OXFORDSHIRE
COUNTY COUNCIL
ENVIRONMENT & ECONOMY
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Policy: Skidding Resistance (currently under Review)

Objectives

All sites exhibiting a measured skidding resistance at or below a pre-determined Investigatory Level should be recorded and investigated. The objectives are, firstly, to confirm whether the Investigatory Level is appropriate. Secondly, to ascertain whether the number of accidents is greater than would be expected for the type of site or if a disproportionate number of accidents occur in wet conditions or where skidding was reported. If so, or if the skidding resistance falls more than a certain level below the Investigatory Level then the site should be prioritised for early treatment. Otherwise, the site should be added to a programme for general improvements carried out over a longer term to bring about an overall high standard of skidding resistance.

The *Design Manual for Roads and Bridges,* Volume 7, Section 3 (HD 28/04) gives factors to consider and a methodology for accident analysis:

Section H of the Highway Management Policy Manual contains guidance on surface dressing operations.

Site Testing

1. Type of Survey

   Routine measurement of skidding resistance is carried out using Sideway-force Coefficient Routine Investigation Machine (Scrim).

   No other systems should be used for routine survey work, as these may affect the consistency of data and interpretation of results.

   Exceptionally, alternative systems may be used for detailed investigation of *local* sites (eg Portable Skid Resistance Tester, or GripTester).

2. Frequency and Coverage

   Current Oxfordshire practice is to survey all A roads annually, all B roads bi-annually, and other sites as necessary. This testing regime exceeds the minimum coverage recommended in HD 28/04.

Scrim survey operational procedures, and processing and computation of characteristic scrim coefficient to comply with HD 28/04

Testing of other roads is not carried out as routine. Apart from A and B roads, testing will normally be prompted only by requests from Area offices (eg following safety inspections), by the Road Safety Team, in response to individual risk assessments, a change in network hierarchy, strategy, or policy, or a significant change in local factors.

Risk Assessment criteria

1. Site Categories

   These must be assigned in accordance with guidance in the *Design Manual for Roads and Bridges* Volume 7.

2. Investigatory Levels

   These are allocated to sites based on road geometry (Site Category), the nature and likelihood of potential conflicts between road users, and the known accident history.

   Factors: road geometry
   speed of traffic
   high traffic flows
   junction frequency
   high proportion of HGV's
   frequency of injury accidents, taking particular account of the proportion in wet conditions and those involving skidding.

   The combination of factors and their likely effect will vary. This provides the rationale for setting appropriate investigatory levels at individual sites.

   The procedure for setting site categories and reviewing them is described in Appendix A to this policy (Oxfordshire County Council: Site Categorisations for Skid Resistance (to HD 28/04).

Process

1. Road Safety Team analyse and monitor the reports submitted by the police for injury accidents recorded on public highways. The information is stored in a database called AccsMap.

2. Road Safety Team sift the data and produce a dedicated file containing the accident data judged to merit further investigation. The file is periodically updated by the Road Safety Team.

3. HO Asset Management team uses software to superimpose accident clusters to the SCRIM data on the Pavement Management System (PMS). Maps are produced that highlight sites with a history of relevant accidents, that are coincident with SCRIM

results at or below investigatory levels. The maps also highlight relevant accident sites on roads not covered by routine testing, as well as other sections of road at or below investigatory level that have no recorded accident histories.

4. HO team consider this data in determining any additional sites for inclusion in the forthcoming Scrim survey. Requests to include specific sites are also invited from the Area offices and Road Safety Team.

5. Scrim survey is commissioned by April of the survey year. Coverage to include the routine annual programme, plus additional sites, recently surfaced sites, and test sites as required.

6. Scrim survey must be carried out between 1st May and 30th September of each year. The data should be processed in time to produce a timely programme of works.

7. Surveys must comply with the relevant British Standards. Contractor must provide evidence of machine calibration and testing.

8. Within and between year seasonal correction factors to be applied to Scrim data in accordance with current national guidance, and as described in Appendix B to this policy (Oxfordshire County Council: Procedure for Developing and Implementing values of Characteristic SCRIM Coefficient).

9. Survey results are interrogated to identify sites at or below Investigatory Level.

10. Plans are produced showing the location of these sites on the network

11. Latest accident data is imported into system, and accident locations superimposed onto the plans.

12. The plans and associated data are passed to the Area offices by November to allow time for Areas to consider sites for inclusion in the following seasons works programme.

