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**M11 Route Single Vehicle
Loss of Control Accident
Review**

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EXECUTIVE SUMMARY

The purpose of this report was to investigate the number of Personal Injury Accidents (PIAs) that have occurred on the M11 motorway that have involved a single vehicle losing control.

This included a simultaneous review of accident clusters between MP62/7 and MP62/5 and between MP 68/5 and 68/0. (The first site is located in the area around Royston Road underpass at Wendons Ambo. The second site is located just south of Junction 9). No clusters were found to exist at either of these two sites.

This report has failed to identify any contributory factors as to why single vehicle lose control on a motorway other than driver error or vehicle malfunction, neither of which can be addressed with purely engineering improvements. Motorways are universally acknowledged as the safest type of road within the United Kingdom.

Nothing in the accident reports suggest that speed is a significant factor in the cause of the accidents, but as in all cases as speed increases so does the severity of the accident. Tiredness may also be a factor but again there is little data to back this up.

Seventy percent of these accidents involve male drivers; however no data is available as to the composition of traffic flow by sex or age for the M11 so it may or may not be significant.

Therefore, under these circumstances it is not possible to suggest any engineering options for accident remedial or safety improvement measures that would contribute to reducing these types of accidents. Education and increasing the awareness of the problem to the public is the best course of action.

1. INTRODUCTION

1.1. Background

1.1.1. Carillion-URS have been commissioned by the Highways Agency to undertake a study reviewing the Personal Injury Accidents (PIAs) that have occurred on the M11 between Junction 7 (A414 Harlow) and Junction 9 (A11 Chesterford) that have involved a single vehicle losing control.

1.2. Study purpose

1.2.1. The purpose of this study is: -

- The purpose of this report was to investigate the number of Personal Injury Accidents (PIAs) that have occurred between Junction 7 and Junction 9 of the M11 that have involved a single vehicle losing control. Simultaneously review accident clusters between MP62/7 and MP62/5 and between MP 68/5 and 68/0. (The first site is located in the area around Royston Road underpass at Wendons Ambo. The second site is located just south of Junction 9),
- Identify any contributory factors; and,
- If possible suggest options for accident remedial or safety improvement measures that would contribute to reducing these types of accidents.

1.3. Format of the report

Section 2 describes the site.

Section 3 contains the accident analysis and summary of the accidents.

Section 4 presents options for treatments.

Section 5 offers the economic justification.

Section 6 presents the conclusions.

Section 7 offers the recommendations.

2. SITE DETAILS

2.1. Location

- 2.1.1. The M11 motorway commences at the A406 London North Circular (near Woodford) and proceeds northwards towards Cambridge. The motorway terminates at the A14 Girton Interchange.
- 2.1.2. The M11 extends for a length of 66.4 kilometres within the limits of Area 8 and passes through the counties of Essex and Cambridgeshire. The area under review, from Junction 7 to Junction 9, is approximately 40 kilometres in length.
- 2.1.3. The M11 is a 2-lane motorway for the majority of its length; however it is 3 lanes between Junction 6 and Junction 8 reducing to two lanes south of Junction 6 (M25). It is subject to the national speed limit for rural motorways within the extents of this study. The route has long un-interrupted sections of carriageway, particularly the 21 kilometre section between Junction 8A and Junction 9.
- 2.1.4. The section of the M11 within Area 8 contains 8 grade-separated junctions (Junctions 7 to 14). The area under review is between Junction 7 and Junction 9. Junctions 7 and 8 off the mainline are controlled by traffic signals. This section comprises approximately 40 kilometres or 60% of the Area 8 route length.
- 2.1.5. A new slip road configuration serving Stansted Airport, Junction 8A opened in January 2003. The northbound off slip to Junction 8A has a localised 50mph speed limit. This also links to the newly upgraded A120 to Great Dunmow.
- 2.1.6. The location of the study area within the local highway network is shown on the General Location Plan in Appendix A.
- 2.1.7. The edge of carriageway markings on the M11 predominantly consist of thermoplastic screed with all sections being raised rib with road studs.
- 2.1.8. Emergency telephones are located at regular intervals and are a mix of types and layouts.
- 2.1.9. The M11 is illuminated on the slip road approaches to Junction 9. The Area 8 MAC is not currently responsible for the circulatory carriageways at this junction. This currently falls within HA Area 6. Junctions 8 and 8A are also lit on the slip roads as well as on the main line some 1,500 metres in advance in both directions.

