Implementing the Transport Scotland skid policy through the use of Operating Companies

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ABSTRACT

Transport Scotland are responsible for the management of the Scottish Trunk Road network which comprises a diverse network including motorways designed to modern standards and evolved single carriageway trunk roads. This is achieved through the appointment of 4 Operating Companies (OC's) who are responsible for ensuring that the network is maintained safely. This responsibility includes supporting the implementation of the Transport Scotland skid policy.

Transport Scotland have developed a guidance document for the OC's and undertake an annual priortisation process to identify sites that require investigation. In addition a Skid Policy User Group has been established to enable feedback on the implementation of the policy and identify appropriate improvements.

The OC's role in implementing the policy is to:

- Complete the site category review on 3 year cycle
- Inspection of data and compilation of a prioritised "long-list"
- Initial Investigations (desk based)
- Detailed Investigations (site based)
- Confirm that default Investigatory Level is appropriate
- Assessment of risk following investigation
- Reporting and recommendations
- Incorporation of recommendations into prioritised programme of works

An annual review is undertaken to assess how the O.C's are performing and identify areas of good practice that can be shared. The paper will consider the challenges presented by the approach adopted and how the OC's have developed to meet the challenge of delivering the policy.

1. INTRODUCTION

Transport Scotland (Scottish Gaelic: *Còmhdhail Alba*) was created on 1 January 2006 as the national transport agency of Scotland. It is an Executive Agency of the Scottish Government's Enterprise, Environment and Innovation Department and accountable to Scottish Ministers. Transport Scotland's remit includes the rail and trunk road networks, local roads policy, aviation, ports and harbours and other travel services.

This paper considers Transport Scotland's role as the Trunk Road authority and how they discharge this role with respect to the management of skidding resistance. Transport Scotland has contracts in place with four Operating Companies (OC) to manage and maintain the motorway and trunk roads, as well as a number of Design, Build, Finance and Operate concessions.

The Scottish Trunk road network is more diverse than the English Strategic Road network, with motorways and busy dual carriageways in the south, and a number of lightly traffic single carriageways in the north (figure 1). Much of the network is not laid out to modern design standards. Transport Scotland is a 'signatory' of HD28/04[1]; however due to the nature of the network this presents different challengers in implementing the standard to those experienced in England. In 2012/13 the 19% of the network below Investigatory Level; mainly comprising single carriageways.

2. TRANSPORT SCOTLAND GUIDANCE

In 2009 Transport Scotland issued the 'Guidance Document for Implementing a Skid Resistance Policy for Transport Scotland' for use by the Operating companies. The aim was to achieve consistency in the interpretation of HD28/04, and for Transport Scotland to interpret the complementary guidance in IAN98/07.[2] The Guidance Document provided advice on a number of issues, including site category rules, seasonal correction and the use of different devices for measurement. A key change was the adoption of a two stage investigation process ensured a year on year consistent approach to reviewing sites. The Guidance Document was updated in 2010 and remains the standard by which the Operating companies performance in monitored.

2.1 NETWORK REVIEW

The Transport Scotland network is subject to an ongoing programme of improvement and change, and as such there is a need to ensure that the skid policy accurately reflects these changes. This work is undertaken by the Operating Companies on a 3 year cycle to a defined set of rules and interpretations laid out in the Guidance Document. The process adopted typically involves using geometric data from high speed surveys, together with forward facing video and OS mapping. It has been observed that there can be significant 'double handling' of data. Currently the OC's are charged to make recommendations on any changes to the site category definitions, which are then implemented by Transport Scotland within the database system.

