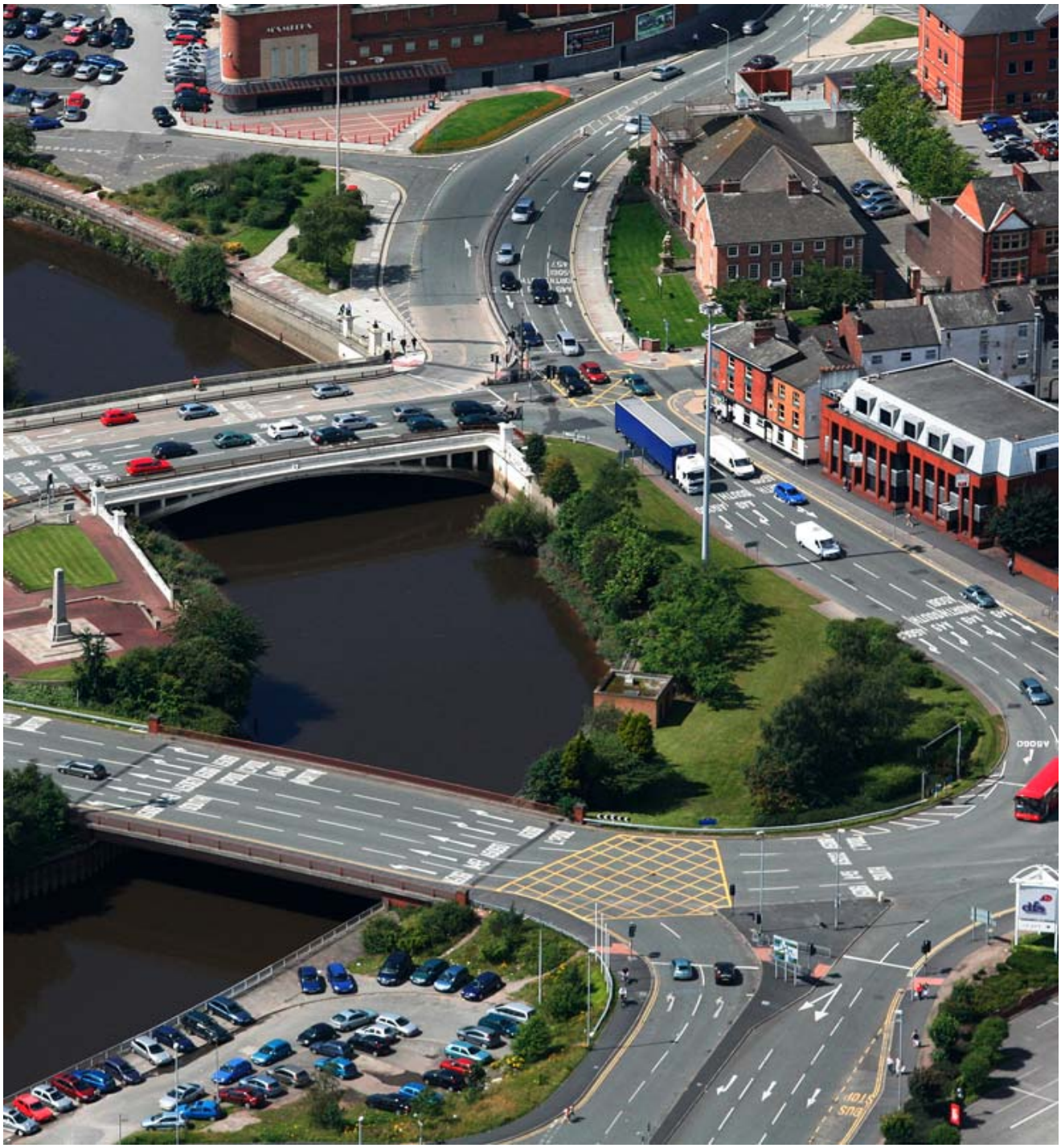
Warrington Borough Council
Highway Skidding Resistance Policy May 2017



WARRINGTON
Borough Council

Warrington Borough Council

Highway Skidding Resistance Policy November 2016

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Revision history	Date	Author
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1. Introduction

The maintenance of adequate levels of skidding resistance on road surfaces is a very important aspect of highway maintenance, and contributes significantly to the safety of users of the highway network.

