Task 474 – Incident Timeline Mapping – Phase 1

Draft Report

23 March 2018

Contains *sensitive* information

Notice

This document and its contents have been prepared and are intended solely for Highways England's information and use in relation to SPATS Task - 474 Incident Timeline Review Phase 1

Atkins assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

This document has 116 pages including the cover.

Document history

Job number:			**Document ref:**			
Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 0.1	Draft	RJ	DC	KD	KD	26-03-18
Rev 1.1	Issue	RJ	MG	DC	KD	25/05/18

Client signoff

Client	Highways England
Project	Task 474 Incident Timeline Mapping Phase 1
Document title	Final Report
Job no.	5163001
Copy no.	
Document reference	

Table of contents

Figures

Glossary of Terms

Term	Meaning / Definition
Average lane closure time	The sum of the lane closure time of all the incidents in a group divided by the total number of incidents in the group
SVR	Statutory Vehicle Removal contract let by Highways England to undertake statutory vehicle removal services Nationally
FRS	Fire and Rescue Service
Incident	Any occurrence on the Highways England network which require the Traffic Officer Service to open a log to record the event
Incident lane closure time	The period that one or more live lanes are closed as a result of an incident
Incident group	A group of incidents sharing a common attribute e.g. Incident Type, Road, Region, etc.
KPI 03 reports	HE reports with records of incidents. The reports are mainly used to assess the number of incidents that are cleared within 60 minutes which is known as the KPI 03 target
Timeline	The different stages involved in the process used by Highways England to clear a live lane traffic incident. These stages are Detection, Verification, Initial Response, Scene Management, Recovery Phase, Restoration and Normality
Weighted average	The average lane closure time of a group of incidents multiplied by a weight between 0 and 1 which is proportional to the number of incidents in the group
DBFO	Design, Build Finance and Operate
APTR	All Purpose Trunk Road
PAU	Performance Analysis Unit
TIKM	Traffic Incident Knowledge and Management
Hydroblasting	Hydroblasting is a technique that uses ultra-high pressure water jets to tackle the most demanding removal of road markings or paint and surface-cleaning task

1. Background

1.1. Aims

Highways England is looking to understand where reductions in time can be made to the incident timeline cycle, to enhance its operational capability and as a result improve Highways England's Key Performance Indicators (KPI's).

1.2. Objective

The aim of this Incident Timeline work will be achieved through the following objectives;

1. Provide a better understanding on the areas which actually contribute to failures; and
2. Identify cutting edge technology and products to address issues and improve response and clearance times that will lead to improved customer satisfaction.

In order to provide a better understanding of the areas which lead to failure and subsequently identify where improvements can be made the task aimed to complete the following activities;

- Stakeholder consultation to explore existing responses, techniques and products;
  - Regional variations; Traffic Officers, Service Providers and DBFOs
  - Emergency Services
  - Other identified stakeholders/partners
- Identify worst impacting types of incidents and which type of roads they occur on, i.e. motorway, smart-motorway or APTR
- Determine which stages in the incident timeline contribute for delay;
  - Discovery/Notification
  - Verification
  - Initial Response
  - Scene Management
  - Recovery
  - Restoration to Normality
  - Normality/Prediction
- Identify the worst affected KPIs – as defined in the Highways England Delivery Plan. This should also consider the planned delay based metric, expected from RIS2 period 2020;
- Identify disproportionate incident locations; and
- Identify interdependent work streams such as patrol route strategies, single crewing and Operational Excellence.

The completion of these activities will lead to the development of a roadmap outlining how and when the cutting-edge technology can be implemented against short, medium and long term improvements.

1.3. Considerations

In developing the road map there was a need to consider how these improvements will be funded. As the improvements are to be financed through designated funding, any roadmap improvements need to be focused around capital (CAPEX) expenditure rather than operational expenditure

(OPEX). Any OPEX based improvements identified during the course of the task, will fall under Business as Usual in the respective business areas.

2. Approach

The project team recognised that there are areas of work already being undertaken within Highways England which are likely to overlap the requirements of this task. Working with the Project Sponsor (Amanda Mushing), representatives from the Incident Management Requirements Team (IMRT), Lean and Operational Excellence Teams were invited to form part of the project team to ensure that effort was coordinated across a number of Highways England's business areas to provide awareness of the task and identify the synergies of these other workstreams around improving the incident timeline already being undertaken elsewhere within Highways England (Figure 1).

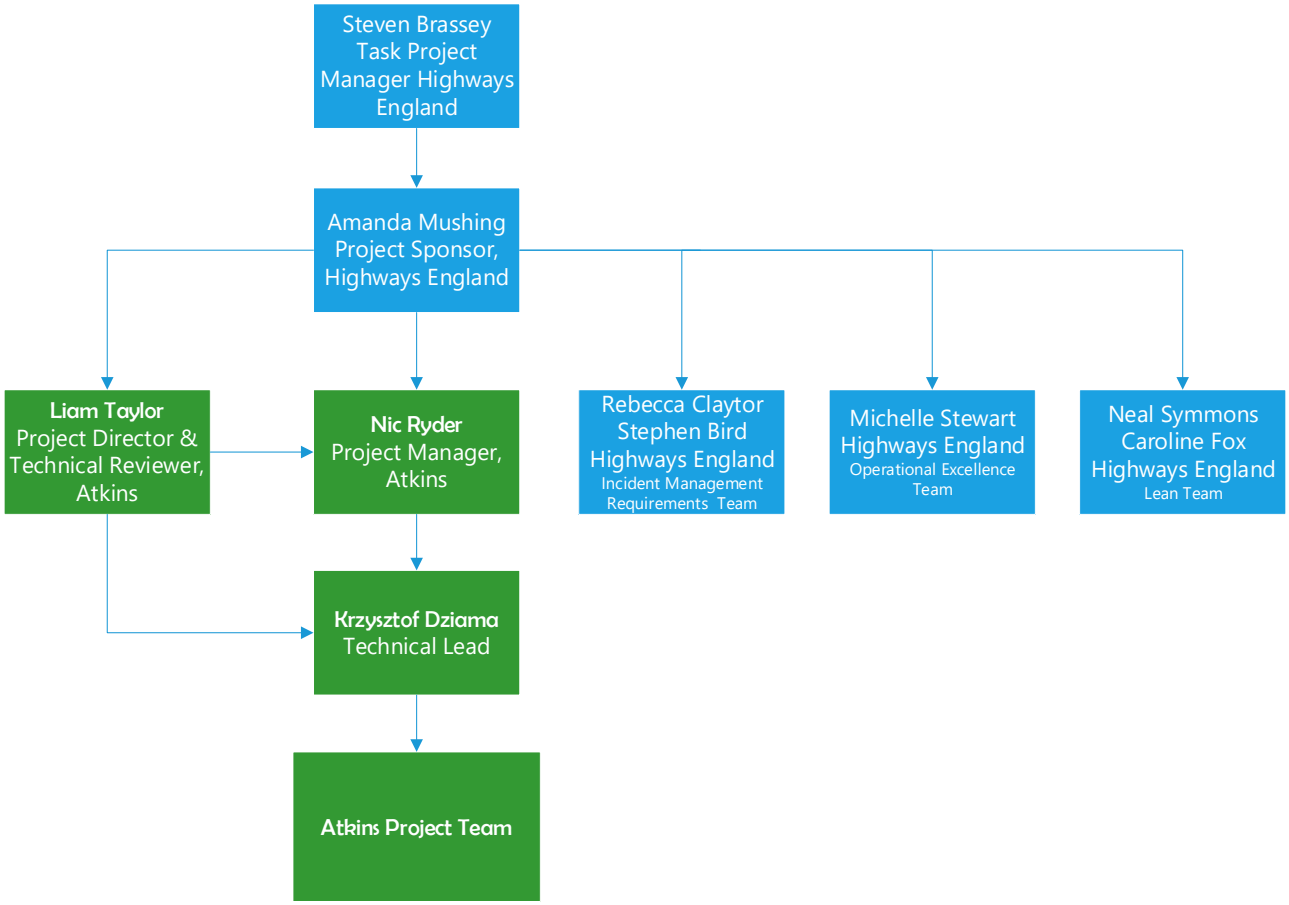


Figure 1. Incident Timeline project team

3. Data

It was recognised that in order to meet with the 3-month timescale of this task it would be crucial to utilise the knowledge gained on other tasks. Upon commencing the project, existing data sets and data models were reviewed. This allowed the project team to quickly identify relevant data gaps which would prevent the objectives of this task being met.

Data which was already available to Atkins was;

- KPI 03 summary reports from January 2017 to May 2017
- Statutory vehicles removal contract data from January 2017 to May 2017
- T-Tear and Spats reports which may inform the outcomes of this task (See 6.3.Appendix A)
- Transport Focus reports identifying customer issues and focus

Additional data obtained during the task

- All Purpose Trunk Road data (APTR) incident data
- Updated KPI 03 data where there were gaps within the data up to Dec 2017
- KPI 03 feedback data from the PAU – April 2017 to December 2017
- Debriefing outcomes (Both on and off road) from the TIKM Team
- NW RCC - Lean process review report and supporting data analysis
- GIS shape files for Smart Motorway Locations

Data which was not available during the task

- Full access to control works data

3.1. Data Definitions

3.1.1. KPI 03 Summary Reports

Data reports developed by PAU which are developed to support Highways England's reporting measure around KPI 03 performance levels as defined for RIS 1.

3.1.2. Statutory Vehicle Removal Contract Data

Performance data kept by Highways England's Contract team which outlines a number of data fields to establish vehicle types and timeline performance of both Highways England and the Contractor. Does not include performance of incidents where private recoveries invoked and cleared.

3.1.3. T-Tear and Spats reports which may be relevant to the incident timeline

A review of tasks which were undertaken either within the T-Tear or SPATS framework to identify specific tasks which could benefit the incident timeline analysis. Once identified review the list of

recommendations which would benefit the incident timeline support the task findings (See Appendix A).

3.1.4. Transport Focus Reports

Transport Focus is an independent group set up by the DfT which amongst other things reviews the needs and requirements of road users who utilise Highways England's network. This data is published against 3 user groups, Car and light commercials, Motorbikes and Goods vehicles. The issues of 'incidents and unplanned events' on the network featured in the top 5 for all user groups (6.3.Appendix E).

3.1.5. APTR and A-Road Incident Data

Data captured by Highways England on the APTR and A roads. Due to the way the APTR data is captured, the format of data did not allow for direct correlation between the APTR data and Control Works data sets. This was due to the fact that on the APTR incident logs there were no fields to differentiate the lane impact information from the incident duration. Therefore, the only aspect that could be compared is the incident duration.

3.1.6. KPI 03 Feedback Data

New data set available to the project team which provided supporting detail around the primary reason for failing KPI 03 metric. The data only covered incidents from April to December 2017 and did not have any additional data for the period of January to March 2017. Example of the data and supporting codes are outlined in 6.3.Appendix B of this document.

3.1.7. Incident Debriefing Outcomes

Following a number of hot and cold debriefs, the Incident Management Requirements Team have collated the issues raised and identified a number of areas where the incident management could be improved which would ultimately benefit the incident timeline outcomes (See Appendix C).

3.1.8. NW RCC – Lean Process Review

Highways England's Lean team undertook a review of the process around Statutory Vehicle removals due to performance issues highlighted. The output of the process mapping and findings made available to the team.

3.1.9. Control works data

Control Works is the incident management system which utilised by Highways England which replaced 'Command and Control' to record information regarding any incidents Highways England deal with. Although there is more data captured on Control Works full access to the data was not available due to the current contractual constraints with Control Works. The data fields that were available throughout the task were through the KPI 03 and KPI 03 feedback reports which restricted more detailed analysis.

3.2. Stakeholder Consultation

Atkins had already established a number of key stakeholders so were able to quickly identify the those that needed to form part of the project team and those added stakeholders where 1:1

discussions would be required throughout the task. These were largely operational resources both on and off-road and in the different operating regions.

During 1:1 consultations namely in the West Midlands RCC it was identified that there were a number of ongoing regional developments which were looking at improving the incident timelines. This led to further discussions within the project team as to how this work was being coordinated between regions and within Highways England. To understand this aspect better, the IMRT Team issued an internal communication to all relevant stakeholder areas to identify and capture the work being undertaken. This would help identify other workstreams and help to provided more focused discussions. See Appendix D for the summary of feedback from this exercise.

From the individual stakeholder discussions which actually took place, the incidents which were identified as being problematic and impact the incident timeline, are incidents which generally involved the need to deploy additional on-road resourcing, for junction closures or additional resources where added plant and equipment usually sourced as secondary response either through the service provider or areas such as Statutory Vehicle Removal were required.

Further analysis showed the majority of these additional resourcing issues could also be mitigated through additional vehicles, equipment or technology solutions. An of example of this is any incident where multiple road closure points are required. In this case multiple Traffic Officer resources are required from adjoining patrol areas which take time to get to scene. A consequence of this delay is that either;

- The incident being dealt directly by Traffic Officers, or;
- as more traffic becomes entangled to the incident within the incident itself this can delay any primary or secondary response by supporting stakeholders such as Emergency services, Highways England's service providers or the SVR contractors.

A possible solution to this could be to install either a remotely controlled (possibly by the RCCs) level crossing barrier which physically closes the slip road or mainline carriageway or by installing overhead gantries with cameras for enforcement at the entrance to the slip road to denote the road additional closure. This would provide a more rapid closure and thereby reduce the initial impact and subsequent effect of the incident.

Although a number of Control Works logs were reviewed in detail (see 6.3.Appendix F) during the data analysis, which highlighted how this type of solution would support the reduction of the incident timeline. What could not be substantiated from the limited case study review, is what proportion of the incident types and or incidents locations this type of solution would actually provide a timeline benefit in any given location without considerable further detailed Control Works incident log analysis. Therefore, it was felt that added resourcing in any identified problematic areas would be a more beneficial and an easier solution to implement as the added resources would benefit every incident type making it easier to quantify the benefits.

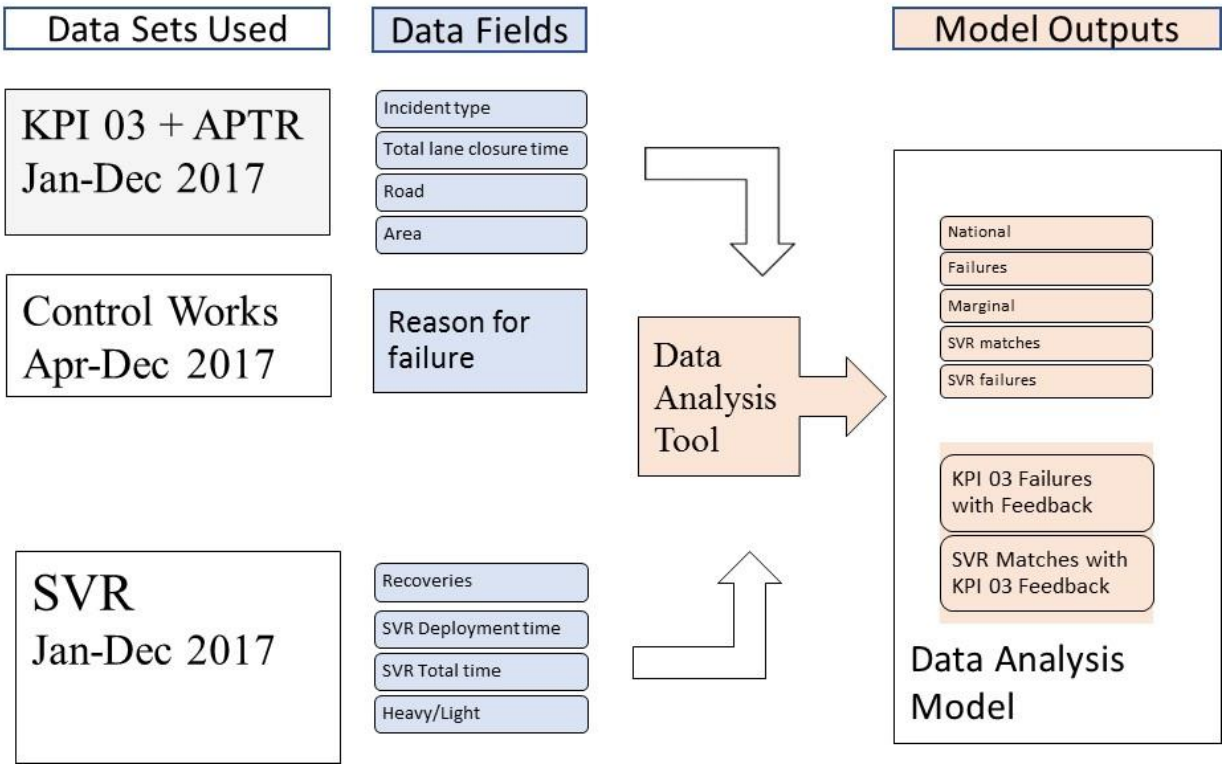
3.3. Data Analysis Model (DAM)

From previous work undertaken by Atkins for the replacement SVR Contract there was already some awareness of issues within some of the data sets previously used. These were largely based around inconsistencies with data fields, duplication between data sets, the way the data was presented i.e. format changes and the fact that analysis would need to be run a number of times with different variables. Atkins had therefore already utilised software which allows the conversion, transformation,

merging and validation of the various data sets, which would allow the project team to undertake a more detailed analysis by being able to run a number of different scenarios to achieve the requirements of this task. Figure 2 identifies the modified DAM model to undertake the additional analysis to meet with the requirements of this task. A combination of existing, enhanced and new data was used within the DAM model. This allowed for different outputs to be compared and analysed concurrently to look for particular data trends.

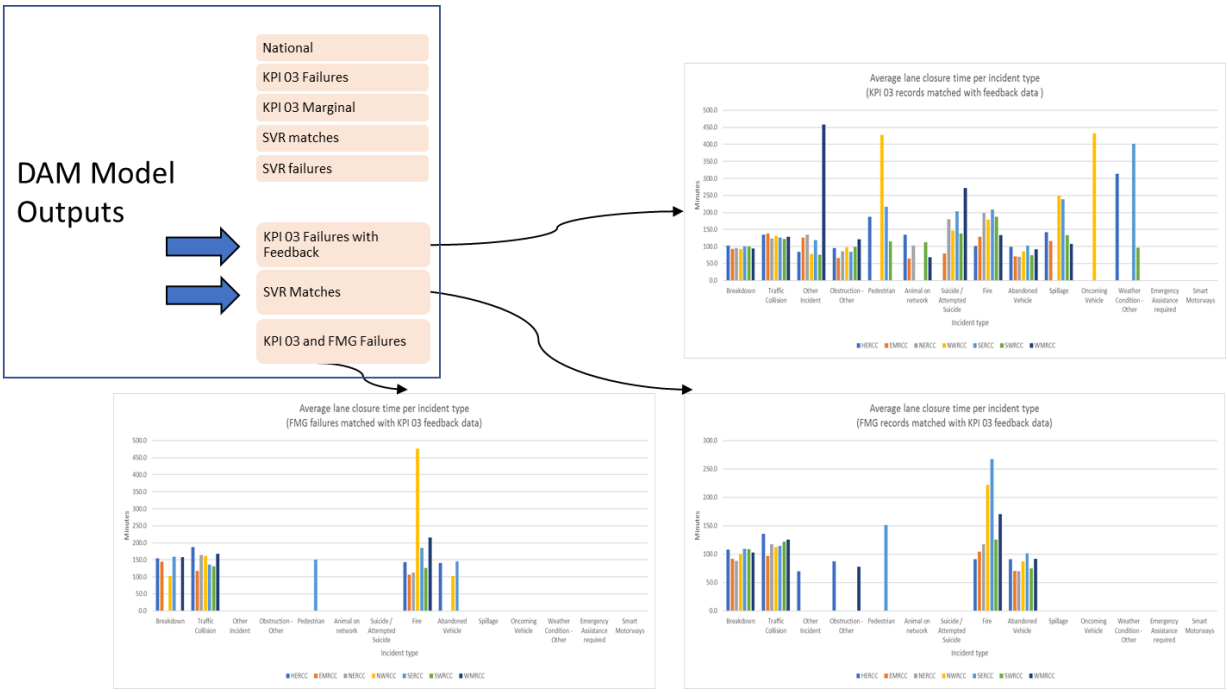
Feedback data for KPI 03 was limited to April to December 2017, due to the period at which point PAU team commenced the detailed and manual analysis of the individual Control Works logs.

Figure 2. Atkins approach to data analysis to determine the requirements



Due to the requirements of this task only incidents which impacted KPI03 were considered. This also included incidents which were hard-shoulder based and may have had one or more lane closures for safety reasons or incidents which may have started in the live lane and subsequently moved to the hard-shoulder.

Figure 3. Example of some of the outputs available from the DAM used for analysis



These outputs as shown in Figure 3 were then analysed to identify the objectives of this task see section 3.4.

Recognising the objectives and the fact there have been a number of changes on the SRN it was important to ensure data was used which reflected the current dynamics of the network so the data period chosen was from January to December 2017. Although historical incident and timeline data was available this was used for correlation against the findings to see if the issues and possible root causes were similar to those previously identified or whether there were any significant deviations and whether these could be attributed to factors such as the introduction of ALR/Smart Motorways.

KPI 03 data which had a marginal pass was defined as an incident being cleared between 50 and 60 minutes to understand if there were any factors that helped expedite how the incident was dealt e.g. resources in the right time and right place, time of day which if they had hindered the performance could lead to more future failures. Although the project team discussed and considered looking at the marginal fails, it was felt that with the analysis undertaken by the PAU on all KPI 03 failures there was sufficient supporting data in the feedback KPI 03 reports to support any further analysis required.

The DAM had also the provision for the data to be run at sub levels which would help in the identification of issues at a regional level or by time of day which again may help focus some of the recommendations to specific periods of the day rather than a total solution.

3.4. Data Objectives

The DAM model would allow for the analysis of the following aspects;

3.4.1. Determine worst impacting incident types

One of the objectives of this task was to identify the incident types that take longer to clear. The worst impacting incident types were determined against the current recorded attribute “Final description” i.e. the primary incident reason rather than any secondary aspects result from the initial incident e.g. a major spillage resulting from a road traffic collision. The example case studies in 6.3.Appendix F highlight that there are often other underlying issues which impact the incident timeline.

From this recorded attribute the average lane closure time per incident type can be determined. This was determined by grouping incidents by incident type and then dividing the total lane closure time of a group by the total number of incidents in the group.

Although this average gives a good idea of which type of incidents take longer to be cleared, it does not give information on which of them are more common and therefore have a larger impact. This was determined by defining a weighted average lane closure time obtained by multiplying the group average by a weighting which in this case is based on the frequency of incidents over the reviewed period.

3.4.2. Determine the worst roads

Initial analysis was undertaken by road name as opposed to road type. This allowed the team to determine network behaviours against previous data reviews that had been undertaken but with current data. This helped identify and confirm if any identified incident trends had previously existed within a given area and region regardless of road type which may rule out the issues being attributed to a road type i.e. road sections which had been upgraded from a motorway to a smart motorway for example.

The one area this did not address is the severity of these incidents although the analysis of the numbers and average duration was likely to give an indication. It was felt that the POPE reports should have picked up the severity impacts differences following any road upgrades to smart motorways.

3.4.3. Determine worst road types

Using information from the worst roads and information from work that had commenced on another Highways England project during this task, Atkins were able to obtain the GIS shape files which when correlated with the worst incident road data within the DAM, allowed the identification of the issues around road types which were not available during the task.

Using this information and the visual data tool Tableau it was possible to plot all the incidents to visualise the worst road types. An example of the plots is shown in Figures 4, 5 and 6. This information would also support the objectives of 3.4.4.

Figure 4. Incidents on Smart Motorway M25 J5-J7

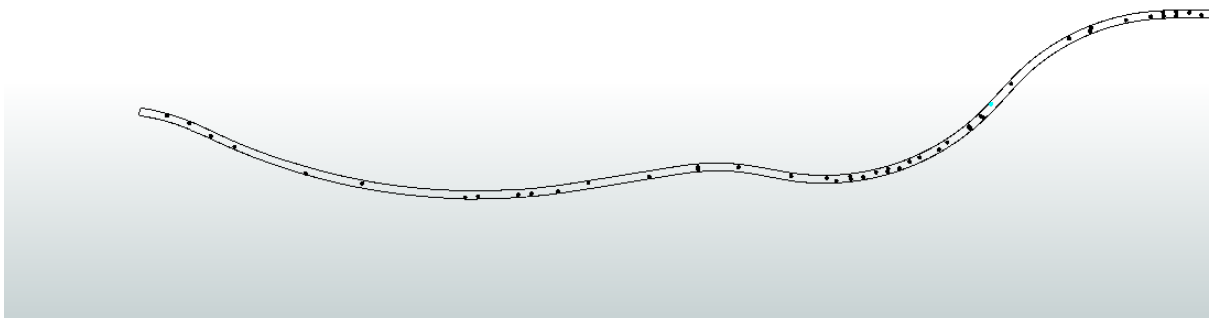


Figure 5. Incidents on Smart Motorway M25 J23-J27

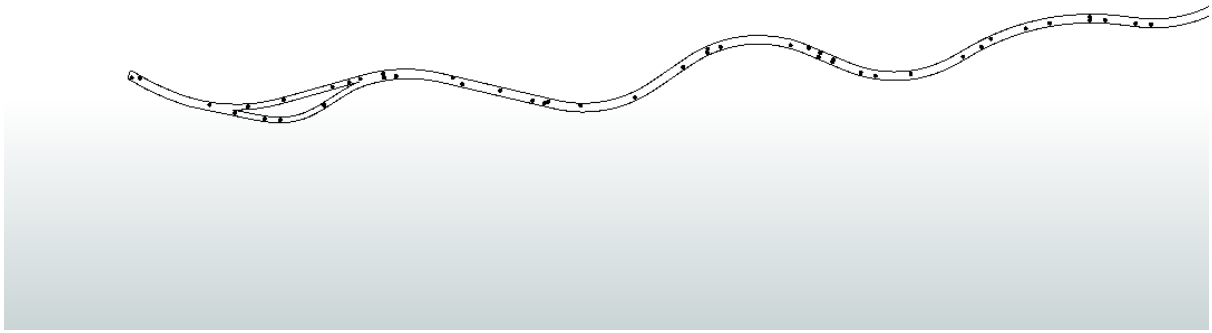
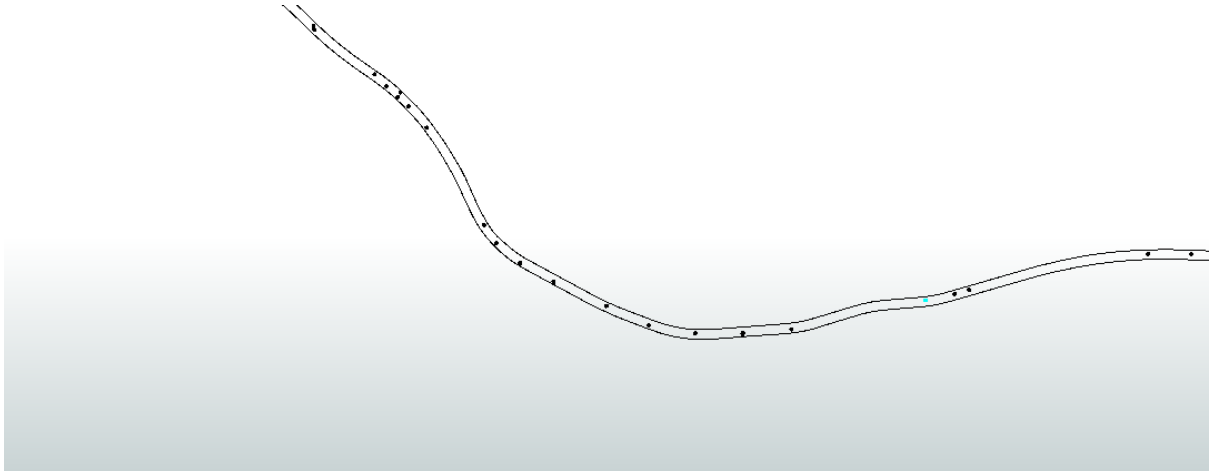


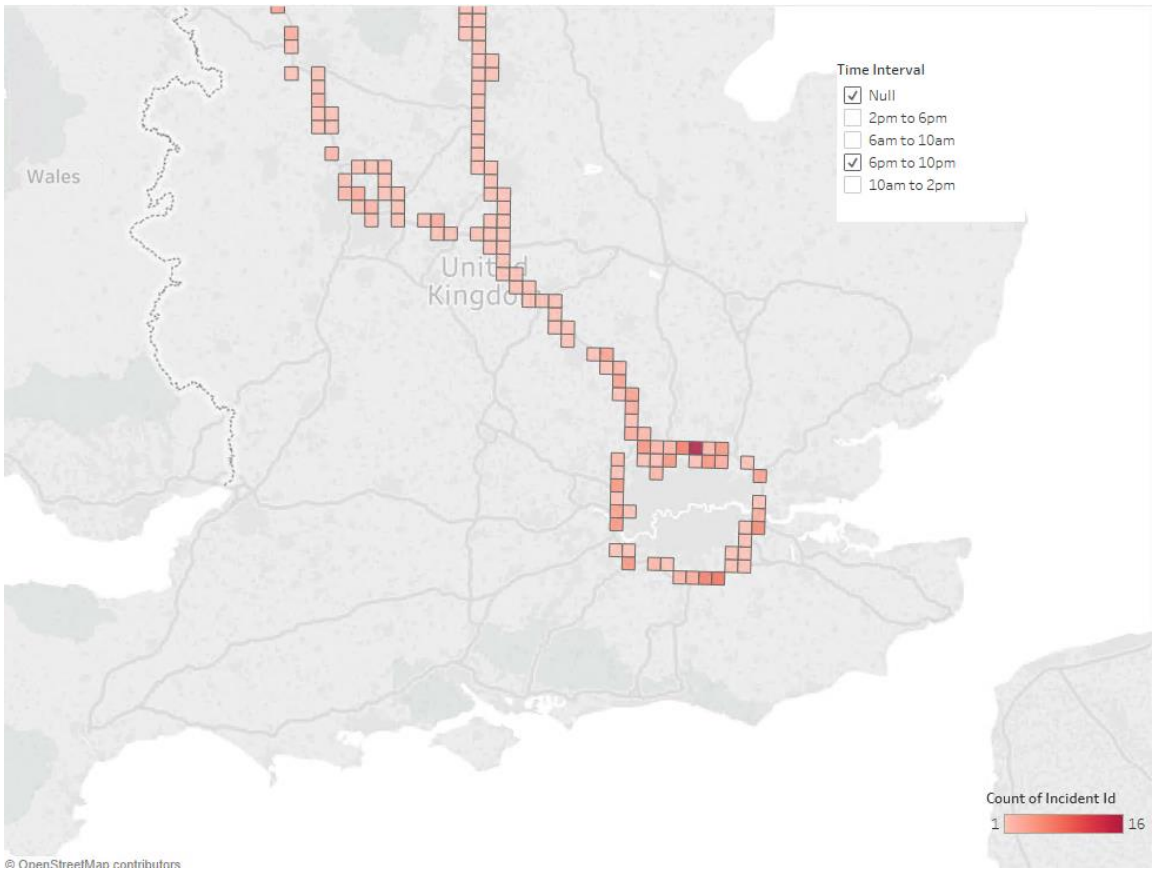
Figure 6. Incidents on Smart Motorway M6 J4-J13



3.4.4. Disproportionate incident locations

In order to determine the disproportionate incident locations, the outputs of 3.4.3 provided an initial view of this, however whilst they provide a ranking by road they did not necessarily reflect the true picture in an area or region. The project team determined this element by breaking up the SRN into a number of quadrants each 5km in size. The quadrants provided another form of analysis output but take into account adjoining roads in any given quadrant which may highlight different outcomes. An example of the quadrant analysis using SVR is shown Figure 7.

