Appendix 1

Flintshire County Council

Skid Resistance Operational Manual

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Contents

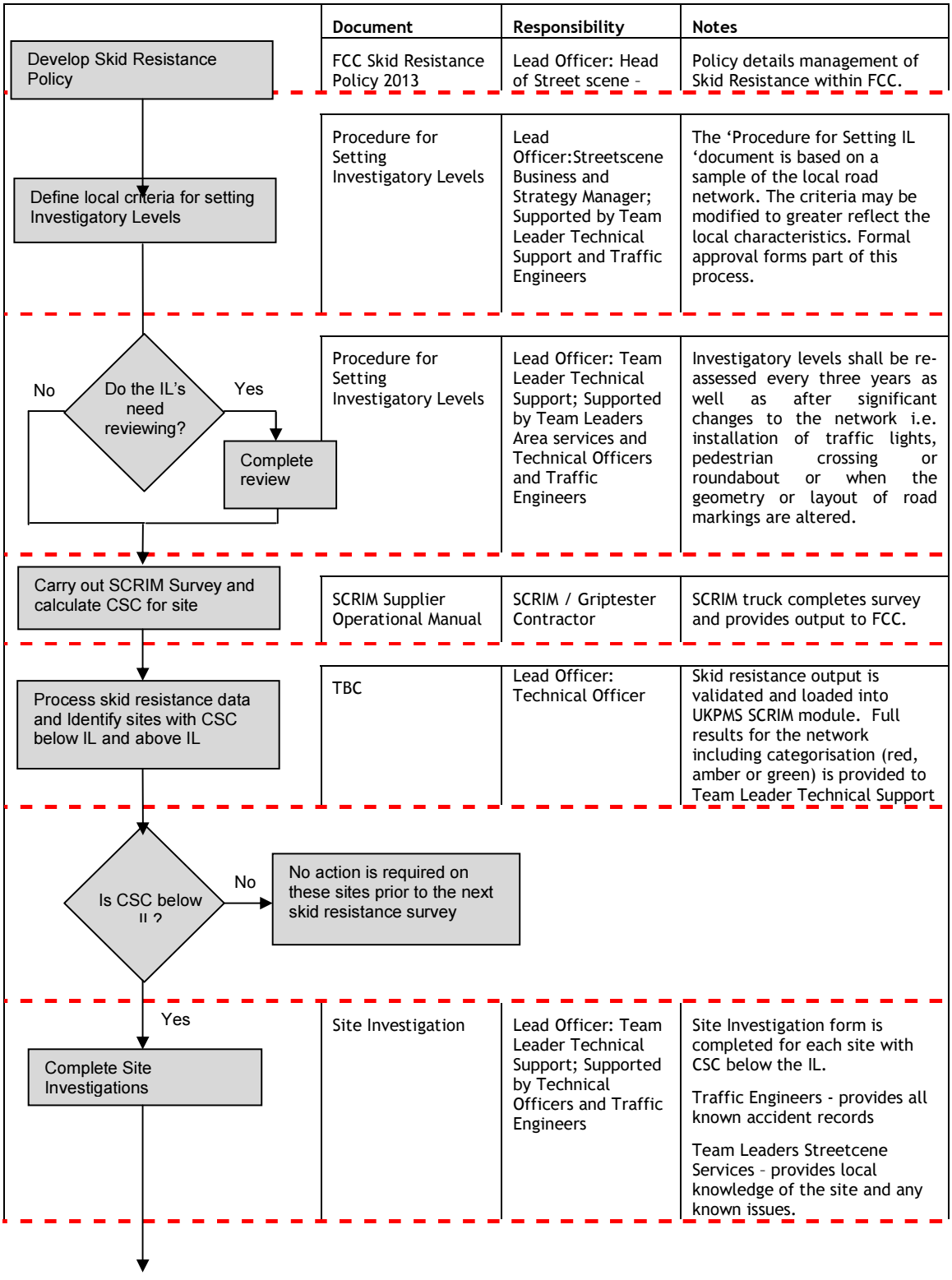
1 Introduction

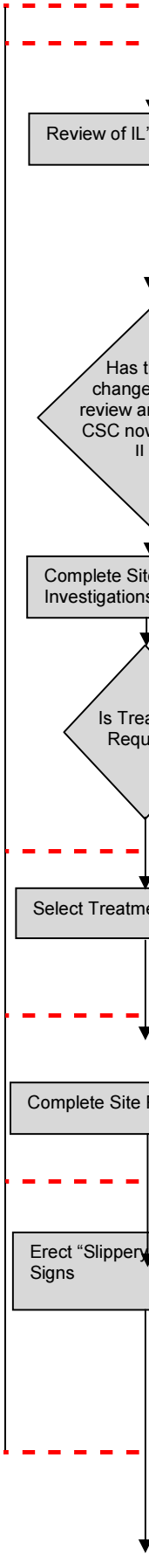
1.1 The purpose of this Operational Manual is to provide detailed processes for managing the appropriate levels of skid resistance on Flintshire County Council Roads

