Development and use of a skidding strategy

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Warwickshire County Council

Current documents

- **Routine Carriageway Skid Resistance Testing.**

  Implementation Strategy and Procedures 2013

- **County Surfacing and Structural Maintenance Strategy – 2009**

- **Both of these are available from the warwickshire.gov.uk website**

Early changes to HD28/04

- Reintroduction of risk rating from HD28/94
- Split single carriageway bends into two at 250m radius (as HD28/94)
- Calculate CSC simply as the mean of last three years and not the complex method in HD28/04

Investigatory levels – WCC - initial

Site categories	Investigatory level at 50 km/hr					
	0.30	0.35	0.40	0.45	0.50	0.55
Risk rating	1	2	3	4	5	6
B dual c'way non-event						
C single c'way non-event						
Q Approaches to junctions and roundabouts						
K Approaches to pedestrian crossing						
R Roundabout						
G1 Gradient 5-10% longer than 50 m						
G2 Gradient ≥10% longer than 50 m						
S1 Bend radius <500 m – dual						
S2a Bend radius 250-500 m – single						
S2b Bend radius <250 m – single						

Orange is default value (as HD28-04) – will change to site specific value over time

Categorisation of sites

- Category 1 – a single 10 m length with SC at or below 0.25
- Category 2 – CSC at 0.1 or more below IL.
- Category 3 – CSC at or more than 0.05 below IL and less than 0.1 below IL.
- Category 4– CSC at or below IL and less than 0.05 below IL.
- High crash sites as defined by Road Safety Intelligence Team

Survey process - 1

The survey process is detailed in the strategy.

Only the main steps will be described here.

All of the site investigations to date have been done by CAC and this is the seventh year and CAC is in the process of handing over.

Survey process - 2

1. Convert the raw data from HMDIF (a text format) to Excel
2. Check for any SC at or below 0.25 (these constitute category 1 sites)
3. Investigate any Cat 1 sites and report
4. Align new SCs with two previous years and average to give CSC
5. Compare CSC with IL
6. Any section with CSC at or below IL is marked for investigation (red, orange, yellow).
7. Depending on site category group into 50m, 100m or bend lengths to determine whether to survey site

