





## 11. Heavy Rescue/Urban Search and Rescue

### Description

Although the standard equipment carried on a rescue pump allows us to successfully deal with the vast majority of incidents, there remains a small number of occasions which require the use of a wider range of heavy duty rescue equipment. Such incidents include multiple vehicle road traffic collisions; large transport incidents involving commercial vehicles, trains, trams or aircraft; and industrial work place entrapments. Traditionally these types of incidents were categorised as 'Heavy Rescue'. In response to the threat of terrorist attack in the UK, principally following the 09/11 bombings in the USA, a New Dimensions programme was set up to equip emergency services to conduct Urban Search and Rescue (USAR) operations in collapsed buildings, and to respond to major non-road traffic transportation incidents such as rail or air incidents.

The UK Government's National Security Strategy identifies and categorises areas of greatest risk, typically declaring major cities as model response sites with agreed minimum response levels. These sites require dedicated resources, including USAR, to be available and ready for use in the event of a relevant incident and within specific time limits. Glasgow, Edinburgh, and to a lesser extent Aberdeen, feature within the planning assumptions for USAR response at the present time. However there is a review of UK-wide USAR resources which may have an impact on equipment and location requirements in the future.

The two categories of Heavy Rescue and USAR are not identical, but can have significant similarities in the skills and equipment required. In this regard this report will consider both within a single section which, when taken together with the previous section on Rescue Pumps, will present an overall package of rescue capability.

### Current Position

Most legacy fire and rescue services in Scotland, prior to the establishment of the SFRS, were supplied with vehicles, equipment and training by the Scottish Government to undertake USAR activities. The existing position inherited by SFRS is a confusing mixture of these resources together with dedicated heavy rescue vehicles or demountable pods which can be uplifted to scene by a prime mover vehicle.

Activity levels for these types of incidents are thankfully low, commonly following the major road networks where RTCs involving commercial vehicles account for the majority of activity, as shown in the map overleaf. Genuine USAR related incidents are rare, with only approximately 15 partial building collapses over the period of 2010-2013, of which the Clutha Bar incident was most notable.

The current position reflects the individual deployment and risk profiling of each of the 8 legacy services in Scotland, set against the constraints of the local geographical boundaries. It does not currently satisfy the UK model response sites planning assumptions; nor the strategic, risk-based requirements of Scotland as a whole. It also does not adequately consider the training requirements and capacity of the crews currently providing these resources

The relatively random nature of resource disposition at present gives an impression of an over-provision for this type of high impact but low occurrence activity. The disparity of procedures, equipment, training and qualifications of USAR personnel in Scotland, however, has prevented the declaration of full resource availability in support of UK-wide planning assumptions. For example, SFRS inherited a position whereby we have over 500 personnel trained to "tool operator" standard, with only 100 trained to the higher level of "technician". A requirement exists to redress this balance of skills, to provide a smaller cadre of better qualified personnel to fully meet interoperability expectations. Furthermore, a structured approach is required to provide, in a strategic and efficient manner, the wide range of equipment necessary and available to deal with USAR and Heavy Rescue incidents.

### What we plan to do

The future strategy for SFRS sees a “package” of rescue capability, encompassing rescue pumps, heavy rescue vehicles and USAR resources. Including increasing our footprint of rescue pumps, as already outlined, we believe that altogether this package will ensure an optimum coverage to meet the inherent risk and anticipated demand.

Dedicated heavy rescue vehicles will be stationed in the following areas, to give cover to specific risks and also to provide a strategic footprint across Scotland:

- Inverness – in recognition of the A9 trunk road corridor and the relative remoteness from supporting resources.
- Stirling – due to its strategic central location and good access to major trunk roads heading north.
- Glasgow (Easterhouse) – recognising the major transport links of the Central Belt and the particular risk presented by the Underground system.
- Edinburgh (Sighthill) – again in recognition of the greater demands and activity levels of the Central Belt, and specifically the new Edinburgh tram system.
- Dumfries - addressing the relatively high level of RTC activity on the A75 trunk road and the relative remoteness of the southern parts of Scotland.

