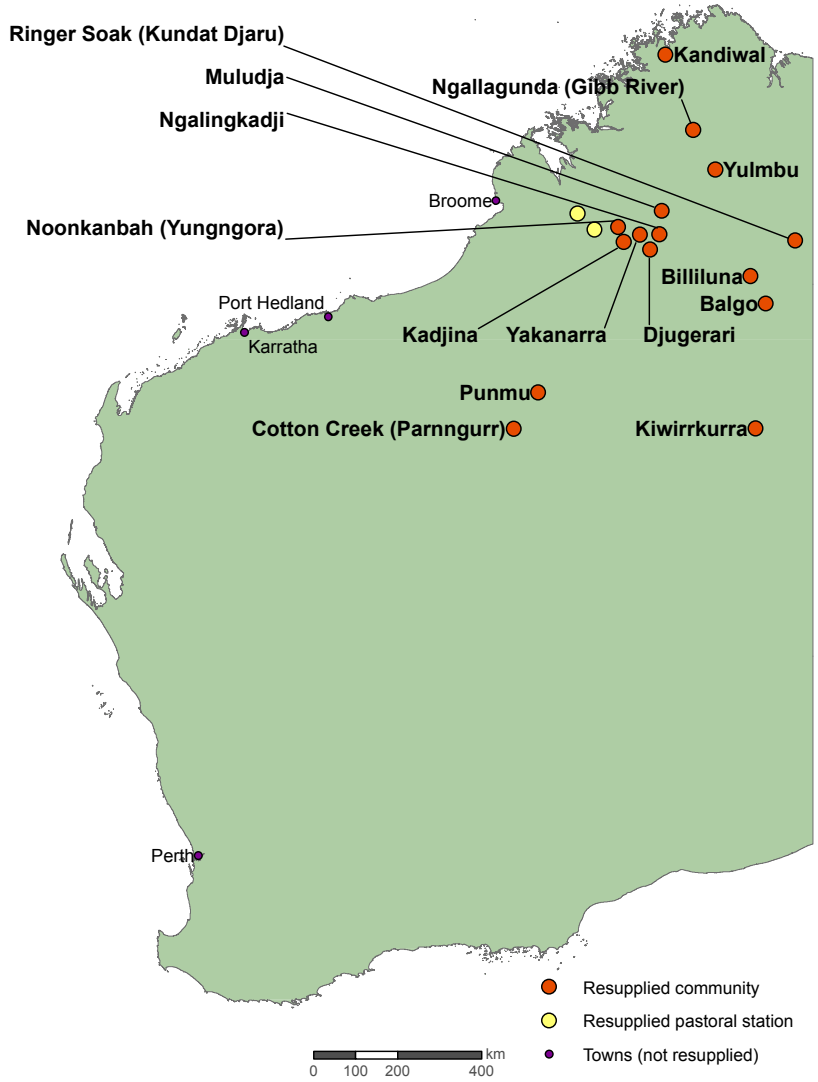
The community was initially cut off by flooding following rainfall from a tropical low that impacted large areas of the Shire of East Pilbara and the Northern Territory in late December 2016. The community remained isolated for nearly two months because of subsequent rainfall, including a tropical low in January 2017.

The first resupply to Kiwirrkurra took place on 13 January 2017 and consisted of more than half a tonne of food, which was transported by fixed-wing aircraft. The last resupply to Kiwirrkurrra was undertaken on 9 March. During this period, a total of 11 resupply missions took place – six by air and five by road, including missions via Alice Springs. More than 4 tonnes of food was transported by air and 14.5 tonnes of food and 53,000 litres of fuel by road.

Some of the challenges included the complexities of distance, accessibility, prolonged weather events and cross-jurisdictional liaison between the WA, Northern Territory and Federal governments. Frequent stakeholder consultation meant the needs of the community were met and ensured the responsible use of available resources.

Figure 19. Loading for Kiwirrkurra in Newman

2017 Wet season resupply of isolated communities



5.3 Flooding

In addition to the flooding in the north of the state there were also a number of significant rainfall events that occurred in southern parts of the State. Most notably two cloud bands brought unusually high rainfall totals to parts of the South West Land Division in late January and early to mid-February. The January event caused minor flooding in the Avon and upper parts of the Swan River as rainfall totals over 200mm were reported in the southwest Central Wheat Belt.

This event was closely followed by another cloud band approximately two weeks later that brought widespread heavy rainfall to southwest WA with totals over several days up to 200mm, particularly around Ravensthorpe. Significant flooding occurred as a result, with major flooding reported in the Avon catchment and flooding in the Swan River. In addition, major flooding was experienced in the Esperance Coast Basin and Blackwood River catchment.

The flooding caused significant road damage, particularly in the Esperance Coast Basin, with the Phillips River Bridge, on the South Coast Highway to the west of the town of Ravensthorpe, destroyed. Ravensthorpe was consequently cut-off by road from surrounding districts with all access roads to the town cut-off by flood waters.

Two fatalities were reported in southwest WA as a result of two separate incidents where motor vehicles were washed off roads when trying to cross flooded rivers. The WA Government declared a natural disaster for the region with many local governments in the South West Land Division impacted.

5.4 Cross-sectoral initiatives

As outlined in section 2.3 of this report, significant changes have taken place in the EM environment during 2016–17, with more expected in the near future. These represent an opportunity to revitalise the EM sector as it continues to strive for improvement while strategic matters such as structural alignment are considered.

Structure

In June 2017, the Government held a Bushfire Mitigation Summit in Mandurah. A wide range of stakeholders explored bushfire management issues, including how a rural fire service could operate. Feedback from the Summit and associated public submission process, will inform considerations on future strategies for bushfire management.

In the draft report on its review of the ESL released in July 2017, the Economic Regulation Authority (ERA) states that a rural fire service could cost between $4.2 million and $560 million per annum depending on the type of model adopted.

A significant structural change since last year's *Emergency Preparedness Report* is the establishment of OEM, another recommendation of the Ferguson Report. The OEM has retained the roles of the former SEMC Secretariat while adopting the recovery function from DPC and adding an assurance function.

The State Bushfire Coordinating Committee has also been established as a subcommittee of the SEMC. The Committee is chaired by the Director of OBRM and has focused on developing a state bushfire policy.

Recovery

Following the severe damage to Yarloop as a result of the Waroona bushfire, recovery was identified as a major area requiring attention in the 2016 *Emergency Preparedness Report*. The fire necessitated a much more comprehensive and exhaustive recovery operation than had been the case in recent memory and raised the importance of planning to recover.

In February 2017, a new State Recovery Coordinator was appointed following the transfer of the Recovery function from DPC to OEM. Soon after the transfer of the function, the OEM recovery team dealt with major flooding events that affected 92 local governments in the State during January and February 2017.

Two major incidents in two years has emphasised the increasing challenges faced in providing recovery services. The SEMC Recovery Subcommittee and OEM recovery team have identified a number of opportunities to improve recovery stemming from previous major incidents. There are a number of key projects underway to ensure that these are lessons learned and not just identified.

Shared responsibility

The responsibility for community safety during emergencies is a shared one. Engagement between the state, local governments, individuals, businesses, households and the broader community was another issue raised in the 2016 *Emergency Preparedness Report*. It was identified that there was still a significant lack of public engagement and understanding of risk. This was despite extensive quality information and education being available. This raised questions about the effectiveness of the messages or the delivery. Reduced engagement was reported among local governments that hadn't needed to respond to an emergency for a significant period.

Since 2013 WA has been building a consistent and comprehensive understanding of the EM risks related to the 27 hazards listed in the Act. District Risk Assessment Reports which analyse the top five or six hazards per district were released in June 2017 and will guide future work programs. The reports provide a body of objective evidence that can help inform investment decisions with a preference towards prevention and preparedness activities. Local governments have been involved in this process and have access to information, which should enhance their understanding of the risks they face.

