

SBEnrc Project 1.35: Transport Network Resilience

Summary of Stakeholder Workshop Outcomes – February 2015

Externally facilitated stakeholder workshops were conducted in Townsville, QLD, and in Broome, WA, involving in each case some 30-35 stakeholders engaged in disaster response and recovery, including representatives of the emergency services, government agencies, community groups, infrastructure providers, media, and businesses. The following question was used as the provocation for the workshop:

“How can we learn from your experiences of past disasters to ensure our cities are resilient to future shocks or stresses; in particular in relation to transport and logistics networks into the city prior, during, and after a disaster?”

Participants were invited to create a vision for the future related to resilience to natural disasters and the following provides a summary of the combined findings from both workshops. As can be seen in the summary below there is a strong focus on transport networks and related infrastructure along with an equally major focus on whole-of-community preparedness which also contains elements related to transport networks. The following represents a summary of that vision:

The transport network is sufficiently resilient to ensure continuous or quickly restored routes after a natural disaster, such as a cyclone or flooding, drawing on roads, rail, shipping, and airport facilities... In the case that the transport network is interrupted there would be clarity around the critical and/or alternative paths that would be the priority for recovery efforts... Such prioritisation would be informed by real time data to identify the location of interruptions to the transport network (such as tilt sensors on electricity poles or trees and reconnaissance drones)...

The resilience of the city infrastructure would be sufficient to provide uninterrupted, or quickly restored, power supplies that draw on locally generated clean energy... and buildings and facilities would have high cyclone resilience with particular facilities identified as playing a role in the recovery process.

The response to a natural disaster would be swift, well informed, and understood by the community so that we are “not caught out”... The evacuation routes would be well known and it would be clear which facilities and buildings are being used for coordination and recovery purposes with appropriate resources provided for them (including in isolated communities)... The roles and responsibilities of various players would be clear and the appropriate skills and training would be provided to response agencies, businesses, and the community to ensure high levels of coordination and an efficient and effective response...

Residents would have a high level of preparedness and understanding that would reduce the impact of the disaster and allow them to contribute to the recovery as a whole-of-community effort that harnesses and strengthens existing relationships and mobilises community resources... Business continuity would be supported along with harnessing business knowhow and resources to support resilience building and recovery efforts... The process to support recovery would be streamlined, avoid red tape, and provide quick access to funds that can be used to build long term resilience.

Following a process to consider what currently exists that either would enable or disable the achievement of such a vision the participants focused on identifying actions that could be taken in order to increase resilience to natural disasters both directly and indirectly related to transport networks. The following provides a summary of the key activity streams identified by

the participants that are intended to be considered for pilot trials in the second stage of this project.

Activity streams related specifically to **transport network resilience**:

- *The assessment of the natural disaster readiness of infrastructure*: A key part of mitigating the damage from natural disasters is to identify infrastructure and facilities that have low or diminished readiness for disasters. This project would focus on developing and implementing a stakeholder engagement process to investigate the ‘Disaster Readiness’ of roads and transport infrastructure (with the potential to expand this scope to include buildings, service infrastructure, and other key assets). Once identified the process would consider costs and benefits associated with remedial actions with a priority on assessing infrastructure and assets critical to the short term recovery effort. The potential economic and social impacts of such critical infrastructure failing will be considered. The outcome of the project would be to recommend specific infrastructure and/or assets to be considered for remedial action, the development of response metrics and post event damage assessment tools, and recommendations related to the potential to upgrade design codes and performance standards.
- *The use of data to inform a rapid response to transport network interruption*: Rather than manually surveying the extent of damage to the transport network following a cyclone or flooding event - which may take, at minimum, several hours – this project would investigate the potential to significantly shorten this process by accessing data collected during and shortly after the event. Data would be collected using sensors (such as tilt sensors on electricity poles, light poles, and large trees that are located near critical transport nodes), and through the use of reconnaissance drones or fixed cameras to photograph key transport network nodes. It is proposed that this data could be analysed during the disaster event to identify interruptions to critical-route intersections and/or transport routes that would be prioritised for emergency response vehicles. Further the data could also be used to route general emergency vehicles around obstacles shortly after disaster events.