This policy sets out Warrington Borough Council's approach to managing skid resistance levels of road surfaces to provide an appropriate level of service to meet the overall requirements of the Highway Asset Management Plan.

It is based on the guidance provisions of Department for Transport Design Manual for Roads and Bridges standards HD28/15 and HD36/06, and takes into account local conditions.

The policy is intended to assist in reducing the number of people killed or seriously injured on Warrington's roads and at the same time ensure that the Authority meets its duty of care requirement under the Highways Act 1980.

2. Skidding Resistance

2.1 Skidding resistance is generally accepted to be a function of:-

- The traffic volume and number of heavy goods vehicles over the life of the surfacing;
- The surface properties of the aggregate (microtexture), indicated by its polished stone value (PSV); and
- The surface texture (macrotexture).

2.2 The friction available on a wet or damp road can be substantially lower than the same surface when dry and is dependent on the condition of the surfacing material i.e. how polished the road surface has become under traffic. This depends primarily on the resistance to polishing of the aggregate, the amount of heavy traffic and the type of traffic movement (free flow, braking, turning etc.).

2.3 The skid resistance of a wet road is dependent upon the *microtexture* of the aggregate particles at the surface. This property is necessary for vehicle tyres to penetrate films of water on the surface of the road and achieve sufficient contact. It is important at all traffic speeds but is seen to predominate up to 50Km/h. At speeds above 50Km/h, skid resistance is more dependent upon the overall texture of the road surface and its ability to disperse water from between the vehicle tyre and the road surface. This ability is provided by the *macrotexture* of the road surface.

2.4 Reduced friction can be an important contributory factor in road collisions although it is not normally a causative factor. However, where high levels of friction are needed, e.g. in an emergency stop, better skid resistance can help to reduce collisions. It is not possible to define a threshold at which the skid resistance goes from being “safe” to “dangerous” because, even on wet roads with low skid resistance, friction will be adequate to achieve normal acceleration, deceleration and cornering manoeuvres. Conversely, the friction needed to avoid a collision in some situations may be higher than can actually be achieved.

2.5 The principle of HD28 is broadly to equalise the risk of skidding collisions across the network by providing a level of wet road skid resistance appropriate to each location. A key part of the Standard is therefore to identify locations where a greater level of friction is likely to reduce the risk of skidding collisions.

2.6 It has been found that skid resistance has a greater effect on collision risk for some site categories than for others. For example, there is a stronger link between skid resistance and collisions for single carriageway roads than for dual carriageway roads or motorways. This is why the different site categories have different Investigatory Levels (IL) for skid resistance.

2.7 There is also a wide variation in collision risk for sites in the same site category, implying that local factors such as road layout, visibility and traffic levels can be important. This is why a range of ILs was introduced for most site categories in the Standard.

2.8 It should be noted that the measured skid resistance is only one aspect of the road surface condition relevant to road safety. Other aspects such as the texture depth or the presence of localised areas of deterioration also need to be considered.

2.9 The objective of the policy is to reduce the risk of skidding collisions at a site, and not necessarily to increase the skidding resistance. The objective is to evaluate and monitor skidding resistance to ensure that this does not fall below the Investigatory Level and, if required, provide an adequate level of skidding resistance by specifying the appropriate properties of the aggregate to be used in surfacing materials, or by surface treatment.

3. Aims and Objectives

The overall objectives of this policy are:

- To formalise processes for monitoring skid resistance on the Warrington road network
- To help reduce the number of people being killed or seriously injured on Warrington's road network
- To be able to robustly defend claims against the Authority
- To ensure Warrington Borough Council meets its duty of care under the Highways Act 1980.

In order to achieve this, the Council will, in accordance with the provisions of Department for Transport Design Manual for Roads and Bridges, Volume 7, HD 28/15, Chapter 2:

- Adopt a set of skid resistance Investigatory Levels based on those recommended in HD 28/15
- Undertake annual surveys of the defined network to measure the skid resistance of the road surface and compare the results with the Investigatory Levels to identify potentially deficient sites where the skid resistance is at or below Investigatory Level
- Evaluate the potentially deficient sites to consider whether work to improve skid resistance is required
- Investigate collision history at other sites where increased wet or skidding collisions to establish whether inadequate skid resistance could be a contributory factor and recommend whether remedial treatment is necessary
- Erect warning signs where necessary and remove them when appropriate
- Make the most cost effective improvement in wet skid resistance, and to prioritise sites for remedial treatment within the resources available
- Provide an appropriate level of intervention and remediation within the overall budget for highway maintenance
- Adopt and specify appropriate standards for materials for maintenance works to reduce potential skidding situations.