The local-level phase of the project commenced in 2017 with local government take-up, participation and support of the project being very strong. The aim of the local-level component is to provide training, support and tools to help local governments undertake the emergency risk management process as required by existing policy. Going forward OEM will focus on enhancing local government emergency risk assessments and moving towards identifying treatment/mitigation options.

An area of concern raised at the Bushfire Mitigation Summit was the need for landowners to better understand their site-specific risk. This is expected to be enhanced as OBRM's BRMP program continues to roll out to all local government areas including landowners/managers.

The Get Set Together program is an all-hazard preparedness program that is to be delivered across urban, regional and remote communities using a digital portal developed by DFES. The structure of the program provides for participatory workshops that are localised and competency-based. It is intended that the user experience is motivating and drives behavioural change. The Get Set Together project is being developed and will be completed at the end of 2017.

Traffic management

The 2016 *Emergency Preparedness Report* highlighted the need for an effective system of controlling access to emergency impacted areas, both to facilitate effective response and recovery and to protect lives. The stated aim was to find a practical balance between the risk to life and the public value of enabling the timely restoration of livelihoods.

The Ferguson Report recommended that the policy for traffic management at emergency incidents be reviewed so it reflects national best practice. While existing policy, plans and guidelines did not require amendment, the following work has been undertaken to implement and communicate the existing processes:

- Development of a Traffic Management Aide-Memoire to help Vehicle Control Point staff differentiate between full and partial road closures and what that means; that is, who is allowed through and who is not. The document was finalised in November 2016 and distributed to all stakeholders.

- Finalisation of the DFES Restricted Access Permit System that determines who gets a permit and the process to do so. A brochure and 10-minute video were produced to inform the community and first responders about the Restricted Access Permit System; that is, what it is and how it works.
- Development of a checklist to guide and aid Incident Management Teams (IMTs) on the establishment and operations of a traffic management cell within the planning function of the IMT.
- Implementation of a communications and marketing plan.

As the 2016–17 bushfire season did not provide the opportunity to fully test the implemented traffic management policy, OEM engaged an independent practitioner to review the traffic management arrangements, policies, plans and guidelines against national best practice.

The Ferguson Report recommended that DFES issue photo identification cards to allow for the recognition of personnel and their vehicles needing to pass through Vehicle Control Points during incidents. Many cards have been issued, with the majority of volunteers who were likely to participate in operational firefighting during the 2016–17 bushfire season issued with an ID Card. Cards continue to be issued across all services.

Resourcing

A lack of dedicated and sustainable resourcing was identified as having adversely affected the ability of stakeholders, particularly local governments, to provide proactive mitigation, asset betterment, recruitment of appropriately skilled staff and response and recovery services.

Significant additional funding through Royalties for Regions has been made available for bushfire risk mitigation:

- $20 million over four years from 2015–16 available to the Department of Biodiversity, Conservation and Attractions for works in the South West; and
- $15 million for the Department of Planning, Lands and Heritage to treat bushfire risk on state-owned land.

In its review of the Emergency Services Levy, the ERA has made recommendations regarding funding of mitigation activities. The outcomes from this review may impact on the funding available to various property owners and managers.

At the Bushfire Mitigation Summit various ways to more effectively use the resources already available to improve bushfire management were discussed. These issues were also addressed in the public submissions. The government is considering the matters raised at the Summit and in the public submissions.

Interagency cooperation

The Ferguson Report recommended that all bushfire Level 3 Incident Management Teams in the Perth Hills and the South West be integrated and pre-formed from the start of the 2016–17 fire season. In response, five 70-person IMTs, including a Level 3 structure and extended support roles within DFES' Regional and Metropolitan Operations Centres, were established for the 2016–17 fire season. These pre-formed teams (PFTs) were not required to deploy during the 2016–17 fire season. Work has been undertaken to further develop the structure, functionality and capability of the State Bushfire Level 3 PFTs.

Interoperability

Automatic Vehicle Location (AVL) tracking and emergency distress capability units have been installed in vehicles across the southern half of WA and portable units have been deployed across DFES regions. AVL tracking devices have also been installed in all metropolitan vehicles to ensure that all vehicles responding to bushfires are visible to the AVL tracking system. The in-cab crew Emergency Distress Button function is operational for vehicles that have the AVL equipment fitted.

Work is continuing to develop an interagency incident resources management tool. This will enable the registration, tasking, management and coordination of EM personnel, vehicles, plant and aircraft, with the system able to fully service Level 3 incidents. The integrated interagency platform is expected to be fully functional for the 2017–18 southern bushfire season.

State Crisis Information Management System (SCIMS) / WebFusion

The purchase of WebFusion software and a contract to host the WebFusion application using cloud technology has been completed in line with the *Digital WA: State ICT Strategy* developed by the Office of the Government Chief Information Officer. DFES and WA Police will pilot the functionality before other agencies are connected to the system.

GOVERNMENT – TO MAINTAIN PUBLIC ADMINISTRATION, DEMOCRACY AND RULE OF LAW

Conclusions 06

06 CONCLUSIONS

6.1 Conclusions

If the EM sector is to act upon the notion of a communal commitment, the sector must fully embrace engagement with the community, both to attract attention and to influence behaviour. Consideration must be given to the way that agencies develop methods and design services for the public so that inherent skills, capacities and connections within the community are harnessed and leveraged to produce positive EM outcomes .

The ability to turn plans into reality ('implementation capability') is crucial to all change efforts. Low implementation capability (particularly among local governments) increases the risk that commitment to mitigation or reform in the EM sector will be neither effective nor sustained.

The EM Act is the cornerstone of the state's EM Framework. Most agencies have internal measures to monitor compliance with the Act, while barriers with legislation have been identified; they are largely covered by proposed amendments to the Act and Regulations. Hazard-specific Westplans are regularly reviewed, monitored and exercised, as are most local government plans.

Most local governments report that their EM arrangements align with the state's EM Policy. However, any cite insufficient resources as an issue – They state that resource constraints have impacted greatly on their ability to deliver EM outcomes across the range of capability measures.

State agencies and local governments report conducting risk assessments and using the findings to make improvements. Knowledge about risks among the state's 138 local governments has been greatly improved through involvement in the State Risk Project. However, capabilities continue to vary due to limitations in capacity, resources, funding and training. Access to training was a particular concern for some regional shires, as training opportunities are oftencentralised in Perth, reducing communication and increasing costs.

Lessons management is integral to a prepared and well-practised EM sector. Significant projects are underway to improve the state's capability in lessons management In particular, co-design and coordination of identified treatments can potentially lead to an overall performance that is transformative in its cost-effectiveness and impact.

A range of mechanisms exists to alert the public to impending or current emergencies. The messages are planned and coordinated and agencies carefully consider communication mediums to ensure messages are appropriate to the urgency, content and audience. Despite significant improvements, more can be done to ensure EM information is accessible and culturally and linguistically appropriate.

The EM sector believes the level of knowledge in the community about hazards that may affect them, vulnerable elements and actions they should take in an emergency is low. Emergency action plans in particular appear to have very low uptake. People who have been exposed to (or who have experienced) emergencies are more likely to access information and are better prepared.

Local governments report that complacency and apathy are at the root of the problem. ***'It'll never happen here', 'Emergencies happen somewhere else'*** *and* '***Someone else will sort it out'.***

Multi-agency groups and EM structures such as LEMCs and DEMCs provide effective forums to share information on a range of topics, including risks, vulnerabilities and treatment options.

Natural ecosystems, including dunes and wetlands, can be the first line of defence against natural hazards. Their identification and maintenance is more prevalent along the coast through coastal management, dune preservation and the work of coastal care groups. Land-use planning is an effective tool to proactively mitigate the impact of hazards on communities. While land-use plans are widely used for Bushfire (80%) and Flood (67%), they are not commonly used for other hazards.

All relevant agencies report having plans in place for the protection of critical infrastructure. However, essential services are predominantly viewed as the responsibility of the asset owner. There is room to improve awareness within the EM sector of the interdependency of services. Disaster resilience depends on the whole interconnected system ('cascading effects') and not simply on individual organisations.