3. ACCIDENT ANALYSIS

3.1. Accident Data

3.1.1. An accident database is maintained for Area 8 containing full Stats 19 accident records. This database was interrogated, the results of which are contained in this section.

3.2. Other Data

3.2.1. Geospatial data on the type of road markings present, road lighting, locations of emergency telephones and road surface condition was overlaid with the accident data. It should be borne in mind that the date and time of each accident cannot be directly matched to the conditions prevalent at the time. The condition of the carriageway or road marking for example may have been different to that recorded in the geospatial data when a specific accident occurred. However it is useful to identify any areas where the conditions are below the desirable levels to see if any improvements could be made.

3.2.2. It is widely accepted that the reasons for vehicles losing control and leaving the carriageway are very rarely recorded. Inappropriate speed; lack of concentration, driving when tired; and failing to adapt to road and weather conditions are the main causes. Obtaining factual information for these types of accident is difficult as the driver at fault is unlikely to admit to an error of judgement on their part.

3.2.3. Incident reports are also made when maintenance of the network is required following accidents. This has been requested to determine if there is a significant incidence of damage only accidents. Whilst this has no bearing on the economic justification it has been requested in the brief. The level of information recorded for the incident report database is insufficient to isolate this specific type of accident. Interrogation of the database showed no information relevant to this study.

3.3. Research

3.3.1. A search into research publications on single vehicle accidents did not produce any results. This included the Highways Agency, TRL, the AA and the RAC.

3.4. Study Area

3.4.1. During the three-year inclusive period between 1 January 2004 and 31 December 2006 there were a total of 92 Personal Injury Accidents (PIAs) recorded on the M11 in Area 8 that have involved a single vehicle losing control. The section between Junction 7 and Junction 9 experienced 61 single vehicle loss of control accidents. These are similar proportions therefore this section does not experience significantly higher rates of single vehicle accidents than the whole of the M11. There are no national levels for single vehicle loss of control accidents available for comparison.

3.5. Traffic Flows

3.5.1. Traffic flow data was obtained from the Highways Agency TRADS website. Yearly classified count data taken during 2007 was obtained for site 8/6083, which is located between Junction 8 and Junction 9 near Newport. The 24 hour Annual Average Daily Traffic flow northbound is 32,433 vehicles and the southbound flow is 35,354. This gives a two-way AADT of 67,787 vehicles.

3.6. Accident Data Analysis

3.6.1. During the period under review, 1 January 2004 to 31 December 2006, 358 accidents occurred on the M11 between Junction 7 and Junction 9. 61 of these accidents involved only one vehicle. Thirty single vehicle loss of control accidents out of a total of 115 occurred on the whole route in 2006. This equates to a level of 26.1%. The Highways Agency investigation level is 21%. For this section of the M11, for the three years under review, the overall level is 17%. The following tables indicate the types of vehicles and drivers involved.

3.6.2. Table 3.1 below shows the breakdown of accidents by severity and year. Some of the following tables will show totals of 60 accidents rather than the total of 61. This is due to incomplete data.

Table 3.1 SVLC PIAs by Severity

Severity	2004	2005	2006	Total
Fatal	1	1	0	2
Serious	3	3	5	11
Total KSI	4	4	5	13
Slight	15	19	14	48
Total	19	23	19	61

3.6.3. Table 3.2 below shows that the majority of vehicle types are cars and light goods vehicles. Heavy vehicles account for only 5% of the accidents. Seventy three percent of the accidents involve male drivers. Accidents involving female drivers are confined to cars and small goods vehicles. All the motorcycle accidents are male drivers with the majority being on the more powerful bikes.

Table 3.2 Drivers classified by age and sex

Vehicle Type	Female	Male	Female %	Male %	Total
Car	15	28	35	65	43
Goods vehicle <=3.5t	1	7	12	88	8
Goods vehicle >=7.5t	0	2	0	100	2
Goods vehicle between 3.5t and 7.5t	0	1	0	100	1
Minibus	0	1	0	100	1
Motorcycle over 125cc & up to 500cc	0	1	0	100	1
Motorcycle over 500cc	0	3	0	100	3
Taxi	0	1	0	100	1
Total	16	44			60

3.6.4. Table 3.3 shows that the majority of these types of accident are caused by younger drivers. The 26 to 35 age range are more at risk than the under 25 element possibly due to the fact that under 25 year old drivers tend to use the motorways less. Drivers under the age of 45 are more at risk, accounting for 78% of the single vehicle loss of control personal injury accidents.