4. Skidding Resistance Strategy

4.1 Network to be Surveyed (the Defined Network) and Frequency of Surveys

A class roads will be surveyed annually in both directions.
B class roads will be surveyed annually in both directions.
Selected C class and unclassified roads carrying one-way traffic flows in excess of 5000 vehicles per day AADT will be surveyed annually in both directions.
The defined network includes the lane to be tested.

For all other highways (unsurveyed C class and unclassified) the Authority will ensure the highway is safe under its Duty of Care outlined in the Highways Act but not to the risk assessment provisions of HD28/15. Routine skidding resistance surveys will not be done on these roads, but site specific testing may be done following repeated personal injury incidents involving vehicles in wet conditions, regular damage to street furniture, or customer concerns.

4.2 Test Equipment and Quality Assurance

The defined network will be surveyed annually using a Sideway Force Coefficient Routine Investigation Machine (SCRIM) in accordance with HD28/15 by an accredited survey contractor.

Testing will be carried out in accordance with Chapter 3 of HD28/15 and the UKPMS user manual, volume 3 chapter 6: SCRIM. The SCRIM vehicles will be calibrated before each test season and regular calibration checks will be made during the season.

Until 2013, a GripTester 2 machine was used to record skidding resistance data. From the 2014 surveys a SCRIM machine has been used, and future surveys will be made using SCRIM. Results will henceforth be presented as SFC, and results from the Grip Tester surveys will be converted to SFC for comparison. The GN results will be kept as archive.

The results from the different machines are not directly interchangeable because of the techniques employed by each system. The output from the GripTester is presented as a Grip Number (GN), whereas the SCRIM machine output is Sideways Force Coefficient (SFC). There is a conversion factor of 0.89 that may be used to relate Grip Number to SCRIM results (TRL report PPR497) but this conversion will not be a direct correlation between the two systems.

Microtexture is the main component measured by SCRIM.
A pendulum skid tester may be used for detailed investigation of individual sites as appropriate.

4.3 Method of Survey to provide an estimate of the Summer skid resistance, referred to as the Characteristic SCRIM Coefficient (CSC) (HD28/15 Annex 2):

The Single Annual Survey method is used. The time of testing will be varied each year so that the network is surveyed during the early, middle and late parts of the testing season. The data from the preceding 3 years will be analysed to establish the Local Equilibrium Correction Factor (LECF) as described in HD28/15 to determine the corrected CSC for each 10m section of road surveyed.

4.4 Approach to setting Investigatory Levels

The Defined Network is divided into sections and each section is allocated a Site Category according to its characteristics as defined in Chapter 4 of HD28/15. If a section has more than one characteristic, e.g. pedestrian crossing on the approach to a roundabout, it will be allocated the site category with the higher Investigatory Level.

Changes to the road network may take place at any time, causing a change in characteristics, e.g. installation of a new pedestrian crossing or change of speed limit. Site categories will be reviewed before each annual survey to ensure that they are correct for the current network.

The Investigatory Level (IL) for each site category has been set in accordance with the procedure in Chapter 4 and Annex 5 of HD28/15. The lower values given in Table 4.1 of HD28/15 have been used, and are shown in Table 1 below. This is because the highway network in Warrington does not exhibit the same characteristics as trunk roads and motorways, as traffic volumes and speeds are generally lower. Setting lower ILs within the permitted values for each category is justified where the risks are well mitigated and a low incidence of collisions has been observed. Where the collision statistics indicate a high risk of collisions at a particular location, the IL will be maintained at the highest appropriate level pending investigation.

The procedure for setting the site category for different characteristics of roads is detailed in Interim Advice Note 98/07.

