

Highways Agency Initial Fire Risk Audit Report

NOT PROTECTIVELY MARKED

Date: 25 May 2011

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Executive Summary

This report provides an initial assessment of the potential fire risk locations around the strategic road network (SRN), consisting of the motorways and trunk roads of England, following the scrap yard fire beneath the M1 near Mill Hill in April 2011. It also provides an overview of the Highways Agency's (HA) approach to protecting the SRN, together with recommendations for improving resilience in future fire risk situations.

Following the fire, the Secretary of State for Transport requested that a survey be carried out by both the HA and Network Rail to identify the locations of bridge structures at potential risk. Using a basic risk assessment process taking into account business type, scale of occupation, proximity to structure and the vulnerability of the structure to fire damage, the HA identified 50 bridges and viaducts out of a total of 3205 across the SRN.

Similar incidents where fire caused by activities on third party land has damaged elevated sections of the SRN are rare, with only two identified: one in 1984 and one in 1986.

In making recommendations in this report, account has been taken of Government policy that has been in place since the 1960s, where land directly beneath viaducts is not normally purchased as part of construction. Only land required for bridge piers and abutments is usually purchased, with legal agreements established with local landowners to provide access for the construction, operation, maintenance and inspection purposes.

Where it is considered that controls are needed on the activities of third parties beneath or adjacent to SRN structures, restrictive covenants are secured. This enables the HA to challenge any activities that are seen to pose a risk. A key recommendation is to review the scope of restrictive covenants in the vicinity of the key fire risk locations identified and, where necessary, take action to reinforce compliance. Where no or inadequate restrictive covenants exist and action is deemed necessary, attempts can be made to secure such covenants. However, this will require the landowners and operators to co-operate and may involve offering them financial recompense.

In seeking to control new developments that potentially may present a fire risk to the SRN, the HA has the power to issue Directions restricting the granting of Planning Permission. Article 25 of the Town and Country Planning Development Management Procedures Order (DMPO) 2010 grants these powers. The Agency has used those and the predecessor orders for many years.

Developers are within their rights to challenge any Directions issued by the HA, which would be considered by the Planning Inspectorate. The HA will liaise with the Department for Transport (DfT) and the Department for Communities and Local Government (DCLG) to establish a stronger policy basis.

Other forms of regulation relating to safety and operational processes control the manner in which types of activity are carried out. Where there are suspected breaches of any such regulations, enforcement action can be undertaken through regulatory

bodies such as the Health and Safety Executive (HSE). The Agency will work with such regulatory bodies to deal with potential fire risk situations.

Through its contracted service providers the HA operates a structured process for formal and informal inspections of the elevated sections of the SRN. These processes could be strengthened to make specific reference to the need to identify and record potential fire hazards and the HA will commit to ensure this happens.

The HA already has well established procedures for incident management. In 2010, the HA liaised with Network Rail in the identification of common critical assets, leading to the production of joint contingency plans. This initial work has already realised new efficiencies, particularly in the sharing of best practice between each organisation. The HA will ensure that these benefits are translated into any joint work to address common fire risk locations identified by either body.

1.0 Introduction

Following the scrap yard fire beneath the M1 near Mill Hill in April 2011, the Highways Agency (HA) and Network Rail (NR) undertook a high level scoping study to understand the scale of potential risk from activities beneath and adjacent to the elevated sections of their networks. The work looked at general principles, vulnerabilities of different structures and types of land use; producing an initial assessment of the potential sources and categories of risk.

This report compiles those findings for the HA's network, together with providing an overview of what the HA currently does to prevent and mitigate against such risks. The report also identifies any factors affecting the HA's ability to mitigate or remove these risks and makes recommendations about how these factors should be addressed.

2.0 Context

2.1 History of Fire Incidents

Prior to the incident on the M1, there had been very few other occasions where fires from premises or activity below or adjacent to the strategic road network (SRN) had caused damage to structures. The incidents below are the only two identified:

- 8 October 1986 – M50 Sandford / Harleton Road Bridge. Hay bales had been stored within an agricultural underpass, which were identified and reported by a bridge inspector. However, on the same night they were reported, the hay bales ignited. This initially closed the M50 and resulted in an extended period of flow restrictions, particularly for heavy loads, which had to be diverted onto alternative local roads.
- 27 August 1984 – M6 Keele Services. A fire in a Service Area kitchen adjacent to an overbridge closed the M6 and the Services for several days whilst repairs were carried out. The fire did not damage the integrity of the bridge structure. However, the buildings on the bridge were totally destroyed, with the resulting falling material damaging the carriageway surface of the M6 below, necessitating repairs.