Figure 7. Example output by quadrant analysis using SVR incidents only.



The model would allow for different incidents and parameters such as time of day to determine disproportionate incident locations.

3.4.5. Stages in the Incident timeline for the delay

This aspect of data is not recorded as a data field within any current or previous incident management system that Highways England currently or previously have operated and can only be determined by individual analysis of all the incident logs. Highways England's PAU have 3 dedicated resources which undertake a detailed of analysis of the incident logs which review failed KPI 03 incidents to determine the reason for the failures.

The failures are logged at 2 levels which determine the area where the failure occurred e.g. Service Provider, FRS or Ambulance and these and then subsequently supported with "further detail for incident not meeting target". Atkins undertook analysis of these reasons for failures and based on discussions with the PAU and operational resources were able to determine which stages they could occur and where these failures were more probable which would allow identification of the various problematic stages by incident type. Figure 8 shows a sample of some of the reason codes generated and how the weightings may be applied to the various incident timeline levels.

Figure 8. Mapping between incident issues and timeline stages

	Detection	Verification	Initial incident response	Scene management	Recovery phase	Restoration
Ambulance_Service						
Ambulance - extended ETA				3	3	
Ambulance - non attendance when required				3	3	
Ambulance - delayed response				3	3	
Ambulance - treatment of person				3	3	
Ambulance - nature of incident				3	3	
Contractor						
Contractor - delayed response				2	3	
Contractor - incorrect equipment				2	3	3
Contractor - nature of incident				2	3	
Recovery_Operator						
Recovery Operator - delayed response				3	2	1
Recovery Operator - incorrect equipment				2	3	1
Recovery Operator - communication breakdown				3	2	1
Recovery Operator - tyre fitter				3	2	
Recovery Operator - nature of incident				1	3	

4. Findings

The analysis in this section shows that the worst incident types are Traffic Collisions, Breakdowns and Fires and that the worst impacting locations involve the roads M25, M1, M6 and M5. A data visualisation programme (Tableau) has been used to visualise the distribution at different time intervals of the worst impacting incidents having these incident types and roads. An analysis of the incident timeline identifies the Scene management and Recovery phase as the problem stages. This is the case for both Motorways and Smart Motorways although the Recovery phase has a larger negative impact on Smart Motorways.

4.1. Worst impacting incident types

In terms of incident types Traffic Collisions, Breakdowns and Fires are the worst impacting incident types for Motorways and Smart Motorways. In the case of APTR roads, the worst impacting incident types are RTC, Obstructions and Other Road Management incidents.

4.1.1. National

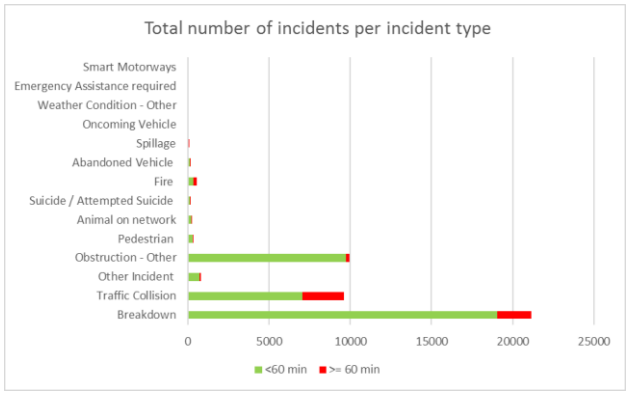
The charts in Figure 9 show the volume and of incident types by Motorway/Smart Motorway and APTR. The green coloured section of the bars represents incidents where the lane closure time was less than 60 minutes (met KPI 03) and the red area correspond to the incidents whose closure time was larger or equal than 60 minutes (failed KPI 03).

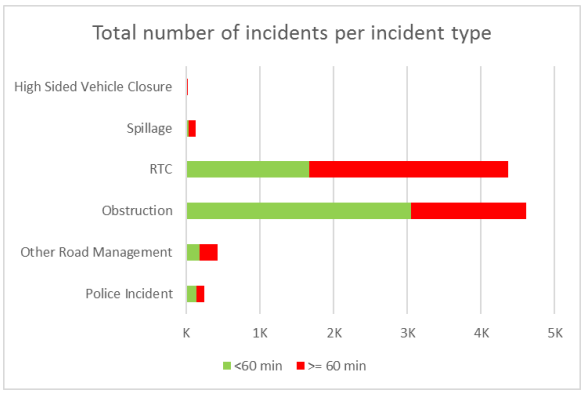
In terms of Motorways and Smart Motorways the most common incidents are live lane Breakdowns which amount to 49% of the total incidents followed by Obstructions and Traffic Collisions with 23% and 22% respectively. Although Breakdowns are the most common incidents they are more likely to meet KPI 03 target than Traffic Collisions. This is because on average the lane is cleared in 30 minutes for Breakdowns and 51 minutes for Traffic Collisions. The less 'harmful' incidents of these three groups are Obstructions as they not only have a relatively low frequency but the smallest average incident duration time of the three i.e. 18 minutes.

On the other hand, the APTR roads data from the same period shows a different distribution of incidents by incident type with Obstruction and RTC incidents being the most common ones with 47% and 45% of the total respectively. The third largest group is Other Road Management with 4%. The remaining 4% is split among the other three types of incidents.

Figure 9 shows the volume and of incidents per type for Motorway/Smart Motorway and APTR roads. Each of the incidents highlights the proportion that passed the KPI 03 metric (green section) and those that failed the metric (red section).

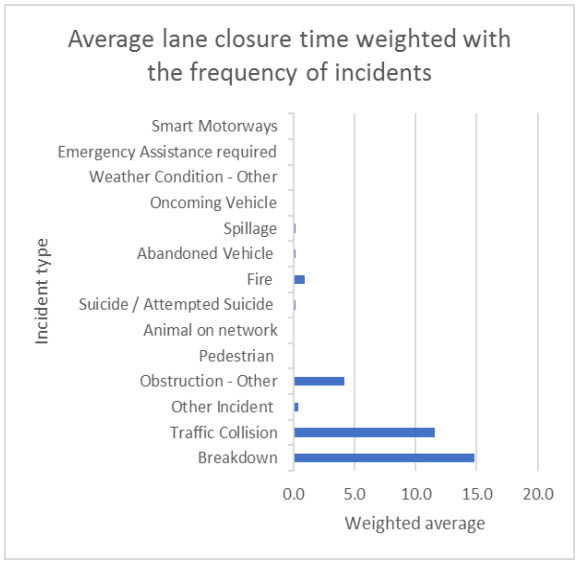
Figure 9. Highlights total number of incident for both Motorway and Smart Motorway (Left) and APTR roads (Right)

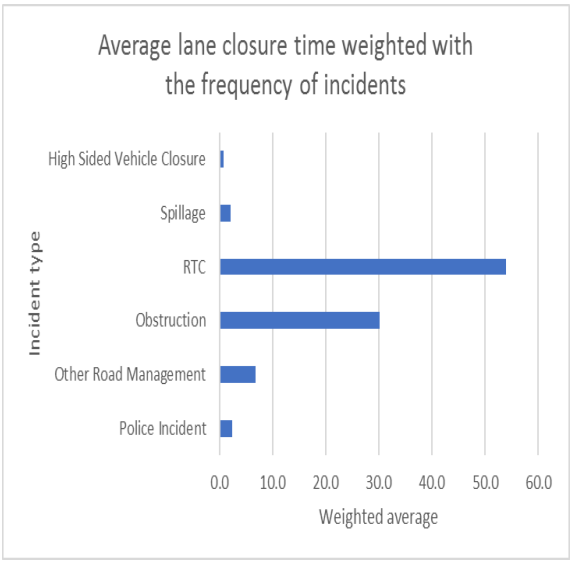




The weighted average lane closure time is an indicator of the worst affecting groups of incidents of a given set. Figure 10 shows the national values of this indicator for both Motorways and APTR roads incidents.

Figure 10. KPI 03 Average lane closure time weighted with the frequency of all Live Lane incidents for Motorway and Smart Motorway (Left) and APTR roads (Right)





It is evident the top 3 incident types i.e. Breakdowns, Traffic Collisions and Obstructions, are ranked the same for both Motorways and Smart Motorways and APTRs roads. However, it can be seen from Figure 10 that on the different road types where Traffic Officers have considerably more patrol coverage the weighted incident duration time is around 50% less. What is not clear from this data is the level of disruption and how this impacts customer perception around these timescales.

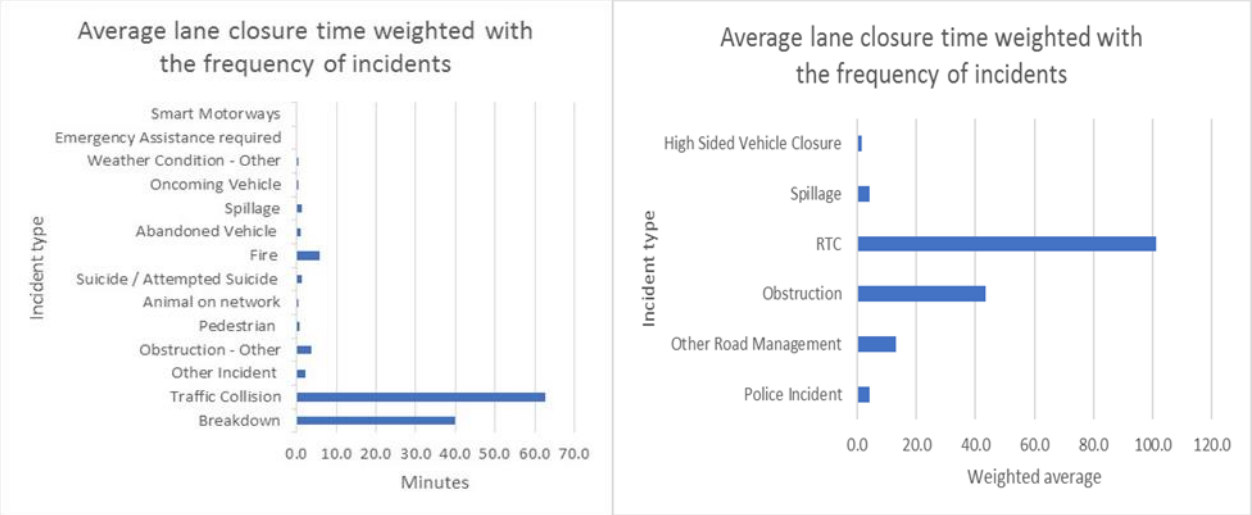
KPI 03 failures

Looking at the weighted averages for the set of incidents failing the KPI 03 target (see Figure 11) it can be identified that on Motorways/Smart Motorways, Traffic Collisions become more relevant than Breakdowns. This is because the former amounts to 48% of the failures while the later represents 40% of the them. The average lane closure times increases dramatically for both reaching 129

minutes for Traffic Collisions and 98 minutes for Breakdowns. Obstructions are still the third largest group but they only represent 4% of the failures just above Fire incidents which amount to 3%. Although the number of Fire failures is smaller than Obstructions it has a larger impact as it has an average lane closure time of 169 minutes, well above the 98 minutes average for Obstructions.

A similar change is observed in the case of APRT and A roads incidents where Obstructions cease to be the largest group with 33% of the total failures only and is overcome by RTC incidents with 57%. Other Road Management Incidents are still the third largest group with 5%. The remaining 5% is split among the other types of incidents.

Figure 11. KPI 03 Failed Average lane closure time weighted with the frequency of all Live Lane incidents for Motorway and Smart motorway (Left) and APTR roads (Right)



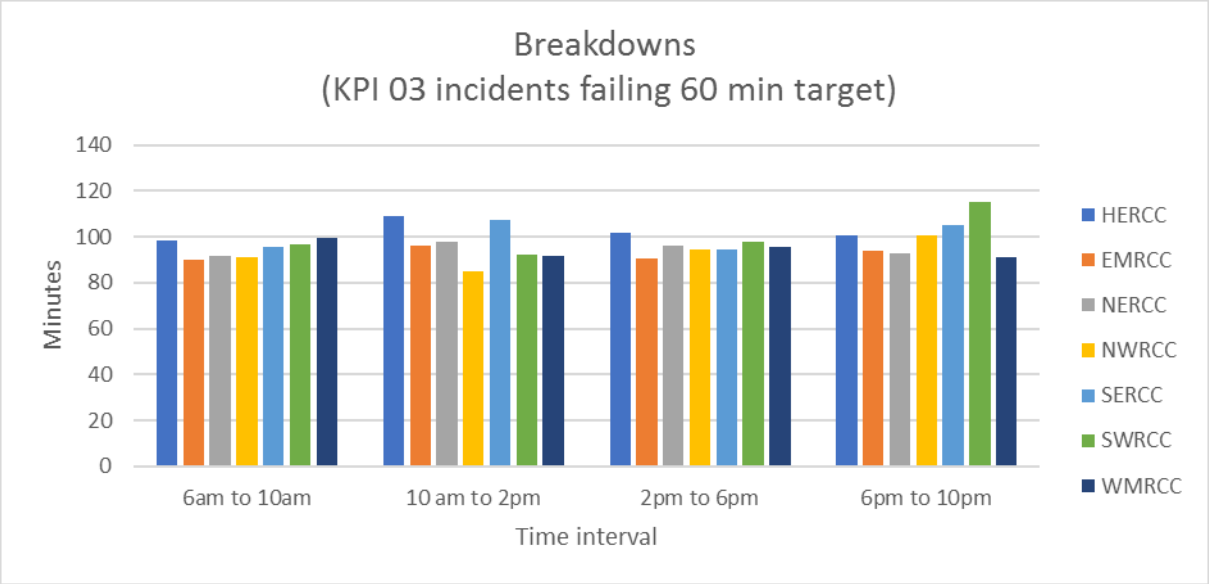
4.1.2. Regional worst impacting incident types

In this section the analysis of incidents is continued, but we now focus on worst impacting incidents per region. incidents per region are only able to be analysed for Motorways and Smart Motorways as they are the only incidents whose region is specified in the source data. This analysis focuses on how different regions perform at different times of the day when dealing with Traffic Collisions and Breakdowns which are the worst impacting incidents nationally as shown in the previous section.

Breakdown KPI 03 Failures

Looking at the average lane closure times of the breakdown incidents that failed the KPI 03 (0) it can be identified that the East and South East regions are the ones that struggle the most with this type of incidents between 6am and 6pm. Although South West performs relatively better during this period of time it is the region with the highest average lane closure time after 6pm.

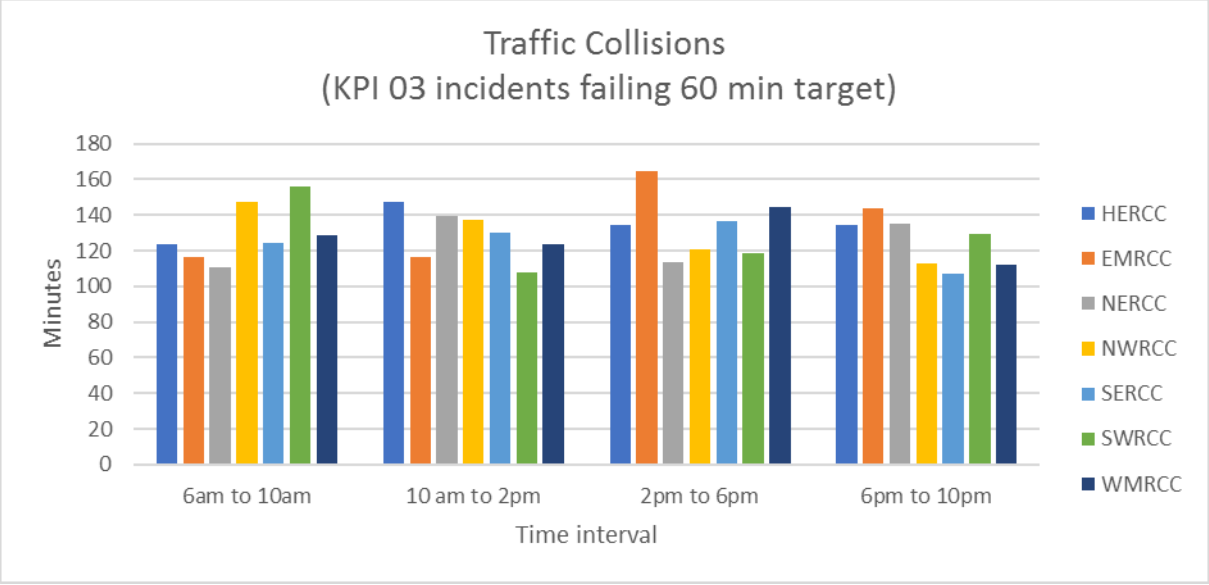
Figure 12. Average lane closure time per region for Breakdown failures (Motorways and Smart Motorways)



Traffic Collision KPI 03 Failures

Moving on to Traffic Collision incidents, Figure 13 shows that the West Midlands is the region with the poorest performance between 10am and 6pm. The performance of the East Midlands is relatively good between 6am and 2pm but it drops during the rest of the day becoming the region with the worst performance between 6pm and 10pm.

Figure 13. Average lane closure time per region for Traffic Collisions (Motorways and Smart Motorways)



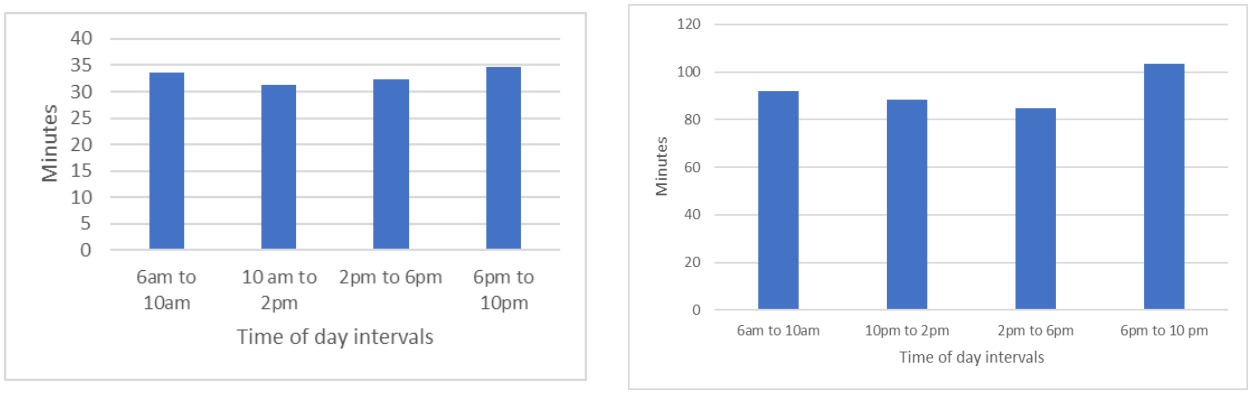
4.1.3. Worst impacting incident types by time of day (National)

All incidents

In this section the lane closure time of Motorways and Smart Motorways is analysed as well as APTR roads incidents at different time of day intervals. As a starting point a review of all the national incidents regardless of whether they met or failed the KPI 03 target.

The following chart shows the average lane closure time for incidents at different times of the day. 4 hours intervals were used for the analysis as they are manageable and sufficient to capture peak times.

Figure 14. Average lane closure time per time of day intervals of Motorways and Smart Motorway Incidents (Left) and APTR roads incidents (Right)

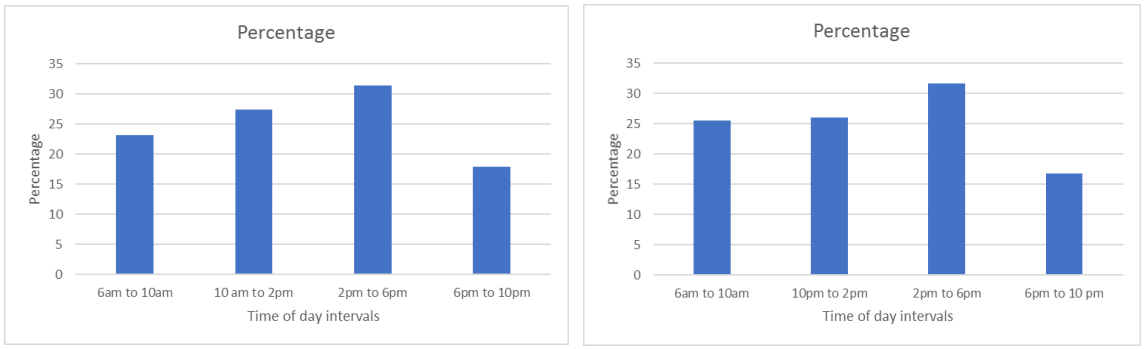


For the Motorways and Smart Motorways incidents the national average lane closure time (See Figure 14) is consistent through different times ranging from 31 to 34 minutes and the total average has a value of 32 minutes. This indicates that the performance of dealing with incidents does not change significantly throughout the day.

In the case of APTR roads' incidents, the average lane closure time changes throughout the day more significant ranging from 84 to 103 minutes.

To complement the national picture, the percentages of the total number of incidents per time of the day was reviewed and is shown in Figure 15.

Figure 15. Percentage of incidents per time of day intervals of Motorways and Smart Motorway Incidents (Left) and APTR roads incidents (Right)

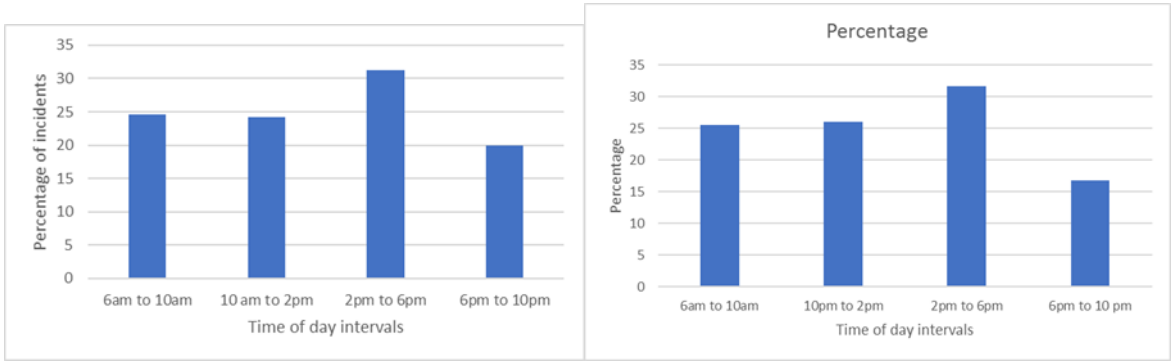


The charts in Figure 15 show that for the two types of roads, the percentage of incidents reaches its highest value in the interval of 2pm-6pm and the lowest value in the interval between 6pm and 10pm.

KPI 03 failures

In the previous section it was identified that although the volume of incidents at different time intervals is variable, their corresponding average lane closure times tends to be constant. For this reason, it is expected that the number of KPI 03 failures shown in is mainly driven by the volume of incidents rather than the average lane closure times. The similarities between Figure 15 and Figure 16 seem to confirm that this is the case.

Figure 16. Percentage of incidents failing the KPI 03 target per time of day intervals for Motorways and Smart Motorways (Left) and APTR roads incidents (Right)



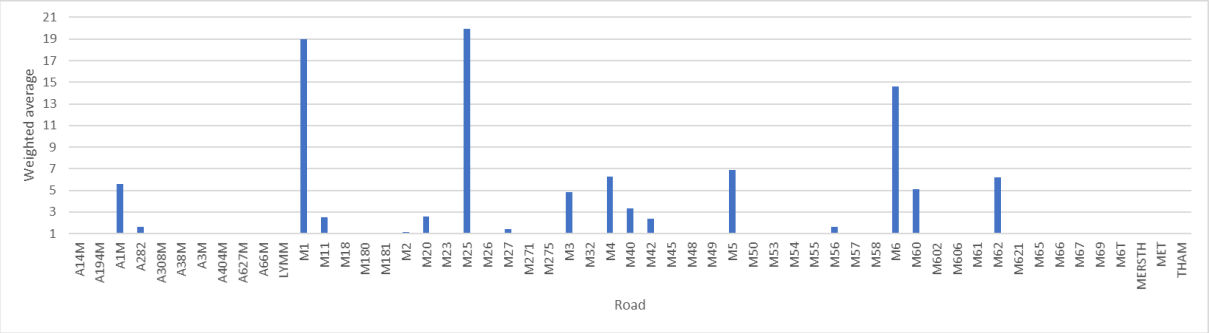
4.2. Disproportionate incident locations

In Section 4.1 the worst affecting incident types were investigated. This section focuses on the analysis of incidents by location. In the first part of the analysis the percentage of incidents per road is analysed in order to determine the roads that are worst affected by incidents in terms of their weighted averages. this information is then combined with the weighted averages for incident types of Section 4.1 in order to determine the worst impacting groups incidents having a particular location and incident type.

4.2.1. Disproportionate Incident Locations by Road

First groups of KPI 03 incidents are determined by road . **Error! Reference source not found.** shows the weighted averages for the corresponding road groups. These values identify the M25, M1, M6 and M5 as the roads as the worst impacting roads.

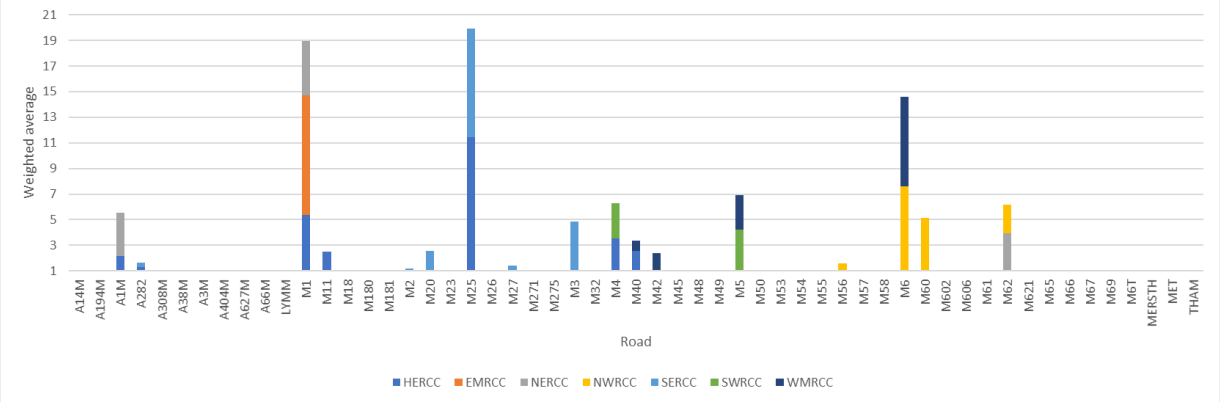
Figure 17. Average lane closure time per road weighted with the frequency of all Live Lane incidents for Motorway and Smart motorway



4.2.2. Disproportionate Incident Locations by Road split by regions

Figure 18 provides a different version of chart of **Error! Reference source not found.** with the bars split by region.

Figure 18. Percentage of incidents per road (All incidents in KPI 03 reports) Average lane closure time per road/region weighted with the frequency of all Live Lane incidents for Motorway and Smart motorway



4.2.3. Disproportionate Incident Locations by Road split by regions

In Section 4.1 a weighted average (see Figure 10) was computed for groups of incidents determined by an incident type. As this average is proportional to both the frequency of incidents and the average lane closure time, it was used as an indicator of the worst impacting groups. This average is also determined for groups of incidents determined by a road/region as shown in Figure 18. Combining these three types of averages can give a weighting for new groups of incidents given by a road, region and incident type combination. Such a weight can be defined as the product of each of the three individual weights. This product can be used as an indicator of the worst impacting permutations. Then the incidents associated to the permutations with the largest weights are identified as the worst impacting incidents.

An example of this is provided by the table of Figure 19 which contains the weighted averages for the permutation Road, Traffic Collision and HERCC obtained from the sets with all the incidents (KPI 03 pass and failures). The M25 has a weighted average which makes it rank first when compared to other roads see Figure 18. This figure also provides an idea of the weights per region where HERCC rank first. Similarly, the Traffic Collision weight makes this incident rank second when compared to other incident types (see Figure 10). The product of the individual weights in the table below amount to 515.7 which makes this particular combination rank third in the chart of Figure 20.

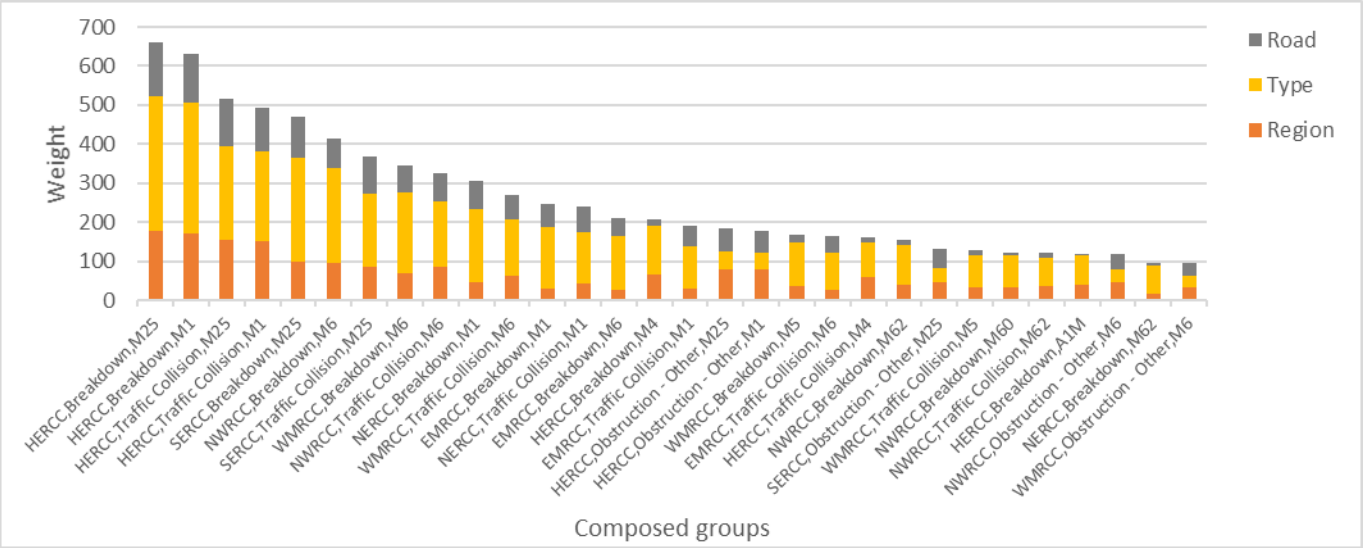
Figure 19. Ranking of a Region, Incident Type and Road combination

Parameter		Weighted average (National)	Ranking
Region	HERCC	7.6	1st
Incident Type	Traffic Collision	11.6	2nd
Road	M25	5.9	1st
Product		515.7	3rd

All incidents

Having described the approach used to identify disproportionate incidents types and locations we now apply this approach to the dataset containing all the incidents. Figure 20 identifies the top 30 combined groups which have the largest weights nationally.