Table 1 – Warrington Site Categories and Investigatory Levels
(derived from Table 4.1 of HD28/15)

	Site category for the Defined Network	Investigatory Level at 50km/h (CSC)							
		0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65
B	Non-event carriageway with one-way traffic (dual carriageway)		●						
C	Non-event carriageway with two-way traffic			●					
Q	Approaches to roundabouts and to and across junctions.				●				
K	Approaches to pedestrian crossings and other high risk sites.					●			
R	Roundabout circulation areas				●				
G1	Gradient 5-10% longer than 50m				●				
G2	Gradient >10% longer than 50m				●				
S1/S2	Bend radius <100m, one-way or two-way traffic				●				
S1/S2	Bend radius <500m, speed limit 50mph or higher				●				

Initial Investigatory Level used on the Warrington defined network shown:	●
Investigatory Levels for each Site Category as shown in HD28/15: normal value in dark grey, value for low risk / low traffic volume / low speed roads light grey.	

4.5 Review of Investigatory Level

A full review of Investigatory Levels will be carried out before the 2017 surveys are carried out.

Investigatory Levels will be reviewed:-

- At least every three years;
- When observed CSC results indicate that a section lies below the current IL and the site investigation provides information that suggests the current IL is inappropriate;
- Where analysis of injury collision records for the previous 36 months show there is a significant number of collisions on wet or damp roads where skidding was recorded as a factor; or
- When changes are made to the defined network.

The objectives will be to:

- Determine whether the current IL is appropriate;
- Determine whether a surface treatment is justified to reduce the risk of collisions in wet/damp conditions;
- Determine whether some other form of action may be required;
- Determine not to carry out any works, but to keep the site under review.

The procedure detailed in this document, site investigation and Chapter 4 and Annex 5 of HD28/15 shall be followed.

Factors influencing the review will include:

- Any changes that have taken place in the site use, surfacing material or road layout e.g. the installation of traffic signals, pedestrian crossings or roundabouts;
- Any relevant local factors such as safer routes to schools, non-injury collisions, complaints or repeated reports of damage;
- Details of injury collisions, particularly those where the road surface was wet, or damp;
- Site investigation.

All recommendations about Investigatory Levels shall be submitted to the Engineering and Flood Risk Manager.

Any adjustments to Investigatory Levels that are deemed appropriate will be made in steps of 0.05 CSC units.

A record of all changes made to ILs will be retained.

4.6 Authorised persons to set or approve ILs

The responsibility for specifying the skid resistance, setting the Investigatory Levels and leading site investigation in accordance with HD28/15 shall be with the Engineering and Flood Risk Manager.

4.7 Analysis of survey data and presentation of results

The data will be validated and processed and supplied in HMDIF format for input to the Warrington Borough Council UKPMS pavement management system by a suitably accredited contractor.

The data shall be checked to ensure that the entire defined network has been surveyed. Where omissions are identified, a decision will be made whether to revisit the omitted locations to carry out a further survey or ensure that the locations are surveyed the following year.

The data shall be corrected to derive the CSC.

The data will be presented in GIS format as a thematic map, which shall show:-

- The sections of road that are above the Investigatory Level – (shown in green)
- The sections of road that are up to 0.05 CSC units beneath the Investigatory Level – (shown in yellow)
- The sections of road that are between 0.05 and 0.1 CSC units beneath the Investigatory Level – (shown in orange).
- The sections of road that are more than 0.1 CSC units beneath the Investigatory Level – (shown in red).
- Sections of road that could not be surveyed shall be highlighted.
- Asphalt road surfaces less than 12 months old shall be highlighted so that they can be omitted from the types of analyses as stated in Annex A, paragraph A.1.26 of HD28/15.

4.8 Initial Investigation

All sites where the measured CSC is at or below IL shall be investigated in accordance with the process stated in HD28/15 Chapter 5. The Site Investigation form shown in Appendix A of this document shall be used for detailed investigation.

4.9 Approach following site investigation

Data are to be shared with the Collision Investigation team to identify if there are any locations where the skid resistance is below the IL and there is also a higher incidence of collisions involving wet skids. Sites where there is a correlation of these factors will be investigated further to identify whether the condition of the road surface being below IL is a causation factor or whether other factors are more significant, e.g. road layout or speed. If it is established that the site needs remedial action to restore the required skid resistance it will be put on a programme of works for treatment.

Sites requiring detailed investigation will be investigated in accordance with the criteria detailed in Appendix A annexed.