Table 3.3 Drivers classified by age and sex

Age	Male	Female	Total
<25	9	6	15
26-35	15	3	18
36-45	10	4	14
46-55	4	1	5
56-65	3	1	4
>65	1	0	1
Not Recorded	2	1	3
Total	44	16	60

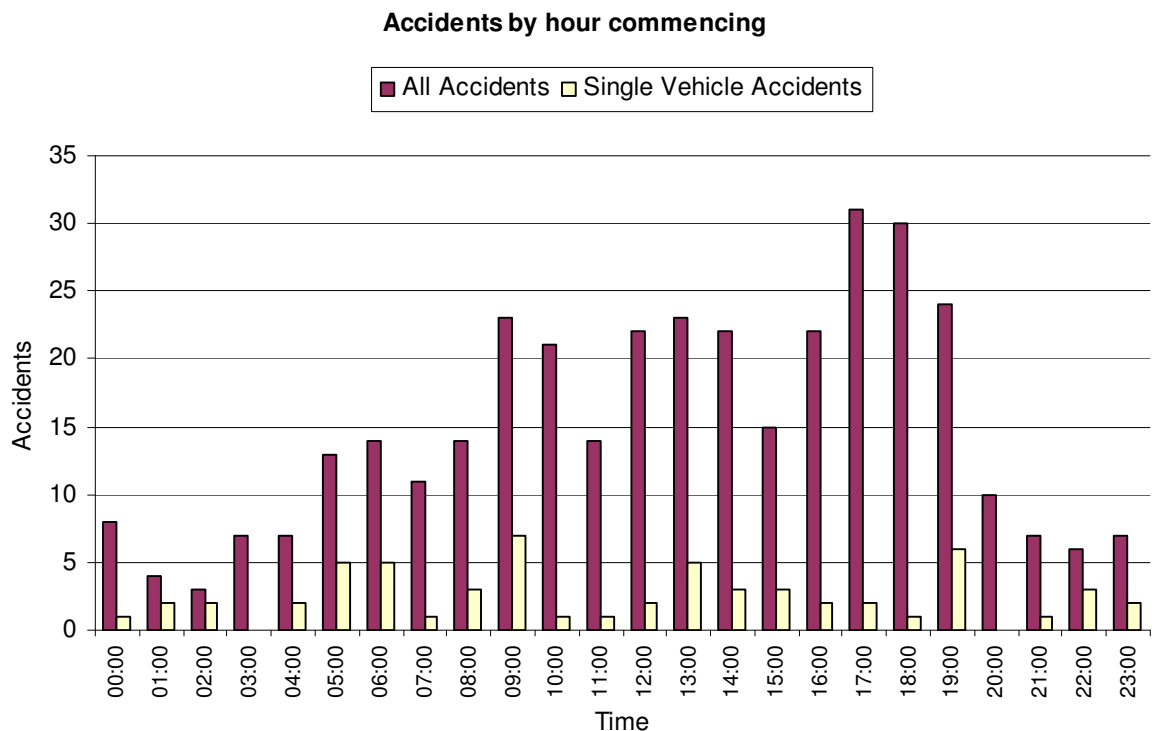
3.6.5. Table 3.4 below shows the frequency of accidents by time of day and day of week.

Table 3.4 Accidents by Day and Time

Hour commencing	Sun	Mon	Tue	Web	Thu	Fri	Sat	Total
00:00	0	0	0	0	1	0	0	1
01:00	0	0	0	0	2	0	0	2
02:00	0	0	1	0	1	0	0	2
03:00	0	0	0	0	0	0	0	0
04:00	0	0	0	0	2	0	0	2
05:00	1	0	0	0	1	1	2	5
06:00	2	0	1	1	1	0	0	5
07:00	0	1	0	0	0	0	0	1
08:00	1	0	0	1	0	1	0	3
09:00	0	2	1	0	1	2	1	7
10:00	0	0	0	1	0	0	0	1
11:00	1	0	0	0	0	0	0	1
12:00	0	0	0	0	1	0	1	2
13:00	0	3	0	1	0	1	0	5
14:00	0	0	1	0	0	0	2	3
15:00	0	1	0	0	0	2	0	3
16:00	0	0	0	0	1	0	1	2
17:00	0	0	0	0	1	1	0	2
18:00	0	0	1	0	0	0	0	1
19:00	2	0	0	1	0	2	1	6
20:00	0	0	0	0	0	0	0	0
21:00	0	0	0	1	0	0	0	1
22:00	0	1	0	0	1	0	1	3
23:00	0	0	1	0	0	1	0	2
Total	7	8	6	6	13	11	9	60

