Reduced Energy Lighting – White Light Initial Site Deployment Monitoring Report

Executive Summary

A 2km section of the M4 between J5 & J6 has had its 250W high pressure sodium (SON) lamps replaced with 140W Cosmo white lights. These white lights use less energy, and emit half the light output compared to the SON lamps and this represents a deviation from prevailing British and European standards. However there is reason to believe the human eye is more responsive to the white light and therefore needs less of it to function effectively compared to under SON lighting. This site has been monitored since it was introduced at the beginning of April 2011. Both quantitative and qualitative evidence has been compiled in order to determine what impacts on road users and road workers might have resulted from these white lights. The evidence (to date) suggests that the white lights have not reduced safety for road users and may have improved safety for road workers.

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Introduction
A project looking at the use of white lights on the motorway network was undertaken to demonstrate the benefits to be gained. This resulted in an initial 2km site being deployed on the network (on the M4 J5-6) to use white lights at 140W compared to the existing high pressure sodium (SON) lights at 250W. The site has been monitored (over a period of 10 months) for any evidence to suggest a change in driver behaviour or safety benefits that indicate a change in safety at the site as a result of the use of white lights.

Data Sources

The main evidence sources identified for monitoring were feedback from the Managing Agent (Area 3), feedback from the Traffic Officer Service, data from the Regional Intelligence unit and police accident data (STATS19). Contact was made with the Managing Agent, Traffic Officer Service and the regional intelligence unit (RIU) requesting evidence that might inform the monitoring exercise. These sources supported this request and agreed to provide any data they became aware of that might implicate the white lights as an influencing factor affecting safety on the respective part of the network.

Quantitative Results

Accident Data:

Unfortunately there are no reportable accident statistics available from April 2011 to December 2011 to use to compare with previous years. While there are some provisional records available, they are not verified and cannot be used for formal reporting or analysis. The preliminary data however, suggests the accident rate is no worse than previous years.

Regional Intelligence Data:

For a comparative 6 month period following activation of the white lights the same 6 month (April to September) period for the years 2008 – 2011, the following closure codes were recorded. These figures apply to closure codes that were recorded when the motorway lights would be switched on (darkness only).

ClosureCodeDescription	2008	2009	2010	2011
Abandoned Vehicle (unspecified)			1	
Breakdown - Hardshoulder	12	9	13	8
Breakdown – offside tyre change			1	1
Breakdown – vulnerable person present				1
Breakdown - out of fuel		2		1
Breakdown – in live lane		1	1	
Event / Incident (Off Network) - Unplanned			1	
Vehicle Fire				1
Hard Shoulder - Other Non Legal use			3	
Anti Social Behaviour with Vehicle			2	
Debris	1	2	2	
Hazardous Spillage			1	

ClosureCodeDescription	2008	2009	2010	2011
Other obstruction (excl breakdown)	1	1		1
Observation – infrastructure problem		1		2
Observation – police/ VOSA intelligence.		1	3	1
Pedestrian on network	2	5	2	4
PNC Transaction			1	1
Roadworks Planned Notification (from contractor)	6	15	14	22
Stopping Vehicles		1		
Road Traffic Collision - Damage Only		3	1	1
Road Traffic Collision - Minor Injury	2			
Total	24	41	46	44

Some of these incidents have little bearing on the presence or type of lighting used, but have been included for completeness. Of note is the damage only and minor injury road traffic collision data. This is a good indicator of the probable impact as a result of the change to the lighting. This suggests that the change to the lighting has had no negative impact so far. All other closure codes (not listed) were zero across all years for the same period.

Comparing the period following activation of the white lights (April – Dec 2011) with the previous full year (April to March) periods for the years 2007/8 – 2011, the following closure codes were recorded. These figures apply to closure codes that were recorded when the motorway lights would be switched on (darkness only).

ClosureCodeDescription	2007/8	2008/9	2009/10	2010/11	2011
Animal on network			1		1
Abandoned Vehicle (unspecified)				2	
Abandoned Vehicle Not Suspicious			1		
Breakdown - Hardshoulder	21	32	35	41	13
Breakdown – offside tyre change	1	5	1	1	1
Breakdown – vulnerable person present					1
Breakdown - out of fuel	7		5	3	1
Vehicle Recovered - privately	6				
Breakdown – in live lane	4	1	6	2	
Infrastructure defect	1		1		
Event / Incident (Off Network) - Unplanned				1	
Vehicle Fire				1	2
Off road fire (e.g. verge fire)				1	
Hard Shoulder	2				

