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Summary of secondment at the Department for Transport (DfT), London

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The Adaptation and Resilience in the Context of Change (ARCC) Network funded a secondment for Dr David Dawson to join the Department for Transport (DfT). The secondment enabled David to engage with a wide range of stakeholders within the transport sector whilst challenging their response to their approach to improving their resilience to extreme weather & climate change. As well as producing a policy response (published 27 November), valuable insight into operational and policy level responses to changing weather and climate was gained and dialogue based on emerging academic research was opened. Key & emerging knowledge gaps were recorded and are to be taken forward in current and future research projects (2015-2018). This briefing paper provides a summary of the secondment; detail of the activities carried out, and outlines future plans for ongoing collaboration on transport resilience.

Background

Transport Resilience Review (TRR)

By way of a formal academic secondment at HM Government's Department for Transport (DfT) the placement aimed to build research capacity and accelerate external engagement between academics, policymakers, and industrial stakeholders in respect to the future resilience of the transport sector to extreme weather events. Following the widespread impacts last winter the Transport Resilience Review (DfT, July 2014) – commissioned by the Secretary of State for Transport – provided practical recommendations on how transport infrastructure stakeholders can strengthen the resilience of our transport systems.



Figure 1. Secretary of State for Transport together with Mark Carne (Network Rail CEO) and Patrick Hallgate (Network Rail route managing director) see the force of the sea at Dawlish after storms closed the southwest mainline for three months in February 2014. Courtesy of Network Rail.

The Review engaged with over 200 stakeholders, including transport infrastructure owners and operators for rail road, aviation and maritime, and also regulators and local authorities to produce 63 recommendations for improving the sectors resilience to extreme weather. Actual improvements on last winter however depend on the response to the recommendations in the TRR, and these need to be prompted, agreed, and recorded.

The ARCC Network supported the part-time secondment (40% FTE) to enable collaboration with the DfT in gathering evidence for the response to the TRR. Although primarily located within the Climate Change Strategy team of the Energy, Technology & International Division the nature of the role provided meant regular contact with a large number of divisions

across the department. The primary activities of the secondment were to:

- Challenge the owners of the 63 recommendations in the Transport Resilience Review (2014) to provide positive responses, with specific focus on putting in place actions in advance of this winter.
- Publish the Government response to the Transport Resilience Review, with Secretary of State Approval on 27 November 2014.
- Promote the exchange of current EPSRC project insight and networks throughout the DfT and with transport stakeholders.

Outcomes

Benefits for the Early Career Researcher

It is rare that an opportunity to understand the policy/industry environment can take place prior to or early in the initiation of a research project. This secondment, therefore, presented a unique opportunity to help shape research and boost the impact of current and future research activities. The secondment provided first hand insight into the delivery of policies, and transport and an in depth understanding of the short-term improvements and responses to extreme weather events across multiple areas of the transport sector. Further specific benefits/outcomes included:

- In depth understanding of the transport sector's resilience plans, strategies and protocols and day to day working of government departments
- Insight into the long & short term barriers to improving transport resilience: from policy to operational perspectives
- Knowledge of the internal structures and personnel needed to engage with in tackling the barriers
- Publication of policy document approved by the Department & the Sectary for State for Transport
- Intensive networking in areas of transport and resilience (> 35 stakeholders in new database)

Benefits for the Department for Transport

The secondment provided on-going academic insight and expertise from current research, specifically:

EPSRC/ESRC's: Infrastructure BUBusiness models, valuation and Innovation for Local Delivery (iBUILD) Centre: The DfT were briefed on ongoing work from the project's Work Stream (WS) 2 - *Rethinking Infrastructure Value*, and the Department was provided with recent University of Leeds report produced in collaboration with HM Treasury and Infrastructure UK titled: *Economic evaluation of systems of infrastructure provision: concepts, approaches* (Brown & Robertson (eds), 2014). As a result, the report is cited directly in the Government Response:

'The DfT has also been made aware of emerging research from recently established academic infrastructure research centres, for example work on infrastructure resilience and value¹. The DfT's engagement with such centres will continue, to ensure emerging thinking is utilised effectively.'

The Government Response to the Transport Resilience Review (2014, p6)

Other WS's of interest to the Department include transport components of *WS3: Issues of scale in local delivery* that will reconcile local scale priorities with regional and national strategic needs; along with identifying cases for *WS4 Integrative Case Studies* that include aspects of the transport network and examples of disruption.

EPSRC's Disruption project (Institute for Transport Studies (ITS), Leeds): Through David's network ITS provided insight and a formal response to the Resilience Review that included commentary on the economics of disruption, social resilience, communication and highways efficiency. The DfT hope to maintain links with ITS and will be actively engaging with them in the new year. David's plans to join the School of Civil Engineering and ITS at Leeds through his

¹ iBUILD's: Economic evaluation of systems of infrastructure provision: concepts, approaches report, University of Leeds, available at: <https://research.ncl.ac.uk/ibuild/outputs/>

future fellowship will also allow continued dialogue with the research groups to continue.

Further benefits of the academic secondment

The secondment provided a wider perspective to the response along with bringing up-to-date, novel and innovative ideas to the policy arena. It also provided a continued degree of challenge to the department and wider transport sector on their approaches to improvements in resilience. This has led to a response with real evidence of improvements and impact. David also oversaw the Rail chapter, leading the engagement with senior Network Rail executives and made a very credible chapter of the aviation section.