Slippery Road warning signs will be erected to warn road users of sites where the skid resistance is lower than the IL and may result in an increased risk of collision. The procedure stated in Chapter 7 of HD28/15 will be followed.

4.10 Prioritisation of remedial works

Sites where the skidding resistance is determined as being substantially below the IL (0.10 CSC units below IL) will be prioritised for investigation. Where there are clear indications that improving the condition of the surfacing is likely to significantly reduce the risk of collisions occurring (as indicated by recent collision data), then remedial treatment will be prioritised.

Priority will then be given to the following sites:

- where the skid resistance is at least 0.05 CSC units below the investigatory level;
- where low skid resistance is combined with low texture depth;
- where the collision history shows there to be a clearly increased risk of wet or skidding collisions.

Where investigations show that treatment is necessary, consideration will also be given to whether other measures may be more appropriate. Surface treatment or resurfacing may not always be a necessary response and other measures to reduce the collision risk of the site may be more cost effective and consistent with local transport policy.

The frequency of collisions involving wet skids per vehicle kilometre will be used as a measure of assessment of priority for remedial works. Other factors to be taken into consideration will be proximity to schools and other areas where there is a greater number of vulnerable road users.

4.11 Early life skid resistance

In accordance with HD28/15 Chapter 7 paragraph 7.5, slippery road warning signs shall not be used at newly-laid asphalt road surfaces.

The provisions of paragraphs A.1.24 to A.1.26 of Annex A of HD28/15 will be applied to newly-laid asphalt road surfaces. Asphalt road surfaces less than 12 months old will be identified during the data analysis process, as these may exhibit different skid resistance properties during this time compared with surfaces that have been exposed to traffic for a longer time. These surfaces will be considered to have reached equilibrium state 12 months after laying.

4.12 Timetable for delivery of each part of the strategy

Testing will be carried out each year as paragraph 4.3. Results will be delivered in the Autumn. Analysis and prioritisation of sites will be done in December, for inclusion in the maintenance programme for coming year in January.

4.13 Responsibility for delivering each part of the strategy is with the Engineering and Flood Risk Manager.

4.14 Documentation to be retained to enable implementation of the policy to be demonstrated:

Documentation	Location
Record of IL for each section of the Defined Network	Yotta Horizons highway asset management database
Survey HMDIF files and coverage report	Files for each annual survey held in yearly folders in ENRG-Design\Asset Management as Grip Tester 2009 etc. or SCRIM 2014 etc.
Map of results as specified previously	Derived from Horizons data, retained as pdf in yearly folders as above
List of sites to be investigated	Asset Management\Skidding Resistance Sites folder on ENRG-Design for each year.
Details and results of investigations	Asset Management\Skidding Resistance Sites folder on ENRG-Design for each year.
List of priority sites and record of how the priority was derived	Asset Management\Skidding Resistance Sites folder on ENRG-Design for each year.
Dates of installation and removal of warning signs	Asset Management\Skidding Resistance Sites folder on ENRG-Design for each year.
Dates of treatments	Asset Management\Skidding Resistance Sites folder on ENRG-Design for each year.
Records of changes to IL and reasons	Asset Management folder on ENRG-Design
Collision data	Key Accident database in Traffic Management and Safety unit

The documentation will be retained for five years.

4.15 Concerns expressed about Skidding Resistance

All concerns about skid resistance will be examined to an appropriate level of detail. In some cases a surface condition report for the site will be prepared by a highway engineer, in consultation with collision investigation and maintenance engineers. Annual SCRIM surveys and other condition survey results will be the basis for responding to any enquiry about skid resistance on the defined network.

4.16 Monitoring of Collision Frequency

The frequency of collisions occurring on a wet or damp road surface can be an indicator of inadequate grip. The Council holds records of all reported injury collisions from Police data. This information will be interrogated annually to identify locations where the frequency of such collisions is a cause for concern. The locations will be examined by a highway maintenance engineer in conjunction with the Council's collision investigation engineers to identify whether skid resistance in these locations is a contributory factor in collisions, and establish whether remedial measures are required.

The procedure will be to:

- Run a collision query for 3 years up to date of last SCRIM survey to identify wet skid cluster sites;
- Compare the sites with SCRIM to see if there is a deficiency in skidding resistance;
- Inspect the sites with wet skid collision history and low SCRIM to see what remedial measures may be required;
- Inspect sites with wet skid collision history *not* on the surveyed network to see if SCRIM testing is needed to see whether the skidding resistance is below the appropriate IL;
- Prioritise treatments in the future maintenance programme.

