



REVIEW OF THE RESPONSE TO THE AUCKLAND STORM OF 10 APRIL 2018

A report to Auckland Coordinating Executives Group

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Executive Summary

The 10 April storm in the Auckland region was a significant natural hazard event, which required a coordinated response from the Auckland Civil Defence and Emergency Management (ACDEM) Group, working with a wide range of partners.

This review was commissioned by the Chair of ACDEM's Coordinating Executive Group and is aimed at identifying opportunities to further strengthen ACDEM's capability to respond to major natural hazard events.

The review is based on a combination of reading the documentary record of the response and interviews with ACDEM participants and of the electricity distribution companies and one electricity retailer. All interviewees were open and constructive in their comments.

Readiness

ACDEM has invested in building readiness for and capability to respond to major natural hazard events. Resilient Auckland (published in 2016) is a comprehensive plan to build resilience in the Auckland region. All the basic building blocks for a response were in place; ACDEM had supported the professional development of its people and participated in practice response exercises, including national exercises led by Ministry of Civil Defence and Emergency Management (MCDEM).

Interviewees noted some ongoing relationship tensions in and around the ACDEM Group. There was not a shared understanding of the way in which ACDEM members would collectively apply the Coordinated Incident Management System (CIMS) methodology in a response, which was the source of concern for some.

Timeline of storm

The 10 April storm was anticipated by weather forecasters, with estimates of the likely extent and potential impact being updated as the storm approached. Forecasts correctly predicted that the main impact of the storm would be from strong winds, with relatively limited rainfall.

The primary impact of the storm was in causing damage to trees, which, in turn, caused significant damage to the Vector and Counties Power electricity distribution networks that supply Auckland. Emergency services responded to the high levels of call-out.

Power supply restoration commenced immediately, but over the next couple of days it became apparent that the duration of outages for a significant number of households would be greater than initially anticipated.

Gaps in information as to which premises on Vector's network were without power at any point in time complicated the targeting of network repair and the provision of welfare support.

As relatively widespread power outages continued, combined with a spell of cold weather, welfare impacts increased. In addition to people dependent on power supply for critical medical support, a range of other groups (for example, old people living alone, houses with recently-born babies) became vulnerable, some of whom required support to manage the impacts.

This necessitated a significant welfare response, initially through the distribution of such things as portable generators and potable water (mainly to relatively isolated areas) and of emergency generators, and then through Operation Connect (14-17 April): a major door-knocking exercise in areas affected by the power outages, aimed at identifying and providing support to any vulnerable households not previously identified.

The situation improved as power supplies continued to be reinstated. The ACDEM response progressively reduced in scale in the second week after the storm, and formally ceased on 24 April.

The response

Many aspects of the response went well. All ACDEM participants showed high levels of commitment to supporting the people of Auckland in the aftermath of the storm. With the exception of electricity-related impacts, infrastructure services were fully restored very quickly.

A welfare response was mobilised at short-notice and involved high levels of collaborative working. Effective communication with the public, both direct and through engagement with the media, was maintained throughout the response.

At the same time, as is always the case in major Civil Defence and Emergency Management (CDEM) operations, there were a number of aspects of the response where interviewees identified opportunities to learn and to further strengthen capability to respond to future major natural hazard events.

A number of ACDEM members have undertaken their own post-event reviews, and implemented changes as a result. A number of the recommendations set out below are already underway, which is a positive reflection of the learning culture that is core to effective civil defence and emergency management.

Recommendations: Auckland Civil Defence and Emergency Management Group

1. Continue to invest in the building and maintenance of constructive relationships amongst ACDEM members, at both operational and governance levels
2. Agree a common approach amongst ACDEM members for use of the Coordinated Incident Management System (CIMS) methodology as the basis for planning for response and implement each of the structured elements of CIMS in any major response
3. Continue to participate in standard nationwide CDEM approaches (normally MCDEM-led), including in relation to any review of CIMS and to professional development
4. Review the call centre, website and app capacity for the front-line response agencies and explore any opportunities to enhance interoperability that would enable load-sharing at peak times following a major hazard event
5. If practicable, work with Met Service and others to develop heuristics to anticipate the nature and extent of damage for a predicted storm, to inform a Standard Operating Procedure on initial response settings

6. Review the approach taken in the lead-up (where possible) and immediate aftermath of a major hazard event to the mobilisation of the Emergency Coordination Centre (ECC), erring (within reason) on the side of cross-ACDEM mobilisation unless and until it becomes clear this would be overkill
7. Review recruitment processes to test, to the extent practicable, that those recruited into critical post-event response positions are able to work effectively under what are likely to be highly-pressurised conditions, while recognising that complementary capabilities will be needed in 'peacetime' to build the necessary relationships, systems and processes
8. Continue to take opportunities to second ACDEM staff to responses in other parts of New Zealand, both to provide support and as a valuable means of professional development
9. Actively support the MCDEM-led work to develop the systems capability to enable the rapid building of a Common Operating Picture following an event, and work with partners to ensure all key contributors are using the same system, and agree and commit to a shared approach to using EMIS in the meantime
10. Review the resources available for major responses (both core Auckland Emergency Management [AEM] staff and Auckland Council Emergency Support [ACES]), with a view to ensuring that:
 - a. the Controller(s) is able to focus on leadership of the response, including a structured implementation of the CIMS model
 - b. each of the critical functions within the ECC has sufficient support, and alternates to enable 24/7 rostering as required
 - c. ACES will be available when required, including in events more significant than the 10 April storm
11. Review the arrangements for supporting staff welfare during a major response, including to ensure that all ECC staff are covered, and that such things as quiet spaces have been designated
12. Consider a potential role for Coordinating Executives Group (CEG) in response, including the possibility of convening at least one CEG meeting early in any major response, to support the Controller in a real-time review of the response to date, and to ensure that all ACDEM organisations are engaged as appropriate, with shared clarity as to roles and responsibilities.

Recommendations: lifelines/utilities

1. Seek assurance from Vector and Counties Power that their call centres and online apps have the capacity to cope with exceptional loads in the aftermath of major natural hazard (and other power outage) events and agree to resource sharing arrangements where appropriate
2. Seek confirmation from Vector and Counties Power that they each have access to as close to real-time data as the available meter technology and related IT systems make possible, on whether power is on or off at the household level

- a. If this does not prove possible, engage with MCDEM and, indirectly, with MBIE and the Electricity Authority, to remove any barrier to this information sharing, through regulation as a last resort
3. Work with Vector and Counties Power to build information systems that enable power outage data to be overlaid on ACDEM maps of Auckland suburbs
4. Work with Vector and Counties Power to agree roles, responsibilities and a plan for managing tree-related risks to power lines
5. Support the electricity industry's requested review by MBIE of the regulations governing trees that are a potential threat to power lines, and contribute to such a review to ensure that the trade-offs as they relate to the Auckland region are fully understood
6. Engage with Vector and Counties Power on plans to strengthen network resilience to natural hazard events, including the extent of undergrounding of existing lines in urban areas
 - a. If appropriate, support Vector in engaging with the Commerce Commission and its customers on a Customised Price Path, which would enable more and faster expenditure on undergrounding (with higher prices to customers as a result)
7. Agree with Vector and Counties Power (and, through the distributors, with the electricity retailers) arrangements for resource sharing in the aftermath of major natural hazard events, including in relation to arborists, contractors and in accessing standby generators.

Recommendations: implementing the welfare response

1. Continue to enhance the comprehensiveness of intelligence gathering and organising. The ideal might be:
 - a. one source of information for each household that meets specified criteria (e.g. an occupant relies on electrical devices for health-support, people with special needs, old people that live alone)
 - b. to the extent practicable, GIS information on vulnerable or potentially vulnerable households that can be mapped against infrastructure availability, particularly power supply
 - c. systematically utilising community-embedded networks such as district nurses, police, rural fire teams, local community leaders to identify communities and individual households that are or could become vulnerable
 - d. agency information systems that can be integrated more than is the case at present. This will always be challenging, but the MCDEM-led work to develop the capability to build a Common Operating Picture represents an opportunity
2. Clarity of accountability across the members of Auckland Welfare Coordinating Group (AWCG) and utility providers for:
 - a. working with vulnerable or potentially vulnerable households to help them develop their own contingency plans, including such things as: people on whom they can rely for support, backup power sources

- b. providing support to vulnerable households/individuals in the aftermath of an event
- 3. Review the status of the ongoing work to build community self-resilience, assess whether sufficient progress is being made and, if not, what additional action is required
- 4. Decide whether a community outreach programme such as Operation Connect should be part of future preparedness and, if so, develop and socialise at least the framework, accountabilities and potential resource requirements (recognising that the specifics could vary considerably from one response to another)
- 5. Work with Fire and Emergency New Zealand (FENZ) to ensure a shared understanding of how most effectively to deploy FENZ full capability - both urban and rural - in the welfare element of future responses
- 6. Continue to support local boards to play an appropriate part in future responses, including clarity of role, access to supporting resources and means of working effectively with Auckland Emergency Management (AEM), including in relation to volunteers
- 7. AEM to lead and coordinate an approach to the development and potential deployment of the various categories of volunteer group.

1. Context for and purpose of the review

The Auckland region has faced relatively few major natural hazard events in recent years, notwithstanding a number of storms and floods.

