Canterbury Engineering Lifelines Group

Priority Routes Project Update
October 2007

Background

- AELG work has been completed – provides a template to build on
- CDEM Group Engineering Lifelines work-plan for 2006/07
  - Year 1 of a 3 year project
  - Purpose to determine a Canterbury wide priority route network for access to important sites in the event of a disaster
- Funded by CDEMG (06/07 to 08/09) and MCDEM (06/07)
- Also - builds on earlier Risks and Realities work
- Linkage to Interdependencies
- Approach covers:
  - Priority community sites
  - Critical lifelines sites
  - Priority Routes
Community Sites AND Lifelines Utility Sites

North Canterbury Network
Central Canterbury Network

Mid & South Canterbury Network
### Project Outline (1/2)

<table>
<thead>
<tr>
<th>Timing</th>
<th>Task Description</th>
<th>Target Status 30 June 2007</th>
<th>KPIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006/07</td>
<td>1. Meet with CAE and Engineering Lifelines representatives to discuss the two related projects, identify areas of overlap, what each project will do, and agree how the interface will be managed over the term of this project.</td>
<td>Completed</td>
<td>na</td>
</tr>
</tbody>
</table>
| 2006/07 | 2. Community Priority Sites  
  a. Review community priorities from AELG-5 and adapt for Canterbury, confirm with CDEM5G  
  b. Agree on the definition, and then update and expand to region-wide the list of community priority sites that is in Risks and Realities – with input from each District EMO  
  c. Establish the reliance of these sites on other utilities  
  d. Map all sites on GIS |  
  a. Complete.  
  b. Underway.  
  c. Complete.  
  d. Substantially complete. |  
  2006/07  
  a. Complete list of Community Sites.  
  b. Spreadsheet completed showing the requirements of each Community Site on Lifelines utilities (similar AELG).  
  c. GIS database and maps completed with Priority Sites shown by type.  
  d. Document in Draft Stage 1 report. |
| 2006/07 to 2007/08 | 3. Critical Lifelines Utility Sites  
  a. Each sector to confirm their own key sites based on criteria similar to AELG-5, using questionnaire  
  b. Each sector establishes the reliance on other lifeline utilities  
  c. Map all sites on GIS | a. Underway.  
  b. Questionnaire distributed to Lifeline Utilities.  
  c. List of Critical Sites distributed to Lifeline Utilities for identification of reliance on other utilities.  
  d. GIS database and maps completed with Critical Sites shown by type. |  
  2006/07  
  Document in Draft Stage 1 report. |

### Project Outline (2/2)

<table>
<thead>
<tr>
<th>Timing</th>
<th>Task Description</th>
<th>Target Status 30 June 2007</th>
<th>KPIs</th>
</tr>
</thead>
</table>
| 2006/07 to 2007/08 | 4. Priority Routes  
  a. Discuss and agree with the Engineering Lifelines Group the role of the consultant team vs individual local authorities in undertaking the tasks required.  
  b. In general, a similar approach to that used for the AELG-5 project is proposed, and a consultative process adopted with local authorities, CDEM5G and the CELG where the consultant team is responsible for completing tasks.  
  c. Routes will be mapped in the GIS.  
  d. Agreement will need to be reached with the CDEM5G on the extent to which hazards are mapped in the GIS, used in the analysis, and any risk assessment and mapping of structures undertaken. |  
  a. Substantially complete.  
  b. Questionnaire developed.  
  c. Initiated.  
  d. Agreement on hazards. |  
  2006/07  
  a. Base plan of regional road network produced on GIS.  
  b. Questionnaire drafted.  
  c. Priority Routes map produced on GIS.  
  d. Hazard overlays and (qualitative) assessment  
  e. Draft Stage 2 Report |
| Later | 5. Interdependencies  
  a. A similar approach can be adopted as for AELG-5, however this aspect will be best determined in association with the Lifelines Interdependencies project.  
  b. For AELG-5, this involved the collation of dependency information – with Lifelines sectors reviewing the priority sites and their own dependency on these sites for recovery.  
  c. This review is then followed by a review of the order of their own critical sites based on the assessment of them made by others.  
  d. Finally, determination of overall regional priorities. |  
  a. Agreement in relation to role of this project as an input to the CAE project |  
  2006/07  
  a. Agreement confirmed.  
  b. Draft Stage 3 & 4 completed.  
  c. To be finalised once 5a confirmed. |
Approach in Summary

Input from EMOs, asset managers, agencies → Priority Community Sites → Critical Lifelines Sites → Determine requirements & expectations for service delivery and restoration → Confirm Priority Routes

Community Priorities

1. Restoration of services providing an immediate threat to public health and safety (e.g., Hospitals, Ambulance).
2. Restoration of supply to emergency services sites (Police, Fire Service, Emergency Operations Centres).
3. Restoration of supply to key infrastructure sites requiring service for their own recovery (Lifeline Utilities including Energy, Telecommunications, Water, Wastewater, Transport).
4. Restoration of services to key organisations which are members of the Canterbury CDEM Welfare Advisory Group.
5. Restoration of supply to major construction resources to which access would be needed in the response and recovery phase (including Contractors, Materials, Plant).
6. Restoration of services to schools.
Community Sites

- Hospitals
- Ambulance stations
- Fire stations
- Police stations
- EOC's
- Broadcasting
- Contractors
- Equipment
- Major hardware
- Steel and concrete
- Schools

Community Sites Lists
Critical Utility Sites Criteria

- The network as it is today.
- A “ground zero” approach, which says that given all services/sites are down, which would be recovered first? It is not a scenario approach looking at damage from specific events.
- Whether the area of outage would be significant if the site failed. If the facility outage and its consequences could be easily managed locally, then it would be considered a lower order priority.
- Whether there is redundancy available, and whether it could reasonably be assumed that an alternative supply point will be operating. If there is, then the site is a lower priority.
- Priority locations are defined as sites (places) or links (eg rings).