3.6.6. Table 3.4 above illustrates that there is no particular day or time when these types of accidents are more likely to occur. However as seen in Figure 3.1 below, which shows all the accidents occurring within the study parameters against the single vehicle accidents, there is a more even spread, suggesting that the twilight hours see a higher proportion of single vehicle accidents. This can be explained by the lower traffic flows experienced at this time of day. It follows that a loss of control during peak hours (heavier flow conditions) is more likely to result in a collision with another vehicle than in the early hours when there is less traffic to collide with.

Figure 3.1 Comparison of accident times



3.6.7. Table 3.5 below shows the frequency of accidents by month and year. Again there does not appear to be any month that stands out. July is the highest over the three years but this is due to a large increase in 2006. March fell from 6 accidents in 2005 to zero in 2006. March 2006 and July 2006 are statistical anomalies and reflect the random nature of these types of accidents.

Table 3.5 Accidents by year and month

Month	2004	2005	2006	Total
January	1	1	1	3
February	0	1	1	2
March	1	6	0	7
April	2	2	1	5
May	3	1	0	4
June	3	2	1	6
July	2	2	7	11
August	2	3	3	8
September	0	1	0	1
October	3	3	3	9
November	0	0	0	0
December	2	1	1	4
Grand Total	19	23	18	60

3.6.8. Accidents involving single vehicles are, in the main, the result of driver error. Secondary factors are objects in the carriageway (including pedestrians) and defects with either the vehicle or the load. Table 3.6 below shows the accident totals for four classifications, Driver Error, Environmental, Vehicle/Load Defect, and Other. The four Vehicle/Load Defect accidents were all tyre blowouts. The Other accident was an incident involving injury to a HATO officer. The three environmental accidents were caused by 1/ a blackout, 2/ falling asleep and 3/ an object penetrating the windscreen.

3.6.9. It is notable that no accident of this type has occurred in the month of November in the three years under study. Again there is no logical explanation for this anomaly.

Table 3.6 Accidents by factor type

Cause	Accidents	Percentage
Driver error	52	86.67%
Environmental	3	5.00%
Vehicle/Load defect	4	6.67%
Other	1	1.67%
Total	60	100.00%

3.6.10. The majority of accidents occurred in fine weather and on dry roads. Wet or icy road surfaces can adversely affect the handling of a vehicle but these are not the underlying factor. It is a lack of driver judgement to adjust to the prevailing conditions as borne out by the previous table. Table 3.7 and Table 3.8 show the breakdown of accidents by weather and road surface conditions respectively.

Table 3.7 Accidents by weather conditions

Weather Conditions	2004	2005	2006	Total
Fine (with high winds)	1	0	0	1
Fine (without high winds)	15	17	16	48
Other	0	2	0	2
Raining (with high winds)	0	1	0	1
Raining (without high winds)	3	2	2	7
Snowing (without high winds)	0	1	0	1
Total	19	23	18	60

Table 3.8 Accidents by road surface conditions

Road Surface	2004	2005	2006	Total
Dry	16	13	14	43
Frost/Ice	0	2	0	2
Wet/Damp	3	8	4	15
Total	19	23	18	60

3.6.11. Table 3.9 below indicates the resultant outcome of the loss of control. A significant consideration is that almost half of the accidents resulted in the vehicle overturning with a quarter not skidding, jack-knifing or overturning.

Table 3.9 Accidents by manoeuvre

Skidding	2004	2005	2006	Total
No skidding, jack-knifing or overturning	4	8	4	16
Overturned	6	1	2	9
Skidded	4	5	6	15
Skidded and overturned	5	9	6	20
Total	19	23	18	60

3.6.12. For a motorway most accidents occurred more than 20 metres from a junction with just over 10% occurring on the slip roads. It would not be unreasonable to assume that the sweeping radii of the two interchanges at 8A and 9 would account for more loss of control accidents. However there is no cluster of accidents on these link roads, therefore there can be no justification for any remediation.

