



New Zealand Lifelines

Lifelines are the essential infrastructure and services that support our communities. All systems of water, wastewater, stormwater, electricity, gas, petroleum, telecommunications, and transportation are included.

Introducing Lifelines

Lifeline Utility representatives collaborate across sectors and with leaders, scientists, emergency managers and others in regionally based Lifeline Groups. Objectives are to reduce infrastructure outage risks and minimise restoration time when outages occur.

Regional Lifeline Groups undertake projects to reduce vulnerabilities to regional scale events. The New Zealand Lifelines Council fosters inter-regional activity and provides links to Government agencies.

The Civil Defence Emergency Management (CDEM) Act requires individual Lifeline Utilities to establish planning and operational relationships with local Civil Defence (CDEM) Groups. Lifeline Utilities support the CDEM Groups by exchanging information about their risk management processes and their reduction, readiness, response and recovery arrangements. In regions, this flow of information is facilitated by participation in Lifeline Group activities.

In summary, the collaborative Lifelines process provides a framework to support the integration of asset management, risk management, inter-dependencies, health and safety, and emergency

management by utilities, and with communities. The emphasis is on pre-event reduction and readiness. Event operational roles remain the responsibility of individual utilities, sector coordinating entities (SCE's), and Government agencies.

NZ Lifelines Groups

- Northland Lifelines Group
- Auckland Lifelines Group
- Bay of Plenty Lifelines Group
- Waikato Lifeline Utilities Group
- Tairāwhiti Lifelines Group
- Manawatu-Wanganui Lifelines Advisory Group
- Hawke's Bay Engineering Lifelines Group
- Taranaki Lifelines Advisory Group
- Wairarapa Engineering Lifelines Association
- Wellington Lifeline Utilities Group
- Marlborough Engineering Lifelines Group
- Nelson-Tasman Engineering Lifelines Group
- West Coast Engineering Lifelines Group
- Canterbury Lifeline Utilities Group
- Otago Lifelines Group
- Southland Lifelines Group

Lifeline Group Activities

Lifelines Groups maintain relationships with regional Civil Defence Emergency Management (CDEM) Groups, with some having specific CDEM roles.

Membership of Lifelines Groups is voluntary. Funding is typically contributed by participating organisations and local authorities but usually only covers the cost of a co-ordinator/programme manager. Participating utilities make significant 'in-kind' contributions through involvement in Lifeline Group work programmes.

A Group priority is to identify key regional infrastructure vulnerabilities, often including a list of critical areas where many services may co-exist (e.g. bridges with other services attached). The documents that result typically include mitigation recommendations. When viewed collectively, mitigation recommendations are often seen to have greater benefits than individual asset owners would take into account.

Lifelines Groups are also involved in readiness activities with outputs including agreed priorities for disaster restoration (including priority routes), petroleum disruption planning and emergency communications arrangements.

While there has been a traditional emphasis on natural hazards, work encompasses all infrastructure service delivery risks. The overall outcome is a much greater understanding of regional vulnerabilities and interdependencies. Individual Utilities are encouraged to take these matters into account in developing their response plans and business cases for new investment.



ABOVE: FERRYMEAD BRIDGE, CHRISTCHURCH, UNDER REDEVELOPMENT. THIS PHOTO, TAKEN SOON AFTER THE FEBRUARY 2011 EARTHQUAKE, SHOWS EXTENSIVE RIVERBANK DAMAGE AND LIQUEFACTION IN THE AREA. CREDIT: H.A. CURRAN

The various outputs from a Lifelines Group provide valuable material for Emergency Managers at regional and local levels, enabling a better understanding of regional vulnerabilities. This facilitates risk communication with the community, including the business sector, in turn assisting their planning.

Utilities face strong commercial drivers to reduce outage risks. Additional benefits from continued Lifeline services accrue to the community at large.

Lifeline Utilities are encouraged to take the wider societal view into account when considering resilience enhancements.



