NSW Critical Infrastructure Resilience Strategy Guide

A Focus on Outcome Strategy 3: Improved Community Resilience

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Introduction: Critical infrastructure resilience

NSW benefits from critical infrastructure (CI) that provides secure and reliable essential services, such as food, water, energy, transport, telecommunications and health care. The CI of NSW is exposed to an increasing number of threats, hazards, shocks and stresses.[1],[2] Disruptions to critical infrastructure can result in loss of life, negative economic impact and harm to communities, including psychological distress.[3] More frequent natural disasters of greater magnitude[4], and a heightened risk profile in relation to criminal threats including cyber-attack[5],[6] mean NSW's infrastructure and organisations must be more resilient than ever. The NSW Critical Infrastructure Resilience (CIR) Strategy[7], released on 13 September 2018, encourages leaders in business and government to support the NSW community by improving CIR across NSW.

The CIR Strategy promotes critical infrastructure that can:

- withstand shock events to continue operating; or
- be returned to service as soon as possible after any disruption; and
- respond to long-term stresses.

A focus on physical infrastructure alone will not achieve this. This strategy has three outcomes:

- Improved **infrastructure resilience** which is focussed on the resilience planned for, designed and built into assets, network and systems (resistance, reliability, redundancy, enhancing response and recovery).
- Improved **organisational resilience** which refers to the resilience of the organisations, personnel and processes supporting the infrastructure to supply the service (organisational resilience, enterprise risk management, business impact analysis, preparedness, response, continuity and recovery).
- Improved **community resilience** which focuses on the role the community plays in building and maintaining its own resilience while contributing to CIR. Building resilience within the community requires an integrated approach involving both government and business (information and warnings, managing service disruptions, community partnerships).
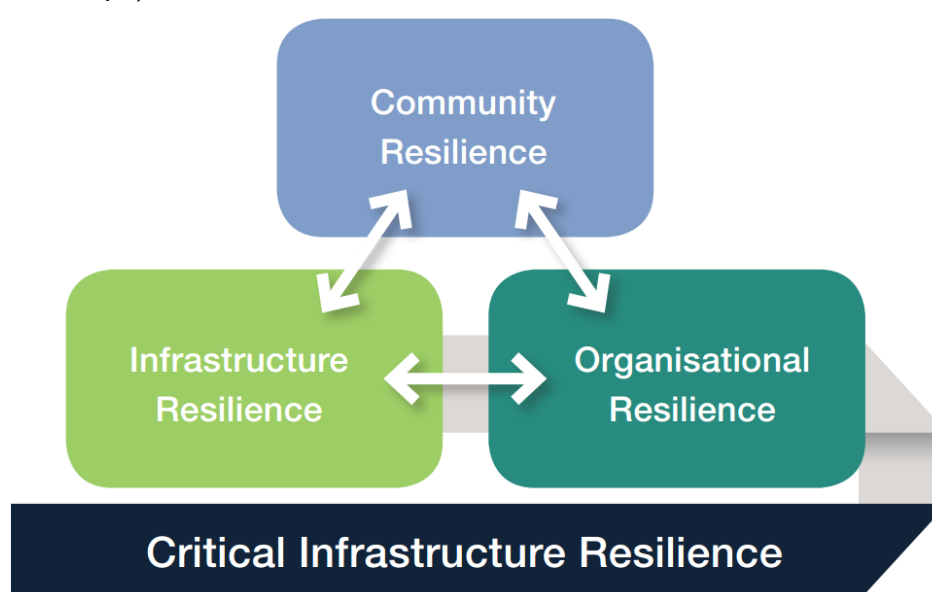

Figure 1: CIR is enhanced through infrastructure, organisational and community resilience

To achieve these outcomes, priority is given to:

- **Partnering** for shared responsibility around critical infrastructure resilience;
- **Preparing** for all hazards, not just the ones we can foresee; and
- **Providing** continued service from critical infrastructure with minimal disruption.

The benefits of the strategy are identified as:

Strategy Benefits

Critical Infrastructure Providers (Regardless of ownership)	- Reduced business disruption - Enhanced reputations and business confidence - Reduced total cost of asset ownership and increased return on investment - Better understanding of infrastructure interconnectedness, allowing vulnerabilities to be addressed across multiple CI provider organisations - Stronger cultures to meet business challenges (not just emergency events)
For Communities	- Reduced service disruption to the people and businesses of NSW - More effective emergency management arrangements - More resilient communities, reducing the social costs of disasters
NSW GOVERNMENT **For Government**	- Enhanced capability and co-ordination of response and recovery agencies - Reduced response, reconstruction, and recovery costs arising from emergency events
For all of us	- Stronger partnerships between business, government and the community - Enhanced resilience against hazards and threats - Insurance premiums that incorporate the benefits of resilience-building activity - Improved adaptation to long-term stresses such as climate change and population growth

Key terminology

Critical infrastructure (CI) is the assets, systems and networks required to maintain the security, health and safety, and social and economic prosperity of NSW. These are underpinned by the organisations and people that support them.

Infrastructure providers include any organisation that provides NSW critical infrastructure, including privately owned organisations, local government, state government, and government-owned corporations.

Critical infrastructure protection (CIP) minimises vulnerability to criminal or malicious threats via physical, procedural, person-based, and electronic defences. CIP is a key part of CIR. At the national level, CIP focuses on mitigation against the specific threat of terrorism. [8]

In NSW, CIP is delivered jointly by the NSW Department of Justice through the Office for Police and the NSW Police Force, by working closely with other NSW agencies and the owners and operators of CI.[9] This Strategy complements existing CIP arrangements by encouraging CI providers in the all-threats and all-hazards approach to protecting CI.

Critical infrastructure resilience (CIR) is the capacity of CI to withstand disruption, operate effectively in crisis, and deal with and adapt to shocks and stresses. It includes the flexibility to adapt to present and future conditions. At the national level, CIR is the term used to describe an 'all hazards' approach to CI activities across the spectrum of prevention, preparedness, response and recovery.

In NSW, while infrastructure providers retain responsibility for CIR, it is delivered as a partnership between infrastructure owners, infrastructure operators, the NSW community, and local, state and federal government.

Within this strategy, CIR outcomes are divided into three categories, or types of resilience:

Infrastructure resilience (IR) is the resilience planned for, designed, and built into assets, networks and systems.

Organisational resilience (OR) is the resilience of the organisations, personnel and processes supporting infrastructure to supply a service.

Community resilience (CR) focuses on the role the community plays in building and maintaining its own resilience while contributing to critical infrastructure resilience.

Strategy outcome 3: Improved community resilience

Communities play an important role in contributing to critical infrastructure resilience. In an emergency, community response can be critical to minimising the consequences and reducing recovery effort. For example, during heatwaves when the electricity network is near capacity, community load reduction can assist the electricity network to continue to function.

Rather than just focusing on the counts of customers with a disrupted or failed service, organisations can view the community as active partners in critical infrastructure resilience, and a valuable resource before, during, and after an emergency.

A resilient community is prepared, dynamic, flexible and quick to respond. Resilient communities can mitigate against disruptive events. The greater the disaster, the less likely that CI providers and government are able to provide an effective response without community assistance. The impacted community is located in the area and usually has some understanding of where outages are and the potential dangers from damaged infrastructure. The community often act as first responder, especially when individual lives are at risk (e.g. downed electricity wires). "In the case of almost any disaster, the fastest response will be from your neighbour"[10]

The community resilience component of Critical Infrastructure Resilience will be enhanced when CI providers and government prepare and support communities with consistent and reliable information, but also engage them as partners in service provision.