By some measures, the 10 April 2018 storm was the most significant natural hazard event and required the most significant CDEM response since the formation of the Auckland Council in 2010. It was also the first major event impacting rural areas since the region's rural fire service moved from the Council to be part of Fire and Emergency New Zealand (FENZ).

The impact of the storm on some individuals and communities was significant, mainly as a consequence of the extent and duration of power outages. Some aspects of the response attracted significant public debate and media commentary.

A critical part of ensuring that any emergency response system is as effective as it can be is to focus on continuous improvement and on learning from experience. Responses to major emergency events are often the best way of learning and improving.

The Chair of the Auckland CDEM Coordinating Executive Group – a statutory body of senior officials from across the emergency management sector – commissioned this independent review to ensure that the learning and improvement opportunities associated with the 10 April response are identified and are able to be realised.

Since the event, a number of the organisations involved in the response have undertaken reviews and initiated action to address identified issues. These are at various stages of development and will likely address a number of the recommendations made in this review.

1.1 Terms of Reference:

The full terms of reference for the review are contained in Annex 1.

In summary, the scope of the review is to describe the impact of the storm and each of the main elements of the response, assess the effectiveness of the response and make recommendations of actions to be undertaken in Auckland, and considered nationally, to ensure that risk is mitigated and minimised for events of similar or greater magnitude and impact in the future.

1.2 Method of review

Information was gathered through reading relevant documentation and undertaking a set of interviews, mainly with people who had key roles in the response, including:

- representatives of Auckland Emergency Management (AEM), a department of Auckland Council
- other parts of Auckland Council
- other parts of the CDEM group, notably the emergency services agencies, and
- CDEM partners, notably the electricity distribution companies and one electricity retailer

Annex 2 lists all interviewees.

Responses to major emergency events are high pressure, requiring sometimes rapid decision-making in the face of considerable uncertainty, and coordination across a wide range of contributing agencies. Due to the nature of emergency management and of the structure used to operate effectively during emergency responses, each participant and agency in a response will see a different subset of the full picture.

Not surprisingly, there was a range of perspectives on important aspects of this response. The comments that follow reflect the weight of views expressed in the interviews. These views were tested, where possible, against the documentary record. Consistent with the purpose of the review, the focus is on opportunities for learning and improvement.

I am grateful to all interviewees for their willingness to be interviewed and for their openness. All those interviewed showed a high level of commitment to emergency management in Auckland, and to the ongoing strengthening of the system both in Auckland and nationally

1.3 Structure of this report

This report contains the following sections:

- Legislative and national frameworks for CDEM
- CDEM in Auckland
- Timeline of the storm and response
- CDEM response
- Utilities/lifelines response
- Welfare response
- Concluding comments and full list of recommendations

2. Legislative and national frameworks for CDEM

2.1 National CDEM framework

The framework and responsibilities for Civil Defence and Emergency Management (CDEM) are set out in the CDEM Act 2002. The Act was amended in 2016, to reflect learnings from major emergency events of recent years, including strengthening the provisions relating to post-event recovery.

The overall purpose of the Act is to ensure that New Zealand is resilient to natural hazard events, through application of the four Rs: reduction, readiness, response and recovery.

Reduction covers actions that can be taken to reduce risk, such as investing to strengthen critical infrastructure, and public education about hazard events and of the importance of household resilience.

Readiness includes the development of plans, the building of relationships with partners whose support will be required in the event of a need to respond and in making the most of any warning of an imminent event (such as a forecast of extreme weather).

Response occurs in the immediate aftermath of a natural hazard and is the primary focus of this review.

Planning for recovery should begin as soon after an event has occurred as possible, and concurrent with the response. Once response is complete, recovery becomes the focus, and typically takes place over much longer time frames. Organisational arrangements revert to business-as-usual once the recovery process is complete.

The CDEM Act reflects the principle that emergency management is undertaken locally, coordinated regionally and supported from the national level.

Under the Act, every local authority must form a Civil Defence Emergency Management Group and must plan and provide for emergency management in their respective areas, in conjunction with the emergency services, lifeline utilities, welfare agencies and other partners.

2.2 Ministry of Civil Defence and Emergency Management

The Ministry of Civil Defence and Emergency Management (MCDEM) has national leadership and oversight of the CDEM system, and undertakes a range of leadership and coordination activities in relation to the system, including in issuing extensive guidance, in supporting professional development and in undertaking large-scale emergency response exercises.

The use of such things as common language, a shared approach to professional development (training and exercising), a standard approach to organisational arrangements, systems and processes facilitates the spread of best practice and the sharing of resources as required (particularly in responses following major emergency events).

2.2.1 Government response to the Ministerial Review: Better Responses to Natural Disasters and Other Emergencies in New Zealand

The Government has recently made decisions about the future direction of the CDEM system in New Zealand, important context for considering how best to further strengthen the Auckland region's CDEM capabilities.

In addition to a number of important strengths in the CDEM system, the Technical Advisory Group (TAG) report to the Minister of Civil Defence, as summarised in the publicly released Cabinet Paper, also identified a number of challenges, including:

- inconsistent approaches to emergency management planning and delivery across the country, making it harder to support one another and for information to flow across the system
- inexperienced people (in some instances) leading responses, resulting in poor decision making, agencies and other groups being excluded (e.g. ambulance and iwi), confusion and siloed working
- lack of clarity about who is responsible for what, leading to duplication of effort, gaps in the response, poor/slow decision-making, and agencies working in isolation

- inadequate information to inform decision-making meaning that emergency managers and the public do not always have the information they need to make timely, good decisions that protect people and their property
- inadequate (in some instances) engagement with communities, which leads to a slow response, gaps in the response and loss of trust and confidence in the system.

Cabinet decisions in response to the TAG report are aimed at addressing these challenges over time, and include strengthening leadership of the system from the centre, more explicit arrangements for resource sharing in large-scale responses (such as through 'fly-in' teams), requiring more consistency of approach (for example in professional development), and in improved engagement and communication with the public.

Continued active participation by the Auckland CDEM Group in implementing the decisions of the Government should enhance the effectiveness of emergency management in the Auckland region and nationally.

2.3 Coordinated Incident Management System

Since 1998, the New Zealand CDEM community, under the leadership of MCDEM, has used the Coordinated Incident Management System (CIMS) as the methodology to underpin emergency response.

The second edition of CIMS, published in April 2014, incorporated learnings from emergency responses over the 2010-2012 period, including the Canterbury earthquakes, Pike River mining disaster and the Rena Incident.

CIMS establishes a framework of consistent principles, language, structures, functions, processes and terminology that agencies can apply in an emergency response. CIMS is designed to be modular and scalable.

A common framework for emergency response is intended to enable agencies to plan for, train and conduct responses in a consistent manner, without being prescriptive.

Key elements of CIMS guidance include:

- a standard set of CIMS functions: Control, Intelligence, Planning, Operations, Logistics, Public Information Management, and Welfare
- doctrines and protocols setting out how the various CIMS functions operate, interact and are to be managed
- Establishing a system for any event response that is responsive to community needs; i.e. responses that aim to mitigate and manage the consequences for the affected community
- establishment of an Incident Management Team to assist the Controller, made up of the various CIMS function managers and which can include a Response Manager (or Chief of Staff)
- early development of a prioritised Action Plan which can guide the actions of the many groups contributing to the response.

A full description of the CIMS methodology is on the MCDEM website.

3. CDEM in Auckland

As a unitary authority, Auckland combines the local and regional levels of CDEM.

Auckland CDEM Group is made up of a number of organisations, including local government, emergency services, some lifeline utilities and welfare agencies. Auckland Council fulfils the administrative functions and duties of the CDEM Group.

Elected-member governance of CDEM is through the Civil Defence and Emergency Management Committee of Auckland Council.

At officials' level, the Coordinating Executive Group (CEG) ensures a strategic overview and commitment of the resources of member organisations to agreed projects and tasks.

CEG is chaired by the Chief Executive of Auckland Council, and includes senior representatives from the main emergency services, some lifelines (utilities), welfare agencies and Auckland Emergency Management (AEM).

AEM is a department of Auckland Council, and is the coordinating agency for CDEM in the Auckland region, working with a wide range of partner organisations in planning for and responding to major events. AEM's roles include Control and Coordination. Individual agencies retain their own Command structures. The type of event determines the lead agency for each major response.

AEM has 32 full-time positions, and primary and backup Emergency Coordination Centres (ECC). Auckland probably has the best-resourced CDEM group of any region in New Zealand, and certainly has responsibility for by far the largest number of citizens.

The nature of CDEM is that responses to major or otherwise significant emergency events require much greater people resource than does business as usual ('peacetime'). AEM has addressed this inherent challenge by working with the wider Auckland Council to recruit and train Council employees as volunteers who can play a variety of roles in emergency responses, principally in contributing to 24/7 operation of ECC as required.

3.1 Auckland CDEM's readiness to respond to major natural hazard events

In 2016, the Auckland CDEM Group completed and published Resilient Auckland: the ACDEM Group Plan for 2016-2021. Amongst other things, the Plan:

- describes Auckland's context, including Auckland's hazards
- sets out Auckland's resilience goals
- discusses the importance of building community resilience
- summarises the current state and a set of planned actions for each of reduction, readiness, response, recovery and resilience.

The Plan contains 80 actions in total, which are described at a high level, and for which measurement of progress and of effectiveness has not been defined.