Table 3.10 Accidents by junction

Junction Detail	2004	2005	2006	Total
Not at or within 20m of junction	18	19	15	52
Roundabout	0	1	0	1
Slip road	1	3	3	7
Total	19	23	18	60

- 3.6.13. Table 3.11 below shows the contributory factors recorded for the accidents. From the sixty accidents identified only forty one had contributory factors recorded. It would appear this information was not recorded (or made available) prior to 2005. Looking at the primary causation factor (Cause 1) and discounting the obvious 'Loss of control' with 9 accidents the highest factor is fatigue and slippery road both with 5 accidents.
- 3.6.14. Illegal tyres account for 2 accidents with 1 alcohol related accident. 'Exceeding the speed' limit accounts for 3 accidents.
- 3.6.15. Looking at the overall totals for causation factors loss of control is still top with 19 recorded instances. However it follows on that most vehicles will lose control following some other causation factor. For example if a driver momentarily loses consciousness through fatigue and this results in a single vehicle accident it is possible that 'loss of control' will be recorded as a cause. Whilst it was a cause of the accident the 'loss of control' would not have occurred if the driver didn't fall asleep.
- 3.6.16. Investigating individual accidents it can be seen that the two instances of 'Fatigue' being recorded as 'Cause 2' follow 'sudden braking' and 'Loss of control'. Both accidents cite 'lost control for reasons unknown' in the accident description. One could argue that fatigue should have been recorded at the primary cause because without that the loss of control or sudden braking would not have occurred.
- 3.6.17. It must be borne in mind that in most cases the sole witness to a single vehicle accident is the driver and their passengers. He/she/they are unlikely to implement themselves as culpable to the accident and therefore the details contained within the accident record and causation factors could be open to interpretation or at best subjective. The causation factors are often completed by the police officer attending the accident and not an experienced accident investigator.
- 3.6.18. Following on from the above it can be seen that 'Fatigue', with 8 recorded instances, is second highest and swerved, with 6, is third. A closer look at the 'swerved' accidents shows that only one was the result of a real cause (attempting to avoid another vehicle) and that the swerve was as a result of another action. Upon closer inspection some of the causation factors do not correlate with the accident description. In conclusion it could be argued that the causation factor data should be used with some degree of caution. It is considered that driver error and fatigue are the underlying reasons why the majority of these accidents occur.

Table 3.11 Contributory Factors

Factor	Cause 1	Cause 2	Cause 3	Cause 4	Cause 5	Total
Aggressive driving (Driver/Rider - Behaviour)	1	0	0	1	0	2
Careless/Reckless (Driver/Rider - Behaviour)	1	0	2	0	0	3
Defective steering or suspension (Vehicle Defects)	0	1	0	0	0	1
Deposit on road e.g. oil, mud, chippings (Road Environment Contrib)	2	0	0	0	0	2
Distraction in vehicle (Driver/Rider - Impairment)	0	0	1	0	0	1
Exceeding speed limit (Drive/Rider - Injudicious)	3	1	0	0	0	4
Failed to judge other person's path/speed (Driver/Rider - Error)	0	1	0	0	0	1
Fatigue (Driver/Rider - Impairment)	5	2	1	0	0	8
Following too close (Drive/Rider - Injudicious)	0	1	1	0	0	2
Illness or disability, mental or physical (Driver/Rider - Impairment)	0	1	0	0	0	1
Impaired by alcohol (Driver/Rider - Impairment)	1	0	0	0	0	1
Inexperience with vehicle type (Driver/Rider - Behaviour)	1	1	0	0	0	2
Inexperienced or learner driver/rider (Driver/Rider - Behaviour)	2	1	0	0	1	4
Junction overshoot (Driver/Rider - Error)	2	0	0	0	0	2
Loss of control (Driver/Rider - Error)	9	3	5	2	0	19
Other (Special Codes)	1	0	0	0	0	1
Poor turn or manoeuvre (Driver/Rider - Error)	1	1	1	0	0	3
Rain, sleet, snow or fog (Driver/Rider - Vision Affected)	0	0	0	1	0	1
Slippery road due to weather (Road Environment Contrib)	5	0	0	0	0	5
Spray from other vehicles (Driver/Rider - Vision Affected)	0	0	1	0	1	2
Sudden braking (Driver/Rider - Error)	1	2	0	0	0	3
Swerved (Driver/Rider - Error)	4	1	1	0	0	6
Travelling too fast for conditions (Drive/Rider - Injudicious)	0	5	0	0	0	5
Tyres illegal, defective or under inflated (Vehicle Defects)	2	0	0	0	0	2
Total	41	21	13	4	2	81