Agencies report identifying and, where possible, minimising or building redundancies for single points of failure; however, road networks represent an enduring challenge, with single road access reported in many shires. Other key areas of single points of failure are identified as information technology and key personnel or expertise.

Plans are in place to reach remote locations during an emergency; however, doing do in a timely manner is an enduring issue. All agencies should engage more with businesses and industries to encourage them to create business continuity plans that will speed up the return to normal routines and activities after an emergency.

EM personnel are generally highly trained and capable, with volunteers making an invaluable contribution, particularly in regional areas. Existing operations centres run by HMAs have the infrastructure capacity to manage multiple concurrent emergencies for most hazards. HMAs report that formalised and tested plans are in place to address mobilisation, predeployment of assets, peak surges and redundancies for outages.

EM structures and protocols define interrelationships and facilitate communication. They are generally well understood. Local governments have a good understanding of their role in evacuations, with 70% of local governments having some form of pre-evacuation emergency plan in place.

Opportunities for improvement in public protection identified in the 2016 *Emergency Preparedness Report* have been actioned. Measures were introduced to control access and verify the identity of people seeking entry to restricted locations. Mass fatality planning is in place for moderate, major and catastrophic emergencies. However, interstate assistance and additional mortuary capacity would be required for catastrophic emergencies.

Managing recovery is complex and lengthy. Focusing on recovery early in the response phase is critical. Response agencies are responsible for coordinating the inputs for comprehensive impact assessments, preferably in conjunction with local governments and key stakeholders.

Strategic direction

07

07 STRATEGIC DIRECTION

7.1 Assurance

Following the release of the Ferguson Report, the newly established OEM was tasked to '… *provide assurance and reporting and to inquire into, monitor and report transparently on EM standards, preparedness, capability, service delivery and investment performance outcomes*'.

Subsequently, the government tasked the OEM to establish an EM assurance framework for WA. The final composition and business plan for the Assurance function remains under development. Work to date has focused on stakeholder engagement and an examination of current governance arrangements. While not confirmed, it is envisaged that the Assurance function will examine areas of EM interest and work to deliver:

An annual assurance report

- to verify information gained through the *Emergency Preparedness Report* and other mechanisms
- to provide updates on the status of recommendations/lessons.

Comprehensive reviews

- 'deep dives' into highlighted areas of concern
- thorough investigation of narrowly focused topics.

Thematic assurance reports

- to report the outcomes of scheduled assurance activities.

The State Capability Framework is the key to the activities of the OEM. It outlines and articulates the elements that are needed to be capable in the face of major emergencies. It is the basis on which the preparedness of the state is judged. It is evolving to be the benchmark for LEMA and it represents the things that should be assured.

The Assurance function could initially seek to substantiate agency capability claims provided to the OEM for the annual SEMC *Emergency Preparedness Report*. This may include analysis of governance, risk management and control processes within organisations.

Lessons management

The Ferguson Report examined the 'lessons learned from previous bushfires'. The report was critical of the lack of systemic monitoring of the implementation of recommendations from previous major incident reviews. A critical component of lessons management is the process of converting a lesson identified into a lesson learnt. This occurs when the lesson has been resolved, embedded in organisations' 'business as usual' practices and tested.

The OEM has commenced the development of a comprehensive lessons management system and intends to develop a complementary exercise management framework overseen by the SEMC Response Capability Subcommittee.

7.2 Hazard plans

There are 27 hazards prescribed within the *Emergency Management Act 2005* and 27 Westplans that do not all directly align with the hazards. The Westplans are developed, maintained and reviewed by HMAs and approved by the SEMC. The purpose of the Westplans is to provide state-level guidance on the management of specific hazards.

There is considerable duplication within the Westplans for hazards with similar consequences. As part of a broader Policy and Governance Review Project, the OEM has been addressing this duplication through the Westplan Rationalisation project, which focuses on two main activities:

- rationalisation and amalgamation of Westplans, as agreed by the SEMC in December 2016
- conversion of all Westplans into succinct State Hazard Plans that will become subplans of the State EM Plan.

The project will enable hazards with similar consequences to be considered together within one plan. For example, it is proposed that the existing Westplans for Cyclone, Storm and Flood be amalgamated under one plan to be called 'Severe Weather'. This will improve coordination and reduce inconsistencies in EM arrangements, particularly when similar hazards are managed by different HMAs. The project will reduce the number of hazard-specific plans to 13. This will ensure the new State Hazard Plans contain only information pertinent to the hazard, making the documents contemporary and fit for purpose.

It is anticipated that the rationalisation process will be completed by March 2018.

Proposed rationalisation of hazard-specific Westplans

Proposed plan	Previous plans
HAZMAT	• Chemical and Radiological component of CBRN • Hazardous Material • Nuclear Powered Warship (NPW) – Annex • Space Re-entry Debris (SPRED) – Annex
Human Biosecurity	• Human Epidemic • Biological component of CBRN
Crash Emergency	• Air Crash • Rail Crash Brookfield • Rail Crash Public Transport Authority (PTA) • Road Crash
Maritime Environment Emergency	• Marine Oil Pollution • Marine Transport Emergency
Name to be determined	• Collapse • Earthquake
Severe Weather	• Cyclone • Storm • Flood
Energy Supply Disruption	• Electricity supply • Gas supply • Liquid Fuel supply
Name to be determined	• Land Search • Marine Search
Heatwave	• Heatwave
Fire	• Fire
Animal and Plant Biosecurity	• Animal and Plant Biosecurity
Terrorist Act	• Terrorist Act
Tsunami	• Tsunami

7.3 Rural fire management

The issue of rural fire management is a complex and significant one for WA. There is no single solution. The state is large and diverse, with changing climates, landscapes and peoples. The rapid growth of urban areas has seen a broadening of the peri-urban fringe and development into bushfire-prone areas, particularly along the Darling Scarp and throughout the South West.

Inquiries into recent devastating fires have reached a similar finding – that a decentralised approach to bushfire management is needed. In 2012 structural and land-use reforms were initiated in response to serious bushfires at Margaret River and in the Perth Hills. In 2016 Special Inquirer Mr Euan Ferguson's preference was to create a Rural Fire Service as an entity separate to the DFES or alternatively, as a sub-department of DFES with its own budget and ability to exercise its own powers and responsibilities.

In June 2017, the government held a Bushfire Mitigation Summit to hear stakeholders' views on a range of bushfire management issues, including the delivery of rural fire management. Members of the public and interested organisations had an opportunity to contribute through public submissions.

Emergency Services Minister Fran Logan commented that 'the summit also demonstrated how complex the task is with many of the issues falling under a range of government portfolios, including local government, environment, regional development, planning, lands and police' (Department of the Premier and Cabinet 2017).

At the time of writing, further major structural reforms are under consideration as recommended by the Ferguson review into the Waroona fire of January 2016. While the outcomes of these considerations are unknown at the time of publication, it is important to acknowledge that meaningful work to enhance bushfire management continues.

7.4 Recovery

The 2016 *Emergency Preparedness Report* highlighted that the same maturity the state displayed in preparing to respond to an emergency was needed when planning to recover from such an emergency. Soon after the transfer of the Recovery function from DPC to the OEM, a major flooding event affected 92 local governments across the state. Two major incidents in two years (the Waroona fire and widespread flooding) emphasise the increasing challenges faced by the state in providing recovery services.

The OEM Recovery team continues to examine these learnings and, following interviews and research, aims to produce a new strategy for recovery in WA. The strategic direction is broader than just roads, bridges and WANDRRA but one that balances built, economic and environmental issues with the psychosocial, health and wellbeing of individuals and communities underpinned by citizen engagement and contribution.

The vision for recovery in WA is that people and communities are resilient to the effects of emergencies and disasters – that they are prepared, they have plans, they can respond and they can thrive.