The graphic below identifies ways to improve community resilience. These are expanded upon within this guide.

Table 1: Ways to improve community resilience

Improved community resilience can be achieved via	
Community Information	• community warnings • community information - before, during and after service outages and emergencies • education around the risk of infrastructure service loss and possible actions the community can take to help mitigate risk.
Reducing Service Disruptions	• infrastructure investment based on community needs • resilience investment based on community needs.

Managing Service Disruptions	• increasing community preparedness for lack of service
	  o [Get Ready NSW](#)1
	• supporting vulnerable customers and communities
	  o more rapid service restoration
	  o advice to vulnerable customers
	• allocation of emergency resources to vulnerable customers.

Community Partnership	• community engagement • community partnerships • community input into emergency risk planning and management • mutual assistance (e.g. public reporting suspicious behaviour around ci) • crowdsourcing emergency information and intelligence (e.g. social media).

Community resilience framework

NSW communities are reliant on the continuity of services provided by critical infrastructure. These services underpin society; the electricity used in our homes and businesses, the safe water we drink, the reliable transportation systems that get us and the goods we need from place to place, the accessible public services and hospitals in our communities, the farms that grow our food, the stores we shop in, and the internet and communication systems we rely on to run businesses or to stay in touch with family and friends.

There are many different types of communities, including communities of place, interest, belief and circumstance. Communities are dynamic – they change over time and interact in different ways. Emergencies can have wide ranging impacts and many NSW communities have experienced the devastation of fire and floods, and the isolation of communities from basic lifelines and needs. The NSW Critical Infrastructure Resilience Strategy identifies the following role for NSW communities:

Table 2: Roles identified for NSW Communities in the CIR Strategy [7]

NSW Communities

- Individuals and communities sharing responsibility to prevent, prepare for, respond and recover from emergencies
- Have an awareness of the threats and hazards that affect their locality
- Be involved in emergency management arrangements, perhaps by volunteering
- Build community support networks ahead of emergencies
- Individual resilience – prepare for prolonged outages without external assistance or essential services
- Respond to government advice on the use of CI (e.g. demand reduction in times of stress to electrical networks)
- Help CI providers by reporting damage to CI
- Report suspicious behaviour around infrastructure
- Use CI (e.g. transport) responsibly

The [National Strategy for Disaster Resilience](#) recognises that emergency management is a shared responsibility for all of society and identifies a resilient community as one in which:

- people understand the risks that may affect them and others in their community.
- people have taken steps to anticipate disasters and to protect themselves their assets and their livelihoods.
- people work together with local leaders using their knowledge and resources to prepare for and deal with disasters.
- people work in partnership with emergency services, their local authorities and other relevant organisations before, during and after emergencies.
- emergency management plans are resilience-based, to build disaster resilience within communities over time.
- the emergency management volunteer sector is strong
- businesses and other service providers undertake wide-reaching business continuity planning that links with their security and emergency management arrangements
- land use planning systems and building control arrangements reduce community exposure to risks from known hazards
- following a disaster, a satisfactory range of functioning is restored quickly.

Community resilience matters not only to the communities themselves, but to infrastructure providers as well:

- resilient individuals and communities are dynamic and can anticipate, survive and adapt in a world that is constantly changing,
- in the context of critical infrastructure resilience, this means that communities can mitigate against, bounce back and thrive in the face of critical infrastructure disruptions and emergencies.
- communities understand their local demographic and can prepare for anticipated hazards and threats, and possible infrastructure service disruptions.
- resilient communities can continue to operate under stress, adapt to adverse or changing conditions, and withstand and recover rapidly from extreme or unexpected events.
- the workforce for an infrastructure provider is usually drawn from the local community. a more resilient community means a more resilient and available workforce.

Building resilience within the community requires an integrated approach. The National Strategy for Disaster Resilience acknowledges that infrastructure providers can and do play a fundamental role in supporting a community's resilience to disasters by providing resources, expertise and many essential services on which the community depends. Critical infrastructure providers can work collaboratively with the community to increase critical infrastructure resilience by engaging the community as active partners and acknowledging them as a valuable resource before, during, and after an emergency. Whilst some critical infrastructure providers may be doing this well, it may require a shift in perception by others.

Every community is different and will have networks, structures and ways of working that are familiar and meaningful to its members. There is no one size fits all approach – each community is different, as is the context for engaging the community. Individuals and community groups are the starting point to build resilience. The way to work with communities is to connect with what is already there and to tap into the communities existing strengths and capabilities. It is important for critical infrastructure providers to recognise that enhancing community resilience to critical infrastructure is a **journey of increasing maturity**. This means it is not a single set of criteria to check off and declare the community to be "resilient" but more that it is a state or condition that the community aspires to which changes over time.

Further reading

Commonwealth of Australia through COAG. (2011), National Strategy for Disaster Resilience: Building the resilience of our nation to disasters – knowledge.aidr.org.au/media/2153/nationalstrategyfordisasterresilience.pdf

Foundations of community resilience: Community engagement

Community engagement is a fundamental process required to build and maintain a level of community resilience that can actively contribute to critical infrastructure resilience.

Community engagement is defined as "the process of stakeholders working together to build resilience through collaborative action, shared capacity building and the development of strong relationships built on mutual trust and respect".[11]

Community engagement is required across all phases of the emergency management cycle (e.g. prevention, preparation, response and recovery). As the different phases of emergency management overlap and intersect, different types of engagement will be necessary. Community engagement works best where it occurs early and is considered as an ongoing, cumulative process enabling relationships and trust to build and strengthen over time.

The Australian Institute for Disaster Resilience (AIDR) has developed a Community Engagement Framework to provide guidance to those working in emergency management on how to effectively engage with the community (Figure 2). The model draws on the internationally recognised International Association for Public Participation (IAP2) Public Participation Spectrum—a tool designed to assist community engagement practitioners select the level of participation that defines the public's role in any community engagement program.

Figure 2: Community engagement model for emergency management

The Community Engagement Model for Emergency Management outlines five elements of engagement and community involvement:

Information: Sharing information with and between communities and agencies to come to a mutual understanding. Everyone is informed and able to take responsibility for decisions and actions.

Participation: Building connected networks and relationships, ownership and trust through active involvement.

Consultation: Sharing information, questions or positions to obtain ideas, feedback, knowledge or an understanding of objectives and expectations.

Collaboration: Partnering with communities to support action, including developing alternatives and identifying a preferred solution.

Empowerment: Individuals and communities have capacity to understand risk and accept responsibility and implement initiatives.

The Community Engagement Model for Emergency Management is circular to show that one engagement approach is not necessarily better than any other, and that different approaches are legitimate depending on the purpose and context of a particular situation. Critical infrastructure providers can incorporate these elements, into the outcomes of their resilience building activity by utilising a variety of strategies and tools to engage with the community depending on the overall aim and scope of the engagement needed to generate community interest and ideas, as well as the time frames and resources available.