Other fire incidents, not directly related to elevated sections of the network, include the Buncefield Oil Depot fire near Hemel Hempstead, which temporarily closed the M1 in December 2005. There have also been closures due to fears of explosion resulting from acetylene incidents. Following extensive research in the last three years, commissioned by a national working group including the DfT, HA and Network Rail, it is now known that only acetylene cylinders directly involved in fire or exposed to heat carry a risk of explosion. One notable incident was on 5 July 2005, when an incident involving acetylene cylinders necessitated the closure of the M25 between Junctions 22 and 21, the adjacent M1 and the Hatfield rail line into London.

Far greater in number are incidents resulting from vehicle fires, the majority of which have a minimal impact to the structural integrity of the network. One example that did was a HGV fire at Oaklawn Bridge on the M25 in Surrey in February 2003. The fire

started from the HGV striking a bridge column, which required the column to be replaced and repairs needed to the bridge deck. The M25 was closed in the aftermath of the fire, with extended restrictions imposed to protect the temporary propping for the damaged column whilst repairs were undertaken.

Given the fact that these incidents are not a result of activity on adjacent land, or in the majority of cases do not result in significant structural damage to the network, no further reference has been made to them within this report.

2.2 Prioritised Risk Locations

There are over **17,600** structures within the SRN, including **3,205** bridges and viaducts. **1,558** of these structures have clear spans in excess of 5 metres.

An initial review of all elevated sections of the network identified 425 locations as having some level of potential fire risk from activity beneath or adjacent to the SRN. However, having reviewed all of these locations through a risk assessment framework as defined in Appendix A, 50 priority locations were identified as warranting further investigation and work is already underway to identify appropriate intervention or mitigation requirements.

3.0 Prevention

3.1 Land Ownership and Agreements

To reduce the need for compensation payments, avoid severance and prevent sterilisation of land, it has been government policy since the 1960's to generally acquire only land required to accommodate the footprint of any bridge piers or abutments needed to support structures. Where land was not acquired, a right was purchased to build, maintain, and operate the road over the section of land.

In some instances, restrictive covenants were also secured to either control activities or limit the storage of certain classes of materials on land not under HA ownership. However, these types of covenants do not exist for all parts of the elevated network. Using the priority risk locations, searches of lands records have commenced to identify whether such restrictive covenants exist.

Timescales for this initial review would not permit all lands records to be reviewed, as they need to be assessed on a detailed site-by-site basis and some locations have extensive numbers of different land ownership agreements, leases and covenants. Therefore, further prioritisation has been undertaken using some of the key risk locations on the most strategic routes.

The routes chosen were those located along the recognised strategic national corridors linking key centres and linking those centres to international gateways (ports and airports).

Further prioritisation was then undertaken to concentrate initially on those locations where the risk from third party activity was on land immediately beneath the network. It was found that some high risk locations do have restrictive covenants in place and further investigations are now needed. However, this should be done through an agreed priority framework, as a complete review of all land agreements and covenants for every risk location will be a significant undertaking (**Recommendation 1**).

The most effective way of taking action to ensure compliance with restrictive covenants would be through direct negotiation with the landowner / operator, provided they are prepared to enter into discussions. Where a landowner / operator refuses to comply with established covenants, there is the possibility of taking formal action through the Courts.

There are risks, as covenants may no longer be appropriate for the current situation at particular locations (eg development may have fundamentally changed the surrounding environment). Therefore, legal advice should be sought about the ability to and the likelihood of succeeding in taking formal action to secure compliance (**Recommendation 2**).



For the particular risk locations where no restrictive covenants exist, it would be appropriate to negotiate new restrictive covenants with landowners / operators (**Recommendation 3**). This will require Legal and Valuation advice, as there is the possibility of financial recompense forming part of these negotiations.

There is the possibility that a landowner / operator at those locations without an existing restrictive covenant may not be prepared to negotiate, or agreement with those that are may not be reached. In these situations, provided that the owner / operator is adhering to any planning permissions they may have and they are not breaching any other safety or operational legislation governing their type of business, there is little that can lawfully be done.

3.2 Planning Powers

For developers attempting to obtain planning permission for either a new or extended facility, or a change of use, the HA can use its Powers of Direction under the Town and Country Planning Development Management Procedures Order (DMPO) 2010. Article 25 of the DMPO permits the HA, on behalf of the Secretary of State, to issue Directions restricting Planning Permission for developments that can be shown to adversely impact on the network. This is already being done, where appropriate, and should continue (**Recommendation 4**). It should be noted that Powers of Direction will not be able to deal with existing developments that either are already operating under an existing planning permission, or they have been operating for such a period of time (usually 10 years) to qualify for a certificate of lawful development.