Figure 20. Disproportionate incident locations and types (All incidents in KPI 03 reports)

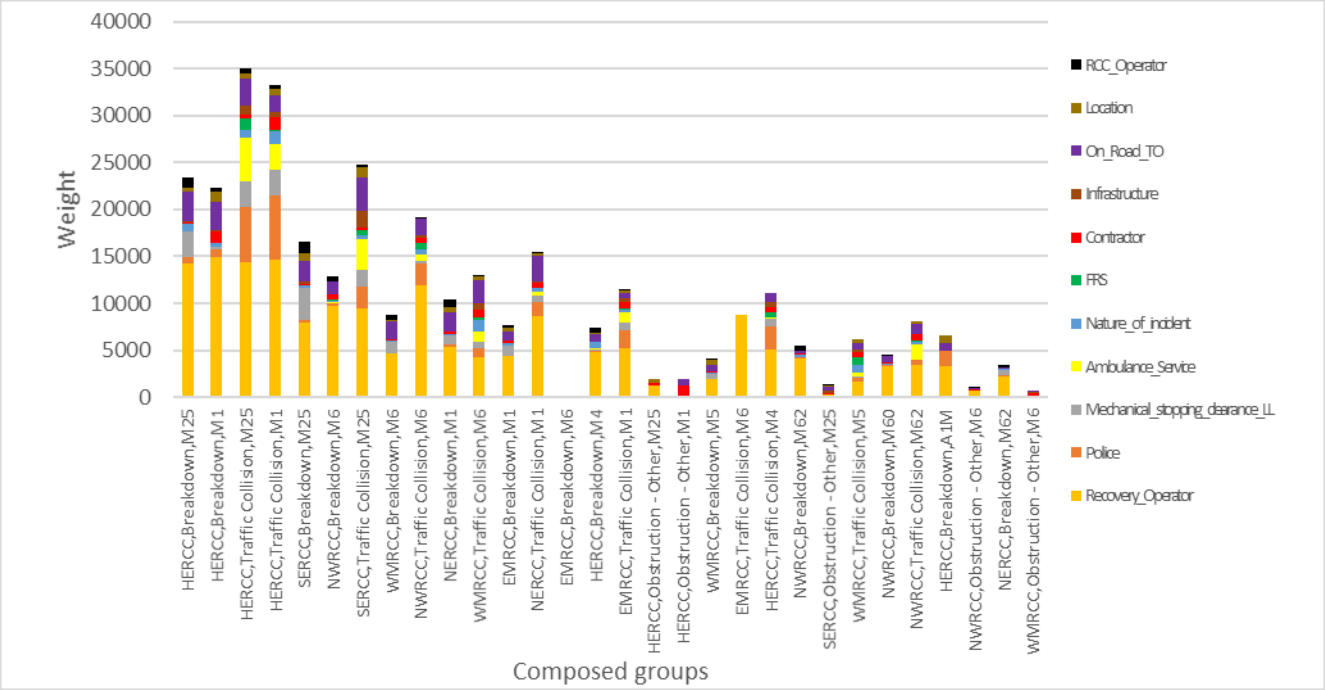


Each of the bars is broken down into three parts as to show their Road, Incident type and Region components (see table in Figure 19Figure 16).

KPI 03 failures

the next step taken was to analyse how the weights in Figure 20 change when considering only incidents that failed the KPI 03 target. As these incidents are covered by the feedback from the Control works (PAU Analysis) we use the reason for the KPI 03 failure, rather than the weights of the previous chart, to split each of the bars.

Figure 21. Disproportionate incident locations and types (KPI 03 records matched with feedback data)



When looking at the changes between Figure 21 and Figure 20, it can be identified that the bars involving Breakdowns seem to have reduced and the bars with Traffic Collisions seem to have

increased. This is consistent with Section 4.1 where it is shown that even when Breakdowns are more common, Traffic Collisions are more likely to fail the KPI 03 target.

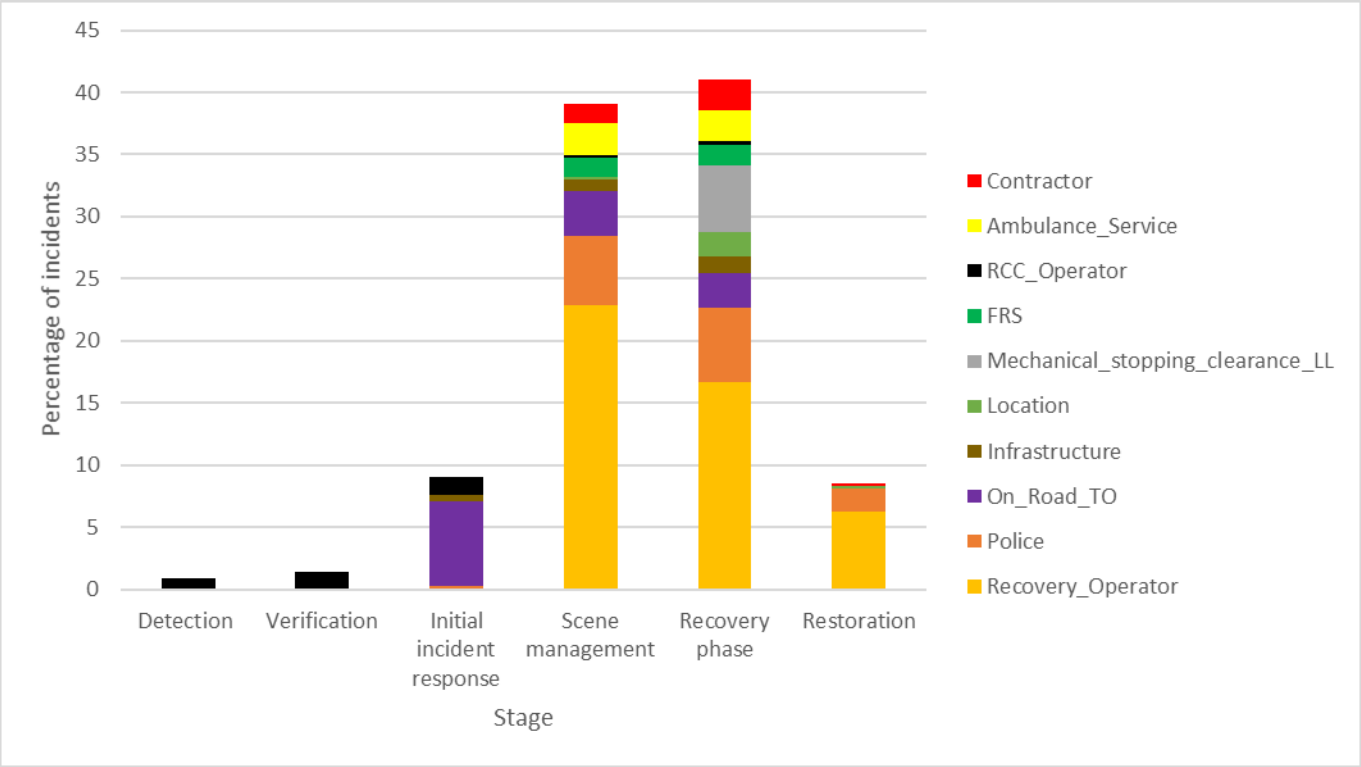
The largest bars in Figure 21 can be considered as an indicator of the incidents that are more likely to fail the KPI 03 target. Tableau(a visual data tool), has been used to investigate these incidents at different time intervals, an example of this type of visualization is provided in Figure 7.

4.3. Stages in the Incident timeline for the delay

As outlined in 3.4.5 the KPI 03 feedback data was used to identify problem stages in the incident timeline, since the feedback data identifies what went wrong during a particular incident that led to the KPI 03 failure.

The bar chart in Figure 22 represents the output of the DAM of the KPI 03 failures (1323 records) and highlights the percentage of incidents that were assigned to each of the timeline stages based on the KPI 03 Feedback descriptors. Each bar is subsequently broken down into smaller percentages representing the contribution that each of the issues categories (see Section 3.4.5) has. The exact values of these percentages are given in the table of Figure 23.

Figure 22. – Percentage of failures per stage (KPI 03 records matched with KPI03 feedback data)



The feedback data only covered the periods between March and December whereas the data sets being assessed were over the 12-month period, the KPI 03 Feedback data was upscaled from 9 months to cover the same period.

So, assuming that the percentages in Figure 23 apply to the set of all the national incidents, the number of national incidents in the period Jan-Dec 2017 that were likely to be affected by a particular issue at a given stage can be estimated. These figures, which are determined by multiplying the total number of incidents in 2017 by the corresponding percentage in the table, are shown in the table of Figure 23.

Figure 23. – Estimation of incidents in the period Jan-Dec 2017 that were likely to experience an issue at a given stage

Issue Category	Detection	Verification	Initial incident response	Scene management	Recovery phase	Restoration
Recovery_Operator	0	0	0	9798	7149	2693
Police	0	0	120	2393	2561	792
On_Road_TO	0	0	2929	1574	1194	2
Infrastructure	0	0	200	400	600	0
Location	7	7	7	75	846	72
Mechanical_stopping_clearance_LL	0	0	0	0	2315	0
FRS	0	0	0	690	690	0
RCC_Operator	381	601	601	85	114	28
Ambulance_Service	0	0	0	1080	1080	0
Contractor	0	0	0	695	1076	64

As described above, the bar chart of Figure 22 gives the percentage of incidents mapped to a given stage. The bars can also be split by incident type as shown in the chart of Figure 24. The table under this chart provides the exact percentage values for each possible stage and incident type combination.

Using the data from Figure 25, it can be identified that Breakdowns and Traffic Collisions are the incident types with the largest weights in each one of the stages of the incident timeline. However, they affect some stages more than others. For example, Traffic Collisions are particularly harmful to the “Scene management”, “Recovery phase” and “Restoration” stages where they amount to 48%, 48% and 51% respectively of the corresponding bars’ areas. Although Breakdowns rank second in these stages, they overtake Traffic Collisions in the stages “Detection”, “Verification” and “Initial incident response” where they amount to 62%, 62% and 46% respectively of the corresponding bars.

Figure 24. – Percentage of failures per stage (KPI 03 records matched with feedback data)

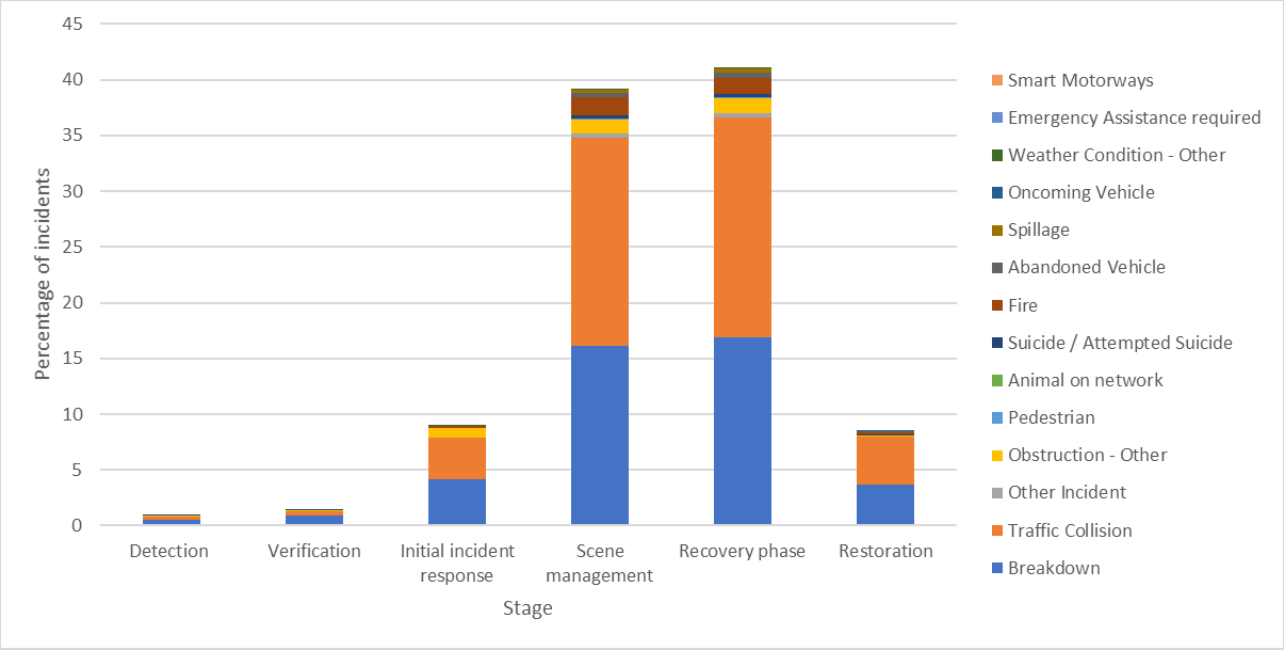


Figure 25. Percentage of KPI 03 failures mapped against incident type and incident timeline stage

Incident type	Detection	Verification	Initial incident response	Scene management	Recovery phase	Restoration
Breakdown	1	1	4	16	17	4
Traffic Collision	0	0	4	19	20	4
Other Incident	0	0	0	0	0	0
Obstruction - Other	0	0	1	1	1	0
Pedestrian	0	0	0	0	0	0
Animal on network	0	0	0	0	0	0
Suicide / Attempted Suicide	0	0	0	0	0	0
Fire	0	0	0	2	2	0
Abandoned Vehicle	0	0	0	0	0	0
Spillage	0	0	0	0	0	0
Oncoming Vehicle	0	0	0	0	0	0
Weather Condition - Other	0	0	0	0	0	0
Emergency Assistance required	0	0	0	0	0	0
Smart Motorways	0	0	0	0	0	0

As before, it has been assumed that the results derived from the feedback data are valid yearly. In this way we can split the total number national incidents in the period Jan-Dec 2017 as per the percentages of the table in Figure 25. In the current context this would provide an idea of the number of incidents per incident type that were likely to experience a delay in a particular stage of the incident timeline during 2017. The values obtained from this computation are given in Figure 26.

Figure 26. – Estimation of incidents in the period Jan-Dec 2017 likely to experience a delay at a given stage

Incident type	Detection	Verification	Initial incident response	Scene management	Recovery phase	Restoration
Breakdown	239	375	1791	6913	7270	1562
Traffic Collision	101	162	1580	8012	8449	1850
Other Incident	2	2	21	177	173	20
Obstruction - Other	45	67	370	516	551	46
Pedestrian	0	0	0	48	42	6
Animal on network	0	0	10	19	19	0
Suicide / Attempted Suicide	2	2	4	108	104	8
Fire	0	0	51	701	645	103
Abandoned Vehicle	0	0	13	150	173	48
Spillage	0	0	14	128	176	6
Oncoming Vehicle	0	0	0	6	4	2
Weather Condition - Other	0	0	4	13	19	0
Emergency Assistance required	0	0	0	0	0	0
Smart Motorways	0	0	0	0	0	0

4.3.1. Worst Roads

As described in Section 3.4.3 it is possible to distinguish between Motorways and Smart Motorways incidents by using a GIS approach. This analysis shows that the percentages of failures per stage for each motorway type resembles that of Figure 24. The main difference between the two motorway types is observed in the stages Scene management and Recovery phases i.e. for Smart Motorways the former amounts to 36% and the later to 44% of the failures while for Motorways the percentage of failures equals 40% in both.

4.4. Summary

From analysis of the different parameters it can be seen that;

- The top 3 worst impacting incident types are the same regardless of road type;
- The volume of incidents on APTR against motorway/smart motorways is only approximately 20% of motorway/smart motorway volumes;

- The weighted duration of incidents is longer on APTRs compared with motorway/smart motorway incidents and therefore the % of incidents that fail KPI 03 requirements is higher on APTR roads compared with motorway/smart motorway;
- It is envisaged that with the introduction of Expressways through upgrading APTRs although they will benefit the incident timeline for Expressways due to the benefit of introducing improved incident detection and management features such as SVD features the overall impact due to a relatively small volume of incidents in relation to motorways/smart motorways;
- The largest impact to KPI 03 performance appears to be affected mainly by frequency rather duration or location of incidents i.e. 2-4 pm has the highest volume of incidents and one of the lowest average incident duration times; and
- Using the top 3 worst impacting incidents, reviewing a number of case studies the supporting de-brief and historic tasks information (Appendix C and Appendix F) the main reasons for KPI 03 failure point towards;
    - On-road resourcing issues at certain periods of the day (2pm - 4pm),
    - The need for added equipment to deal with Traffic Collisions namely VRO and service provider secondary response which could be mitigated through better equipping Traffic Officers and their vehicles; and
    - Communication between on-road and RCC (often technological issues) as well as communication between other key stakeholders.

5. Previous project outcomes

A review of previous projects from T-Tear and SPATS has been undertaken that has identified a number of projects which could benefit the outcomes of the incident timeline review. The recommendations from these tasks have been extracted and reviewed to identify their relevance and to determine whether they still have relevance against this task. The Outcomes of the review are listed within Appendix A. The findings from these earlier tasks would help identify whether the trends were the same as well as understand better some of the root causes which would aid the identification of possible solutions

Based on a review of a number of logs reviewed during this task, the supporting information from the Traffic Officer incident debriefs, the findings were compared with the previous outcomes and more detailed analysis which was contained within the reports. The previous findings seemed to confirm;

- Resourcing is an issue at certain part of the day;
- Upskilling Traffic Officers to deal with added tasks as has been done with the removal aspects in live lane to the hard-shoulder or ERA has provided operational benefits and improved performance;
- Further upskilling Traffic Officers (similar to what happens in the Police having specialist roles) will provide further benefits to Highways England;
- Although the volumes and dynamics may have changed the disproportionate incident locations are broadly the same irrespective of incident type; and
- The top 3 incidents have synergies in that they often need a common secondary response i.e. Recovery Operator (SVR) to remove vehicles, Service Provider to deal with debris, spillages and/or to repair the network asset these services continue to be sub-contracted out providing a heavy reliance on external services.

6. Recommendations

Using the outcomes of;

1. of the data analysis in this task;
2. Supporting information from other business activities outlined in the Appendices of this document; and
3. Other tasks previously undertaken by Highways England.

It was possible to determine a number of requirements that would benefit Highways England in reduction of the incident timeline. The project team determined how the proposed solutions could be developed into a supporting roadmap to provide short, medium and long-term solution to enhance Highways England's incident management capability to reduce the incident timeline. The key feature developed was the improved ability to deal with spillages.

6.1. Incident Timeline Measures

6.1.1. Dedicated Spill and spilt load Vehicle

In the cases where a sizeable spill has taken place, a spill resulting from traffic collision or a breakdown a number of varying responses are required, this often includes an initial response from the Traffic Officer service and/or service provider to apply treatment to the carriageway. In some cases, the spill cannot be treated until the casualty vehicle is moved which can prolong the incident timeline. Once at scene, the service provider resources may deem the spill to be too big which results in a secondary response from the service provider in the form of a gritting vehicle and the application of sand which subsequently means there is a need for a road sweeper to clear up the contaminated waste. Some Service areas will utilise a hydroblaster to deal with the spill and there are obvious environmental concerns around seepage into the embankment or water course in addition to the speed the hydroblaster operates at to clear the carriageway. Subsequently waste from the road sweeper and the hydroblaster are considered as contaminated waste which means that the road sweeper needs to be de-contaminated prior to it being used elsewhere.

Often when a spilt load occurs there is a need to bring in specialised equipment to be able to remove it. Inciden debriefs and historical data highlight that often, before the specialised equipment arrives this can result in resource at the scene trying to manually remove the spilt load with minimal impact until the appropriate secondary response arrives at the scene in the form of plant such as a JCB. Sometimes what is required is the ability to move the spilt load enough so that the carriageway can be re-opened in part to start traffic flowing again until such time that appropriate resources and equipment can get to scene to deal with the spilt load in its entirety.

6.1.1.1. Incident Timeline impacts

Mobilising an array of responses often requires larger number of resources from a number of sources to deal with the incident such as Service Provider vehicles with sorbent material, gritting vehicles, hydroblaster, roadsweepers and VRO in some cases. Due to their nature the gritting vehicle cannot deal with clearing up the incident, therefore once it has applied its measure it is no longer effective for dealing with the incident, hydroblasting vehicles will only clean the carriageway and a road sweeper will only deal with picking up the contaminated waste, this causes unnecessary delays as

a result of waiting for the secondary response to reopen the carriageway. Additionally, there may be a need to have multiple levels of response which needs multiple resources and equipment as the current response is only partially effective.

The problem stages for this type of incident impact scene management, recovery and restoration to normality phases of the incident timeline.

6.1.1.2. Proposed Solution

Develop a dedicated vehicle which is designed to deal with medium to large spills and spilt loads initially while waiting on additional resources and equipment, thereby reducing the timeline of an incident. The features of the vehicle should include;

- Ability to apply sand or apply any alternate sorbent material to deal with any spills;
- Carry containment material for any larger or ongoing spills;
- Have the ability to use a modified plough to plough the debris/spilt load to the side, undertake sweeping and allow the carriageway to be re-opened in part or fully;
- Clear up and deal with any contaminated waste;
- Provide wash-down of the carriageway where required;
- Have the facility of a Hiab crane to lift and move any significant spilt load or contaminated material; and
- Have scope for different attachments on the crane to pick up loaded pallets and loose material

6.1.2. Spill Measures

Spillages continue to be a key factor around incidents on the network. There have been a number of recently identified issues which include conflict between using different types of product between service providers and Traffic Officers, where the use of differing product creates further problems as part of any clean up. The choice of products used by service providers varies based on mainly commercially driven decisions as well as the effectiveness of the product. There are also aspects which need to be considered around environmental impacts especially around the use of liquid based sorbents.

It is clear that although service providers do undertake some trials around the performance of their products these are not based on any standards. Some service providers are unaware if their product can be left in situ and allow for the carriageway to be re-opened quicker and safely in accordance with set European guidelines (AFNOR).

6.1.2.1. Incident Timeline Impact

Traffic Officer incident debriefs have shown issues experienced when dealing with spills, largely around conflicts of material used, as well as the lack of understanding whether the material can be left in situ safely or not, often means that the material needs to be cleared up at that time which can lead to other secondary response requirements such as Hydroblasting which is a slow process as it only deals with a small area at a time. This mainly impacts the scene management, recovery and restoration phases of the timeline.

6.1.2.2. Proposed Solution

A number of cases have shown that due to the general inconsistencies between the products used by service providers and Highways England, there needs to be further work undertaken in the following areas;

- Review the need for specifying approved materials similar to the draft outcome based specification based on previous work undertaken by Highways England in areas such as the Specification for Highway Works;
- Consider any new sorbent materials such as Nanobite against the previously tested sorbents which have the potential to substantially reduce the requirement for clearing up following application allowing the road to re-open sooner; and
- Determine whether the new materials are safe to leave in situ whilst they work to allow vehicles to traffic safely over the material and allow the road to be re-opened sooner.

6.1.3. Improved Initial response measures

From previous and current data analysis it has been determined that there are a number of occasions where Traffic Officers could clear an incident if they had the right equipment and vehicle. What has been apparent form the current results are that the majority of 13,000 SVR Contract removals, 10,400 (80%) are light vehicles and of the that number 2948 (28%) were Live Lane incidents. Of the Live Lane incidents 2,275 were down to Traffic Collision, 380 Breakdowns, 184 Fire incidents and 109 other. The DAM analysis showed that the issues are more prominent in 3 areas namely the North West, West Midlands and the East regions which have the highest levels of live lane incidents involving SVR. Whilst the Traffic Officer vehicles can deal with the majority of breakdowns and some of the Traffic Collisions the current Traffic Officer vehicles are not designed to deal with Traffic Collisions as a result they will often require added response from the Service Provider and or VRO due to the restriction of the current vehicle platforms used.

Although Connect Plus Services operates with Incident Support Units (ISU) as part of the M25 contract on behalf of Highways England, the ISU provide an initial and mitigating response (such as being better equipped to deal with spillages and TTM) they are, however unable to deal with the removal of the casualty vehicle or can only start the clear up once the casualty vehicle is removed by the VRO.

It is also recognised that the current Traffic Officer vehicle platforms already operate at their limits and it is felt that the only way to enhance capability would be to compromise on current features such as passenger carrying capability. The need for added equipment is raised within the debrief outcomes, therefore alternate vehicle platforms or other solutions would need to be considered to enhance the Traffic Officers capability.

6.1.3.1. Incident Timeline Impact

As outlined in the analysis of the data, KPI 03 clearance time is often lost due to the need to get the Traffic Officer to scene first before it can be determined that a SVR and or a response from the service provider is required. From the DAM data it can be seen that this average is over 30 minutes for all incidents involving SVR and affects approximately 10% of all incidents.

The problem stages for this type of incident impact initial response, scene management and influence recovery and restoration to normality phases of the incident timeline.

6.1.3.2. Proposed Solution/s

Investigate the implementation of alternate Traffic Officer vehicles in the areas highlighted by the data to provide better incident management. This could be based either on providing mitigation measures to undertake further damage limitation until such time that secondary response can attend the scene or though enhanced vehicles negating the need to have secondary response. Measures to be considered should include;

- Increase the current Traffic Officer vehicle platform to carry more initial response equipment (Vehicle platforms based on Ford transit or similar);
- Dedicated trailers which can be towed by existing Traffic Officer vehicles as well as Service Providers to deal with different types of incidents. This could be either box trailers or a hook lift trailer which can bring multiple response units or pods to the scene.
- Enhanced vehicle platforms to deal with the incident in its entirety by being able to remove more of the casualty vehicles. (Modified accident units used by the VRO).

6.1.4. Special Operations Response Team (SORT)

Often Major or Critical and some standard Bronze response incidents will warrant a specialised response to deal with the incident. By their nature they are often protracted and can be complicated based on the varying levels of response required. The analysis of prolonged incidents highlighted that there can be between 6 and 12 agencies and supporting services that may be required at a scene.

These incidents could be anything from Traffic Collisions, complicated breakdowns, unexploded bomb through to severe weather events such as flooding, snow or high winds. From the various analysis KPI 03 feedback data, incident debriefs and historical data analysis, there are seasonal or time of day related events at specific locations which put considerable strain on existing Traffic Officer patrols.

The feedback from the TIKM incident on road debrief papers also confirmed the need for appropriate scene Commanders and the value that effective scene commanders bring to reducing the timeline of incident. This was listed as being the top national issue for on-road resources.

Initial responses also need to include the appropriate level of resource and equipment. This was previously mitigated by Highways England through having Traffic Officers and immediate despatch of ISU supporting resources.

6.1.4.1. Incident Timeline Impacts

The problem stages for this type of incident impact initial response, scene management and influence recovery and restoration to normality phases of the incident timeline.

6.1.4.2. Proposed Solution

The proposed solution would be to introduce a small dedicated team of experienced and upskilled Traffic Officers who are mobilised to deal with such events either through proactive and reactive means. It is intended that the Traffic Officers have additional training to upskill themselves to allow them to undertake a number of functions in addition to their current Traffic Officer role which includes

scene command, aspects that the service provider and vehicle recovery operators would be expected to undertake such as TTM, dealing with spillages and the ability to deal with the highest impacting incidents such as Traffic Collisions (light vehicles only) by being able to remove vehicles and deal with spilt loads.

In doing so they would be stationed and deployed in their region to target and deal with problems areas such as smart motorways as part of their day to day role and in the case of critical or major incidents be in a position to be deployed as scene commanders to provide improved Highways England ownership and scene support. This approach is similar to that already undertaken by a number of other Emergency services and agencies such as breakdown operators who will deploy specialist recovery vehicles to areas which are experiencing flooding or snow events.

The added benefits are that they are better placed with the added experience and supporting equipment (revised vehicles and incident equipment) to deal with the high impacting incidents which will either negate the need for secondary response or identify when and what level of secondary response, needs to be mobilised. This would lead to a reduction of the incident timeline across the top 3 impacting incidents.

It is intended that the Traffic Officers would have additional equipment and vehicles to support the different types of work they are likely to undertake. The intention is that these resources sit over and above the existing defined patrols and resources to provide resilience and contingency within the regions. As they are a resource that sits over and above the current operational requirement this means that they could easily be deployed to other regions to provide support to cover other major incidents with minimal impact to the region.

It is envisaged that their key role is to is to undertake scene command and provide added enhanced capability and function at the scene. Their role is not to replace the roe of service providers and the VRO but complement them in them in the need to clear the carriageway by identifying the right level of response required sooner.

Proactive deployment – It is envisaged that they will work closely with the PAU to identify problem areas such as Smart Motorways, seasonal and time of day demands and provide support for severe weather events.

Reactive deployment – In the event of any critical or major events they can be re-deployed either within the region or to other regions to provide support as required especially where the incidents could be protracted.

6.1.5. High Level Platform and Satellite images

Due to the extent of Highway England's network there are a number of areas which do not have CCTV coverage and therefore until a Traffic Officer resource can be deployed and to get to scene it can take some time to determine the extent of the incident.

Additionally, there are a number of scenarios which influence Highways England's ability to manage and operate their network, these include;

- The areas not covered by the Traffic Officer service leave Highways England blind and reliant on their service providers to deal with the incident;

- Major or critical incidents off Highways England's network, however due to the disruption and extent of the incident can impact Highways England's Network examples include flooding or off network fires; and
- Where the incident occurs on Highways England's network however creates additional problems around the area such as the use of diversions which may not be suitable for all types of traffic namely HGVs.

6.1.5.1. Incident Timeline Impacts

The delay in establishing the extent of an incident and subsequent consequences to Highways England's network results in either delays in the correct level of response being deployed as part of the initial response or not allowing time for Highways England to implement contingency measures. Once the extent of the incident is established it is possible then to deploy the correct level of response to deal with and clear the incident as part of the scene management and recovery phases.

6.1.5.2. Proposed Solution

Initial discussions with the Satellite Application Catapult (SAC) have highlighted the development of small cube satellites which can be deployed for a cost of around £25k each which could be utilised to provide added imagery and give a much better overview of the initial incident as well as allow a much-improved monitoring of the subsequent impacts around the incident to confirm road closures whether diversions are in place, and establish of the diversion is effective.

6.1.6. Improved Blackspot Communications

It has been recognised from various feedback that there are several areas on the SRN which have either no or variable air wave coverage. This can create problems with dealing with incident in the form of providing updates or mobilising additional response to the scene. Other operational difficulties are experienced during peak periods when airwave traffic is high.