Activity streams related to **whole-of-community resilience including aspects of transport networks resilience**:

- *A process to undertake ‘Disaster Repurposing’ at a city infrastructure level*: In response to calls for a greater level of disaster response facilities this project seeks to investigate the potential to harness existing facilities and infrastructure across the city to provide disaster recovery support. The first stage would focus on a stakeholder led process to identify recovery needs and linking them to potential infrastructure and facilities that could be temporarily repurposed such as the repurposing of existing buildings to offer recovery centres, accommodation shelters, command hubs, energy supply points, warehouses, access to cash, medical services, and wellbeing services; the repurposing of highways as temporary airstrips; the repurposing of alternative logistics options such as shipping; and the repurposing of parks or ovals as camp grounds. The second stage would focus on stakeholder led process to develop a repurposing action plan to include the process to repurpose facilities and infrastructure, the allocation and location of supply caches to support repurposed facilities, the allocation of emergency car parks to assist in repurposing (at potential supply cache locations for instance), and the investigation of the provision of mobile recovery services, especially to isolated communities.

- *Strategic planning to increase whole-of-community resilience to natural disasters:* The response to natural disasters involves a number of complex tasks that can be informed by prior strategic (as well as tactical) planning. This project would focus on stakeholder led processes to develop strategic approaches to building the whole-of-community resilience to natural disasters. The project would consider strategic imperatives such as community evacuation plans (for residents and animals) with specific transport routes and staging areas that are clearly communicated to the community, preparedness checking and remediation of key assets and infrastructure such as critical path transport routes (as in the above project), the continuity of critical services (such as transport, electricity, water, sewerage, and fuel), the continuity of business activities and their role in recover activities, the harnessing of data (as in the above project for road infrastructure) and a process to assess and build the capacity of stakeholders, together with the need for specialised emergency service skills,

Activity streams focused on **whole-of-community resilience to natural disasters:**

- *Streamlining governance structures to support disaster recovery:* A key element of the effective resilience of communities to natural disasters is the existence of governance structures that affect the provision of support for recovery works. This project would focus on two streams, firstly an investigation into opportunities to streamline existing regulations and requirements and remove unnecessary impediments, and secondly an investigation into the opportunity to amend funding structures related to funding rules and requirements, eligibility and access to funding, controls over the use of funding, and the potential for social impact bonds. A key element of this project would be to inform decision making in these areas potentially through site visits and stakeholder interaction by decision makers.
- *Culturally appropriate community activation:* A key element in natural disaster readiness, response, and recovery is an activated community that is well informed with strong social structures in place. This project would consider options to support the community through the provision of behaviour change programs (such as those related to setting up disaster kits and stores, or to preparing outdoor areas to be cyclone or flood ready), capacity building sessions (such as on increasing the disaster readiness of homes, ways to increase personal safety during disaster events, and options for volunteer responders to assist with recovery efforts), community events (such as ‘Cyclone Sunday’ currently run in Townsville to inform residents, or community cyclone practice drills), and street level events (such as a ‘Cyclone Ready Streets Program’ where relationships are fostered at a street level to increase the resilience to disasters through greater sharing and good will.)
- *Multi-Agency coordination and communications strategies and practices:* Key to a strong response is the coordination and communication between disaster response agencies. This project would be developed in two streams, firstly to investigate options to enhance multi-agency coordination through a focus on the clarification of roles and responsibilities, the development of inter-agency structures and standard operation procedures, undertaking succession planning and capacity building for staff, and the potential for equipment, facilities, and staff sharing. The second stream would investigate multi-agency communication strategies through a focus on the development of standard protocols for communication (including frequencies, technology types, and conversation protocols), a strategic approach to the accurate and timely sharing of information, investigating the

potential to harness social media and smart phone applications, and the identification of specific communication needs and audiences to match to appropriate communications platforms, technologies, and message.

In summary, the outcomes of the workshops have been analysed using an emergent approach that led to identification of the four themes outlined above and the resultant proposals for intervention.

Further following conversations with the CEO of the indigenous community at One Arm Point in the Kimberley and the manager of the Indigenous Rangers Program the following topic was raised:

- *The nexus of transport and energy for isolated communities:* It is often the case that isolated communities source energy from diesel generators providing electricity to a local grid. The provision of the diesel is reliant on the resilience of the transport network to disaster events. A focus on local energy generation stands to both strengthen the energy resilience of isolated communities, and also reduce the regular transportation of diesel that can have impacts on the quality of unsealed roads.