CSC example

Road	Section	Section Length	Sub section Ch from	Ch to		Site Category	Invest. Level		Site Category	Invest. Level	speed limit	rec no	CL1 early 10 SC	CL1 mid 11 SC	CL1 late 12 SC	CL1 CSC	CL1 CSC-IL	CR1 early 10 SC	CR1 mid 11 SC	CR1 late 12 SC	CR1 CSC	CR1 CSC-IL
						Forward direction			Reverse direction													
A423	110	246	100	110	↓	G1-	0.4	↑	G1-	0.4	50	513	0.45	0.44	0.45	0.45	0.047	0.45	0.43	0.47	0.45	0.050
A423	110	246	110	120	↓	G1-	0.4	↑	G1-	0.4	50	514	0.44	0.45	0.35	0.41	0.013	0.44	0.41	0.48	0.44	0.043
A423	110	246	120	130	↓	G1-	0.4	↑	G1-	0.4	50	515	0.44	0.43	0.37	0.41	0.013	0.42	0.4	0.48	0.43	0.033
A423	110	246	130	140	↓	G1-	0.4	↑	G1-	0.4	50	516	0.45	0.34	0.45	0.41	0.013	0.43	0.42	0.43	0.43	0.027
A423	110	246	140	150	↓	Q	0.5	↑	G1-	0.4	50	517	0.41	0.42	0.46	0.43	-0.070	0.43	0.39	0.41	0.41	0.010
A423	110	246	150	160	↓	Q	0.5	↑	G1-	0.4	50	518	0.36	0.45	0.49	0.43	-0.067	0.43	0.4	0.43	0.42	0.020
A423	110	246	160	170	↓	Q	0.5	↑	G1-	0.4	50	519	0.43	0.45	0.49	0.46	-0.043	0.43	0.4	0.44	0.42	0.023
A423	110	246	170	180	↓	Q	0.5	↑	G1-	0.4	50	520	0.44	0.47	0.48	0.46	-0.037	0.4	0.37	0.44	0.40	0.003
A423	110	246	180	190	↓	Q	0.5	↑	G1-	0.4	50	521	0.45	0.47	0.46	0.46	-0.040	0.41	0.36	0.43	0.40	0.000
A423	110	246	190	200	↓	Q	0.5	↑	G1-	0.4	50	522	0.43	0.47	0.47	0.46	-0.043	0.44	0.36	0.41	0.40	0.003
A423	110	246	200	210	↓	Q	0.5	↑	G1-	0.4	50	523	0.4	0.45	0.44	0.43	-0.070	0.51	0.35	0.37	0.41	0.010
A423	110	246	210	220	↓	Q	0.5	↑	G1-	0.4	50	524	0.41	0.48	0.41	0.43	-0.067	0.48	0.42	0.36	0.42	0.020
A423	110	246	220	230	↓	Q	0.5	↑	G1-	0.4	50	525	0.44	0.47	0.45	0.45	-0.047	0.44	0.47	0.4	0.44	0.037
A423	110	246	230	240	↓	Q	0.5	↑	G1-	0.4	50	526	0.47	0.47	0.43	0.46	-0.043	0.43	0.48	0.46	0.46	0.057
A423	110	246	240	246	↓	Q	0.5	↑	G1-	0.4	50	527	0.44	0.49	0.43	0.45	-0.047	0.46	0.49	0.48	0.48	0.077
A423	120	794	0	10	↓	C	0.4	↑	Q	0.5	50	528	0.44	0.49	0.45	0.46	0.060	0.44	0.47	0.48	0.46	-0.037
A423	120	794	10	20	↓	C	0.4	↑	Q	0.5	50	529	0.41	0.48	0.48	0.46	0.057	0.46	0.48	0.5	0.48	-0.020
A423	120	794	20	30	↓	C	0.4	↑	Q	0.5	50	530	0.45	0.53	0.47	0.48	0.083	0.41	0.43	0.46	0.43	-0.067
A423	120	794	30	40	↓	C	0.4	↑	Q	0.5	50	531	0.48	0.53	0.45	0.49	0.087	0.4	0.45	0.45	0.43	-0.067
A423	120	794	40	50	↓	C	0.4	↑	Q	0.5	50	532	0.47	0.53	0.43	0.48	0.077	0.35	0.37	0.46	0.39	-0.107
A423	120	794	50	60	↓	C	0.4	↑	Q	0.5	50	533	0.48	0.51	0.42	0.47	0.070	0.35	0.39	0.44	0.39	-0.107
A423	120	794	60	70	↓	C	0.4	↑	C	0.4	50	534	0.5	0.46	0.45	0.47	0.070	0.36	0.4	0.39	0.38	-0.017
A423	120	794	70	80	↓	C	0.4	↑	C	0.4	50	535	0.5	0.39	0.45	0.45	0.047	0.38	0.41	0.41	0.40	0.000
A423	120	794	80	90	↓	C	0.4	↑	C	0.4	50	536	0.48	0.42	0.45	0.45	0.050	0.39	0.42	0.44	0.42	0.017
A423	120	794	90	100	↓	C	0.4	↑	C	0.4	50	537	0.44	0.43	0.45	0.44	0.040	0.39	0.41	0.45	0.42	0.017
A423	120	794	100	110	↓	C	0.4	↑	C	0.4	50	538	0.48	0.43	0.46	0.46	0.057	0.4	0.4	0.46	0.42	0.020

Survey Process - 3

8. Go through the same process for the SCANNER files. These are much larger than the SCRIM files – 800,000 lines for A3400 last year
9. Extract only those parameters that are required
   - OSGR (LCOO)
   - Texture depth (LLTX)
   - Rut depth in each wheel track (LLRT &LRRT)
   - Irregularity over 3 m wavelength (ride quality) (LV3)
10. Highlight poor values (red orange yellow (blue))