In addition, USAR resources will be deployed from:

- Clydebank, Kilmarnock and Cumbernauld to satisfy model response planning for Glasgow and Central Belt.
- Newcraighall/Dalkeith to satisfy model response planning requirements for Edinburgh and Central Belt.
- Aberdeen and Dundee to provide suitable equity of access balanced against our capacity of stations and crews to maintain competency.

These USAR resources will also be mobilised as heavy rescue attributes should the incident location dictate, resulting in an overall picture of heavy rescue cover which satisfies all anticipated risks and demand levels.

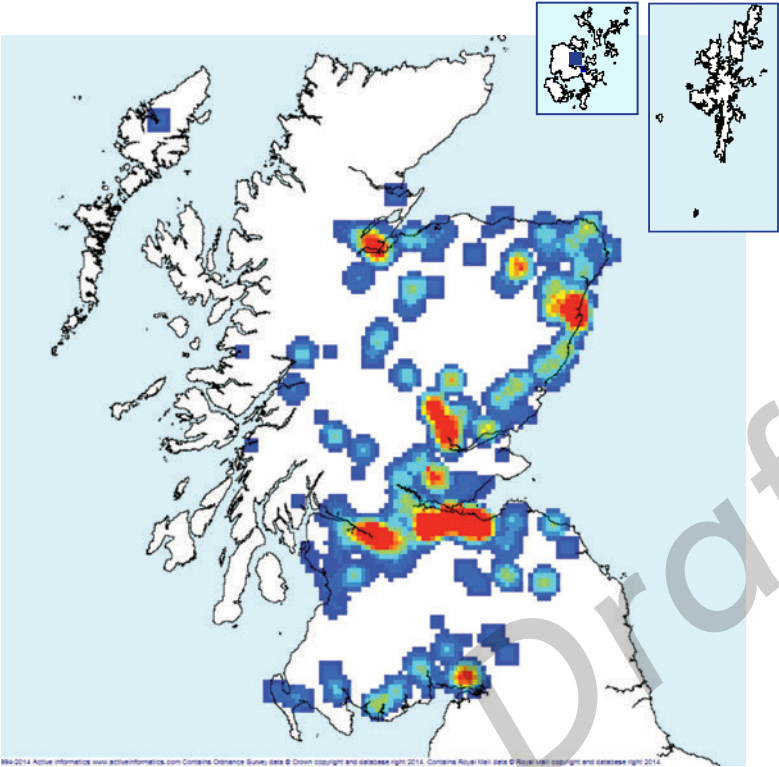
These heavy rescue resources and USAR resources are sent as a supplement to well-equipped Rescue Pumps already in attendance. Taken together with the full package of rescue pumps, this represents a significant improvement in current arrangements, with a proportionate distribution of these assets across all areas of need in Scotland.

This will ensure a balance of the provision of national coverage in line with Scottish Government expectations in relation to the communities of Scotland having equity of access to specialist resources, and also allows Scotland the capacity to respond to a USAR event within and outwith Scotland whilst ensuring resilience.

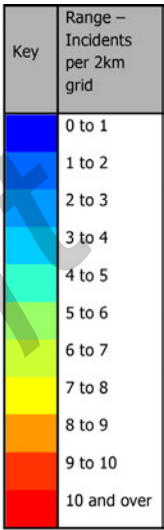
This recommended level of resilience ensures capacity for major events such as the Commonwealth Games, whilst also allowing these units to provide support for the rescue pump and heavy rescue package previously outlined, without compromising the USAR resource declaration.

These units will all be deployed using a dedicated vehicle, as opposed to the current range of deployment methods such as demountable pods. Crews will be trained to technician level as demanded by UK national resilience policy, and the resources will be deployed from stations which are not overburdened with a number of specialist resources, as at present, and can therefore devote the necessary time for training to ensure competency in this complex arena.

