**Practitioner Fellowships**

Risk Terrain Modeling and Accident Improvement Programmes

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* Partner Universities: University of Dundee
* Academic Supervisors: Dr Alastair Geddes
* Year: 2014
* Duration: 6 months

**Research Context and Objectives:**

As the Data Analyst for Tayside Safety Camera Partnership for eight and a half years, I have long sought a positive answer to the often posed question "You mean we have to wait until someone is hurt or killed before we can have a camera here?" (most usually asked in a tone of incredulity verging on anger). The Scottish Safety Camera Programme, as with the majority of Accident Improvement Programmes (AIPs), is empirically-based and reactive in nature. It requires a cluster of injury accidents and recorded evidence of high vehicle non-compliance before a core speed or red-light camera site can be established. Furthermore the current selection criteria fails to take into account the huge reductions in the number of personal injury collision occurring on Scotland's roads over the last decade.

In the new era of Police Scotland, responsibility for road safety education has shifted entirely to the local authority arena. The policing focus is now very much one of upholding road traffic law through a target-driven approach to the detection of motoring offences. In my experience, the actual utilisation of road policing resources appears to be a largely subjective affair, with officers attending at locations either known to have high offending rates or in a community appeasement role. Unlike in the detection and prevention of traditional crime types, it seems there is little use of intelligence products when it comes to road collision reduction.

The aim of my research is to offer an alternative approach to these traditional ways of working; one that retains the validity of empiricism whilst being proactive in its implementation. I plan to do this with reference to the Risk Terrain Modeling (RTM) crime forecasting tool, developed by Joel Caplan and Leslie Kennedy at Rutgers Center on Public Security, Rutgers University, New Jersey. RTM utilises the power of modern geographical information systems (GIS) to amalgamate the multiple risk factors that have a bearing on a particular crime type into a single risk map that highlights the most vulnerable neighbourhoods. The strategic deployment of resources into those areas defined as high risk then has a mitigating influence, reducing the likely occurrence of the target crime type.

It is my belief that a similar approach can be taken to road accident prevention. By defining either a road type e.g. Rural 'A' Class, City Street or road user type, e.g. Young Driver, Leisure Rider, the key common causal factors can be identified. This knowledge is applied at a national level to identify the high risk sections of roads. Appropriate road safety interventions can then be properly targeted at these areas. The result: a proactive and preventative strategy that offers good value for money for the public purse.

**Planned Activities :** At present I see the research activities taking the following path:

* A review of my existing collision database to identify a suitable road type or road user type on which to base the initial RTM analysis. This study group will need to be broad enough to be statistically meaningful and representative of the chosen road type or road user type, without being too generalised or onerous to analyse.
* An in-depth analysis of the collision history of the study group to isolate common factors present in the occurrence of these crashes.
* Literature reviews of published work in the field of collision analysis to confirm factors identified in previous stage and ascertain further risk factors that should be considered in the risk terrain model.
* Data gathering and construction of initial risk terrain model, including testing model parameters for statistical reliability and layer weighting.
* Refinement of the model against same road/different data range, comparable road/same data range and comparable road/different data range sources.

I envisage the final outputs as being:

* A presentation of methodology and results in academic paper format and the submission of this for peer review.
* The creation of online Collision Risk Map based on the road type/road user type made available for general consumption and debate.

Based on feedback to the initial project I would see future development being the refinement of the model to include additional road types/road user types, creating a Collision Risk Map toolkit for those practitioners working in the field of AIP to utilise.