

Incident Management Investment Decision Model

The Highways Agency Network Services Incident Management Policy Team have been working on a prototype model designed to analyse the effects that proposed research projects would have on reducing the timeline for different types of incidents. The model has the additional benefit of being able to link its outputs to average vehicle delay savings. Ultimately, the model should be capable of calculating the anticipated benefit to road users for each improvement project, against a baseline derived from 'real' data obtained from Regional Control Centres and Service Providers (and eventually the Emergency Services). This will help to ensure that limited funds are targeted in areas that yield the greatest returns, whether this results in changes to procedures, better Incident Support Units or responder equipment.

The Incident Management Policy Team's Investment Decision Model (IMIDM) simulates incidents by their various phases (from occurrence through to resolution) and the associated 'responder streams' (e.g. Traffic Officer Service only, or Officer and Incident Support Unit together etc), as shown schematically in the accompanying figure.

The model currently deals with the most serious congestion-causing incidents, which for the purpose of the model are classed as those resulting in a lane closure. Each of the incident processes has an associated time distribution and these have been obtained from actual incident data. These time distributions cover the range and probability associated with the various phases. The incident data used to construct the prototype model was selected from the Regional Control Centre in the West Midlands between March 2008 and April 2009. Of the 77,000 incident

logs analysed, just under 3,200 logs were identified as 'congestion causing', resulting in lane closures.

Having obtained the distributions, the model was constructed. It uses the 'Monte Carlo' technique to simulate total incident durations and, in basic terms, it enables the Agency to understand what the effect of reducing the duration of part of the process will have on the total incident timeframe. This tells us where our efforts should be focused in terms of improvement opportunities through research projects. For example, should we invest in the detection phase or should we improve our capability at the incident scene itself? The model helps to provide the answers and is now being used to target the research programme and inform operational working practices.

Eventually the model will aim to collect command and control data from Emergency

Services so that work streams involving those Services can also be analysed. Other incident responders have already expressed a desire to be more involved with this work.

Project Sponsor Paul Hupton said: "We were not satisfied with having a model that purely demonstrates time savings at incidents through improvement projects. We wanted to be able to convert this time into the Average Vehicle Delay metric used by the National Operations Group, so that each project's contribution to the Agency's Public Service Agreement target can be demonstrated. We believe that the prototype model has shown this potential and so work continues on its refinement."

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