Public Alerting Framework

for Auckland

1. Introduction

The vision of the Auckland Civil Defence and Emergency Management (CDEM) group plan (2016-2021) is: *'working together to build a resilient Auckland'*. The plan recognises that everyone from individuals and families; communities; business and government both central and local must work together to help build a resilient Auckland.

To achieve the vision of *'a resilient Auckland'* the group plan identifies the following goals:

Reduction: Reducing risks from hazards to Auckland.

Readiness: Increasing community awareness, understanding preparedness and participation in emergency management.

Response: Enhancing Auckland's capability to manage disasters.

Recovery: Enhancing Auckland's capability to recover from disasters.

Resilience:
Auckland-specific goal

Building a resilient Auckland to support the vision of Auckland as 'the world's most liveable city'.

The Auckland-specific goal of 'resilience' is central to the work of Auckland CDEM. Most of Auckland CDEM's work is centred around building community resilience; helping everyone to get ready and reducing risks to minimise impact. Effective public alerting to imminent or potential threats from hazard events such as storms and tsunami is one tool used by Auckland CDEM to reduce risk, minimise impact and, ultimately, build resilience.

The Public Alerting Framework for Auckland has been designed to:

- explain what public alerting in a CDEM sense is, what it can and cannot do;
- give detail on the range of channels for public alerting currently available in Auckland;
- highlight the advances being taken with regards to public alerting at a national level;
- provide some commentary on tsunami sirens, their uses and limitations; and
- assist with decisions taken by the Auckland CDEM Group Committee, local boards and partners and stakeholders with regards to the prioritisation of budgets and options for enhancing public alerting across the Auckland region.

2.   Key definitions

Community resilience

The Auckland CDEM group plan (2016-2021) defines 'resilience' as "…adapting to demands, challenges and changes. It also means flourishing in times of adversity"[1]. With regards to public alerting to hazard events GNS Science defines resilient communities as those with "adequate and varied alerting systems in place to allow for a timely and appropriate response from all of those at risk"[2].

Public alerting

A 'public alert' is "an advisory or warning heads-up and/or message delivered to the public...An advisory or warning is provided by an alerting agency to the public to make them aware that a hazard threat is present and that action is, or could be, required. A public alert ideally contains both heads-up and instruction information"[3].

Public alerts differ from 'natural warnings' where the effect or precursor to a hazard is felt or witnessed by the public. A good example of a natural warning is an earthquake prior to a tsunami. Natural warnings are often the best and most reliable form of warning and are particularly so for tsunami events where the time taken to analyse, process and report data from tide gauges etc. can be greater than the length of time taken for a tsunami wave to reach the shore from its source.

3.   National and local warning systems

At the national level the responsibility for issuing official civil defence warnings rests with the Ministry of Civil Defence and Emergency Management (MCDEM). In Auckland, the responsibility for issuing official warnings to local communities rests with Auckland CDEM and its partners and stakeholders (the civil defence 'group').

MCDEM may issue warnings via its national warning system. This system consists of email, SMS text and other messages sent to: local CDEM groups across the country; a range of national agencies; lifeline utility companies and, if required, to key national radio and television stations. Information at the national level about hazard and other events is also sent out via social media and through the MCDEM website. A full description of the national warning system can be found at section 19 of The Guide to the National CDEM Plan.

When messages need to be sent to local communities, either as part of the national warning system described above, or in response to local level threats, Auckland CDEM has the ability to send alerts to communities using a range of channels. Alerting options available in Auckland include: motorway billboards, emails, radio and TV, SMS text messages, helicopter loudspeakers, radio broadcast, Red Cross hazard mobile app, social media and websites, and fixed tsunami sirens. A full list and description of each current alerting channel available to Auckland CDEM can be found at **Appendix A**.

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[1] ACDEM (2016), Auckland Civil Defence and Emergency Management Group Plan 2016-2021, P-16
[2] GNS Science (2014), Public Alerting Options Assessment: 2014 Update, P-7
[3] GNS Science (2014), Public Alerting Options Assessment: 2014 Update, P-viii

4. Principles of an effective public alerting system

It is important to understand that no one public alerting system is perfect. Public alerting systems work by getting messages out to those at risk from a hazard event. There are many international examples[4] where at-risk populations have failed either in full or in part to respond to official emergency alerts even when a well-resourced and thought to be well planned public alerting system was in place. It is generally accepted across the emergency management profession that effective public alerting systems are those that take a holistic approach. That is, that they are well planned, well placed, well understood, reliable and trusted and are backed up by effective public information campaigns and education.

The following principles are those generally agreed to represent an effective public alerting system:

Resilience

Public alerting systems work by getting messages out to those at risk. Once those messages are received individuals then have to make their own decision on their next steps. Not everyone, for a variety of reasons, will act upon official messages. The individual decision-making steps that members of the public go through after receipt of public alerting messages ultimately affects the time available for action to be taken. The more 'resilient' communities are the more able they are to expect, understand and act upon alerting messages.