The Plan was signed-off by the then Minister of Civil Defence, Hon Nikki Kaye, as meeting the purpose set out in the CDEM legislation.

AEM and ACDEM have invested in preparedness, for example in developing and refreshing Standard Operating Procedures, in carrying out exercises (sometimes as part of national exercises) and in professional development of CDEM staff.

AEM has established relationships with CDEM partners, notably emergency services, utilities (through the Auckland Lifelines Group) and welfare agencies (through the Auckland Welfare Coordination Group), each of whom is represented on the Coordinating Executives Group (CEG).

Interviewees reported some tensions in relationships amongst some ACDEM members, for a variety of historical reasons. One contributory factor was a perception amongst some Group members that AEM did not use a standard CIMS approach in the planning for and implementation of post-event responses.

In recent years, AEM has developed some of its own training programmes (in collaboration with the University of Auckland), over and above national training programmes, including for Controllers and for Auckland Council volunteers.

4. Summary timeline for 10 April storm and response

A summary of the timeline is contained in Annex 3. At a very high level, the main elements in the timeline were:

- pre-storm (9-10 April): reviewing and communicating the weather forecasts that correctly anticipated severe winds (and their relatively unusual direction, from the south to south-west). The degree of severity varied as forecasts were updated. The strongest winds recorded during the event were above the forecast level
- the immediate aftermath of the storm (10 April), with high levels of emergency call-outs, mainly relating to damage to trees which, in turn blocked roads, damaged property and had a significant impact on Auckland's electricity distribution networks
- a period post the storm in which the effects appeared to be relatively limited (e.g. no lives at risk, limited damage to infrastructure apart from electricity distribution)
- an emerging awareness through 11-13 April that the extent of damage and duration of the power outages could be much greater than originally thought, with a number of consequences, notably impacts on some infrastructure (including mobile networks, the recharging of phone batteries, some rural wastewater systems) and a range of welfare-related concerns (including people dependent on power supplies for medical support, people becoming vulnerable through cold, lack of access to medication because a number of pharmacies were shut, health risks e.g. through food in fridges and freezers going off)
- the distribution of portaloos, potable water, food and emergency generators (mainly to relatively isolated areas), and the organising of Operation Connect, implementation of which started on 14 April and finished on 17 April, to connect with households that appeared not to

have power and were potentially vulnerable, with the provision of practical support to those in need

- an increasing focus on support for some of the more remote communities (which had some of the longest power outages, which in turn impacted on local water and wastewater supplies)
- continuing the range of activities with reducing intensity as more areas had power restored, and more normal conditions re-emerged (with a long tail of storm debris to be cleared in the coming weeks and months).

Throughout the response, the electricity distribution companies were working to restore their networks as quickly as possible, engaging with the Auckland Emergency Coordination Centre (EGC) and others to prioritise customers for whom power supply was most critical.

ECC undertook all the core response functions, including building an intelligence picture, issuing regular Situation Reports, ongoing engagement with the media and communication with the people of Auckland.

5. The Group response

Led by the Controller, ECC was populated by staff from AEM, trained volunteers from Auckland Council and representatives of CDEM Group members (such as emergency services). Individually and collectively this group of people was highly committed to supporting the people of Auckland through the response, working long hours in stressful conditions.

A key element in reviewing the performance of ACDEM was the largely unanticipated change in the nature of the event from:

- a major storm characterised mainly by unusually strong winds and damage to trees and hence to power lines; to
- a sustained loss of power for a number of communities and households, with consequent welfare implications for medically dependent and otherwise vulnerable people and families.

Had the duration and extent of power outages been accurately predicted, operating mode and decision-making by the ECC in the first couple of days of the response would likely have been different.

This review included interviews with a number of senior people who were in the ECC, or who interacted regularly with the ECC. Interviewees' perceptions were markedly varied. The following represents an 'on balance' distillation of the range of views expressed. The distillation has been tested, where relevant, by reference to the written records of the response.

5.1 Emergency Coordination Centre

Feedback overall was that ECC operated through the response in a relatively unstructured way and did not utilise a formal CIMS-based approach. For example:

- the fact of ECC's activation was not formally communicated to CDEM partners. As a result, some CDEM Group members did not (at least initially) put representatives into ECC, which had an adverse impact on some aspects of information-gathering and of coordination
- ECC did not consistently utilise an Incident Management Team or a structured daily routine, and a number of interviewees noted that allocation of roles and responsibilities within ECC was unclear at times, including in relation to decision-making, which contributed to both stress and delay
- development of an Action Plan that could have acted as a focal point for all CDEM members was relatively late and the Plan was relatively limited.

A number of interviewees commented on the time required of the Controller in engaging with the media (see below) and questioned whether this was compatible with the other elements of the Controller's leadership of the overall response.

The perception that AEM did not use the CIMs model (or used a form of 'adapted' CIMS, the definition of which was not understood by others), was a source of some confusion to some CDEM members.

Rostering became more structured over time but in the early stages in particular, and partly as a result of a strong sense of commitment, some people noted that they and others worked very long shifts (15-16 hours, versus a target maximum of 12 hours).

The logistics function responded effectively to some very short turnaround requests, for example in procuring portaloos and potable water, and supporting Operation Connect.

A number of ECC staff were tasked with elements of delivery activity, particularly as part of Operation Connect, which meant some diversion of resource (including leadership) from the core ECC/Control functions.

A number of interviewees commented on the relatively high levels of stress observable in ECC (relative to the scale of the response), and some reflected on the stress they had felt personally. The relatively unstructured mode and sometimes lack of role clarity in ECC's operations was a source of stress for some.

One contributory factor may have been the high proportion of people who were new to AEM, following a period of above-average turnover of staff, meaning that many of those on duty through the response were relatively new to the CDEM environment in Auckland and/or to participating in large-scale responses more generally.

Some interviewees noted the importance of deploying people in response who are resilient to the stresses inherent in such roles (and which are very different from the challenges of CDEM business in 'peacetime').

Support was provided for staff welfare, although some interviewees felt this was not as systematic as it might have been. A survey of staff after the event on how they had been supported was mostly positive, including 99% of volunteers saying they would volunteer again.

Interviewees valued the role of MCDEM's Regional Emergency Management Advisers, at least one of whom was present in ECC at all times, and who were available as a source of advice, expertise and a linkage to partner agencies.

Although a few interviewees questioned whether AEM had sufficient resource (sometimes referencing headcount or budget per person supported in Auckland as compared to other regions) there was no real evidence that resources were insufficient for effective functioning, subject to being able to successfully mobilise other (including trained volunteer) resource as required in the intense period of the response.

Having said that, some interviewees noted the challenge for AEM/ECC in accessing ACES (Auckland Council Emergency Support) as needed, reflecting the fact that they each had demanding 'day jobs' and, for some, the storm had impacts on their home situation.

All the call centres of organisations central to the post-storm response faced much higher demand levels than usual (notably FENZ and Vector, but also Auckland Council), which meant that many people had to wait a long time to get through, with potentially serious consequences. Differences in call centre technology limited the extent to which one centre could provide back-up to another.

5.2 Intelligence and Situation Reports

Drawing on pre-existing plans and relationships, ECC had access to intelligence in relation to each of the key elements relevant to the response.

ECC issued 21 SitReps in the course of the response, with the first at 09.45am on Wednesday, 11 April and the last at 12.00pm on Tuesday, 24 April. The SitReps became more comprehensive as the Response unfolded.

Interviewees noted a number of issues in relation to this intelligence gathering and the related SitReps:

- the limited information on power outages at the household level and on likely restoration times, which is discussed later in this report
- the challenge of integrating across different information sources in order to build a comprehensive operating picture
- the timing for completion of the SitReps did not always match other requirements, e.g. for briefing the media
- the challenges in using the Emergency Management Information System (EMIS) systematically, both for those contributors to ECC that did not use EMIS regularly and because of its limited functionality (more a keeper of the record than enabling the building of a comprehensive operating picture). The limitations of EMIS were noted in the Ministerial Review of Responses, one of the actions from which is for MCDEM to lead development of a system that will enable a common operating picture
- some of AEM's partners had concerns about the process through which the SitReps were put together, including the decision-making as to the content and, sometimes, the ways in which information they had provided was used or not used.

5.3 Public communication and engagement

ECC's Public Information and Management (PIM) function draws on designated people from Auckland Council's communications team. In responses, a PIM team sets up adjacent to the ECC and is directed by the Controller.

Interviewees were positive about the work of the PIM team in supporting the Controller in his extensive engagement with media, in supporting the broader ECC team, in working with partner agencies, in engaging with the media more generally, in communicating with the public and in utilising a range of communication methods including social media.

The PIM team played an important part in the rapid development and distribution of material on such things as how to manage in the event of a sustained power outage (e.g. in relation to food that might be contaminated), where to go for support, and the location, extended opening hours and services available (such as free hot showers and mobile phone recharging) at designated council facilities.

Feedback suggested that the team operated in a structured way, including in rostering, which may in part reflect the fact that team members had extensive experience in working together in pressurised circumstances.

5.4 Coordinating Executives Group (CEG)

- CEG did not meet during the response. A number of interviewees questioned whether at least one meeting might have added value, including:
- for the Controller, to get feedback on the status of the response and to test any key upcoming judgements
- for partner agencies, to raise any concerns about the response (including in relation to role clarity) and to check at a senior level that they are contributing optimally.