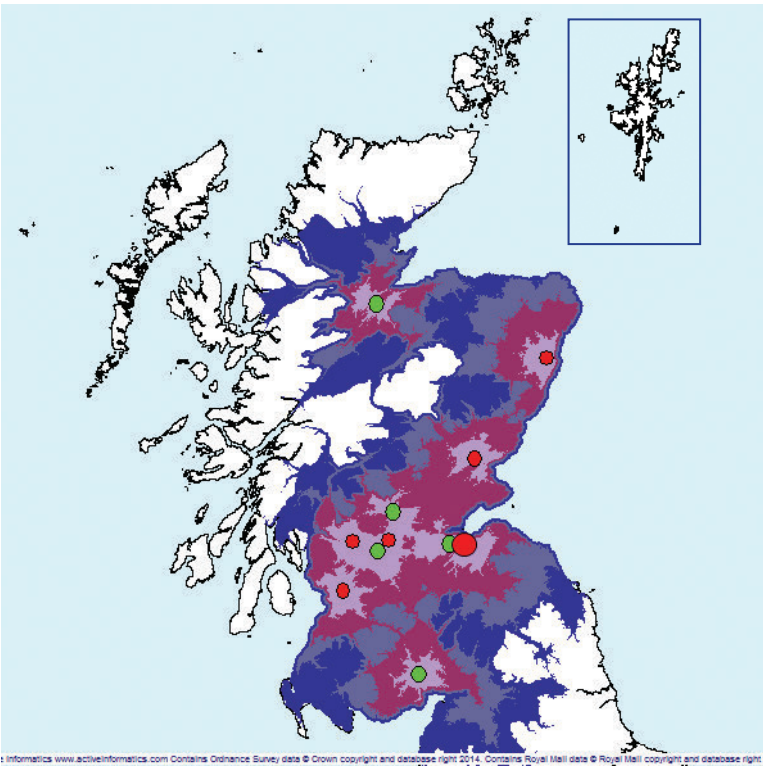
Combined Urban Search and Rescue and Heavy Rescue incident activity



The adjacent diagram shows the incident activity for large vehicle RTCs and partial building collapses across Scotland in the period 2010-2013. As the key below demonstrates this is a map of very low activity levels.



Combined Urban Search and Rescue and Heavy Rescue resource coverage



The adjacent diagram shows the coverage across Scotland that is achieved when heavy rescue resources and USAR resources are both made available for such incident types.

HEAVY RESCUE VEHICLE	
Inverness	
Sighthill (Edinburgh)	
Easterhouse (Glasgow)	
Stirling	
Dumfries	
USAR	
North Anderson Drive (Aberdeen)	
Kilmarnock	
Clydebank	
Cumbernauld	
Newcraighall and Dalkeith combined	
Macalpine Road (Dundee)	

**Key - Travel Time**

Light Purple	20 minutes	Grey	60 minutes
Dark Purple	40 minutes	Blue	90 minutes

## 12. High Volume Pumps



### Description

High Volume Pumps (HVP) and their associated equipment are capable of pumping vast quantities of water over large distances. These highly specialist resources, provided under the New Dimensions programme like Mass Decontamination, DIM and USAR, were to deal primarily with mass flooding which has shown itself to be an increasing problem in recent years, but are also effective at delivering very large quantities of water for firefighting purposes when required. The HVP and hose carrying/ laying equipment that complements it, is carried on a Prime Mover chassis to the incident ground where the crew will generally remain at the incident to operate the equipment and ensure continued reliable pumping operations for the duration.

### Current Position

There are four HVPs in Scotland, located at Elgin, Clydesmill (Cambuslang), Falkirk and Hawick. Elgin is already a prime mover station, and is also in an extremely good strategic location to cover the oil industry risk in Aberdeen as well as flooding risks in the Speyside and Inverness area. Clydesmill (Cambuslang) and Falkirk provide cover for the majority of Scotland's heavy industry including major sea ports, ship building yards and oil and chemical production. Both of these stations are also located near to the motorway network that allows rapid access to all of Scotland's trunk roads heading across the Central Belt and to the North, Ayrshire and the Borders. Hawick is a rural and relatively remote location to the South of Scotland, located only 15 miles from the border with England. Whilst there is a recognised flood risk in the Borders area as with most other areas, the siting of an HVP in Hawick, one of only 4 in Scotland, is closer to Carlisle, Penrith and Newcastle than it is to Glasgow, Stirling or Dunfermline.