Reach

The 'reach' of public alerting systems must be appropriate to the density of population living in the area covered by that alerting system. Some percentage of the at-risk population will always be unreachable for a number of reasons. International literature[5] suggests that effective public alerting systems must be able to reach 70% of the at-risk population. The remaining 30% can be expected to receive alerts through informal means (e.g. media including social media and word-of-mouth).

Redundancy

No one public alerting system is perfect. It is important that multiple systems and alerting platforms are used as all systems have the potential for failure. Technical and procedural difficulties and issues, for example, weather; breaks in power supply, radio and data transmission; time of day; language and readability; audibility etc. of some alerting systems over others means that all available alerting systems should be used if the intention is to reach and communicate with as many different people and communities as possible. Redundancy in public alerting systems, is therefore, important.

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[4] GNS Science (2014), Public Alerting Options Assessment: 2014 Update
[5] See for example: Mileti, D.S. and Sorensen, J.H., (1990) and Mileti, D.S. and Kuligowski, E., (2008)

Response

The response of communities to alerts has been found[6] to relate to a variety of factors such as age, ethnicity, gender, previous experience of hazards and/or past alerts, proximity to the hazard, and the responses of others receiving the same alert. It is essential that communities are given enough information and that public education is prioritised so that people understand: who will issue an alert message, what the message could say, how the message will be issued and, importantly, what should be done in response.

Reliability

Reliable public warning messages during a hazard event are critical. Research[7] has shown that effective warning system messages should:

- be focussed on people at risk;
- be ubiquitous;
- be capable of reaching people irrespective of what they are doing;
- be easy to access and use;
- not create added risk;
- provide appropriate lead time so people have a chance to act upon the messages;
- generate authenticated messages; and
- be reliable.

Resourced

Effective public alerting systems must be resourced both for initial start-up costs and for ongoing maintenance costs. Communities need to determine whether these costs are appropriate for their own circumstances, risk profile and ability to fund. Resilient communities, in the broadest sense, are those that weigh up the different pros and cons of public alerting systems alongside other options such as training and public education, use of alternatives, and modifying behaviours and risks such as through land-use planning and modification of potentially hazardous processes.

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[6] Sorensen, J.H., (2000), Hazard warning systems: review of 20 years of progress, Natural Hazards Review, 1: 119-125
[7] Partnership for Public Warnings (2002), Improving the effectiveness of the homeland security advisory system, Workshop on Effective Hazard Warnings

5.   Recent advances in public alerting at the national level

Critical Public Alerting System
The Critical Public Alerting System (CPAS) is one of eight projects under the Emergency Services Information and Communications Strategy and Roadmap 2013-2017. The objective of the CPAS project is to enable multiple government agencies to effectively warn at-risk communities of critical adverse events and threats to life and property.

The CPAS project is working with telecommunications providers to investigate the funding and deployment of Cell Broadcast capability in New Zealand to directly alert the public of a critical threat in their location via their mobile handsets. The project is being managed by MCDEM.

Cell Broadcast technology uses equipment in the mobile network to send a message to selected cell towers which then broadcast as a blanket message to all active devices within the coverage area. The message is delivered rapidly, in large volumes, to a defined geographical area. It does not require identification of specific numbers or devices and is not affected by network congestion. However, because it is a blanket message, the receipt of messages is not recorded. Cell Broadcast technology is not currently installed in New Zealand networks and devices but is able to be supported by telecommunications vendors. Currently Cell Broadcasting is used for public alerting in the United States of America, Japan, Israel, the Netherlands and Chile.

Common Alerting Protocol
In recognition of the importance of interoperable emergency communications to the safety and security of New Zealanders, a New Zealand Common Alerting Protocol (CAP) Working Group was assembled in December 2015. It was jointly led by MetService and GNS Science until December 2016, thereafter chaired by the MCDEM. It is made up of New Zealand agencies, groups and companies responsible for the creation and/or dissemination of alerting messages. Its purpose is to use CAP as the standard for effective message interchange.

CAP is an international format for exchanging all-hazard emergency alerts. It supports consistency in the application of public warnings across and the dissemination of warnings over many channels at the same time. Adopting and using CAP-enabled systems in New Zealand will enhance our warning capability by providing one format for all warnings, no matter what the warnings are for. It also facilitates consistent behaviour of systems and message output channels across all warnings.