The three fundamental principles for effective community engagement are:

1. Understanding the community: its capacity, strengths and priorities
2. Recognising complexity and embracing community diversity
3. Partnering with the community to support existing networks and resources

It is important to establish whether or not community engagement activities are making a difference through robust evaluation. Effective engagement is complex and requires a long-term commitment to build and maintain relationships with the community. Critical infrastructure providers should recognise that building capacity and capability to undertake community engagement activities is a **journey of increasing maturity** which requires a commitment to continuous improvement building on the successes and lessons of previous community engagement campaigns.

Further reading

Australian Disaster Resilience Handbook Collection, Handbook 6 - National Strategy for Disaster Resilience: Community Engagement Framework - knowledge.aidr.org.au/resources/handbook-6-community-engagement-framework/

Resilience Priority 1: Partner

*Resilience improvement is best effected when critical infrastructure providers **partner** with all levels of government and the community in shared responsibility.*[12]

Shared responsibility

The primary responsibility for providing critical infrastructure services resides with infrastructure owners and operators. Critical infrastructure providers are responsible for the security of their assets, the safety of their staff and are best placed to effectively manage risks to their infrastructure.

However, the full responsibility for critical infrastructure resilience is not just the responsibility of infrastructure providers and governments, but is shared by multiple stakeholders including individuals, households, businesses and communities[13]. The shared responsibility approach is not intended to reduce government or critical infrastructure provider responsibility in emergency management, but aims to effectively engage the community to actively fulfil their part in the shared responsibility model and to strengthen community participation and influence.

Just as we all rely on critical infrastructure, we all play a role in keeping it strong, secure, and resilient. Resilience outcomes are best achieved when critical infrastructure providers partner with all levels of government and the community (refer Figure 3). It is important that critical infrastructure providers recognise and understand the key role the community plays in contributing to its own safety.

NSW Communities

Infrastructure Providers

Local Government

State Government

Federal Government
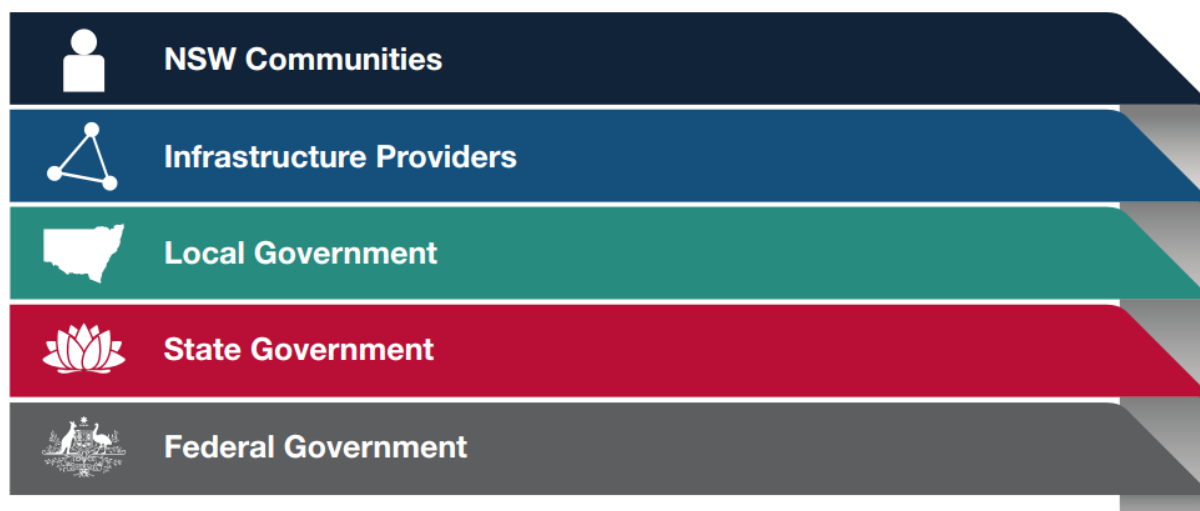
Figure 3: Partnerships for Building Critical Infrastructure Resilience [7]

Multi-Agency partnerships – Local emergency management committees

Critical infrastructure providers should consider building their capacity and capability to undertake community engagement activities by working with their Local Emergency Management Committee (LEMC). LEMCs across NSW are chaired by local government, the level of government that is closest to and best understands the local community. Therefore, the LEMC provides an effective forum for engaging local communities. Sustainable community engagement requires substantial resources to identify and develop different skills, bring existing expertise to the process and build partnerships and networks. An effective way of

achieving this is to work in partnership with the LEMC on joint community initiatives that focus on strengthening existing social networks and assets that are fundamental to community resilience (refer to LEMC case study at Appendix A).

Community partnerships

Every community has capabilities, experience and local knowledge that it can contribute across all phases of the emergency management cycle and these are invaluable resources that critical infrastructure providers can draw upon. Engaging a community in how it can prepare for, respond to and recover from emergencies is more likely to result in decisions and outcomes the community is confident about and will act upon, and this in turn will support the work of critical infrastructure providers and emergency management organisations.

In a large scale emergency, critical infrastructure providers are more likely to provide an effective response and keep the community safe with a bottom-up approach that seeks community input and assistance. This will likely be critical to minimising the consequences of the impact and reducing the recovery effort. For example, during bushfires when the mains water supply is near capacity, communities can assist with reducing water consumption to ensure supplies are available for fire-fighting.

Community champions

In some communities, it may be possible to identify community leaders to assist with championing community and critical infrastructure resilience issues. A Community Champion can assist with critical infrastructure resilience by bringing multiple community stakeholders together to help raise awareness of relevant issues, by providing feedback on behalf of the community and by assisting with increasing the community's understanding of critical infrastructure resilience. These community leaders or champions may already exist in some areas, but may need developing in others (refer to Redland City Council and TRC case study at Appendix A).

Further reading

New Zealand Lifeline Utilities. Available at www.civildefence.govt.nz/cdem-sector/lifeline-utilities/

Resilience Priority 2: Prepare

"*We must **Prepare** for all threats and all hazards, not just the ones we can foresee.*" [14] In the context of community resilience, effective preparation begins with a comprehensive understanding of the risks faced by the community as well as mitigation practices to reduce the impact of an emergency and to assist the community recover. The more thoroughly a community readies itself for the impact of an emergency, the more robust it is likely to be in the event and the quicker the community is likely to return to a state of normality.

Managing risks – All hazards approach

Critical infrastructure providers should adopt an all-hazards approach to mitigating and managing the risks that their infrastructure is exposed to from natural (e.g. bushfire, storms, and floods), technological (e.g. cyberattack) and malicious (e.g. sabotage or terrorism) hazards and to take steps to ensure they are able to continue providing services during or as soon as possible after an emergency. Adopting an all hazards approach enhances community resilience by focusing on the consequences of infrastructure disruption (e.g. loss of amenity to people, businesses and community), rather than the cause of the disruption.

Further information on risk management can be found in a separate topic specific resource on Organisational Resilience that has been developed to support the implementation of the Critical Infrastructure Resilience Strategy.

Understanding and communicating risk

It is essential that critical infrastructure providers work closely with their LEMC to obtain community input into emergency risk planning and management and to understand the local risks that may affect their infrastructure.

Critical infrastructure providers should ensure that any required actions to protect individuals, their assets and their livelihoods during a service disruption or failure are contextualised and communicated to the affected community. This will help ensure that the community has comprehensive local information about hazards and risks, including who is exposed and who is most vulnerable, that they are advised on what action they can to take to prepare for outages so they can be adaptive and flexible to respond appropriately during emergency situations.