5.5 ACDEM: recommendations

1. Continue to invest in the building and maintenance of constructive relationships amongst ACDEM members, at both operational and governance levels
2. Agree a common approach amongst ACDEM members for use of the Coordinated Incident Management System (CIMS) methodology as the basis for planning for response and implement each of the structured elements of CIMS in any major response
3. Continue to participate in standard nationwide CDEM approaches (normally MCDEM-led), including in relation to any review of CIMS and to professional development
4. Review the call centre, website and app capacity for the front-line response agencies and explore any opportunities to enhance interoperability that would enable load-sharing at peak times following a major hazard event
5. If practicable, work with Met Service and others to develop heuristics to anticipate the nature and extent of damage for a predicted storm, to inform a Standard Operating Procedure on initial response settings

6. Review the approach taken in the lead-up (where possible) and immediate aftermath of a major hazard event to the mobilisation of the Emergency Coordination Centre (ECC), erring (within reason) on the side of cross-ACDEM mobilisation unless and until it becomes clear this would be overkill
7. Review recruitment processes to test, to the extent practicable, that those recruited into critical post-event response positions are able to work effectively under what are likely to be highly-pressurised conditions, while recognising that complementary capabilities will be needed in 'peacetime' to build the necessary relationships, systems and processes
8. Continue to take opportunities to second ACDEM staff to responses in other parts of New Zealand, both to provide support and as a valuable means of professional development
9. Actively support the MCDEM-led work to develop the systems capability to enable the rapid building of a Common Operating Picture following an event, and work with partners to ensure all key contributors are using the same system, and agree and commit to a shared approach to using EMIS in the meantime
10. Review the resources available for major responses(both core AEM staff and ACES), with a view to ensuring that:
 - a. the Controller(s) is able to focus on leadership of the response, including a structured implementation of the CIMS model
 - b. each of the critical functions within the ECC has sufficient support, and alternates to enable 24/7 rostering as required
 - c. ACES will be available when required, including in events more significant than the 10 April storm
11. Review the arrangements for supporting staff welfare during a major response, including to ensure that all ECC staff are covered, and that such things as quiet spaces have been designated
12. Consider a potential role for Coordinating Executives Group (CEG) in response, including the possibility of convening at least one CEG meeting early in any major response, to support the Controller in a real-time review of the response to date, and to ensure that all ACDEM organisations are engaged as appropriate, with shared clarity as to roles and responsibilities.

6 Lifelines/utilities

The Lifeline Utilities Coordination function was stood-up on the morning of Wednesday, 11 April.

The extent and duration of power outages in Auckland and the resultant impact on the health and well-being of some of those impacted was the main consequence of the storm.

6.1 Context for power outages

Electricity customers in the Auckland region are physically supplied by two main electricity distributors. Vector supplies around 550,000 and Counties Power around 40,000 customers.

The structure and regulation of the electricity industry involves a number of parties.

Generators produce electricity at power stations around the country.

The Transpower-owned transmission system transmits the power from these power stations at high voltages to distribution networks and to a small number of large industrial customers.

Distribution networks take power from the transmission system and distribute it, via progressively lower voltages, to individual industrial, commercial and residential premises. Some small-scale generation connects into distribution networks.

Retailers have contractual relationships with customers: purchasing generation, paying for transmission, distribution and meter information on consumption and charging the customer sufficient to cover all these costs plus a profit margin.

The main generators are also large-scale retailers. A number of smaller retailers sell electricity without owning generation.

Metering is a separate business. Modern meters are 'smart', including in taking half-hourly readings and being able to be read remotely.

On Vector's network, as across much of New Zealand, there are two main meter companies, one of which is a non-regulated Vector business. Vector maintains a strict separation between its regulated and non-regulated businesses. Counties Power owns the vast majority of the meters on its network.

6.2 The 10 April storm event

Following receipt of Met Service forecasts of high winds, Vector and Counties Power put their contractors on standby.

Vector noted that the most severe wind speeds recorded were higher than forecast, in addition to being from the south-west, which is unusual.

Tree-related damage was the primary impact of the storm on the two distribution networks. Vector noted that none of its lines failed, other than as a consequence of trees.

The damage was widespread, impacting on both the high and low voltage elements of the two networks. In fifteen minutes after 9pm on 10 April, Vector recorded 180 faults on its high voltage lines, significantly more than in previous storm events.

As a result of the widespread power outages, Vector's app and website both crashed, meaning that customers did not have access to their normal source of information on network outages and likely restoration times and that Vector did not have its normal means of communicating with customers.

As the storm abated, both companies and their contractors commenced the process of fixing faults, prioritising high voltage assets (which enable supply to multiple customers) first. Some faults on lower voltage lines can only be detected once the power is flowing at the higher voltages.

6.3 Access to information on which households were without power

One of the complications in the storm response was that, on its network, Vector did not have access to good information that would enable it to tell on any given day (or at any given point in time), which customers were without power.

Vector relies on customers making contact via its app and call centre to identify households without power (as has been common practice in the industry historically). This did not work well for the period in which both the app and the call centre were overloaded.

Cell phone unavailability as a consequence of the interruptions to electricity supply complicated the reporting of power outages for some customers.

The absence of access to household-level data on power outages impacted both on prioritisation of Vector's restoration of its lower voltage networks and on the targeting of CDEM support for households and individuals that were, or became, vulnerable as a result of the outages.

This was an avoidable hindrance to the response in the Vector network area. In contrast, Counties Power was able to draw on real-time information from household electricity meters to identify areas without power, which facilitated better coordination and prioritisation of resources during response.

Modern 'smart' meters can remotely provide information on whether or not power is on at a particular premise. This can be either by 'pinging' the meter electronically at any time (to check if power is on or off), or via 'last gasp' data, which indicates that a meter has lost power supply. Almost all the meters in the Auckland region are 'smart', although their functionality varies with model and with age, and with investment in the associated IT systems.

Metering is an unregulated activity. Retailers typically enter into commercial arrangements with meter owners that give the retailers exclusive access to half-hourly consumption data for individual customers. Retailers are required to make consumption data available to consumers on request, but are cautious about providing such data to potential competitors (for example in relation to solar panels or batteries).

Some anonymised and aggregated half-hourly information is generally made available by retailers to distributors to assist with network planning, but this is not real-time information and does not assist operational response during an outage event.

Notwithstanding limitations around access to half-hourly consumption data, distributors are able to negotiate commercial arrangements with meter companies to receive information on whether power is on or off for a customer at any point in time or on any given day. There may be some additional cost in ensuring that the data is provided in a form that is readily useable by the distributor.

ACDEM and the two distribution companies would need to work together to ensure that meter data could be integrated with GIS maps to match meters to premises.

6.4 Speed of restoration given the extent of damage

The majority of the power outages occurred on the night of Tuesday, 10 April. Subsequent bad weather contributed to some additional outages. A low level of outages occurs in normal circumstances, and remained the case through the period of the response.

Counties Power completed its storm response on 18 April. Vector advised its storm response ended on 21 April.

Given the nature of the storm event, the main resources critical to restoration for Vector and for Counties Power included:

- accurate information on where power was out
- capacity, particularly of suitably trained/ qualified arborists, to deal with trees that had caused damage to power lines (Auckland Council and Auckland Transport also needed arborist resource to deal with trees obstructing roads and other public land and/or were safety risks)
- line crews to undertake the necessary repair work on the networks.

Working on damaged trees and power lines in bad weather is dangerous. Health and safety considerations limited the resource that the various entities involved in power restoration could access.

Standalone generators were a constrained resource that was important to reduce the impact of the outages on vulnerable people.

Both Vector and Counties Power drew on resource from contractors and from other distributors.

The two distributors, Auckland Council and Auckland Transport, shared arborist resource where practicable.

Reaching an objective view on whether the electricity distributors restored power as quickly as was possible, given the full set of circumstances at the time, is difficult, but it is clear that both companies were very committed to timely restoration.

Having said that, most interviewees who expressed a view felt that the extent and duration of the outages, given the likely increase in frequency and intensity of storms in Auckland, was not acceptable, nor were the information gaps that hindered the targeting of support to those impacted by the outages, including information on where crews were working.

6.5 Options to enhance network resilience

The following paragraphs address options to enhance the resilience of the electricity networks to future storm events. Each has a range of costs and benefits, and involves potentially contentious choices.

6.5.1 Trees

The Auckland climate contributes to relatively rapid growth in trees, which can mean they are less strong (for a given height) than in slower-growth environments.

Other things being equal, the impact of storms on electricity networks would be reduced to the extent that:

- trees were at greater distances from power lines, and
- for trees that are within range of power lines, at-risk trees or branches were proactively removed.

Many of the trees that damaged power lines were on Council land. Some trees pre-date nearby power lines.

Storm-damaged trees are an ongoing risk to power supply and to the safety of life and of property.

Some environmental groups in Auckland are 'pro-tree', advocating for more trees, which would increase the associated power supply and safety risks.

Trees on private land are the responsibility of the landowner. Vector and Counties both noted that awareness of this amongst landowners was limited.

6.5.2 Tree regulations

The electricity distributors have raised with Ministry of Business, Innovation and Employment (MBIE) the desirability of reviewing and strengthening regulations that relate to trees within range of power lines.