[1] HD28/04: Skid Resistance. Design Manual for Roads and Bridges.DFT
[2] IAN87/07: Guidance for HA Service Providers on Implementing the Skid Resistance Policy. DFT

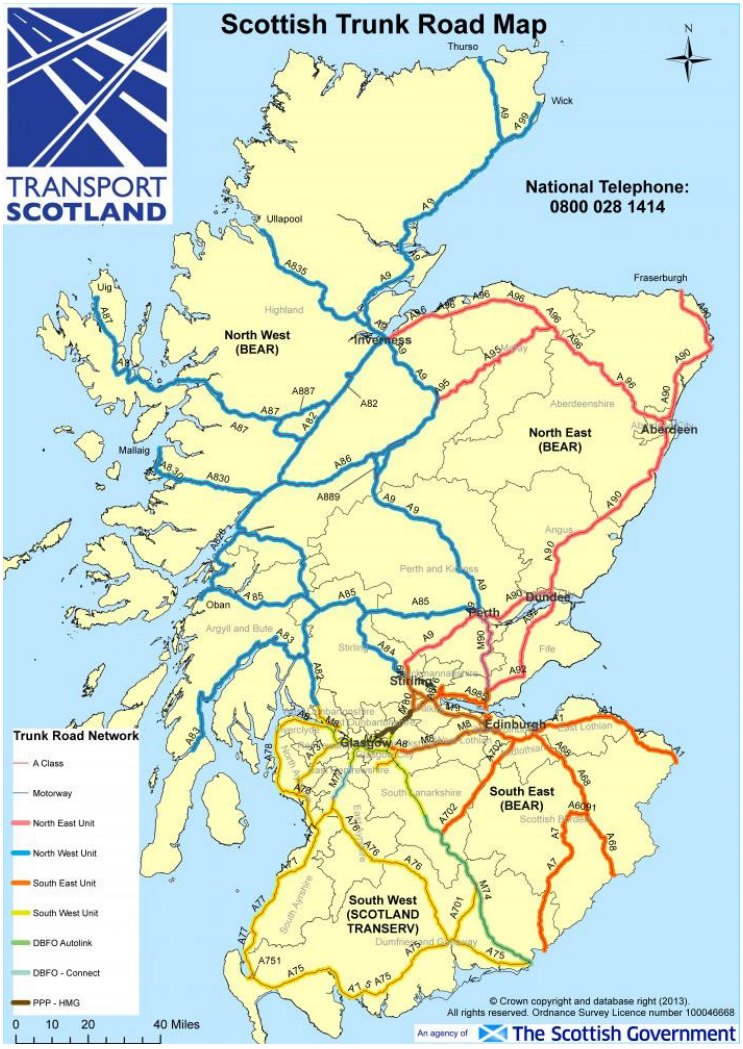

Figure 1: Scotland trunk road network (2013).

2.2 SURVEY STRATEGY

Until 2011 Transport Scotland surveyed half the network every year; however in 2012 the survey strategy was changed so the whole network is surveyed annually, ensuring changes to skid resistance are identified at the earliest opportunity. A number of benchmark sites have been established, and these are used to apply seasonal correction to the survey data using the 'Annual Survey with benchmark sites methodology' outlined in HD28/04. The change in survey strategy has had a consequential impact on the priortisation and investigation programme. With the transition to annual network surveys it is intended to move to the CSC correction methodology when sufficient data has been collected. This will provide the opportunity to define 'localities' for the purposes of the CSC calculation where different local correction factors can be applied.

2.3 PRIORITISATION

In the early stages of implementing the Transport Scotland skid policy it became apparent that the HD28/04 approach of investigating everything below Investigatory level could not be applied in Scotland for 2 principle reasons; the number of sites identified was significant (over 16000 in 2009) and the contractual arrangements were such that the OC's would need to bring in significant additional resources to undertake this work, at an additional cost to Transport Scotland. This was considered to be a disproportionate response in terms of the actual risk present and the degree of remedial work likely to be brought forward.

A priortisation methodology was therefore developed using crash records and SCRIM difference. Of the 16000 sites identified in 2009 over 12000 involved sites that were between 0 and 0.10 below Investigatory level with no recorded wet crashes. These were consequently considered lower priority sites than those with wet crashes, or more than 0.10 difference.

The development of the priortisation allows the 'long list' of sites to be generated using the Transport Scotland Road Information System in November each year on receipt of the seasonally adjusted SCRIM data. This initiates the annual SCRIM cycle for the OC's.