The primary responsibility for managing a recovery following an emergency rests with local governments (s. 36b of the EM Act 2005). Recognising that a major event can quickly outstrip the capacity of local government, the state also has an important role to play in recovery.

The state must be ready to assist local governments in their recovery functions in order to reduce impacts, alleviate suffering and minimise costs. Recovery arrangements will need to be flexible, scalable, timely and coordinated. They will require engagement and cooperation across all levels of government, industry and the not-for-profit sector.

The OEM recovery team, in conjunction with the SEMC Recovery Subcommittee, have identified a number of lessons from previous major incidents. Key projects to address these have been developed and are being progressed to improve recovery in WA.

7.5 Mitigation

Extreme events are inevitable. The current trajectory for climatic conditions indicates that these major events will become more frequent and severe. These risk factors are amplified by denser urban development, higher construction and rebuilding costs and increasing home asset values. The risks are further increased through an ageing population, increased reliance upon support services, reduced ability to prepare properties, and fewer numbers or availability of emergency volunteers.

The economic cost of natural disasters in Australia exceeded $9 billion in 2015 and is predicted to rise to $33 billion by 2050. To date, Commonwealth and state governments have focused on post-disaster relief and reconstruction, rather than on pre-disaster mitigation. The Productivity Commission concluded in 2015 that:

- disaster funding arrangements weren't efficient, equitable or sustainable
- governments over-invest in post-disaster reconstruction and under-invest in mitigation
- post-disaster support to state and territory governments should be reduced
- support for mitigation should be increased.

For the most part, the mitigation argument has been based around economic factors and costs. While economic factors are valid, the true benefits of effective mitigation are realised through community safety.

Of concern is that those in our society that can least afford it are disproportionally affected by disasters; they may build in areas that are more at risk and are less likely to be able to afford insurance.

The benefits associated with building the resilience of our communities and investing in disaster mitigation include:

- improved community safety and resilience
- improved safety for emergency responders
- a reduction in damage to property
- more affordable and universal insurance
- job opportunities in local mitigation activities
- speedier community recovery and greater continuity of local economies, businesses and jobs
- a reduction in overall costs to the state and national economy.

Unlike most other States, WA is fortunate to have a comprehensive evidence base. The SEMC and OEM focus on risk, capability and impact over recent years has provided an evidence base to inform a holistic mitigation strategy.

An important point to consider is that the burden of mitigation does not need to be borne by governments alone and that not all mitigation incurs a large expense. Effective mitigation strategies should be based around partnerships, cooperation and coordination with industry, businesses, the community and individuals alike..

ENVIRONMENT – TO PROTECT THE ECOSYSTEM AND BIODIVERSITY OF THE STATE

References and appendices

08

08. REFERENCES AND APPENDICES

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Appendices

Appendix A. Emergency Situation Declarations

Section 50 of the *Emergency Management Act 2005* allows for the declaration of an 'emergency situation' by the HMA or State Emergency Coordinator.

An 'emergency situation' may be declared where the HMA or State Emergency Coordinator is satisfied that an emergency has occurred, is occurring, or is imminent and that Part 6 powers of the EM Act are required to prevent or minimise:

- loss of life, prejudice to the safety, or harm to the health, of persons or animals
- destruction of, or damage to, property
- destruction of, or damage to, any part of the environment.

The declaration of an 'emergency situation' allows for hazard management officers, appointed by the HMA, to exercise emergency powers under Part 6 of the *Emergency Management Act 2005*. These powers include, but are not limited to:

- obtaining identifying particulars
- the movement and evacuation of people
- using vehicles or property
- exchanging information for EM purposes.

In 2016–17, no emergency situations were declared. However, extensions were sought for the Waroona fires of January 2016. These extensions allowed for the continued use of EM powers during recovery. These were:

- On 10 January, the emergency situation for the Shires of Waroona and Harvey was extended, by the State Emergency Coordinator, for a further 7 days.
- On 15 January, the emergency situation was extended for another 7 days by the State Emergency Coordinator.
- On 21 January, the State Emergency Coordinator again extended this emergency situation to 30 June, to allow for EM powers to be used to assist the recovery efforts. These powers were specifically limited to s. 69 of the Act, to allow for the use of property and s. 72 of the Act, to allow for the exchange information for EM purposes.
- On 28 June, the emergency situation was further extended, by the State Emergency Coordinator, until 31 July. The powers were again limited to ss. 69 and 72 of the Act, to assist recovery efforts.
- On 12 July, the emergency situation was extended again, by the State Emergency Coordinator, until 30 August, to allow for continued use of powers under under ss. 69 and 72 of the Act, during recovery.
- On 22 August, the emergency situation was extended once more, by the State Emergency Coordinator, until 31 October, to allow for continued use of powers under ss. 69 and 72 of the Act, during recovery.

It should be noted that while no emergency situation declarations were made in the 2016–17 period, there were natural disasters that required the activation of WANDRRA. These were:

- Tropical Low and flooding in the Pilbara (26 December 2016)
- Flooding in WA (January and February 2017)
- Flooding in the Shire of Kellerberrin (23 April 2017)

An activation of WANDRRA is not dependent upon a declaration of an emergency situation as no additional EM powers are required or sought.

Appendix B. Hazard table

	**Air crash**	Worldwide aviation incidents are a regular occurrence. Fortunately, disasters are less frequent but have far more devastating impacts. Major aviation incidents have shown that an air crash may cause hundreds of fatalities and injuries and be hazardous to rescuers. Crash sites may also contain a wide variety of hazardous materials. In Australia, 14 commercial airline accidents since 1950 have resulted in injury or death.
	**Animal or plant: pests or diseases**	Agriculture is a major industry within WA, representing about 10% of the state's economy. Agricultural products are the second largest export commodity. Animal or plant: pests or diseases can threaten the industry, causing major economic loss, while also affecting the state's environment, social amenity and human health.
	**Biological substance**	Biological substances are organic substances that pose a threat to the health of humans, environment and property. Worldwide, it is estimated that about 320 000 workers die each year from communicable diseases caused by work-related exposure to biological substances.
	**Chemical substance**	There is a risk of a chemical substance emergency wherever chemical substances are manufactured, used, stored, or transported. These substances are capable of causing loss of life, injury to people, impacts to the environment and property.
	**Collapse**	The collapse of natural landforms or built infrastructure such as buildings, bridges or subsurface commercial operations is a risk. A landslide in 1996 near Gracetown in the south-west of WA resulted in nine deaths and a further three injuries, after 30 tonnes of rock and soil was dislodged.
	**Cyclone**	On average, WA experiences five large-scale cyclone events that threaten the coastline each year. Two of these cyclones cross the coastline, one at high intensity. These have the potential to cause deaths and injuries along with major damage to homes, infrastructure and industry.
	**Earthquake**	WA has experienced at least one significant earthquake each decade since Federation in 1901. Earthquakes of magnitude 4.0 or greater are relatively common and occur about every five years in the South West Seismic Zone, which is adjacent to the main population centres of the state. The 1968 Meckering earthquake measured 6.9.
	**Electricity supply disruption**	Electricity supply disruptions are inevitable. There is a wide variety of hazards that can disrupt electricity supplies, including cyclones, storms, floods and bushfires. A severe disruption can potentially have serious, costly and distressing consequences.