The regulations were developed and promulgated in the mid-2000s. The regulations specify a growth limit zone within which trees must not encroach.

Both distribution companies noted that the regulations did not address risks to power lines from trees that are outside this zone. For example, a tree could be some distance from a power line but still damage the power line were the tree to fall.

MBIE has responsibility for the relevant legislation and, in light of the concerns expressed by distribution companies, is intending to undertake a review of the tree regulations in 2019, subject to other government priorities.

6.5.3 Investing to strengthen network assets

Commerce Commission data shows that 55% of the Vector and 28% of the Counties Power networks are underground with the balance above ground. The comparable figures for Wellington and Christchurch are 63% and 52% respectively (comparisons are of limited value given differences in such things as history, density of population, topography and geology).

Undergrounding of lines improves visual appearance and some dimensions of network resilience. Underground lines are not vulnerable to wind events, although they can be more vulnerable than overhead lines to floods and earthquakes. Faults on underground lines generally take longer to locate and repair.

Restoration following major disasters, such as the Christchurch earthquakes, is likely to be more rapid for overhead lines.

The Auckland Council Unitary Plan requires that power distribution to new developments is undergrounded.

Because they are monopolies, most electricity distribution networks (including Vector) are subject to price and quality (e.g. network availability) regulation by the Commerce Commission. 'Consumer-owned' distribution companies, including Counties Power, are subject to lighter regulation, in the form of information disclosure, including of network performance. The Commission also reviews distributors' long-term asset management plans.

The system is designed to allow regulated distributors a return on capital that is just high enough to ensure that they are incentivised to invest in necessary new assets. The price control generally requires distributors to reduce prices by a small percentage per annum (reflecting scope for ongoing efficiency improvements).

Distributors that believe they need to invest, for the benefit of their customers, at a level higher than is possible under the default price regulation are able to apply to the Commission for a customised price path (a process that requires the distributor to engage with and seek support from its customers). Orion did this to enable reinvestment following the Christchurch earthquakes.

Decisions on the level of investment in undergrounding are for the distributor's board (on behalf of the owners).

Vector noted that:

- undergrounding of existing assets can be of the order of 10 times the cost of the existing above-ground lines, involve significant disruption in built-up urban areas, and result in early obsolescence (with associated financial implications) for the existing assets, an outcome that is unlikely to be palatable to their customers
- the longest storm-related outages were in the more rural (low density) parts of the network, where the economics of undergrounding are particularly difficult to justify
- network resilience can be improved through reducing the risk caused by trees (discussed above) and considering such things as use of steel rather than concrete poles (the former having more flexibility) and shorter line spans.

Council could potentially use Unitary Plan revisions as one forum through which to consider the optimal future path for electricity distribution as an integral element in the development and resilience of the Auckland region, although the complexity of the plan-making process and the need to balance a range of often-conflicting views on most issues might limit the effectiveness of this option.

6.6 Other Lifelines/utilities

By comparison with electricity, the impacts on the other lifeline sectors was much more modest, and mainly a consequence of the power outages. In each sector, normal service was restored within a small number of days after the event, apart from a tail of issues that were not resolved until the power was reconnected.

6.6.1 Transport

Auckland Transport leads the transport-related elements of response to natural hazard events in Auckland, primarily through the Auckland Transport Operations Centre (ATOC).

ATOC received the same weather forecasts as AEM, and planned accordingly. ATOC liaised with police, AEM and other partners on the decision as to whether to close the harbour bridge pre-storm (the decision was to leave the bridge open, but with restricted traffic flows). Ferry and rail services were temporarily suspended.

If ECC is activated, ATOC puts a person into the centre, to support coordinated response.

Floods and slips can cause more problems to the transport system than strong winds. The 10 April storm had relatively little rainfall as compared to a number of other recent storms.

The main transport consequences of the storm were the combination of roads blocked by fallen trees and power outages impacting on traffic signals.

ATOC deployed its standby generators to enable continued signal operation at key intersections. The temporary unavailability of the Vector website reduced the information available to ATOC to inform response to the elements of the transport system impacted by the power outages. Direct communication with Vector was limited because of the pressure Vector was under.

ATOC worked with other agencies, notably Vector, Counties Power and Council's Community Facilities team, to progressively deal with the impact of fallen trees. Interviewees noted that coordination of crews working on tree removal and electricity restoration worked reasonably well. ATOC provided support to Vector in sourcing equipment where possible.

6.6.2 Telecommunications

The main impacts of the storm for telecommunications were through the power outages, which caused some infrastructure unavailability (mobile towers, parts of the Chorus network) and limited the ability of impacted communities to communicate via mobile phones as batteries could not readily be recharged.

Some interviewees noted the increased vulnerability of mobile and fibre networks relative to copper landlines in the event of power outages. Copper landlines are likely to further reduce as a proportion of the overall telecommunications system in the years to come, suggesting that some form of battery backup or alternative means of phone recharging may become increasingly important for household resilience to multi-day power outages.

The telecommunications companies deployed their limited generator capacity at key sites.

Services were progressively reinstated as power supplies were restored.

Auckland Council extended opening hours for community facilities to, amongst other things, provide a place at which mobile phones could be recharged.

6.6.3 Water

As noted above, the 10 April storm brought relatively little in the way of heavy rainfall and flooding. The impacts on the three waters - potable water, wastewater and storm water - were mainly as a result of the electricity outages, particularly for those parts of private networks (generally in rural areas) that required power for operations such as pumping.

The Watercare system generally maintained operation.

Providing support to those impacted, pending restoration of power supplies, was a priority for the welfare response (discussed below).

6.6.4 Interdependence between lifelines/utilities

The 10 April storm highlighted the interdependencies amongst lifelines, in this case the impact of power outages on other lifeline systems.

ECC's Lifelines Utilities Coordinator recognised this interdependence, which was a focus of coordination activities.

6.7 Lifelines/utilities: recommendations

The following learnings/recommendations are for ACDEM, and focus on the relationship with Vector and Counties, rather than being recommendations relating to the roles and responsibilities of central government departments, regulators or the broader electricity industry.

Many of the following are already underway in one forum or another.

1. Seek assurance from Vector and Counties Power that their call centres and online apps have the capacity to cope with exceptional loads in the aftermath of major natural hazard (and other power outage) events and agree to resource sharing arrangements where appropriate
2. Seek confirmation from Vector and Counties Power that they each have access to as close to real-time data as the available meter technology and related IT systems make possible, on whether power is on or off at the household level
 - a. If this does not prove possible, engage with MCDEM and, indirectly, with MBIE and the Electricity Authority, to remove any barrier to this information sharing, through regulation as a last resort
3. Work with Vector and Counties Power to build information systems that enable power outage data to be overlaid on ACDEM maps of Auckland suburbs
4. Work with Vector and Counties Power to agree roles, responsibilities and a plan for managing tree-related risks to power lines
5. Support the electricity industry's requested review by MBIE of the regulations governing trees that are a potential threat to power lines, and contribute to such a review to ensure that the trade-offs as they relate to the Auckland region are fully understood
6. Engage with Vector and Counties Power on plans to strengthen network resilience to natural hazard events, including the extent of undergrounding of existing lines in urban areas
 - a. If appropriate, support Vector in engaging with the Commerce Commission and its customers on a Customised Price Path, which would enable more and faster expenditure on undergrounding (with higher prices to customers as a result)
7. Agree with Vector and Counties Power (and, through the distributors, with the electricity retailers) arrangements for resource sharing in the aftermath of major natural hazard events, including in relation to arborists, contractors and in accessing standby generators.

7 Implementing the Welfare Response

The objective of welfare response in the CDEM context is to carry out activities across all the dimensions of resilience (reduction, readiness, response and recovery) to:

- provide for the needs of people affected by an emergency, and

- minimise the consequences of emergencies for individuals, families and whānau, and communities.

The starting point is to build resilience within communities, families and whānau, as the most effective way to enhance overall resilience and recognising the reality that in a major event help may be some time in coming.

CDEM is not resourced for major welfare-related deployments across the region; only the most critical issues are likely to be prioritised in the aftermath of a major natural hazard event.

A number of interviewees commented on some of the recent trends in Auckland's demographics, which, overall, have probably reduced resilience within communities, including:

- major new housing developments in hitherto semi-rural areas, that typically have infrastructure that is more vulnerable than in higher-density urban communities
- an increasing proportion of people moving from urban to semi-rural areas without necessarily having the self-reliance of people who grew up in a rural environment
- more people living longer, with an increasing number living alone, including in relatively remote communities
- the increasingly diverse nature of Auckland's population, including a growing number for whom English is not their first language and, sometimes, with different patterns of connectivity within and between sub-communities
- rapid population growth, for example in the south and north-east of Auckland, putting significant pressure on hard and soft infrastructure capacity, including across the health system.

Identifying, understanding and then addressing the implications of these and other trends will be an important element in the reduction and readiness elements of the 4 R's, as well as informing planning for future responses.

7.1 Welfare response implications of the 10 April storm

The immediate aftermath of the 10 April storm did not create major welfare issues. The consequences of fallen trees were the main initial impact.

