ANTI-VEHICLE MINES: Understanding the impact and managing the risk

A resource for security management
Contents

1.0 Introduction ......................................................... 2
2.0 Background ....................................................... 7
3.0 Understanding AVM incidents .................................... 12
4.0 Avoiding AVMs: The impact of access denial .................... 22
5.0 Managing the threat to humanitarian agencies .................... 33

Annex A ................................................................. 60
Annex B ................................................................. 64
Annex C ................................................................. 66
Annex D ................................................................. 68
Select Bibliography .................................................... 73
Endnotes ................................................................. 74
1.0 Introduction

11 October 2004, Save the Children UK were travelling from Hariba to Mushbat ... when they drove over [an anti-vehicle] landmine. They were driving late in the day in a single vehicle and had fuel stored in the car. The driver of the vehicle suffered burns to 20% of his body, whilst the remaining staff in the vehicle were burned [to death]. The driver was forced to walk three hours to report the incident due to lack of communications equipment in the vehicle. According to GOS military reports, military patrols had not used the area for four months due to SLA movements. Excerpt from UNMAS Sudan Incidents and lessons learned

In certain post-conflict environments, particularly where they have been used on roads, anti-vehicle mines (AVMs) present a serious threat to individuals and organisations. These mines are much larger than anti-personnel mines and are designed to disable or destroy armoured vehicles. A single AVM incident can leave a number of people dead or seriously injured. As in the example above, humanitarian agencies have suffered such incidents as they attempt to undertake life-saving projects in conflict or post-conflict environments.

The way in which organisations respond to this threat can have very wide-ranging implications for the local population. If organisations delivering aid decide that certain routes are too dangerous to travel, large populations may be cut off from basic humanitarian assistance. People have died as a result. For an aid agency, however, not making such a decision might leave it vulnerable to accusations of failing in its ‘duty of care’ if an incident were to happen. There is therefore a difficult balance that needs to be found between the humanitarian imperative to provide assistance and the risks that are accepted by an organisation’s staff. This report is intended to help people who have to strike that balance.

In many countries where AVMs are a serious problem humanitarian organisations should be able to seek assistance from ‘mine action’ agencies – those organisations specialising in landmine clearance and disposal of unexploded ordnance (UXO). Such agencies have a very important role in managing the risks associated with the anti-vehicle mine threat. They can be a source of specialist advice about the risks associated with different routes, they can provide risk education to drivers and they can use their technical resources to reduce the risks of trafficking AVM contaminated routes to such an extent that humanitarian organisations can responsibly start using them again.

There are serious limitations though to the ability of mine action agencies to make the risks of AVMs go away. It is increasingly recognised that the best use of mine action resources might be to ‘reduce’ the physical threat, without claiming to have eliminated all such items. Such an approach accepts that some level of risk remains, and such roads processed by mine action agencies should never be considered ‘fully cleared’ or ‘safe’.

This makes it all the more important that humanitarian organisations take responsibility for assessing the risk of AVMs to their operations and ensure that their operational teams and headquarters’ management have agreed that this risk is acceptable.

This report is designed as a resource for security management regarding AVMs. It developed out of a realisation that in certain environments contaminated with AVMs, humanitarian organisations have had little to guide them either in understanding the possible impacts of the threat, managing and reducing the risk that AVMs presented, or in liaising with a range of specialist actors offering sometimes conflicting advice. Tools for management decision making on the issue have been very limited, whilst the results of such decisions are extremely important.

The decision not to use certain roads due to the suspected threat from AVMs can have a very severe impact on communities that are dependent on humanitarian assistance. Although this impact is rightly identified as a direct consequence of the presence of AVMs, the decision is ultimately made by security coordination bodies and
humanitarian organisations in an effort to avoid the risk presented by these weapons. As such, there is a need for the security management processes that lead to this decision to be clear, consistent and justifiable with regards to the humanitarian consequences of suspending assistance to vulnerable populations. Good security management on this issue is not only about reducing risk to agency staff – it is also about ensuring that all feasible measures have been taken to avoid unnecessary suffering for the civilian populations aid agencies are trying to assist.