Preventing critical infrastructure issues

Community members should be actively engaged in critical infrastructure security issues. Individuals and communities can provide additional eyes and ears on the ground and can be actively encouraged to report suspicious behaviour or actions that may prevent a disruption to critical infrastructure. The need for community members to report suspicious behaviour around critical infrastructure is generally well understood and should be actively encouraged (refer to airport case study at Appendix A).

Additionally, critical infrastructure providers can engage individuals and communities in asset maintenance. Tools, such as smartphone apps, are available that make it easy for individuals to report maintenance issues or damage (refer to mobile apps for reporting infrastructure damage case study at Appendix A).

Preparing for outages and service disruption

No infrastructure service is immune to disruptions. Critical infrastructure providers should engage with individuals and communities to increase preparedness for loss of service. The aim is to assist in "prevention, preparation and mitigation through carefully designed and pre-tested communication campaigns, to facilitate emergency response during a crisis and to expedite recovery through a combination of information and dialogue"[15]

Critical infrastructure providers may already have a range of existing community messages or campaigns to deliver regular and ongoing key safety messages to individuals and communities on critical infrastructure issues e.g. TV or radio campaigns to prepare residents for storms affecting the electricity network, etc. As an example, Ausgrid delivers an annual campaign on being ready for the unpredictable weather and powerful storms that the winter brings (refer to case study at Appendix A). These campaigns are designed to keep the community safe by educating them on appropriate responses when an event occurs e.g. messaging around fallen power lines or other risks such as the need to boil water and so on.

Get Ready NSW

Existing programs such as Get Ready NSW provide ongoing opportunities for critical infrastructure providers to develop community partnerships and tools to promote community resilience activities. As an example, Get Ready NSW focuses on being prepared in order to save lives and includes: know your risk; plan now for what you will do; get your home ready; be aware; and look out for each other. A key strategy of the Get Ready NSW campaign that is heavily promoted by LEMCs is the need to have access to an emergency kit with a supply of bottled water, torch and battery powered radio to mitigate water and power infrastructure failure or service interruption. The Get Ready NSW resources provides information relevant for councils, animals and business. Additional Get Ready NSW information for businesses can be found on the Small Business website.

Supporting vulnerable customers

Critical infrastructure providers need to support their vulnerable customers and communities. Critical infrastructure providers deliver services that are relied upon by some individuals within the community to run life support systems such as oxygen, haemodialysis machines and ventilators. Supporting vulnerable customers may involve specific targeted advice, registration and pre-planning for vulnerable customers (e.g. list of customers with life support equipment), prioritised service restoration and prioritised allocation of emergency resources where available (refer to vulnerable customer case studies at Appendix A).

Training and exercises

Training is an essential component for personnel involved in emergency response and recovery operations. Training can also be provided for individuals and communities so that they are better equipped to undertake their role in shared responsibility for critical infrastructure resilience. Training can take many forms from awareness raising presentations to fully certified training courses. Training in the prevention phase that provides community members with the skills to be self-reliant and actively involves community members as active partners in the response and recovery phase are encouraged (refer to TRC case study at Appendix A).

An effective way of providing people with experience of the response and recovery activities without the stress of a real event is through exercising. Exercises offer a legitimate and

effective means of improving understanding of the response and recovery plans and procedures and the various roles, responsibilities and inter-dependencies that exist in a coordinated response and recovery effort. Exercises are a useful and effective way of evaluating and validating the content of the plans themselves and the processes and procedures contained within those plans.

Involving community members in emergency exercises can take many forms. It may simply be a case of informing them about exercises that are taking place in their communities to allay fear and to promote the work of emergency service agencies. It could involve inviting the public to observe an exercise, or to actively engage the public to play survivors or the family and friends of victims during the exercise or to provide an opportunity for community members to practice any roles they have agreed to undertake on behalf of their community (refer to NSW Police, TRC and Redland City Council case studies at Appendix A).

Further reading

Get Ready NSW (Councils) – https://www.nsw.gov.au/resilience-nsw/get-ready-program-for-local-councils

National Disaster Risk Reduction Framework Disaster Risk Reduction National Resilience Taskforce. (2019) – knowledge.aidr.org.au/resources/national-disaster-risk-reduction-framework/

Resilience Priority 3: Provide

No infrastructure is immune to disruptions. The aim is to **provide** critical infrastructure services with minimal interruptions and more rapid recovery from outages. In the context of community resilience this means investment should be based on community need and that the community must be prepared and be able to **respond** to and **recover** from any impacts caused by any disruption.

New infrastructure and significant upgrade planning

Community engagement is a particularly useful tool for providing input into new infrastructure projects and significant upgrades. Infrastructure and resilience investment should be based on community needs. Without an understanding of community requirements, infrastructure providers may commit resources where they are not needed (refer to Murrindindi Shire Council case study at Appendix A).

Infrastructure provision based on direct engagement of communities in planning and decision-making delivers resilient, sustainable systems that meet the needs of people and the environment under conditions of uncertainty. Further guidance is available through the CIR Strategy on Resilient Infrastructure Planning.

Community Information and Warnings

Messaging by critical infrastructure providers should promote partnerships with the community during all phases of the emergency management cycle. Without information, communities and individuals under stress are unable to make good decisions. Community resilience is enhanced when critical infrastructure providers and government prepare and support communities with clear, consistent and reliable information before, during and after infrastructure service outages and emergencies. Communication should be two-way wherever possible, be accessible to a variety of audiences and address diverse communication needs. It is important that critical infrastructure providers deliver regular and ongoing media and social media campaigns to provide key safety messages to individuals and the communities on critical infrastructure safety issues (refer to safety messaging case study at Appendix A).

In some circumstances, it may be necessary to issue an Emergency Alert to the affected population in relation to critical infrastructure risks. When warnings are necessary, critical infrastructure providers may need to work closely with their LEMC to convey to the community in a timely manner, a clear and practical set of actions that they can take to prepare for impact and to mitigate any danger. Communication must be coordinated, relevant, accurate, targeted, credible and consistent. Key messages must be regularly repeated and provided through a range of channels. .

Further information is available in the Australian Disaster Resilience Handbook Collection, Handbook 16 – Pubic Information and Warnings.

Managing service disruptions and outages

The community is often unaware of the complexities associated with critical infrastructure and take for granted that it is not only secure, but reliable. Communities are however, acutely aware of the reduction in amenity that service outages cause. Some critical infrastructure providers already provide outage maps and information on their websites but should consider how to integrate systems with other providers to deliver coordinated information to the community on the status of critical infarstructure (refer to Disaster Hub case study at Appendix A).

Damage assessments

Comprehensive, timely and accurate assessments of impacts to critical infrastructure will be of vital concern following a major event, and will have great bearing upon the speed and efficiency of response and recovery efforts.

Good decision making requires accurate and comprehensive information, the flow of which will improve over time. Following any emergency or disruption to critical infrastructure, there will be a need to undertake a rapid damage assessment process followed by more comprehensive assessments at a later date. Further information can be found in the separate topic specific resource on Rapid Damage Assessment that has been developed to support the implementation of the CIR Strategy.