Developers are within their rights to challenge any Directions issued by the HA, if they feel they have not been dealt with fairly. In such instances, any Appeals would be considered by the Planning Inspectorate in accordance with the Town and Country Planning Act. Planning law currently establishes the presumption that planning permission must be granted unless it can be shown there is a strong likelihood that demonstrable harm would result. Under the current policy frameworks and given the infrequent nature of incidents around the network, it is unlikely that the Planning Inspectorate would classify the possibility of a fire as being a strong likelihood.

However, there are possibilities for trying to establish a clearer policy basis for using Powers of Direction to protect the SRN from developments where there is a heightened risk of harm resulting from catastrophic incidents such as fire. The first would be to incorporate wording into the National Planning Policy Framework about protecting the strategic national transport corridors from such incidents. This would provide a strong policy basis, but may not be appropriate for the nature of the document, which is intended to be a high-level strategic document, avoiding such detail.

An alternative approach, and one that is more likely to be achieved, is to incorporate such references to fire risk (along with other physical impact risks) into the planned revisions to the DfT Circular 02/2007 "Planning and the Strategic Road Network". There is already agreement with DfT that a review of the Circular is required, which should commence as soon as details of the finalised Localism Bill become clear. Such a review is within the scope of the Secretary of State for Transport and a revised

document would benefit from Planning legitimacy and authority derived from the need for sign-off by Ministers from both DfT and DCLG (**Recommendation 5**).

3.3 Highways Act 1980

The Highways Act makes it an offence to light a fire within 50 feet from the centre of a highway that results in damage to the highway. Similarly, it is also an offence to light a fire on third party land that results in users of the highway being injured, interrupted or endangered.

The Act only makes reference to the perpetrators of such fires being liable for a fine, as defined within the Highways (Amendment) Act 1986. Obviously, this does not prevent harm from occurring in the first place.

3.4 Wider Legislation

The manner in which activity is carried out on land is also subject to controls in the form of wider legislation and regulations; including building control, fire safety, control of hazardous substances and health and safety. Therefore, the nature of the business or activity may be lawful, but the manner in which the business is undertaken may not be.

Where such breaches of rules can be identified, enforcement notices can be issued by the regulatory bodies (e.g. HSE) requiring compliance within stated time limits. Also, in certain circumstances “stop notices” can be issued that mandate immediate cessation of unauthorised and dangerous activity. The latter may be particularly appropriate where there is an immediate threat to life and /or property.

In locations where it is suspected that the working practices of a business may not be lawful and may be putting at risk the operational integrity of the SRN, the HA should approach the controlling bodies to encourage them to investigate and where necessary, take action (**Recommendation 6**). Although the regulatory bodies are likely to be sympathetic to the HA’s concerns, there is a possibility that their ability to act may be hampered by resource constraints and other competing priorities.

4.0 Mitigation

4.1 Inspection Regimes and 'Watchman' Role

The HA's day-to-day operational management of the SRN is overseen by a series of contractual arrangements with its Managing Agent Contractors (MACs). These MAC Contracts include the responsibility to undertake formal inspection regimes for our structures, as defined with the Design Manual for Roads and Bridges (DMRB).

Volume 3 of the DMRB includes BD 63/07 "Inspection of Highway Structures", which defines the following inspection regimes that MACs must adhere to:

- a) Safety Inspections, which provide a cursory check of structures to identify any obvious deficiencies or signs of damage and deterioration.
- b) General Inspections, which are biennial visual inspections of all parts of the structure that can be inspected without the need for special access equipment or traffic management arrangements.
- c) Principal Inspections, a detailed close examination of all inspectable aspects of a structure, usually undertaken every 6 years.

This inspection regime includes a requirement to note any deficiencies at or near the structure, which would include hazards on land either beneath or adjacent to the structure. This could include potential fire hazards. The HA's Structures Management Information System (SMIS) is not currently configured to enable specific fire hazard information be input – but can be updated accordingly at a relatively low cost.

Incorporating this facility alongside an information campaign to HA and MAC staff involved in undertaking and recording inspections will, over time, establish a detailed understanding of the fire risk locations to structures. This information can then be reviewed by Lands and Planning experts to take action, wherever possible in removing or reducing those identified risks (**Recommendation 7**).

In addition to formal inspection regimes, MACs have a wider contractual responsibility through the 'Watchman' Role, which requires them to:

- a) Monitor the operation of the network, including safety issues, and
- b) Identify and notify of any material risks to the network, its users or members of the public

In most instances, the Watchman role is the HA's first line of defence, encouraging its workforce to inform of any risks or hazards observed whilst travelling or working on the network. Again, currently fire hazards are not specifically recognised, on the basis that any hazard, including fire, should be reported. However, we will enhance the monitoring of the network to specifically include fire hazard identification. (**Recommendation 8**).