				CL1 (2011)								CR1 (2012)				(CL1 on dual)			
				LV3	LLRT	LRRT	LLTX			Section		LV3	LLRT	LRRT	LLTX		OSGR		
road no	section	from	to	sq.mm	mm	mm	mm	Road no	no.	Start	End	sq.mm	mm	mm	mm	metre	easting	northing	upping
A4390	20	0	10	2.2	10.2	8.8	0.58	42160	A4390	20	0	9;	5.1	6.4	7.5	0.19	9	419740	255021	43.996
A4390	20	10	20	5	13.7	11.8	0.77	42161	A4390	20	9	19;	5.7	6.2	8.4	0.33	19	419743	255012	43.785
A4390	20	20	31	3.2	9.3	11.1	0.67	42162	A4390	20	19	29;	1.3	11.5	8.9	0.49	29	419747	255003	43.514
A4390	20	31	41	5.2	6.8	10.8	0.67	42163	A4390	20	29	39;	6.8	8.7	14.5	0.29	39	419749	254994	43.217
A4390	20	41	51	1	5.7	8.7	0.33	42164	A4390	20	39	49;	13.6	16.9	19.1	0.36	49	419752	254986	40.422
A4390	20	51	61	0.9	5.4	7.4	0.74	42165	A4390	20	49	59;	1.9	11.2	19.2	0.33	59	419755	254976	40.291
A4390	20	61	72	47.2	9.2	10.8	1.04	42166	A4390	20	59	69;	2	16.3	19.3	0.36	69	419756	254966	40.143
A4390	20	72	82	1.3	6.9	9.7	0.44	42167	A4390	20	69	79;	1.3	8.6	18.3	0.42	79	419757	254956	39.899
A4390	20	82	92	1.5	5.9	8.9	0.81	42168	A4390	20	79	89;	0.3	8	19	0.44	89	419758	254946	39.739
A4390	20	92	102	1.3	6.8	6.2	1.09	42169	A4390	20	89	99;	9.5	12.4	16.6	0.39	99	419760	254936	39.558
A4390	20	102	113	61.2	5.8	8.6	0.76	42170	A4390	20	99	109;	3.2	9.4	14.9	0.48	109	419761	254926	39.469
A4390	20	113	123	11.6	9.2	9.1	0.72	42171	A4390	20	109	119;	0.9	10.2	19.9	0.43	119	419761	254916	39.275
A4390	20	123	133	1.1	7.2	6.9	0.73	42172	A4390	20	119	129;	0.9	14.7	19.7	0.46	129	419762	254906	39.075
A4390	20	133	143	1.2	7.6	10	0.74	42173	A4390	20	129	139;	2.3	12.8	17.3	0.53	139	419763	254896	38.857
A4390	20	143	154	13.9	7	10.4	0.74	42174	A4390	20	139	149;	12.4	12.2	17.1	0.53	149	419763	254886	38.655
A4390	20	154	164	19.7	5.5	11.2	0.92	42175	A4390	20	149	159;	32.3	13.9	18.5	0.45	159	419763	254876	38.528
A4390	20	164	174	4.6	5.8	0	0.75	42176	A4390	20	159	169;	17.8	10.7	19.1	0.43	169	419762	254866	38.485
A4390	20	174	184	2.7	5.4	11.3	0.83	42177	A4390	20	169	179;	3.1	6.1	14.2	0.54	179	419762	254856	38.431
A4390	20	184	195	0.8	5.9	7.7	0.96	42178	A4390	20	179	189;	0.8	7	17.1	0.53	189	419760	254846	38.419
A4390	20	195	205	1.2	3.7	6.9	1.24	42179	A4390	20	189	199;	3.6	7.4	15.7	0.51	199	419759	254836	38.416
A4390	20	205	215	11.7	3.9	8	1.21	42180	A4390	20	199	209;	1.3	7.2	12.5	0.55	209	419757	254827	38.353
A4390	20	215	225	6.5	6	7.8	1.03	42181	A4390	20	209	219;	1.1	5.2	10.3	0.6	219	419755	254817	38.28
A4390	20	225	236	5.4	9.1	6.9	1.22	42182	A4390	20	219	229;	1.8	4.9	10.4	0.57	229	419752	254807	38.321
A4390	20	236	246	9.8	3.2	10.4	0.99	42183	A4390	20	229	239;	7.3	4.4	7.2	0.61	239	419750	254797	38.429
A4390	20	246	256	1.4	3.8	9.1	1.03	42184	A4390	20	239	249;	2.9	4.1	8.2	0.72	249	419749	254788	38.417
A4390	20	256	266	1.6	5.6	7.3	0.99	42185	A4390	20	249	259;	2.4	9	8.1	0.7	259	419747	254778	38.387
A4390	20	266	277	22.9	8.5	9.4	0.94	42186	A4390	20	259	269;	1.5	7.3	8.1	0.63	269	419745	254768	38.43
A4390	20	277	287	3.1	11.1	11	0.86	42187	A4390	20	269	279;	1.3	7.7	8.6	0.51	279	419742	254758	38.423
A4390	20	287	297	4.1	2.7	11.8	0.64	42188	A4390	20	279	289;	1.9	7.4	11.9	0.53	289	419740	254749	38.419