It is widely acknowledged that the community can play an important role in capturing and sharing information before, during and after an emergency. Community members can be encouraged to assist with damage assessment processes by reporting damage in a timely manner. Critical infrastructure providers should develop tools to ensure this process is as easy as possible such as pulling data uploaded by the community onto social media e.g. Facebook and Twitter using specific sites and hashtags or push technology such as apps that crowdsource geo-tagged emergency information and intelligence from smart phones that can assist with rapid damage assessment and enhance community input into critical infrastructure resilience (refer to crowdsourcing intelligence case study at Appendix A).

Further reading

Australian Disaster Resilience Handbook Collection, Handbook 16 – Pubic Information and Warnings - knowledge.aidr.org.au/resources/handbook-16-public-information-and-warnings/

Appendix A Case Studies

Case Studies: Cross Sector Collaboration – Partner

Central Coast Local Emergency Management Committee (LEMC)

The Central Coast Council is located on the coast of NSW, approximately 76 kilometres north of the Sydney Central Business District (CBD), and about 80 kilometres south of Newcastle. The Central Coast Council was established on 12 May 2016 by the amalgamation of Gosford City and Wyong Shire Councils. The shire covers an area of 1,680km2, and has a resident population of over 335,000 people.

The Central Coast Local Emergency Management Committee (LEMC) has an active and strong representation of Critical Infrastructure (CI) providers which has been stable and consistent over time. Stable membership has facilitated the development of professional working relationships and engendered a genuine interest by CI providers to actively engage in emergency management.

Infrastructure providers regularly contribute to the delivery of short presentations on topical issues within their area of responsibility at LEMC meetings. They work collaboratively with the LEMC on community engagement initiatives, undertake joint planning, and contribute to the development and review of the Central Coast LEMC Emergency Management Plan.

CI providers also often participate in emergency management exercises. This has strengthened professional relationships and cross-agency collaboration and led to a greater understanding of each agencies' strengths and capabilities.

During times of emergency, infrastructure providers supply a liaison officer to be based in the Emergency Operations Centre, helping to reduce response and recovery times and provide significant benefit for the community. The partnerships that were created during planning and preparation, create great benefits for the people and businesses of the Central Coast during response and recovery from an emergency event.

Case studies: Engaging community in critical infrastructure resilience – Partner

Engaging passengers in airport security

The September 11 World Trade Centre attacks in 2011 and subsequent terrorist incidents around the led to a heightened awareness of national security issues. The aviation industry was dramatically impacted and since that time body scanners, security queues, shoe removal, liquid bans and a host of other measures have become the norm.

Australia's national strategic approach to countering terrorism (prepare for, prevent, respond to and recover from a terrorist act) requires a multi-layered and collaborative approach based on strong relationships between governments, private industry, international partners and the community.

Sydney International Airport has actively engaged with their clients in a partnership to reduce the risk of infrastructure service interruption. As a result of enhanced public messaging and education, passengers have become aware of their shared responsibility in relation to airport security processes. Passengers provide additional eyes and ears on the ground in terms of surveillance and are actively encouraged to report suspicious behaviour in the form of unattended bags or questionable individual actions.

This is a strong example of how critical infrastructure resilience can be enhanced through effective community engagement and promotion of a shared responsibility to risk reduction.

Case studies: Supporting vulnerable clients during critical infrastructure disruptions - Partner

Hunter Water – Supporting Haemodialysis patients

Hunter Water understands that some customers have medical needs that mean they need to use large amounts of water at home, especially those using haemodialysis machines. Hunter Water is committed to communicating with all their customers in advance of any planned water supply interruption.

If an unplanned water supply interruption occurs (such as a water main break) notice may not be given and haemodialysis patients are advised to follow the training provided by their dialysis centre. Hunter Water will inform their local dialysis centres and NSW Health of any significant changes to water quality that might impact on those receiving treatment either in the local dialysis centres or at home. The dialysis centre is responsible for advising patients on how to manage the impacts to their supply.

Endeavour Energy – *Supporting patients on life support*

Endeavour Energy has a legislated responsibility to provide support to patients that rely on a continuous supply of electricity to run critical medical equipment such as an oxygen concentrator, a kidney dialysis machine or a ventilator. Endeavour Energy holds a register of premises needing life support equipment. To join the register, affected customers require certification from a medical practitioner. Once registered, Essential Energy can provide customers with practical advice and an emergency phone number in the event of a power failure or interruption (planned or unplanned). Essential Energy recommends customers also advise their local energy retailer who will keep Endeavour Energy informed of any changes to the customers contact details and / or circumstances. Endeavour Energy aims to provide a safe and reliable electricity supply. However, registering as a life support customer does not guarantee continuous 24 hour power supply to the premises. Life support customers will be notified in writing at least four business days prior to any planned interruption, giving details of the date, time and duration the interruption is scheduled for. Life support customers are recommended to discuss an action plan with their doctor or medical service provider to help them deal with an unplanned interruption to power supply.

These case studies demonstrate how critical infrastructure providers can partner with other organisations to provide a high level of service to those dependent upon the services provided by critical infrastructure.
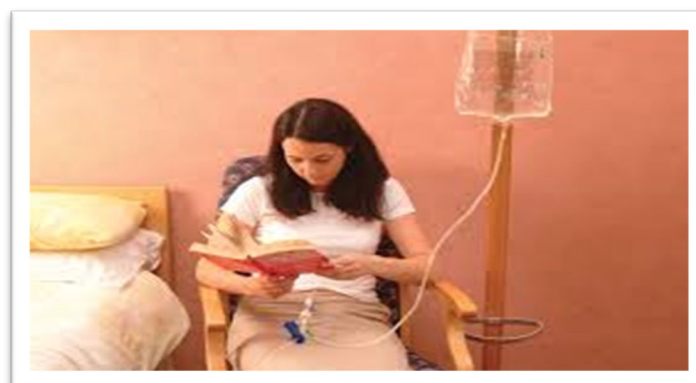
Case Studies: Community as a partner in infrastructure maintenance – Partner

Mobile applications for reporting infrastructure damage

A number of NSW critical infrastructure providers are promoting the use of smartphone technology in order to enhance their response to critical and routine infrastructure issues.

Some organisations are using software they have developed in house, whilst others are promoting the use of publicly available apps to residents so they can easily and instantly capture, report and provide feedback to their local Council and other infrastructure providers on common issues such as water leaks, pot holes, fallen trees, cracked pavements, broken playground equipment, graffiti, illegal dumping and a range of other issues that need attention.

Some platforms are increasingly sophisticated and allow transfer of images and use the smart phone's GPS location. These platforms provide an example of how smart phone technology can be used to crowdsource information from the community in order to enhance response to critical and routine infrastructure issues.