	**Fire**	Each year in WA, thousands of fires occur that destroy or damage houses, sheds, garages, commercial and industrial buildings, vehicles and vast areas of bushland. Some of these become critical events, subject to size, location or prevailing weather conditions.
	**Flood**	WA has a history of floods, often causing widespread impact. Floods are a natural phenomenon. After heavy rainfall, rivers, creeks and catchments may be unable to cope with water volumes and overflow causing flash flooding or slower rising riverine flooding, which is the most common cause of floods in Australia.
	**Gas supply disruption**	Industry and communities rely heavily upon natural gas. A gas supply disruption threatened WA in 2008 when an explosion occurred at the Varanus offshore plant that supplies over 30% of the state's gas needs, including large mining companies.
	**Heatwave**	Heatwaves kill more people than any other natural hazard in Australia. On average, all areas of WA will experience heatwave conditions annually. Heatwaves can cause increased sickness and death, increase bushfire risk and disrupt electricity supplies and train services.
	**Human epidemic**	There have been nine human epidemics in Australia since 2000. Historically, Australia has experienced several epidemics – including the bubonic plague, H1N1, poliomyelitis and the 'Spanish flu'. Experts consider the next influenza pandemic to be inevitable.
	**Land search**	Remote, harsh terrain and extreme temperatures create a challenging environment for people who undertake search and rescue missions. The need for specialist skills, equipment, medical care and interagency cooperation could elevate such searches to a critical level.
	**Liquid fuel supply disruption**	The world is heavily dependent upon energy products and a disruption to liquid fuel supply would significantly impact both industry and the community. Natural hazards such as floods and storms continue to demonstrate that liquid fuel supply disruptions affect the whole community.
	**Marine oil pollution**	Marine oil pollution can have severe impacts on the environment and economy, with the response phase lasting months and the recovery phase sometimes lasting for decades. Marine oil pollution events in WA include the 2009 Montara oil spill that lasted for 76 days with about 60 tonnes of oil entering the environment each day.

	**Marine search**	Sinking, lost and distressed vessels and aircraft, along with marine searches, occur frequently off our coastline. Australia has a search-and-rescue service that covers 52.8 million square kilometres of the Indian, Pacific and Southern oceans. Plans are in place to coordinate efforts where Commonwealth and state responsibilities intersect.
	**Marine transport emergency**	Marine transport emergencies can threaten lives and have significant consequences for the economy and environment. Marine transport emergencies in Australian waters include the 2007 Pasha Bulker incident which grounded the ship for almost a month.
	**Other substance (HAZMAT)**	Other substances not covered under the biological, chemical or radiological hazards which are capable of causing loss of life, injury to a person or damage to the health of a person, property or the environment. These substances include dangerous goods and petroleum and can also take the form of emissions from fires, or odours from situations including mixed products that may involve plastics, tyres, mixed chemicals as well as wastes and scrap metals.
	**Radiation: Nuclear powered warships**	If when traversing WA waters, the fuel in a nuclear-powered warship melted, hazards could result from direct radiation from the vessel, radiation from a drifting cloud, inhalation of airborne particles and ingestion of contaminated food and water. Arrangements are in place to limit the consequences.
	**Radiological substance**	There is a risk of a radiological substance emergency wherever radiological substances are manufactured, used, stored or transported. These substances are capable of causing loss of life, injury to people, and impacts to the environment and property.
	**Rail crash**	WA has over 5000km of freight rail network. Despite ongoing maintenance, it is not possible to eliminate the risk of derailment, collision, malicious acts or other rail incidents on the network. In addition, over 1000 passenger train services operate within WA. A derailment or collision on such a service could result in a mass casualty incident requiring substantial resources and coordination.
	**Road crash**	On average, 192 people are killed in car crashes every year in WA. A single road crash can result in numerous fatalities and injuries such as the road crash in Kempsey, NSW, in 1989 that caused the deaths of 35 people and injured 41.

	**Space re-entry debris**	Space debris has descended out of orbit at an average rate of about one object per day for the past 50 years (2011). In 1979 debris from Skylab landed south-east of Perth and was found between Esperance and Rawlinna.
	**Storm**	Storms can be both deadly and destructive. Storms have killed over 770 people in Australia since 1824. Hailstorms in Perth in 2010 were the most costly event in WA history causing over $1 billion worth of damage.
	**Terrorist act**	A number of terror organisations and cells have been identified as operating or having a presence in Australia. Their activities have varied from fundraising and providing material support for terror activities overseas to plotting and undertaking domestic terrorism. The emergence of Islamic State has raised concerns globally.
	**Tsunami**	Several tsunamis have reached WA over the past few decades. In 2006 a tsunami inundated the Steep Point area, near Shark Bay, causing widespread erosion of roads and sand dunes. It damaged vegetation and destroyed several campsites. Significant losses could be expected if a similar tsunami were to hit a populated area.

Appendix C. District risk scenarios

Goldfields–Esperance

Hazard	Scenario
Bushfire	During the Christmas and New Year holiday, a lot of tourists are in the area. On a hot, dry and windy summer's day, a Fire Danger Index of 200 occurs resulting in a catastrophic fire warning. A dry weather storm with north-westerly winds crosses the region resulting in multiple dry lightning strikes. Up to 16 fires ignite, including three large fires: west of Gibson, south-west of Esperance along the coast and south-east of Dalyup near the South Coast Highway. Throughout the day, the wind changes to a strong dry south-westerly, causing the fires to become out of control. The Gibson fire passes through the town and close to the airport. The fire near Esperance moves into the west of the town and the fire near Dalyup crosses the South Coast Highway.
Earthquake	During spring, just prior to school pick-up time, a magnitude 5.6 earthquake (7.5km depth) occurs on a fault line 20km from Kalgoorlie town centre. Kalgoorlie town centre experiences ground shaking of Modified Mercalli Intensity 7–7.5 (severe damage with some collapse). Approximately 35% of the buildings in Kalgoorlie sustain some damage and there are a number of injuries and deaths.
Human epidemic	The scenario concerns the spread of H5N1R5-alpha (avian) influenza virus. Two cases of severe respiratory illness were admitted to Laverton Hospital. These patients were then transferred to Kalgoorlie and Perth hospitals and their conditions are deteriorating. A third case presenting at Laverton Hospital died after transfer to Perth. A fourth patient, a foreign national who was attending the NAIDOC festival in the Goldfields, passed away from severe pneumonia and post-mortem pathology confirmed H5N1R5-alpha influenza virus. About 50–60% of the population would be infected. The epidemic and its spread is exacerbated by limited public health staff, limited health staff vaccination uptake, and limited isolation bays and Tamiflu stocks in smaller clinics.
Marine transport emergency	During a winter storm, an iron ore vessel in berth 3 at the Port of Esperance breaks its moorings and blocks the inside channel. The vessel becomes grounded and breaks up into parts, releasing approximately 1500 tonnes of oil into the harbour. The port is closed for up to 6 months having major impacts on the import/export economy including iron ore and grain.
Rail Crash	The Indian Pacific passenger train (carrying approximately 300 people) derails at approximately 6am on a Monday morning in winter 450km east of Kalgoorlie. The locomotives and at least two carriages are significantly damaged and several carriages have come off the tracks. Fuel from the locomotives has spilt into the surrounding environment. The railway line is damaged and unusable. There are multiple deaths and injuries. A rainfall event prior to the derailment has turned dirt access tracks into mud and some airstrips are unusable.
Storm	During the April school holidays, a slow-moving ex-tropical cyclone with an associated band of severe thunderstorms moves over the district. Rainfall totals 250–300mm with daily totals of 100–150mm. The storm causes flash flooding inland and wind damage across the district impacting the area between Kalgoorlie and Esperance.