4.2 Engineering Solutions

The design of a structure will influence its ability to resist damage due to the effects of fire. The vast majority of the Agency's bridges and viaducts have a deck formed from reinforced or prestressed concrete slabs, supported by either steel or reinforced / prestressed concrete beams. All forms of construction are, to varying degrees, susceptible to the effects of fire, with prestressed concrete and steel elements considered to be at highest risk, along with joints and bearings.

It must be recognised that it is not practical to totally protect structures from the effects of fire. Measures can however be taken to extend the time period of protection for vulnerable structural elements in the event of a fire.

The simplest form of protection for existing structures is the application of an insulating material to the exposed faces of the structure. The two types most commonly used are a spray / trowel applied material, or boarded systems attached to the structure. Each has associated drawbacks, such as obscuring structure surfaces from visual inspections. Therefore, in addition to paying for the insulation, there would be additional ongoing costs for maintaining the protection and extra costs in accessing structure surfaces during inspections.

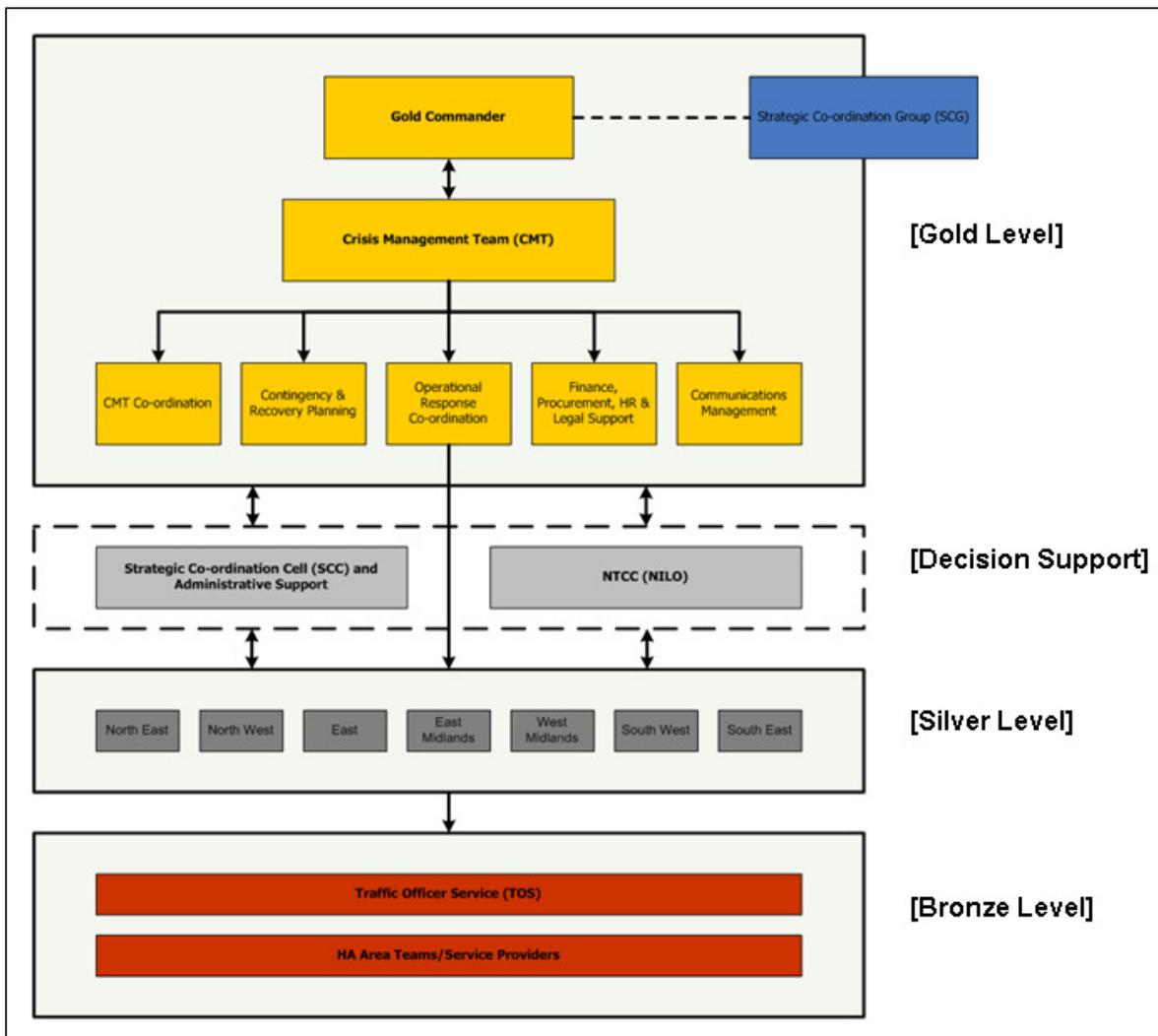
Therefore, whilst it is feasible to provide additional fire protection to vulnerable structures, there are associated difficulties and significant costs, depending on the scale of work undertaken. For these reasons, this approach has not been considered further in this report.