1.2 This policy will apply to all surfaced roads and surfaces designed to be shared with pedestrians managed by Flintshire County Council. This doesn't include trunk roads as they are managed by North Wales Trunk Road Agency or surfaces used only by pedestrians. This policy will be implemented, monitored and managed by the Head of Service.

2.0 **Process Summary**

2.1 Figure 2.1 shows the skid resistance process from start to finish. Relevant documents and responsible personnel are also included





Document	Responsibility	Notes
	Lead Officer: Team Leader Technical Support; Supported by Traffic Engineers	After the first survey of the network all IL's for sites below CSC should be reviewed. The SCRIM truck follows the criteria set out exactly as documented. Local characteristics known by the Team Leaders Streetscene Services need to be factored into the IL's.
	Lead Officer: Team Leader Technical Support; Supported by Technical officers and Traffic Engineers	Treatment options are selected jointly by Team Leader Technical Support and Technical/Traffic Engineers/Officers. It is important to consider non surfacing treatments.
Procedure for Prioritisation of Skid Resistance Sites	Lead Officer: Team Leader Technical Support; Supported by Team Leaders Area services/ Area Services Manager	All proposed treatment sites are processed following the Prioritisation procedure. The expected output is the current surfacing programme consisting of the highest priority sites.
FCC Skid Resistance Policy 2013	Lead Officer: Team Leaders Street Scene services / Safety Engineers	Slippery Road" warning signs will be erected as soon as practicable at all sites where remedial measures have been determined as being necessary. These signs will only be removed when the remedial action has been taken and Team Leader Technical Support is satisfied that skidding resistance levels have been

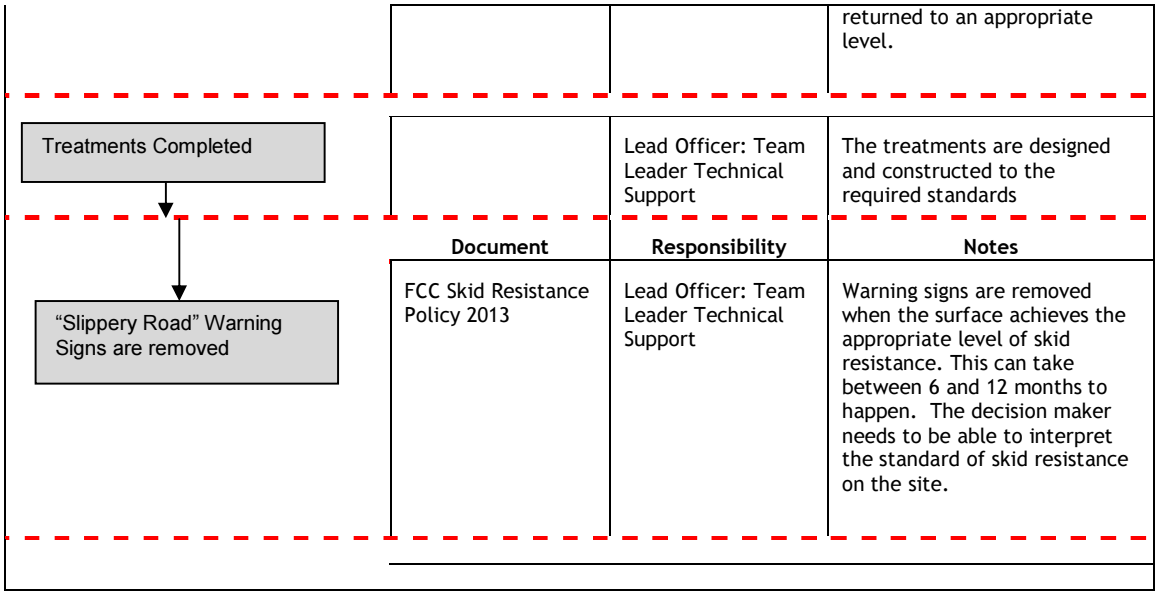


Figure 2.1: Skid Resistance Management Process

3 Measurement of Skid Resistance

Flintshire County Council has adopted the Single Annual Survey Method of measuring SCRIM. This approach is based upon a single annual survey of the network. The method uses measurements from the preceding 3 years to characterise the long-term skid resistance of the network. This value is used with the mean network skid resistance in the current year, to calculate a correction factor, which is applied to the current year's data to make current values consistent with the long-term average.