Welfare concerns became more acute as the widespread power outages continued longer than anticipated, with adverse consequences for a range of those impacted, including:

- people reliant on power for medical support
- people reliant on daily access to medication (such as methadone) from pharmacies, given a number of pharmacies were impacted by the power outages
- households which were vulnerable to various health and well-being risks as the result of a combination of absence of power and hot water in conjunction with cold weather
- some rural/remote communities that relied on power to operate private wastewater systems (in addition to the other consequences of power being out).

The building of a picture of which households were without power at any point in time was complicated by:

- the close-to-real-time metering data limitations on Vector's network
- the ongoing bad weather, which meant that some households were reconnected and then lost power again
- the impact of the power outages on some parts of the mobile network and on the availability of mobile phones.

The Auckland Welfare Coordinating Group (AWCG) was mobilised on the morning of 11 April, involving the main welfare agencies, including the health cluster and Ministry of Social Development.

As noted above, ACDEM members were not formally advised that ECC had been activated, and so some (including FENZ) did not initially have a representative in ECC, including as a source of intelligence on emerging welfare needs.

The main elements of the response included:

- building and monitoring a picture of who was in need, focusing on those areas most impacted by the power outages
- putting in place appropriate support, including:
 - making contact with the known or potentially vulnerable and offering appropriate support
 - distribution of portaloos, potable water, food and, in a few cases, emergency generators
 - changing normal practices as appropriate, e.g. not sending people home from hospital if their homes had no power
 - extending opening hours of libraries and leisure centres to provide warmth, power and hot drinks
- Operation Connect: an extensive door-knocking exercise, as a result of ongoing concern that some vulnerable people had still not been identified, and as one means of making practical support (e.g. potable water) readily available.

Feedback from interviewees included the following themes:

- generally, the welfare response worked well:
 - AWCG worked broadly as planned, and was able to leverage good pre-existing relationships and shared understandings
 - practical support (such as portaloos and potable water) was procured and distributed as required (some portaloos had to be made more secure subsequently, because of forecast strong winds and resultant safety risks)
- some sources of intelligence may not have been accessed as systematically as they might have

- some medically-dependent individuals and some providers of medical services did not have contingency plans for power outages, putting increased pressure on the core health system
- the welfare response was considerably complicated by the ongoing (although reducing) uncertainty about the location and likely duration of power outages, and hence on which households were or could become vulnerable
- there was some lack of clarity around accountability for support for some people, for example as between the electricity companies, AEM or health providers in relation to medically-dependent customers impacted by the outages.

7.1.1 Operation Connect

Operation Connect was an operational exercise to collect data on vulnerable people affected by the power outage, by means of door-to-door enquiry. Feedback from interviewees indicated that:

- ACDEM did not have a plan/procedure to underpin a community outreach programme and so had to develop one from scratch
- people in door-knocked houses generally appreciated the contact; some additional needs were identified and addressed. Feedback from the relevant communities was positive
- the decision-making and planning (including the targeting) in relation to Connect was not ideal. The relatively late decision (as expectations around the timeliness of power restoration changed) and very late requesting of (non-AEM) Council staff to participate limited the number who received or who were able to respond to the request, and the same was true for partner agencies
- given the lack of time for planning and preparation, the effort on the ground was exceptional. A number of interviewees noted the performance of the Police team in organising Connect and, with the AEM Welfare team, ensuring that field staff were properly briefed (where to go, what questions to ask etc.)
- the opportunity cost of the resource deployed was significant, for example in temporarily diverting police from their normal duties.

7.2 Volunteers and community-led response

A number of local board members expressed concern about the availability of information and support specific to their local communities. Some drew a comparison with what they perceived to be stronger CDEM presence in local communities pre-council amalgamations, and commented on the gap created by the move of rural fire stations from Auckland Council to FENZ.

Volunteers in the April storm included Council-trained staff working in the ECC, volunteers working in Operation Connect from across the CDEM agencies, and trained response teams used to support Council operational activities such as delivery of water supplies. The role of volunteers in supporting the welfare response was raised by a number of interviewees. Comments included:

- the formal contribution of Council-trained volunteers (ACES) was limited. The main purpose in training ACES is to be ready to do shifts in ECC during a response, rather than as an integral part of any deployment in support of distressed communities

- a lack of clarity around the possible role and tasking of formal volunteer groups (including FENZ, search and rescue). The strengthening in recent years of health and safety requirements in relation to volunteers has required a more professional approach than may have been the case in the past
- so-called 'spontaneous volunteers' such as the student army that formed following the Christchurch earthquakes did not eventuate following the Auckland storm but should be part of planning for possible future responses to major hazard events.

7.3 Implementing the welfare response: recommendations

1. Continue to enhance the comprehensiveness of intelligence gathering and organising. The ideal might be:
 - a. one source of information for each household that meets specified criteria (e.g. an occupant relies on electrical devices for health-support, people with special needs, old people that live alone)
 - b. to the extent practicable, GIS information on vulnerable or potentially vulnerable households that can be mapped against infrastructure availability, particularly power supply
 - c. systematically utilising community-embedded networks such as district nurses, police, rural fire teams, local community leaders to identify communities and individual households that are or could become vulnerable
 - d. agency information systems that can be integrated more than is the case at present. This will always be challenging, but the MCDEM-led work to develop the capability to build a Common Operating Picture represents an opportunity
2. Clarity of accountability across the members of Auckland Welfare Coordinating Group (AWCG) and utility providers for:
 - a. working with vulnerable or potentially vulnerable households to help them develop their own contingency plans, including such things as: people on whom they can rely for support, backup power sources
 - b. providing support to vulnerable households/individuals in the aftermath of an event
3. Review the status of the ongoing work to build community self-resilience, assess whether sufficient progress is being made and, if not, what additional action is required
4. Decide whether a community outreach programme such as Operation Connect should be part of future preparedness and, if so, develop and socialise at least the framework, accountabilities and potential resource requirements (recognising that the specifics could vary considerably from one response to another)
5. Work with Fire and Emergency New Zealand (FENZ) to ensure a shared understanding of how most effectively to deploy FENZ full capability - both urban and rural - in the welfare element of future responses

6. Continue to support local boards to play an appropriate part in future responses, including clarity of role, access to supporting resources and means of working effectively with Auckland Emergency Management (AEM), including in relation to volunteers
7. AEM to lead and coordinate an approach to the development and potential deployment of the various categories of volunteer group.

8 Concluding comments

8.1 What if the 10 April event had been more significant?

The 10 April storm was characterised by unusually severe winds, but little in the way of heavy rainfall or flooding.

The Resilient Auckland CDEM Plan identifies a super storm as an event that could plausibly hit the Auckland region, and for which a response would be required.

Working through the possible additional challenges that Auckland's CDEM and local communities would face in responding to a super storm as compared to the 10 April storm is one source of important learning.

Additional challenges in a bigger storm could include: much greater damage to transport and water infrastructure, isolated communities and limited ability to communicate because of the impact of power outages and flooding on telecommunications networks. More individuals across the CDEM agencies would likely be personally affected.

The pressures that emerged in the response to the 10 April storm highlight the importance of using the resultant insights to help inform the planning for and practising of the response to potentially larger storms that, for example, combine very strong winds and heavy rainfall.

8.2 Effectiveness of response: overall assessment

Every major emergency event is different in its impacts; assessment against an objective standard is difficult.

The Auckland CDEM Group led a response that enabled a return to normality for the vast majority of those impacted within two weeks or so, with a set of residual issues that required longer to resolve (including dealing with all the post-storm debris).

The extent, duration and consequence of the power outages turned out to be much greater than initially anticipated and, in the view of many, was unacceptable given the scale of the event and the likely frequency of events of similar scale in the future.

This review has identified many areas of the response that went well and a range of aspects where further enhancements appear both necessary and achievable. The set-up and operation of the ACDEM response, the issues relating to the electricity system and the challenge of supporting local communities to build greater self-resilience should be primary areas of focus.

The Auckland CDEM community is well placed to address these challenges and opportunities, drawing on the existing base of resources, relationships and of people - both the CDEM professionals and the many others who step-up and contribute in times of crisis.

Annex 1: Terms of Reference for the Review

Project Brief	
Project title	10 April 2018 Auckland Storm Event Independent Review
Sponsor	Stephen Town, Chair of Auckland Civil Defence Emergency Management (CDEM) Coordinating Executive Group (CEG)
Owner	Auckland CDEM Coordinating Executive Group (CEG)
Project manager(s)	Koro Dickinson, Executive Officer – Auckland Council

Background

The 10 April 2018 storm event in Auckland resulted in the most widespread power outage event in New Zealand history with almost one third of households in the Auckland region (approximately 560,000 Aucklanders) affected. The response to this event saw the largest welfare exercise undertaken in Auckland and the most significant in New Zealand since the 2011 Christchurch earthquake.

Considering the unprecedented scale of this event it would be useful to confirm the outcomes – this includes risks, welfare needs, outreach, communications and overall effectiveness.

The Auckland CDEM Coordinating Executive Group - in its statutory role supporting the Auckland CDEM Group Committee and in providing leadership/coordination across a range of agencies/organisations working in the CDEM sector - has agreed to commission an independent review of the Auckland CDEM Group response to the 10 April storm event and subsequent power and hot water outages¹.

Purpose

The Auckland CDEM Coordinating Executive Group seeks to understand successes and areas for improvement arising out of the response by the Auckland CDEM Group to the 10 April 2018 Auckland storm event. The CEG also seeks to identify steps that could be taken to ensure that risk is minimised/mitigated for events of a similar or greater magnitude/impact in the future.