3.7. Cluster Sites

- 3.7.1. The brief specifically required a review of accident clusters between MP62/7 and MP62/5 and between MP 68/5 and 68/0. The first site is located in the area around Royston Road underpass at Wendons Ambo. The second site is located just south of Junction 9.
- 3.7.2. Upon interrogating the database it was identified that there is only one single vehicle loss of control accident at the first site. The second site has no single vehicle loss of control accidents. There are 5 accidents to the north of this area but three are located on the junction 9 north bound off slip and two on the main line. These two sites are not considered to be significant clusters.

3.8. Summary of Accidents

- 3.8.1. There were a total of 61 single vehicle accidents PIAs on the M11 in Area 8 during the three year period 2004 to 2006.
- 3.8.2. Forty four of the accidents were attributed to male drivers. All but one of the female drivers was driving a car; the remaining one was driving a light goods vehicle. Ten percent of accidents were caused by the driver of a heavy goods vehicle. No other factors were considered to have any significant bearing on the accident rate.
- 3.8.3. The contributory factors recorded for the accidents are not complete. Prior to 2005 the contributory factors were not recorded in STATS19 format resulting in nineteen of the sixty accidents (31.6%) being without a valid contributory factor.

4. OPTIONS FOR TREATMENT

4.1. Introduction

- 4.1.1. In essence single vehicle accidents can have many causes; inappropriate speed, lack of concentration, driver error, mechanical failure, fatigue, objects in carriageway etc. The only easily quantifiable cause is inappropriate speed.
- 4.1.2. On a motorway single vehicle accidents are less likely due to the higher design standards used. Motorways are the safest roads by design due to the lack of dangerous junctions or bends. Visibility is at a premium. In addition there is a higher traffic flow therefore losing control in heavy flow conditions is more likely to result in a collision with another vehicle.
- 4.1.3. Therefore there are fewer engineering solutions available to an engineer in which to improve the accident rate of single vehicle loss of control type accidents.

4.2. Road Markings

- 4.2.1. Road markings enable drivers to differentiate the running lanes from the hard shoulder and hard strip. Loss of lane discipline can lead to a collision between vehicles and therefore would not qualify as a single vehicle accident. It is therefore at night or during adverse weather conditions that poorly maintained or inadequate road markings can contribute to single vehicle accidents. A recent Carillion-URS report on hard shoulder accidents looked into the type and condition of road markings on the M11.
- 4.2.2. The use of raised rib marking, diagram 1012.2, has proven to be useful in alerting drivers when they stray off the main carriageway, due to the vibration felt by the driver when they are over-run. However their effectiveness in a large vehicle is diminished slightly. The majority of hard shoulder accidents occurred in daylight with fine weather conditions.
- 4.2.3. All of the mainline M11 has raised rib edge of carriageway markings. All of the accidents under review occurred at locations marked with raised rib. The condition of these markings has not been recorded but it is assumed that they are fit for purpose. Therefore this is not an area considered for improvement.

4.3. Road Signs

- 4.3.1. It was identified in the recent Carillion-URS report on M11 hard shoulder accidents that temporary variable message signs could be used to remind drivers of the dangers of driving whilst fatigued. There could also be a benefit in respect to single vehicle accidents relating to inappropriate speed.
- 4.3.2. The current Highways Agency view is that temporary VMS (Mobile VMS) should be used by the Highways Agency and Police as part of national road safety campaigns. Therefore it should be quite simple to implement the display of any such messages on the network using the existing temporary VMS units.

4.3.3. Overlong messages are difficult for drivers to take in. It is acknowledged that a significant number of car drivers drive on motorways at speeds in the region of 70-90 mph and fail to keep an appropriate distance from the vehicle ahead. As a result of a previous study Carillion-URS have already erected "Keep 2 chevrons apart" signs and chevron road marking on a section of the M11. Data is not yet available as to the benefits of the improvements.

4.3.4. Chapter 4 of the Traffic Signs Manual, which relates to warning signs but is relevant to any safety message, states:

Appropriate warning signs can greatly assist road safety. To be most effective, however, they should not be overused. Their frequent use to warn of conditions which are readily apparent tends to bring them into disrepute and detracts from their effectiveness. Care should be taken to ensure that a route is treated consistently and that signs, or backing boards, are used only for good road safety reasons. Unjustified signing should not be used at individual locations simply in response to complaints from the public. Inconsistent treatment, in terms of size or numbers of signs, can be misleading.