6.   Tsunami sirens

Auckland currently has 44 fixed tsunami warning sirens across nine sites (see **Appendix B** for details) in legacy Rodney and Waitakere. These sirens were installed in 2008 and 2010 and do not meet current MCDEM technical standards[8] for tsunami warning sirens. All new and existing siren installations will need to meet the MCDEM standard by June 2020. Auckland CDEM is currently investigating the of upgrading its existing siren network from 'tone-only' sirens to those with PA/voiceover loudspeaker capability to meet the MCDEM standards. It is expected that this upgrade will be completed by the end of 2017.

Tsunami sirens, while useful as part of a package of measures to warn the public, do have their limitations. The estimated reach of Auckland's current sirens is eight per cent of the 'at-risk' population[9]. Without effective public education and engagement activities sirens are not generally effective in alerting the public to take action and may cause greater confusion when activated. That said, sirens can be useful and, in particular, can be used to alert the public at night when other potential forms of communication (e.g. cell phones and radio broadcasting) may not be as effective.

Any decision taken to add additional tsunami sirens to Auckland's siren network must give careful consideration of:

Hazards: *"the threat of a tsunami event occurring over a given timeframe that will have a negative effect on people, infrastructure and the environment".*

Risks: *"tsunami risk not only represents the possibility that a tsunami hazard could occur, but also its likelihood and consequences on people, infrastructure and the environment*[10]*.*

In order to assist with discussions and decision making with regards to Auckland's current and future siren network Auckland CDEM is in the process of assessing the relative hazard and risk profiles of Auckland's many coastal communities.

Some provision exists within Auckland Council's Long-term Plan for public alerting including tsunami sirens. It is likely that if other communities choose to install sirens that a cost-sharing model would be used.

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[8] MCDEM (2014), Tsunami Warning Sirens Technical Standard [TS 03/14]
[9] Defined as those living within tsunami evacuation zones
[10] MCDEM (2014), Tsunami Warning Sirens Technical Standard [TS 03/14], P-7

Appendix A: Public alerting channels currently used by Auckland CDEM

Fixed tsunami warning sirens, 44 across nine sites in Rodney and Waitakere. Signal-only sirens are triggered through a remote access login that uses VHF radio transmission to activate and deactivate the sirens.

Helicopter loudspeaker is available from the Auckland Rescue Helicopter Trust (ARHT). Westpac Rescue Helicopters can be fitted with a customised PA loudspeaker that can disseminate tone-only, pre-recorded or live messages by flying over a populated area.

Mobile PA Loud speakers can be used to make announcements to the public. Emergency service vehicles (including police, fire service and Auckland CDEM) have PA loudspeakers attached to their vehicles that can be used to alert the public.

Radio announcements are commonly applied to convey warning information to the public. The announcements are made upon the request of warning agencies to radio stations on the basis of prior arrangements. Auckland CDEM (through MCDEM) maintains MOUs with Radio NZ, the Radio Broadcast Association and Mediaworks for the broadcast of emergency announcements.

Red Cross Hazards App sends official warnings and alerts directly from participating organisations based on selected locations. The app contains step-by-step guides to help your household create an emergency plan and prepare getaway kits. Auckland CDEM messages are sent through the Red Cross Hazards App from the web-based, multi-channel platform described above. The Red Cross hazards app is available free through app stores.

Route alert involves the physical door-to-door delivery of a warning by persons. Normally route alert would in the first instance be undertaken by staff from NZ Police and NZ Fire Service. Door-to-door notification is also commonly applied via volunteer networks (e.g. CDEM volunteers and neighbourhood watch groups).

Telephone trees are used to pass on a warning message from one person to another using their normal telephones. Telephone trees require careful planning and understanding by residents of their responsibilities.

Television announcements are commonly applied to convey warning information to the public. The announcements are made upon the request of warning agencies to television stations on the basis of prior arrangements. Auckland CDEM (through MCDEM) maintains MOUs with TVNZ and Mediaworks for the broadcast of emergency announcements. Television stations will normally announce the warning by broadcasting a scrolling banner over the existing programme.

Variable message signs (VMS) positioned in areas with high traffic volumes allow pre-set messages to be displayed electronically. VMS signs can be static (e.g. mounted on the side of the road or overpass), mobile (e.g. mounted on a trailer). Static signs and messages are generally electronically telemetered from a central location. Mobile signs and messages need to be pre-set on deployment. VMS signs are available from ATOC and equipment hire stores.

Volunteer and community networks have the potential to reach many people and may take many forms from telephone trees and community meetings to more advanced solutions that are used by the respective organisation. Examples of networks include Surf Lifesaving, Neighbourhood Support, Volunteer Coastguard, Salvation Army, Red Cross and Service Groups (e.g. Rotary International, Lions etc.)

Web-based, multi-channel communications platform that allows a single message to be sent simultaneously to stakeholders and the public. Messages can be sent via phone, SMS, email, Facebook, Twitter, website and smartphone app (e.g. Red Cross App)

Appendix B: Current fixed tsunami siren network