Further information is available from:

- Bega Valley Shire Council
- Campbelltown City Council
- Sutherland Shire Council
- Essential Energy
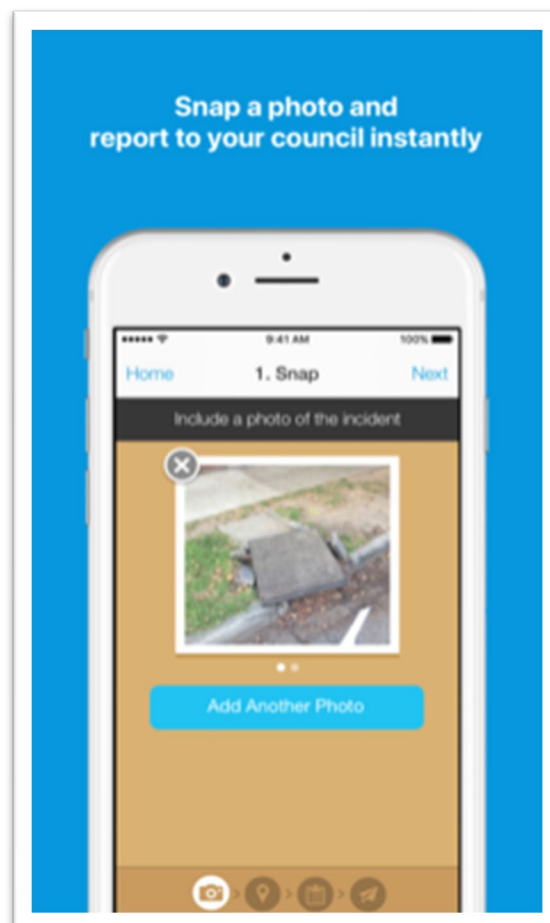
Case study: Community champions - Prepare

Redland City Council – Community Champions Program

Redland City Council is a local government area located in the southeast of the Brisbane metropolitan area in South East Queensland. At the 2016 census, Redland City Council's population was 147,010.

Redland City Council's Community Champions initiative was born out of the Russell Island fires in 2016. These fires isolated the residents and made them appreciate how vulnerable they were in this type of an event. Nobody knew where to evacuate to, there was no communications and nobody was organised to do anything. As a result of this event, a number of interested and willing community members agreed to step up and assist in emergencies to do what needs to be done.

The program has established a network of 29 people, nominated by residents to work with Council to raise disaster preparedness awareness. The community champions have been trained in evacuation centre management, assessing and assisting people in trauma and managing volunteers in community recovery. These volunteers are a reliable first point of information for other community members during natural disasters and emergencies.

On Thursday 8 June 2017, Redland City Council hosted Exercise Exodus. This exercise was designed to test evacuation procedures on Russell Island as well as the surrounding islands and the mainland. The exercise involved the Community Champions who were provided with an opportunity to put theory into practice and fully test out their new roles.

To find out more about the Redland City Council Community Champion Program refer to www.youtube.com/watch?v=6RRaBmhdgnw

Further information on Exercise Exodus can be found here: www.redlandcitybulletin.com.au/story/4699634/mock-evacuation-training-on-russell/

Case study: Engaging community in resilience building - Prepare

Tablelands Regional Council - Community Resilience Program

Tablelands Regional Council, located 100 km west of Cairns in Far North Queensland has a population of approximately 23,000 people, dispersed across 11,334 km². On 3 February 2011, very destructive winds from severe Tropical Cyclone Yasi affected the region. Yasi was the largest and most powerful cyclone to have affected Queensland since records began. It was an exceptional event that stretched Council and the responding agencies to their limit. As a result, a more innovative way of collaborating with communities across all phases of disaster management (prevention, preparation, response and recovery) was identified as a requirement by the multi-agency Local Disaster Management Group (LDMG).

Tablelands Regional Council received $700,000 grant funding as part of a Community Development and Recovery Package under the Disaster Recovery Funding Arrangements (formerly NDRRA). This enabled Council to recruit a full time Community Resilience Officer on a two year fixed term basis to work closely with communities to assist them in projects that helped build their resilience to natural hazard events.

Under this program, Tablelands Regional Council worked collaboratively with local residents and community organisations to produce seven Community All-Hazard Disaster Plans (based on Police divisions) covering the majority of small communities in the Council area. The plans involved residents identifying Community Disaster Coordinators to champion the cause, to assist with increasing resilience efforts and improving the communities' response to disasters. These plans were adopted by the LDMG.

The Community All-Hazard Disaster Plans essentially formalised what was already happening in smaller communities by clearly identifying resources in the local area that can be deployed to assist the community. In some communities, residents agreed to monitor flood levels and reported back to the coordination centre on heights at bridges and other key locations, some residents organised local resources to respond to priority jobs in their community, others checked on vulnerable persons and many more provided situation reports from their locality into the coordination centre.

To support the plans, Tablelands Regional Council also initiated an associated Skills and Capability Training Program. This involved 284 community members obtaining a chainsaw ticket, another 246 gaining a first aid qualifications and another 798 residents attending other skill training courses for example, psychological first aid, radio communications and leadership. This project won the Encouragement Resilient Australia Award for Queensland in 2012 and was also a finalist in the Local Government Managers Association (LGMA) Awards for Excellence 2016 under the community shaping category.

Additionally, Tablelands Regional Council held two table top exercises that involved local residents and members of the Community Disaster Teams. Exercise Whirlwind was based on a cyclone scenario and Exercise Bright Spark on a bushfire scenario. Exercise Bright Spark was awarded Highly Commended in the Resilient Australia Awards 2015.

The case study demonstrates how key community members can be actively engaged in a whole of-community approach to emergency management and how initiatives can be implemented that are aimed at empowering individuals and communities to build their own resilience.

Case studies: Involving community members in training and exercises - Prepare

NSW Police – Exercise Barangaroo

On Sunday 28 August 2016, NSW Police hosted a full-scale live exercise at Barangaroo, an inner-city suburb of Sydney which is located on the north-western edge of the Sydney CBD and at the southern end of the Sydney Harbour Bridge.

The exercise simulated an accident in which a Boeing 777 experienced a tail strike during take-off from Sydney airport and crashes onto a busy street at Barangaroo.

More than 700 personnel were involved in the exercise which provided emergency services with an opportunity to practice how they would respond to a mass casualty scenario and the actions they would take to minimise loss of life and protect critical infrastructure. This realistic scenario-based exercise tried to simulate the pressure of a real emergency and involved emergency services rescuing and triaging 500 injured persons (mannequins) and transporting them to hospital through a gridlocked city, as friends and family rushed to the scene.

The family and friends of those affected were role played by 300 volunteers from various services and 70 community members. Exercise Barangaroo was one of the nation's largest disaster response planning and training exercises. A short video clip can be found here: www.theaustralian.com.au/video/id-JvM3FrNTE6cY4LIr2QqKS47Wi0ACIYsi/Emergency-Exercise-Barangaroo-Plane-Crash?nk=acd82d9e98d8bf9559b735b3990ac352-1543054217

Case studies: Preparing communities for critical infrastructure disruptions – Prepare