### What we plan to do

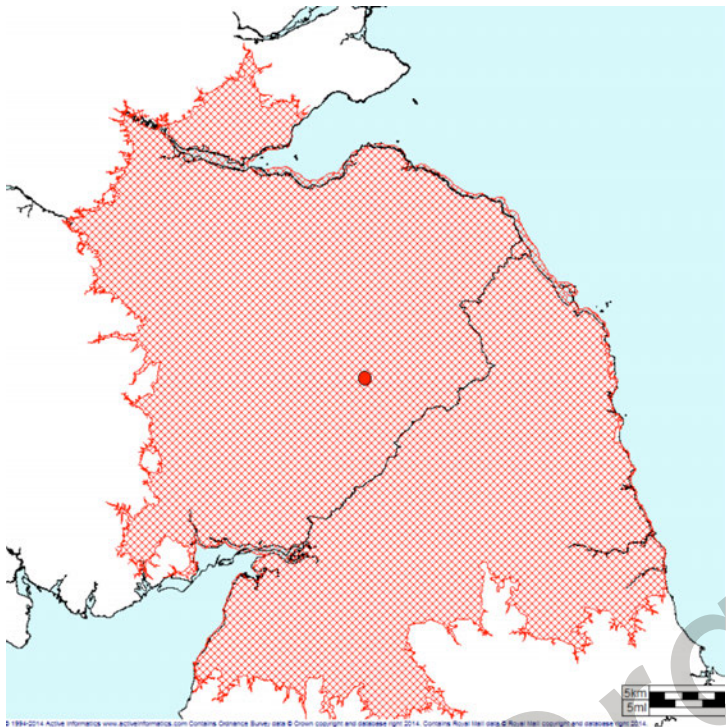
Similar to all resilience assets provided under the New Dimensions programme, the anticipated use of HVPs is classed as being low frequency but high impact. Originally provided to respond to major flooding events, their abilities to add considerable value to certain firefighting operations has widened their expected use, and are now considered a vital resource for controlling fires and to allow the cooling of large oil storage tanks such as those found at the Grangemouth oil refinery, Finnart oil terminal and Dalmeny tank farm.

The requirement to provide an HVP in response to major flooding can generally be expected as part of a long term solution to a protracted event, whereas the use of HVPs at a tank fire would require as swift a response as possible to ensure rapid intervention and reduce the risk of the incident escalating. At Grangemouth in particular, the 'domino' effect is recognised in emergency planning scenarios due to the close proximity of several large plants and high risk processes in a single site. A fire in one plant can quickly spread to neighbouring plants if rapid intervention cannot be achieved.

To reflect this, the following plans are considered to provide the best utilisation of these resources across Scotland:

- All HVPs will be located in wholtime stations, and where possible, stations without additional special resources.
- In recognition that a large tank fire at any of the above locations would require more than one HVP to successfully mount a firefighting attack and prevent a major explosion or boil over scenario from occurring, strategic locations will be used.
- The existing HVP at Hawick will be relocated to Alloa to ensure its availability to address the significant industrial risk within this area, whilst maintaining the capability to respond to flooding incidents in the Borders as required and within reasonable timescales for this type of incident.
- The remaining HVPs will be maintained in their current locations which are considered suitably placed to address the anticipated risks and with good access links to all areas.