The Priortisation system describes sites as priority 1 -4 using the following approach

Priority 1.	CSC < IL and have had at least one wet crash in the past 3 years.
Priority 2.	CSC ≤ IL - 0.1 and have not had any wet crashes in the past 3 years.
Priority 3.	CSC is between the IL and IL+0.05 and has had at least one wet crash in the past 3 years.
Priority 4.	CSC is between the IL and IL – 0.1 and has not had any wet crashes over the past 3 years.

Sites that don't meet any of the above criteria are 'not priority sites.' Crashes are located on the Transport Scotland network using police reports.

2.4 INVESTIGATIONS

Transport Scotland have prescribed a 2 stage investigation process, the first stage being a review of contemporary data relevant to the site, including crash records, condition and works programmes, at which time it is decided whether a secondary investigation is required. Transport Scotland has set targets for the number of sites investigated, with the aim that each OC completes sufficient initial investigations to identify a minimum of 200 sites for detailed investigation, the intention being that ALL Priority 1 sites are investigated. It has been observed that the OC's have adopted different strategies to achieve this. Some review sites individually working down the 'long list' until 200 sites have been identified; whereas others apply a 'batch' process to all sites, arriving at the 200 sites. Records of all investigations are entered into the Road Information System database. In the past it has been observed that some OC's have reached the 200 target through adding lower priority sites adjacent to the higher priority sites (e.g. other side of road/ next SCRIM summary length). Whilst investigating the identified site and adjacent lengths is recognised as good practice; it is considered that the 200 sites should be identified in priority order. It is acknowledged that the Guidance Document does not

specify how the OC's undertake investigations.

The OC's have taken different approaches to undertaking secondary investigations. Typically they are undertaken by the 'planned maintenance' teams within the OC's, but the nature of the staff involved changes. One has used summer vacation students, who receive detailed training, and close supervision. The recommendations from these teams are peer reviewed and then subjected to scrutiny by the skid manager in the OC. Other OC's have imbedded the investigations in the work of the road safety and maintenance design teams. Both have been demonstrated to be effective, and through the review process the outcomes observed are generally consistent with the evidence presented.

The priortisation process has been in place for 5 years and it is recognised there may be some benefit from refinement. Observations have been made that single 'slight' wet crashes on marginally SCRIM negative sites often provide insufficient evidence to warrant a treatment. Equally sites with significantly low SCRIM but without crashes might warrant treatment and these currently have a lower priority. A concern is that due to the differing nature of the networks in each Unit, there is a risk that sites with particular characteristics may be investigated in one area, but not in another due to the respective number of priority sites in each area. Typically the North West area has more priority 1 sites and the detailed investigations are mostly made up of priority 1 sites; whereas the South East typically has fewer priority 1 sites, and priority 2 and 3 are subject to detailed investigations, in order to meet the target number of sites.

It has also been observed that the SCRIM investigation programme can be used to identify candidate sites for treatment before the investigation is completed to determine the most appropriate response based on the evidence provided. This seems in part be due to the culture within each OC. It has also been observed that in the past some OC's have been more risk averse than others, and therefore are inclined to recommend treatment at high ranked sites, sometimes irrespective of what the evidence might suggest.

3.0 SKID POLICY USER GROUP

A Skid Policy User Group (SPUG) has been established and meets 2/3 times a year. Each OC is represented on SPUG by the designated skid manager and an operational member. The purpose is to share experience and look at potential improvements to the process and the group has proved to be a success in this regard by providing a discussion forum to debate operational difficulties and experience. It has contributed to greater consistency and led to changes in the system, the process and the guidance. 2013 and 2014 has been a period of change with new OC contracts being awarded and new members of SPUG being introduced.

4.0 ANNUAL REPORTS

The OC's produce an annual report setting out their progress on the various tasks undertaken in delivering the skid resistance policy. It has been noted that the detail in each report varies significantly with some OC's providing a detailed listing of sites reviewed and others providing a more summarised overview. Whilst the information is held in the Road Information System, the inclusion of the summary information on sites in the annual report provides a focus on the nature and types of sites reviewed, as well

as how existing programmes address skid resistance concerns on the network. It has been observed that, depending on the recommendations made after investigation, it can be difficult to verify that the recommended treatment has been completed, and the annual report assist with this. This is especially the case where routine maintenance (drainage/ road markings/ signing) is recommended, or where the surface treatment is delivered by other teams. Changes to the system have been made to address this and the inclusion of a 'backward' look to recommendations from previous years will be added to the 2014 reporting requirements.