Additionally, an introduction of equipment and technology to Traffic Officers enable better communication and transmission of images allows for a better understanding of the scene and improves the chances of a "Right First Time" response. However, as equipment may rely on cellular technology which can often be patchy, time may be wasted in trying to transmit the information.

6.1.6.1. Incident Timeline impacts

Discussions with stakeholders and the debrief outcomes confirm that due to current issues there are delays in mobilising added resources to form a RRB or to undertake junction closures which can often protract an incident unnecessarily and therefore impact both the initial response and scene management phases of the timeline.

6.1.6.2. Solution

As part of the Satellite Applications Catapult discussions a number of measures are being looked for improving audio and data communications within the emergency services this includes the trial and development of an intelligent lightbar. In addition to providing a low cost integrated solution, the lightbar has the benefit of integration of hybrid satellite/terrestrial communications into new and existing vehicles. The product will incorporate intelligent dynamic routing between multiple mobile networks, to enable seamless operation of IP-based applications over these networks.

6.2. Development Roadmap for Measures

As part of the task brief the timeline stages were reviewed and confirmed to cover the three phases of delivery;

1. Short – up to 12 months following phase 1 of the incident timeline review (2018-2019) - phase 2;
2. Medium – between 12 and 24 months following phase 1 of the incident timeline review (2019-2020) – Phase 3; and
3. Long Term – RIS 2 Period and beyond (2020 – onwards).

With this in mind the measures have been assessed against these requirements to determine what actions need to be undertaken to implement the measures against the timescales;

6.2.1. Dedicated Spill and spilt load Vehicle

Develop the requirements for a dedicated vehicle to deal with spills and spilt loads.

6.2.1.1. Short Timescale

- Work with the National Winter team to identify suitable vehicles for the trial;
- Identify the specification of suitable equipment to fit the current Din plate mounting, this should include a rotary broom, hydraulic fork lift attachment and a modified plough;
- Confirm any vehicle modifications e.g. software on the controls for example;
- Ensure that the vehicle is plated and conforms to all regulatory requirements as it is no longer classed as dedicated winter fleet vehicle;
- Speak with VCA and DVSA about future certification requirements;
- Commence off road trials prior to on-road trials;
- Identify any process or changes either within the Traffic Officer service and or the Service Provider;
- Look at defining future features prior to investing future vehicle platforms; and
- Commence on road trials.

6.2.1.2. Medium Timescale

- Review the initial trial outcomes;
- Make any adjustments to the trial vehicles and commence further regional trials;
- Develop a requirements and vehicle specification; and
- Develop Benefits, fleet size, regions or parts of the network to be covered for the business Case from supporting data.

6.2.1.3. Long Timescale

- Undertake procurement exercise for additional vehicles; and
- Roll out the fleet amongst regions.

6.2.2. Spill Measures

Improve Highways England's capability to deal with spills

6.2.2.1. Short Timescale

- Undertake a review previous and ongoing diesel spill work;
- Undertake a review of commercially available product such as Nanobite against the list of materials previously reviewed;
- Procure any additional material to undertake testing of new products against recognised standards;
- Consider implications of introducing alternate products for Traffic Officer and Service Provider as part of a recognised standard for Highways England requirements i.e. SHW;
- Identify any process or changes either within the Traffic Officer service and or the Service Provider that may be required;
- Consider any additional stakeholders such as the Recovery industry implications to PAS 43 or contract changes to the SVR Contractor; and
- Develop and issue an interim report.

6.2.2.2. Medium Timescale

- Progress the implementation of the outcomes;
- Undertake any necessary procurement actions to change any products for Traffic Officers; and
- Revise and supporting Highways England standards such as the SHW.

6.2.2.3. Long Timescale

- Transition revised spill measures to business as usual.

6.2.3. Improved Initial response measures

Improved initial response through added capability at different levels.

6.2.3.1. Short Timescale

- Determine options to be take forward for trial;
- Develop supporting specifications;
- Undertake discussions with Highways England procurement and suppliers;
- Undertake procurement of initial option; and
- Commence implementation of initial trial option/s.

6.2.3.2. Medium Timescale

- Undertake procurement of added options;
- Expand trials;
- Monitor and review the trials; and
- Develop long term technical requirements.

6.2.3.3. Long Timescale

Undertake procurement of the preferred options and begin role out.

6.2.4. Special Operations Response Team

6.2.4.1. Short Timescale

- Develop a detailed proposal and delivery plan.

6.2.4.2. Medium Timescale

- Understand progress and outputs of other timeline measures;
- Revise proposal and develop a business case;
- Review point to determine whether to progress to trial; and
- Confirm roll out plan.

6.2.4.3. Long Timescale

- Commence activities to undertake trials namely; recruitment (if necessary), training, provision of added equipment and vehicles;
- Commence and monitor trial;
- Undertake review points; and
- Review trial period and determine next steps.

6.2.5. High Level Platform and Satellite images

6.2.5.1. Short Timescale

1. Undertake discussions to confirm capability and timescales;
2. Review outputs of other SAC trials and developments; and
3. Develop requirements for medium term measures.

6.2.5.2. Medium Timescale

1. Implement medium term measures;
2. Commence trials of HLP and satellite imaging; and
3. Review the trial and determine next steps to enhance trial and subsequent role out.

6.2.5.3. Long Timescale

4. Expand initial trial;

5. Develop full business case to implement a permanent solution; and
6. Roll out permanent solution following business case approval.

6.2.6. Improved Blackspot Communications

6.2.6.1. Short Timescale

- Monitor the trial being undertaken of the intelligent lightbar;
- Review and monitor trial progress; and
- Determine the next steps for Highways England to undertake trials which includes not only the vehicle activities but any technology requirements within the RCC.

6.2.6.2. Medium Timescale

- Undertake activities for Highways England's trial of the intelligent lightbar;
- Commence trial;
- Review the trial outcomes; and
- Incorporate requirement in the Traffic Officer vehicle specification.

6.2.6.3. Long Timescale

- Implement the lightbar as part of standard vehicle procurement.

6.3. Budgets to support timeline measures

From the current investigations undertaken indicative budgets have been developed for each of the timeline measures. These are highlighted in the table below;

		Timeline		
	Measure	**Short**	**Medium**	**Long**
1	Spill and spilt load	£40k[1]	£50k	£1m
2	Spill Measures	£25k	£35k	BAU
3	Improved initial response	£25k	£240k	£400k
4	Special Operations Response Team	£20k	£60k	£1.2m
5	High Level Platform and satellite images	£15k	£100k	£500k
6	Improved Blackspot communications	£10k	£50k	BAU
Sub Totals		**£135k**	**£535k**	**£3.1m**

Note 1 – Assumes transfer of existing winter fleet at no cost

Note 2 – BAU assumes costs to be supplemental to areas responsible for procuring and managing existing equipment and material currently.

It should also be noted that the costs assume Capital and resource costs.

Appendix A. T-Tear and Spats reports

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Consistent Customer Experience at any location on the Strategic Road Network (SRN).			✓	✓	It is recognised by breakdown and insurance companies that there are issues when recovering their members from breakdowns on Highways England's network. A breakdown or recovery following an incident from a live lane, will often require initial removal by a Highways England Traffic Officer or a VRO, via the Statutory Removal contract to a place of safety, before a safe recovery can take place to the customers' desired location under their existing recovery arrangements. Where the removal is undertaken by a VRO under Statutory Removal a cost is imposed to the customer irrespective of the fact that they have paid for their own breakdown cover. This proposal suggests that the recovery and insurance companies look to either include an additional form of insurance either as an option or mandated as part of the policy cost to cover customer costs of removal from a live lane area via Statutory Removal.
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Option 7 - Mandate the risk of Statutory Removal to be covered within breakdown cover.			✓		
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Operational Consideration: Review how data is collected (including performance data and Health and Safety).			✓		In order to monitor if the service is being delivered efficiently and to support Highway England in achieving current and future Key Performance Indicators (KPIs).
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Funding Strategies: Review of the current funding mechanisms to demonstrate value for money. It is important that the service is aligned with the requirements of RIS 2.			✓		
Task 092: Next Generation Vehicle	WP05 Recommendations for proposed national vehicle recovery	Organisational Considerations: The new NGVR contract will need to have a clear and consistent governance structure ensuring efficient contract management and administration.			✓		

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
Recovery (NGVR) Feasibility Study	model, Rev 1.0, 10/03/2017".						
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Strategies for Severe Weather and Vulnerable location: Identify how vulnerable areas are identified and how pre-positioning can be more effectively executed to improve operational performance.			✓		
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Manage the response times. Highways England current arrangements require all incidents to be cleared within 60 minutes. Consider if variable response target times by location, day of the week and time of day could be set as new KPIs.			✓		
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Collaboration with Stakeholders: The Police and Highways England Major Projects were identified as key stakeholders. Incorporate strategies that will facilitate enhanced collaboration with these key stakeholders to realise increased efficiencies and time reductions.			✓		
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Option 6 – Highways England to develop a national framework that Police and other Emergency Services can utilise.			✓		
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Incentivise more VROs to support Highways England NVR Statutory recovery requirements, by increasing the fee received by these.			✓		

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	The use of Highways England's operational depots for VROs to base and operate from, could then facilitate operational availability requirements (i.e. facility to base a number of vehicles in HE provided depots to ensure that an agreed number of vehicles are permanently available for this service);			✓		
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	• An incentive to develop good practice along the lines for stakeholders and customers engagement (section 3 in this report);			✓	✓	
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Flexibility to respond to changes in the practice and capability for vehicle recovery of the Traffic Officer (TO) service; and Flexibility to respond to identification of statutory recovery remotely/directly by the Regional Control Centres (RCC).			✓		
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Incentives such as cumulative contract penalties or cost sharing should be considered to incentivise reduced response times.			✓		
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Option 2 - Transition to a regional Vehicle Recovery Model – external Service Provider Provide a national framework to operate the NGVR contract and transition for operating and management requirements to the HE region to provide greater accountability and ownership.			✓	✓	
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Option 3 – Transition to a regional NVR delivery model with Highways England undertaking service provider requirements.	✓		✓	✓	The key principle behind this option is to adopt an approach consistent with Highways England's Asset Delivery operating model under which Highways England procures suppliers directly, in this case the VROs.

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
Task 092: Next Generation Vehicle Recovery (NGVR) Feasibility Study	WP05 Recommendations for proposed national vehicle recovery model, Rev 1.0, 10/03/2017".	Option 4 – Transition to an area maintenance NVR based delivery model. A number of international models highlighted that the Area Service Providers undertake the responsibility for vehicle removals and vehicle recovery as part of their incident management role.			✓	✓	One of the key benefits of this approach is that there are fewer 3rd party agencies to deal with and it is easier for the Service Provider to coordinate with all parties as part of the incident response and incident restoration phases. As part of this approach it has been easier for the Managing Road Authority to include additional incentives, such as financial. This model has led to reduction of the average incident duration period by around 80%.
T-TEAR Task 310 – Enhanced Incident Response Requirements	Enhanced Incident Response Requirements - Future Model Paper, Rev 2.0, 11/05/2015	Considering incidents simply as unplanned events has a valuable role in developing incident response thinking. An early objective of incident response becomes to address the unknowns of an incident and move to a position where the incident can be dealt with as a planned event. This early response and dynamic assessment to move from incident management to event management utilises the strengths of the Traffic Officer Service.	✓		✓		Whether on scene or remote at a control centre, Traffic Officers could readily develop their duties to respond, assess risk and establish a control plan. The Service Provider is then in a strong position to help plan and to effectively and efficiently coordinate their resource.
T-TEAR Task 310 – Enhanced Incident Response Requirements	Enhanced Incident Response Requirements - Future Model Paper, Rev 2.0, 11/05/2015	Making best use of organisations' skillsets through improved coordination and improved information provision from scene to the customer.		✓	✓		
T-TEAR Task 310 – Enhanced Incident Response Requirements	Enhanced Incident Response Requirements - Future Model Paper, Rev 2.0, 11/05/2015	The Traffic Officer Service, Service Providers and recovery agents must work closely together to deliver a combined and connected service to customers. An incident response as a 'joint' service requires developments in behaviour to ensure responders work closely together, and a commercial environment which formally shares targets and accountability.	✓		✓	✓	

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
T-TEAR Task 310 – Enhanced Incident Response Requirements	Enhanced Incident Response Requirements - Future Model Paper, Rev 2.0, 11/05/2015	Create the Incident Coordinator role to manage collaborative working between incident responders and to appropriately draw upon the respective responder skillsets.	✓		✓		Highways England has a flow of information to and from the RCC, and the Service Provider executing activities on scene. This leaves scope for a suitably qualified and experienced person to deliver on Highways England's level of incident response accountability – an Incident Coordinator. Currently Highways England relies upon the RCC to deliver this coordination, however this is generally at a more operational level as opposed to the tactical oversight the Incident Coordinator would deliver.
T-TEAR Task 310 – Enhanced Incident Response Requirements	Enhanced Incident Response Requirements - Future Model Paper, Rev 2.0, 11/05/2015	Higher level incident response requirement at 'Hotspots': A nationally consistent set of incident response requirements for Service Providers, with a clear framework for focussing incident response where it is needed most.			✓		It is recommended that network 'Hotspots' should be identified and included in the Network Information, which will allow Service Providers to incorporate them from first tendering activities. In addition, an increase in resource is identified in requirements terms which will benefit Provider confidence in tendering and resourcing.
T-TEAR Task 310 – Enhanced Incident Response Requirements	Enhanced Incident Response Requirements - Future Model Paper, Rev 2.0, 11/05/2015	Improve the way that requirements are grouped and presented; noting that only limited changes are required to what the Service Provider does on scene.			✓		Requirements for Service Providers working to the Asset Support Contract are set out in the Asset Maintenance and Operational Requirements (AMOR) document. This document is structured to meet a specific criteria and deliver an overt set of outcome-driven requirements. Industry feedback has suggested that the requirements in AMOR could be presented in a format which is easier to administer.

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
T-TEAR Task 310 – Enhanced Incident Response Requirements	Enhanced Incident Response Requirements - Enhanced Incident Response Requirements for ASC, Rev 3.0, 11/05/2015	Accurate and timely information allows prospective road users to make an informed decision about their journey in relation to the effects of an incident. This may be for road users within congestion or those planning journeys.			✓		
T-TEAR Task 310 – Enhanced Incident Response Requirements	Enhanced Incident Response Requirements - Enhanced Incident Response Requirements for ASC, Rev 3.0, 11/05/2015	Appropriate resource on-scene by ensuring the right resource is on scene at the right time, with the right knowledge to work effectively. Road users should perceive that there is a concerted effort to clear the Incident	✓		✓	✓	
T-TEAR Task 310 – Enhanced Incident Response Requirements	Enhanced Incident Response Requirements - Enhanced Incident Response Requirements for ASC, Rev 3.0, 11/05/2015	Ad hoc enhanced response - Match response to needs at times of stress			✓	✓	Defining an enhanced level of service will directly contribute to Rapid Incident Clearance and indirectly contribute to both Accurate and Timely Information and Activity on Scene.
T-TEAR Task 310 – Enhanced Incident Response Requirements	Enhanced Incident Response Requirements - Enhanced Incident Response Requirements for ASC, Rev 3.0, 11/05/2015	Amend the Tactical Incident Response Plan (TIRP) To increase the value of the TIRP, emphasis should be shifted from the current focus of ‘plan quickly’ (driven by Performance Requirement Levels in Table 3.1), to ‘estimate accurately’.			✓		
T-TEAR Task 310 – Enhanced Incident Response Requirements	Enhanced Incident Response Requirements - Enhanced Incident Response Requirements for ASC, Rev 3.0, 11/05/2015	Simplify the Incident Requirement Measures.			✓		AMOR Table 3.1 currently sub-divides incidents into 27 categories for measurement. This was designed to acknowledge differences in relative importance between times of day and classes of road. However, the result is a complex measure with some categories applying to very few incidents.

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
T-TEAR Task 310 – Enhanced Incident Response Requirements	Enhanced Incident Response Requirements - Enhanced Incident Response Requirements for ASC, Rev 3.0, 11/05/2015	Rapid Incident Clearance - The CLEAR initiative has highlighted that sharing information and a joined-up response can reduce the incident timeline.	✓		✓	✓	
T-TEAR Task 310 – Enhanced Incident Response Requirements	Enhanced Incident Response Requirements - Asset Support Contract (ASC) Incident Data Issues, Rev 1.0, 04/05/2015	Errors / Inconsistencies in reporting the Incident data - The Agency can address this and help to mitigate the impact on the business by taking sample audits of Provider Incident data and verifying it against RCC data.			✓		
Task 120 (4/45/12) ATKS Incident Response Metrics 21/06/13		Current Metrics Recommendation 1 - Increase understanding of the relationship between the RCC data and the Service Provider performance. Recommendation 2 - Consider how actual performance can be measured to provide corroboration to the metrics. Recommendation 3 - Better understand the incident timeline, how this is recorded and how this relates to the metrics.			✓		

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
Task 120 (4/45/12) ATKS Incident Response Metrics 21/06/13		Future Metrics Recommendation 4 -Further develop the concept of lane restriction minute credits and debits using Service Provider sourced data to verify suitability. Recommendation 5 - Consider widening the metrics remit to include non-live lane incidents. Recommendation 6 - Develop a definitive list of incident types to be included in the metrics and place these into groups. Recommendation 7 - Develop thresholds and weighting factors to suit any amended metrics to ensure the level of service delivered continues to meet the network need. Recommendation 8 - Consider how clearance time is actually measured and subsequently logged. Recommendation 9 - Consider the relationship between the RCC and Service Provider logs. This should also drive improvements in data quality. Recommendation 10 - Develop an understanding of how the different parties contribute to the incident timeline under the new ASC arrangements and ensure metrics across Service Provider, Vehicle Recovery and Traffic Officer Service all align.			✓		

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
Task 153 Incident Response Requirements Development and Validation Project 09/07/14	Review of DfT Strategic Road Network Specification 2013-2015 & Highways Agency Business Plan 2014-15	Network Availability1. Ensure TIRP is accurate and decision making is revised frequently to allow RCC to update motorists regarding incidents in a timely manner, particularly when sections of the SRN are unavailable.Journey Time Reliability2. Ensure the RCC and SP database can verify/ or automatically generate incident descriptors (i.e. motorway / time / traffic classification / lane numbers, etc) to ensure incidents fall into the correct metric categories. Incident Management3. Ensure the incident duration time is accurate by corroborating results between SP and RCC datasets with the aim of resolving discrepancies at an earlier stage. This cross-checking process will ensure incidents are accurately recorded and performances can be continuously improved based on previous years.Incident Provision4. Accurate submission, use and then updating of TIRP will provide the Agency with the information to inform motorists of incidents in a timely mannerCustomer Satisfaction5. Use improved information flows to enable enhanced communication to inform road users of delays caused by incidents which will assist the Agency in improving/maintaining satisfaction scores.			✓		

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
Task 153 Incident Response Requirements Development and Validation Project 09/07/14	Review of TMD 10+	6. Introduce metrics that measure SP performance based on three levels of service (LOS) to match TMD10+ future requirements 7. Introduce further SP performance requirement metrics based on: • Peak times (i.e. morning and evening rush hour); • Weekday and weekend traffic, and; • Periods that coincide with special events (i.e. bank holidays, sport events, concerts, etc). 8. Ensure SP are fully informed when attending an incident and deployment of additional resources is kept to a minimal level.			✓		

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
Task 153 Incident Response Requirements Development and Validation Project 09/07/14	Review of AMOR	9. Ensure the Provider Outcomes continue to match the Agency's strategic objectives. 10. Require the TIRP to be revised periodically to account for changes from initial incident assessment.11. Outline in detail situations where debris collection or asset work can be postponed to later; this will eliminate short incidents from the metrics and give a more accurate representation of actual incident durations.12. Define the terms 'Major' or 'Critical' incident; this will help align the RCC and SP datasets 13. Promote the RCC confirming SP are meeting their 15 min target of communicating lane closure by checking with CCTV or on scene TOs; this will help towards improving customer satisfaction.14. Instil culture of collaboration between TOS and SP by 'passing' and 'failing' both services using common metrics.15. Ensure TOS and SP are recording notification time, arrival at scene incident and handover to Bronze Scene Commander to enable accurate measurement of incident durations.			✓		
Task 153 Incident Response Requirements Development and Validation Project 09/07/14	Engage and Understand Linkages	1. Consider how incentivisation of SPs could result in PRL being bettered as opposed to complied with. Also consider how poor performance links to contractual consequences to ensure failure is unpalatable to the SP. 2. Consider the use of a dynamic PRL based upon an initial forecast of incident duration which would lead to incident specific PRLs and as a peripheral benefit it would enable improved provision of information to the public.			✓		
International Incident Management Best Practice 12/06/15		· Stopped Vehicle Detection – consider current trials and develop further as appropriate		✓	✓		

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
International Incident Management Best Practice 12/06/15		· Traffic Officer Service Equipment – as the TOS's role continues to evolve, are the current vehicle and personal equipment specifications still appropriate? This should be considered in the context of potential changes in future maintenance arrangements		✓	✓		
International Incident Management Best Practice 12/06/15		· Collaborative Planning and Response – develop collaborative, rather than cooperative relationships with other responders			✓		
International Incident Management Best Practice 12/06/15		· Stranded Vehicle Rapid Removal – consider the use of 'push pads' in addition to the current towing arrangements		✓	✓		
International Incident Management Best Practice 12/06/15		· Rapid Incident Scene Clearance – consider the implementation of a capability to rapidly clear lanes		✓	✓		
International Incident Management Best Practice 12/06/15		· Enhanced Spill Clearance – further develop hydrocarbon spill capability to protect carriageways		✓	✓		
International Incident Management Best Practice 12/06/15		· Decision Support Tools – implement DSTs to help inform decisions relating to traffic management.		✓	✓		
International Incident Management Best Practice 12/06/15		· External Information – enhance Highways England's capability to communicate with customers and those affected by incidents		✓	✓		
International Incident Management Best Practice 12/06/15		· Lessons Learned – enhance the lessons learned process to promote innovation			✓		
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Improve data capture in the RCC-** Given the data quality issues it is important to improve data capture if studies such these are to maximise their accuracy and benefits.		✓	✓		Put in place either paper or electronic based proformas to ensure better quality data capture occurs at scene. Equally improve supervisor checking process

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Improve the capability to manage live lane breakdowns -** Live lane breakdowns can take a number of hours to resolve. Although unlikely to be in a live lane for that length of time these are very disruptive incidents.		✓	✓		Quick-win trial towing poles as opposed to straps. Consider ISUs towing vehicles as well as TOS. Consider other options set out in the report for further trials / study
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Improve the capability to manage spillages of all types unaided.** Spillages can delay the opening of a lane or even a carriageway for a long time. Early intervention can often make a significant difference to incident duration.		✓	✓		Bolster trained knowledge via 'toolbox' talks regarding containing spillages to make best use of resources and the environs of the scene.
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Improve the knowledge of hazardous spillages.** Hazardous spillages are likely to require emergency service attendance however early actions can make a significant difference to the incident timeline.	✓		✓		Significantly improve knowledge of dangerous goods spillages to ensure early identification. Also, TOS HazMat Advisors would be a useful tool for minimal outlay
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Improve clearance times for removal of abandoned vehicles** Abandoned vehicle incidents often take a number of hours to close.			✓		Work is ongoing with this already. Will require review in 12 months time to determine success.
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Facilitate faster removal of hardshoulder breakdowns** Although a vehicle on the hardshoulder does not in itself create delays it does create a risk of a secondary incident and limits hardshoulder use by incident responders.			✓		Further review is required to identify regional trends to determine optimum solution. Quick win is to ensure current equipment / arrangements are used to best effect. Fuel provision to be avoided
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Reduce the number of fires and their impact on the network** Fires are often dramatic events which result in traffic delays. The Fire and Rescue Service will always be required but prevention and early intervention may yield savings.	✓	✓	✓		Consider deployment, on a trial bases, of a CAFS/FFS system following discussion with Fire and Rescue Service. In addition, further study to identify any particular verge fire prone areas and consider close mown fire breaks

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Minimise ETM / TM usage at scene Deployment and removal of ETM / TM takes time**. If the number of times this is required could be reduced then it would reduce the incident timeline for some incidents.		✓	✓	✓	All options to be developed and potentially deployed. That is: 1. Improve vehicle livery 2. Improve rear VMS 3. Improve lightbar position and spec 4. Vehicle side sequential lights The vehicle side sequential lights have the potential to make a significant improvement
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Reduce time take to deploy and remove ETM/TM** The deploying and removal of ETM/TM is currently a manual task which takes time. If an automated, faster method could be found then savings may be realised.		✓	✓	✓	Quick win: Confirm that signage and cones in use provide the optimum solution. Subsequently all other options are worthy of further study: 1. Automatic cone layers for smaller vehicle 2. Laser guidance and warning system 3. Roof mounted VMS
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Improve capability to assist at medical emergency incidents** Medical emergencies capability is currently very low yet the numbers of incidents are dramatically increasing (60% increase in 18 months of data)	✓	✓	✓		Initially further discussions are required with the ambulance service. But initially AEDs to be deployed. Subject to HA viewpoint TOS/ISU staff should be trained as community responders.
Review of the Capability Gap in Vehiclesand Equipment at Road Traffic Incidents 30/03/08		**Improve animal on the network equipment**Currently the TOS frequently need assistance to manage animal on network incidents. This may be reduced throughequipment or training.	✓	✓	✓		Three separate elements to this:1 Provide enhanced training on a regionallevel to match animals likely to beencountered2. Consider a trailer in some / all regions totransport animals off network3. Feasibility study into preventing animalsaccessing network in known hotspotsusing humane deterrents
Review of the Capability Gap in Vehicles and Equipment at		**Improve management of oncoming vehicle incidents** Currently these are not managed uniformly across the network and although difficult to prevent often result in significant collisions.		✓	✓		No equipment available but TOS data to inform engineering solutions by the Service Providers.

Project Source	Report name	Recommendation	Area of improvement				Comments
			People	Systems & Technology	Processes	Supply chain	
Road Traffic Incidents 30/03/08							
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Improve management of caravan/trailer incidents** Some Regions manage significantly more of this type of incident than others.			✓		No specific equipment over and above that for other capability gaps but the work ongoing to educate those towing trailers / caravans to continue. Consider working with VOSA to promote a voluntary testing regime for trailers etc.
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Concentrate on solutions for car and light goods vehicle incidents** The majority of incidents involve cars or light goods vehicles therefore maximum benefit will stem from aiming resource at these.			✓		Self-explanatory action to be considered when specifying vehicles and equipment
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Ensuring best use of resources at scene.** TO and ISU staff comment they can wait for prolonged periods prior to being released. If not occupied then consider what other duties / assistance could be offered.	✓		✓		A study is required to determine if the perceived waiting time is significant. Then consider why the waiting is occurring and if this can be reduced. Finally, a list of alterative tasks should be drawn up to ensure staff are employed in a useful activity. Better proactive on scene communication may improve the situation and build relationships.
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Early incident information is inaccurate** The information available early in an incident is often inaccurate and those on road have had to wait whilst information is confirmed. RCC need to ensure the best information is received.	✓	✓	✓		Make more fields in Command & Control mandatory. Determine how big an issue this really is and then either implement wide ranging changes to call handling process or simply refresh staff training with tool box talks.
Review of the Capability Gap in Vehicles and Equipment at Road Traffic Incidents 30/03/08		**Research technology to identify breakdowns / abandoned vehicles.** To ensure these are identified quickly to allow faster recovery technology such as smart CCTV etc could constantly search for breakdowns. Would require development and deployment of technology on the network.		✓	✓		

Appendix B. PAU Feedback supporting Data

The table below shows a small section of the available data which outlines the main reason code for failure as well as aspects of the incident timeline failure such as whether desk time met, deployment time which allowed for further analysis.