ClosureCodeDescription	2007/8	2008/9	2009/10	2010/11	2011
Hard Shoulder - Medical Emergency	1				
Hard Shoulder - Tacho Break (HGV)			1		
Hard Shoulder - Drive Away	1		1		
Hard Shoulder - Other Non Legal use	7	1		4	
Anti Social Behaviour with Vehicle				3	
Assistance to Other Agencies			1		
No Trace	1		1	2	1
Debris	3	3	5	7	4
Hazardous Spillage				1	
Other obstruction (excl breakdown)		2	1	2	1
Observation – infrastructure problem	1		4		2
Observation – police/ VOSA intelligence.		1	3	4	1
Pedestrian on network	6	5	10	2	5
PNC Transaction				3	1
Roadworks	6				
Roadworks Planned Notification (from contractor)	11	10	45	25	23
Roadworks Unplanned	1				
Stopping Vehicles			1		
Road Traffic Collision - Damage Only	6	5	8	5	5
Road Traffic Collision - Minor Injury	1	3			
Road Traffic Collision – Serious Injury			1	1	
Poor Visibility - Fog	1				
	88	68	132	111	62

Some of these incidents have little bearing on the presence or types of lighting used, but have been included for completeness. Of note is the damage only and minor injury road traffic collision data. This is a good indicator of the probable impact as a result of the change to the lighting. This suggests that the change to the lighting has had no negative impact so far. The 2011 period is shorter than the 12 month comparisons but the trend suggests this is not degrading significantly. Across the (nearly) five years of data, two closure codes (one live lane breakdown and one traffic collision – damage only) occurred

within road works. One of these occurred in December 2009 and the other in January 2010. All other closure codes (not listed) were zero across all years for the same period.

Qualitative Results

Feedback from Traffic Officer Service

Two phases of the project involved contribution from the Traffic Officer Service. The off-road demonstration invited traffic officers from Area 3 (Easton Lane Outstation). Their participation in the off-road demonstration provided valuable feedback on the Traffic Officer Service views of the impact of white lights as a replacement for the SON luminaires. Their comments were very positive and suggested it made sense to deploy the white lights on the network and that they felt more comfortable operating under the (140W Cosmo) white lights compared to (250W) SON lamps.

When the white lights were deployed onto the live network they were installed in Area 3 but in the region covered by Chieveley outstation. The Chieveley outstation traffic officers were contacted via their operations manager and invited to consider the white light site and offer feedback about their experience operating under these changed conditions. Following a period of weeks with no feedback from the traffic officers a second approach was made to solicit feedback. The result of this second approach suggested that no news was good news. Typically, the Traffic Officers have a reputation for being quite quick to report problems if they are concerned about something but tend to remain fairly quiet if they are not concerned about something (and likewise if they are happy with something they remain quiet). The absence of feedback was a strong indicator that they were not concerned about the impact on operations following the introduction of the white lights. Since the white lights have been in service there have been no expressions of concern from the traffic officers at Chieveley outstation or from Heston outstation that sometimes patrol this section.

The drawback to this approach is that it remains fairly passive and is not very effective at gathering positive feedback if any of the Traffic Officers have noticed improvements as a result of the change.

Feedback from Managing Agent

The Area 3 managing agents (who carried out the change to white lights) were familiar with the site and were contacted on several occasions to check if there were any problems encountered or improvements noticed. The general feedback via telephone conversations was positive and the managing agents preferred the white lights to the SON lighting. There was no evidence to suggest any unusual failure rates specific to the new equipment.

The Area 3 managing agent received correspondence from an Enterprise Mouchel Network enforcer expressing his strong support for the white lights and noting the safety improvements they offered to road workers. The gentleman expressed a view that the

white lights were an improvement on the SON lamps while recognising that the 140W Cosmo (white lights) were of a lower wattage than the SON lamps.

Other Feedback

The general public have opportunity to contact the Highways Agency via the Information Line (HAIL) and this option was available to the public if anyone wished to express a view about these white lights. So far no HAIL reports have been received from the public expressing views about these white lights.

Propagating the information about this site to colleagues who had reason (official or unofficial) to drive through this section at night had two types of reaction. The most common reaction was one of “I didn’t even notice” and the other was one of “They seem quite nice”. One person expressed uncertainty about whether there was any improvement with the white lights. On a couple of occasions the same person reported on the site twice. The first time reporting “they didn’t even notice” and the second time – having made a point of noticing – expressing generally favourable views.

Conclusion

The deployment of 140W white lights on a 2km section of the M4 between J5 & J6 has been in operation for 10 months now. Since that time the site has been monitored to try to identify any adverse changes resulting from this change to the lighting. To date there has been no quantitative or qualitative evidence to suggest the 140W white lights are introducing degraded safety compared to the 250W SON lights previously operated at that site.

Most feedback received about this installation has been either neutral or positive with some knowledgeable feedback giving favourable views. There has been views expressed suggesting these white lights have actually improved safety for road workers and this compares favourably with the results recorded from the off-road demonstration previously completed at Moreton-in-March off-road test track.

Generally the energy savings, environmental and safety benefits from deploying white lights on the motorway network currently appear to outweigh any drawbacks as a result of reduced light levels, or non-conformance with industry good-practice as described through BS and EN standards. This conclusion will be reviewed if evidence presents itself to suggest something to the contrary.