5.0 ANNUAL REVIEW

Transport Scotland has commissioned an annual review of each OC to determine how the policy is being implemented, and to identify any improvements to the methodology . The review involves a desktop assessment, meetings at the OC offices and the review of a number of initial and detailed investigations, including site visits. The first review was completed in 2009/10 and it is evident that there has been a significant improvement over the last four years in both the approach and the consistency in managing the skid policy.

Each Unit applies a different approach to the investigation process; however all demonstrate that they meet the investigation requirements and use the outcome to inform the programme of work. There remain differences in the approach adopted, and it has been noted that the change of 2 OC's in 2013 has resulted in significant changes. At the time of writing it is too early to assess the impact of these changes.

One area of inconsistency concerns how the OC's use crash data. Crashes are held in the database and can be easily interrogated; however the crash descriptions are not readily available, so contributory factors, vehicle details and other flags in the crash record are used. One OC has used crash data as the primary filter at initial investigation; however the approach adopted appears to have evolved over time as an 'in house' approach to manage the long list. Another OC doesn't use the detailed crash data at the initial stage and therefore might make recommendations that aren't supported by the detailed crash reports.

It has been noted that during the reviews the site category data includes a number of potential errors. These may be in part due to the processes adopted, but there may be a lack of understanding of some of the detailed interpretation required within the guidance document.

A common concern identified during the reviews is the funding for works identified from the investigations. Transport Scotland has not allocated dedicated funds for treatments arising from the policy so works are funded from existing budgets. One approach is to top slice this funding to ensure that monies are available to undertake treatments within the same financial year as the investigations however others appear to use a more informal process of working within existing budgets streams. A more formal move towards ring-fencing a proportion of existing budgets is currently being explored.

6.0 DEVELOPMENTS

The Transport Scotland skid policy has been going through a process of change since

2009. With the change of OC's in 2013 and 2014 there is a current period of consolidation and there are a number of developments planned for the coming years.

6.1 RESEARCH

Funding has been allocated to undertake research into the Transport Scotland skid policy. The objectives will be to use the data held in the Information System to gain a better understanding of how different materials and aggregates are performing on the Transport Scotland network.

6.2 ASSESSING POLICY BENEFITS

Transport Scotland have invested a considerable sum in the management of the skid policy, in terms of surveying costs and payments (direct and indirect) to the OC's to manage the process, as well as undertaking treatments. The benefit of this investment has not yet been assessed in detail and a review of the costs and benefits of the policy is planned for 2014/15.

6.3 PRIORITISATION

The priortisation model was introduced as a means to manage the lengths of the network that are below investigatory level in a systematic manner, and has ensured that the OC's have developed working procedures to investigate sites and prioritise works accordingly. It is considered that for the 2014/15 site listing there will be an opportunity to develop a new priortisation model using the experience gathered to date from the investigations completed.

7.0 CONCLUSION

The Transport Scotland skid policy is based on HD28, with some local variations contained the guidance document. Transport Scotland has implemented a number of processes to assist their Operating Companies to implement the policy, but also to enable monitoring to ensure that the policy is being implemented correctly. The Scottish trunk road network presents a number of different challenges to the Highways Agency network that have informed the approach adopted.

Author Biographies

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Martin McLaughlin is the Engineering and Programme Manager for transport Scotland with responsibility for managing the Transport Scotland skid policy.

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Mark Stephenson is a Chartered Civil Engineer with over 30 years' experience of Highway design and maintenance. He spent 22 years in local government in a variety of design, operational and policy roles, and was the assistant director for Cornwall County Council from 2005 -2008. In 2008 he joined W.D.M. limited, and leads the consultancy team in the company.