Metropolitan

Hazard	Scenario
Bushfire	During the second week of December, a fire near Busselton commits all South West DFES resources. Two days later, a fire starts in Kings Park and a significant number of DFES resources are mobilised. One day later, dry lightning ignites two large fires in Helena and Bullsbrook. The Helena fire is pushed upslope by a change in wind direction and crosses the Helena River and the Great Eastern Highway. The fire is contained south of Mundaring. The Bullsbrook fire is also pushed upslope and reaches residential properties on Smith Road. One day later, the fire is held to the west and north of the Avon Valley National Park. Due to the fires near Busselton and in Kings Park, DFES and Parks and Wildlife have limited available resources for the Helena and Bullsbrook fires.
Earthquake	At the beginning of June, a magnitude 6.4 earthquake occurs west of Rottnest Island. Ground shaking of between Modified Mercalli Intensity (MMI) 4 and greater than 7.5 is experienced. Approximately 300,000 buildings are expected to sustain damage ranging from slight to complete damage. A number of injuries and fatalities are expected.
Ex-tropical cyclone	An ex-tropical cyclone tracking offshore crosses the coast south of Perth at an intensity of category 1. To the north of the track, hot and dry conditions are present with wind gusts 90–100km/h and isolated gusts above 125km/h. To the south of the track, widespread rainfall of 25–50mm with scattered totals of 100–150mm occurs. The transition between the hot and wet conditions will likely be gradual. Flash and riverine flooding occurs in Swan Coastal, Lower Murray and Harvey catchments.
Flood	Above average rainfall is experienced in the year preceding the event and catchments are wet due to rainfall. A slow-moving cold front with a rainband resulting in heavy rainfall moves over the Metropolitan District resulting in a multi-day flood event. Over 300mm rainfall occurs over four days with peak daily rainfall of 150mm. The Swan River catchment has major flooding over four days, the Lower Murray experiences flooding for a day and the Harvey catchment experiences flooding over three days.
Hazmat	A chemical plume is released from a Kwinana industrial complex. Further details of the scenario were given in the workshop, but are not included in this report.
Heatwave	After an unusually cool December, a heatwave occurs across the Metro area in mid-January. On days 1 to 3, temperatures are in the low to mid 30s. Between day 4 and 5, a power substation is the target of malicious intent and an isolated block in Armadale has no power for several days impacting approximately 30,000 customers. On day 4 temperatures begin to increase into the 40s, heating to peak temperatures on day 6 and 7. On day 6, a bushfire is ignited in the Cockburn/Baldivis area. Because of the heat, rail networks are impacted; trains are stranded on the tracks and/or rail lines are closed leaving people stranded in the heat. On days 8 to 10, temperatures decrease to the 30s. In addition, mains water pipes in North Perth and Yangebup burst.
Storm	During the Australia Day Skyworks day, in the early evening, a warm season storm bringing severe thunderstorms, lightning, heavy rainfall conducive to flash flooding and large hail moves across the Metro area. Destructive winds are in excess of 125km/h, heavy rain of 40-50mm per hour and hail are >20mm in diameter. This storm is considered extremely dangerous.

Midwest–Gascoyne

Hazard	Scenario
Animal and plant biosecurity	The owner of a small rural residential block in the outskirts of Dongara has some pigs for personal consumption. One of the owners returned from Nepal with meat contaminated with the foot-and-mouth disease (FMD) virus. The meat was fed to the pigs, which subsequently contract FMD. The virus is spread to the neighbouring cattle farm (2000 head of cattle). Ten cattle are taken to the saleyard and sold as two groups. Approximately 620 head of cattle move through the saleyard that day before being moved throughout the district. Cattle show signs of lameness and drooling and a veterinarian notifies DAFWA of possible FMD. Two days later, FMD is confirmed and DAFWA activate their response plans and a 72-hour national stock standstill is put in place to prevent further spread. All infected animals are destroyed.
Bushfire	During the Australia Day weekend in January, an extreme fire weather danger warning is in place. Two fires are ignited by dry lightning. One fire begins east of Eneabba close to the town and highway. The second fire begins north-east of Dongara. Wind conditions throughout the day change from north-east through north-west through west through south-west causing both fires to spread. The Dongara fire crosses over the Brand Highway and Midlands Road causing their closure for at least three days. Eneabba is evacuated as the fire threatens the town. The following roads will be closed for at least three days: Brand Highway from Indian Ocean Drive to the north; Three Springs Road to the east; and Coorow Green Head Road to the south. Indian Ocean Drive will be closed near Eneabba even though the fire might not cross it.
Cyclone	During the Australia Day weekend, a category 4 tropical cyclone moves down the coast along the shoreline. Between Coral Bay and Carnarvon, the cyclone is category 4 (240km/h winds), decreasing in intensity (category 3) south of Carnarvon and is category 2 (150km/h winds) north of Geraldton. The heaviest rain occurs near the cyclone track. Storm surges occur in Carnarvon (4m above high tide), Denham (5.5m above high tide) and Geraldton.
Earthquake	At 12:37pm on a Tuesday in June, a magnitude 6.0 earthquake occurs 10km north of Geraldton. Geraldton experiences shaking of Modified Mercalli Intensity (MMI) 9 – destruction of weak buildings, Carnarvon experiences shaking of MMI 4 – noticeable inside buildings. Approximately 80% of buildings within Geraldton could be impacted. Fatalities, critical and serious injuries occur because of the earthquake.

Hazard	Scenario
Flood	There is above average rainfall in the year preceding the event, which results in saturated soils. A slow-moving tropical cyclone with a rainband results in heavy rainfall in the Gascoyne area (Gascoyne River) over three days over the Australia Day weekend in January. Over 400mm of rain is expected with daily peaks of 250mm. Major flooding is expected across the Midwest–Gascoyne district. Wet catchments from the previous day's rainfall increases the flooding potential.
Road crash	A tourist bus travelling north on the Brand Highway is forward of the lights on the overpass over the NW Coastal Highway when a fully loaded road train (with 4 trailers) crashes into the back of the bus. The bus ends up blocking the NW Coastral Highway. One of the truck trailers spills its load onto the railway line and the truck and other trailers end up on the western onramp to the NW Coastal Highway. The truck is carrying a mixed load and hazmat material spills out of one of the trailers and forms a plume. The plume blows to the north-west towards Geraldton Hospital, Geraldton Universities Centre and Juniper Hillcrest aged-care facilities. The Brand and NW Coastal highways and railway line are closed for 3–4 days. The hospital, education facilities and aged-care facilities in the area may need to be evacuated. The incident occurs at approximately 3 pm on a weekday.

Pilbara

Hazard	Scenario
Air crash	After a cyclone blue alert is issued in Karratha, a Fokker 100 aircraft with 100 people on board landing towards the east at Karratha Airport crashes on the runway. The crash happens late in the afternoon because of an unknown mechanical problem with the plane. The plane breaks apart and a fire takes hold in one half. Approximately 20% of the people are fatally injured, 10% are able the walk away and the rest are injured. As a result, the runway is closed for 2 days for an investigation and clean-up. All Fokker aircraft are grounded immediately until inspected, reducing capacity across the state by up to 50% for at least a week.
Cyclone	During the Christmas/New Year period, a category 5 cyclone makes landfall west of Karratha. The cyclone is moving at 15km/h in a south-east direction and weakens to become a category 2–3 system as it passes Pannawonica. The system weakens further to become category 1 before reaching Newman. Wind gusts of up to 280m/h are experienced near the centre of the system as it crosses the coast. Heavy rainfall is associated with the cyclone. A 9m storm surge is expected in Karratha on top of a high tide, resulting in a storm tide reaching 12m above high tide.
Flood	In the year preceding the flood scenario, the Pilbara receives above average rainfall. Further rain at the beginning of December saturates the catchments. During the Christmas/New Year period, a slow-moving category 5 tropical cyclone makes landfall west of Karratha with a significant rainband resulting in heavy rainfall. Rainfall during the event is in excess of 600mm over 5 days, with a peak daily total of 350mm. Flooding is expected in major catchments in the district.
Human epidemic	A fly in-fly out worker flew in from Bali to Port Hedland before being transported to the mine site by bus. He had flu-like symptoms before he left Bali and worked for 2 days before presenting to medical staff. The bus driver is suffering severe respiratory symptoms. A 3-year-old boy on the same flight from Bali also presents with severe respiratory symptoms and was transferred to Perth. The boy has tested positive to H5N1R5-alpha influenza virus, a novel avian influenza virus and is the first confirmed case in Australia. A ship from China is due to dock at Port Lambert but is refused. One crew member had flu symptoms and is airlifted to Karratha. The fly in-fly out worker and bus driver are confirmed to have the H5N1R5-alpha influenza virus as does the ship's crew member. These patients are evacuated to Perth.
Marine transport emergency	A fully laden iron ore ship leaving Port Hedland suffered steering gear failure and runs aground in the channel. Parts of the ship break during the grounding; however, the ship does not completely break apart. The ship blocks the channel for at least two weeks before it is salvaged. For this scenario, it was assumed that no oil/fuel would leak from the ship.