				CL1 (2011)									CR1 (2012)				(CL1 on dual)			
				LV3	LLRT	LRRT	LLTX				Section		LV3	LLRT	LRRT	LLTX		OSGR		
road no	section	from	to	sq.mm	mm	mm	mm		Road no	no.	Start	End	sq.mm	mm	mm	mm	metre	easting	northing	upping
A4390	60	0	8	2.7	6.4	5.1	1.19	42252	A4390	40	419	429;	1.4	3	8.2	0.89	429	419621	254124	37.901
A4390	60	8	18	3.5	8.5	7	1.15	42253	A4390	40	429	439;	3.2	2.8	8.9	0.9	439	419619	254114	38.11
A4390	60	18	28	2.8	11.9	4.6	1.22	42254	A4390	60	0	6;	1.7	1.8	5.4	1.38	6	419656	254066	38.544
A4390	60	28	38	0.9	6.1	2.9	1.3	42255	A4390	60	6	16;	1.2	2.5	7	1.44	16	419661	254066	38.448
A4390	60	38	48	0.6	4.5	2.2	1.21	42256	A4390	60	16	26;	0.7	3.4	5.8	1.49	26	419671	254064	38.396
A4390	60	48	58	0.7	5	2.6	1.21	42257	A4390	60	26	36;	1	3.9	7	1.18	36	419681	254062	38.396
A4390	60	58	68	4.3	5.5	3.4	1.38	42258	A4390	60	36	46;	0.8	3.2	8.3	1.38	46	419690	254059	38.375
A4390	60	68	79	0.5	4.8	3.8	1.29	42259	A4390	60	46	56;	0.3	3.4	6.4	1.34	56	419700	254056	38.304
A4390	60	79	89	0.6	4.8	5	1.28	42260	A4390	60	56	66;	0.6	3.7	7.4	1.33	66	419709	254054	38.222
A4390	60	89	99	0.8	4.9	4.7	1.48	42261	A4390	60	66	76;	2.9	6	8.1	1.59	76	419719	254052	38.148
A4390	60	99	109	0.7	2.7	4.3	1.31	42262	A4390	60	76	86;	0.4	4.8	9.5	1.52	86	419729	254050	38.089
A4390	60	109	119	0.9	1.4	4.2	1.31	42263	A4390	60	86	96;	0.4	4.1	8.2	1.29	96	419739	254049	38.029
A4390	60	119	129	1	2.1	4.3	1.31	42264	A4390	60	96	106;	0.5	4.2	7.6	1.31	106	419749	254048	37.962
A4390	60	129	139	1.6	4.2	6.9	1.41	42265	A4390	60	106	116;	0.3	3.9	6.4	1.34	116	419759	254047	37.866
A4390	60	139	149	1.6	3.5	5.4	1.46	42266	A4390	60	116	126;	0.8	5.2	7.8	1.51	126	419768	254046	37.768
A4390	60	149	159	1.4	3.5	4.3	1.49	42267	A4390	60	126	136;	0.5	5.5	8.8	1.4	136	419778	254045	37.69
A4390	60	159	169	0.6	2.2	4.3	1.43	42268	A4390	60	136	146;	0.4	4.3	6.6	1.33	146	419788	254044	37.639
A4390	60	169	179	0.8	1.9	3.7	1.45	42269	A4390	60	146	156;	0.9	5.6	7.5	1.23	156	419798	254043	37.595
A4390	60	179	189	0.7	2.8	3.7	1.54	42270	A4390	60	156	166;	0.4	6.3	7.9	1.42	166	419808	254041	37.566
A4390	60	189	199	0.5	2.4	3.7	1.32	42271	A4390	60	166	176;	0.8	6.3	8.1	1.64	176	419818	254040	37.529
A4390	60	199	210	0.6	3	3.8	1.45	42272	A4390	60	176	186;	0.3	5.3	8.1	1.53	186	419828	254039	37.497
A4390	60	210	220	0.5	2.7	3.5	1.41	42273	A4390	60	186	196;	0.3	5.1	8.5	1.35	196	419837	254037	37.462
A4390	60	220	230	0.6	2.4	4.4	1.25	42274	A4390	60	196	206;	0.3	5.4	8.8	1.34	206	419847	254035	37.456
A4390	60	230	240	1	4.3	4	1.21	42275	A4390	60	206	216;	0.9	5.1	9	1.33	216	419857	254033	37.451
A4390	60	240	250	1.4	5.1	3.9	1.11	42276	A4390	60	216	226;	0.2	5	7	1.21	226	419866	254031	37.468
A4390	60	250	260	1.1	6.2	5.9	1.08	42277	A4390	60	226	236;	0.3	5.6	10.1	1.32	236	419876	254029	37.495

Survey process - 4

11. Obtain crash data from Road Safety Intelligence
12. Merge all the above data into a single, paper, file for each site and carry out desk study. This highlights:
    - Potential causes of crashes
    - Factors to particularly check on when visiting sites
13. Visit all sites with at least a drive over (in urban areas a cycle is very useful as it saves a lot of walking)

N115

Accident Date BETWEEN '01-Jan-2011' AND '31-Dec-2013'

No	Area L/A	Reference	Severity	Day	Date	Time	Grid Coords	Link/Node	Street
1	E07000222	S01074513	Slight	Wednesday	24/07/2013	13:45	436067/263452		

Location: B4455 Fosse Way, at its Junction with A425 Southam Road, Radford Semele **1st Rd:** B4455 **2nd Rd:** A425

Speed	C'Way	Jct Det/Ctrl	Lighting	Weather	Rd Surf	PedX - Human	- Phy Fac	Special	Hazard
MPH	Roundabout	R'dabt Give	Daylight	Fine	Dry	None	None	None	None

Veh	Vehicle type	Towing	Manoeuvre	Dir	Veh loc	Junct. loc	Skidding	Hit obj in	Left cway	Hit obj off	Sex	Age	B/T
1	Car	No	Start	SW NE	On main	Mid junction	No	None		None	Male		N/R
2	Car	No	Waiting	SW NE	On main	Mid junction	No	None		None	Female		N/R