The Single Annual Survey Method is implemented as follows:
The whole network is surveyed once during the Testing Season in each year. Surveys are planned such that in successive years each road length is tested in the early, middle and late parts of the season.

The early middle and late parts of the season are defined, respectively, as: May to mid-June, mid-June to mid-August and mid-August to the end of September. For example, a route tested in the early part of the season in year 1 could be tested in the late part of the season in year 2 and in the middle part of the season in year 3. In year four, it must be tested in the early part of the season again, etc.

4 Procedure for Setting Investigatory Levels

4.1 Background

4.1.1 Table 4.1 lists the intervention levels that are to be considered on the council's county roads. They are based on those contained in HD28/04. This document allocates a band of two or three acceptable limits for each road event. The table shows the banded limits with the preferred values for Flintshire.

4.1.2 It is important that the Investigatory Level is not set too low. If, during the site investigation process the Investigatory Level of a site is found to be too high then it can be lowered. However, if the Investigatory Level is initially set at too low a level then the need to improve the skid resistance may not be detected until it has already fallen further than is desirable.

4.1.3 Site Categorisation and SCRIM Investigatory Levels for the council's network are as shown in the Table 4.1:

4.1.4 Investigatory levels shall be re-assessed every three years as well as after significant changes to the network i.e. installation of traffic lights, pedestrian crossing or roundabout or when the geometry or layout of road markings are altered.

Site Category & Description			Investigatory Level at 50km/h						
		CSC	0.30	0.35	0.40	0.45	0.50	0.55	0.60
		Grip No.	0.35	0.41	0.47	0.53	0.59	0.65	0.71
B	Dual carriageway non-event			X					
C	Single carriageway non-event				X				
Q	Approaches to and across minor and major junctions, approaches to roundabouts					X			
K	Approaches to pedestrian crossings and other high risk situations						X		
R	Roundabout					X			
G1	Gradient 5-10% longer than 50m					X			
G2	Gradient >10% longer than 50m						X		
S1	Bend radius <500m – dual carriageway					X			
S2	Bend radius <500m single carriageway						X		

Table 4.1: Investigatory Levels for Flintshire County Council

Legend: **X** Investigatory Levels selected by FCC

Investigatory Levels detailed in technical Standard HD 28/04

Notes:

1. Investigatory Levels are for the mean skidding resistance within the appropriate averaging length.
2. Investigatory Levels for site categories A, B and C are based on 100m lengths or the length of the feature if shorter.
3. Investigatory Levels and averaging lengths for site categories Q and K are based on 50m approach to the feature but shall be extended when justified by local site characteristics.
4. Investigatory Levels for site category R are based on 10m lengths.
5. Categories G1 and G2 must not be applied to uphill gradient on dual carriageways.
6. Categories S1 and S2 must not be applied to bends with a speed limit below 50 mph.
7. Residual lengths less than 50% of a complete averaging length may be attached to the penultimate full averaging length, providing the site category is the same.
8. As part of the site investigation, individual values within each averaging length should be examined and the significance of any values that are substantially lower than the mean value assessed.

4.2 Choosing the Appropriate Site Category

4.2.1 Identify which site category from Table 4.1 is most appropriate to the road layout at each point on the network.

4.2.2 Only one site category can be assigned at each point; if there is more than one category that is applicable then

- If IL values are different - choose the one that allows a higher IL
- If IL values are the same – choose the one highest up the table

4.3 Selecting an Investigatory Level

4.3.1 For each Site Category, allocate an Investigatory Level from within the range shown in Table 4.1. The IL corresponding with the lowest value is selected in all cases except:

- Where there are identifiable hazards present, as listed below, that aren't acceptably mitigated
- Where there is more than one type of event present, unless acceptably mitigated.

  In both of these exceptions higher ILs are selected.

4.3.2 The following factors need to be considered when assessing the IL. All forms of local knowledge should be accounted for in this review.