South West

Hazard	Scenario
Animal and plant biosecurity	There is a foot-and-mouth disease (FMD) outbreak in Queensland and New South Wales. A family with 4 goats travel overland from Qld to WA and arrive at a family's farm at Burekup which raises vealers. Goats are showing signs of FMD but this attributed to the long travel. FMD is transferred from the goats to the vealers within the first 1–2 days. Vealers are sent to Boyanup saleyard and are sold to farmers in Busselton and Manjimup. Another 1128 cattle are sold to 69 properties, including feedlots, on the same day. A national livestock standstill is called due to FMD outbreaks in Qld and NSW. After 5–6 days. at least 10 properties have FMD, which has spread beyond the South West.
Bushfire	During an extended dry, hot period (low 40s), a series of dry thunderstorms moves over the South West. Winds are initially from the north-east, shifting to the north-west by late morning. A further wind shift occurs mid-afternoon shifting to the south-west and strengthening. Fire danger indices are in excess of 100 with warnings issued for catastrophic fire conditions. The thunderstorms produce dry lightning strikes, igniting multiple fires including two large fires. Fire 1 is located in Collie near coal mines and power infrastructure and fire 2 comprises two minor fires in the Dunsborough and Cape Naturaliste areas which converge to form a major fire moving south impacting Yallingyup, Cape Naturaliste, Dunsborough and Wilyabrup.
Electricity supply disruption	During a hot December weekend with extreme fire weather, two bushfires are ignited; one south of Bunbury and the other south of Muja. The bushfires cause significant damage to two Western Power electricity transmission lines which supply the lower South West. This damage causes electricity to be cut off to the lower South West (south of Bunbury) for 4–5 days. Bunbury Regional Prison is close to one of the fires and would lose electricity. The Bussell Highway remains open but the South Western Highway is closed.
Flood	There is above average rainfall in the year preceding the event and wet catchments from some rainfall in weeks prior. During the Australia Day weekend, the remnants of a tropical cyclone with a rainband results in heavy rainfall over the South West district over 3–4 days. Over 300mm rainfall falls over 3 days with peak daily rainfall of 150mm. Major flooding occurs in most catchments across the district.
Storm	A cool season front across a large part of the South West brings strong winds and heavy rain to many parts of the district. The storm occurs during the July school holidays. During the storm, two tornadoes form impacting Bunbury and Busselton. The Bunbury tornado travels for 5–10km through the Bunbury Port, Australind and the Kemerton Industrial Site. The Busselton tornado forms off the coast of Yallingup before travelling inland through Dunsborough and Busselton. The storm system impacts multiple locations.

Appendix D. Status of Westplans

#	Westplan	Status	HMA
1	Air Crash	Current	Commissioner of Police
2	Animal and Plant Biosecurity	Current	Agriculture Director General
3	Chemical, Biological, Radiological and Nuclear *Biological*	Current	State Health Coordinator
4	Hazardous Materials Emergencies [HAZMAT] Chemical	Under Review	Fire and Emergency Services Commissioner
5	Collapse	Current	Fire and Emergency Services Commissioner
6	Cyclone	Current	Fire and Emergency Services Commissioner
7	Earthquake	Current	Fire and Emergency Services Commissioner
8	Electricity Supply Disruption	Current	Coordinator of Energy
9	Fire	Current	Fire and Emergency Services Commissioner
10	Flood	Current	Fire and Emergency Services Commissioner
11	Gas Supply Disruption	Current	Coordinator of Energy
12	Heatwave	Current	State Health Coordinator

#	Westplan	Status	HMA
13	Human Epidemic	Current	State Human Epidemic Controller
14	Land Search	Current	Commissioner of Police
15	Liquid Fuel Supply Disruption	Current	Coordinator of Energy
16	Marine Oil Pollution	Current	Marine Safety, General Manager
17	Marine Search and Rescue [MARSAR]	Current	Commissioner of Police
18	Marine Transport Emergency	Current	Marine Safety, General Manager
19	Hazardous Materials Emergencies [HAZMAT] Other Substances	Under review	Fire and Emergency Services Commissioner
20	Nuclear Powered Warships (NPW)	Current	Commissioner of Police
21	Hazardous Materials Emergencies [HAZMAT] Radiological	Current	Fire and Emergency Services Commissioner
22	Rail Crash PTA (Passenger) Brookfield Rail Crash (Freight)	Current Current	Public Transport Authority Brookfield Rail

#	Westplan	Status	HMA
23	Road Crash	Current	Commissioner of Police
24	Space Re-entry Debris [SPRED]	Current	Commissioner of Police
25	Storm	Current	Fire and Emergency Services Commissioner
26	Terrorist Act	Current	Commissioner of Police
27	Tsunami	Current	Fire and Emergency Services Commissioner

Appendix E. Recommendation tracking

A number of significant reviews have been carried out into major fires in WA since February 2011. These reviews identified a total of 218 items, including recommendations, additional commitments made by government, opportunities for improvement and actions resulting from lessons identified. These items were, in the opinion of the individual report writers, intended to improve the outcomes of future emergencies in WA.

Recommendations from these historical reviews were examined and assessed by the Ferguson Special Inquiry (*Reframing rural fire management: the report of the special inquiry into the 2016 Waroona fire*). Based on the Special Inquiry's assessment of the 218 items, 118 were considered to be incomplete as at 29 April 2016. In addition, the Ferguson Special Inquiry report made a further 17 recommendations and identified 23 opportunities for improvement, many of which incorporated items already raised in previous reviews.

The key agencies responsible for the Ferguson recommendations and opportunities for improvement and the 118 previously unresolved items were asked to provide an update against each for the purpose of this report. At the time of publication, the status of the 158 items is as follows:

- 46 are considered complete.
- 55 are considered in progress.
- 22 are on hold / not yet progressed.
- 26 have been superseded by recommendations made by the Ferguson Special Inquiry.
- 4 are deemed no longer relevant.
- 5 have no update provided.

This leaves 82 active items that will remain subject to ongoing progress tracking and reporting. Due to the high number of outstanding and long-running items still awaiting closure, the Ferguson Special Inquiry suggested that the implementation and monitoring of these items needed improvement. As a result, the OEM will undertake a comprehensive review of lessons management in WA in 2017–18. The need for the review was supported by the agencies submitting comments for this latest update.

As part of the review, the OEM aims to assess and rationalise all items dating back to the first Keelty report (2011) using a common framework – the State Capability Framework. The rationalisation will reduce duplication and allow items that have been superseded or are deemed to be no longer valid to be 'closed'.

In addition, a number of items identified in the various reviews have an intention or measure of success that is not clear. The rationalisation will include developing key performance indicators for all items that are measureable and clearly linked to capability development. The review will refocus the items to improve capability across the EM sector in WA.