ABOVE: NEW WATERMAIN UNDER CONSTRUCTION BENEATH MANGERE BRIDGE, AUCKLAND. COLLABORATION IS OFTEN REQUIRED BETWEEN DIFFERENT INFRASTRUCTURE OWNERS WHEN NEW CONSTRUCTION OR MAINTENANCE IS PLANNED. CREDIT: WATERCARE SERVICES LTD

Key Observations and Outcomes

Key observations from Lifelines projects and experience from New Zealand events include:

- Infrastructure services must be considered as systems of physical assets, controls and functions. One of many examples is domestic and international air travel where Airways New Zealand is a critical component to navigation in New Zealand's airspace.
- Many utility assets are highly vulnerable to natural hazards, particularly those located where ground deformation could occur or in floodplains.
- All utilities are now critically dependent on other utilities. Maintaining and restoring services to other utilities (and to their contractors and consultants) is therefore vital for broader community recovery.
- There are also vulnerabilities within individual utility organisations. For example, outsourcing key functions can add to service continuity challenges especially in emergencies.

A considerable range of mitigation and readiness improvements have been undertaken by individual Lifeline Utilities. Lifeline Group activities have often sharpened the focus and leant a greater sense of urgency to this valuable work, much of which is not expensive. Individual and collective Lifeline mitigation work proved most valuable in facilitating resumption of Christchurch infrastructure services following the 2010 and 2011 earthquakes.



ABOVE: LINES DAMAGED IN CHRISTCHURCH EARTHQUAKE. KIWIRAIL CARRIED OUT QUICK REPAIRS AT THIS AND OTHER DAMAGED SITES

The New Zealand Lifelines Council

The New Zealand Lifelines Council (NZLC) works with the regional Lifelines Groups to ensure that new ideas and key learnings are actively exchanged between the Groups.

The NZLC's focus is:

'Enhancing the connectivity of lifeline utility organisations across agency and sector boundaries in order to improve infrastructure resilience'.

The NZLC has adopted four themes to advance infrastructure resilience. These are the need for:

- Robust assets, or alternative service continuity arrangements.
- Appropriate resource commitment by infrastructure organisations
- Effective coordination, pre and post-event, at national and local levels.
- Realistic end-user expectations, so that users are risk-aware and better able to consider options.

The principal functions of the NZLC are:

- **Linking between lifelines activities**, lifeline utilities and Government agencies.
- **Advising Lifelines Groups** on best practices across a range of activities, including encouraging new projects and supporting them.
- **Promoting resilience-related research** and disseminating the results from regional, national and international research to support businesses cases for investment.
- **National Lifeline Utilities Forum**. This annual Forum is a flagship national event to raise awareness, gain insights on the latest developments and support collaborative effort.

Current NZLC members

Current NZLC members are:

- First Gas
- Spark
- Transpower New Zealand Limited
- New Zealand Transport Agency, Waka Kotahi
- Vector Limited
- Water New Zealand, Waiora Aotearoa
- National Emergency Management Agency, Te Rākau Whakamarumarū
- Ministry of Business, Innovation and Employment, Hīkina Whakatutuki
- Powerco Limited
- GNS Science, Te Pū Ao
- Land Information New Zealand, Toitū te whenua
- National Institute of Water and Atmospheric Research, Taihoro Nukurangi
- Chorus
- T4 Group

NZLC Members greatly appreciate the participation and support of:

- New Zealand Infrastructure Commission, Te Waihanga
- New Zealand Treasury (National Infrastructure Unit), Te Tai Ōhanga
- Natural Hazards Commission, Toka Tū Ake
- KiwiRail
- Taumata Arowai
- Department of Prime Minister & Cabinet
- Telecommunications Forum

Further Information

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ABOVE: INSTALLATION OF A TEMPORARY TRANSFORMER AT THE NEW BRIGHTON SUBSTATION, CHRISTCHURCH, FOLLOWING THE FEBRUARY 2011 EARTHQUAKE. AN EMERGENCY 66kV OVERHEAD LINE WAS ALSO QUICKLY BUILT TO SUPPLY THE AREA. CREDIT: ORION NEW ZEALAND LIMITED