- Hazards present or conflicts between road users that could lead to a vehicle losing control or to sudden braking or avoidance manoeuvres.
- The likelihood of an accident situation occurring, considering:
  - Traffic flow and speed
  - Road layout
  - Presence of warning signs or other measures that reduce the risk
- The severity of the outcome in the event of an accident, giving particular attention to the following situations, which are the main mechanisms of death and serious injury:
  - Head-on or side impacts at speed.
  - Accidents involving vulnerable road users.

A. Non-event Site Categories

A non-event site category (B or C) should be assigned to any length of road where there are no junctions, roundabouts, crossings, bends or gradients present.

A.1. Category B: Dual Carriageway Non-Event Selection Criteria

A.1.1. Site Category B is allocated to

a) All non-motorways, dual carriageways and other lengths with one-way traffic.

b) Junction areas where traffic merges or diverges if:
   - the junction layout allows traffic leaving or joining the mainline to match the speed of the mainline traffic,
   - there is adequate taper length for merging to occur.

A.1.2. Investigatory Level

Table 4.2 and 4.3 are used to allocate Investigatory Levels for Category B sites. Table 4.2 shows that a minimum IL of 0.35 is required on the Flintshire road network before further investigation is required. A list of circumstances for selecting the higher IL of 0.40 is provided in Table 4.3.

CATEGORY B: DUAL CARRIAGEWAYS NON-EVENT		**Investigatory Level at 50km/h**						
	CSC	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**	**0.55**	**0.60**
	GN	**0.35**	**0.41**	**0.47**	**0.53**	**0.59**	**0.65**	**0.71**
			X					

Table 4.2: Category B Investigatory Levels for Flintshire County Council

	Lower Investigatory Level	**Higher Investigatory Level**
Category B	IL = 0.35	IL = 0.40
Circumstances	All except where a higher IL is justified	Considerations for raising IL to the higher value include: • Hazards on roads where the speed limit is 50mph or above where category Q is not appropriate, including: o Junctions where the geometry does not justify using category Q. o Bus stops, laybys etc. o Other accesses, e.g. houses. • Bends on roads with a speed limit below 40mph if they present a particular hazard in spite of the lower speed. • Uphill sections that give rise to a speed differential between vehicles, but category G1 or G2 is not appropriate.

Table 4.3: Category B Investigatory Level Circumstances

A.2. Category C: Single Carriageway Non-Event Selection Criteria

A.2.1. Site Category C is allocated to:

a) All carriageway sections with two-way traffic.

b) Junction areas where traffic merges or diverges if:
- the junction layout allows traffic leaving or joining the mainline to match the speed of the mainline traffic,
- there is adequate taper length for merging to occur.

A.2.2. Investigatory Level

Table 4.4 and 4.5 are used to allocate Investigatory Levels for Category C sites. Table 4.4 shows that a minimum IL of 0.40 is required on the Flintshire road network before further investigation is required. A list of circumstances for selecting the higher IL of 0.45 is provided in Table 4.5.

CATEGORY C: SINGLE C/WAY NON-EVENT		**Investigatory Level at 50km/h**						
	CSC	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**	**0.55**	**0.60**
	GN	**0.35**	**0.41**	**0.47**	**0.53**	**0.59**	**0.65**	**0.71**
				X				

Table 4.4: Category C Investigatory Levels for Flintshire County Council

	Lower Investigatory Level	**Higher Investigatory Level**
Category C	IL = 0.40	IL = 0.45
Circumstances	All except where a higher IL is justified	Considerations for raising IL to the higher value include • Areas where pedestrians or other vulnerable road users are common but category K is not appropriate • Hazards on roads where the speed limit is 50mph or above where category Q is not appropriate, including: o Junctions where the geometry does not justify using category Q. o Bus stops, laybys etc. o Other accesses, e.g. houses. • Bends on roads with a speed limit below 40mph if they present a particular hazard in spite of the lower speed. • Uphill sections that give rise to a speed differential between vehicles, but category G1 or G2 is not appropriate. • Popular overtaking areas

Table 4.5: Category C Investigatory Level Circumstances

B. Event Site Categories

For all event site categories, consider carefully how far the category needs to extend upstream and downstream.