Scope

The scope of this independent review will cover the response to the storm event from the Auckland CDEM Group and will provide:

- A description of the 10 April 2018 Auckland storm event and its impacts and scale.

¹ This was endorsed at the 3 May 2018 meeting of the Auckland CDEM Coordinating Executive Group.

- A description, timeline and summary of the Auckland CDEM Group response to the storm event.
- A summary of the legislative and other responsibilities of those CEG agencies and lifeline utilities in the response to the event, and identification of gaps. A description of those actions undertaken by those CEG agencies and lifeline utilities involved in the response to the event.
- A summary of communications and engagement with the public during the storm response by the Auckland CDEM Group and lifeline utilities.
- A summary of the actions of the Auckland Emergency Management Emergency Coordination Centre in leading and mobilising the support of the wider Auckland Council organisation in responding to community needs.
- An assessment, based on documentation and interviews and a consideration of debrief materials and action plans, of the overall effectiveness of the Auckland CDEM Group response to the storm event.
- The effectiveness of the Auckland CDEM Group in obtaining and sharing situational awareness.
- The effectiveness of relationships with key stakeholders including lifeline utilities (and other infrastructure providers) and how that informed the response
- Recommended actions to be undertaken in Auckland and considered nationally to ensure that risk is minimised/mitigated for events of similar or greater magnitude/impact in the future².

Process

Subject to the purpose and scope of this Project Brief the independent reviewer will determine his/her own procedure for undertaking the review. That said, the sponsor expects that the reviewer will adopt the following general process:

- A fact-finding stage (which may include interviews, reviewing records, and site inspections).
- Analysis of information gathered.
- Preparation of a draft report (consistent with the scope of this Project Brief) with related CDEM sector maturity matrix or similar for the review of the sponsor.
- Feedback on the draft report by members of the Auckland CDEM Coordinating Executive Group.
- Preparation of a final report for delivery to the sponsor.

² The Auckland CDEM Coordinating Executive Group recognises that some of the recommended actions may not fall within the remit or responsibilities of the CEG and its member agencies and organisations. The engagement and input of those agencies and organisations, including lifeline utilities (providers and retailers), will be encouraged throughout the process of this independent review.

It is expected that the final report will be considered and agreed by the Auckland CDEM Coordinating Executive Group and recommended to the Auckland CDEM Group Committee for adoption of its recommendations.

Deliverables

- Communications plan – working with the sponsor, the independent review lead will determine the best way to communicate the learnings from the review and to achieve its purpose.
- Draft and final reports outlining both learnings and recommendations – this includes coverage of issues, which are systemic in nature and can be applied to future events.
- Presentation to the CEG of the report's learnings and recommendations.

Review team

The review is to be conducted under an Auckland Council contract. Secretariat and project management support will be provided to the review team by Auckland Council. The cost of conducting the review will be met by Auckland Council.

The final report is to be provided to the sponsor no later than 22 October 2018 for consideration by the Auckland CDEM Coordinating Executive Group at its meeting on 5 November 2018.

Annex 2: List of interviewees

1 August	Ben Hankinson - Head of Emergency Management Operations / Auckland Council
	Petrus Nel - Emergency Response Coordinator / Auckland Council
	Adam Maggs - Head of Competency and Public Readiness / Auckland Council
	Sarah Sinclair – Chief Engineer / Auckland Council
	Matthew Bramhall - Emergency Response Coordinator / Auckland Council
2 August	Jennifer Rose - Head of Recovery / Auckland Council
	Councillor Sharon Stewart Councillor John Watson Councillor Wayne Walker
	Ministry of Civil Defence and Emergency Management John Titmus Suzanne Vowles
	Craig Glover - Head of Strategy and Planning / Auckland Council
13 August	NZ Police Karyn Malthus
	Dean Kimpton - Chief Operating Officer / Auckland Council
14 August	Craig Mcilroy - General Manager Healthy Waters / Auckland Council Jayesh Solanki - Lifecycle Planning Team Manager / A
	St John Graham Ferguson - St John Emergency Management Advisor for St John Auckland District Operations Manager and CEG member
	Rod Sheridan - General Manager Community Facilities / Auckland Council Agnes McCormack - Head of Operational Management & Maintenance / Auckland Council
	NZ Defence Force Benny Austin
	Auckland Transport Operation Centre Claire Howard - Operations Manager
	Waitemata DHB Jocelyn Peach - Heath CEG representative

15 August	Catherine Cooper - Head of Resilience and Welfare / Auckland Council
	John Dragicevich – Director Auckland Emergency Management / Auckland Council
	Jo Davidson - Manager Corporate Communication / Auckland Council
	Counties Power Geoff Douch Adrian Nadan
	Vector Nicolas Albrecht Andre Botha
20 August	Local Board Regional/Sub-Regional Cluster Workshop – Manukau
	Ministry of Social Development John Cavanagh
	Local Board Regional/Sub-Regional Cluster Workshop – Central
29 August	Fire and Emergency NZ Kerry Gregory – Fire Region Manager

Annex 3: Overview and timeline of 10 April storm

A detailed timeline is attached to this report. The following is a summary of how the storm and its aftermath unfolded, and key steps taken by AEM and partners in the response. The summary is unavoidably selective, and should not be read as a complete and balanced reflection of the detailed timeline.

Monday, 9 April – Tuesday, 10 April

Met Service issued a severe gale warning on the evening of Monday, 9 April for the following evening. The forecast was updated on Tuesday morning (high risk of thunderstorms, then severe/damaging gales). The winds were forecast to be from the west to south-west, not the predominant wind direction for storms impacting on Auckland (which complicated the prediction of potential impacts).

AEM and partner agencies monitored these weather warnings and took preparatory action such as putting contractors on standby and preparing public communications. AEM alerted internal and external stakeholders.

The severe winds duly arrived and at 2100 on 10 April, FENZ activated its Multiple Incidents Procedure, and advised AEM accordingly.

AEM monitored the developing situation, and sought information on call volumes to FENZ and to Council. By 2150, 1400 calls had been answered, most relating to fallen trees and powerlines, with 89 requests for service logged for downed trees (which increased to 128 calls by midnight).

The Controller decided to operate with a 'virtual ECC', comprising the Controller, Duty Officer and PIM.

PIM duty manager received the first media contact at 2205, querying effects of the storm. AEM assessment at that stage was that emergency services had call outs under control, there were no significant call volumes coming in to Auckland Council's contact centre, and Met Service forecasts were not changing. PIM initiated social media and AEM continued to monitor.

At 2300, FENZ sought assistance from Auckland Council's call centre, because of the volume of calls.

At 2310, AEM contacted ATOC and was advised that all rail and ferry services had been suspended.

At 2352, AEM retweeted a Vector tweet on the severe winds causing widespread outages and that Vector was aware of difficulties reporting outages via its app.

Wednesday, 11 April

At 0300 on 11 April, media reported significant power outages of the order of 50,000

The timeline states that the Controller decided to fully activate the ECC by 0730. This appears not to have happened in a formal way, with some partners stating they were unaware several days later that ECC had been activated (and so had not placed anyone into ECC).

The PIM team was established in the ECC at about 0700.

At 0815 the Lifeline Utilities Coordinator (LUC) sent an email to internal (to Council) partners (including water- and building-related), seeking an update on storm damage, the outcome of which was no known reports of damage.

[The Controller kept elected members and senior Council management informed of the unfolding situation at regular intervals].

AEM received the first ATOC situation report at 0817, reporting a number of road closures, power outages impacting on some traffic lights and train services, all ferries were operating, but some bus routes were impacted by road closures.

By 0822, FENZ had attended 902 incidents. Council had three arborist crews working overnight, with more contractors on the way.

At 0827 AEM received a media advisory from Vector on the estimated extent of power outages (110,000 homes and businesses) and the number that had been restored overnight (70,000). These early estimates understated the full extent of the impact. Counties Power provided an update on its network at 1059 (6331 properties without power).

At 0830, LUC decided to stand-up the LUC function in ECC and sought up-to-date information from the various lifeline providers.

AEM's Sitrep#1 was finalised at 0945, and covered the weather outlook, status of calls to FENZ and to Council, the work of Council's arborist crews, the estimated extent of power outages and the closure of 8 schools. The SitRep noted the absence of any social or health impacts to date, the absence of any reported telecommunications problems, minimal impacts on wastewater and no impacts on water supply.

This was the first of 21 AEM-issued SitReps, the last of which was on 24 April.

AEM forwarded SitRep#1 to MCDEM's Regional Emergency Management Advisers at 1002.

AEM issued Media Release #1 at 1020, coverage of which included storm clean-up, power outages and impacts on transport, council facilities and food safety.

On the Wednesday morning, AEM started to receive information from the telecommunications companies on the impact of power outages on their networks, and the status of backup power supplies.

AEM Welfare Function was activated at 1100. AWCG core group was contacted and liaised with throughout the day.

At 1119 Vector provided an update on the extent of damage to its network, the resource being deployed and additional resource being sourced, and noting that it might be several days until power was restored in some areas. On Wednesday afternoon, an update from Vector noted the difficulties customers were having in reporting problems via Vector's website and app, because of the large numbers affected. Vector also noted that it was urging impacted customers to develop their own contingency plans in the event that power was not restored by the evening.