Figure 27. Main reason code analysis for incidents which failed KPI 03

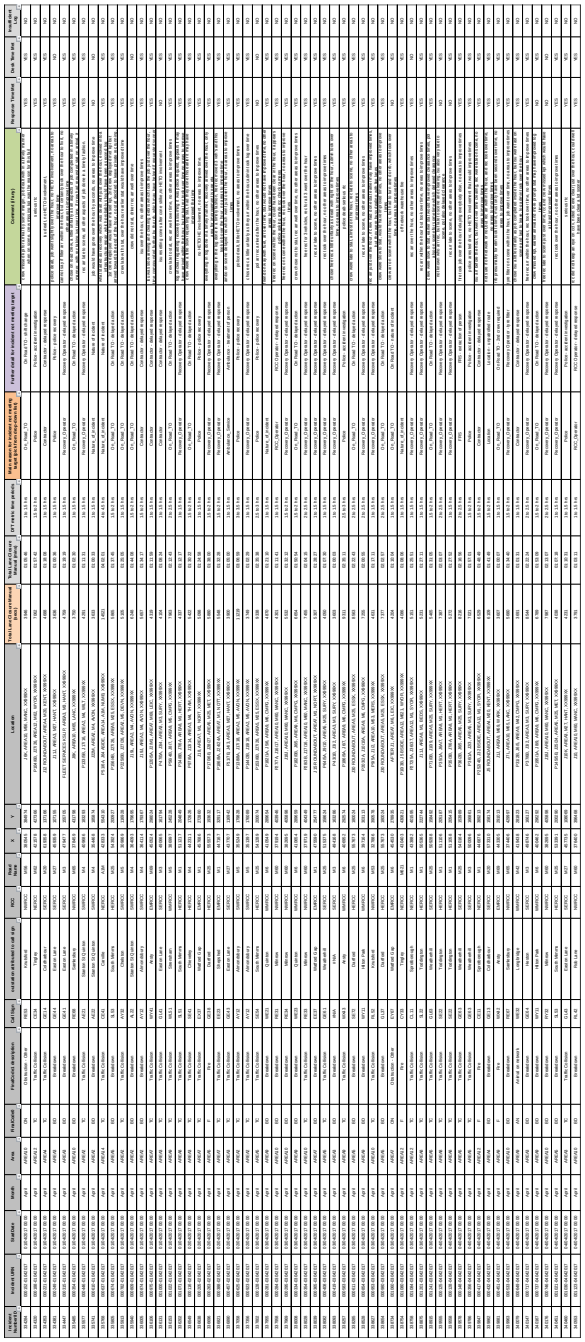


Figure 28. Supporting codes and reasons for failure

Drop down reason	Definition	Example
RCC_Operator		
RCC Operator - incorrect CMB entry	Where the CMB times are incorrect.	▪CMB should not have been used as the vehicle was within an existing closure. ▪Request to clear signals was made at 14:51 within CMB KPI. Signals were cleared outside of signal clearance KPI of two minutes at 15:04 which is the time used as clearance. ▪Lane one was only set when tyre fitter arrived at scene at 14:45. This is the time the compromise should have been recorded from and not the incident start time ▪Operator overwrites times.
RCC Operator - delayed response	Operator slow to deploy patrol, recording or closing Logs. Incorrect clearance time input. Desk time has not been meet.	▪RCC slow to dispatch. Admin took over time . Operator did not chase up soon enough
RCC Operator - nature of incident	Desk time took over time due nature of incident. No resource available	▪ Delayed deployment due to limited patrol availability, no units available. ▪ Having no double crew patrols available
On_Road_TO		
On Road TO - 2nd crew required	Waiting for second crew to move the vehicle from Live Lane	▪ 2nd patrol required to remove broken down vehicle from live lanes
On Road TO - shift change	T.O. delayed due resource availability during shift change hours	▪Patrol were not deployed until 22:23 due to shift change over ▪ Delay in deploying patrol (but only by approx. 3 mins) due to shift change
On Road TO - delayed arrival	Travel time took over time	▪Due congestion.
On Road TO - delayed action	Clearance time took over time	
On Road TO - communication breakdown	Communications breakdowns between T.O and other bodies failed and are the reason of failing the metric.	▪ HETO assistance requested but were delayed to scene as confusion as to correct vehicle location Operator did not chase up soon enough, should have stat earlier
On Road TO - nature of incident	Clearance time took over time due nature of incident make it impossible to cleared it under 1 hour	▪ Serious injury RTC. Vehicle broken down within smart motorway section ▪RTC with complex heavy recovery required and area team injured whilst making temp repair to barrier
Police		
Police - accident investigation	Live Lane cannot be clear before the Police finish their investigation	HETO crew diverted form incident to an RTC. Police left to deal
Police - police recovery	The Police recovering the vehicle took overtime	Rec took over time, police dealing
Police - police declined	Police declined access to the scene	▪Police led incident. On HETO arrival at scene, police refused to allow HETO to clear vehicle from live lane. HETO left scene and left police to deal ▪HETO waiting for police to finish speaking to driver from RTC before being allowed to move vehicle clear of live lanes
Police - delayed response	Police delay to response to the incident	had to wait for pol to arr rec as private road,pol late to scene
Police - nature of incident	Nature of incident make it impossible to the Police to clear it under 1 hour	HETO patrol required to provide block for police to turn vehicle facing the wrong way
FRS		
FRS - small vehicle fire	Small vehicle fire took over 1 hour to clear the vehicle from Live Lane	FRS at scene dealing with small veh fire
FRS - large vehicle fire	Large vehicle fire took over 1 hour to clear the vehicle from Live Lane	FRS at scene attending to large vehicle fire
FRS - extraction of person	FRS extracting a person from a complex incident	Lane closure required for hiab/ ambulance to access RTC vehicle in ditch
FRS - declined to move from live lane	FRS declined to H.E. to move the vehicle from Live Lane	FRS at scene dealing with small veh fire
FRS - delayed response	FRS delay to response to the incident	fire dealt,took over time,everything late
FRS - nature of incident	Nature of incident make it impossible to the FRS to clear it under 1 hour	fire extraction...fire dealing with gas bottle took over time...fire took over time
Ambulance_Service		
Ambulance - extended ETA	Ambulance extended ETA	▪ Ambulance did not arrive at scene until 18:46 ▪ Due to extended eta for ambulance, police at scene did persuade driver to move vehicle off network and wait for ambulance and recovery there
Ambulance - non attendance when required	Ambulance required but don't attend	Ambulance required but don't attend

Appendix C. Incident Management Requirements Team Debriefs

The following pages highlight the outcomes as recorded by the IMRT of a number of collective debriefs which highlight a number of the reasons which affect the ability to deal with incident effectively and subsequently lead to KPI 03 failures;

Debrief outcomes
On-road – Paper 4

Introduction

There were 2560 debrief outcomes recorded for period July 2015 to June 2016. As part of its commitment to use debrief data for continuous improvement purposes the Traffic Incident and Knowledge Management (TIKM) team reviewed all information relevant to the Traffic Officer Service (TOS) on-road function for the period, with it being highlighted as the overarching theme in 641 instances.

Purpose

This paper is one of several methods the TIKM team use to highlight debrief learning and areas for improvement, with data analysed to identify conclusions and actions which are then assessed against a prioritisation criteria.

The data sample size enables a broadly accurate determination of trends at the national and/or regional level. More immediate safety related updates are made available in Traffic Operations Weekly and the Traffic Officer Briefing Tool; while the action tracker process can be used to follow current debrief issues and opportunities to be taken forward as they are received by the TIKM team. Any concerns regarding the sharing of actions at a local/regional level should be addressed through line management.

Contents

Key learning points: These feature throughout the paper, being relevant and useful for all staff involved in incident management at the operational and tactical level. These are supplementary to the prioritised improvement activities.

Previous published on-road debrief outcomes papers

Paper 1
Paper 2
Paper 3

Executive summary

The Traffic Incident and Knowledge Management (TIKM) team reviewed all information relevant to the on-road traffic officer (TO) theme for the period to June 2016; with the following representing the improvement activities prioritised through application of the prioritisation criteria (see page 16). Score 5 being the highest and score 1 the lowest. Actions with a safety theme and which represent a customer improvement opportunity are scored 5 and 4 respectively.

Regional traffic operations

Action 1: Regional traffic operations should consider the adoption of regional trailer champions as per notable practice employed in the SE region.
Prioritisation score: 4

Action 2: Regional traffic operations should ensure that its scene and tactical commanders undertake frequent liaison during NILO critical incidents through scheduled briefings and SIT REPs, utilising the SW region notable practice approach as highlighted in this paper.
Prioritisation score: 5 (Safety)

Action 3: Regional traffic operations management to inform staff of the need to use debriefing as a means to capture any equipment faults experienced in course of managing a NILO critical incident (or other mandatory type).
Prioritisation score: 4

Traffic Incident and Knowledge Management team

Action 4: The feasibility of a programme of innovative scene commander (bronze) training should be explored by TIKM with OCSD PO governance and L&D colleagues.
Prioritisation score: 4 (Customer improvement opportunity)

Action 5: The TIKM team is to liaise with the CLEAR team to illustrate work of the team and identify ways to work better together and build upon recent instances such as providing debrief data for use as evidence in a presentation given to Transport Focus.
Prioritisation score: 4

Action 6: The TIKM team is to seek agreement from regional traffic operations management for a nationally consistent exercise roll-out approach across the regions which could be both managed and delivered locally by operational staff (see regional control centre paper 4).
Prioritisation score: 4

Action 7: The TIKM team is to clarify with contracts team colleagues if any further provision, such as flasks, is considered necessary and incumbent upon Highways England to provide. The responsibilities of both the organisation and the individual will then be clarified and should be communicated to manage expectations.
Prioritisation score: 4

Action 8: The TIKM team is to determine and communicate the customer welfare position to all regional traffic operations managers.
Confirmed closed

Action 9: The TIKM team is to determine and communicate organisational response to reverse access issues identified with partner responders via a safer, smarter working update. TIKM to then create a desktop exercise based on a real life scenario to safely test knowledge and understanding of reverse access.
Prioritisation score: 5 (Safety)

Contracts team

Action 10: Since compilation of the debrief data the NGVR Performance and Compliance Manager has now confirmed that a new 'HGV Incident Co-ordinator' role has been created to manage every aspect of all HGV incidents for continuous improvement purposes.
Confirmed closed

National summary

1. **Scene commander role (84)**: As raised in the last two on-road summary papers, colleagues have highlighted the necessity and value of positive TOS ownership at the scene of incidents for resource and signal setting requirement purposes, more effective communications, including media, and to challenge other responders in line with Highways England aims. Particular praise was given to team managers in the SW and NE regions. Issues relating to an absence of scene commander presence in all but the WM region were raised on 18 occasions.

   Key learning points: The value of on scene command presence was demonstrated:

   - In the SW where briefings were held every 30/40 minutes promoting JESIP and involving tactical and operational managers.
   - Through influencing CLEAR focused approach to incident management with the opening of lanes during instances of accident investigation in the SE, East and WM regions.
   - In the SE where the promotion of a JESIP approach established clear and unambiguous incident management priorities.
   - In the WM and NW it was highlighted that even when an incident scene is entirely in the hands of another organisation, the loss of continuity when there is no TOS resource presence is acute. Therefore, wherever possible a scene commander should remain at scene.

   A scene commander safer, smarter working aide produced by the TIKM team can be accessed here and contains a range of top tips for colleagues to refer to.

   Any future training should look to ensure effective representation of Highways England's interests at incidents with challenging scenarios to test decision making, techniques to influence stakeholders and support staff safety. This can be provided to those on-road TOs on deputising duties and others on a volunteer basis, expanding on JESIP training rolled out by TIKM team previously. Any case will need to be built upon analysis of clearance KPI data to highlight specific areas where we can work smarter.

   Facilities are available to assist individuals/ teams practice their scene commander responses to real-life incidents with simulated scenarios through the Hydra system or simulation technology similar to that used in driver refresher training.

2. **Resourcing (60):** Maintaining minimum staffing levels has been reported as an issue nationally and has been highlighted when attempting to deal with major and multiple incidents, particularly on nights. It is believed that more (TO) resource at incidents debriefed would have allowed more timely, thorough and effective responses in the managing of incidents. Specifically, TMs crewing up as patrols impacted on the ability to provide a scene commander, welfare and trauma diffusion in the NE, WM, SE and SW regions. In the East region, incidents on the A14 were problematic, as due to the number of closures required they could not all be managed. This highlighted the fact that police and service provider (SP) resources have also been cut-back preventing the support that would have fulfilled this resourcing gap in the past.

   Positive approaches were raised in the EM, East and NW regions where crews were flexible, being proactively split up to fulfil a tactical approach to carriageway closures. This was achievable due to single crew training.

   As raised previously; minimum staffing levels should reflect need and be based on utilisation intelligence and data with contingency plans put in place at a local level to prevent any fall below numbers required. The proactive use of single crews to meet

demands is an option, but long term this may mean the need to increase the number of TOVs at certain locations to facilitate this. A national review is currently being undertaken by the vehicles team. Regional budgets aside, there should also be a reiteration of the fact that all crews are part of a national strategy and can be deployed accordingly, with a smarter management of resources in covering other outstation shortfalls.

'Qlikview' or other management information tools can be used to review and analyse command and control/ control works historical data to better inform where resources can be more smartly used. It is understood this option is being explored by Customer Service Improvement colleagues to inform TO resource utilisation.

3. **NGVR contract (46):** Debriefs highlighted the link to the scene commander role relevant to recovery; most notably that being on scene is essential to influence recovery and incident timeline. The majority of references to use of the NGVR contract were positive. Some points of note:

    - The ability of FMG to provide coaches to transport members of the public away from a hazardous incident to a place of safety.
    - FMG confirmed that they have the authorisation to use funds via the contract to clear vehicles by any means necessary, providing the required equipment and personnel as necessary. Eg: vehicles in excess of 44 tones.
    - A heavy wrecker can typically only carry one passenger
    - An LGV on the back of a low loader was too high to pass under overbridges and so was crushed down to size to allow forward progression.
    - In one instance in the NW, the on-road team manager (TM) advised that the NGVR operator used too high a vehicle to recover the stricken LGV. This meant that bridges in the area were not able to be cleared, adding 1-2 hours to the recovery to normality phase of the incident. Route planning by an NGVR incident manager to oversee recovery response would have been beneficial.

    A need to clarify recovery ownership with the police and request statutory recovery at the earliest opportunity was recorded as lacking in six instances in the NW, NE, WM and SE regions. This included a lack of West Yorkshire Police understanding in the NE that if they organised their own recovery they are responsible for the load also.

    Key learning point: Recovery operations should be managed by Highways England wherever possible to maintain a CLEAR approach and this is something scene commanders should be looking to ensure. This should include restricting recovery at times of the day when traffic has increased/ is likely outside of normal peak periods due to school and public holidays and when nearby public events are taking place.

4. **CLEAR (45):** Positive working at scene was highlighted in all regions, primarily through influencing police through joint decision making, keeping lanes open past the incident scene and leaving vehicles in situ that were leaking oil.

5. **Communications (41):** Information from on-road crews to the RCC and other responders was sighted as being inadequate on a number of occasions, primarily due to a lack of updates from scene and not logging on correctly, in all regions but for the NW and SW.

    In terms of Airwave use in the East region, a lack of etiquette and overuse of point to point hindered effective information sharing with all parties on the incident talk group.

    Activity sheets should be correct, at least at commencement of patrol. Decisions taken at scene and planned responses should be shared with the RCC for a clear, centric approach to incident management. As in the previous paper, it should be noted that all crew status changes should be updated with the RCC.

As with updating incident logs, etiquette when sending messages over Airwave should follow the principles of CAROT (Concise Accurate Relevant Objective Timely).

In the East region a teleconference was held from scene to ensure that all control rooms received the same information.

Key learning point: When a talk group is transmitting, think of it as being in a conference call. To gain access as the next caller and transmit an important message (non-emergency) it is necessary to press and *hold* the PTT (press to talk) button. This will ensure that you stay at the top of the queue of those requesting access. As soon as you release the button you go to the back of the queue.

6. **Incident screens (40):** Debriefing again highlighted the ability to retain traffic flow and open lanes/ carriageways through approved use, up from two occurrences in the last paper, perhaps aligned to the safer, smarter working aide produced by the TIKM team at the time (available on the TIKM Portal page). Screens were used proactively in the EM, SE and WM regions to adapt to scene changes. In the SE they were also used in duplicate locations on several occasions due to overbridges. Conversely in the WM region it was also identified at an incident where three crews were unaware of how to correctly attach the screen bases.

   The TIKM team have liaised with the on-road capability (ORC) team who advised that incident screen deployment familiarisation sessions are taking place in the WM region which the ORC team have been providing information for.

   In terms of lighting, the ORC team have also trialled a remote area lighting system as a part of the Vito van trial.

   Key learning point: In the EM it has been suggested that due to limited use weekend trailer checks should be utilised for refresher 'training' with deployment where space allows. At two incidents in the SE the safety of deployment in the dark was raised, with requests for lighting on/ around the screens to be made available.

7. **Incident planning (40):** Forecasting incident timescale was listed as important, linking to having a scene command presence to ensure joined up communications and understanding. Local infrastructure knowledge was also highlighted as important in ensuring closures are implemented to enable most suitable agreed diversion routes and for adequate resourcing. In the NE and WM regions RRBs were reported as being ineffective, both in approaching too close to scene, increasing trapped traffic, and hindering access by other responders, respectively.

   In the NE region it was highlighted that the TOS were proactive in requesting the fire and rescue service (FRS) to attend scene despite the fact that no persons were trapped. Due to the location of the vehicle down an embankment, the FRS was able to assist access.

   In the WM region rearward relief was performed by directing traffic through the local motorway service area.

   In the WM region the limitations of an incident protection vehicle's capability in long term road works was highlighted; it could only cover stricken vehicles and not ETM.

   Key learning point: As also highlighted in the RCC debrief outcomes paper 4, at a cool debrief in the East region the following approach was promoted: at major spillages a theoretical grid can be placed over the affected area and a timing taken to clean one box, potentially a square metre as a control factor. A multiplication of this timing by the number of boxes in the grid can then give a more accurate and achievable timeframe for individual

lane clearance and overall return to normality. This approach would be viable where the carriageway can be saved from resurfacing.

8. **Welfare (36):** A lack of welfare provision for on road staff working at scene has been recorded in all but the East region, including provision of refreshments, a lack of flasks, relief from an on-going incident (particularly when seconded to another outstation with further travel time home) and trauma diffusion/ checking on staff welfare.

   Conversely, staff welfare was addressed quickly in other instances through discussions with the duty OM in the NW and the organisation of a drop-in centre with an EAP (now PAM) counsellor in the SE region.

   In the SW region on-road colleagues have debriefed the need for consideration of TMs taking flasks/ refreshments to scene dependent on weather conditions. Consideration should also be given to availability of welfare provision via service providers.

9. **Rearward relief (23):** Overall there were mainly positive examples of the use of the work instruction by staff in the NE, SE and WM regions. In the SE a motorway access gate was used for improved access and egress to scene, both for emergency service vehicles and for the rearward relief of trapped traffic. In the WM region, relief was conducted via the L (exit) slip instead of the M as this avoided issues with LGVs using a narrow turning circle.

   The question has been raised (as in previous paper), with remote working and reduced numbers, should a team manager be required on scene to conduct rearward relief?

10. **Equipment (22):** The Action App was used during the pilot trial to effectively update the area team on infrastructure damage prior to attendance in order to assess severity and resource requirements.

    Equipment requested via debrief:
    - Operational commander tabards
    - Diversion signs for traffic officer vehicles
    - Whiteboard for diversion signage on TOVs
    - PA/ tannoy system to pass messages to queueing traffic (TIKM assisted with mandate for change). In the EM region police attempts to use such equipment in liaising with a person threatening suicide were ineffective due to road noise.
    - Slip road gates
    - Breathing apparatus (TIKM team have already investigated with contracts and national H+S teams)
    - TO/ TOV cameras (TIKM already investigated)
    - Defibrillator - At an incident in the SE region it was stated by the on-road crew on scene that if TOVs were equipped with defibrillators lives may have been saved in this instance, although there is understanding that we are not classed as an emergency service.
    - Atlases - In the EM region a road atlas was noted as being useful for knowledge of less familiar parts of the network and for closure plans/ agreed diversion routes.
    - Tabards/ jacket inserts for TOS scene commanders.

11. **Rolling road blocks (RRBs) (17):** TO crews were prepositioned on both carriageways at incidents in the EM and WM regions to enable closures to be implemented and removed in quick succession, and for repetition of the process to minimise the time traffic was held for.

    In the EM and SE regions traffic released under RRBs ensured the timely egress of recovery vehicles and the transmission of customers through incident scenes in a safe manner.

In the WM region it was noted that crews were not always proactive in requesting a separate incident talk group for two vehicle RRBs to ensure effective communications.

12. **Health and safety (17):** Near misses were debriefed primarily for the following issues:
    - Hard shoulder abuse – six instances in the NW, NE, WM, EM and SE regions
    - RRB breach – three instances in the NE and SE regions
    - Closure breach – eight instances in the NW, NE, EM and East regions

13. **Technology (15):** Poor Airwave coverage was reported in most regions and tracked via the debrief action tracker process.

    Positive equipment use was highlighted through the use of the bullhorn and flashing headlights to access scene in the SE region.

14. **Reverse access (14):** In the East region, access to an incident scene was enabled for the Met Police, fire and SP via TOs escorting responders the opposite way down the carriageway. Issues were identified in the NE, EM and SE regions with responders travelling against traffic flow prior to reverse access implementation, near misses being raised.

15. **Hard shoulder running (11):** Debriefs highlighted that HSR could have been used with temporary traffic management (TTM) support to reduce incidents' impact on the strategic road network (SRN) in the EM and WM regions.

    Following discussion with the procedures team, TIKM clarified that if the circumstances are such that significant contractor resources and a dedicated traffic management unit are on scene then the TOs present should not need to focus on, or input into the TTM layout - all they should do is task them with the requirement to establish hard shoulder running and, when incident resolution has been achieved, advise when the TTM can be removed. Chapter 8 is only guidance, albeit a persuasive example, and there is scope for an initial 'make do' approach within it if circumstances or equipment availability so dictate on arrival at an incident.

16. **Local knowledge/ familiarisation (9):** Debriefs have highlighted the essential nature of local area knowledge in effective incident planning, particularly for complicated closures and to enable guidance from management to dynamic risk assessments, such as where topography is an affecting factor.

17. **Full carriageway closure (8):** The requirement to use two TOVs to implement a full carriageway closure has been problematic with resource availability. The emergency traffic management (ETM) work instruction has now been reviewed following debrief information received, with the secondary TOV requirement being for ETM infill only going forward. Although all necessary control measures should be considered in the decision making process used.

18. **Joint emergency services interoperability principles (7):** Joined up working via JESIP decision making and guidance has been recorded as enabling effective communications and management of incident timelines in the NW, EM and SE regions.

    Key learning point: JESIP tools such as the METHANE mnemonic, joint decision model and working strategy should be used in managing incidents, particularly in a joined up response with other responders.

    TIKM team have represented Highways England at a joint responder engagement event, promoted e-learning packages available on their website, and written desktop exercises to demonstrate applicability of JESIP and shared situational awareness tools. The JESIP

team now collaborate with TIKM as a first point of contact in relation to ongoing JESIP developments and initiatives.

19. **Images from scene (6):** Images sent to NILO from CCTV stills and via the NILO App trial in the WM region, enabled the team to Tweet improved information to the public from Highways England approved equipment. The App has also been used to update the service provider on a bridge strike and provide an overview of potential damage severity prior to arrival.

    In the NW region it was noted that the provision of images by members of the public at the outer cordon of a vehicle fire ensured other customers were warned of incident severity and traffic congestion was most likely reduced.

    A new TO App has been designed and will allow TOs to take images at scene with approved hardware (Samsung S6 units), guidance and redaction capability, meeting the Company's data security requirements. This will allow images to be recorded of both incidents and asset defects on a national basis. As per the ten overarching rules personal devices must not be used to provide images.

20. **Debriefing (5):** Positive notable practice recorded includes:
    - A debriefing and trauma diffusion session being organised by a team manager in the SE region to supplement what had taken place the day before. This enabled a more in-depth and inclusive discussion for all involved.
    - Dual debriefs being held in the SE region to discuss significant incidents that had been managed by the same staff. This reduced time spent debriefing and allowed a comparison of ways of working while still satisfying completion requirements.
    - A cold debrief being used in the East Mids to better understand accident investigation and to enable improved joined up working in the future.

    Debriefing examples listed demonstrate the mind-set of using debriefs as a tool to share notable practice, progress opportunities and raise issues through an agreed, official process to the appropriate areas of the company to enact change.

21. **Animals (4):** In the East region both carriageways were closed due to an agitated horse which then kicked free from its horsebox, validating this cautious approach. In the SE region a different approach was used for a loose horse adjacent to the motorway; with emergency traffic management (ETM) implemented. This restricted both carriageways to one lane running, causing congestion and slowing traffic in case a full stop was required. SE TOs also assisted police with a horse incident off the SRN through the provision of incident screens (managed by TOs for the duration).

    A project to define the way that the TOS should deal with animals on the network is currently in progress, and a layered training solution has been agreed upon and will be rolled-out over the coming months.

22. **Customer welfare (4):** In the EM and WM regions a lack of clarity has been evidenced over whether water could be provided to customers by our staff. In the EM a lack of provision led to customers contacting friends and family to bring supplies and remove vulnerable passengers from the network. Members of the public were then crossing the carriageway on foot to access the trapped traffic, placing many people at risk.

    This remains a contentious issue. TIKM team have previously liaised with resilience colleagues, who have confirmed that the feasibility of regional emergency welfare plans alongside category one responders and other key partners is still being investigated by local resilience forums. More recently the TIKM team have been informed by the National Resilience and Security Team (NRST) team leader that:

'Highways England does not maintain independent plans to deliver welfare to customers trapped on the strategic road network. Experience has shown that this is beyond the capability of any single organisation working on its own. Planning for, and delivery of such support is a joint responsibility for each of the Local Resilience Forums (LRFs). Highways England is a member of every LRF in England and we will support this planning and delivery. In the event that the need is identified during an incident to provide welfare support (or that this is likely to be needed in the future) then this should immediately be escalated to the multi-agency Tactical Coordination Group (TCG). If a TCG has not yet been established, this should be requested (usually through the police). The TCG will agree and plan the most appropriate way to deliver the necessary assistance as part of a multi-agency response to the emergency.

There have been a number of occasions where welfare has been delivered successfully in recent years through a collaborative effort involving the emergency services, local authorities, and our own Traffic Officer Service and service providers. The exact detail of how this is achieved in each case varies depending on local plans, the specific circumstances of the situation, and the availability of suitable resources from each of the responding organisations. It is important to note that it is always preferable to prevent the need for welfare support in the first place using the full range of incident management tools and effective communications with customers'.

A major incident needs to be called to get the full multi-agency involvement, this position being endorsed in the Pitt Review following the Gloucester floods of 2007 when he stated that no single agency should be expected to respond and deal with a major incident in isolation.

23. **All-purpose trunk roads (4):** TO patrols in the EM region could not manage incidents on some APTR sections of the A1 due to a lack of central reservation. A regional 'critical register' has been created to record these locations for risk assessment.

    Having liaised with Max Brown, Smart Motorways Team Leader, the TIKM team have ascertained that the stretches of the A1 specified in EM debriefs are currently listed as 'planned or potential' expressways as part of any future rollout by DfT for an expressway network by 2040. Although, it is important to note that this map is purely an aspiration and by no means a commitment. Within the Road Investment Strategy paper there is a map indicating planned/ potential expressways on a national basis, page 49.

24. **Sphag sorb (4):** In the East region an amount of sorb far in excess of that recommended or carried in a TOV was used to treat a large diesel spill prior to delayed service provider attendance, preventing the likely need for resurfacing of three lanes, and associated delays and costs. In the WM region TOs were advised not to use their sorb as it was incompatible with the service provider treatment and are using Sphag Sorb now for all spills up to a lane width square (well below the 50L limit).

25. **Agreed diversion routes (4):** As well as ADR issues highlighted in RCC debrief outcomes paper 4, in the East region, discrepancies were found in guidance contained in TOV battle bags in relation to RCC systems and the actual route/ system detail for the A14/ M11 interchange. Clarification was needed on which was correct.

26. **Spillages (3):** In the WM region, following debriefs, a trial is being run for the TOS to manage the spillage assessment and treatment process, retaining service provider attendance to check prior to opening. The aim is to build evidence to take over the role following the trial whilst maintaining service provider liability.

27. **Single crew capability (3):** EM and NE debriefs highlighted the resource implications of single crewed TOs not being able to attend ever increasing stretches of ALR as the first

resource. In the NW region single trained crews enabled effective closures to be implemented due to increased resource availability.

28. **Traffic officer vehicle availability (3):** Instances of TOV shortages recorded were again infrequent. In the EM it was advised that Felley outstation needs five vehicles to operate effectively at shift handover (one of the five has been loaned to training). In the SE and NE regions team managers had to join other crews to attend incidents. In the NE this was due to an increase in single crewed TOs using more vehicles.

    As highlighted in point 4, TOV fleet use needs to be monitored in relation to single crewing requirements. A national review is currently being undertaken by the vehicles team.

29. **Call signs (2):** In the NE and SE regions it has been suggested that when crews split up at an incident they are given adapted call signs to differentiate between the two. Suggestions are for an alpha and bravo or oscar (observer) and delta (driver).

    Call signs adapted to individuals when a crew is split up (for incident management purposes) could be considered on a nationally consistent basis to ensure clarity of role and location, particularly during border incidents.

30. **Planned carriageway reopening (2):** In the WM it was debriefed that reopening at two significant incidents was protracted. Resources need to be pre-positioned to effect more expedient removal of traffic management as in an example noted in the NE region.

31. **Accessing incidents (2):** Staff in the EM region highlighted the fact that if they were able to travel to incidents on routes other than the strategic road network, they would have been able to use local knowledge and attend more swiftly.

32. **Filtering for high sided vehicles (2):** Filtering was undertaken in the NE and NW regions to ensure vehicles did not get stuck on diversion routes with known low bridges/ weight restricted roads. This is only identified as permissible in the SW regional specific work instruction.

33. **TTM use (2):** In the NW and SW regions 'big foot' cones already in situ on the carriageway were used to establish more substantial closures, as part of the dynamic risk assessment process

34. **Traffic Management Cell (2):** In the SE region the TMC has been used at Dartford to allow for a quicker closure of the bravo carriageway A282/M25 for incidents between the exit of the bores and junction 30.

35. **Infrastructure damage response (2):** In exceptional circumstances in the SE and WM regions TOs assisted with ETM for repairs/ inspections to infrastructure damage using RRBs at Medway motorway services for a broken overbridge window, and for the inspection and removal of lamp columns in high winds, respectively.

36. **Up and over (2):** Where incidents occurred between junction slips, up and over closures were utilised to reduce impact on the network, as highlighted in the emergency services paper 4.

Other notable points raised on a one off basis

Long term road works - TTM and recovery provided
In the SE region it was noted that all responsibility for live lane incidents was with the long term roadworks contractors who provided all TTM, clean-up and recovery.

Emergency traffic order (severe weather)
In the NE region it is being investigated as to the potential for an emergency traffic order to be prepared in draft and the legality of the duty operations manager to sign it to put it into effect for the purpose of closing a road (the A628 Woodhead Pass) in severe weather.

High volume pump (HVP)
To clarify aspects of HVP deployment, TO visits can be organised to introduce staff to the agreed ways of safe joined up working. For instance, when contractors deploy the HVP, they will deliver this role only and will not provide TTM.

NILO reports
In the SE region it was noted that all TMs should receive NILO reports and pay particular attention when they are single point of contact for any critical reports that will need a debrief. In this instance, the debrief discussion could have been completed on the night.

Park up strategy
In the SE region the night shift park up strategy was reported as needing to be more centralised as crews took too long to attend scene.

Accident investigation equipment
In the East region it was noted that when accident investigators are using cameras they must seek permission to pass the scene and field of vision of the camera as although they may be outside the cordon the points of reference the camera uses may not be.

Utilising local expertise/ equipment
In the NW region a member of the public at an incident scene offered to contact her brother, a local farmer, to get him to bring his cattle trailer to assist in control and removal of the livestock. This offer was accepted and on his way the farmer picked up a stockman from the cattle mart at J36 to assist. It took two trips under police escort to remove all the sheep; on the second trip to the mart a vet was brought to scene to euthanize the injured animals. This assistance ensured that the incident was resolved in the timeliest fashion.

Traffic officers assessing road surface after spillages
EM region staff identified a training need to enable them to ascertain whether a road needs resurfacing or not following a diesel spill. With Asset Delivery now in operation this need appears less necessary with the Head of Asset Management for Area 7 saying that 'we need to play to roles strengths and the traffic officers' strength is to effectively manage incidents and the customer and the inspectors' strength is managing the assets. In the East Midlands this is working effectively and we aren't having any conflicts related to surfacing.' For regions where ASCs operate the responsibility and thus the decision to reopen a road rests with the provider, due to the nature of risk based contracts in place and technical competence required.

A trial in the West Mids involves TOs assessing small spillages that are within the limits outlined in the TOS Manual work instruction and Sphag Sorb manufacturer recommendations in order to test success and competence levels of TOs to undertake the task unsupervised. The TOs have received training from Kier, the Area 9 provider, to confirm their competence in undertaking the assessment task required along with written assurance that this will not compromise the Section 58 Special Defence arrangement. If successful, this could be a template for successful national roll-out, potentially saving hundreds of hours per year from spillage related closures

Directing traffic through motorway service areas (MSAs)
In the SW it has been suggested that a work instruction could be created for running traffic through MSAs, although this would need further supporting data and investigation regarding legality and commercial implications. There has been one instance recorded of this approach at debrief in the WM region

Storage bins (M6 J2)
In the WM region, at M6 J2 southbound TOs advised that there was not enough ETM equipment on one TOV to close a large/ complex junction. The provision of bins and re-stocking/ maintenance at such locations has been raised and investigated previously. However, the cost of providing and maintaining, even on a trial basis, is currently unlikely with current prioritisation and allocation of funds.