The secondment also extended the academic & government network involved with the Department, for example through Leeds' work with HM Treasury's Green Book update. The Department were also provided with insight into on how to engage successfully with academia (i.e. engaging with impact activities and utilising university innovation hubs) that will help in future activities.

Finally, David also led the development of a specification of work to be commissioned by the DfT related directly to a larger recommendation in the TRR on national single points of failure; building the overall scope (e.g. Figure 2) and also pushing to include a local council led resilience groups to exploit mutual benefits and improve value for money.

Future research and collaboration opportunities

New understandings gained from working at the Department and from the involvement in the publication of the Government Response will be incorporated into long-term research plans with support and resource from current projects such as iBUILD and David's future fellowship (Dawson: 2015-2018). Below is a list of the potential knowledge gaps to be addressed in future collaborations and research:

The economics of disruption & valuing resilience: how resilience is factored into transport appraisal schemes is not well understood and the sector has a number of challenges to cross at different levels in order to

improve this. Joint academic/policy thinking in this area has the potential to directly improve decision making and provide real impact in the coming years.

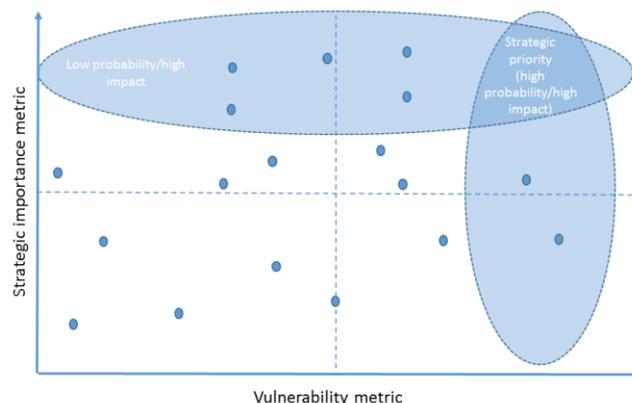


Figure 2: Schematic of analysis of strategic transport network. Blue dots represent areas and/or specific sites of vulnerability defined as single points of failure. Vulnerability metrics can be determined by joint probability analysis; the strategic importance metric would initially include intensity of use (passenger flows and tonnage carried) as a place holder for future input from wider on-going research.

Social resilience: the TRR recommendations focused on operational responses in order to provide an industry baseline of understanding on resilience. It has had limited impact on user behaviour and their response to disruption. ITS (University of Leeds) have significant expertise in this growing area and will be able to engage directly with this challenge in future research.

Long-term foresight: individual organisation's annual resilience reviews observed during the secondment are a step in the right direction however a lack of long-term foresight (beyond current funding cycle) could lead to future unexpected consequences. Academic research offers an opportunity to provide insight here, for example combining climate and socio-economic scenarios.

Cross-modal opportunities: there is a lack of evidence/action of cross-modal working and partnership between sectors. Experience has shown that interconnections are a key characteristic of

transport infrastructure, seeking these interactions has the potential to uncover and exploit new opportunities (protocols, responses, etc.) that could reduce the resource required to reduce the impact of disruptions and improve the resilience of the transport network as a whole. 'Systems thinking' is the key to motivating this gap and this is an area being developed by current EPSRC research (e.g. iBUILD).

Cross-sector opportunities: similar to the above, transport infrastructure exists as part of a wider system of systems. Exploiting opportunities to reduce resilience in collaboration with other sectors (e.g. water, waste, energy, ICT) will only serve to improve the nation's ability to cope with climate and weather changes among other threats.

Emerging technologies: integrating new and innovative technologies (such as slope sensors) that will improve the detection and foresight of failure has been noted as an area that requires more focus (particularly in the rail sector).

Key points

- The transport sector has been successfully challenged on resilience and its response has been collected and published in the Government document approved by the Secretary of State for Transport & other Whitehall Officials
- Mutual research & policy challenges to resilience recorded during the secondment have been identified through knowledge exchange
- A plan for collaboration & engagement on the challenges in 2015 and beyond have been agreed with the various units within the Department and includes the Deputy Chief Scientific Advisor

Next steps

The Department is planning an update to the response next year, and collaboration and engagement will be sought for this for mutual academic/policy benefit.

Key members of the Analysis and Strategy Group will be invited to attend research events focused on the knowledge gaps outlined in this briefing.

Engagement will continue with work commissioned by the DfT to provide insight for research on cross-modal work.

Information

- Government Response to the Transport Resilience Review (2014): <https://www.gov.uk/government/publications/transport-resilience-review-governments-response>
- Infrastructure **B**usiness models, valuation and Innovation for **L**ocal **D**elivery (iBUILD) Centre: <https://research.ncl.ac.uk/ibuild/>
- Adaptation and Resilience in the Context of Change Network: <http://www.arcc-network.org.uk/>
- Sustainable & Resilient Infrastructure group at Leeds: <http://sure-infrastructure.leeds.ac.uk/>

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Dr David Dawson is currently a Research Fellow at the Institute for Resilient Infrastructure, School of Civil Engineering, University of Leeds. In 2015 David will begin a Leverhulme funded Early Career Fellowship on Transport Resilience in the UK.

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