B.1. Category Q: Approaches to Junctions and Roundabouts Selection Criteria

B.1.1. Site Category Q is allocated to

a) Approaches to Junctions

i. On the major road (where traffic has permanent priority):

- Apply site category Q across the extent of the junction between throat limits and continue for a further 50m in the direction of oncoming traffic on each side.
  Note:
  - For roads with a speed limit of 50mph or above, consider extending this distance to 100m, depending on the risk of traffic having to brake unexpectedly.
  - On roads with two-way traffic, consider both directions separately to determine the overall extent of the site category

ii. On the minor road (where traffic is required to give way):

- Apply site category Q to the 50m approach to the stop / give way line.
  Note: Extend the distance, if necessary, to take into account likely queues.

b) Approaches to other significant accesses

i. Where the volume of traffic using the access warrants it (eg. Petrol stations, superstores etc) treat as for major / minor priority junctions, above.
Note: If the volume of traffic is low, use the appropriate non-event categories instead.

c) Approaches to roundabouts and traffic signals (except for high risk circumstances).

i. Apply site category Q to the 50m approach to the stop / give way line.
Note: Extend the distance, if necessary, to take into account likely queues.

B1.2. Investigatory Level

Table 4.6 and 4.7 are used to allocate Investigatory Levels for Category Q sites. Table 4.6 shows that a minimum IL of 0.45 is required on the Flintshire road network before further investigation is required. A list of circumstances for selecting the middle IL of 0.50 is provided in Table 4.7.

For major / minor priority junctions, the risks are greater on the major road. Drivers on the major road have permanent priority and are not expecting to give way, but may have to brake sharply if a vehicle emerges unexpectedly from the minor road or turns right across their path. Factors to consider are:

a) Right turning vehicles are at risk of a side impact with traffic on the major road, and the outcome of this type of crash is likely to be severe.
b) The risks increase where the speed of traffic joining or leaving the main carriageway differs greatly from those continuing straight on. This is heavily influenced by the taper length, provision of dedicated lanes for right-turning traffic, etc..

On the minor road, the risk of having to brake unexpectedly is lower since the need to give way is indicated clearly in advance of the junction.

CATEGORY Q: APPROACHES TO JUNCTIONS AND ROUNDABOUTS		**Investigatory Level at 50km/h**						
	CSC	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**	**0.55**	**0.60**
	GN	**0.35**	**0.41**	**0.47**	**0.53**	**0.59**	**0.65**	**0.71**
					X			

Table 4.6: Category Q Investigatory Levels for Flintshire County Council

	Lower Investigatory Level	**Middle Investigatory Level**
Category Q	**IL = 0.45**	**IL = 0.50**
Circumstances		
On the major road (traffic with permanent priority)	• The speed limit is below 50mph • The speed limit is 50mph or above but the traffic volume and speed differential between the major and minor traffic streams results in an acceptably low risk	• The combination of speed differential and traffic volume result in a moderate level of risk • Sight lines on the minor road are poor, leading to the possibility of driver error • Right-turning traffic is not adequately catered for High levels of traffic on the mainline may induce drivers joining it to take risks when pulling out.
On the minor road (traffic required to give way)	All except where a higher IL is justified	Considerations for raising IL to the higher value exist if the sight lines on the minor road approaching the junction are poor, leading to the possibility of a driver changing their mind at a late stage
Significant Accesses	Treat other significant accesses as for major / minor priority junctions.	
Roundabouts & Traffic	• Where speed limit is below 50mph	Where speed limit is 50mph or above.

Signals	• Roads where speed limit is 50mph or above if there is a higher speed limit but actual traffic speeds are low, e.g. because the road layout does not lend itself to higher speed.	

Table 4.7: Category Q Investigatory Level Circumstances

C. Category K: Approach to Pedestrian Crossings and High Risk Situations Selection Criteria

C.1. Site Category K is allocated to

a) All signal controlled pedestrian crossings and zebra crossings
b) Railway crossings
c) Other situations where there is both a likelihood vulnerable users in the road and a high risk of injury in the event of a crash.

Site category K is to be applied for the 50m approach to the event. Consider extending this distance for roads with speed limits of 50mph or above, depending on the likelihood of traffic having to brake unexpectedly.

C.2. Investigatory Level

Table 4.8 and 4.9 are used to allocate Investigatory Levels for Category K sites. Table 4.8 shows that a minimum IL of 0.50 is required on the Flintshire road network before further investigation is required. A list of circumstances for selecting the higher IL of 0.55 is provided in Table 4.9.