Having raised the issue with NRST and the Resilience Coordination Group, the TIKM team have been advised that if there is a specific junction/ location where there is a frequent problem with cones/ signs then this should be identified to the regional EPT who can then make a bid through the network resilience allocation bids. It was recommended that the bins have a standardised fixed inventory of equipment to maintain consistency across locations. After a bin has been used following an incident it should be checked and restocked accordingly as part of the recovery to normality process. Contract and training considerations would also need scoping out.

Other options include the national rollout of the 'Vito van' trial or exploration of alternative measures to provide a more dynamic and ready provision of extra TTM/ETM on a regional basis. The possibility of the TOS having its own larger cone capability remains an option which the organisation can explore further, with the activity having already been risk assessed, thereby removing reliance on provider maintenance crews and the uncertainty surrounding their arrival when requested.

Parked up LGVs
During roadworks in the NE region TOs did not attend LGVs parked up on a slip road waiting reopening, when issues were identified. It was confirmed in region that TOs should be deployed and attend as they have the required powers and relevant procedures in place for directing traffic. If necessary they can then escalate non-compliance to the police.

Sweeps of 'sterile' area
During and following a full carriageway closure in the WM region, TOs completed sweeps of the 'sterile' area. They confirmed no un-attended vehicles, and informed customers as to what to do when their recovery got to them. Recovery operators were also informed on how to access their customers that had broken down inside the closure.

Scene access
Access to an incident scene on the M62 (J26 – J25) in the NE was extremely difficult as a result of the trapped traffic across all four lanes of the carriageway.

TOV RTC policy
In the WM region it has been requested that guidance and documentation to be completed when a TOV is involved in a road traffic collision should be reissued to clarify the correct process and necessary communications.

TOS responsibilities/ dealing with illegal immigrants (1): Such incidents should be police led, covered by overarching rules and SLAM.

Crossing central reserve (1): In the WM region, this approach was authorised when traversing from one sterile area to another sterile area on a carriageway closed in both directions. In such situations all available control measures must be in place beforehand to reduce risk of harm.

Conclusions

The TIKM team has identified the following as areas for improvement, highlighting priority actions where necessary and other initiatives already planned or in place. To optimise success the team will help co-ordinate these improvement activities where necessary:

1. Scene commander standards need to be maintained nationally as the role is critical to our ability to deliver our business priorities.

   Action: The feasibility of a programme of innovative scene commander (bronze) training should be explored by TIKM with OCSD PO governance and L&D colleagues.

   Action: Regional traffic operations should ensure that its scene and tactical commanders undertake frequent liaison during NILO critical incidents through scheduled briefings and SIT REPs, utilising the SW region notable practice approach as highlighted in this paper.

2. A single point of contact via a VRO scene commander should be recognised in the new NGVR contract negotiations. Provision of such a supervisory role for more complicated recovery operations would ensure that the correct recovery is organised first time, including the consideration of local infrastructure.

   Action: The NGVR Performance and Compliance Manager confirmed that a new 'HGV Incident Co-ordinator' role has been created to manage every aspect of all HGV incidents for continuous improvement purposes.

3. In the SE region at Dartford, people have already been recruited to provide refresher training involving setting up incident screens periodically when they have had little use. They also oversee the records, maintenance and operations of the incident screen trailers allocated to Dartford Outstation. This would also address fault finding as identified in the SW and SE regions.

   Action: Regional traffic operations should consider the adoption of regional trailer champions nationally as per notable practice employed in the SE region.

4. The TOS health and safety team have made clear in TOW edition 95 that colleagues need to carry sufficient refreshments, both for their shift and any unexpected circumstances such as extended shift duration and hot weather.

   Action: The TIKM team are to clarify with contracts team colleagues if any further provision, such as flasks, is considered necessary and incumbent upon Highways England to provide. The responsibilities of both the organisation and the individual will then be clarified and should be communicated to manage expectations.

5. CLEAR working is essential to effectively manage the incident timeline. As an example, recent figures indicate that a full closure of a four lane motorway can cost approximately £214k for the first hour, rising to £3.4 million for four hours.

   Action: The TIKM team are to liaise with the CLEAR team to identify ways to work better together and build upon recent positive instances such as providing debrief data for use as evidence in a presentation given to Transport Focus.

6. Uncertainty continues to surround Highways England's position in respect of customer welfare in the event of protracted incidents and what direct support our staff can provide.

   Action: The TIKM team is to determine and communicate the customer welfare position to all regional traffic operations managers.

7. Rearward relief and a need for re-familiarisation is still being evidenced as being beneficial, particularly as there are often large gaps in its use, up to years at a time. The TIKM team have created exercises which can provide operations with a means to overcome such a gap.

   Action: The TIKM team is seeking agreement from traffic operations management for a nationally consistent exercise roll-out approach across the regions which could be both managed and delivered locally by operational staff.

8. Any equipment faults should be recorded to ensure evidence collation for action tracking purposes and change going forward.

   Action: Regional traffic operations management to inform staff of the need to use debriefing as a means to capture any equipment faults experienced in course of managing a NILO critical incident (or other mandatory type).

9. Reverse access has been identified as an issue in terms of understanding by and communications with partner responders.

   Action: TIKM team to highlight issues identified and organisational steps to address, via a safer, smarter working update. TIKM team to create a desktop exercise based on a real life scenario to test capability.

Prioritisation criteria

The following criterion is based on two primary factors: 1) Debrief evidence to support change (quantitative) and 2) envisaged benefit(s) to business and customers (qualitative) and is applied by the TIKM team to give each action a prioritisation score. *Actions with a safety theme will automatically be scored a five and those with a customer improvement opportunity a four.* The prioritised list is shown in the executive summary (pages 2-3).

Score	Criteria					
	Attractiveness			Affordability	Achievability	
	KPI	Reputation	Benefits	Cost	Time	Risk
1	Does not support a KPI	Will not reduce risk of adverse impact on Company reputation	No clear benefits	Will require considerable budget	Will require considerable cumulative time disproportionate to any benefit	Unlikely or uncertain that required change will be achieved
3	Supports one KPI	May reduce risk of damage to Company reputation	Clear qualitative benefits	May require some investment	May require some time investment	May meet end objective
5	Supports more than one KPI	Will reduce risk of damage to Company reputation	Will result in qualitative benefits and quantifiable benefits (measurable)	Delivered with no additional budget	Delivered with minimal cumulative time investment	Required change will be achieved
Weighting	30%	12.5%	12.5%	20%	12.5%	12.5%

Examples:
Where a 5 is scored for KPI the weighting would be calculated as 5 x 0.3 = 1.5

Where a 3 is scored for cost the weighting would be calculated as 3 x 0.2 = 0.6

Where a 1 is scored for risk the weighting would be calculated as 1 x 0.125 = 0.125

The calculation for each column is added together, with the score then being used to determine the appropriate option:

Options	Analysis						
	KPI	Reputation	Benefits	Cost	Time	Risk	Score
Option1 *Do nothing*	0.30	0.125	0.125	0.20	0.125	0.125	1-2
Option 2 *Regional best practice opportunity*	0.9	0.375	0.375	0.6	0.375	0.375	3-4
Option 3 *Recommendation to act*	1.5	0.625	0.625	1.0	0.625	0.625	5

Debrief outcomes
Regional control centre – Paper 4

Introduction

There were 2560 debrief outcomes recorded for the period July 2015 to June 2016. As part of its commitment to use debrief data for continuous improvement purposes the Traffic Incident and Knowledge Management (TIKM) team reviewed all information relevant to the Traffic Officer Service (TOS) regional control centre (RCC) function for the period, with it being highlighted as the overarching theme in 749 instances.

Purpose

This paper is one of several methods the TIKM team use to highlight debrief learning and areas for improvement, with data analysed to identify conclusions and actions which are then assessed against a prioritisation criteria.

The data sample size enables a broadly accurate determination of trends at the national and/or regional level. More immediate safety related updates are made available in Traffic Operations Weekly and the Traffic Officer Briefing Tool; while the action tracker process can be used to follow current debrief issues and opportunities to be taken forward as they are received by the TIKM team. Any concerns regarding the sharing of actions at a local/regional level should be addressed through line management.

Contents

Key learning points: These feature throughout the paper, being relevant and useful for all staff involved in incident management at the operational and tactical level. These are supplementary to the prioritised improvement activities.

Previous published RCC debrief outcomes papers

Paper 1
Paper 2
Paper 3

Executive summary

The Traffic Incident and Knowledge Management (TIKM) team reviewed all information relevant to the RCC function for the period up to June 2016, with the following representing the improvement activities prioritised through application of the prioritisation criteria (see page 16). Score 5 being the highest priority and score 1 the lowest. Actions with a safety theme and which represent a customer improvement opportunity are scored 5 and 4 respectively.

Regional traffic operations

Action 1: Regional traffic operations (WM, SE and East regions) should ensure that contact lists held in RCCs are managed locally and updated periodically by a designated lead, being available on ICCS/Control Works and local drives/G: drives as necessary.
Prioritisation score 5

Action 2: Regional traffic operations (NW and SE regions) should assign someone to periodically check the tactical/ silver suite, where available, on a regular basis, ensuring all equipment is available and fit for purpose to allow effective management of incidents at a tactical level.
Prioritisation score 5

Action 3: Regional traffic operations should work with emergency planning teams to review key strategic points in region and develop operational plans (for closures/opening and management of traffic) for situations such as severe weather and major incidents where these do not already exist.
Prioritisation score 4 (Customer improvement opportunity)

Action 4: Regional traffic operations (NW, SE and East regions) should use the new TO briefing tool to aid information handover during ongoing significant incidents.
Prioritisation score 4

Action 5: The following examples of notable practice should be adopted by regional traffic operations staff during incident management (via TO Briefing Tool or other method):

- Seeking tactical incident response plan updates from providers at regular defined intervals via the Network Control Centre for timely, structured information sharing where incidents are of a protracted/ escalated nature. Timings can be agreed and set depending on need.
- Ensure necessary steps are taken for on-road TOs to be made aware by control room staff when an incident becomes NILO critical given all that it entails e.g.: debriefing, increased public and media interest.
- Avoiding use of local names in place of marker posts/ carriageway locations.
- Making on-road updates via short data messaging or planned point to point briefings to team managers for further distribution.

Prioritisation score 4

Action 6: Regional traffic operations (NW and SE regions) should assign a champion or super user to share knowledge and experience in how to use smart boards.
Prioritisation score 4

Action 7: Regional traffic operations should look at the NE list of actions regarding management of significant roadworks closures and over-running roadworks with a view to using, should circumstances require.
Prioritisation score 4 (Customer improvement opportunity)

Action 8: Regional traffic operations (EM, WM, SE and East regions) should create and maintain up to date VMS plans, ready to implement in various scenarios, demonstrative of a proactive approach to managing incident timelines.
Prioritisation score 4 (Customer improvement opportunity)

Traffic Incident and Knowledge Management team

Action 9: The TIKM team is seeking agreement from regional traffic operations management agreement for a nationally consistent exercise roll-out approach across the regions which could be both managed and delivered locally by operational staff (see on-road paper 4).
Prioritisation score 4 (Customer improvement opportunity)

Action 10: The TIKM team is to provide evidence to a mandate for change in VSS policy, with the intention to enable the setting of solid diversion symbols on VMS
Prioritisation score 4 – Confirmed completed.

Action 11: The following examples of notable practice should be incorporated by the TIKM team into its products as necessary:

- Seeking tactical incident response plan updates from providers at regular defined intervals via the Network Control Centre for timely, structured information sharing of incidents of a protracted/ escalated nature. Timings can be agreed and set depending on need.
- Ensure on-road TOs are made aware by control room staff when an incident becomes NILO critical and all that entails e.g.: debriefing, increased public and media interest.
- Avoiding use of local names in place of marker posts/ carriageway locations.
- Making on-road updates via short data messaging or planned point to point briefings to team managers for further distribution.

Prioritisation score 4

Action 12: The TIKM team is to raise faults listed with NTRM team to reinforce debrief actions taken forward and help ensure improvement is achieved.
Prioritisation score 3

National Resilience and Security Team

Action 13: A formalised nationally consistent approach to incident decision logging, including a robust template, is to be overseen by NRST in collaboration with regional emergency planning teams.
Prioritisation score 4

National summary

1. **Communication (252 occurrences)**

1.1 Communications with on-road operations: Issues raised primarily focus on the inaccuracy and/or a lack of incident information to on-road resources on a national basis. Specific examples include the following:

- RCC dispatch using local names, on-road crew not knowing where to attend until marker post or junction was provided.
- The on-road scene commander would have found it useful to be updated as to when their incident became NILO critical.
- Tactical decisions such as reopening should be consulted with the scene commander prior to being actioned.
- Requesting on-road crews to work against procedure, such as crossing central reserve and deploying single crews to wide roads.

Positive working included:

- Creation of an 'incident pod' in the WM region allowing two operators to interchange on an incident talk group and carry out incident related tasks whilst monitoring rearward relief.
- Regular welfare checks

1.2 Communications to service providers: Debriefs highlighted the importance of sharing information at the earliest opportunity, particularly for specialist resources to positively influence the incident timeline. It was highlighted in the WM region that hourly tactical incident response plan (TIRP) updates with the NCC allowed for timely, structured information sharing. However, also in the WM it was agreed that difficulties in contacting certain service provider and OD operational staff could have been allayed by escalating to alert and subsequent conference calls. The provider is to produce and record the TIRP on notification of the incident to outline immediate steps that they will undertake to make safe the asset and to ensure the expeditious movement of traffic.

In the NE and EM regions service provider staff were without Airwave equipment or reluctant to use it, respectively, impacting on a joined up approach to incident management.

1.3 Communications with NTOC: As in the previous paper, NILO and NTIC are recorded as being updated as soon as practicable by regional control centres with information such as closures and diversion routes, particularly for strategic signalling purposes.

Again, it was also noted that NILO task logs should be read by RCC operators before closing, as actions had not been addressed causing delays in incident resolution.

Communications were highlighted as being particularly good from the East region.

Other points of note include:

- In the WM the method of passing diversion route information to NILO was highlighted as being time consuming and unfit for purpose.
- In the NE, due to the amount of hard signage implemented for a scheme's roadworks the time taken to remove was in excess of 60 minutes. There were complaints that signage was then incorrectly advising of road closures following reopening.

1.4 Communications to police: Across all regions it is apparent that RCC staff need to be proactive in chasing information from the police, both in clarifying detail given, and to influence the incident timeline and ensure a CLEAR but safe approach is taken. It was also noted in the East region that TfL will only accept non-SRN road closure requests direct from the police, but this can still be influenced by Highways England promotion.

In the EM region, knowledge was gained through debrief as to the resources available from police and their suitability for potential suicide incidents; rope access teams were available, whereas 'fall bags' would not be appropriate for an intentional jump situation.

1.5 Communications with local county councils: Two points highlighted were the sharing of information regarding the use of diversion routes and clarification of any road works on those routes. Northamptonshire County Council provided EM RCC with a contact card to ensure they receive updates regarding SRN closures. In the East and SE regions partners provided assistance with traffic light rephrasing.

1.6 Communications to the media: The EM and WM regions impressed the need to be proactive in ensuring information provided via NTOC/ press office is accurate and demonstrative of any positive messages Highways England want to be used, particularly through the use of Tweets.

1.7 Communications by operations managers: Overall, communications by OMs were recorded as positive with just two instances of a requirement to focus on responsibilities associated with incident escalation, as in point 10.

1.8 RCC centric communication: Joined up communications via the RCC were highlighted as enabling joint working and decision making with partners in the NW, NE, East and SE regions.

2. **Signs/ signals (71):** VMS signal message plans (pre-defined, location specific signage) were utilised in the NE and SW regions for closures on the M4 and Ouse Bridge respectively to adapt quickly in managing incidents. The SW also used gold command authority to put time delays on VMS when NTIC encountered technology issues and was unable to set strategic signals.

   In the WM region the legality of signing for traffic to use the M6 Toll due to M6 closures was queried as to whether it counts as advertising and if reimbursement would then be required for compliant traffic.

   Individual instances of slow or incorrect signage by RCC staff were highlighted in the East, SE, EM and WM regions.

3. **Closure plans (58):** Positive working was highlighted where plans were put in place prior to or at the time of incident inception. These were successful in cases where local knowledge enabled suitable resource deployment, dependent on incident severity. This includes ensuring closures are put in at the most suitable junctions for agreed diversion routes and in a timely manner; sometimes prior to attending scene if police are present. Trapped traffic was also reduced on several occasions in the East region through the use of electronic closures, successfully influencing driver behaviour prior to resource arrival.

   It was also raised in the WM region that issues with TTM deployment in high winds indicated that it's not acceptable to create a plan from scratch each time severe weather is encountered i.e.: adaptation of infrastructure plan.

   The WM region had explored taking the following two recommendations forward prior to moving to the new regionalised structure:
   - For the more involved junctions/intersections to have closure plans set on COBS.
   - Ready to use flip chart junction plan highlighting where resources need to be deployed.

4. **Airwave - Incident channel/ emergency services talk group (53):** As in previous papers, when a significant incident occurs it is easier to manage Airwave communications through the use of an incident talk group. This can be used for all responders (internal and other organisations) to the incident, or conversely by just the rest of the TOS staff in region, to

prevent committed resources having to change channel whilst otherwise occupied, particularly when single crewed. Having dedicated operators also helped consistency and understanding of incident management.

In the SE it has also been suggested that a dedicated approach is used for Operation Stack.

The WM region has previously expressed a desire to take forward the following approach:

a. Standardise placing the incident on an incident channel
b. Go to an incident channel early – you can always move back
c. Nominate an "Incident coordinator" to ensure all appropriate actions are carried out.
d. Produce aide memoir for incident coordinators ensuring all possibilities and actions are considered.

The NE and SE regions demonstrated good joined up working with partner organisations through the use of emergency services talk groups. A minor issue raised in the NE was that a decision should be made prior to use to ensure one organisation takes priority control for answering calls and etiquette consistent. Other points of note; Met Police are on a different radio system and in the East the incorrect talk group was used resulting in the wrong police force being contacted.

5. **Technology failures (46):** Primarily, the faulty control room technology raised as an issue was: a lack of CCI ports and COBS and signals malfunctioning, on a national basis. Examples raised specific to regions were: poor Airwave signal and faulty CCTV in SE (M23, J10-J11) and incorrect prioritising of signal layering in WM (M6, J9-J12).

6. **Incident escalation/ CMM/ command structure (33):** The management of incidents at a tactical level apparently fell down at the point where escalation should have taken place to a silver command level (NW, NE, WM, EM and East regions).

   At debriefs in the EM and East regions it was apparent that incident escalation was inconsistent between partner organisations with a limited understanding of Highways England process.

   Escalation to regional alert should take place more frequently to ensure joined up working at this level, with a proper communications framework between interested parties via coordination group meetings/ conference calls. If nothing else, escalation can be used to ensure effective communications take place and to protect best interests of the organisation. It should not be the case that an escalation is seen as an error if the potential event does not come to pass, but for assurance purposes in case it does. In the East region it was noted at cool debrief that this approach would have ensured more consistent handovers between silver commanders to maintain the momentum of recovery to normality, throughout the incident timeline.

7. **Agreed diversion routes (29):** As in the previous paper, information held was found to be outdated. Specific examples raised:

   East – A11 diversion route PDFs on GIS (following road improvements)
   East – A14 J36-J34 (inconsistent symbols on GIS)
   SE – M27, J3 (incorrect symbols on GIS)
   SE – M271, J1 (incorrect symbols on GIS)

   Agreed diversion route information available to control room staff should be kept up to date through regular review of IT systems, alongside service provider checking of physical routes, hard signage etc. However, a project within operations to update all agreed

diversion routes on a national basis has now lost funding. The routes will now have to be managed on a regional basis with the area teams.

In the NE region the inability to set solid diversion symbols on VMS prevented accurate and consistent (with hard signage) diversion advice to our customers. TIKM have supported a mandate for change with evidence from the debrief process.

8. **Incident log completion and awareness (25):** It was identified in the East and EM regions that there were significant differences between the TOS and partner logs, such as timelines and escalation triggers. Also, as on the last paper, various elements of information were found to be lacking off logs, particularly the record of decisions made and why (East, WM and SW).

   It has been suggested that single incident logs are created between Highways England and partner agencies, managed by the incident lead in each case. This would obviously need scoping out as a viable option, considering data protection and contractual considerations, but would ensure consistency of communication and decision making.

9. **CCTV (25):** CCTV was used in most regions proactively to provide improved incident information to tactical command and on-road staff. Other points noted: In the NE region the Woodhead Pass (A628) has very limited coverage, notably as not a patrolled section.

   Note - In the EM an incident on the M1 at J28 had good coverage but as the cameras had not been added to the cellstack recorder, footage requiring tagging was missed.

   Key learning point: Control room staff should have input as to where CCTV is positioned on the network in schemes to ensure for effective coverage i.e.: not behind bridges or signage, as in the East and WM regions, respectively.

10. **Resource (22):** A lack of staff was raised in all regions, but primarily in the EM, NE and SE RCCs where this was recorded as affecting the ability to provide an incident talk group.

11. **Mutual aid (22):** Working with other regions proved essential in on-road resourcing for incidents involving multiple closures, particularly in the EM region (lending and receiving). In the WM region an incident screen deployment request was delayed due to uncertainty of mutual aid provision: a quick yes/no decision from the EM would have helped.

    Minimum staffing levels should reflect need and be based on utilisation intelligence and data with contingency plans put in place at a local level to prevent any fall below numbers required to ensure ability to deal with day to day operations effectively. Mutual aid, fall back exercises and overtime are only to be considered if necessary.

    Key learning point: With the move to a regional structure, consideration should still be given to neighbouring regions and how support can be provided or acquired in order to manage incidents effectively on a national basis.

12. **Lack of signage (20):** A lack of available permanent signage for effective incident management was encountered at the following locations:
    EM A42 (between M1/J14)
    East M4 (J4-J3) (lack of VMS)
    NW M53 (J1)
    NE M62 (J22-J23) (lack of diversion route signage)
    SE A31 (between the A338 and the M27)

    As in previous papers issues have also been made apparent through the lack of variable messaging availability within long term road works. The option of using portable variable

message signs (pVMS), both for long term road works, event management and to fill signalling gaps should be considered locally

Key learning point: Portable VMS should be considered in planning discussion for long term road works and informing of incident related closures ahead. This requirement could be added to specific detailed local operating agreements by OD representatives, with prior contractual agreement for national consistency. Within schemes the onus would be on the contractors to provide a similar service.

13. **Contact list (14):** The following contacts were recorded as being unavailable for incident management purposes:

    WM Team managers
    East Oxfordshire County Council and long term road works Traffic Safety and Control Officers
    SE Various internal phone numbers for on-road crews/ team managers and for livestock assistance.

    As an example of notable practice for ensuring contact lists are available, the WM region would like to take the following forward, although there is some uncertainty moving to the new structure as to how we are going to work or if these recommendations will be adopted nationally:

    A list updated daily for the RCC team managers' desk with the following:
    a. Duty operations manager
    b. SOoC
    c. Press officer
    d. Service provider silver
    e. Service provider out of hours
    f. On-road bronze/ duty team manager

14. **Resource management/ planning (9):** In all regions TOS resource was noted as being deployed to positive effect in anticipation of closures required due to incident type, as well as ensuring access to scene and expedient closure removal.

15. **Customer welfare (8):** Concerns over what welfare provision should be allocated and by who was raised in the EM and East regions. This was particularly of note in terms of water provision on hot days. In the NW region a local school was used as a refuge for customers who had been evacuated from within a Hazchem cordon.

    The TIKM team have previously liaised with resilience colleagues, who have confirmed that the feasibility of regional emergency welfare plans alongside category one responders and other key partners is still being investigated by local resilience forums. More recently the TIKM have been informed by the National Resilience and Security Team (NRST) team leader that:

    'Highways England does not (at this time) maintain independent plans to deliver welfare to customers trapped on the strategic road network. Experience has shown that this is beyond the capability of any single organisation working on its own. Planning for, and delivery of such support is a joint responsibility for each of the Local Resilience Forums (LRFs). Highways England is a member of every LRF in England and we will support this planning and delivery. In the event that the need is identified during an incident to provide welfare support (or that this is likely to be needed in the future) then this should immediately be escalated to the multi-agency Tactical Coordination Group (TCG). If a TCG has not yet been established, this should be requested (usually through the police). The TCG will agree

and plan the most appropriate way to deliver the necessary assistance as part of a multi-agency response to the emergency.

There have been a number of occasions where welfare has been delivered successfully in recent years through a collaborative effort involving the emergency services, local authorities, and our own Traffic Officer Service and service providers. The exact detail of how this is achieved in each case varies depending on local plans, the specific circumstances of the situation, and the availability of suitable resources from each of the responding organisations. It is important to note that it is always preferable to prevent the need for welfare support in the first place using the full range of incident management tools and effective communications with customers'.

A major incident needs to be called to get the full multi-agency involvement, this position being endorsed in the Pitt Review following the Gloucester floods of 2007 when he stated that no single agency should be expected to respond and deal with a major incident in isolation

On a separate point, the WM region identified a 'hard shoulder abuse' campaign as being beneficial for understanding of smart motorways rules and regulations. TIKM have identified that an internal communications plan is currently being created with a budget for various distribution techniques including TV advertisements, to address such issues.

16. **Re-opening plans (7):** Closure plans (see point 3) would benefit from complementary reopening plans and proactive methodical approaches to this, particularly through effective communications. An essential element of this is accurate (or near as can) forecasting.

    At cool debrief in the East region the following approach was promoted: At major spillages a theoretical grid can be placed over the affected area and a timing taken to clean one box. A multiplication of this timing by the number of boxes in the grid can then give a more accurate and achievable timeframe for individual lane clearance and overall return to normality. This approach would be viable where the carriageway could be saved from resurfacing.

    A methodical approach to releasing traffic at complicated junctions was praised in the WM region, particularly ensuring trapped traffic queue protection. In terms of forecasting reopening, issues were highlighted in the WM and EM regions whereby this was inaccurate by several hours.

17. **Handover (6):** In the NE, NW and East regions there were individual instances of handover between RCC operators and shifts being inadequate for ongoing incidents and their understanding. In the SW region a white board is kept available for passing information at shift changeover. In the SE there was not a board available to plan closures etc.

18. **Equipment (5):** At flooding incidents in the East region it was identified that a swifter response could have improved the incident timeline through provision of Highways England owned water pumps.

    High volume pumps (HVP) - key points noted were:

    - Area team authorisation is required for deployment and may be used outside of the NE region, where currently stored at Bradbury. Location in terms of deployment is currently based on proximity to trained operators (and training venues) rather than flooding locations.

    - The HVP should be used rather than a fire and rescue service (FRS) resource for any incidents of flooding on the network without an immediate life risk. Given the location of the pump there may be cases where an FRS resource would be more

appropriate and then could be relieved by the HVP. This not only removes the cost implications of using the FRS resources but means that running of the SRN can be prioritised without impacting on the availability of FRS resources.

- In order for the service provider to pump water off the network permission must be sought from either the Environment Agency or a Fire and Rescue Tactical Advisor or the land owner.
- There is also the option to provide images from scene via HVP CCTV, to highlight flooding severity and positive remedial work undertaken on the network.

Also, in the WM region it was identified that a grab bag should also be available for the duty operations manager to assist with incident escalation.

19. **Incident screens (4):** The following tips have been shared at debrief for the improved ability of screen deployment:

    - East - Consider requesting an on-road crew from further afield to deploy screens to enable availability of more local resources for timely closures.
    - East - RCC should check with staff/ partners on scene if available to check wind speed prior to investing time in deploying screens.
    - SW - At co-locations, RCC staff could be trained as banksman and in hitching up incident screens to enable their deployment by a single crewed on-road traffic officer.

    Key learning point: Incident screens should be deployed as part of a proactive incident plan dependent on factors such as the severity and location of the incident. Deployment of screens from further afield, weather conditions and banksman training, as noted, are considerations which should be scoped out for further reflection.

20. **Debriefing (4):** Road works scheme debriefs involved and were shared with the TOS to ensure more collaborative and knowledgeable joint working in future.

21. **Images from scene (4):** In the WM region the NILO App trial was used as an opportunity for TOs to pass incident images to the NILO team to Tweet and provide press releases, gaining positive HAIL and Tweet responses.

    A new TO App has been designed and will allow TOs to take images at scene with approved hardware (Samsung S6 units), guidance and redaction capability, meeting the Company's data security requirements. This will allow images to be recorded of both incidents and asset defects on a national basis. As per the ten overarching rules personal devices must not be used to provide images.

    In the East region a hints and tips guide for barrier repairs has been suggested with before and after images from real life incidents, to demonstrate typical resource and incident timeline requirements.

22. **Technology (3):** Google heat maps were used in the SW region to monitor both the strategic and local authority networks.

    In the WM region a mechanism which advises when a region has escalated to a crisis management stage has been suggested, such as a splash screen.

    In the WM region, the Highways England YouTube channel has been identified as a supplementary tool to provide operational learning/ updates to our customers.

23. **Overrunning roadworks plan (3):** In the NE region a roadworks plan has been created to provide a checklist of tasks to be undertaken when roadworks overrun.

    Key learning point: The below list of actions have been agreed by the senior management team in the NE region for use in the event of over-running works:

    1. Inform NILO
    2. Inform NTIC and request they use proactive VMS legends to advise of the over-run, such as 'M1 J30-J31 2 lanes closed' or 'M1 J30-31 closed until …'
    3. Deploy a patrol to the area to maintain a high-visibility customer facing presence, deal with any breakdowns in the congestion, manage traffic at junctions etc.
    4. Inform the Duty Operations Manager who can provide further guidance on the actions required.
    5. Update stakeholders such as the emergency services that the closure is over-running
    6. Inform the local authorities including relevant urban traffic control centres.
    7. Monitor via CCTV and update the log/NILO/NTIC on what the impact from the works is.
    8. Where roadworks border other regions, ensure the neighbouring region is informed, via task log.
    9. Ascertain from the TSCO detail of why the works have over-run.
    10. Start a hot debrief.
    11. Record the details of the incident on the roadworks tracker which can be found here.

    The NE acknowledges that the above list is subject to change and that it highlights the importance of completing hot debriefs. The TIKM team will be reviewing this list of actions with NTIC business colleagues with a view to enhancing where possible and helping embed as recognised practice, potentially within a work instruction.

    Key learning point: In the EM region requests were made to shorten closure lengths to the minimum safe requirements at road works expected to overrun. Upon implementation this approach was identified as reducing impact and congestion at peak times on the network.

24. **DLOA/ scheme point of contact (3):** In the WM and SW regions limited communication and joined up working have meant issues with network management during long term road works schemes. Solutions identified include one TOS point of contact for each scheme and knowledge of associated DLOA, and the creation of an easy access guide for RCC staff.

25. **Tactical/ silver command suite equipment (3):** Smart boards were referenced as 'a good resource for incident planning', but noted that not all staff have been trained in their use.

    As in the previous paper, infrequently used equipment was also found to be defective and weekly checks being suggested to help remedy this.