4.3 Crisis Response

The Highways Agency Network Resilience Team (NRT) is responsible for the security and resilience of the Strategic Road Network. This includes the development and upkeep of protocols for responding to crisis events impacting at a national level. These protocols and the associated command structure are set out in the HA National Crisis Management Plan (NCMP). The specific objectives of the Plan are:

- To explain the strategic context and key principles which shape the HA's approach to crisis management
- To present the HA's crisis management structure, including key external interfaces
- To set out the key protocols, roles and responsibilities that underpin this structure
- To explain the infrastructure which enables effective operation of the structure

The HA's crisis management structure, as defined within the Plan, is illustrated below.



To date there has not been a requirement to fully invoke the plan. However, a light touch version of the Plan developed to deal with smaller scale incidents has been used on several occasions including the swine flu pandemic in 2009 and the severe weather salt management in early 2010.

A flowchart outlining the full end-to-end HA crisis management process has been included in Appendix B.

4.4 Critical Asset Resilience

There is a specific focus within the HA National Crisis Management Plan on Critical National Infrastructure (CNI) assets, identified through robust assessment criteria approved by the UK Security Service. These are particular assets on the SRN where loss would cause substantial economic and social disruption. There are currently 17 specific HA CNI assets identified within the Plan and the HA National Resilience Team manages an ongoing programme to assess and reduce their vulnerability.

For each of these assets, regular and in-depth risk assessments are undertaken through liaison with Security Service and Police representatives. This enables the implementation of robust protective security measures and the development of detailed contingency plans, should there be any disruption to these assets. These plans are designed to specifically identify and address interdependencies with adjacent operators, which requires collaboration as outlined below.

4.5 Joint Contingency Planning

During the third quarter of 2010, the HA Network Resilience Team worked with Network Rail to identify high risk locations at which the Strategic Road and Rail Networks intersect. These locations have provided an initial focus for joint contingency planning efforts between the two organisations.

During the fourth quarter of 2010, the first Joint Contingency Plan for one of the eight prioritised locations was produced by HA and Network Rail. This includes a full consideration of the risks from activities taking place underneath or adjacent to the site.

On the 19th April, the HA and Network Rail ran a joint desk-top exercise to test the appropriateness and capability of the Contingency Plan against a theoretical threat scenario. Participants in the exercise included the local Police and Fire services, the Army, the Local Authority, Mountain Rescue, the UK Security Service and various staff from the HA and Network Rail. The outcomes of this exercise identified a number of enhancements to the Plan, which are now being progressed.

The updated Plan will then form a template for developing new joint Plans for the remaining 7 Critical Network Intersection Locations. These Plans will also be tested via desk-top exercises and once established, will be reviewed and updated regularly. Clear efficiencies demonstrated from the work done to-date on the first Joint Contingency Plan include:

- Clearly defined communication lines, mechanisms and responsibilities, both internal and external
- Agreed trigger and contact points for incident escalation using a Gold / Silver / Bronze model
- Agreed command centre locations, aligned to incident scale
- Joined up protocols for asset monitoring and inspections
- Sharing of risk assessments, including asset vulnerability data
- Strengthening of relationships through the consultation and desk-top exercise processes