13. All sites at or below Investigatory Level warrant further investigation.
The investigations should be carried out in priority order.

Priority

1. Sites or routes at or below Investigatory Level with greatest clusters of relevant reported accidents should be looked at first. If the skidding resistance is below Investigatory Level * and the accident records support the case to improve skidding resistance then, subject to site inspection and the degree that the site is below Investigatory Level, the carriageway should be included in a future programme of works.

2. Sites with lesser incidence of associated relevant accidents should be considered next, and ranked according to frequency and severity of accident, and by the amount that a site is below its Investigatory Level *

3. Sites well below Investigatory Level and with no history of relevant reported accidents should then be considered.

4. Remaining sites below Investigatory Level are a lower priority.

   * Maintenance decisions should not be made purely on the basis of a single survey unless the result is clearly below Investigatory Level (20% or more), as results can vary considerably. Either the mean of two well-spaced surveys in a single year, or the trend in results collected over two or more years is recommended to assess any particular site.

Programming of Works

1. Ranking

   The ranking of the works in the overall programme will depend on the status of the site compared with others that have been assessed according to these criteria. Sites measuring 20% or more below Investigatory level are deemed to be 'considerably below Investigatory Level,' and should be considered for early treatment. However, this definition should be taken in context.

   Where skidding resistance is determined as being considerably below the Investigatory Level and there are clear indications that improving the condition of surfacing is likely to significantly reduce the risk of accidents occurring, then remedial treatment should be prioritised as a relatively urgent task.

   Comparisons of estimated accident savings and the cost effectiveness of treatments can assist in establishing relative priorities of treatments at different locations. The cost effectiveness of treatments at different locations can be calculated by dividing the estimated accident saving by the anticipated cost of treatment.

   Sites below Investigatory Level, but to a lesser degree, should in most cases be entered into a programme of remedial works for completion within a reasonable timescale and taking into account other maintenance requirements. A comparison of the frequency and severity of accidents at each site should assist in determining the order of schemes in the works programme. Measurements of surface texture depth should also be considered. These may be available from Scanner Surveys, High Speed Road Monitor Surveys, or from the site investigation work that is undertaken following the skid resistance test. Cases of very low surface texture should be rectified. A combination of measured low skidding resistance and low texture depth should be given particular attention when considering the necessity and priority for remedial works. Furthermore, although surface texture depth does have a greater influence on skidding resistance at higher speed, it should not be ignored on roads with lower speed limits.

2. Timescales

   Accident histories and priorities for treatment must be re-examined annually, using the most recent available data.

Programmes should be formulated by November to allow timely pre-patching of surface dressing sites and commissioning of contracts.

Occasionally, urgent action may be required in advance of the main programme of works to address skid resistance problems that are leading to a high accident frequency.

Other considerations

1. Treatment

Considerations include the structural condition of the existing carriageway and the most suitable form of treatment (eg surface dressing, anti-skid, reconstruction, etc.). Other measures to reduce the accident risk of the site may be more cost–effective and consistent with local transport policy and must be discussed with the Road Safety Team.

The polished stone value (psv) of aggregates used in surface dressing and other resurfacing works must be appropriate for the task, and considered in the context of traffic speeds, the site environment and the potential for reducing the risk of accidents.

The change in skid resistance associated with the transition between a newly laid material and adjacent in-service materials can give rise to added accident risk. Transitions must be avoided at sensitive locations such as on bends and where vehicles are braking for junctions or crossings.

2. Erection of Signs

"Slippery Road" warning signs to Diagram 557, Traffic Signs Regulations and General Directions (2002) should be erected as soon as practicable at sites where remedial measures to improve skidding resistance have been determined as being necessary (ie schemes included in a list of future works). These signs should only be removed when the remedial action has been taken and maintenance engineers are satisfied that skidding resistance levels have been returned to an appropriate level.

Newly laid road surfaces can also exhibit a reduced initial skidding resistance until the binder film wears off. Consequently, braking distance could be affected until the aggregate surfaces are exposed by the action of weather and traffic. Consideration should therefore be given to erecting warning signs at the time of surfacing, irrespective of the reasons for applying the treatment. Therefore:

Where new asphalt surfaces are laid on higher speed roads (speed limit above 40mph) slippery road signs should be erected for at least 6 months unless a risk assessment establishes that this is not required.