Ausgrid – Preparing for storm season

Ausgrid recognises that severe storms often arrive quickly and can be unpredictable, leaving damaged homes and businesses in their wake. They recognise that many of their customers are at risk of experiencing severe weather events that may result in potentially dangerous flood waters, inconvenient power outages or even damaging winds. Ausgrid believe that whatever the risk, it's always best to be prepared wherever possible and put safety first.
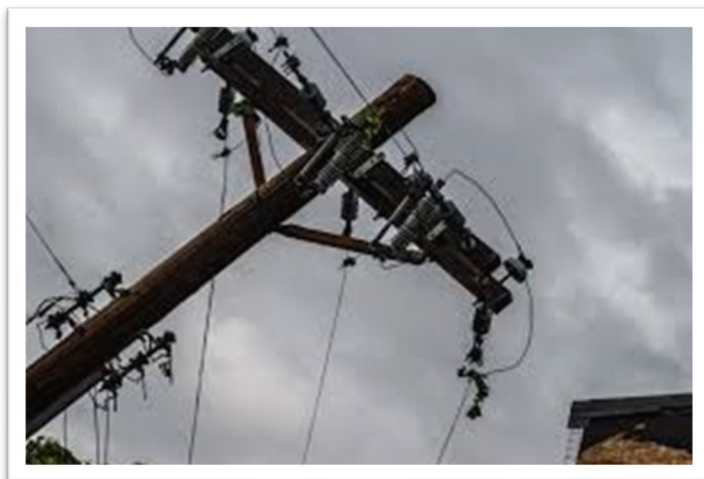
Ausgrid has put together some simple tips to educate communities to ensure they are ready to face the summer storm season. Ausgrid promotes a number of quick preparations for customers to take before the storm season arrives, to help ensure they are not faced with a big clean-up afterwards. Ausgrid also educates communities affected by severe weather that their supplies may have been damaged and that professionals should be called to minimise further damage and check everything is safe. Ausgrid also provides an outage map for their customers as well as a Facebook and Twitter account to keep customers up to date on what is happening with the electricity network.

Case studies: Informing community on status of critical infrastructure resilience – Provide

Lismore Disaster Dashboard

Lismore City Council has implemented their innovative Disaster Dashboard that delivers real-time emergency related information to the public via a dashboard.

The aim is to reduce public risk and ensure the community is kept informed before, during and after emergency events. The dashboard provides a one-stop-shop for emergency related information by bringing data together from a variety of sources to provide live updates on road closures, power outages, evacuation centres, and school closures as well as current weather warnings and preparedness information for the community.

This one-stop shop of authoritative information for residents alleviates pressure on infrastructure providers who can get on with the job of restoring service rather than answering enquiries or responding to community rumours.

The Disaster Dashboard is a great example of the role technology can play in gathering intelligence and real time information from multiple sources to enable better decision making in emergencies as well as a tool to assist multiple critical infrastructure providers work together to build community resilience.

Other NSW councils such as Central Coast are already investigating the provision of their own disaster hub information.
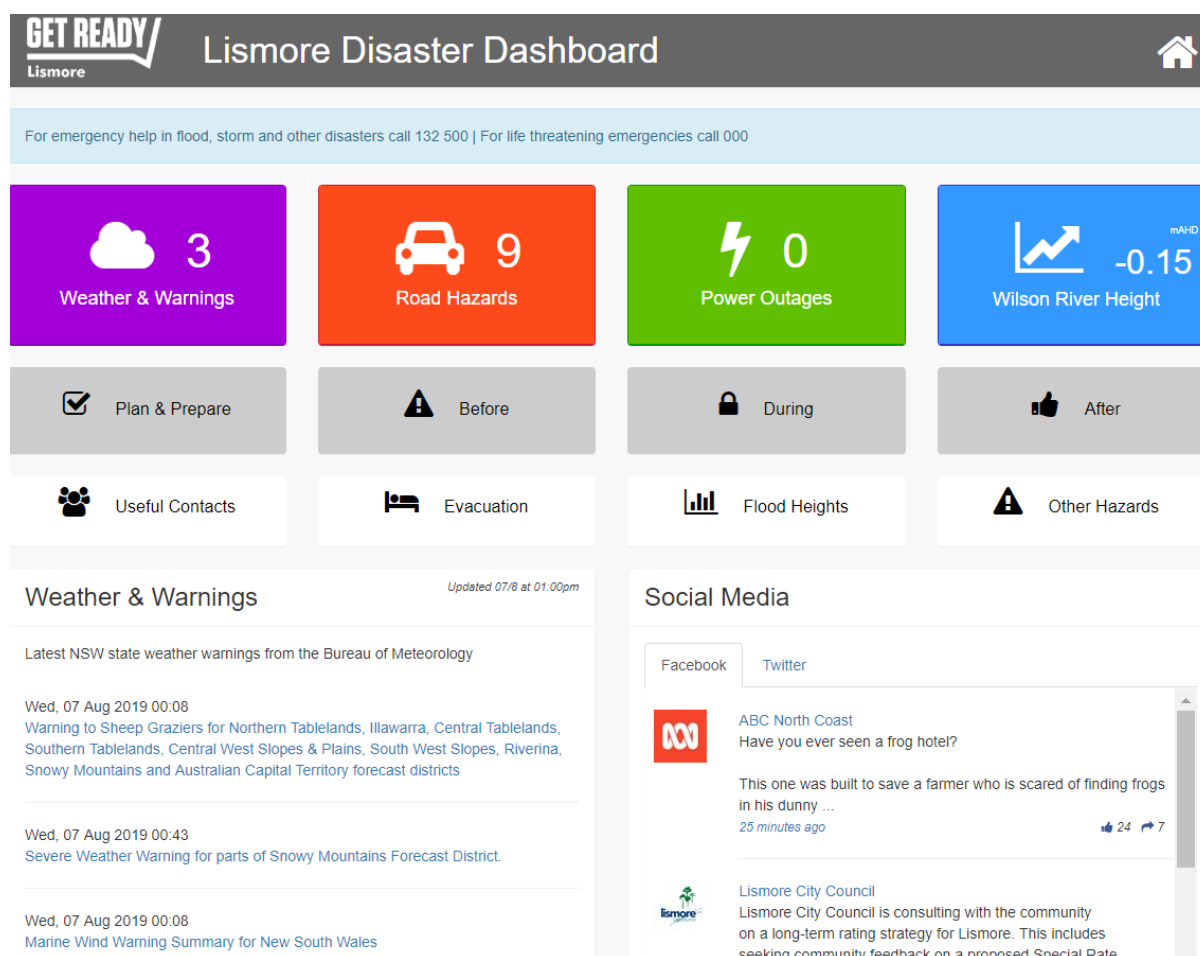
Case studies: Delivering effective community safety messaging - Provide

Horizon Power – Stay 10 Metres away

Horizon's power line safety campaign advising the community to stay at least 10m away is both simple and effective. Instead of simply advising customers how dangerous power lines can be or explaining that fallen power lines can energise the ground for metres around it or give the science as to why getting to close could be deadly, Horizon Power have instead chosen to visually demonstrate the dangers involved. Using a short video clip, the demonstration shows a tree branch falling on a power line which hits the ground and lights up a Stay 10m Away sign. The 30 second clip is engaging, educational and thought provoking.

The Horizon Power "Stay 10 Metres Away" campaign can be viewed here: www.horizonpower.com.au/our-community/news-events/news/safety-campaign-drives-home-safety-message/

Ausgrid – Keeping safe around electricity poles and powerlines

Ausgrid have produced a short video (1 minute 38 seconds) aimed at young children on the dangers of electricity. It teaches children that electricity dangers are all around us and that they should be careful where they play. The short clip identifies that children should not be climbing trees, flying kites or undertaking other activities around electricity infrastructure as there is the risk of electrocution and serious harm. The video is short, educational, and engaging and is an innovative way of sharing targeted key safety messages with a young audience.

The Ausgrid Video can be viewed here: www.youtube.com/watch?v=tyAK4E8LTKc&index=4&list=PLuwbkkdVkz930VdPR1BeNLkwqYgRDw5lq

These case studies demonstrate how infrastructure providers can provide simple but effective community education and safety messaging around critical infrastructure resilience issues.