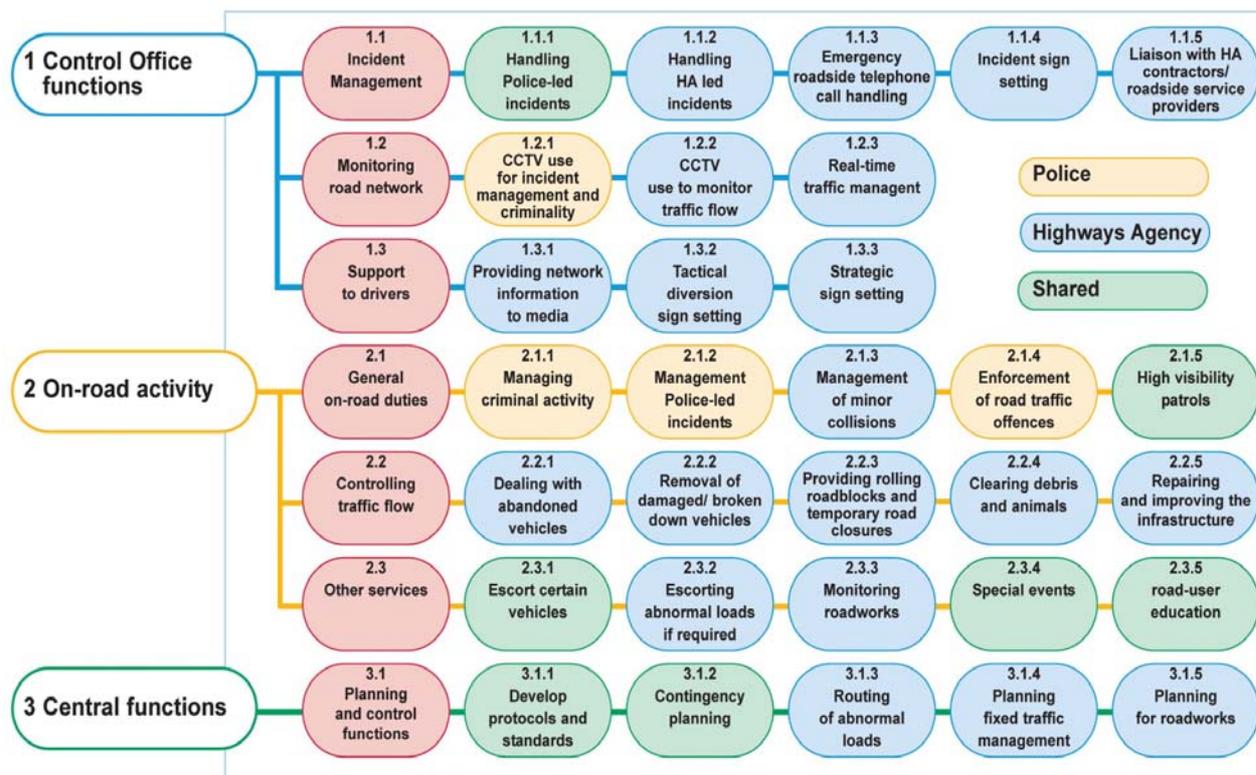
5.0 Incident Management

5.1 General

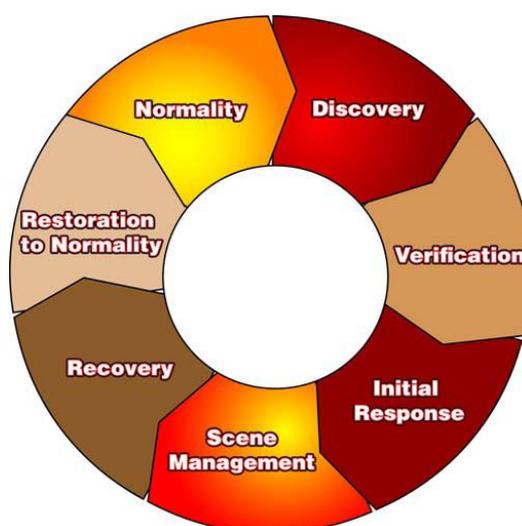
Incidents on the highway happen at random with little or no advance warning. They vary widely in scale, severity and complexity from debris on the carriageway, through to major incidents such as a multi-vehicle collision. The threat to public safety, congestion, delay and secondary incidents are all unwelcome consequences of these events.

In these circumstances, each of the responder organisations called upon to deal with the incident will have their own processes and procedures which enable them to effectively, efficiently and safely carry out their functions and responsibilities. The objectives, processes, response times and methods of operation of each organisation quite legitimately differ and they will encounter separate challenges in the face of shifting needs to achieve a co-ordinated and effective outcome.

Achieving a safe, effective and efficient resolution of an incident requires the completion of separate and distinct activities, each of which may be the responsibility of a specific organisation. The documents used by the HA to coordinate these separate functions are the 'National Guidance Framework v3 Dec 2009' (NGF) and the 'Traffic Incident Management Guidance Framework' (TIMGF) – January 2009. They hold strategic agreements between the Highways Agency and the Association of Chief Police Officers (ACPO), with an extract below from the National Guidance Framework showing the functional split between the HA and the Police when dealing with incidents on the network.



Communication, co-ordination, collaboration and co-operation are the keys to successful resolution of incidents. This requires a clear understanding of each others' roles and responsibilities, to have trust in one another and to transfer command and control of an incident when appropriate to do so. To ensure that this understanding is embedded within both HA staff, the Police and other involved parties, the HA produces and distributes an Aide Memoire to the Traffic Incident Management Guidance Framework. This includes a defined Traffic Incident Management (TIM) Timeline Cycle as illustrated below, which defines the key roles of the HA and the Police at every stage of dealing with an incident.