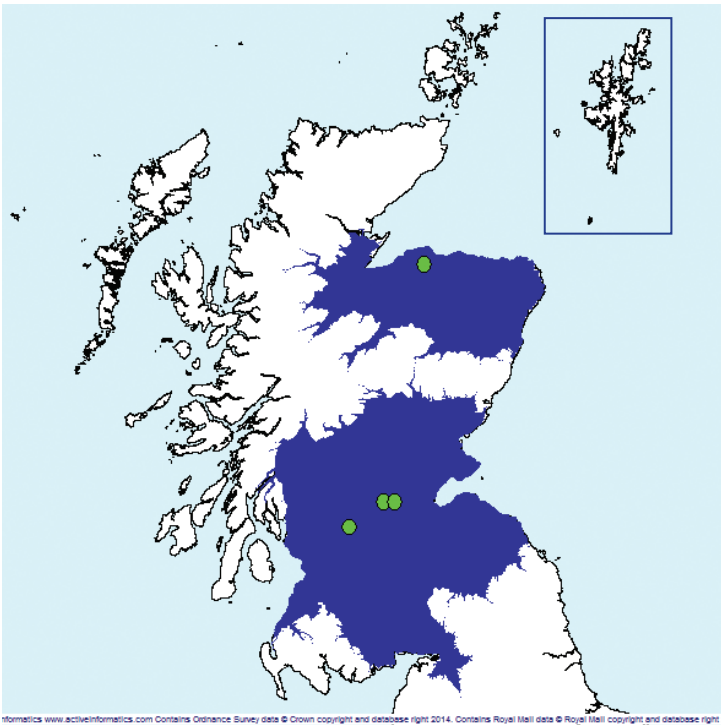




The diagram on the left shows the coverage currently achieved by a High Volume Pump located in Hawick with a 90 minute mobilising time. It can be seen that a significant part of this area is outside of the SFRS service area.

The adjacent diagram shows the coverage that can be achieved for Scotland with HVPs located at Elgin, Clydesmill (Cambuslang), Falkirk and Alloa. This distribution gives very good coverage to address Scotland's flood risk, whilst ensuring the availability of HVPs close to our major industrial fire hazards.

HIGH VOLUME PUMPS	
Elgin	
Clydesmill (Cambuslang)	
Falkirk	
Alloa	



## 13. Mass Decontamination



### Description

Mass Decontamination (MD) is the procedure used to remove contaminants from very large numbers of people in the event of industrial, accidental, or intentional contamination; by chemicals, biological, radiological material, or other substances potentially damaging to health. As with USAR and others, this equipment was supplied under the New Dimensions programme. These resources, again like USAR, form part of a UK-wide response capability which is focused on our major cities as being the greatest risk.

### Current Position

As previously discussed for USAR, the position inherited by SFRS is the legacy desire and requirement of each previous service to provide these resources within their geographical boundaries. This position takes little account of risk or overall planning. In addition, the current situation presents additional risks in terms of community and firefighter safety as crews in some areas are overburdened with complex specialist equipment which compromises their ability to train adequately for each attribute. Once again, these resources are stowed and deployed using a range of methods which lack any consistency and gives cause for concern regarding actual availability and competency.