Case studies: Rebuilding infrastructure that meets community need - Provide

Murrindindi Shire Council — A cautionary tale

The Shire of Murrindindi is in the Hume region of Victoria. It is located in the north-east part of the state and covers an area of 3,889 square kilometres. Based on the ABS Estimated Resident Population (ERP) figures, between 2001 and 2008, Murrindindi Shire's population grew steadily. In 2009, there was a significant drop in numbers (around 400) due to the impact of the Black Saturday bushfires (refer graph below).
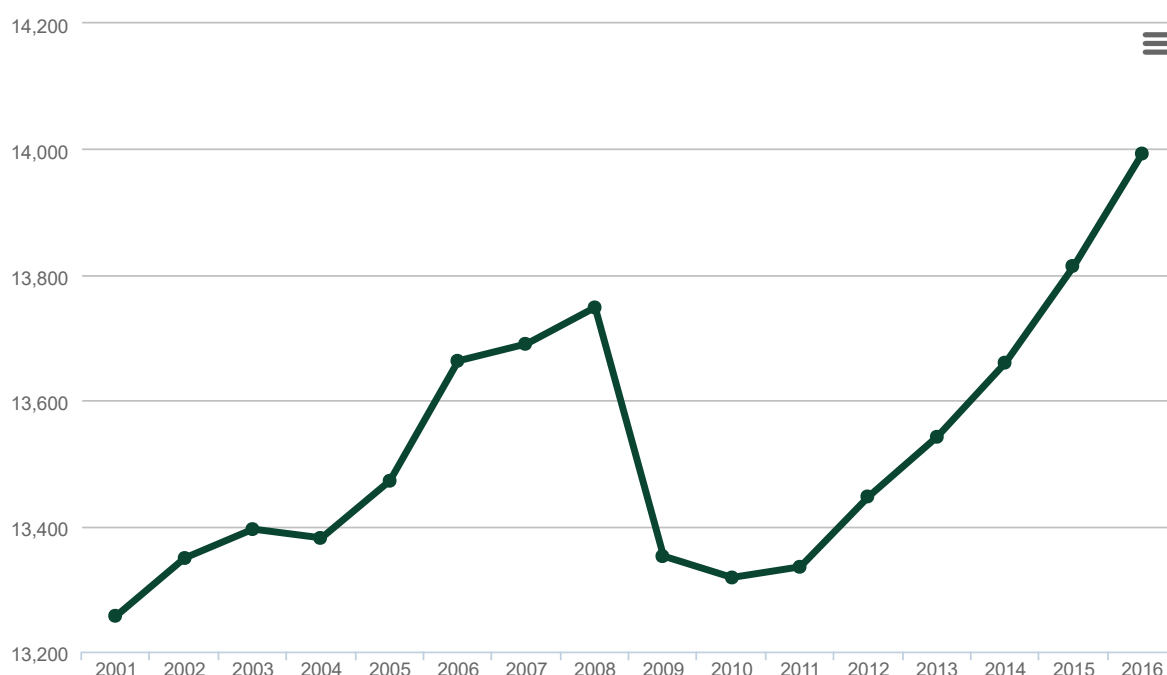
Murrindindi Population 2001-2016

Parts of the Murrindindi Shire, notably the towns of Marysville and Kinglake were badly affected by the February 2009 Black Saturday bushfires. The bushfires resulted in 106 fatalities across the Shire, including 38 deaths in Kinglake and 34 in Marysville. More than $400 million was donated by the Australian public and State and Federal governments to help rebuild the affected towns. New infrastructure, built with about $33 million given to the Council after the fires, included new community halls, stadiums, sporting facilities and parks and public playgrounds.

Unfortunately, this overwhelming generosity has resulted in a number of unintended negative consequences for the Murrindindi Shire. The operating costs, maintenance and repairs of infrastructure as well as future renewal costs, average $1.72 million per annum - a costly financial burden for a small Shire.

Less than 50% of houses affected by the fires have been rebuilt which has had a significant impact on Councils revenue. With a dwindling rate base, the Murrindindi Shire, struggled to meet the whole of lifetime costs for these new assets that were "gifted" to the community during the recovery and reconstruction phase of the Black Saturday bushfires.

The ratepayers that did return to Murrindindi are now bearing the costs with substantial rate increases of up to 18% to cover the ongoing operating costs and maintenance. Local residents feel that inadequate consultation was undertaken about the facilities which they feel are too big, too expensive to hire and do not fit with the needs of a small community. An example is the multi-million dollar basketball stadium that was built with donated recovery money which is grossly under-utilised and never used for a single game of basketball in the 3 years following completion of construction. Local residents don't feel that they "own the infrastructure", they argue that they didn't ask for it and they also didn't understand that they would need to meet the ongoing costs. This new infrastructure is unsustainable and is essentially perceived by some members of the community as a 'white elephant'.

This case study provides lessons for other communities rebuilding after a disaster and clearly demonstrates the need to adequately consult to understand the need before investing in significant community infrastructure. Communities are best placed to drive their own recovery – they know what they need and can work collaboratively with government and infrastructure providers to use post-disaster funds to best advantage.

Since 2011, the population of Murrindindi has begun to increase steadily once again, and has now exceeded the pre-bushfire population (refer graph above). At the 2016 census, the population of Murrindindi was approximately 14,000. A short video on the experience of Murrindindi Shire Council can be found here: www.abc.net.au/news/2015-01-13/bushfire-recovery-inspirations-and-warnings-emerge/6014518

Appendix B: Abbreviations and glossary

Abbreviation	Meaning
All Hazards	An approach to manage the uncertain nature of emergency risk by building resilience to all or multiple hazards
CI	Critical Infrastructure
CIP	Critical Infrastructure Protection (protection against terrorism specifically)
CIR	Critical infrastructure resilience (protection against all hazards)
Dependency	When a critical infrastructure relies on another critical infrastructure, good or service for continued service provision
Disaster	When a hazard or threat intersects with a vulnerability, and the ability of local resources or business as usual to cope is overwhelmed
EMDRR	NSW Emergency Management and Disaster Resilience Review
Hazard	A threat, usually natural, that unintentionally disrupts critical infrastructure service provision
Infrastructure Provider	An organisation responsible for providing an infrastructure service at a state, regional or local level, whether publicly or privately owned
Interdependency	When multiple critical infrastructures rely on each other for continued service provision
Mitigation	Measures taken in advance to reduce the likelihood or consequence of a hazard or threat.
Sector	An industry or service group identified within the NSW CIR Strategy
SEMC	State Emergency Management Committee
SCADA	Supervisory Control and Data Acquisition (SCADA) systems are used for remote monitoring and control in the delivery of critical services such as electricity, gas, water, waste and transportation.
SLERA	NSW State Level Emergency Risk Assessment
Threat	A hazard, usually man-made, that deliberately disrupts critical infrastructure service provision
TISN	Trusted Information Sharing Network (information sharing network co-ordinated by Commonwealth Home Affairs Department)
Vulnerability	The conditions determined by physical, social, economic, and environmental factors or processes which increase the susceptibility of an individual, a community, assets, or systems to the impacts of hazards. (Source: NDRRF Glossary)

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