This report fits within the developing literature of security management good practice. It is not intended as an introduction to security management but recognises that general security management good practice is a key requirement for managing this specific risk effectively.

The first half of the report is divided into the following sections:

- **Background** providing a brief overview of AVMs and key risk management terms as used in the report, along with an information box outlining some key myths and misconceptions regarding AVMs.
- **Analysis of AVM incidents** as a base of information for understanding when, where and how AVM incidents occur.
- **Analysis of the impact of ‘access denial’** examining the how efforts to avoid AVM incidents can result in populations being denied humanitarian assistance.

The second half of the report provides materials to support humanitarian organisations that must work in AVM contaminated environments. Specifically it covers the following:

- **Security management good practice** highlighting that an organisation’s approach to security management in general will have an important role in the management of AVMs as a specific threat.
- **Evaluating the risk from AVMs** this section discusses indicators regarding the threat of AVMs and the vulnerability of an organisation. It provides suggestions for the sorts of information that might inform a risk assessment in relation to AVMs.
- **Reducing the risk** looking at some practical measures that can be taken to reduce risk. These include general operating procedures, possible specialist vehicle protection and considerations regarding restructuring operations to avoid areas of threat.
- **In the event of an AVM incident**
  This information box provides some practical advice and guidelines on what to do if your vehicle, or a vehicle with which you are travelling, is involved in an AVM incident.
- **Old mine or new mine?**
  This information box looks at some of the issues surrounding the reporting of AVMs as ‘new mines.’ It highlights some of the reasons why this claim may be more prevalent than the reality, and present some specific options for reducing risk if new mine laying is a possibility.
- **External assistance** this section provides advice on working with security coordination bodies and specialist mine action organisations. In many environments these bodies may be a key source of advice and guidance. However, organisations need to take responsibility for the risks to which they expose their staff. This means being able to ask the right questions of external bodies – and evaluating whether the answers received are adequate.
A set of Annexes also provide additional information on:

- Vehicle protection against AVMs
- Mine action options for reducing the threat of AVMs
- Non-technical assistance the mine action sector can provide
- Suggested practices for the conduct of route assessments by mine action organisations.

The approach taken to security management in this report highlights the following key issues:

- General security management good practice is proactive and should help to identify AVMs as a specific threat. Where AVMs are a threat they need to be evaluated and addressed through specific mechanisms.

- Every organisation needs to take responsibility for the risks to which it exposes its staff. Even if working under collective security arrangements individual organisations have a responsibility to have scrutinised the processes used and evaluated that the advice being given is appropriate.

- It is important to consider the effects of any risk management decisions on the local population. Good security management on this issue is not only about reducing risk to agency staff – it is also about avoiding unnecessary suffering for the civilian populations aid agencies are trying to assist.

- Although AVMs are often addressed by specialist mine action agencies this does not mean humanitarian organisations do not need to evaluate the risks for themselves. Seeking advice is vital – but managers need to evaluate the quality of the advice they are being given.

- When evaluating the possible impact of an incident it is important to look beyond immediate casualties and understand wider ramifications: impact on morale of all staff; possible suspension of activities by other organisations; possible legal scrutiny of how the accident happened.

- Risk assessments and risk management responses need to be undertaken as a team, they need to be documented and staff need to explicitly understand any residual risks that are being accepted.

- Although every effort can be taken to limit risks, there is always the possibility that an incident will occur. Agencies need to be prepared for the worst case scenario, which means ensuring training has been given and procedures are in place and fully understood with regards to what to do in the event of an AVM incident. It is important to remember that such preparedness needs to be put in place for new staff and practiced by all staff.
Additional materials and training resources

Based on this report Landmine Action has developed materials for AVM security management training as a component of broader security management.