5. Aggregates and Materials for Road Surfacing

5.1 Surfacing Materials

Surface texture, combined with the polished stone value (PSV), is desirable for high-speed skid resistance; however in an urban environment it is not as critical as suitable skid resistance can be achieved by specifying an appropriate aggregate PSV and selection of the surfacing type. Increased texture depth for new surfacing may also be specified in addition to higher PSV.

The PSV of surfacing materials and its relationship to the Investigatory Level and volume of traffic is shown in table 3.1 of HD36/06. The minimum PSV shall be 50. When specifying materials to be used for new construction or resurfacing, the PSV of the aggregate shall be appropriate to the site category where it is to be laid (normally this will be minimum 60 PSV). The Aggregate Abrasion Value (AAV) for chippings or coarse aggregate used shall be in accordance with table 3.2 of HD36/06.

Table 2 – Minimum PSV for given IL

PSVs in the shaded rows are to be used on roads where the speed limit is greater than 40mph.

Minimum PSV required for given IL, traffic level and type of site												
	NRSWA Road Category as Table S1.1		**3**	**2**	**1**	**1**	**1**	**0**				
	Traffic (msa) at design life 20 years		**0.5-2.5**	**2.5-10**	**10-15**	**15-20**	**20-30**	**30-40**				
	Traffic (commercial vehicles/lane/day) at design life		**0-250**	**251-500**	**501-750**	**751-1000**	**1001-2000**	**2001-3000**	**3001-4000**	**4001-5000**	**5001-6000**	**Over 6000**
Site Category	**Site Description**	**IL**										
B1	Dual carriageways or one-way roads where traffic is generally free-flowing on a relatively straight line	0.35	50	50	50	50	50	60	60	60	65	65
		0.4	50	50	50	55	60	65				
B2	Dual carriageways or one-way roads where some braking regularly occurs (e.g. on 300m approach to an off-slip)	0.35	50	50	50	55	55	60	60	65	65	65
		0.4	55	60	60	65	65	68+				
C	Two-way carriageways where traffic is generally free-flowing on a relatively straight line	0.4	55	60	60	65	65	68+	68+	68+	68+	68+
		0.45	60	60	65	65	68+	68+				
G1/G2	Gradients >5% longer than 50m as per HD 28	0.45	55	60	60	65	65	68+	68+	68+	68+	HFS
		0.5	60	68+	68+	**HFS**	**HFS**	**HFS**				
K	Approaches to pedestrian crossings and other high risk situations	0.5	65	65	65	68+	68+	68+	HFS	HFS	HFS	HFS
		0.55	68+	68+	**HFS**	**HFS**	**HFS**	**HFS**				
Q	Approaches to major and minor junctions on dual carriageways and single carriageways where frequent or sudden braking occurs but in a generally straight line.	0.45	60	65	65	68+	68+	68+	68+	68+	68+	HFS
		0.5	65	65	65	68+	68+	68+	68+	HFS	HFS	HFS
		0.55	68+	68+	**HFS**	**HFS**	**HFS**	**HFS**				
R	Roundabout circulation areas	0.45	55	55	60	60	65	65	68+	68+	HFS	HFS
		0.5	68+	68+	**HFS**	**HFS**	**HFS**	**HFS**				
S1/S2	Bends (radius <500m) on all types of road, including motorway link roads; other hazards that require combined braking and cornering	0.45	55	55	60	60	65	65	68+	68+	HFS	HFS
		0.5	68+	68+	68+	**HFS**	**HFS**	**HFS**	HFS	HFS	HFS	HFS
		0.55	**HFS**	**HFS**	**HFS**	**HFS**	**HFS**	**HFS**				

Table 2 above is based on Table 3/1 of HD36/06. The ILs are derived in accordance with Table 1 on page 10.

Volumes of commercial vehicles per day (cv/d) above 3000 are not generally experienced on the Defined Network in the Warrington BC area. National standards will be adopted for roads carrying in excess of 3000cv/d.

If there is no traffic information available, the NRSWA road categories as applied to each street on the network will be used when specifying the PSV of surfacing materials.