Cas No	Veh ref	Cas Class	Sex	Age	Severity	Car Pass	Ped Direction	Ped Movement	Ped location	School Pupil
1	2	Passenger	Female	-1	Slight	Front	Not ped	Not ped	Not ped	Other
2	2	Passenger	Male	-1	Slight	Rear	Not ped	Not ped	Not ped	Other

Description: V1 and V2 tvl N on B4455at rab jnt with A425 V2 gives way but V1 runs into rear of V2

User Information:

No	Area L/A	Reference	Severity	Day	Date	Time	Grid Coords	Link/Node	Street
2	E07000222	S01056513	Slight	Tuesday	11/06/2013	07:45	436075/263482		

Location: A425 Sotham Rd, at its Junction with B4455 Fosse Way, L/Spa **1st Rd:** A425 **2nd Rd:** B4455

Speed	C'Way	Jct Det/Ctrl	Lighting	Weather	Rd Surf	PedX - Human	- Phy Fac	Special	Hazard
MPH	Single c'way	R'dabt Give	Daylight	Fine	Wet	None	None	None	None

Veh	Vehicle type	Towing	Manoeuvre	Dir	Veh loc	Junct. loc	Skidding	Hit obj in	Left cway	Hit obj off	Sex	Age	B/T
1	Car	No	Going ahead	NW SE	On main	Mid junction	No	None		None	Male	-1	N/C
2	Pedal Cycle	No	Going ahead	SW NE	On main	Mid junction	No	None		None	Male		N/A

Cas No	Veh ref	Cas Class	Sex	Age	Severity	Car Pass	Ped Direction	Ped Movement	Ped location	School Pupil
1	2	Drv/Rider	Male	23	Slight	No	Not ped	Not ped	Not ped	Other

Description: V1 trav SE failed to give way at rab and collided with V2 trav NE and already on rab

User Information:

Survey Process - 5

14. Type up and file all reports
15. Produce summary report
16. Produce overview report which includes all recommendations for action including:
    - Changes to IL
    - Need for resurfacing
    - Traffic management recommendations for consideration
    - Other maintenance needs such as improving lateral visibility
    - Etc
17. Deliver all reports (9 full lever arch files last year)

Sample form – top half

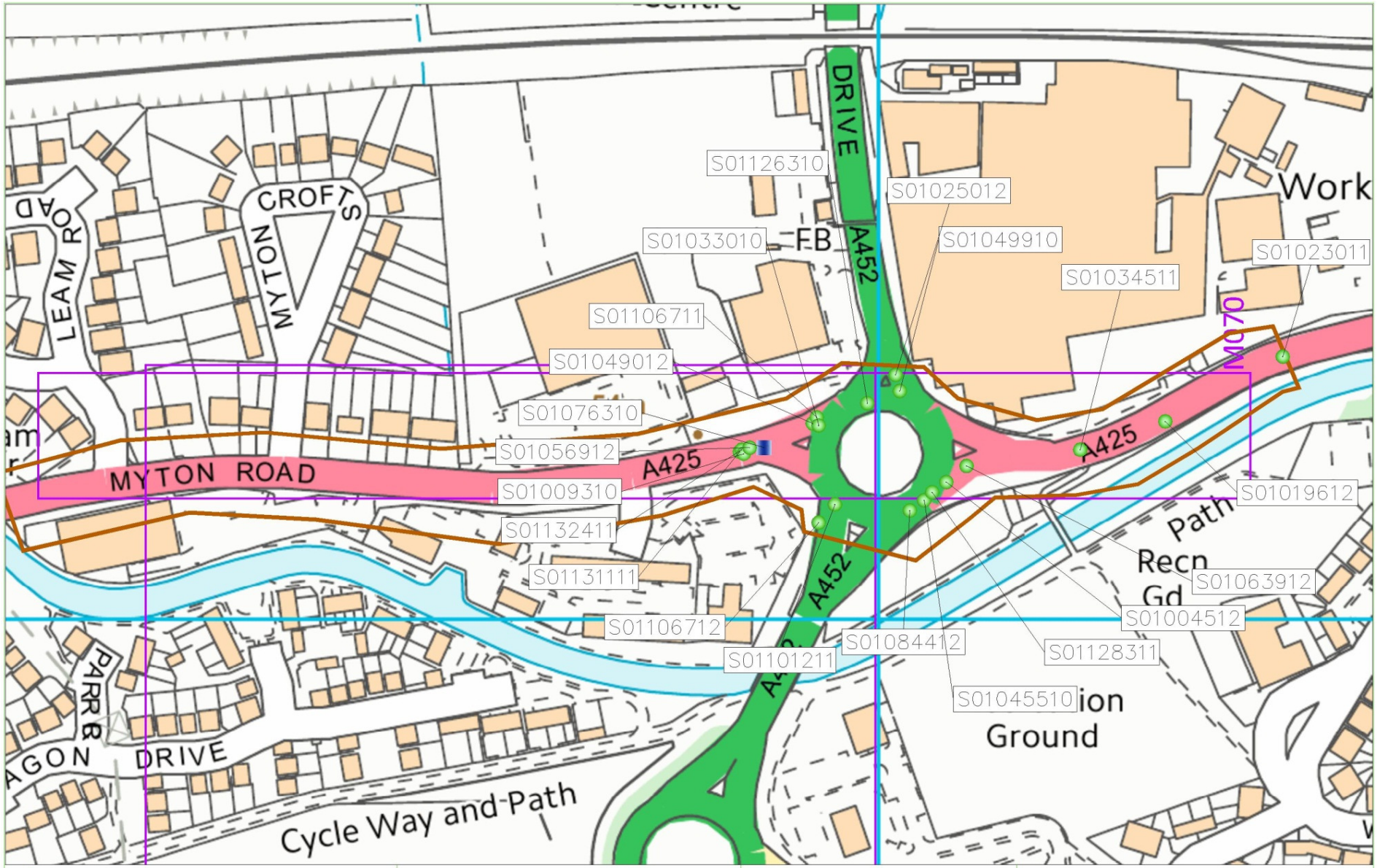
General information					
Investigation reference	*M19*	Previous year ref	*L21*	Low skid or high crash?	*Low skid*
Road no	*A45*	Location	*C74 Main street Willoughby*		
From section/metre	*460/390*	To section/metre	*470/60*		
Name of investigator	*C A Catt*	Date(s) of investigation	*Spring 2013*		
Summary of results and recommendations					
No crashes for 4 years *Change Q- to Q**					
Data					