4.3.5. There is a danger of over emphasising safety messages to a point where they significantly reduce their impact on the drivers that they are targeted at. Telling "fast" drivers to slow down as well as keeping two chevrons apart may have very little effect.

4.3.6. An inappropriate speed is an unquantifiable value therefore not related to the speed limit. A speed limit is a limit not a target speed, fog and heavy rain can greatly reduce the appropriate speed at which a vehicle can travel. The average modern family car is capable of speeds that exceed 100mph. The improved handling and safety characteristics leads drivers to believe they can safely drive beyond their capabilities until the prevailing conditions find them wanting.

4.3.7. Conversely, the condition of vehicles involved in these accidents is recorded only if they are considered to be a contributory factor by the Police. The contributory factor records are incomplete in the database. The 200 series is used to identify vehicle defects and only one accident has a 204 code (defective steering suspension). This was recorded as a secondary factor after 401 Junction overshoot (Driver/Rider - Error).

4.4. Speed Enforcement Cameras

4.4.1. As reported above inappropriate speed, rather than just speed, is a major factor in single vehicle loss of control accidents. Reminding drivers about speeding has most likely reached saturation point and there is an element of the driving public who systematically break speed limits.

4.4.2. There are two types of speed cameras available: (i) fixed and (ii) average speed. A fixed camera, usually in a van parked on a motorway overbridge, can have an effect on traffic flow as some drivers will see the camera van and brake sharply to slow

down. The domino effect of braking vehicles leads to a negative effect on the traffic speed profile and traffic throughput. Some drivers can even be seen to brake for fixed cameras even when they are driving below the speed limit. It is a common term that drivers camera surf; i.e. slow down at fixed camera sites and speed up again afterwards. Average speed cameras can produce better results and influence safer driving practices and can improve traffic flow if implemented correctly.

4.4.3. There are only five accidents where inappropriate speed was identified as a causation factor. In none of these accidents was this cited as being the primary cause (Slippery road surface or exceeding the speed limit). Two of these accidents occurred on a wet/damp road, one on ice.

4.4.4. The two dry road accidents involved motorcyclists (motorcycles over 500cc). One fell from their bike whilst negotiating the bend at Junction 8A off slip, which has a 50mph speed limit, and the second occurred on a straight section of road whilst overtaking on the straight. For both these accidents inappropriate speed was given as the primary cause.

4.5. Road Lighting

4.5.1. The M11 is a rural motorway and as such is unlit with the exception of the slip roads and approaches to Junction 8/8A and the circulatory carriageways¹ and slip roads at Junctions 9A, 10 and 11. It is difficult to predict the location of single vehicle loss of control accidents, however it is reasonable to assume that it is more likely they will occur on a slip road or link road such as are in use at Junctions 8A and 9 than on the main carriageway.

4.5.2. Overall, 36% of the accidents occurred during the hours of darkness, whilst 29.5% of accidents occurred during the hours of darkness with no street lighting present. The Highways Agency Intervention level for dark accidents is 13.4%² and for single vehicles 21%. Whilst this is not a direct comparison it is more likely that accidents occur at a higher rate at night due to the fact that higher speeds are achievable due to lower traffic volumes, and the significantly reduced chance in being prosecuted for speeding. Losing control during peak hours is less likely to result in an accident involving only one vehicle at current traffic levels.

¹ Area 8 are only responsible for the slip roads at these junctions and not the circulatory carriageways.

² Safety Operational Folder - English Trunk Road Investigatory Levels (2004-2006)

5. ECONOMIC ASSESSMENT

5.1. General

- 5.1.1. It is considered that there may be some benefit from installing an average speed camera system to improve the accident rate and general operation of the M11.
- 5.1.2. It is not considered that GATSO type or mobile speed enforcement cameras would be of much benefit.
- 5.1.3. The latest version SPECS3 is pending type approval, which allows a much wider enforcement regime than the previous versions. Also an ISDN line and power is all that is required to each camera site. The controller for the system would be located in the headquarters of the relevant camera safety partnership. The civils work for each individual site would be in the region of £1M. Other costs that need to be taken into account are: design preparation, construction supervision, statutory undertaker countermeasures, optimism bias and variation of price.
- 5.1.4. It is a legal requirement to install signs at the start of the SPECS system and at one kilometre intervals thereafter. Assuming a 300mm x-height this would require a large sign to be mounted in the verge. Passively safe posts will most likely be required. The cost of each sign is likely to be in the region of £4,000 - £5,000.
- 5.1.5. The average cost of a personal injury accident is £69,150³. It would require a saving of 15 accidents to save a million pounds in accident terms.