CATEGORY K: APPROACHES TO PEDESTRIAN CROSSINGS AND OTHER HIGH RISK SITUATIONS		**Investigatory Level at 50km/h**						
	CSC	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**	**0.55**	**0.60**
	GN	**0.35**	**0.41**	**0.47**	**0.53**	**0.59**	**0.65**	**0.71**
						X		

Table 4.8: Category K Investigatory Levels for Flintshire County Council

	Lower Investigatory Level	**Higher Investigatory Level**
Category K	IL = 0.50	IL = 0.55
Circumstances	All except where a higher IL is justified	Considerations for raising IL to the higher value exist where there is reason to believe pedestrians or other vulnerable road users may misjudge the speed of oncoming traffic, e.g. • Near schools or other facilities for children • Near public houses • Where the speed of approaching traffic is high

Table 4.9: Category K Investigatory Level Circumstances

D. Category R: Roundabout Selection Criteria

D.1. Site Category R is allocated to:

a) Roundabout circulation areas
b) Approaches to traffic lights on roundabouts

D.2. Investigatory Level

Table 4.10 and 4.11 are used to allocate Investigatory Levels for Category R sites. Table 4.11 shows that a minimum IL of 0.45 is required on the Flintshire road network before further investigation is required. A list of circumstances for selecting the higher IL of 0.50 is provided in Table 4.11.

CATEGORY R: ROUNDABOUT		**Investigatory Level at 50km/h**						
	CSC	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**	**0.55**	**0.60**
	GN	**0.35**	**0.41**	**0.47**	**0.53**	**0.59**	**0.65**	**0.71**
					X			

Table 4.10: Category R Investigatory Levels for Flintshire County Council

	Lower Investigatory Level	**Higher Investigatory Level**
Category R	IL = 0.45	IL = 0.50
Circumstances	All except where a higher IL is justified	Considerations for raising IL to the higher value include • High speed of circulating traffic • High incidence of cyclists or motorcyclists • Absence of signalised control on roundabouts at grade separated interchanges.

Table 4.11: Category R Investigatory Level Circumstances

E. Category G1/G2: Gradient Selection Criteria

E.1. Site Category G1 is allocated to

a) Dual carriageways, with lengths of at least 50m with an average downhill gradient of between 5 and 10%.
b) Single carriageways, with lengths of at least 50m with an average downhill gradient of between 5 and 10%.

E.2. Site Category G2 is allocated to

a) Dual carriageways, with lengths of at least 50m with an average downhill gradient of 10% of higher.
b) Single carriageways, with lengths of at least 50m with an average downhill gradient of10% or higher.

This assessment will be based on gradient information obtained from the machine condition survey.

E.3. Investigatory Level

Table 4.12 and 4.13 are used to allocate Investigatory Levels for Category G sites. Table 4.12 shows the minimum IL requirements for meeting the skid resistance needs of the Flintshire road network. A list of circumstances for selecting the higher IL is provided in Table 4.13.

SITE G: GRADIENTS		**Investigatory Level at 50km/h**						
	CSC	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**	**0.55**	**0.60**
	GN	**0.35**	**0.41**	**0.47**	**0.53**	**0.59**	**0.65**	**0.71**
G1: Gradient 5-10% longer than 50m					**X**			
G2: Gradient >10% longer than 50m						**X**		

Table 4.12: Category G Investigatory Levels for Flintshire County Council

	Lower Investigatory Level	**Higher Investigatory Level**
Category G1	IL = 0.45	IL = 0.50
Category G2	IL = 0.50	IL = 0.55
Circumstances	All except where a higher IL is justified	Considerations for raising IL to the higher value • High approach speeds • Injury potential if vehicle loses control – eg large drop off into valley, solid feature, bend at the end of the grade.

Table 4.13: Category G Investigatory Level Circumstances

F. Category S1/S2: Bend radius < 500m Selection Criteria

F.1. Site Category S1 is allocated to

a) bends on dual carriageway roads where the speed limit is 50mph or above where the radius of curvature is less than 500m for at least 100m.

F.2. Site Category S2 are allocated to

a) bends on single carriageway roads where the speed is 40mph or above where the radius of curvature is less than 500m for at least 50m.

Note:
This category should not be used for:

- Roundabout exits
- Bends on roads below 40mph, use the non-event site category B or C

The site category should be extended upstream and downstream to where the road is essentially straight.

This assessment will be based on gradient information obtained from the machine condition survey.

F.4. Investigatory Level

Table 4.14 and 4.15 are used to allocate Investigatory Levels for Category S sites. Table 4.14 shows the minimum IL requirements for meeting the skid resistance needs of the Flintshire road network. A list of circumstances for selecting the higher IL is provided in Table 4.15.