Table S1.1 Road categories (From the Specification for the Reinstatement of Openings in Highways (New Roads and Street Works Act 1991: Second Edition 2002)

Road Category	Traffic Capacity Table	Table NG1.1, (6% growth rate)
Type 0	> 30 to 125 msa	> 2220 to 7350 cv/day
Type 1	> 10 and < 30 msa	> 1000 and < 2220 cv/day
Type 2	> 2.5 and < 10 msa	>380 and < 1000 cv/day
Type 3	> 0.5 and < 2.5 msa	> 100 and < 380 cv/day
Type 4	< 0.5 msa	< 100 cv/day

(msa: million standard axles)

5.2 The use of High Friction Surfacing

High Friction Surfacing (HFS) incorporating calcined bauxite to Specification for Highway Works clause 924 has traditionally been used to increase skidding resistance at high-risk locations such as the approaches to controlled pedestrian crossings, traffic signals and roundabouts. It has also been used at locations such as bends to improve skidding resistance where there has been a history of collisions where loss of control has been a contributory factor.

The cost of bauxite, the key aggregate ingredient in HFS and generally imported from China, has risen by about 100% since 2005. It is likely to continue to rise in the future due to scarcity of the raw bauxite, and its use must be economically justified.

HFS has ongoing expenditure requirements to maintain its effectiveness. On application to the road surface, the resin binder fills the voids in the road surface material. As the HFS aggregate wears under traffic, the underlying resin adhesive is exposed and the surface texture depth is reduced, which can result in the road being slippery in wet conditions. This deterioration can occur after a comparatively short period depending on the amount of traffic and the condition of the underlying surfacing. At this point, the HFS must be re-applied or the road surface replaced. If the HFS is re-applied, the material eventually becomes thick and brittle and is prone to shearing away from the road surface.

The cost of applying HFS is comparable to the cost of replacing the surface course material. However the expected life of the HFS is in the range of 5 to 10 years but experience suggests that this may be nearer to 2 or 3 years, whereas the life of hot rolled asphalt surfacing is expected to be in excess of 20 years.

The required skidding resistance in locations where HFS has traditionally been used can be achieved in most cases by the use of high PSV aggregates in the surfacing materials. Because of this, it is usually more economical in whole life terms to replace surfacing material than apply and re-apply HFS to achieve the required skidding resistance.

The required PSV for the various site categories and traffic volumes is shown in Table 2 above. Where the PSV can be obtained by specification of appropriate aggregates for surfacing materials, these will be specified for both new construction and maintenance instead of HFS.

HFS will be considered as a surface treatment to improve skidding resistance when:

- A higher PSV is required (as shown by “HFS” in Table 2 above) than can be achieved with high PSV aggregates in surface course materials for new construction or maintenance schemes;
- Improvements to skidding resistance on existing surfaces are recommended following site investigation after identification of a significant collision history where resurfacing is not justified on maintenance grounds.

The general policy will be to avoid the use of HFS in favour of using high PSV aggregates as appropriate for the site. A site-specific assessment will be used to justify the use of HFS, as shown in Appendix A.

The natural light buff colour of HFS provides a contrast to the normal dark colour of asphalt surfaces, and this can help to alert drivers to a hazard ahead. However, there is less contrast between buff HFS and white road markings, and therefore the road markings are less obvious. The contrast of white road markings, for example zebra crossing stripes and give way lines, signal stop lines and zigzags on a dark asphalt road surface is clearer, and gives more relevant information to drivers than given by an area of HFS.

At controlled pedestrian crossings, measures such as the use of brighter LED-lit pedestrian crossing beacons and illuminated posts can help to make them more conspicuous to drivers, and increasing the distance from the give way or stop line to the actual crossing point to 3 metres to provide a margin of safety in the event of late braking can make a positive contribution to safety at these locations and, combined with the use of high-PSV surface course materials, reduce the need for HFS.

