

CIHT – How to create a resilient transport network



(Image published in Transportation Professional)

On Monday 14th March, CIHT held a seminar entitled ‘How to Create a Resilient Network’. The sessions dealt with various network resilience topics, from a reactive approach to a more proactive approach, as well as, resilience through cyber security. Sessions were supported by Local Authority case studies, as well as, workshop discussions covering current resilience challenges, customer engagement and the future.

This briefing note outlines the key discussion points for the benefit of those that were not able to attend. A number of presentation slides can also be viewed [here](#).

This document provides a number of case studies exploring different aspects around how to create a resilient transport network.

Key Note Speaker and Sponsor

Steve Draper BEng (Hons) CEng MICE MCIHT, Technical Director Asset Management (UK), Opus International Consultants

The opening discussion highlighted a number of issues that resilient networks need to address as follows:

- Risks and mitigation of consequences.
- Implementation plans and costs.
- Traffic behaviours and the interaction between the various road users, incl. emergency services.
- Social science.

FORTH ROAD BRIDGE (FRB) – IT'S CLOSURE AND MITIGATION

Case study by: Hugh Gillies, Head of Network Operations Trunk Road & Bus Operations Directorate, Transport Scotland



(Image published by Transportation Professional)

In early December 2015, for safety reasons, the decision was made to close the Forth Road Bridge. In doing so it immediately cut off a major critical road route that not only connects Fife with Edinburgh but also the east side of Scotland.

This case study session looked at how Transport Scotland and key stakeholder partners responded to this transport resilience challenge, exploring at how resilience was achieved as a reactive approach to manage a major incident on the Forth Bridge in Scotland, from both an asset management approach and a network operations perspective. This outlined a number of key points as follows:

- Resilience evaluated at national, regional and local contexts.
- Minimisation of diversion routes for customers.
- Partnerships with local enterprises to facilitate in various areas.
- Feeding the media with information and good use of social media.
- Ensuring personal and team resilience (availability of staff).
- Pushing boundaries in customer behaviours to change choice of transport.

FLOODING

Case study by: Steve Berry OBE, Head, Local Roads, Light Rail and Cableways Branch, Department for Transport and Paula Claytonsmith, Director, Strategy and Performance, Gaist



(Image published by Transportation Professional)

This session looked at the recent flooding events in the North of England 2015-2016, exploring resilience using media and technology by local authorities to assess the flooding situation in different parts of the County and the condition of assets. Key points were:

- Drone technology was used to collect data.
- 3D modelling was carried out through video technology.
- Live-streaming body cameras were used to capture ongoing events.
- Vast amount of data was analysed to help determine solutions.

STRATEGIC TOOLS – A CASE STUDY

Case study by: **Jon Munslow, Asset and Infrastructure Group Manager, South Gloucestershire Council**



Many South West highways were inundated by flood water last year – such as the A372 near Muchelney in Somerset (Image published by Transportation Professional)

This session reviewed the Highways Infrastructure Resilience Assessment Modelling (HIRAM), a tool to understand the potential impacts of climate change. This tool was developed by the South West Highways Alliance to plan for resilience prior to emergencies happening. Key points were:

- A web-based network level assessment tool.
- Aligned to the WebTAG economic assessments.
- Provides evidence for business cases, both financial and social impacts.
- Currently being adopted by a number of local authorities in the South West of England.

Case study by: Chris Allen-Smith, Head of Profession, Asset Management & Maintenance, Hertfordshire County Council and Damien Douglas, Senior Asset Manager, Hertfordshire'



(Image supplied by Hertfordshire County Council)

Hertfordshire County Council hasn't been as challenged – as for instance Cumbria has in recent years by severe events but, at the same time, while the current focus is understandably on flooding, there is a lot more to resilience than just that.

This session explored Hertfordshire CC's approach towards developing a resilient network. Apart from maintaining a resilient network in the County, this exercise addressed key recommendations from the Transport Resilience Review document, as well as, the self-assessment questionnaire. Key points were:

- Initial network based on the winter maintenance routes.
- Evaluated traffic movements using traffic counts, whilst considering a number of traffic generators.
- Classified the resilient network in 3 tiers, motorways, trunk roads, and other routes.
- Future work will assess resilience in relation to flooding events.
- Moving forward this network will be used to enable better decision-making, risk management and inform forward works programmes.

PROTECTIVE SECURITY ISSUES & DIGITAL BUILT ENVIRONMENTS – THE PHYSICAL, PERSONNEL & CYBER SECURITY CHALLENGES

Case study by: Government Security Adviser, Centre for the Protection of National Infrastructure (CPNI)



(Image supplied by Transportation Professional)

This session covered a range of security threats to the physically and built environment and security-minded thinking. Key points were:

- Building Information Modelling (BIM) is very beneficial, and as much it can benefit the project, it can damage or used as a threat. Too much and unnecessary information shared with multiple users.
- [A Passport to Good Security](#) was published by CPNI.
- [PAS1192-5:2015](#) provides further information about security-minded communication.

WORKSHOP

The workshops were led by:

James Elliott, Group Director, Asset Management, WSP | Parsons Brinckerhoff
John Lamb, Calderdale's Chief Officer for Highways and Engineering;
Eric Opoku-Ohemeng, Deputy Asset Manager, Colas

Workshop discussions covered current resilience challenges, customer engagement and the future. CIHT will look to develop the points raised

1. What do people have to deal with currently? What are the challenges?

Key points coming out of the workshop sessions

- Uncertainty due to climate change.
- Lack of a connected transport network/options/alternative in places highlights gaps in interdependencies.
- Budget constraints/asset sweating/cost cutting/capital v revenue/resources v identified need.
- SRN v fragment local networks (competing needs across services and within highways).
- Changing technologies v reducing resource base.
- Political environment.
- Understanding where the risk sits between client and contractor.
- Managing expectations.

2. Customers – how do we communicate, how do we manage expectations?

Key points coming out of the workshop sessions

(People and transport customers increasingly expect immediate information about network disruptions including changes and closures).

- Social media, traditional media, consultations, public engagement.
- Concerns over how accurate the information is (e.g. through social media).
- Be proactive rather than reactive – give the public the facts.
 - Engage all stakeholders; operators, public
 - Offering choice
 - Engage communities early on to help managed expectations/be part of the decision making process
- Improve links between local authorities, transport operators, consultants, contractors and stakeholders.
- Develop a communications strategy.

3. 30 years' time: how resilient will the network be?

Key points coming out of the workshop sessions

- Need to understand the type of networks that will be required.
 - Changing retail habits
 - Changing technologies e.g. autonomous vehicles
- Reviewing resilience now for the future.

- Depends on how well we assess what the future issues will be. We may change our view on what critical infrastructure is.
- There should be more data to analyse and manage demand.
- Demand management depends on flexibility and adaptability.
- Expect increased pressure on transport infrastructure networks.
- Self-healing roads.
- More cars but lower mileage.
- Development of autonomous vehicles.
- Improved communication and choices.