Sample form – bottom half

Type of site	*Junction and bend*	Speed limit mph	*50*
Site category (WCC)	*Q-, S2-*	Investigation level	*0.45, 0.4*
Typical CSC	*0.38*	Deficiency	*0.07, 0.02*
Typical macrotexture – describe as low, medium, or high or obtain from SCANNER data?	*0.6 – 1.3 mm*		
Ride LV3	*Fair*	Rut	*Up to 13 mm*

	2010/2012			*2009/2011*
	On line	*Off line*		
Number of crashes	*0*	*0*	Number of crashes	*0*
Wet crashes	*0*		Wet crashes	*0*
Skid crashes	*0*		Skid crashes	*0*
Wet skid crashes	*0*		Wet skid crashes	*0*

Crash notes	
Check this specifically on site	
Site visit comments	*Give way line nearly extinct*



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Communities

Graeme Fitton BSc, MSc, C.Eng, MICE.
Head of Transport and Highways

Accident Severity

- Slight
- Serious
- Fatal

N

Road Safety Intelligence Team
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M70 A425

Survey Checklist

1. Is surface consistent with SCANNER data
2. Is ride poor and could it contribute to likelihood of crashes
3. Does deep rutting increase drainage problems
4. Significant patching
5. Contamination
6. Drainage
7. Problems for vulnerable users (particularly in urban areas)
8. Junction layout
9. Visibility from side roads
10. White lines and other marking
11. Redundant markings or signs
12. Are sign supports sensibly placed
13. Are all signs visible
14. Collision debris
15. Other visible problems