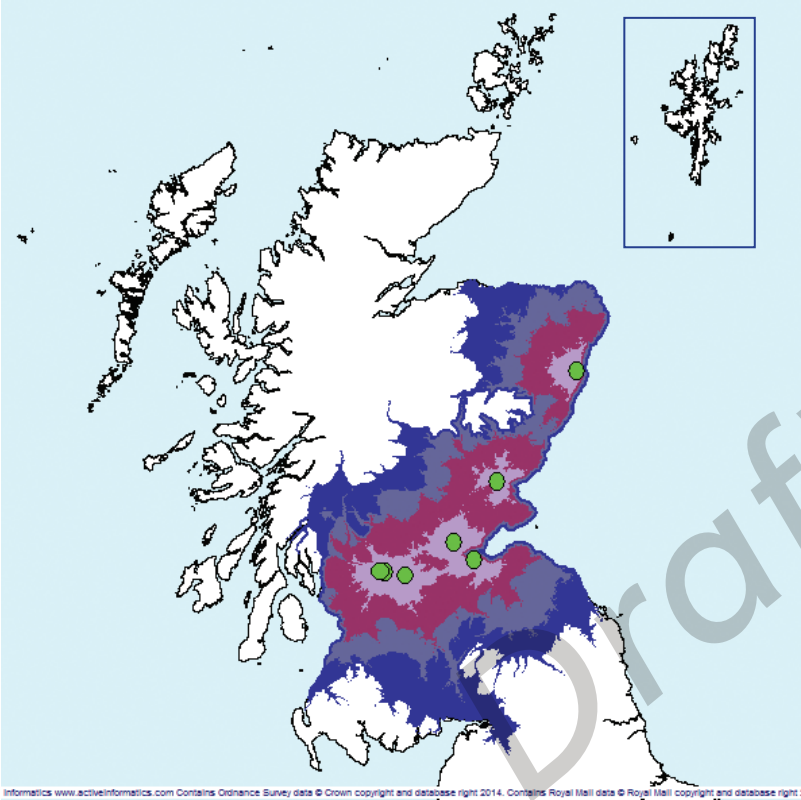
Further, the inherited position was based on a set of planning assumptions contained within a UK Government concept of operations which have recently been updated to include "interim decontamination" which places a lower expectation on the numbers of affected casualties and subsequently eases the necessary response arrangements. Interim decontamination involves the use of standard fire service equipment, including hoses and ladders, to provide a simple but effective method of decontamination for smaller numbers in the early stages of an incident. Every fire appliance and crew in Scotland already has the means to provide this form of decontamination prior to the arrival and set-up of full Mass Decontamination equipment. As already stated within the section on USAR, an ongoing review of UK-wide planning assumptions could have an impact on future resourcing and location requirements.

### What we plan to do

In line with the recommendations in the previous section under USAR, this report identifies a requirement for 7 stations to be fully trained and declared Mass Decontamination units in Scotland, in line with requirements to contribute to UK-wide planning and support. Basic principles will be adopted:





- All MD assets will be deployed using dedicated vehicles as opposed to the range of deployment options currently provided.
- Recognition is given to the implications of interim decontamination.
- Once again, training for competency is a fundamental criterion upon which the following recommendations are based, with a clear desire to avoid the existing position where stations across Scotland are expected to operate a range of specialist attributes, such as USAR and MD, together. Alternative stations have been identified to ensure an appropriate distribution model can be achieved which will provide the necessary, risk-based cover delivered by competent crews:
  - ◆ Glasgow and the Central Belt will be covered by Coatbridge, Springburn (Glasgow) and Maryhill (Glasgow).
  - ◆ Edinburgh and the Central Belt will be covered by Dunfermline and Crewe Toll (Edinburgh).
  - ◆ Central (Aberdeen) and Blackness Road (Dundee) will have units to complement and support the USAR resources strategically placed to cover the risks within Scotland's remaining cities.

Mass Decontamination - Proposed End State



The adjacent diagram shows the proposed distribution of Mass Decontamination resources across Scotland and the coverage that will be achieved.

MASS DECONTAMINATION
Central (Aberdeen)
Crewe Toll (Edinburgh)
Coatbridge
Dunfermline
Blackness Road (Dundee)
Springburn (Glasgow)
Maryhill (Glasgow)

Key - Travel Time	
	20 minutes
	40 minutes
	60 minutes
	90 minutes



## 14. Detection, Identification and Monitoring Vehicles (DIM)



### Description

In conjunction with USAR and MD above, the purpose of a DIM capability is to provide enhanced detection support, via mobile laboratory, in the event of serious chemical, biological, nuclear and radiological incidents. It also has a significant part to play in any mass decontamination incident and can support USAR, Hazmat and flooding incidents.