For additional materials, contact:

Landmine Action
89 Albert Embankment
London SE1 7TP

+44(0)20 7820 0222
info@landmineaction.org
# Glossary of Common Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSO</td>
<td>Afghanistan Non-Governmental Safety Office</td>
</tr>
<tr>
<td>AVM</td>
<td>Anti-Vehicle Mine</td>
</tr>
<tr>
<td>APM</td>
<td>Anti-Personnel Mine</td>
</tr>
<tr>
<td>CNIDAH</td>
<td>National Inter-sectoral Committee for Demining and Humanitarian Assistance (Angola)</td>
</tr>
<tr>
<td>DfID</td>
<td>Department for International Development (UK)</td>
</tr>
<tr>
<td>ECHO</td>
<td>European Community Humanitarian Office</td>
</tr>
<tr>
<td>GICHD</td>
<td>Geneva International Centre for Humanitarian Demining</td>
</tr>
<tr>
<td>HMA</td>
<td>Humanitarian Mine Action</td>
</tr>
<tr>
<td>ICRC</td>
<td>International Committee of the Red Cross</td>
</tr>
<tr>
<td>IDP</td>
<td>Internally Displaced Person</td>
</tr>
<tr>
<td>IED</td>
<td>Improvised Explosive Device</td>
</tr>
<tr>
<td>IOM</td>
<td>International Organisation for Migration</td>
</tr>
<tr>
<td>ISAF</td>
<td>International Security Assistance Force</td>
</tr>
<tr>
<td>JMC</td>
<td>Joint Military Commission</td>
</tr>
<tr>
<td>LIS</td>
<td>Landmine Impact Survey</td>
</tr>
<tr>
<td>MAG</td>
<td>Mines Advisory Group</td>
</tr>
<tr>
<td>MRE</td>
<td>Mine Risk Education</td>
</tr>
<tr>
<td>MSF</td>
<td>Medicins sans Frontieres</td>
</tr>
<tr>
<td>NGO</td>
<td>Non Governmental Organisation</td>
</tr>
<tr>
<td>NPA</td>
<td>Norwegian Peoples Aid</td>
</tr>
<tr>
<td>OCHA</td>
<td>Office for the Coordination of Humanitarian Affairs</td>
</tr>
<tr>
<td>SAC</td>
<td>Survey Action Centre</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
</tr>
<tr>
<td>UNDSS</td>
<td>United Nations Department of Safety and Security</td>
</tr>
<tr>
<td>UNMACA</td>
<td>United Nations Mine Action Centre for Afghanistan</td>
</tr>
<tr>
<td>UNMAO</td>
<td>United Nations Mine Action Office (Sudan)</td>
</tr>
<tr>
<td>UNMAS</td>
<td>United Nations Mine Action Service</td>
</tr>
<tr>
<td>UXO</td>
<td>Unexploded ordnance</td>
</tr>
<tr>
<td>UNHCR</td>
<td>United Nations High Commission for Refugees</td>
</tr>
<tr>
<td>WFP</td>
<td>World Food Programme</td>
</tr>
</tbody>
</table>

Mine protected Save the Children UK Land Rover, Huambo Angola. Save the Children UK adopted mine protected Land Rovers following a near miss with an AVM in Huambo in October 2002.
2.0 Background

This section is designed to provide an extended reference section regarding key terms, concepts and technologies.

2.1 Anti-vehicle mines (AVMs)

Anti-vehicle mines are sometimes also called anti-tank mines – we use the former term in this report but make no particular distinction between them. Most AVMs are constructed in such a way that they are likely to be activated by a vehicle driving over the mine (rather than by a person stepping on it).

2.1.1 History and patterns of use

AVMs have their origins in World War I where they were developed to stop armoured fighting vehicles, such as tanks. During World War II they came to be used in large numbers. In state doctrine they are often for use as fixed barriers (such as border minefields or perimeter defence minefields around towns.) However, as early as World War II they were also deployed during battles to provide a more flexible response to the movement of enemy armour.¹

As part of a fixed barrier, AVMs are generally buried beneath the ground, however when used flexibly on the battlefield it is recognised that AVMs do not need to be buried in order to be effective.²

The period since World War II has seen increased development and production of AVMs with only a very small metal content, making them difficult to locate once buried.

Post-World War II AVMs have been used in a wide range of conflicts. With the proliferation of intra-state conflicts, AVMs were of particular utility for non-state actors against the more mechanised forces of the state. For the state forces, often fighting against an enemy with little or no substantial armour, AVMs were generally of limited utility. However, for non-state actors, AVMs provided a capacity to attack military convoys and disrupt transport infrastructure without expending substantial resources.