	Keelty, 2011	Keelty, 2012	Noetic Solutions, 2012	Noetic Solutions, 2012	SEMC, 2014	SEMC, 2016	Ferguson, 2016
Status	Perth Hills	Margaret River	Margaret River	Nannup	Parkerville, Stoneville, Mt Helena	O'Sullivan and Lower Hotham	Waroona
Complete	40	15	39	21	17	9	5
In Progress	10	2	10	5	5	5	18
On hold / Not yet progressed	–	2	1	–	–	2	17
Superseded by Ferguson recommendation	4	–	5	6	7	4	–
Deemed no longer relevant	–	–	3	1	–	–	–
No update provided	1	–	–	–	–	4	–
TOTAL	**55**	**19**	**58**	**33**	**29**	**24**	**40**
Items Outstanding	**11**	**4**	**11**	**5**	**5**	**11**	**35**

Appendix F. Agency respondents

Agency surveyed	Interview	Survey	Currently known as
Hazard Management Agencies			
Brookfield Rail Pty Ltd		■	Arc Infrastructure
Department of Agriculture and Food, WA	■	■	Department of Primary Industries and Regional Development
Department of Finance, Public Utilities Office		■	Department of Treasury, Public Utilities Office
Department of Fire and Emergency Services	■	■	No change
Department of Health	■	■	No change
Department of Transport (Marine Safety)	■	■	No change – change of duties
Public Transport Authority		■	No change
Western Australia Police	■	■	No change – change of duties
Emergency Management Agencies			
Australian Red Cross, WA	■	■	No change
Bureau of Meteorology	■	■	No change
Defence Force (Commonwealth)	■	■	No change
Department of Planning		■	Department of Planning, Lands and Heritage
Department for Child Protection and Family Support	■	■	Department of Communities
Department of Education		■	No change – change of duties
Department of Environment Regulation	■	■	Department of Water and Environmental Regulation
Department of Housing		■	Department of Communities
Department of Parks and Wildlife		■	Department of Biodiversity, Conservation and Attractions
Department of the Premier and Cabinet		■	No change
Main Roads WA	■	■	No change
Office of Emergency Management		■	No change

Agency surveyed	Interview	Survey	Currently known as
St John Ambulance Australia, WA			No change
Water Corporation of WA			No change
Western Australian Local Government Association			No change
Service Providers			
ATCO Gas Australia			No change
Dampier Bunbury Pipeline			No change
Forest Products Commission			No change
Horizon Power			No change
Insurance Council of Australia			No change
National Broadband Network – Australia			No change
Telstra			No change
Western Power			No change

Appendix G. Local government respondents

The 2017 emergency preparedness and annual report survey (combined collection to reduce impost) was sent to all 138 local governments within WA. Almost 90% of these (N=122) responses were received on time or within a reasonable period beyond the initial cut-off date. An additional five responses were received after the point where data and answers could be incorporated into this year's *Emergency Preparedness Report*. Eleven local governments failed to submit responses.

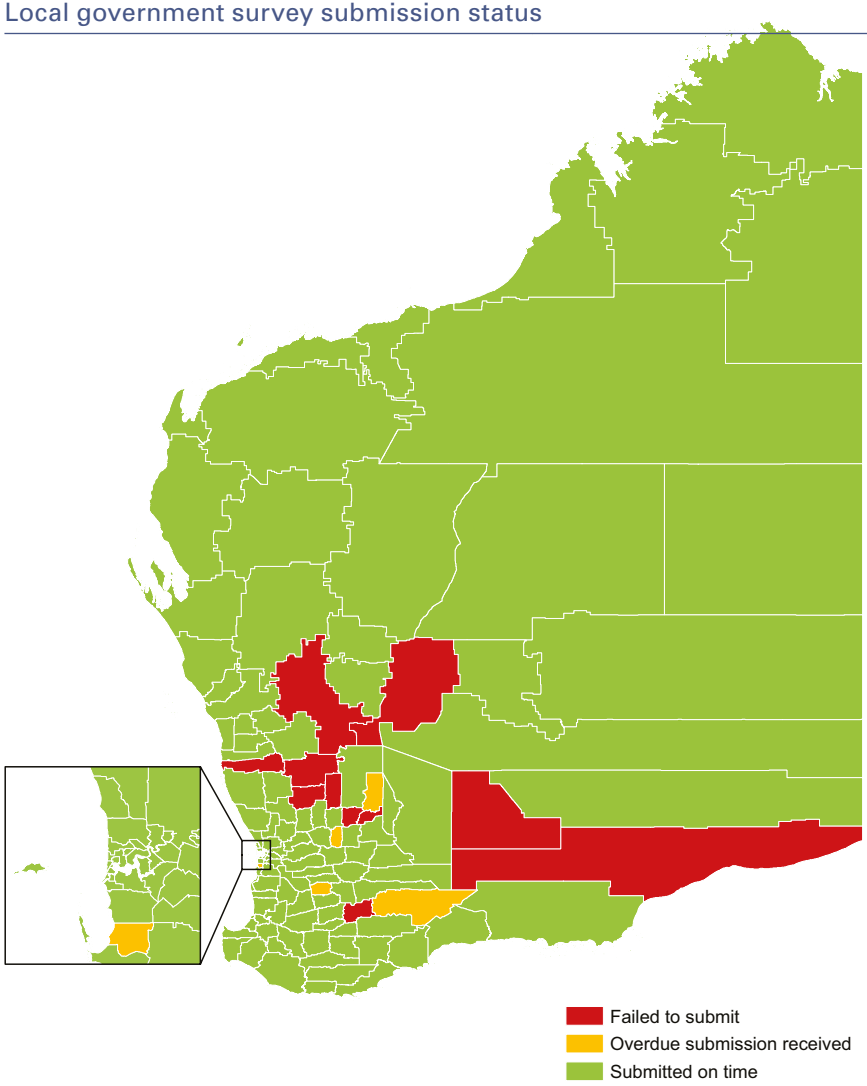
Overdue submission received

Cuballing
Kwinana
Lake Grace
Mukinbudin
Tammin

Failed to submit

Coolgardie
Coorow
Dalwallinu
Dumbleyung
Dundas
Koorda
Nungarin
Sandstone
Trayning
Wongan–Ballidu
Yalgoo

Local government survey submission status



Appendix H. Acronyms

Acronym	Term in full
AIIMS	Australasian Inter-service Incident Management System
AWARE	All West Australians Reducing Emergencies NDRRA
AVL	Automatic Vehicle Location
BOM	Bureau of Meteorology
BRMP	Bushfire Risk Management Plan
C3	command, control and coordination
CaLD	Culturally and Linguistically Diverse
CESM	Community Emergency Services Manager
CIA	comprehensive impact assessment
CPFS	Department for Child Protection and Family Support
CSV	Communication Support Vehicle
DAFWA	Department of Agriculture and Food, Western Australia
DBCA	Department of Biodiversity, Conservation and Attractions
DEMC	District Emergency Management Committee
DFES	Department of Fire and Emergency Services
DoT	Department of Transport
DPC	Department of the Premier and Cabinet
DVI	disaster victim identification
EM	emergency management
EM Act	*Emergency Management Act 2005*
EM Regulations	Emergency Management Regulations 2006

Acronym	Term in full
EMA	Emergency Management Agency
ESL	Emergency Services Levy
HMA	Hazard Management Agency
IMT	Incident Management Team
ISG	Incident Support Group
LEMA	Local Emergency Management Arrangements
LEMC	Local Emergency Management Committee
MICC	Major Incident Control Centre
MoG	Machinery of Government
MOU	memorandum of understanding
NBMP	National Bushfire Mitigation Program
NDRP	Natural Disaster Resilience Program
NDRRA	Natural Disaster Relief and Recovery Arrangements
NERAG	National Emergency Risk Assessment Guidelines
NIAM	National Impact Assessment Model
NSDR	National Strategy for Disaster Resilience
OASG	Operational Area Support Group
OBRM	Office of Bushfire Risk Management
OEM	Office of Emergency Management
P&W	Parks and Wildlife Service
PFT	pre-formed teams
PIO	Public Information Officer

Acronym	Term in full
PTA	Public Transport Authority
REMS	Remote Essential and Municipal Services
RFDS	Royal Flying Doctor Service
SAR	Search and Rescue
SBCC	State Bushfire Coordinating Committee
SEMC	State Emergency Management Committee
SES	State Emergency Service
SEWS	Standard Emergency Warning Signal
SJA	St John Ambulance
SLSWA	Surf Life Savers WA
SPIL	State Public Information Line
TA	Thunderstorm Asthma
USAR	Urban Search and Rescue
VMR	Volunteer Marine Rescue
WA	Western Australia
WAERN	WA Emergency Radio Network
WALGA	WA Local Government Association
WANDRRA	Western Australia Natural Disaster Relief and Recovery Arrangements
WAPC	Western Australian Planning Commission
Westplans	Hazard Specific Plans

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