CATEGORY S: BEND RADIUS <500m		**Investigatory Level at 50km/h**						
	CSC	**0.30**	**0.35**	**0.40**	**0.45**	**0.50**	**0.55**	**0.60**
	GN	**0.35**	**0.41**	**0.47**	**0.53**	**0.59**	**0.65**	**0.71**
S1: Bend radius <500m – dual carriageway					**X**			
S2: Bend radius ,500m – single carriageway						**X**		

Table 4.14: Category S Investigatory Levels for Flintshire County Council

	Lower Investigatory Level	**Higher Investigatory Level**
Category S1	IL = 0.45	IL = 0.50
Category S2	IL = 0.50	IL = 0.55
Circumstances	All except where a higher IL is justified	Considerations for raising IL to the higher value due to the particular potential for loss of control include: • The geometry of the bend is particularly hazardous, taking into account the traffic speed • Traffic needs to slow down to safely negotiate the bend • Adverse camber is present.

Table 4.15: Category S Investigatory Level Circumstances

5 Site Investigation

5.1 Objectives and outcomes

5.1.1 Sites with low skid resistance are identified through the following methods:

- the results of the skid resistance survey are below the Investigatory Level
- a high level of wet skidding accidents
- routine safety inspections
- Third Party reports

5.1.2 The objective of the site investigation is to determine whether a surface treatment or any other form of action will reduce the risk of accidents in wet conditions or those involving skidding. This investigation is an important part of the Skid Resistance operational Manual. In conjunction with the process of setting Investigatory Levels, the objective is to promote effective targeting of treatments.

5.1.3 The main form of justifications for any treatments are

- based on an accident analysis, the site has a higher than average proportion of accidents in wet conditions or involving skidding for the type of site being considered;
- the nature of the individual site and the demands of road users mean that a higher accident risk (compared with other sites in the same Site Category) might be expected with the skid resistance at its current value or if it were to fall further before the next measurement. In this case, preventive treatment is justified to pre-empt a potential increase in accident risk.

5.1.4 If neither of the above are true then there is currently no justification for treatment to increase the skid resistance. If the site remains below the Investigatory Level at the next measurement, then it will automatically be subject to a further investigation.

5.1.5 If the skid resistance and accident pattern remain stable for an extended period, for example, more than 3 years, then lowering the Investigatory Level should be considered. However, it is important that stability is observed before reducing the Investigatory Level, because, unless the skid resistance falls further, regular investigation that would detect an increase in accidents would no longer be prompted by the procedures contained within the Operational Manual.

5.2 Procedure

5.2.1 Sites requiring investigation shall be identified as soon as practicable on receipt of the CSC values, accident reports or from other reports eg. customer complaints or safety inspection reports.

5.2.2 Site investigations shall be completed Jointly by Engineers/Technical Officers from both the Streetscene and Traffic departments. They will be able to identify broadly the difference between good and poor skid resistance to enable confirmation of SCRIM data. An understanding of how local surface material wears under local traffic conditions will be of benefit to the process. A site investigation standard form is provided at the end of this procedure. Each site investigation requires the full completion of this form. The Head of Service is responsible for approving each form.

5.2.3 Site investigations will be completed in a prioritised order. Sites with accidents within the previous three years will have the highest priority. The remainder of the sites will be completed initially based on the amount by which the skid resistance is below the Investigatory Level. This order may be refined to take into account the efficiency of conducting investigations.

5.2.4 Persons with relevant local experience on the history of the site may be consulted if appropriate, during the site investigation process. These may include adjacent landowners, local policeman and local ambulance drivers. These people may be aware of activities such as farm vehicles leaving slippery debris on the road surface or areas where standing water after rainfall causes surface slipperiness.

5.2.5 The results of the site investigation, including whether further action is required, shall be documented and retained together with the identity of the assessor and other parties consulted.

Flintshire County Council / *Cyngor Sir y Fflint*
Standardised form for Site Investigations

SCRIM Site Investigation Report			**Survey year:**
Unit	**Route**	**Site ID**	**Location**
Business and Strategy			
Site Location and Use			
Location and Nature of Site			
Current Site Category and Investigatory Level			
Pavement Condition			
Skid Resistance and texture depth			
Other aspects of pavement condition			
Accident Data			
3 year review			
	No	%	
Wet No:			
Dry No:			
Total			
Site Inspection			
Inspected by:	Weather:	Date:	Time:
Method: **Walked**			
Visual Assessment			
Type and condition of surfacing			