### Current Position

There are 4 DIM vehicles in the SFRS, all provided by Scottish Government resilience. They are currently located at North Anderson Drive (Aberdeen), Blackness Road (Dundee), McDonald Road (Edinburgh) and Springburn (Glasgow). These resources are currently deployed in a range of methods, most often by utilising flexi-duty officers to provide the vehicle and to act as Hazardous Material advisers. This commonly requires officers to travel considerable distances to uplift the vehicle and proceed to the incident, with resultant delays in deployment.

### What we plan to do

The plan is to maintain the same number of DIM vehicles, but to increase and formalise the role they play within the wider hazardous materials context, as will be discussed in the next section. The plan will follow the basic principles of:

- Retain a good geographic spread across Scotland, but follow the overarching principle of this report to ensure the vehicles are not located at stations which are potentially overburdened.
- Operate from stations with wholetime crews who will be responsible for weekly testing and maintenance of the DIM vehicle and its associated equipment. They will also be tasked with transporting the vehicle to the incident ground and providing necessary assistance in setting up equipment.
- In fulfilling the criteria above and to fit in with the national model of specialist resource distribution, DIM vehicles will be located at the following stations:

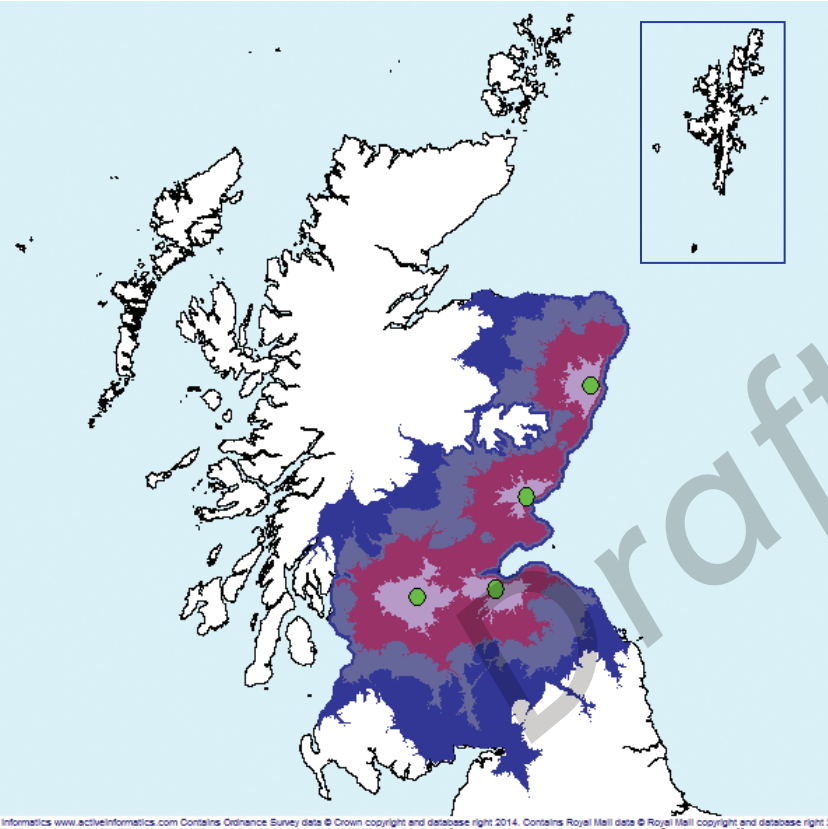
North Anderson Drive (Aberdeen)

Balmossie





McDonald Road (Edinburgh)

Bishopbriggs

Detection, Identification and Monitoring Vehicles  
- Proposed End State



Informatics www.activeinformatics.com Contains Ordnance Survey data © Crown copyright and database right 2014. Contains Royal Mail data © Royal Mail copyright and database right.

Key - Travel Time	
	20 minutes
	40 minutes
	60 minutes
	90 minutes

The adjacent diagram shows the coverage that will be achieved with the proposed distribution of DIM resources.