The more extensive and widespread the use of AVMs the more difficult the problem is likely to be to address. Conflicts which have created extensive AVM contamination have often been long and drawn out, involving separate but overlapping phases of fighting taking place over decades. As a result large numbers of the weapons were used, generally by poorly developed military infrastructures with limited training, little ability to retain accurate information and very limited commitment to such a task.

The following types of deployment have been most common:

- **Barrier minefields**: large mined areas placed around key military and economic infrastructure such as electricity plants, railroads, airstrips and military bases.

- **Defensive minefields**: placed around large towns under siege from opposition forces or on which an attack is expected.

- **Bridgehead minefields**: placed around key bridges either to prevent attacks taking place over bridges, to create hazards at a choke point, or to hinder their reconstruction afterwards.

- **Route denial**: used to prevent opposition forces utilizing a road for access, either to engage in military attacks or to provide logistical support to military deployments.

- **Ambushes**: sporadic mining of roads to ambush convoys.³

In many conflicts it was common for records to be kept by individuals responsible for certain sections of road, as 'mental maps.'⁴ One mine action operator in Sudan observed that:
“There are no records. Typically those who laid them are told to guard the mine. When they die or move, the information goes with them.”

A member of the Sudanese Armed Forces stated that although they did have maps, they “were not accurate... they were usually made in a rush and were ‘emergency maps’.”

With barrier minefields, defensive minefields and minefields around bridges it is generally possible to obtain information about the approximate location of the mined area, if not its exact perimeter and minefield pattern. Even if no records exist the purpose of the minefield is linked to certain geographical features which provide clues to its likely location. The use of AVMs on roads, for route denial and ambushes, presents a far greater problem.

AVM use on roads often results in relatively low numbers of items spread across an extensive road network. This combination of low density of items combined with large suspect areas presents a uniquely difficult problem for mine action operators. There is currently no way for mine action organisations rapidly and effectively to determine for certain if suspect routes are actually free from AVM threats – or to rapidly find and destroy mines where they are present.

2.1.2 Additional complications

Several specific issues increase the technical complexity of dealing with the AVM threat:

- **Low metal content mines:** although some anti-vehicle mines are relatively easy to detect as they have large metal casings others are made almost entirely of plastic. Whilst it may be possible to detect these mines the process will be extremely slow.

- **Deep buried mines:** mines may be deeply buried either as a deliberate tactic or because of soil movement over time. Such mines might be too deep for conventional detectors to locate but will become a threat if the road surface degrades sufficiently for vehicle pressure to reach them.

- **Track and verge:** The threat from AVMs does not lie only on the road itself, but in many cases devices have been planted along the verges of roads. Whilst different systems can and have been developed to locate mines on the road itself, these are not always compatible with the identification of mines off the main body of the road.

- **Booby traps and anti-handling devices:** AVMs may be booby trapped or have in built anti-handling devices that mean the mine can be activated by the contact of a person. These are a particular threat to mine clearance personnel.

- **Stacking and boosting:** AVMs are sometimes laid in multiples, known as ‘stacking,’ or have additional explosives added to them such as rockets or mortars, known as ‘boosting’, in order to increase the blast size and counter armoured vehicles. This can cause substantial damage to vehicles even when they have been designed and proven to withstand AVM blasts.

2.1.3 Types of AVM

AVMs can be categorised by their method of attack, by their fusing mechanism and by their means of delivery:

**Method of attack**

- **Blast mines**

  Blast mines rely on the blast effect of the main explosive charge (normally 5–7kg) to incapacitate vehicles. These mines are usually activated by the pressure of the vehicle driving over the mine. The blast effect is normally devastating to non-armoured vehicles. Damage to medium size armoured vehicles is usually contained to the wheel stations or tracks. The shock effect transferred to the hull can cause injury to occupants, especially if the hull is penetrated.
Blast AVMs can be made more powerful still by stacking two or more mines together.

**Shaped charge mines**

“Shaped charge” mines focus the blast effect in order to make it more powerful. These mines have a more effective armour-piercing capability and may be capable of penetrating even heavily armoured vehicles.