5.2 HA Role in Managing Incidents on the Strategic Road Network

While the police and other emergency services will continue to be the primary lead at significant incidents, such as serious or fatal road traffic collisions or spilled hazardous chemicals, the HA has a key role to play in managing less serious incidents.

Where the circumstances of the incident do not require a police response and there is no injury, alleged offence or a threat to public order or safety; the HA will lead the management of incidents, with the Traffic Officer Service (TOS) overseeing that activity. In this context the term HA includes all of the internal and contracted resources it has at its disposal, including its Incident Support Units (ISUs) and National Vehicle Recovery capability.

When managing incidents, the Traffic Officer Service operates to:

- Ensure the safety of road users and incident responders
- Minimise the effect of an incident on the travelling public
- Ensure rapid and safe removal of obstructions
- Manage congestion

- Restore the network to normal conditions as quickly as possible
- Assist vulnerable road users
- Provide information to road users

The HA also manages traffic around police led incidents, instigating strategic message signing, appropriate diversions, liaising with other road service providers, restoring the network after clearance and identifying and promulgating any lessons learned.

On average, the Traffic Officer Service attend 375 live lane incidents a day nationally. Last year (2010/11) they arrived at 82% of all incidents within 20 minutes (national target 80%), clearing all lanes within 30 minutes in 87% of occasions (national target 80%).

At present, the TOS only operates on Motorways and key Trunked 'A' Roads in England. Therefore, not all of the trunk road network is served. When incidents occur on the sections of trunk road network not patrolled by the TOS, the HA will ordinarily be represented by its ISUs. When police are in attendance, ISUs will provide appropriate support.

To restore the strategic road network to normal conditions the HA has the capability available to deploy substantial resources in response to incidents in the form of plant, people and machinery. This capability delivered the interim engineering solution allowing capacity to be restored on the M1 following the recent fire.

5.3 Information, Media and Diversion Routes

The HA's National Incident Liaison Officer (NILO) team notify and advise senior management, press officers and its key partners of serious incidents on the network. They are responsible for the identification and dissemination of incident data to the correct personnel and key supporting organisations to ensure incidents are dealt with as quickly and efficiently as possible. Their links to traffic media also ensure that messages quickly go out to the users of the network, informing them of incidents and the progress being made in dealing with them. Based at the National Traffic Control Centre (NTCC) at Quinton near Birmingham, a team of 12 operate on shift patterns to ensure that there is 24 hour cover, 365 days a year.

The HA currently has over 350 fixed Variable Message Signs (VMS) at key 'decision points' across the SRN. The signs allow the NTCC to set messages informing motorists of incidents and network restrictions and provide clear alternative diversion routes. These messages are reinforced by information made available to the media and other operational partners, such as the Traffic England website (www.trafficengland.com).

In addition to Strategic Diversion Routes, the Agency has established a national framework of Emergency Diversion Routes to help us and local highway authorities manage traffic where major incidents close sections of the SRN. These routes, agreed where possible with the relevant Local Highway Authorities, take road users off the SRN ahead of the incident and divert them along pre-established suitable local routes, before returning them to the SRN to continue their journey. These pre-planned routes are clearly signed. Maps of the routes are also provided to the TOS and ISU staff.



5.4 Acetylene Gas Cylinders

The HA has been undertaking joint research with the Fire and Rescue Service, the DfT Dangerous Goods Unit, The Association of Chief Police Officers, the British Compressed Gas Association, the Chief Fire Officers Association, the HSE, Network Rail and Transport for London into the properties of acetylene gas when a cylinder is involved in either a fire or a heavy impact-related incident. Previously, the potential threat or belief that there may be an explosion from either of these scenarios has required the Fire and Rescue Service to establish procedures requiring the enforcement of a 200 metre hazard zone perimeter around a scene until it is deemed safe, which could potentially be for up to 24 hours.

For such incidents close to the SRN, this would involve closures for the duration of the implementation of the hazard zone perimeter, creating significant disruption to road users. Recognising the implications of this, the HA has been working with the above organisations for the last few years to gather evidence to support a better understanding of the behaviour of acetylene gas and a major review of those Fire Service procedures for incidents involving acetylene.

This research has recently concluded and following Fire Service led revised procedures and cylinder tests shortly to be published and adopted, made recommendations to the Fire and Rescue Service that their procedures can in the correct circumstances, reduce the hazard zone duration from a period of up to 24 hours, to just 3 hours. This will have significant benefits to all parties and create efficiencies in dealing with such incidents in the future.