³ Road Casualties Great Britain 2006 – Table 2a

6. CONCLUSIONS

6.1. General

- 6.1.1. The purpose of this study was to identify if an accident problem exists on the M11 motorway that resulted from single vehicles leaving the carriageway. This type of accident is difficult to assess as there is an issue with the driver usually being the only witness and therefore their description of events could be somewhat prejudiced. Invariably, if they are culpable through an act of negligence it is unlikely that this will be recorded.
- 6.1.2. This makes it difficult to assess the reasons why a particular accident occurred. In the main it can be stated with some confidence that driver error and fatigue are the two main reasons these accidents occur. The time of day at which they occur is significant in that the lower traffic flows facilitate the ability to lose control yet not collide with anything and the fact the fatigue is obviously more likely to occur, however it would be remiss to suggest that it is a night time problem.
- 6.1.3. No low cost engineering measures have been identified to alleviate the single vehicle loss of control accident rate on the M11 between Junctions 7 and 9.
- 6.1.4. Vehicle speed is considered to be the only quantifiable factor for single vehicle loss of control accidents. Average speed cameras can reduce the mean speed of vehicles and also reduce the variation between average speed and 85 percentile speeds. They can smooth traffic flow along a link as camera surfing is eliminated.

6.2. Cluster Sites

- 6.2.1. The brief identified two areas to be looked at between MP62/7 and MP62/5 and between MP 68/5 and 68/0.
- 6.2.2. No specific cluster sites were identified as specific problems areas. The radii on the link roads at Junctions 8a and 9 are designed to standard and do not warrant any special treatment. It is not considered that improvements to the road markings, traffic signs or road lighting would be of any benefit in this area. There may be a benefit from using the temporary VMS signs already in situ to display warnings or advice to drivers and the cost associated with this would be negligible.

7. RECOMMENDATIONS

7.1. Introduction

7.1.1. There are few engineering solutions available to address the problem under review. The type of accident, whilst identifiable and quantifiable, is completely random with two factors; driver error and environment, neither of which can be controlled by engineering improvements. The environmental factor can be one of several things, vehicle condition, driver condition, weather conditions or other vehicles/objects, which can lead to a driver losing control of their vehicle.

7.2. Road Markings

7.2.1. It is recommended that the in situ raised ribbed markings be maintained to the highest standard to alert drivers of heavy vehicles when they are straying onto the hard shoulder when fatigued or losing concentration.

7.3. Road Signs

7.3.1. It is not proposed to add to the existing signing on the M11. It is recommended that use is made of the temporary VMS signs recently installed. The Highways Agency should consult with the police and the MAC road safety team to determine what messages if any may be considered beneficial to road safety.

7.4. Speed Enforcement Cameras

7.4.1. It is considered that there may be a benefit in installing a system of SPECS camera to the overall operation of the M11 however it is not possible to justify the financial outlay required to implement such a scheme on the basis of single vehicle loss of control accident savings alone.

7.4.2. It is recommended that a route study be commissioned to identify if any benefits exist to justify the substantial costs involved in such a scheme. This should include, but not be limited to; journey time, traffic flow, vehicle conditions⁴. There is little evidence to suggest that vehicle condition is an area for concern with this specific accident problem.

7.5. Road Lighting

7.5.1. It is not considered that additional road lighting would assist in preventing this type of accident.

⁴ Vehicle condition checks are made by the Police as a matter of course from time to time. They include checks that vehicles are insured, taxed and drivers' have a valid MOT certificate.

7.6. Education and Information

- 7.6.1. This type of accident has a very varied range of causes. It may involve a vehicle or carriageway defect, an object in the carriageway or driver error. As accident reduction schemes continue to be rolled out across the network there are fewer “easy win” areas. Eventually the standard of vehicles and roads will reach an optimum level where the only area for improvement is driver skill. This is an area for the government to raise awareness of the driving public of their responsibilities to drive safely and within their capabilities.