    Key learning point: Incident boards should be available in the suite/ control room/ both to clarify incident location, road layout and resource location at significant incidents, and wherever of benefit. This 'big picture' approach can assist with closure and re-opening plans, particularly with complicated local infrastructure.

26. **Red 'X' non-compliance (3):** In the East and SE regions non-compliance was recorded as hampering access to scene, the RCC being unable to implement an emergency access lane. There is a project ongoing in the East region working on red 'X' enforcement, and a warning letter in the interim.

    Consistent red X enforcement needs to take place for safety and access to scene on smart motorways. The prompt implementation of signals to close a lane(s) prior to scene can significantly improve responder access, especially on smart motorways.

The current legal status of verge mounted MS4s displaying a red X, used on new sections of ALR, is that they are currently unenforceable. TIKM have liaised with Max Brown, Smart Motorways Team Leader regarding compliance issues surrounding the availability of flashing lanterns around signals displayed. The "Compliance Group" have stated that; "funding is to be sought for the upgrading of ALR MS4s to display the red flashing lanterns around the 'wicket' aspect. A programme for this work has been developed, with timeline to be confirmed".

27. **Access to scene (3):** The importance of early consideration of how resources will get to scene and by which route. This is of greater prominence due to the increasing number of smart motorways and road works during this reporting period.

    As raised in previous outcomes papers, it has been noted that in order to positively influence the incident timeline, particularly in enabling key resources such as hydroblasters and recovery to get to scene, thought should be given by the TOS to incident access lanes and other approaches e.g. reverse access and hard shoulder running at the earliest opportunity. These could be an integral part of any closure plans that are compiled on a localised basis.

28. **Infrastructure (3):** Issues identified:
    - In the East region an RCC TM was unsure of approach to dealing with a potentially damaged bridge on the network.
    - In the vicinity of the Dartford road crossing (Cotton Lane bridge) box junctions may prevent junction gridlock at J1A, M25, currently impacting on staff access to site.
    - In the SW region the duty operations manager that during severe weather, the TOS has a responsibility to the whole regions network and should not concentrate solely on TOS patrolled routes.

29. **Traffic management cell (TMC) (2):** Following an incorrect configuration of the TMC control panel a SE operator learnt how to resolve such issues and distributed TMC instructions to colleagues.

    During a failure of the over height beam detectors to the Dartford tunnel entrance, there was an inability to locate the TMC minimum operating requirements manual.

    Closing the tunnel and redirecting vehicles into the east using the TMC is a slow process that involves stopping the main carriageway and closing J1a M Slip.

30. **Network familiarisation (2):** In the East and SE regions, RCC operators were not familiar with geographic description of some junctions and locations. SERCC advised that "RCC operators will refer to COBS which has named roundabouts. The key thing here is that all persons refer to the same place by the same name to avoid any confusion." Therefore, having relevant strip plan diagrams available of locations would be beneficial.

Other notable points raised on a one off basis

Severe weather exercising: In the NE it was detailed that the response to severe weather on the Woodhead Pass could be better planned in terms of operation and closure through operational staff taking part in desktop exercising.

C+C/ Control Works use on laptop/ tablet: Access via laptop/ tablet of the RCC log for multi-agency silver command has been raised as a potential option for ensuring that communications and operations are more efficient.

Consistency of operational commander allocation: In the SE region standing protocol is that if there is a team manager (TM) at the outstation from where the incident is being managed, the duty TM will attend rather than the SPOC. This does not appear to happen with Dartford off-road, and dialogue is required with Dartford TMs and RCC to agree this protocol is extended to include Dartford 'off-site'.

Call signs: In the SE RCC there was confusion over similar call signs at shift changeover between nights and earlies.

Traffic light control: At J9, M20 in the SE region, neither the RCC nor provider has control over traffic lights to assist with traffic flow. A partnership agreement/ level of understanding is required with the local council.

Single crew consideration: In the SE region a single crewed TO was left at scene with no support, when as an escort vehicle it should have had back up from another unit.

National roster team (NRT): In the NW region the NRT was utilised successfully to source additional staff on overtime.

Plaza release (trapped traffic): At the Dartford Crossing an instance was recorded whereby trapped traffic was not released from the east plaza once a closure had been put in. It should be made best practice to clear any trapped traffic at the plaza quickly.

Conclusions

The TIKM team has identified the following areas for improvement, highlighting for each an action or other initiative already planned or in place. To optimise success the team will help co-ordinate these improvement activities where necessary:

1. Communications

   In the NE region, the potential use of VMS to sign for the reopening following road works closures has been raised. VSS policy is currently under review and work with NTIC for a more proactive approach to such circumstances is being investigated. Consideration is being given to circumstances such as over-running roadworks, for NTIC to have the ability to pro-actively sign 'now open' legends, when a road has re-opened, even where traffic management may still be being withdrawn.

   Action: The following approaches should be adopted as best practice by regional traffic operations staff during incident management:
   - Seeking tactical incident response plan updates from providers at regular defined intervals via the Network Control Centre for timely, structured information sharing of incidents of a protracted/ escalated nature. Timings can be agreed depending on need.
   - Ensure necessary steps are taken for on-road staff to be made aware by control room staff when an incident becomes NILO critical given all that it entails e.g.: debriefing, increased public and media interest.
   - Avoiding use of local names in place of marker posts/ carriageway locations.
   - Making on-road updates via short data messaging or planned point to point briefings to team managers for further distribution.

2. Signal message plans (pre-defined, location specific signage) have been utilised for closures enabling approach to be quickly adapted in managing incidents

   Action: Regional traffic operations should create, maintain keep up to date VMS plans, ready to implement in various scenarios, demonstrative of a proactive approach to managing incident timelines.

3. Incident (closure) plans, as part of operational orders and planning, ready for use is proven best practice as a pre-emptive or response consideration. However, instances have occurred where plans still need to be created based on frequency and nature of requirement (potentially with support from the regional intelligence unit) and stored in the RCC for easy access when a response is required.

   Action: Regional traffic operations should work with emergency planning teams to review key strategic points in region and develop operational plans (including closure/management of traffic) for situations such as severe weather and major incidents where these do not already exist.

   The above plans can be supplemented by desktop exercise scenarios to safely test understanding and different approaches. TIKM have created such exercises at different organisational levels for such use, including a tactical led approach to test understanding and ability to apply crisis management principles.

   Action: The TIKM team is to seek agreement from regional traffic operations management for a nationally consistent exercise roll-out approach across the regions which could be both managed and delivered locally by operational staff.

4. Technology failures recorded at debrief have been confirmed as being addressed/ raised locally on an individual basis, during this timeframe. The TIKM team has been notified of updates, via the debrief action tracker. Technology faults listed on previous papers have also been raised with the NTRM team as a national overview.

   Action: The TIKM team is to raise faults listed with NTRM team to reinforce debrief actions taken forward and a need to ensure improvement is achieved.

5. For evidential and reputational purposes logging needs to be more recognised as a business essential task. It may align best to the current NCM role where available, but may not be role specific and will need to be accessible over a 24/7 period. Ideally, a culture of maintaining decision logs could be embedded across operations so that individual logs of options, decisions and rationales could be kept for potential audit and review purposes when required (this is separate from an incident log).

   Action: A formalised nationally consistent approach to incident decision logging, including a robust template, is to be overseen by NRST in collaboration with regional emergency planning teams.

6. The TOS should look to promote the value of communication as a means to positively influence the incident timeline, support safety and engage with road users through innovative ways to use designated incident talk groups and better ensure emergency services interoperability (see emergency services paper 4). The West Midlands region has previously expressed an interest in taking this forward.

7. Up to date contact lists detailing supply chain, partner functions and local authorities are an essential tool for incident management purposes.

   Action: Regional traffic operations should ensure that contact lists held in RCCs are managed locally and updated periodically by a designated lead, being available on ICCS/Control Works and local drives/G: drives as necessary

8. A comprehensive handover is essential in maintaining effective management of an ongoing significant incident(s) during shift changeovers and breaks. Closure and reopening plans, decision logs and incident layout with resource locations on a whiteboard/ smart board can all be referenced to support this.

   Action: Regional traffic operations should use the new TO briefing tool to aid information handover during ongoing significant incidents.

9. Following earlier issues with roadworks overrunning, the NE region created a list of actions to proactively manage such circumstances successfully where they may occur again.

   Action: Regional traffic operations should look at the NE list of actions regarding management of significant roadworks closures and over-running roadworks with a view to using, should circumstances require.

10. Smart boards were referenced as a useful resource for incident planning, but not all staff has been trained in their use.

    Action: Regional traffic operations should assign a champion or super user to share knowledge and experience in how to use smart boards.

    Action: Regional traffic operations should assign someone to periodically check the tactical/ silver suite, where available, on a regular basis, ensuring all equipment is available and fit for purpose to allow effective management of incidents at a tactical level.

Prioritisation criteria

The following criterion is based on two primary factors: 1) Debrief evidence to support change (quantitative) and 2) envisaged benefit(s) to business and customers (qualitative) and is applied by the TIKM team to give each action a prioritisation score. *Actions with a safety theme will automatically be scored a five and those with a customer improvement opportunity a four.* The prioritised list is shown in executive summary (pages 2-3).

Score	Criteria					
	Attractiveness			Affordability	Achievability	
	KPI	Reputation	Benefits	Cost	Time	Risk
1	Does not support a KPI	Will not reduce risk of adverse impact on Company reputation	No clear benefits	Will require considerable budget	Will require considerable cumulative time disproportionate to any benefit	Unlikely or uncertain that required change will be achieved
3	Supports one KPI	May reduce risk of damage to Company reputation	Clear qualitative benefits	May require some investment	May require some time investment	May meet end objective
5	Supports more than one KPI	Will reduce risk of damage to Company reputation	Will result in qualitative benefits and quantifiable benefits (measurable)	Delivered with no additional budget	Delivered with minimal cumulative time investment	Required change will be achieved
Weighting	30%	12.5%	12.5%	20%	12.5%	12.5%

Examples:
Where a 5 is scored for KPI the weighting would be calculated as 5 x 0.3 = 1.5

Where a 3 is scored for cost the weighting would be calculated as 3 x 0.2 = 0.6

Where a 1 is scored for risk the weighting would be calculated as 1 x 0.125 = 0.125

The calculation for each column is added together, with the score then being used to determine the appropriate option:

Options	Analysis						
	KPI	Reputation	Benefits	Cost	Time	Risk	Score
Option1 *Do nothing*	0.30	0.125	0.125	0.20	0.125	0.125	1-2
Option 2 *Regional best practice opportunity*	0.9	0.375	0.375	0.6	0.375	0.375	3-4
Option 3 *Recommendation to act*	1.5	0.625	0.625	1.0	0.625	0.625	5

Appendix D. Incident Management Areas of development - Feedback

Current Areas of Development

As detailed below, there are currently a large number of teams engaged in incident management improvements. These teams and related workstreams / packages are in addition to the work carried out by the Incident Management Requirements team (IMRT).

Internal

1. Operational Capability Team

Main Objectives and Activities
Continue to lead on the initial incident timeline mapping exercise which concludes at the end March. The outputs and follow on phases will then transfer to the IMRT to take forward – under designated fund for innovation. The aim is to produce a graphical road map and research report for each of the four road types that will make up HE's strategic road network.

Commence a 3 year project focusing on freight and also to continue work Commercial Vehicle Incident Prevention (CVIP), in delivering an ANPR/Weigh-in-Motion site.

2. Operational Excellence/Asset Delivery (Ops)

Main Objectives and Activities
Proposed to undertake an 'End to End' process evaluation of the incident timeline and cycle with a view to identifying existing pain points and offering solution.

One of the purposes of the End to End process reviews has become to inform the development of the 'Target Operating Model' for Operations. This will include the 'target' for how incident management should work in the future.

Also looking at several ROC initiatives, some of which are already in progress. These include roadworks end state process, optimise debrief process, enhance planned event awareness, optimising briefing process, enhance asset intelligence feed, incident delay predictor tool, ETTRO deployment, optimising existing signs and signals utilisation.

3. Operations Customer Service Improvement Group

Main Objectives and Activities
One of the improvement themes within the Customer Service Delivery Plan 18/19 is Incident Management. To discharge this, a programme of work comprising a number of key deliverables ranging from developing customer standards to the embedment of a new enhanced network management role will be introduced during the course of the financial year.

4. Major Projects Customer Service Division

Main Objectives and Activities
'Response to incidents in roadworks', with the following deliverables:

- Issue an MPI for improving and standardising incident debriefing
- Review current Vehicle Recovery Standards, explore the customer perception of 'Free Recovery' within roadworks and recommend whether to issue a standardised instruction, and if appropriate issue an instruction to standardise Vehicle Recovery Standards

- Review how we help vulnerable/disabled users at the recovery point and make recommendations for improvement and if appropriate issue an instruction on improvements to helping vulnerable/disabled users

Breakdowns and Incidents on Smart Motorways - aim is to support the Roadworks Strategy and recommendations from the EAG with key customer insights pertaining to breakdowns and incidents on smart motorways, standard motorways and trunk roads.

5. National Resilience and Security Team

Main Objectives and Activities
Crisis Management Manual (CMM) - this is the overarching company policy and guidance under which all other incident management and crisis management plans sit.

Debriefing - similar to the CMM, we would like to have an overarching policy that links together many other aspects of debriefing across all directorates and parts of the business.

Enhanced Mutual Aid (EMA) - Essentially, this will be by following a crisis management approach to establishing the appropriate command and coordination groups.

Other projects also have a link to incident management in its wider sense – e.g. new business continuity policy, network security standard, threat levels and response levels standard, training and exercising.

6. National Traffic Operations Centre

Main Objectives and Activities
Enhanced National Network Operations project, encompassing the recruitment of 5 National Operations Manager posts, to evaluate and manage the impact of planned and unplanned incidents on the network. The National Operations Manager will lead coordination, on a national basis, during incidents escalated under the Crisis Management process.

7. Strategic Partnership Team (Corporate)

Main Objectives/Activities

The two main organisations that the Strategic Partnership Team (Corporate) (SPTC) engage and collaborate with are the Freight Transport Association (FTA) and The Road Haulage Association (RHA). Relations with both of these are very strong and have been built up over a number of years.

As part of the revised vision for SPTC, they are moving away from dealing with more traditional operational issues and instead focussing on a strategic approach to look at issues such as safety, campaigns etc and where they can assist other areas of the business by involving and seeking advice/guidance from these organisations.

Also, worked together on the TOS deployment on LHA roads around the Oldbury scheme. We have put together a presentation with recommendations based on customer insight. Once we've secured agreement on how the business would like to proceed, we will assist with implementation.

8. Variable Signs and Signals (VSS) Policy – Customer Development Team

Main Objectives and Activities
VSS policy review, including Human factors research, Customer focused VSS training to embed changes to VSS policy and includes incident and information management. Also looking at reviewing the appropriateness of variable speeds and how best to use pVMS across the network and within road works.

Diversion routes for unplanned events to improve the customer experience and safety of our diversion routes for unplanned events, through the standardisation of policy and procedures that ensure the review and improvement of the quality and coverage of these routes across the strategic road network.

9. Operations Directorate

Main Objectives and Activities
Control Works App proof of concept – initial exercise to measure potential benefits to support a full business case of rollout of the capability to update incident logs from scene rather than have to request, await and conduct a call back over Airwave.

eCru vehicles and jointly resourced patrols – innovation designated funds bid for five vehicles to support incident management within the West Midlands.

Dual trained Traffic Officer Inspectors – on hold pending HR professionalization work.

RCC/NCC integration within WMRCC during ASC extension – dual training all RCC and NCC staff to be able to operate on Kier CPA system, NOMS and HE systems.

10. Learning and Development

Main Objectives and Activities
Lead for the design & delivery of foundation training for new entrant TOs (on road & control room) which focuses on the safety critical basic skills and knowledge required for the role.

Coaching frameworks (on road & control room) including singly crewed.

Training for existing TOs (using in place BAU products) and refresher training, subject to need being identified and agreed.

Leading in the design and delivery of operational initiatives including incident management training for various roles within ops.

11. Health and Safety Team

Main Objectives and Activities
- Wearable technology (for lone worker protection)
- Vehicle and plant-related injury accidents
- Automation of high risk activities
- TOS vehicles and equipment ergonomics, which may cross over with other work within the SES R&D or TechCon portfolios.

12. Next Generation Vehicle Manager

Main Objectives and Activities
- develop work that Atkins have undertaken with relation to the options for the procurement of statutory vehicle recovery
- The scope of the work is to understand the primary levers for lane clearance improvement in relation to statutory vehicle recovery, and then design a contract / in-house capability to deliver this.
- This work covers potential for HE process / policy revision around - free recovery from Smart Motorway / ALR; immediate request for stat recovery upon incident identification.

13. Lean Group

Main Objectives and Activities
- In 2013 we worked with Enterprise Mouchel Highways Maintenance provider to understand the root causes of variation within the maintenance incident response timeline, from incident through to opening of the carriageway. We focussed on areas of the process that we could directly improve, namely the work of the Maintenance Supplier and the Traffic Officer Service.
- Worked with the TOS in SW to deliver localised improvements using Lean structured problem solving techniques. The lean intervention led to reduced incident clear up times and thus improvement to KPI 3.
- In 2017 and on-going, the NW lean team are undertaking a lean intervention with the NW Traffic Officer team to improve KPI 3 in terms of reducing incident clear up rates.

- Lean Colleagues in the South East have undertaken a study on the relationship between Incident workload and incident clearance rate %.

14. Risk Management Arrangements Team

Main Objectives and Activities
Currently working on developing a data dive into safety reporting to identify our highest risk activities, a programme of BBS safety interventions (two-year plan) and a National Accident Frequency Rate Reduction plan for Operations that will involve looking at incident data type of incident predictability to target interventions.

These are in planning phases at the moment however one area we are interested in is do incidents occur towards the end of the timeline to meet the one-hour KPI clearance rate if it does how can we remove the worry of time pressures to get incidents cleared.

15. Insight and Strategic Partnership Group

Main Objectives and Activities
Insight is leading a project to identify what customers want to know and how they want to receive information during incidents that cause delays on the SRN.

We will target customers who were affected by delays on a previous incident, to identify and contact these individuals and ask these customers to recall their experience of the incidents with a specific focus on the information they received (or lack of) in relation to welfare such as rest stops or toilet breaks.

16. Innovation Group

Main Objectives and Activities
Develop an innovation process for Ops and also look at a number of innovation projects (most of which were received via an Operations innovation survey). Haven't progressed anything related to incident management past a concept stage.

External

16. Vehicle Recovery Operators - SURVIVE (ERRI/FOVRA/ANS)

Main Objectives and Activities
To support the vehicle recovery industry in a 'centric approach' to assist them with recovery and how to operate on our network, in particular Smart Motorways.

Earlier in September 2017, at the Tow Show, the IMRT were able to present our updated guidance for recovering vehicles from a smart motorway at our Highways England stand and in an address to representatives of the vehicle recovery industry.

17. CLEAR (Emergency Services)

Main Objectives and Activities
Review and rationalise existing documentation, to identify how this links in with other Incident Management principles across stakeholders such as with JESIP and whether this requires to remain as a stand-alone document/initiative or whether it can be built in to another document such as the IMM.

18. LANTRA

Main Objectives and Activities
Once the Incident management manual is developed and signed off the IMRT will work with LANTRA to initiate training across the industry for incident management, to be aligned to the incident management timeline and include emergency traffic management for service providers.

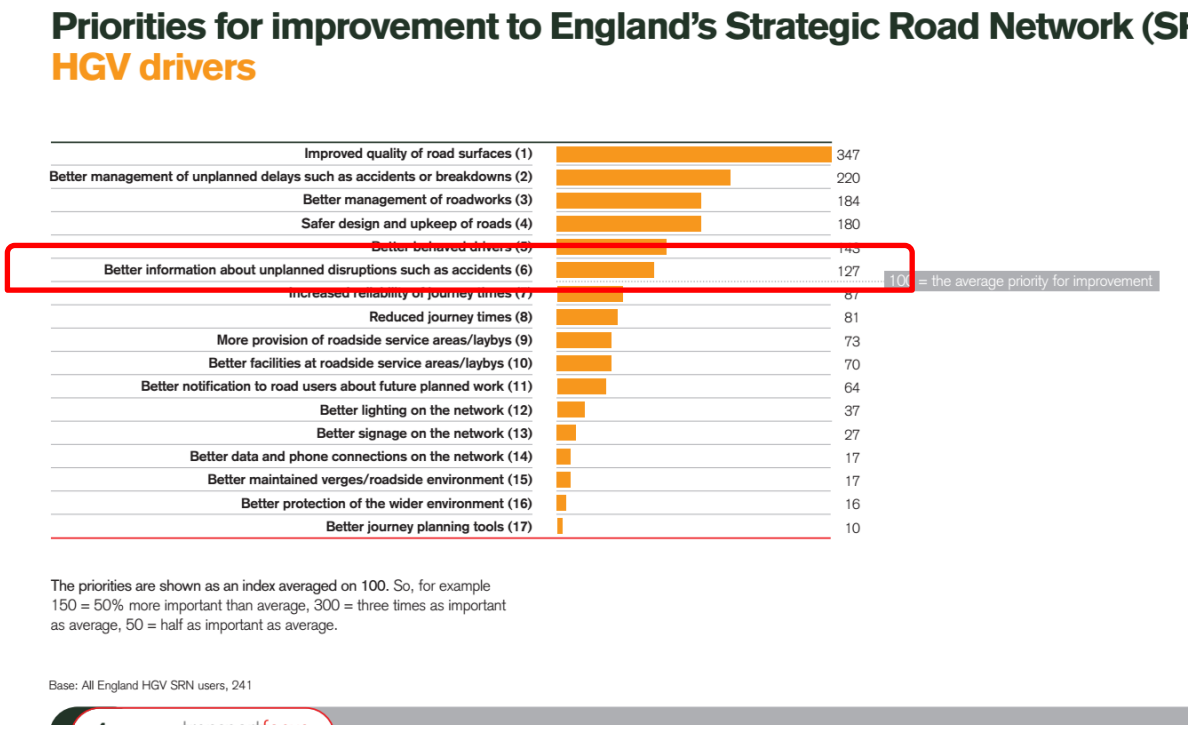
Ongoing work by Incident Management Requirements Team

Main Objectives and Activities

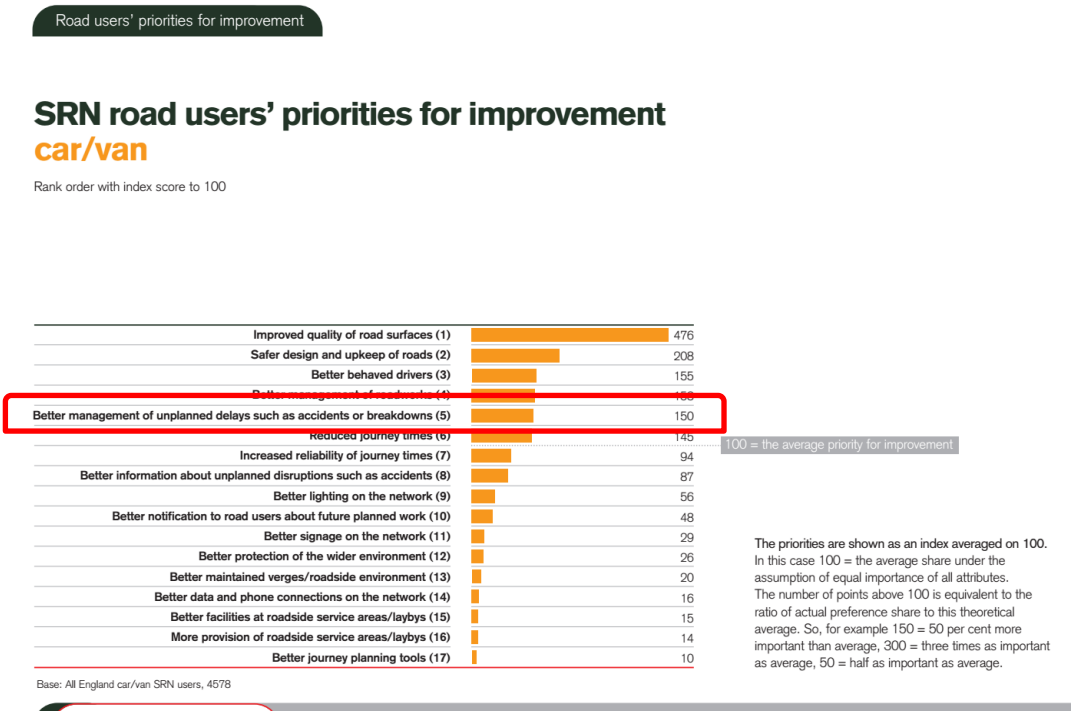
- Incident management manual development / checklists
- Incident management policy (Traffic Operations policy, Single crewing policy, VSS policy, Chapter 8, CLEAR)
- Incident management powers of Traffic Officers and Highway Inspectors.
- Design manual for Roads and Bridges requirements
- National Highway Sector Scheme (32) (National Coordination Community/Regional engagement)
- Impact assessment tool generation
- Incident debriefing national standard
- Incident management/Scene Command training
- Incident management variable signs and signals (PVMS)
- Incident management tools and technology (system integration)
- Incident management communication (interoperability/ESN)
- Informed decision making process
- Human factors research and development
- Internal incident management exercises and knowledge checks
- Multi-stakeholder incident management exercises
- Customer insight into incident management
- Industry best practice review (DRD)

Appendix E. Transport Focus user priorities

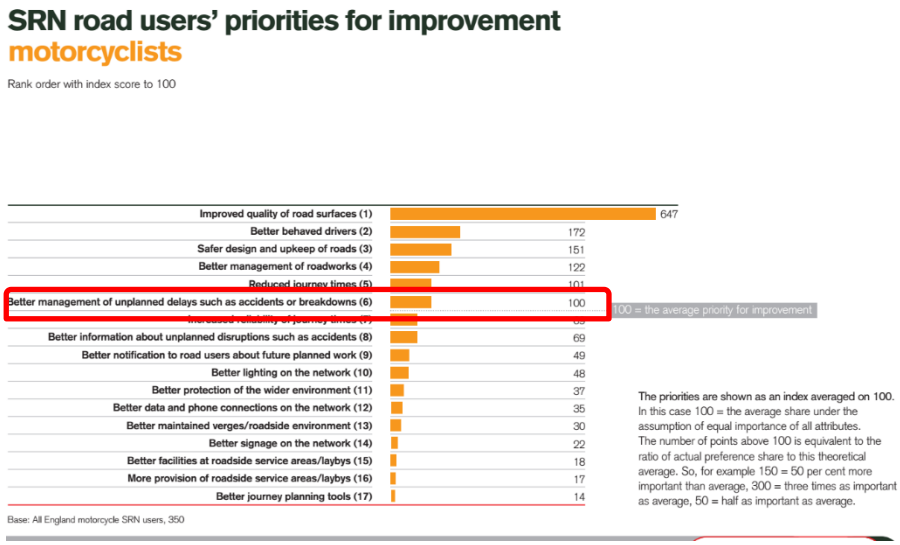
E.1. HGV user priorities



E.2. Car/Van user priorities



E.3. Motorcyclists



Source Transport Focus group reports.