Prior to these results being known, a contract was established between the HA, Network Rail, Transport for London and the surrounding Home Counties to utilise Remotely Operated Vehicles (ROVs) similar to those used by the Military for bomb disposal. These vehicles allow Fire Service Incident commanders a 'safe access' option into the hazard zone without threat of human life to carry out remote inspections and appropriate intervention. These changes to the acetylene incident policy will now make the use of ROVs the exception, rather than the rule.

6.0 Recommendations

Incidents such as the M1 fire are rare. The Agency has a robust framework for managing incidents, from minor to severe, when they occur. It has also recognised the risk from activities on neighbouring land when implementing restrictive covenants on land agreements and using Powers of Direction to deter inappropriate new development.

The following recommendations are additional steps that will be taken by the HA to further reduce the risk and impact of such incidents.

6.1 Using Land Agreements to Deter Future Hazards

The HA can make more use of covenants restricting inappropriate activity adjacent to the network, including both securing compliance with existing covenants and attempting to establish new covenants as necessary where gaps have been identified.

Recommended actions are:

Recommendation 1

Establish and work through a priority framework for reviewing detailed lands records to identify land agreements and associated restrictive covenants on land beneath or adjacent to the priority risk locations around the network. This priority framework should be cross-referenced against other such information sources that would ensure that relevant risk locations are identified and assessed.

Recommendation 2

Where there is an identified breach of an existing covenant relating to land-use and storage, the HA should ensure that covenants are enforced to secure compliance where non compliance poses a risk to the HA network.

Recommendation 3

Where restrictive covenants do not exist, investigate with Legal and Valuation advice the possibility of negotiating new covenants restricting hazardous activity and the storage of flammable and other unsuitable materials.

6.2 Planning and Wider Legislation Recommendations

There is a need to create a firmer policy basis for issuing Directions to deter new developments that have a risk of harming the integrity of the SRN. However, this will not stop the HA continuing to make representations to Local Authorities to deter development that increases the risk of harm to the SRN. Also, the HA will work more closely with regulatory bodies that have powers to change or stop unsafe practices close to the SRN.

Recommendation 4

HA to continue to use its Powers of Direction to prevent inappropriate development adjacent to the elevated sections of the network.

Recommendation 5

Liaise with DCLG and DfT Legal about the possible inclusion of wording within the forthcoming National Planning Policy Framework about protecting national transport networks from the impacts of fires or other risks on adjacent third party land. If this is not deemed possible, incorporate such wording into the agreed review of the DfT Circular 02/2007 "Planning and the Strategic Road Network".

Recommendation 6

Where compliance with regulated working practices of legal businesses beneath and adjacent to the SRN is questionable, the HA shall make contact with the relevant regulatory bodies to encourage their investigation and possible enforcement.

6.3 Network Inspection Regimes

Existing inspection regimes and contractual arrangements with the HA's service providers do not have specific focus on the identification or recording of fire hazards.

Final recommended actions are:

Recommendation 7

Incorporate specific prompts for potential fire hazards to structures within the HA's Structures Management Information System and undertake an information campaign about the new requirement for HA and service provider staff involved in inspections.

Recommendation 8

Revise the guidelines for routine inspection of structures to specifically include fire hazard identification and implement the most appropriate option to reduce risk to acceptable levels.

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Annex A - Risk Assessment Criteria

This is a simple formula to determine the ranking for identification of critical sites. The highest identified risk score was allocated for each category.

Business type below/adjacent motorway/trunk road	Score (A)
Petrol or chemical storage	5
Other combustible materials in open storage (including agricultural storage of hay/straw)	4
Materials in closed storage, industrial building	3
General office buildings, housing or car parking	2
Open ground, river, canal, road, railway	1

Scale of occupation	Score (B)
Total occupancy or large volumes of materials	5
Medium occupancy	3
Low occupancy	1

Proximity to structure	Score (C)
Beneath structure	5
Business within 5metres of edge of structure	4
Business between 5 and 10 metres of edge of structure	3
Business between 10 and 100 metres of edge of structure	1

Structure vulnerability	Score (D)
Structure has critical components or vulnerable features such as pre-tensioned beams, post-tensioning, hinge or half-joints, steel beams or is already subject to BD79 management for its deck	5
Structure has a reinforced concrete deck	3
Brick or masonry arches	1

Risk factor (for prioritisation ranking only) $Score A \times B \times C \times D =$ Overall score

There is no determining cut-off score for potential further action. However, to establish a focus for this initial scoping study, risk bandings have been established. For the purposes of this report, scores of 125-625 are considered higher risk, 50-125 to be of medium risk and less than 50 a lower risk.

Only High Risk locations have been prioritised for further investigation .

Appendix B – HA Crisis Management Process

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