Resilience Fund Application Form

This form provides the minimum information for the application. A detailed project plan should be developed to inform this application and may be attached.

Project title	Enhancing Situational Awareness for Extreme Weather Response
Date of application	6 Nov 2023
Details on application	
Applicant *[CDEM Group must endorse/sponsor all applications]*	Waikato Regional Council, Flood Response Team and Resilience Team
Sponsoring CDEM Group	Waikato CDEM Group
Other local authorities, Groups or organisations supporting this proposal	
Project description	
Executive summary *[200 words maximum]*	

This project seeks to utilise artificial intelligence (AI) to improve situational awareness within crisis times. CIMS Intelligence function assumes a pivotal role providing comprehensive understanding of the incident and potential developments, involving the collection and analysis of information and creation and dissemination of intelligence products. A recurring issue observed in generated situation reports is the need for more structured intelligence on the evolving situation and related analysis. This deficiency can impede the development of comprehensive situational awareness, ultimately affecting timeliness and quality of intelligence products.

Our project goal is to automate several aspects of information collection and analysis; by employing a data-driven approach, utilising machine learning and natural language processing techniques to enhance the quality and precision of early intelligence products. We aim to develop a proof of concept for a web-based spatial Operational System customised for flood response, aligning seamlessly with CIMS and established procedures. Focus and approach to developing emergency tools is assessing impacts, addressing how hazards affect decision-making processes and outcomes more effectively.

The past two years, Waikato Regional Council has collaborated with University of Waikato on the TAIAO project (http://taiao.ai), supporting a research team developing AI tools to enhance flood management (https://taiao.ai/news/20220421T000000_flood-prediction.en/). This project builds upon tools developed in the TAIAO research project, making them operational for flood and severe weather emergency responses, with no restrictions on intellectual property of the Operational System as the tools are open source.

Challenge/opportunity *[200 words maximum]*

The project to enhance situational awareness during crises through AI presents a dynamic landscape of challenges and opportunities in operational systems.

Opportunities abound. AI has the potential to revolutionise crisis management; providing real-time insights leading to informed and rapid decision-making. AI can enhance predictive capabilities, identifying trends and patterns, enabling proactive resource allocation. The scalability AI models allow for adaptation to diverse crisis scenarios and locations, maximising efficiency. Automating communication processes can improve information dissemination, while AI systems' learning and adaptation can continuously refine crisis response capabilities. Resource optimisation can lead to cost savings, more effective asset utilisation. Finally, the success of the project can set a positive precedent for the broader Civil Defence and Emergency Management sector, potentially leading to significant improvements in crisis response on a national scale.

Further, challenges include the need for high-quality and timely data, which can be tough. Handling sensitive information responsibly while respecting privacy and security is important. Ensuring AI works well in different crisis situations and smoothly fits with existing emergency procedures can be complicated. Finding the right balance between using computers and human judgment in emergencies is also a tricky task that needs to consider data privacy and security.

Alignment with priorities and objectives of the National Disaster Resilience Strategy (NDRS) *[200 words maximum]*

The project seeks to boost the region's resilience by proactively managing risks, preparing for efficient emergency responses, and enabling, empowering, and supporting individuals, organisations, and communities to take actions that ensure the safety and welfare of all.
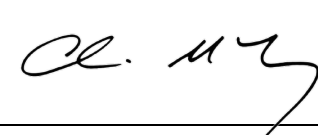
This project strongly aligns with the National Disaster Resilience Strategy three priorities, particularly in the areas of risk management, effective emergency response, and recovery. The primary objective of this project is to ensure the safety and well-being of individuals (relating to Objective 7). On the other hand, the tool will enhance the identification and comprehension of risk scenarios by allowing access to historical data from past events, encompassing hazards, exposure, and impacts (addressing Objective 1). The impact analysis will provide insights into the economic consequences during and after a disaster, aiding resilience efforts and promoting investment in resilience (corresponding to Objective 6). The tools being developed will enhance the information and intelligence system that supports decision-making during emergencies (relevant to Objective 12). The project aims to create integrated tools that will enhance the capabilities and capacities of the emergency management workforce (in line with Objective 11).

Alignment with Principles and Allocation Preferences *[200 words maximum]*

The project is well aligned with the Resilience Fund principles and all three priorities of the NDRS.

The tool will enable quicker and more precise information sharing within the CDEM community, promoting better coordination and communication among teams, and ultimately enhancing responsiveness and resilience. It will establish consistency in regional hazard management and increase visibility into local-level information, resulting in improved decision-making support during crises and assist the enhancement of equality of outcomes for Māori communities.