Problems highlighted by checklist

Poor visibility to side

Road too narrow for 2 way traffic

Changing Investigation Level

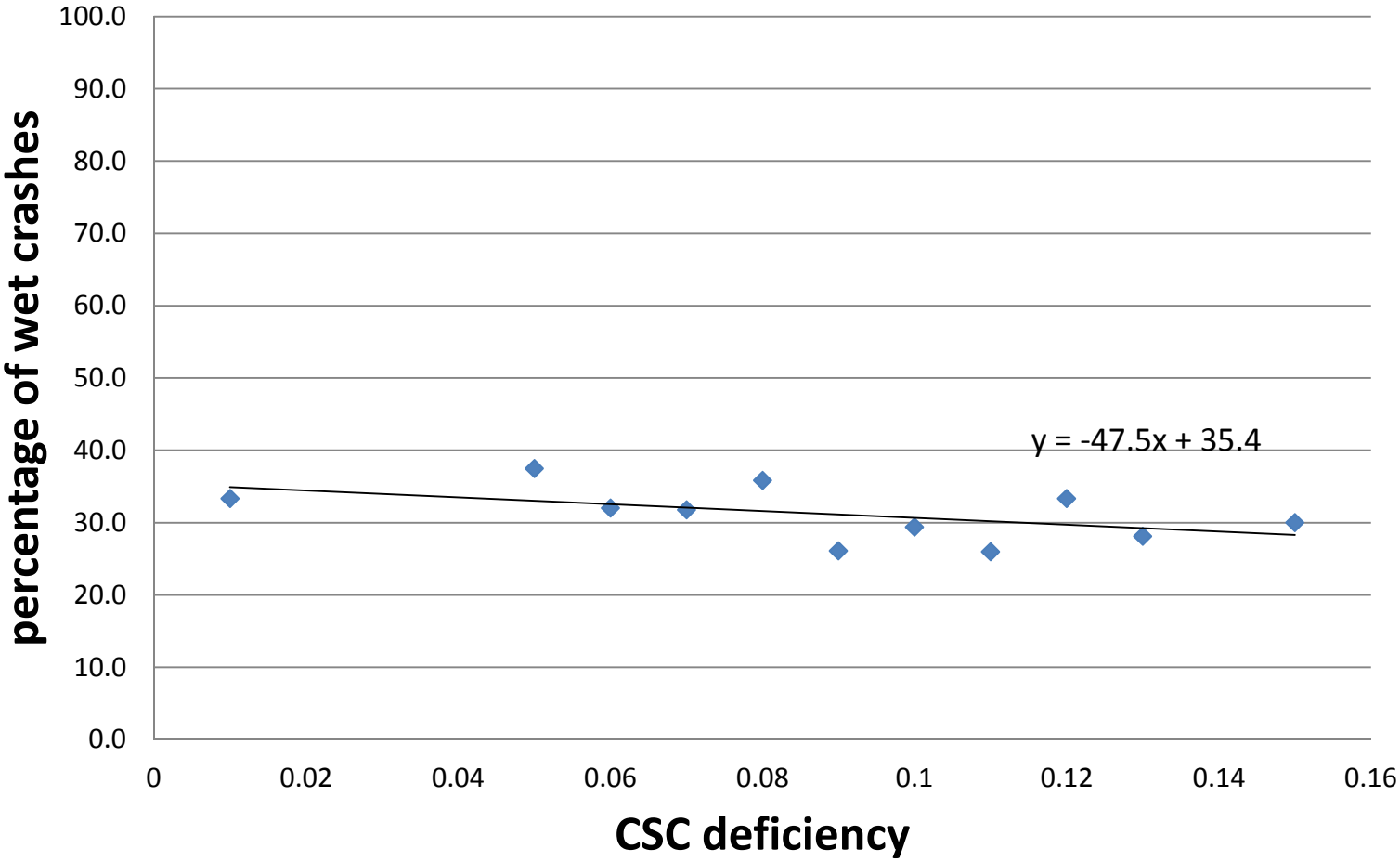
- Raising IL – no IL has needed to be raised
- Reduce IL by 1 step
  - Existing CSC below IL
  - No on-line crashes for 3 years
- Reduce IL by 2 steps
  - Existing CSC is below reduced IL
  - No crashes for at least 4 years (except drunk or excessive speed)
  - Cannot be reduced to below surrounding road (0.4)

General reduction in 30 mph areas?

Factor	**Proportion in 40-70 mph zones**	**Proportion in 30 mph zones**	**Significance level of difference**
Total no of crashes	4381 (number)	689 (number)	
Wet crashes	34.9%	31.7%	5% (probably significant)
Wet skid crashes	13.1%	5 7%	About 1 in 10^8
Dry skid crashes	13.6%	4.8%	Beyond 1 in 10^9 (limit of statistical tables in the author's possession)

Proportion of wet crashes v CSC deficiency

deficiencies with less than 15 results deleted



- On the basis of this data it was decided that there was sufficient justification reduce all the ILs in 30 mph areas by one level except for Category C
- A similar exercise was carried on 40 mph roads but there was insufficient data to provide statistical significance. (All 40 mph low CSC sites had had IL reduced on a site by site basis.)

Site category and definition		Investigatory Levels at 50 kph.					
		0.30	0.35	0.40	0.45	0.50	0.55
	Risk Rating	**1**	**2**	**3**	**4**	**5**	**6**
B	Dual carriageway non-event.		B	B+			
C	Single carriageway non-event		C-	C			
Q	Approaches to and across minor and major junctions, approaches to roundabouts			Q#	Q-	Q	
K	Approaches to pedestrian crossings and other high risk situations			K#	K-	K	
M	Approaches to single carriageway minor junctions (D roads and heavily trafficked private accesses)		M#	M-	M		
R	Roundabouts		R#	R-	R		
G1	Gradient 5-10% longer than 50m		G1#	G1-	G1		
G2	Gradient >10% longer than 50m			G2#	G2-	G2	
S1	Bend radius <500m - dual carriageway		S1#	S1-	S1		
S2	Single carriageway 40 mph or above Bend radius 500m – 250m		S2#	S2-	S2		
S3	Single carriageway 40 mph or above Bend radius <250m – 100m			S3#	S3-	S3	
S4	Single carriageway all speeds Bend radius < 100m			S4#	S4-	S4	