Appendix A

Carriageway Skidding Resistance Survey
Detailed Site Investigation Form

WARRINGTON Borough Council

1. General Information	
1.1 Site Investigation Reference	
1.2 Road Name	
1.3 Posted Speed Limit	
1.4 Environment (rural / urban)	
1.5 Date of inspection	
1.6 Time of inspection	
1.7 Weather conditions	
1.8 Name of assessor	

2. Section(s) Data								
Name	Section Label	Length (m)	Site Category	Road Type	Chainage	Investigatory Level	CSC	Diff

3. Location and nature of site			
3.1 Plan(s) attached	☐ Yes	☐ No	
3.2 Has the site been previously investigated? If so when?	☐ Yes	☐ No	
3.3 Describe any features that could be expected to require road users to be able to stop or manoeuvre to avoid a collision? For example, junctions, lay-bys, other accesses, crossings, bends or steep gradients.			
3.4 Does the site contain a sharp bend to the left in combination with traffic braking or accelerating. For example, a sharply curved roundabout approach or exit? In these circumstances the offside wheel path can become more polished than the nearside wheel path.	☐ Yes	☐ No	
3.5 Does SCANNER data indicate low texture depth?	☐ Yes	☐ No	☐ Not available
3.6 Does SCANNER data indicate other defects that may contribute?	☐ Yes	☐ No	☐ Not available

4. Collision History: Within the section length in the last 3 years.			
4.1 Period start date			
4.2 Period end date			
4.3 Number of collisions during the period		Number per year	
4.4 Number that were wet collisions		Number per year	
4.5 Number that were wet skid collisions		Number per year	
4.6 Number of wet road fatal or serious injuries		Number per year	
4.7 Number of wet road fatal or serious injuries to a targeted high risk road user group. Currently, 60+ age group; pedal cyclists; motor cyclists		Number per year	
4.8 Are collisions linked to surface condition?			
4.9 Does the position of wet or wet skid collisions coincide with the lengths of low skid resistance?			
4.10 Other collision information e.g. reports or visual evidence of damage only collisions			

5. Visual Assessment	
5.1 Material and condition of surfacing.	☐ HRA ☐ DBM ☐ Thin surfacing ☐ Slurry seal ☐ High friction surfacing
5.2 Is the condition consistent with the survey data across the site?	☐ Yes ☐ No
5.3 Are there localised defects? Variation of surfacing across the carriageway, polishing, low texture, patching, rutting, fretting, potholes etc. If yes provide details. State if low skid resistance or texture depth occurs where road users need to stop or manoeuvre.	☐ Yes ☐ No Description
5.4 Could these localised defects affect vehicle handling?	☐ Yes ☐ No
5.5 Is the site free from debris and other contamination? Consider the likely route taken by different road users.	☐ Yes ☐ No
5.6 Does drainage appear adequate? If No provide details	☐ Yes ☐ No

6. Road Users	
6.1 What is the traffic volume? High – built up commercial or retail area with heavy volume of pedestrian & commercial traffic Medium – built up area with light pedestrian and commercial traffic. Low – other areas.	☐ High ☐ Medium ☐ Low
6.2 Does the site have a high proportion of vulnerable road users. For example, elderly, cyclists, children. If Yes provide details	☐ Yes ☐ No
6.3 Are observed traffic speeds appropriate to the site?	☐ Yes ☐ No
6.4 Is there evidence of road users consistently failing to negotiate the site e.g. verge overrunning.	☐ Yes ☐ No
5. Signs, Markings and Visibility	
5.1 Does the road layout appear to meet current design specification?	☐ Yes ☐ No
5.2 Is the layout appropriate for vulnerable road users?	☐ Yes ☐ No
5.3 Are road markings and signs correct and visible?	☐ Yes ☐ No
5.4 Are signs clear of encroaching vegetation?	☐ Yes ☐ No
5.5 Are sight lines adequate and unobstructed through junctions and at accesses and side roads?	☐ Yes ☐ No
5.6 Is queuing traffic likely? Would end of queue be visible to approaching vehicles?	☐ Yes ☐ No

Other observations

Recommendations			
Is further action required?	☐ Yes ☐ No		
If Yes what action is proposed			
Resurface	☐	Replace/upgrade road markings	☐
Slurry Seal	☐	Drainage / gully works	☐
Surface dressing	☐	Clean debris/ remove overhanging vegetation etc.	☐
High Friction Surfacing	☐	Install skid risk warning signs before treatment	☐
Replace/upgrade signs	☐	Change Investigatory Level	☐
If No Provide a reason for your answer			

Approval		
Print name	Signature	Date

Appendix B

Map of Defined Network for SCRIM surveys