Appendix F. Case Studies

F.1. Incident Logs Reviewed during Task

Log Number	Description
1281-030118	Fire on HS C7230S near lane 1 – from MOP
1039-310117	Milk tanker (C36985) – Petrol tanker on fire on HS – well alight – from UU15
1272-120417	Breakdown live lane C64306 – BDMV – Massive artic lorry broken down on live lane
776-290117	AV L1 C14358 TS21 – GL61: lane 1 required 2 vehs in lane 1 and grass verge
1226-070317	RTC lane 1 – C8140 – CCTV – 2 vehs RTC in lane 1
1539-120417	L1C L2C L3C J29/30 – M1 northbound btw J20 & 30, closing lanes 1/2/3
1226-090517	Police interface – Incident from Hampshire Constabulary
413-080517	C14560 – Van on fire
1243-090517	C55676 RTC NTIC CONF – Road traffic collision - Essex fire REF 54144
533-230317	Vehicle fire

Incident Timeline: 1039-310117
Milk Tanker On Fire – On H/S – This is well alight M6 Area 10
MILK TANKER (C36985)

Date	Time	REM	Content
31/01/2017	15:48:54	FCH	Details changed from <empty> to PETROL TANK ON FIRE
31/01/2017	15:50:05	SYS	Incident created with Reference 1039
31/01/2017	15:50:26	RES	Resource RL54 deployed to Incident 1039-310117
31/01/2017	15:50:30	SYS	Incident exported to external agency CHESHIRE CONSTABULARY External Incident Reference 515 31/01/17 (070004001700028469)
31/01/2017	15:51:57	RES	Resource RL43 deployed to Incident 1039-310117
31/01/2017	15:52:34	RMK	RL54>> Well ablaze stopping C/Way
31/01/2017	15:54:18	RIL	Incident 1039-310117 has been linked with Incident 1045-310117
31/01/2017	15:54:19	RES	Resource RL51 deployed to Incident 1039-310117
31/01/2017	15:54:49	FCH	Closure code F-Fire added
31/01/2017	15:56:09	FCH	Title changed from Petrol Tanker On Fire to Milk Tanker (C36985)
31/01/2017	15:57:18	RMK	VMS Amended to vehicle fire – slow down at 6958A, 6969A & 6986M
31/01/2017	15:58:52	RMK	RL54 – Fire gone up slip at A50. If you can ring them quick they can travel Contra at J20 it is completely safe
31/01/2017	16:00:31	RMK	RL43 – Approaching J20 S/B. Any instructions? RL54 – Hold just prior to J20
31/01/2017	16:03:40	RES	Resource RL54 arrived at incident 1039-310117
31/01/2017	16:03:55	RES	Resource RL43 arrived at Incident 1039-310117
31/01/2017	16:04:25	RMK	RL54 – Will need STAT – Tanker carrying 23,000 gallons of milk – one to go – approx. 40 tonnes

31/01/2017	16:06:28	RMK	RL54: CB: Req STAT for the HGV – DE13OMO HGV on fire / fire on scene / full lift / loaded with milk – 23,000 ltrs 44 tonne HGV – Sorting now
31/01/2017	16:06:48	RMK	Speaking to NVRM
31/01/2017	16:09:30	RMK	RL54 – Spoken to Fire officer. We can open L3/4. Can signals be set for L1 / 2C
31/01/2017	16:10:09	VRT	Recovery / Request successfully transmitted for VRM DE12OMO Receipt number: 1278288584 (1156636)
31/01/2017	16:10:34	RMK	6980A, M6 – Set to Lane 1 and 2 Closure
31/01/2017	16:10:57	RMK	RL54 >> Traffic Running past in L3/4
31/01/2017	16:15:51	RMK	RL54 >> We will take L1 out on slip rd and get whole c/way running – load is fully intact – no leakage
31/01/2017	16:19:47	RMK	RL54 >> All 4 lanes now running on main c/way – amend signals to 50's main c/way and L1 closure on M56 to M6
31/01/2017	16:22:58	VRT	VRT Recovery dispatched, VRM DE13OMO VRT ID 127828 ETA: 31/01/2017 16:57:00 Comment: Recovery Ref: HSR1724824CR Despatch Date-Time: 31/01/2017 16:21:26 Vehicle Recovery Operator: Bower Lymm (1156636)
31/01/2017	16:22:58	FCH	Form changes – Burnt out DE13OMO: Recovery Status changed from 'requested' to 'despatched' Recovery reference changed from '<empty>' to 'HSR1724824CR'
31/01/2017	16:23:44	RMK	RL4 CB – Police are leaving scene, 1 fire left damping down
31/01/2017	17:07:07	VRT	Recovery Arrived, VRM DE13OMO VRT ID 127828 Comment: Recovery Ref: HSR1724824CR Arrive Date-Time: 31/01/2017 16:55:01 (1156636)
31/01/2017	17:32:37	RMK	RL54 >> Hand stopped C/Way for a little bit while we turn the wrecker
31/01/2017	17:33:43	RMK	RL54 >> Traffic Running again
31/01/2017	17:56:42	RMK	RL54 >> Stopping traffic again for a short while
31/01/2017	17:59:26	RMK	RL54 >> Traffic Released
31/01/2017	18:40:14	RMK	RL54: Scene Clear – Clear Signs
31/01/2017	18:40:18	RES	Resource RL54 Released from Incident 1039-310117
31/01/2017	18:42:37	FCH	Carriageway status changed from compromised to clear with time recorded as 31/01/2017 18:40:00
31/01/2017	18:51:25	FCH	Status changed from NR – Not Resourced to FI – Finished
31/01/2017	18:55:44	VRT	VRT – Recovery Cleared, VRM DE13OMO VRT ID 127828 Comment: Recovery Ref: HSR1724824CR Clearance Date-Time: 31/01/2017 18:30:00 (1156636)

Incident Timeline:	1281-030118 FIRE ON HS C72305 – M5 CLOSURE FROM MOP FIRE ON HS NEAR LANE 1		
Date	**Time**	**REM**	**Content**
03/01/2018	15:06:29	SYS	Record of Contact created
03/01/2018	15:08:33	RES	Resource WT27 deployed to Incident 1281-030118
03/01/2018	15:09:49	RES	Resource WT27 released from Incident 1281-030118
03/01/2018	15:09:57	RES	Resource WL23 deployed to Incident 1281-030118
03/01/2018	15:10:14	RMK	FROM CCTV – HGV ON ITS SIDE ACROSS ALL LANES UNDERNEATH BRIDGE – C/RES BARRIER DAMAGE
03/01/2018	15:10:51	RMK	FROM PPOLICE – DRV OUT OF CAB, LORRY IS WELL ALIGHT
03/01/2018	15:10:57	RMK	CAN YOU GET CREW TO DO UP AND OVER CLOSURE ASAP ON THE N/B C/WAY
03/01/2018	15:10:59	RMK	FROM TSO – THEY WILL SEND THEIR FREE RECOVERY FOR WHEN ITS OUT
03/01/2018	15:11:51	RMK	VERBALLY FROM CMPG – CAN YOU DO THE NB WE WILL DO SB
03/01/2018	15:14:23	SYS	A short data message informing WT27 deployed to 1281-030118, F – FIRE, J4/3, AREA9, M5, CMPG, XX999XX was sent to the resource on 03/01/2018 at 15:14.
03/01/2018	15:14:32	RMK	AMBO LOG NO 2442 – THEY ARE ON ROUTE
03/01/2018	15:14:48	RMK	VERBALLY FROM CMPG – WILL CALL ABO LOOKS LIKE SOMEONE ON THE FLOOR
03/01/2018	15:14:55	RMK	NTIC ADVISED AND WILL SET
03/01/2018	15:16:22	SYS	Action prompt cleared: 1281-030118: New Log: FROM CCTV – HGV ON ITS SIDE ACROSS ALL LANES UNDERNEATH BRIDGE – C/RES BARRIER DAMAGE (15:10 03/01/18)
03/01/2018	15:16:24	RMK	DUTO OM SIMON ADVISED
03/01/2018	15:16:38	RMK	FROM CCTV AMBO ON SCENE
03/01/2018	15:17:40	RMK	AREA 9 ADVISED TO START MAKING FOR FIRE DAMAGE AND POTENTIAL CLOSURES
03/01/2018	15:18:31	RMK	NTIC ADVISED OF UPAND OVER NORTH AND SOUTH
03/01/2018	15:20:33	RMK	FROM WT39 – THERE WAS AN HGV ON TH E SLIP AND THEN SOMEBODY WAVING WHEN I CAME THROUGH ABOUT 15 MINS AGO – ADVISED WT39 THAT THIS WAS PROBABLY DUE TO THIS INCIDENT
03/01/2018	15:23:32	RMK	AREA 9 ASKED TO GO TO BOLSTER CLOSURE AT J4 NB
03/01/2018	15:23:40	RMK	WL23 WILL PUT FULL CLOSURE UP AND OVER
03/01/2018	15:23:41	RMK	FREE REC WILL TURN OUT TO HELP WITH THIS
03/01/2018	15:28:09	RMK	FROM NILO – TWEET ISSUED TO WMIDS TWITTER FEED AND NILO NON-CRITICAL REPORT RAISED, NTIC DELAYS ARE 10 MINUTES ABOVE PROFILE
03/01/2018	15:30:13	RMK	WL23 1224: GOING TO SCENE TO FIND OUT WHAT IS HAPPENING
03/01/2018	15:32:09	RES	Resource WT27 arrived at Incident 1281-030118
03/01/2018	15:32:21	RMK	WL23: WELL ALRIGHT, AMBO ARE LOOKING TO LAND
03/01/2018	15:33:27	RMK	WL52 APPROACHING SJ5 CAN WE MAKE TO SCENE

03/01/2018	15:33:37	RMK	FROM CMPG – WE HAVE CLOSURE ON THIS ISLAND – WE WILL KEEP THAT IF YOUR CREW CAN MAKE MAY TO TAKE OVER THE SB
03/01/2018	15:33:39	RMK	HA: YOU WILL NEED GET ON AND OFF
03/01/2018	15:33:57	RMK	WL23: THIS IS WELL ALRIGHT
03/01/2018	15:34:18	RMK	ASKED FOR SECOND CREW TO MAKE TO RELIEVE WT27 ON THE SB CLOSURE SO TM CAN GO TO SCENE
03/01/2018	15:34:58	RMK	ASKED AREA 9 FOR CH8 TO START MAKING FOR THE NB CLOSURE
03/01/2018	15:35:18	RMK	WL23: H/S IS CLEAR NOW
03/01/2018	15:36:04	RMK	WL52 ARE MAKING TO SB CLOSURE TO HELP WT27 WT27: DVR HAS SMOKE INHALATION NO OTHER INJURIES, IS OUT OF VEH
03/01/2018	15:36:28	RMK	WL23: WILL NEED KIER TO SCENE TARMAC WILL NEED RE TARMACING
03/01/2018	15:37:37	RMK	WL23: NO ONE KNOWS WHAT IS INSIDE HGV
03/01/2018	15:38:56	RMK	1224: CMPG HAVE CLOSURE TO TAKE VEH OFF IPV BLOCKING LANE 2 PRIOR TO CLOSURE 1228: JUST PUTTING CLOSURE IN NOW
03/01/2018	15:39:35	RMK	WL52: AT J4 NOW
03/01/2018	15:39:52	RMK	OT65 THIS IS CARRYING POST
03/01/2018	15:40:03	RMK	WL23: M5 AT OLDBURY WORK HAS FULL TM CREW WHO CAN PUT CH8
03/01/2018	15:41:15	RMK	WL52: FIRE HAVE HYDRONS SET UP
03/01/2018	15:41:44	RMK	WL23: LIASES WITH M5 WORKS AND ADVISED TO LIASE WITH KIER
03/01/2018	15:42:58	RMK	WL23: OLDBURY WORK THINK IT IS ROYAL MAIL VAN CARRYING PARCELS
03/01/2018	15:43:41	RMK	WL23: SHOULD BE LOOKIG AT STAT BUT K2 ARE ON SCENE CAN YOU CONFIRM WHO IS RECOVERY THIS VEH
03/01/2018	15:43:59	RMK	SB CLOSURE TO REMAIN ON UNTIL SPECIALIST FROM TENDER HAS ACCESSED SCENE
03/01/2018	15:44:00	RMK	FROM OT65 – WE'RE AHEAD OF THE RRB AT J4 – AVAILABLE IF REQUIRED
03/01/2018	15:45:01	XUP	FROM FIRE COMAND BRIDGE WILL REQUIRE A STRUCTURAL ENGENEER TO CHECK IT OUT CAN YOU ADVISE AREA 9
03/01/2018	15:45:10	RMK	WL23 JUST LIASED WITH K2 AND SAID TO GO WITH STAT
03/01/2018	15:45:29	RMK	WT27 WILL NEED SPECIALISED RECOVERY
03/01/2018	15:45:58	RMK	WL52: TURNED AT FRANKLEY ON ROUTE TO WT27
03/01/2018	15:46:46	RMK	M5 CLOSED AT J4 VMS SET 7214A, M5 (ACCIDENT)
03/01/2018	15:46:58	RMK	AREA 9 HAVE REQUESTED STRUCTURAL ENGINEER
03/01/2018	15:48:16	RMK	WL23: HOW ARE WE RECOVERY? WT27: GET STAT ROLLING WL23: CAN NOT GET VEH DETAILS AS STILL WELL ALRIGHT
03/01/2018	15:49:32	RMK	WL23: HAVE CLOSURE IN BUT NO CONFIRMATION THAT EVERYONE HAS LEFT WL52: IT IS A POLICE OFFICER DIRECTING TRAFFIC

			WL23: OK TO RELEASE WL52: ABOUT TO TAKE OVER FROM WT27 THEN HE CAN MAKE TO SCENE AND CONFIRM
03/01/2018	15:50:07	RIV	Incident 1281-030118 viewed in summary panel by NILO39
03/01/2018	15:50:08	RIV	Incident 1281-030118 viewed in object window by NILO33
03/01/2018	15:50:23	RMK	WL23: CMPG INSPECTOR ADVISE FROM FIRE WILL NEED STRUCTURAL ENGINEER TO LOOK AT BRIDGE AND SB C/WAY
03/01/2018	15:50:50	RMK	NVRM STATED TO SEND HGV THROUGH WITH ASS MUCH INFO AS POSS WITH OUT REG
03/01/2018	15:50:58	RMK	WL23: FIRE WILL COME DOWN K SLIP WRONG WAY AND TRY TO PUT FIRE OUT
03/01/2018	15:51:04	SYS	Action prompt cleared: 1281-030118: New Log: FROM OT65 – WE'RE AHEAD OF THE RRB AT J4 – AVAILABLE IF REQUIRED (15:44 03/01/18)
03/01/2018	15:52:55	RMK	WT27: EXCHANGING WITH WL52 "HGV SIDE ON FIRE – LOADED WITH PAPE"
03/01/2018	15:53:01	RMK	WL23: MINOR INJURY
03/01/2018	15:54:08	RMK	WT27: WILL TRY TO GET TO SCENE THROUGH INCIDENT AND THEN TURN AT AMBULANCE STATION
03/01/2018	15:54:31	RMK	WL23: FIRE AND POLICE HAVE CLOSED ISLAND FOR HOSES 1228: UNDERSTOOD
03/01/2018	15:54:47	RMK	FROM AREA 9 CAN WE HAVE H/S RUNNING ADVISED YES
03/01/2018	15:55:31	RMK	WT27: WILL DRIVE PAST ON SB, THEN LEAVE EVH ON SB AND LIASE WITH 1224 ON NB
03/01/2018	15:56:11	RMK	WL23: WILL LIASE WITH FIRE AND SEE IF WE CAN GET SLIP OPEN
03/01/2018	15:56:36	VRT	Update recovery request successfully transmitted for VRM UNKNOWN VRI ID 142060 Message: RECOVERY CAN HAVE H/S RUNNING WITH CAUTION
03/01/2018	16:00:07	RMK	WL23 1228: SPOKE TO DVRS AND TOLD THEM IT WILL BE A WHILE WL23 1224: FIRE HAVE SAID ROAD TO BE KEPT CLOSE FOR APPROX 15MINS, CLOUD WILL GET BIGGER HE WILL LET ME KNOW WHEN WE CAN RELEASE SLIP
03/01/2018	16:01:28	RMK	WL52 DEPLOYED AND ARRIVED LATE DUE TO NOT BEING BOOKED ON PROPERLY
03/01/2018	16:02:04	RMK	BRIDGE ENGINEER IS STATING IF WE DAMPEN IT DOWN THEN IT MAY SAVE STRUCTURE
03/01/2018	16:02:06	RMK	WT27: HAVEN'T CLIMBED C/RES STILL ON SB
03/01/2018	16:02:19	RMK	WT27: UPDATE ON KIER
03/01/2018	16:02:48	RMK	ADVISED THEY HAVE H/S RUNNING APPROX 2 MINS AGO
03/01/2018	16:04:21	RMK	K2 ARE STILL ON SCENE AND ALSO OLDBURY WORKS
03/01/2018	16:04:57	RMK	FROM NVRM – RS RECOVERY ON ROUTE FROM J2 – THEY ARE ON ROUTE FROM J2 – THEY HAVE ASKED ABOUT COMING DOWN THE SLIP ROAD – I HAVE ADVISED THEM TO MAKE THEIR PRESENCE KNOWN FROM THE ISLAND

			AND GET THE ALL CLEAR THEN TO COME DOWN THE SLIP ROAD
03/01/2018	16:05:47	RMK	CREWS ADVISED ON STAT RECOVERY
03/01/2018	16:06:18	VRT	Recovery Despatched, VRM UNKNOWN VRT ID 142060 ETA: 03/01/2018 16:30:00 Comment: Recovery Ref: HSR1758953CR Despatch Date-Time: 03/01/2018 16:06:43 Vehicle Recovery Operator: R S Recovery Kings Norton Allocation centre (4032162)
03/01/2018	16:06:18	SYS	Action Prompt created: 1281-030118: New Log: Recovery Despatched, VRM UNKNOWN VRT ID 142060 (16:06 03/01/18)
03/01/2018	16:10:41	RMK	WL52: RS RECOVERY ABOUT TO COME OFF SBJ4
03/01/2018	16:11:30	RMK	WL52: COLLEAGUE SPOKEN TO RS RECOVERY ARRANGED TO MEET POLICE AT ISLAND AND COME DOWN SLIP
03/01/2018	16:11:32	RMK	FROM NILO – SMS SENT TO HE SLT. NILO REPORT UPGRADED TO CRITICAL. APPROX 28 MINS DELAYS REPORTED IN BOTH DIRECTIONS. …BREAKING NEWS WAS BEING SET…NILO WILL AWAIT CONFIRMATION, TO SEE EXACTLY WHAT IS CLOSED.
03/01/2018	16:12:08	RMK	FROM NILO – TWEETS CONSTANTLY UPDATED. CMPG + NILO NOW TWEETING PICS OF SCENE
03/01/2018	16:12:34	RMK	WT27: LIASED WITH M5 WORKS DURING FULL CLOSURE AT J4 FREE RECOVERY AND TM CREW HAVE GONE UP SLIP ROAD
03/01/2018	16:13:03	RMK	WT27: VEH NOT ALIGHT ANYMORE
03/01/2018	16:13:24	RMK	WL23: STILL HAVE FIRE OFFICERS ON SLIP ROAD
03/01/2018	16:16:47	RMK	FROM OT67 – IS THERE A CH8 COMING FOR J4 NORTHBOUND ? SO WE CAN REMOVE OUR CONES AND RESUME
03/01/2018	16:16:47	SYS	Action Prompt created: 1281-030118: New Log: IS THERE A CH8 COMING FOR J4 NORTHBOUND ? SO WE CAN REMOVE OUR CONES AND RESUME (16:16 03/01/18)
03/01/2018	16:18:58	RMK	WL23: STILL WAITING FOR PERMISSION TO OPEN SLIP
03/01/2018	16:19:07	RMK	WT27 – VEH NOW BEEN PUT OUT BY FOAM- FROM FIRE COMMANDER – ASKLED FOR ENVIRONMENTAL AGENCY TO COME TO SCENE DUE TO THE ISSUES WITH TEHE FOAM AND ENVIRONMENT
03/01/2018	16:19:11	RMK	ADVISED WL23 KIER HAVE PERMISSION TO RUN H/S NB
03/01/2018	16:19:25	RMK	WT27 – POLICE HAVE LEFT – HAND OVER TO US – FIRE STILL ON SCENE
03/01/2018	16:19:26	RMK	FROM NILO- WE HAVE SET STRATEGIC SIGNS AT 16.05 TO ADVISE ROAD USERS TO USE M6, M42 FOR SWEST. MANY THANKS
03/01/2018	16:19:26	SYS	Action prompt created: 1281-030118: New Log: FROM NILO- WE HAVE SET STRATEGIC SIGNS AT 16.05 TO ADVISE ROAD USERS TO USE M6, M42 FOR SWEST. MANY THANKS (16:19 03/01/18)
03/01/2018	16:19:28	RMK	WT27 for reopening the L slip is 20/30 mins

03/01/2018	16:20:32	RMK	OT unit, Paramedic wishing to come down the northbound L slip, Is this ok?
03/01/2018	16:20:57	RMK	Yes to allow paramedic to go down slip… Have updated the OT unit
03/01/2018	16:21:28	RMK	WL23: Paramedic coming down slip
03/01/2018	16:22:33	RMK	WL23: Two more paramedics coming down slip to scene
03/01/2018	16:22:44	RMK	OT67 Updated ref; CH8 crews on route
03/01/2018	16:27:15	RMK	WL23: HGV still on fire
03/01/2018	16:27:21	RMK	WT27 – Water at premium at a mo – If want bridge hosing down will need another truck meaning we need to hold slip longer – what damage is done is done
03/01/2018	16:31:35	RMK	WT27: Vehicle of someone unwell on SB Ambo are dealing with him in Lane 3 Need to find out if there is any recovery
03/01/2018	16:32:00	RMK	WL52: Ambo coming up wrong way on slip
03/01/2018	16:32:28	RMK	WL23: RS recovery wrecker on scene will reverse down slip wrong way
03/01/2018	16:33:14	RMK	WL23: Will make WT27 aware RS Recovery coming down wrong way
03/01/2018	16:35:30	RMK	WT27 – Spoke to Oldbury TM – 10 Mins ago the plan was that they would do the CH8 = But not confirmed – can you confirm this with the vehicle on SB – He was the driver who assisted who has smoke inhalation will be going to shop – Police taking his vehicle
03/01/2018	16:39:10	RMK	WT27: Looks like HART team are leaving
03/01/2018	16:39:29	RMK	Bridge engineer is at scene
03/01/2018	16:42:39	RMK	WL23: RS Recovery are just about scene
03/01/2018	16:47:00	RMK	Call area 9 for C/RES damage
03/01/2018	16:48:31	RMK	Request from TSO for assistance from HATO to manipulate traffic in order to put CH8 out
03/01/2018	16:51:29	RMK	WL23: Traffic will need to go down to Fairfield Island, Bridge engineer is here I presume
03/01/2018	16:52:41	RMK	WL23: Kier have TIER
03/01/2018	16:53:27	RMK	Call from CCC, they have got royal mail on the phone asking if it has been confirmed as one of their vehicles, I have advised there is nothing on the log to confirm this, CCC will be contacting the police for any further information regarding the vehicle
03/01/2018	16:53:28	RMK	From CCTV, Traffic driving over the hydrant from the A491
03/01/2018	16:53:41	RMK	From NILO – Breaking news has been set advising customers to use M6 and M42 as alternative routes
03/01/2018	16:58:17	RMK	WL23 – Local police sending local officers for closures Bridge engineer at scene – Will send him down the wrong way before release traffic
03/01/2018	16:59:04	RMK	WL23 – Believe cherry picker coming down to check below the bridge – will be shut for while – will with bridge engineer

03/01/2018	17:01:47	RMK	WL23: Just sending engineer down the wrong way
03/01/2018	17:03:21	RMK	WT27: Can we get British Red Cross here people need water
03/01/2018	17:07:32	RES	Resource WY51 deployed to Incident 1281 – 030118
03/01/2018	17:07:50	RMK	WY51 making from J6 to assist TSO
03/01/2018	17:08:43	RMK	WT27: Bridge engineer are going to check SB First then they will check NB I will liaise with fire officer
03/01/2018	17:16:01	RMK	From Kier – Bridge is fine on the SB so from their point of view they can reopen the C/Way on the SB
03/01/2018	17:16:55	RMK	WL23: When can we open Lip, child unwell in car 1224: Fire still laying hoses hopefully not too much longer now
03/01/2018	17:31:29	RMK	WT27 All Ambos have been stood down no longer any on scene
03/01/2018	17:33:46	RMK	WL23: Not happy with traffic running over hoses
03/01/2018	17:36:22	RMK	WL23 1224: Is the bridge safe for traffic to be running over it?
03/01/2018	17:39:24	RMK	WT27 – Have spoken to bridge engineer – they are not happy to open bridge on A38 until they have visually checked N/B Side
03/01/2018	17:58:06	RMK	WL52 – Can we change signs and sigs ready for opening
03/01/2018	17:58:43	RMK	L2/3O & VMS cleared 7214A, M5
03/01/2018	18:25:05	RMK	Verbally from Area 9 Cherry Picker stuck in stationary traffic J5, M5 – Asked for access to scene but advised there was nothing we could do as traffic held
03/01/2018	18:26:27	RMK	Advised area 9 traffic is now released so cherry picker should start moving shortly
03/01/2018	18:31:07	RMK	WT27: Most of RS Recovery here waiting for crane, we need to get bridge inspected first before we can start recovery
03/01/2018	18:31:32	RMK	WT27: When cherry picker arrives need to close M Slip so it can reverse to scene
03/01/2018	18:32:44	RMK	WT27: Fire is leaving scene now HA Will reattend if needed and will come back for update
03/01/2018	18:42:40	RMK	All crews moving over to Channel 1
03/01/2018	18:55:14	RMK	Asked area 9 if know where cherry picker is – advised no number in log to call him
03/01/2018	18:57:06	RMK	Now traffic is moving signs for closure can be removed – NITC Dave advised
03/01/2018	18:57:31	RMK	WT27: Recovery are dragging vehicle over
03/01/2018	18:59:02	RMK	WL23 – IRF 164221 – Damage to central res – Damage to L3 part of the C/W deep groove diesel L1/2/3 – Fire damage L1/2/3 Large amount of burnt metal debris – potential damage to bridge structure – damage to nearside verhe barrier – damage to sign on bridge
03/01/2018	19:09:23	RMK	From Duty OM – Bridge inspector on scene can't make the final decision about the bridge stability – It will be a chartered engineer that will have to make the decision so even if the guys on scene give the go ahead will have to wait for the decision to come from the OM Via Kier before reopening
03/01/2018	19:13:30	RMK	WT27: HI AB On scene to inspect bridges

03/01/2018	19:23:18	STC	Status code 06 received from WL21
03/01/2018	19:23:19	RES	Resource WL21 Arrived at incident 1281 – 010118
03/01/2018	19:37:56	RMK	WL21 Can release traffic L3 coned out
03/01/2018	20:16:01	RMK	WT27 – Bridge Inspectors have finished with their inspections, 2 HIABS have left with contents from HGV, 1 more HIAB has arrived to collect what is left, rec will then take place.
03/01/2018	20:23:27	RMK	Verbally from TONY at area 9 – The chartered Surveyor has stated that the bridge is ok to open
03/01/2018	20:38:10	RMK	WT27: Bridge engineer has left scene
03/01/2018	21:07:47	RMK	From Duty OM – Can reopen bridge
03/01/2018	22:19:26	RES	Resource WT37 deployed to Incident 1281 – 030118
03/01/2018	22:26:51	RES	Resource WN22 deployed to Incident 1281 – 030118
03/01/2018	22:28:19	STC	Status code 06 received from WN22
03/01/2018	22:28:19	RES	Resource WN22 arrived at Incident 1281 – 030118
03/01/2018	22:34:19	RES	Resource WL21 Released from Incident 1281 – 030118
03/01/2018	22:43:29	RES	Resource WT37 arrived at Incident 1281 – 030118
03/01/2018	22:55:22	RMK	WT27 – Left with WT37, Code 2
03/01/2018	22:55:25	RES	Resource WT27 released from Incident 1281 – 030118
03/01/2018	23:05:27	RMK	From WN22 can we have a crew ready to take our closure off, they will need to do RRB
03/01/2018	23:06:24	RES	Resource WN11 deployed to Incident 1281 – 030118
04/01/2018	00:35:04	RES	Resource WN11 Deployed to Incident 1281 - 030118
04/01/2018	01:32:55	RMK	Have asked WN11 to poss go and relieve WN22 for short while so they can have comfort break
04/01/2018	01:52:15	RES	Resource WN22 released from Incident 1281 – 030118
04/01/2018	01:53:02	RES	Resource WN11 arrived at Incident 1281 - 030118
04/01/2018	02:02:29	RMK	WT37 – Spoke to RS Recovery manager looking at 3AM for everything to be clear I will speak to Malcolm at Kier here and see if we are going to go to plan B now and not re-tarmac
04/01/2018	02:24:35	RMK	WT37 – Load has been secured
04/01/2018	03:16:58	RES	Resource WN22 deployed to Incident 1281 – 030118
04/01/2018	03:30:48	RMK	S7214A, M5 Cleared
04/01/2018	03:37:13	RMK	WN22 – We are clear from J4
04/01/2018	03:37:51	RMK	WN22 Does WT37 Need relieving WE ARE OK
04/01/2018	04:05:45	RMK	WN22 – Veh been delivered to C2
04/01/2018	04:48:34	RES	Resource WT37 released from Incident 1281 – 030118
04/01/2018	06:31:47	RMK	NILO FYI – Road reopening with a L3C in place until tonight
04/01/2018	19:31:17	RMK	TSO – Request RRB to fix taper
04/01/2018	19:33:02	RMK	No crew currently, will await double crew to C2
04/01/2018	19:53:47	RES	Resource WL52 deployed to Incident 1281 – 030118
04/01/2018	19:56:34	RMK	J4A Entry for the TM Crew
04/01/2018	20:17:52	RES	Resource WL52 released from Incident 1281 – 030118
04/01/2018	20:20:22	RMK	From TSO – Thank you for help, all refixed now
04/01/2018	20:20:27	FCH	Qualifier L13 – Rolling closure added

04/01/2018	21:59:06	FCH	Lead organisation changed from contractor to Highways with time recorded as 04/01/2018 21:59:05

Incident Timeline:	HSR1724533CR BREAKDOWN – LANE B P35/5B, J6/5, AREA5, M25, SURY, M25/4358B HE Log REF: 776		
Date	Time	REM	Content
29/01/2017	17:29:29	RIV	RoC 776-290117 viewed in object window by 2130, 29/01/2017 - 17:29:29
29/01/2017	17:30:36	SYS	Incident created with reference 776
29/01/2017	17:31:30	RES	Resource GL23 deployed to Incident 776-290117
29/01/2017	17:34:42	FCH	Carriageway status changed from Clear to Comprimised with time recorded as 29/01/2017 17:29:29
29/01/2017	17:40:26	RES	Resource GL61 deployed to incident 776-290117
29/01/2017	17:40:49	RMK	FROM GL61: WILL GO TO SCEEN. GL23 WILL PUT ON RRB
29/01/2017	17:42:33	SYS	Action Prompt created: 776-290117: Resource GL61 has Arrived at Incident, notified by radio status code (17:42 29/01/17)
29/01/2017	17:42:51	RMK	FROM GL23: RRB COMP AT P37/3B, M25
29/01/2017	17:42:55	RES	Resource GL23 arrived at incident 776-290117
29/01/2017	17:42:59	SYS	Action Prompt cleared: 776-290117: Resource GL61 has Arrived at Incident, notified by Radio Status Code (17:42 29/01/2017)
29/01/2017	17:43:13	RMK	FROM GL23: GL61 HAVE PASSED US
29/01/2017	17:44:56	RMK	GL61: WE HAVE PUT OUT A LANE 1. HA 2228 FOR PNC
29/01/2017	17:46:56	RMK	TALK THRU GL61/GL23: BRING THRU SLOWLY. L1 CLOSURE IS OUT.
29/01/2017	17:48:09	RMK	GL23: R/R RELEASED AT 35/8
29/01/2017	17:51:32	RMK	CALLING AREA 5 FOR PROTECTION
29/01/2017	17:52:31	FCH	Form changes - N6786FPX: Recovery Status changed from "<empty>" to "Requesting" VRTId changed from "<empty>" to "127719"
29/01/2017	17:52:32	VRT	Recovery Request successfully transmitted for VRM N6786FPX Receipt number: 12771931526 (1140523)
29/01/2017	17:52:34	VRT	Recovery requested for VRM N6786FPX
29/01/2017	17:52:35	RES	Resource GL23 released from Incident 776-290117
29/01/2017	17:55:46	VRT	Recovery Despatched, VRM N6786FPX VRT ID 127719 ETA: 29/01/2017 18:45:00 Comment: Recovery Ref: HSR1724533CR Despatch Date-Time: 29/01/2017 17:55:45 Vehicle Recovery Operator: Reliance Recovery Clacket Lane EastB (1140523)
29/01/2017	17:56:43	VRT	Update Recovery Request successfully transmitted for VRM N676FPX VRT ID 127719 Message: UPDATE ON VEHICLE REG: N676FPX (1140523)
29/01/2017	18:22:34	RMK	FROM GL61: RELIANCE RECOVERY ST6

29/01/2017	18:33:20	RMK	FROM GL61 READY TO PICK UP, RRB ON 40/1 BY GL23
29/01/2017	18:43:24	RMK	SIGNALS CLEARED
29/01/2017	18:43:33	RES	Resource GL61 released from Incident 776-290117
29/01/2017	18:43:40	FCH	Carriageway status changed from Comprimised to Clear with time recorded as 29/01/2017 18:43:39
29/01/2017	18:43:47	FCH	Status changed from NR - Not Resourced to FI - Finished
29/01/2017	18:52:32	VRT	Recovery Arrived, VRM N676FPX VRT ID 127719 Comment: Recovery Ref: HSR1724533CR Arrive Date-Time: 29/01/2017 18:28:29 (1140523)
29/01/2017	19:26:51	VRT	Recovery Cleared, VRM N676FPX VRT ID 127719 Comment: Recovery Ref: HSR1724533CR Clearance Date-Time: 29/01/2017 18:50:00 (1140523)
29/01/2017	19:26:51	SYS	Action Prompt created: 776-290117: New Log: Recovery Cleared, VRM N676FPX VRT ID 127719 (19:26 29/01/17)
29/01/2017	21:02:54	FCH	Status changed from FI - Finished to CL - Closed

Krzysztof Dziama
Atkins Ltd
10 Holliday Street
Birmingham B1 1TF

Email Krzysztof.dziama@atkinsglobal.com
Telephone **0121 483 5439**