Pedestrian crossings

Surfacing on approach to pedestrian crossings

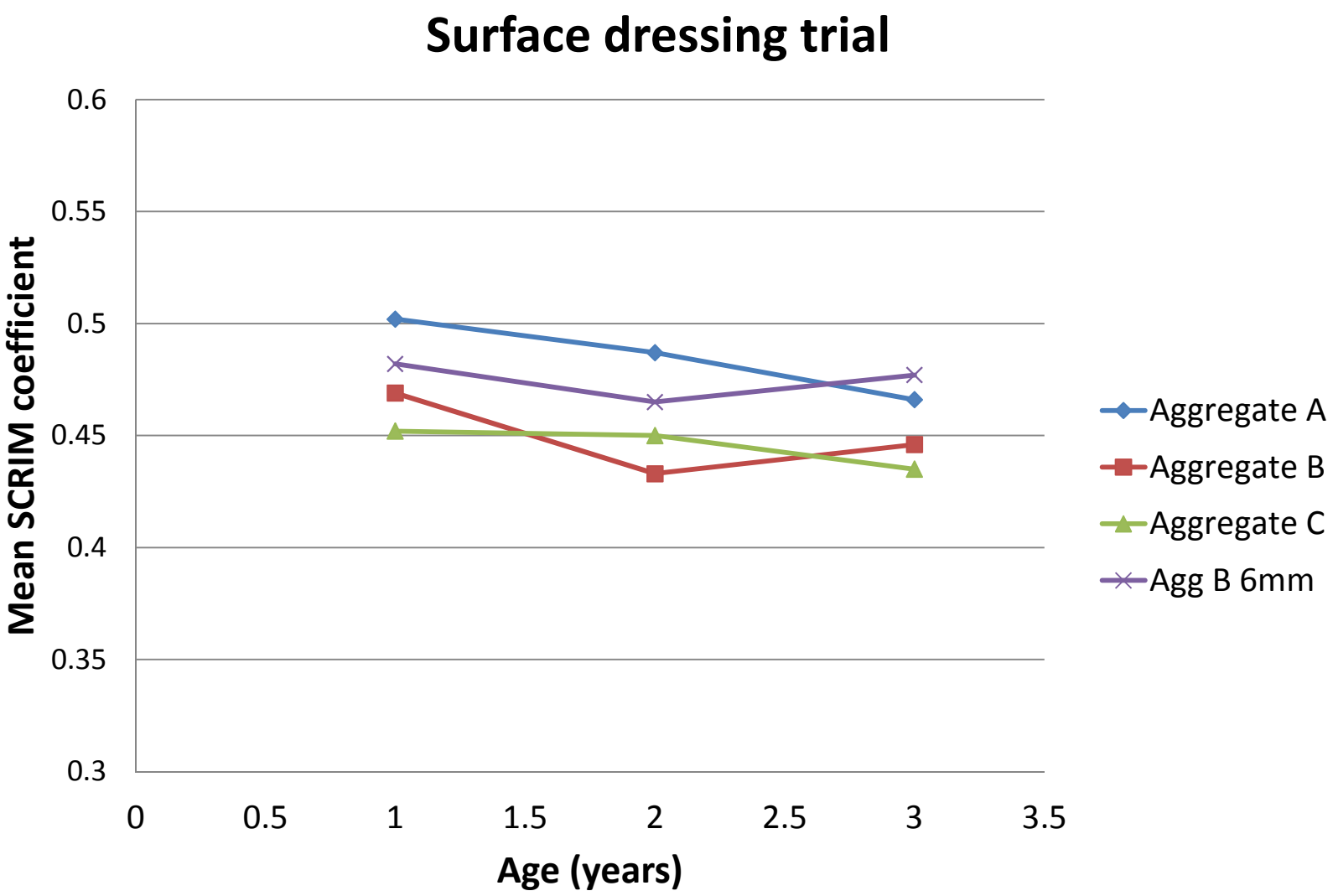
- Normal surfacing or high friction

Result of statistical analysis

- No significant difference in crash rate between high friction and normal surfaces
- Nearly all crossings considered were light controlled and most crashes caused by pedestrian or vehicle jumping red light.
- Slight indication that zebra crossings had higher crash rate but too few data for significance to be established

Surface dressing trial

- Skidding resistance of various aggregates
  - 3 aggregates from Aggregate Industries – the same as used in the paper by Allen and others at the last conference here looking at PSV and Wehner-Schulze test. The same nomenclature is used. A=65 PSV, B=60 PSV and C=55 PSV.
- Site about 3 km long, 4 sections. Same existing surface
- All aggregates 10/6 racked in dressings and aggregate B a single 6 mm dressing also


Surface dressing trial
Mean SCRIM coefficient
0.6
0.55
0.5
0.45
0.4
0.35
0.3
0
0.5
1
1.5
2
2.5
3
3.5
Age (years)
Aggregate A
Aggregate B
Aggregate C
Agg B 6mm

That’s all - farewell