Lifelines Utility Sites Lists
Approach

- Questionnaires – circulated to EMOs and LL utilities
- Workshops – completed (Rangiora, Christchurch, Ashburton, Timaru)
  - Council asset managers, emergency management staff, other lifelines agencies (power, telecommunications, fuel, broadcasting)
  - Assist in completing questionnaires
- Follow up contact with Community site owners - initiating
  - What are their priorities?
- Round-up of Lifelines agencies – completed questionnaire for each site

Site-based Response Questionnaire (All Sites)

<table>
<thead>
<tr>
<th>Service/Utility</th>
<th>Question 3a</th>
<th>Question 3b</th>
<th>Question 3c</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Required during an emergency (Y/N)</td>
<td>Priority Ranks each Service*</td>
<td>Alternative/Back up Facilities Provide (% of Function)</td>
<td>Desired Service Restoration (even do you need service restoration from your normal provider?)</td>
</tr>
</tbody>
</table>

Example: Water supply

<table>
<thead>
<tr>
<th>Water supply</th>
<th>Y</th>
<th>y</th>
<th>Y</th>
<th>Time (hrs)</th>
<th>Quantity</th>
<th>Quality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank water supply</td>
<td>2</td>
<td>4</td>
<td>100% for 4 hours</td>
<td>Delivery truck access</td>
<td>1000 m³/day</td>
<td>100</td>
</tr>
</tbody>
</table>

Example: Transportation

<table>
<thead>
<tr>
<th>Transportation (road)</th>
<th>Y</th>
<th>y</th>
<th>Y</th>
<th>Time (hrs)</th>
<th>Quantity</th>
<th>Quality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access off minor side road</td>
<td>20% access (people only, no deliveries)</td>
<td>48 hours</td>
<td>Delivery truck access</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Priority Rankings based on:
1. No functionality or service delivery can be maintained without this supply.
2. Some functionality or service delivery can be maintained without this supply.
3. Functionality or service delivery can generally be maintained without this supply.
NA = not applicable
### Site-based Response Questionnaire (Orion Example)

<table>
<thead>
<tr>
<th>CRITICAL SITE NAME</th>
<th>Question 1a</th>
<th>Question 2a</th>
<th>Question 3a</th>
<th>Question 4a</th>
<th>Question 5a</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orion Head Office</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>218 Manchester St</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orion Control Centre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service/Utility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation (road)</td>
<td>Y 1</td>
<td>Access off two streets</td>
<td>4 lanes</td>
<td>1 entrance</td>
<td>50%</td>
<td>Provider: CCC</td>
</tr>
<tr>
<td>Transportation (rail)</td>
<td>Y 3</td>
<td></td>
<td>Provider: Tranz Rail</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telecommunications</td>
<td>Y 1</td>
<td>CDCM &amp; 2 demob women</td>
<td>12 50%</td>
<td>ASAP</td>
<td>100%</td>
<td>Information/feedback from customers essential (Provider: Telecom)</td>
</tr>
<tr>
<td>Broadcast/Media</td>
<td>Y 1</td>
<td>Call Centre</td>
<td>Provider: Various</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas supply</td>
<td>Y 2</td>
<td>Electric heating</td>
<td>100%</td>
<td>1量子</td>
<td>Provider: Rockgas NZ Ltd</td>
<td></td>
</tr>
<tr>
<td>Electricity supply</td>
<td>Y 3</td>
<td>Generators</td>
<td>Generator can carry</td>
<td>Control Centre, emergency load</td>
<td>ASAP</td>
<td>12 hrs fuel</td>
</tr>
<tr>
<td>Petroleum supply</td>
<td>Y 2</td>
<td>Portable trailer can be used to replenish generator supply</td>
<td>800lts or 4 days supply</td>
<td>ASAP</td>
<td>100%</td>
<td>Refill after 4 days</td>
</tr>
<tr>
<td>Water supply</td>
<td>Y 1</td>
<td>Larger capacity tanks</td>
<td>50%</td>
<td>1 week</td>
<td>10,000lt</td>
<td>100%</td>
</tr>
<tr>
<td>Wastewater disposal</td>
<td>Y 1</td>
<td>Tank capacity</td>
<td>1 day</td>
<td>1 day</td>
<td>100%</td>
<td>Provider: CCC</td>
</tr>
<tr>
<td>Storm water disposal</td>
<td>Y 1</td>
<td>Close to Avon</td>
<td>ASAP</td>
<td>100%</td>
<td>Provider: CCC</td>
<td></td>
</tr>
<tr>
<td>Airports</td>
<td>Y 2</td>
<td></td>
<td>Provider: Airport Control Authority</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ports</td>
<td>Y 2</td>
<td></td>
<td>Provider: Lyttelton Port Co</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### Telecom Power Interdependency

![Telecom Power Interdependency Diagram]
## Summary Worksheet

### Outputs

- GIS maps of priority community sites
- GIS maps of critical lifelines utility sites
- Priority route maps including categorisation of bridge vulnerability