Any inconsistencies with survey data	
Presence of debris or other contamination	
Local defects (potholes, fatting-up etc.)	
Is drainage adequate?	
Road Users	
Volume and type of traffic	
Traffic speeds in relation to road layout	
Type of manoeuvres and consequences of driver error	
Road Layout	
Appears to meets current design spec.?	
Layout appropriate for vulnerable road users?	
Junctions appropriate for turning manoeuvres?	
Markings Signs and Visibility	
Markings and signs clear and effective in all conditions	
Signs etc. protected from vehicle impact?	
Clear sight lines / visibility of queues / vegetation	
Additional Information and Other Observations	

Recommendation		
Surface treatment required	Y/N	
Change IL	Y/N	
Other action required	Y/N	
No action required	Y/N	

Approval		
Print name	Signature	Date

6 Prioritisation of Sites

6.1 Objective:

6.1.1 Site investigation results in the identification of lengths of pavement where treatment may be warranted to improve the skid resistance. Treatments in this context include both surface treatment and or other safety measures which are shown to reduce the accident risk.

6.1.2 DMRB gives advice about the choice of surfacing materials to provide the appropriate level of skid resistance and about the use of re-texturing treatments to provide short-term improvements to skid resistance. Other aspects of pavement condition must also be taken into account in selecting the most appropriate form of treatment.

6.1.3 The most appropriate form of treatment shall be identified for each treatment length taking account of current advice.

6.2 Site Selection Priority

6.2.1 Sites are only considered for prioritisation if there treatments have been recommended following the approved Site Selection Procedure. There are three levels of priority as defined below in Table 6.1:

Priority	Description
1	All sites with recorded wet skidding accident sites within the last three years or since the last resurface whichever is shortest.
2	Where the measured skid resistance is 0.10 CSC units or more below the IL values required by Table 1 of the Operational Manual.
3	Where the measured skid resistance is below 0.05 CSC units below the IL values required by Table 1 of the Operational Manual.

Table 6.1: Descriptions of Site Selection Priority Levels

6.2.2 A ranking of all selected treatments within each 'Priority Group' is completed to enable the Head of Service to allocate the funds to the sites which pose the highest risk. This process will only be required when insufficient funds are available to complete all the identified treatments within a 'Priority Group'... Skid resistance is a 'Safety' aspect of highway management and therefore ranking orders need to reflect a reduction in accident risk.

a) Priority 1 sites have a history of wet and skidding related accidents. The ranking order identifies the sites with the most cost effective solutions to

reducing the risk of accidents. This is calculated by dividing the estimated accident savings by the anticipated cost of treatment.

b) Priority 2 and 3 will be ranked using the Prioritisation Attributes Approach detailed below:

6.3 Prioritisation Attributes Approach for Non Accident Sites

6.3.1 The Prioritisation Attributes Approach uses non price related attributes as a means of comparison. Each attribute is assigned a weighting which reflects its level of contribution to future accident risk.

6.3.2 In this skid resistance process three attributes have been selected, speed environment, investigatory level and road group. The respective weightings are shown in Table 6.2, 6.3 and 6.4 below. Note: Attributes can be included or removed at the discretion of the Head of Service.

a) Speed Environment: This attribute accounts for the travelling speed of the average vehicle approaching the event. Note: This is not the legal speed as that doesn't necessarily represent the actual speed of vehicles.

Speed Environment (miles/hr)	Weightings
40 or less	1
Between 41 & 50	2
Between 51 & 60	3
Between 61 & 70	4

Table 6.2: Speed Environment Categories

b) Investigatory Level: This attribute accounts for the importance of the site in terms of skid resistance need.

Investigatory Level	Weightings
Less than 0.35	1
Between 0.40 & 0.35	2
Between 0.45 & 0.40	3
Between 0.50 & 0.45	4
More than 0.55	5

Table 6.3: Investigatory Level Categories

c) Road Group: This attribute accounts for the importance of the site in terms of road hierarchy.

Road Group	Weightings
Other	1
U/C	2
C	3
B	4

A	5

Table 6.4: Road Group Level Categories

d) Individual Prioritisation Attributes Score
The attribute score represents the importance of the site and is calculated in the equation below using the weightings from the above tables.

e) The final step is to rank the sites using the Overall Prioritisation Attributes Score.

Overall Prioritisation Attributes Score
= [(Speed Environment x 0.50) + (Investigatory Level x 0.30) + (Road Group x 0.20)] / 3

6.3.3 The priority for treatment should be established for all new treatment lengths and for those lengths previously recommended for treatment to improve the skid resistance, but where treatment has not yet been carried out or definitely programmed. If more than a year has elapsed since the site investigation was carried out then the accident history and priority for treatment must be re-examined using the most recent data available. This programme should be reviewed and progress recorded at appropriate intervals.