Application of outcomes/benefits to sector *[200 words maximum]*
Duration of project is one-year, anticipated results are expected to bring substantial value to the broader Civil Defence and Emergency Management (CDEM) sector.

The project will deliver a structured tool to improve situational awareness. It will incorporate impact-based features using advanced AI algorithms and spatial tools, which can be seamlessly integrated into a specialised operational dashboard for hazard emergency response.

The tool can also be used for risk scenario analysis by accessing and analysing historical data from past events, encompassing hazards, exposure, and impacts.

For CDEM groups, this will help inform planning for response and recovery. The Council will use the results of this project to enhance its storm and flood risk management.

The development of this tool based on AI technology is expected to have national benefits. The tool will be shared with regional councils nationally via SIGs (Hazard Risk Management, CDEM, River Managers, Environmental Data and Flood Forecasting and Warning group). |
| Ongoing costs (post-project) and how it will be funded *[200 words maximum]* |
| The primary ongoing expense will involve sustaining the service cloud platform's functionality. Depending on their operational requirements, these costs can be integrated into the agency or organisation that adopts the operational system.. Additionally, we may seek future Resilience Fund support for specific, interconnected opportunities, such as advancing initiatives in research or along the maturity pathway. |

Project design

Project manager	Phil Mourot (WRC Resilience team)
Other project members	
External providers/contractors	Web developer, the Artificial Intelligence Institute (University of Waikato)
NEMA resource (if needed)	

Deliverables *[Note: payments will be made after successful completion of milestones identified]*

Key milestones	Date for completion	Cost (invoice amount)
Milestone 1 – Workshop and Setting the scene	Mid-September 2024	$8,000
Milestone 2 – Web-based platform development	31 December 2025	$35,000
Milestone 3 – Artificial Intelligence models	31 March 2025	$40,000
Milestone 4 - Deployment	31 May	$8,000
Milestone 5 – Training workshops	30 June 2025	$8,000

Identified risks	
Risks	Suggested mitigation / management
Time and cost exceed budget estimate	Milestone cost reviews and revise scope to stay on budget.
Key staff become unavailable	Ensure other members are able to take over the roles.
Data accessibility	Work with data providers to fine-tune data needs and prepare Non-Disclosure Agreements as applicable.
Lack of commitment or availability of key stakeholders, including Council and businesses	Building and maintaining relationships is key: engage early, communicate, and clarify roles and expectations.

Funding request and use				
CDEM Resilience Fund contribution	$99,000			
Local authority / organisation contribution	$			
Other sources of funding or support	In kind from Waikato Regional Council and the University of Waikato.			
Budget *[please supply spreadsheet]*	$TBC (will be supply with the application)			
Applies if application exceeds $100,000 over the life of the project	Are you prepared to attend an interview in support of this application (if needed)?	Yes ☐		No ☐

Application confirmation				
Is this application from an individual or other organisation		Yes ☐		No ☒
Does the CDEM Group support this application? *[sign off below confirms support]*		Yes ☐		No ☐
Approval of Chief Executive [Chief Executive or Head of the organisation receiving the funding]	Name: Christopher David Andrew McLay			
Approval of CEG Chair	Name: Langley David Cavers			

All communications regarding the application, including approval decisions will be addressed to the Chief Executive and CEG Chair

CDEM Group comment

Note: Only complete forms will be considered for assessment. All completed forms and supporting documents must be emailed to NEMA at resilience.fund@nema.govt.nz

NEMA Assessment [internal use only]		
Principles	**Yes**	**No**
Local / regional focus	☐	☐
Values the role of Māori in the Emergency Management System	☐	☐
NEMA involvement required	☐	☐
Allocation Preferences		
Alignment with NDRS	☐	☐
Achieves equity of outcomes for Māori communities, marae, hapū, iwi and Māori organisations	☐	☐
Outcome focused	☐	☐
Applicable in other regions / CDEM Groups	☐	☐
Supports national consistency	☐	☐
Wider funding / resource commitment	☐	☐
Build on existing work	☐	☐
Operational expenditure (Opex)	☐	☐
Capital expenditure (Capex)	☐	☐
Other		
Application from individuals or other organisations endorsed/sponsored by CDEM Group		

NEMA Subject Matter Expert Comment	Supported ☐	Not supported ☐

	Supported	Not supported
NEMA Regional Emergency Management Advisor Comment	☐	☐

	Supported	Not supported
NEMA Review Panel Comment	☐	☐

	Approved	Declined
NEMA Director Decision Sign-off	☐	☐

Director of Civil Defence Emergency Management