At 1300 the Controller held a media stand-up at the Town Hall, following a number of media interviews. Media interest remained high throughout the response, reflecting the Auckland-base for

many media organisations and the size of the population potentially impacted. Servicing the media required a significant resource commitment from AEM and from the PIM team in particular.

At 1342, St John contacted LUC regarding medical patients on oxygen who needed power restored as a priority. The information was forwarded to Vector.

At 1500, Watercare updated AEM on the impact of the power outages on wastewater pumping station and the deployment of Watercare's generators in response.

By the Wednesday afternoon, it was becoming clear that the main impacts of the storm were on power supplies and the consequent implications for other lifeline providers and for the welfare of a subset of power consumers (most immediately those who relied on power supply for medical support).

Through Wednesday into Thursday and beyond, Vector and Counties Power worked to restore their networks, prioritising critical customers as much as possible. AEM priorities included coordinating across lifeline providers, identifying and addressing welfare needs and ongoing communication with the media and public.

As the duration of power outages became increasingly apparent, and given ongoing difficulties in identifying exactly which customers were still without power, and which were most vulnerable, AEM focused increasingly on the impact of the ongoing power outages, with remote communities (some of which required power to run private wastewater systems) and vulnerable customers being the main concerns.

Thursday, 12 April

AWCG was formally stood up at its 8am meeting.

On Thursday morning, AEM started to develop plans to procure and distribute portaloos, potable water and food. Distribution commenced on the Friday.

AEM's SitRep#5 at 1753 noted:

- the full mobilisation of the AEM Welfare Team to provide 24/7 support to affected members of the community
- updated estimates from Vector of 35,000 customers still without power and of plans for restoration
- calls to FENZ and to Council had tapered off
- latest information on telecommunications, transport and wastewater.

Media Release#5 at 1600 invited members of the public requiring portaloos or drinking water to call AEM. At around the same time:

- the Council contact centre started to receive welfare requests from members of the public
- AEM commenced development of key messaging and a welfare flyer containing advice on how to manage during power outages, and
- AEM commenced planning of a door-knocking exercise, to give more confidence that vulnerable members of Auckland's communities had been identified and supported.

An AEM public alerting email at 1800 noted that although much of Auckland was returning to business as usual, asked people to check on neighbours, warned of more bad weather and provided power outage tips.

Friday, 13 April

SitRep#6 at 1000 on 13 April noted an estimated 16,300 customers were still without power (15,000 Vector and 1,300 Counties Power).

Media Release#6 at 1215 included an update on power outages, urged people to check on friends and family, updated the weather outlook, provided power safety advice, portaloos and water availability, and noted that council libraries were open and council leisure facilities were offering a hot shower for free.

The timeline notes an AWCG meeting at 1200, which included discussion of the information requirements for an Action Plan.

At 1300, the timeline notes difficulties in accessing ACES for shifts in the ECC and for delivery of potable water to members of the public who had requested it.

Through the remainder of 13 April, AEM priorities included distributing the welfare flyer as widely as possible and planning for Operation Connect, the proposed door-knocking exercise. This latter included AEM's Welfare team working with the PIM, Strategy and GIS teams to generate data and mapping to support decision-making for Operation Connect.

At 1700, AEM completed Action Plan #1 (covering the next 3-5 days), which was sent to stakeholders at 1915.

At 1900, the Welfare team met with Land Search and Rescue (LandSAR) and NZ Police to plan Operation Connect.

At around 2100, emails were sent to ACES and to all Council employees requesting their participation in Operation Connect the following morning.

Saturday, 14 April

Operation Connect commenced, following briefings for the team leaders by Group Welfare and NZ Police, and interaction with Vector to ensure the most up-to-date information on where power was still out. A number of bases were established for each of the Connect teams, and as a point to which members of the public could come for information and drinking water.

At 0812 LUC requested that a Vector liaison person be installed in the ECC.

At 0900 a Vector advisory noted that poor weather on the previous night had seen some new trees come down and a substation had overloaded, which complicated the picture in relation to power outages.

At around 1200, following a needs assessment the day before, AEM and partners discussed whether extra welfare provision was required in Piha, given the ongoing power outages. Connect sent a door-knocking team (Police and NZDF staff) to Piha to get a clearer picture and to offer support.

At 1350 Vector proposed arranging community meetings at Piha, Riverhead, Bethels and Muriwai, given that repairs to the low voltage network would likely extend to the middle of the following week.

At 1319 AEM was contacted by FENZ Waitemata Area regarding opening Bethells Beach, Piha and Karekare fire stations.

SitRep #09 at 1800 noted:

- 38 Auckland Council and 80 agency (Police, FENZ, SaR, NZDF and Red Cross) volunteers had assisted with Operation Connect
- as at 1730, AEM had delivered 19000L of water and 191 portable toilets
- Vector had 6400 customers still without power (with power restored to 96% of those who had lost power since 10 April)
- all traffic signals were now operating under mains power.

A meeting at 1800 between AEM and Vector discussed the issues constraining access to data availability for individual customers and how to work together to care for affected people.

Sunday, 15 April

Operation Connect continued, as did dialogue between AEM and Vector and Counties Power about the areas and properties still affected by outages and likely restoration times.

At 1000, Logistics finalised a plan for securing previously distributed portaloos, which were a potential hazard in expected high winds.

SitRep #11 at 2000 noted that Operation Connect had visited 5000 properties over the weekend and identified 41 urgent needs requirements.

From Monday, 16 April

Operation Connect continued for two more days.

Power restorations continued.

LUC worked with Vector and MCDEM, and attempted to contact electricity retailers to improve access to customer-specific data on power outages.

ECC continued in operation, with a progressive transition to business as usual.

An update from Vector on 17 April at 1656 showed 850 homes without power and 2000 without hot water.

On 18 April at 0830 AEM and MCDEM held an initial recovery meeting.

The 21st and final SitRep was issued at 1200 on Tuesday, 24 April.

Annex 4: What is welfare in emergencies

Welfare in emergency management is made up of emergency services, social and health services and non-government organisations. We work together to minimise and address the impacts of an emergency on individuals, whānau and communities.

The principles applying to emergency welfare services are to:

- recognise the diverse and dynamic nature of communities; and
- strengthen self-reliance as the foundation for individual and family and whānau and community resilience; and
- ensure that emergency welfare services address the specific welfare needs of individuals and families and whānau and communities; and
- ensure flexibility in the services provided and how they are best delivered; and integrate and align with local arrangements and existing welfare networks

Role of welfare function

The welfare function is part of AEM's CIMS structure.

The Welfare function is responsible for the overall coordination of welfare services in an emergency. This is delivered in partnership through the Auckland Welfare Coordination Group (AWCG).

The welfare function is based within the ECC but also support ACE and other council and AEM staff on the ground, such as in Civil Defence Centers and Welfare Centers

Role of the AWCG

The AWCG is charged with planning for and responding to emergencies, through developing a shared plan of action that can be followed in the event of an emergency.

Each of the AWCG core Group is tasked with delivering a sub function (diagram below)

AWCG agencies worked within the response, their role and subfunction

Health Coordinating Executive Group

Health has its own Coordinating Executive Group (Health CEG) this group is made up of all health services and is responsible for coordinating health related emergency management planning activities across Auckland, this is separate to their role in AWCG sub function of Psychosocial support.

The Health CEG priorities are:

- The continuation of essential health services
- The relief and treatment of people injured or in distress as a result of the emergency
- The avoidance or reduction of ongoing public or personal health risks to all those affected by the event.

Under the AWCG sub function Health is responsible for the delivery of Psychosocial Support to individuals and communities.

Agency	Subfunction	Commentary
Ministry of Social Development (lead Agency)	Financial Support	Provision of financial support to affected households and individuals Contribution to the April storm flyer
Health Representative of the AWCG	Psychosocial Support	This included District Health Boards St John Public Health Nurses Primary health Ministry of Health Contribution to the flyer Working directly with Welfare function, life line and vector to provide up to date information on vulnerable people
Red Cross (Support Agency)	Needs Assessment	On the ground needs assessment and area assessment before operation connect
Oranga Tamariki (Lead Agency)	Care and Protection of children and young people	Included Ministry of Education for first three days to inform in intel about schools and ECC closures
Salvation Army (Support Agency)	Needs assessment Household goods and services Direct support to individuals	Provision of warm food Direct support for individuals and follow up interactions based on needs assessment
Ministry for Primary Industries (lead agency)	Animals	To work across rural sector, rural support trust and federated farmers
New Zealand police (Lead Agency)	Inquiry	Provision of advice on intelligence to the AWCG and connection to the operation connect along with Welfare function
Auckland Emergency Management (Lead Agency)	Registration Needs Assessment Goods and Services	Coordination of activities across sub functions

Annex 5: Acronyms used in the report

ACDEM	Auckland Civil Defence and Emergency Management Group
ACES	Auckland Council Emergency Support
AEM	Auckland Emergency Management
AWCG	Auckland Welfare Coordination Group
CDEM	Civil Defence and Emergency Management Group
CIMS	Coordinated Incident Management System
CEG	Coordinating Executives Group
ECC	Emergency Coordination Centre
FENZ	Fire and Emergency New Zealand
MCDEM	Ministry of Civil Defence and Emergency Management
PIM	Public Information and Management