Where new signs are erected consideration must be given to the County Councils 'de-cluttering' vision. In all cases, signage overall will be kept to a practicable minimum.

3. Risk Assessments for Signing

Although Interim Advice Note 49/03 provides some guidance on signing in these situations, it is written with motorways and trunk roads in mind. Given the extent, nature and variety of the County road network, it is more prudent to undertake risk assessments at individual sites to substantiate the need for signing where appropriate. As signs will be limited to particular sites they are more likely to affect driver behaviour. Similarly, unnecessary signing of sites could undermine the credibility of the message.

The risk assessments should pay heed to the conditions at a site, the nature of any potential hazards, and their possible effects. Factors such as the alignment, gradient, junctions, constraints, type of traffic, traffic speed, accident histories and local factors are all considerations. Implications for motorcyclists should receive particular attention**.** Reference should be made to site category designations and Intervention Levels where these exist. Categories can be assigned to other sites as part of the risk assessment process undertaken at individual sites.

4. Removal of Signs

Where signs have been provided following the provision of new asphalt road surfaces they must remain in place for **at least** 6 months, and removed when no longer required. Although the timing may prove difficult to ascertain precisely, the decision can be qualified in part by including specific sites in successive seasons Scrim survey programme.

Information and construction details must be passed to HO team by the client team responsible for the works. An Investigatory Level will be set for each site. These sites may then be included in the following seasons Scrim survey programme and results compared. Signs must remain in place until maintenance engineers are satisfied that skidding resistance is at an appropriate level. Again, implications for motorcyclists should be a particular consideration.

Thin Surfacing Treatments

Binder rich materials such as Stone Mastic Asphalt (SMA) provide durable and economic surfacing treatments that perform well in many situations. They also absorb more road noise than conventional surfacings, so are quieter in use. However, there has been some recent conjecture concerning the early life skidding resistance of these materials. Whilst there is no qualified evidence to substantiate this, the materials are the subject of ongoing research and debate. New national guidance is anticipated, *possibly* during 2006.

The following practice will apply to all thin surfacing applications on carriageways in Oxfordshire, from April 2006. The practice will be reviewed as new guidance is subsequently released:

> **From April 2006, fine abrasive grit must be rolled into the running surface of all thin surfacing carriageway materials laid by or for the County Council on public highway. Under traffic, the abrasive action of the grit will assist in**

breaking down the binder layer and exposing the aggregate surface. The grit must conform to a standard specification as produced by the Council's term consultant, and implemented by its contractors. Roads must be thoroughly swept shortly after application to remove surplus grit. From this date also, materials containing limestone fines will not be permitted. Developers will be expected to adhere to the specification. County Council design guides should be amended accordingly.

Thin surfacings are unlikely to be used for minor patching works because they are difficult to hand lay. Utility companies will be advised of the Council's requirements, but are unlikely to use thin surfacings for similar reasons.

The application of grit to thin surfacings is also in keeping with CSS/British Horse Society guidance (May 2005) aimed at addressing the incidence of horses slipping on road surfaces.

The protocol described in this policy for the erection and removal of signs applies equally to sites where thin surfacing materials have been laid.

Review

1. Feedback and advice

Ongoing dialogue is required between the Road Safety Team, Area and HO teams. The Road Safety Team will advise Area staff on accident related issues, and qualify that proposed measures are most appropriate in terms of accident prevention.

Area offices must provide a provisional list of surface dressing sites to HO by mid October of each year.

Area offices and HO to agree provisional and final works programme using the most recent survey data where practical.

Area offices to supply construction data to HO monthly throughout surface dressing season.

HO to feedback details of sites and treatments to Road Safety Team within one month of programme completion.

2. Monitoring

The results of investigations and actions arising should be recorded by the HO team and shared with the Road Safety Team. These must be retained to enable implementation of policy to be demonstrated in court.

Maintaining records of the accident numbers in the years before and after treatment, plus the type and cost of treatment will also allow the cost–effectiveness of different treatments to be assessed. This information should also be supplied by the Road

Safety Team to the CSS and Highway Agency “Monitoring Of Local Authority Safety SchemES” (MOLASSES) database, where it is collated centrally.

Road Safety Team will monitor sites post treatment until a judgement can be made concerning its success in preventing or reducing accidents.

HO Asset Management Team will monitor the cost effectiveness of treatments, and undertake a full review of Site Investigatory Levels every 3 years.

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