DETECTION, IDENTIFICATION AND MONITORING
North Anderson Drive (Aberdeen)
Balmossie
McDonald Road (Edinburgh)
Bishopbriggs

## 15. Hazardous Materials and Environmental Protection



### Description

The term Hazardous Materials (Hazmats) refers to incidents involving any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Fire services have for many years adopted plans and systems to manage such incidents through identifying the substance where possible, neutralising the hazard and protecting the environment as far as possible. This approach now overlaps substantially with the DIM arrangements detailed above, particularly where the hazardous material involved is unknown or has not been identified.

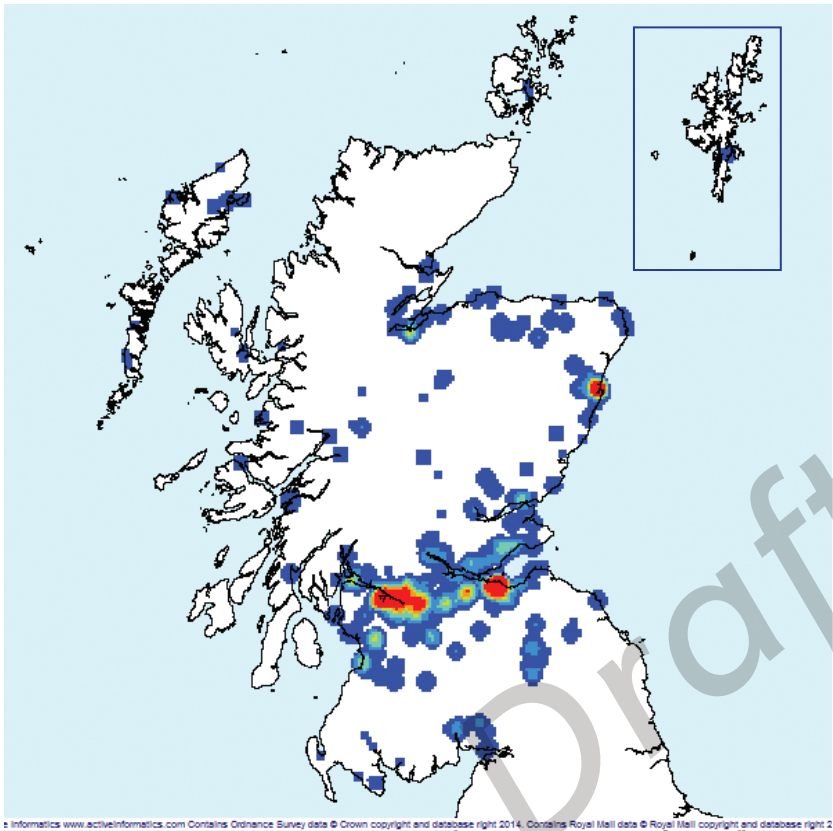
### Current Position

Again the inherited position is widely varied across Scotland, ranging from formal arrangements with external scientific advisers to provide 24/7 support on the incident ground; to less formal supporting arrangements or total reliance on service personnel with Hazmats training. The existing 4 DIM vehicles are currently supported by a total of 11 Hazmat/Environmental resources across the SFRS. Of these, 8 are demountable pod systems.

### What we plan to do

The recommendation is to formally merge the DIM and Hazmat attributes, providing an attendance which includes suitably trained officers supported by external advice where deemed necessary, to all relevant incidents. In addition to the 4 DIM vehicles already discussed, we plan to retain the 3 dedicated vehicles at Forfar, Kilsyth and Hamilton. The remaining 8 demountable pods will be rationalised to 4, strategically sited at Elgin, Perth, Dunfermline and Renfrew fire stations, to be transported as required by Prime Movers which will be fully detailed in the following section. We believe this approach will provide more than adequate cover for the risk profile and expected activity, standardising and improving our ability to manage these incidents.





This diagram shows the levels of 'Hazmat' incident activity in Scotland over 4 fiscal years (2009/10 – 2012/13).

Key	Incidents per 2km square
Blue	0 - 7.9
Yellow	8 - 15.9
Red	16 and over

HAZMAT
Elgin
Perth
Dunfermline
Renfrew