**Off route mines**

Off route mines are designed to detonate next to a vehicle rather than underneath it.

**Fusing mechanism**

- **Pressure activated**
  Most AVMs are activated by the pressure of a vehicle driving over the top of the mine. The amount of pressure needed to detonate the mine can range from 50–500kg.¹³

- **Tilt rods, trip wires, break wires and scratch wires**
  Some AVMs can be detonated by a vehicle (or in some cases a person) making contact with a rod, wire or other device that is attached to the mine.

- **Other sensors**
  Some more modern AVMs are detonated by sensors that detect the acoustic or the seismic signal of a vehicle.

**Means of delivery**

- **Manually emplaced**
  Most AVMs can be placed by hand. Traditionally this has involved burying the mine so that it is not visible.

- **Mechanically emplaced**
  Some mines can be laid by vehicles. These systems may bury the mine or may leave the lying on the surface.

- **Remotely delivered**
  Some AVMs can be delivered remotely – usually by rocket or artillery. These mines will usually lie on the surface and may be referred to as ‘scatterable mines.’

### 2.2 General risk management terms and concepts

- **Threat**
  ‘Threat’ refers to security hazards in the operating environment, mostly external to the organisation and the result of human agency (as opposed to health and safety issues.)

- **Vulnerability**
  ‘Vulnerability’ is the degree of exposure of an organisation to these threats, determined by a range of internal factors including mission in context and competence at managing risk and programmes.

- **Risk**
  ‘Risk’ is a function of both the threats and agency vulnerability to them. The overall ‘level of risk’ is determined by exposure – the likelihood of encountering the threat – and the impact of that incident, should it occur.

- **Risk assessment**
  ‘Risk assessment’ is a structured process for evaluating the number, and level, of security risks an organisation is running. It is built upon both threat and vulnerability assessments. The risk assessment process should be conducted as a team.

- **Residual risk**
  ‘Residual risk’ is the risk that remains once all reasonable security management processes and plans have been put in place or undertaken. Based on a risk assessment, processes need to be developed that work to reduce both the likelihood of incidents and the impact of an incident should one occur.
Tolerable risk

‘Tolerable risk’ is a level of residual risk that agencies decide is acceptable. The acceptability of this level of risk must be evaluated in qualitative and subjective terms by the staff involved in the risk assessment. The level of risk accepted should be explicitly understood by both the agency and staff directly involved.

Residual risks that emerge after security management processes have been implemented may or may not be considered ‘tolerable’ for the agency concerned. If they are considered unacceptable then the agency should suspend or revise its operations.

Risk management

‘Risk management’ refers to the overall process of analysing risk (risk assessment), implementing risk-reduction measures and assessing whether the level of residual risk is tolerable to the organisation as a whole.

Whether a residual risk is tolerable or not depends on the nature of the humanitarian mission on which an individual agency is engaged.

If the mission is considered life-saving then a higher level of risk may be tolerated. However, decisions to this effect need to be explicitly documented and clearly understood – in particular by those who will be most exposed to this risk. Good practice suggests risk assessment and management processes be undertaken as a team. Typically, teams in the field location, the field management location and the international HQ will have different perceptions of what is and is not tolerable. These differences need to be negotiated and resolved.

In some situations (such as when working under collective security arrangements) agencies may lose control of their ability to determine the parameters of acceptable risk for themselves. In such situations tensions can arise between organisations with different perspectives on the humanitarian need for their work and the risks that are appropriate to meet that need.
ANTI-VEHICLE MINES: MYTHS AND MISCONCEPTIONS

So prevalent were certain beliefs amongst UN and NGO staff interviewed in the research for this report that it is worth highlighting here five specific points regarding AVMs that seem to need special clarification.

Myth Anti-vehicle mines and anti-personnel mines are basically the same thing.
Reality In terms of security management there are big differences that mean these threats must be treated separately. The impact of an AVM incident is likely to involve a destroyed vehicle and all occupants killed or very severely injured. AVMs are likely to be found in different places and their effect on the planning and management of operations can be very different.

Myth "Ballistic blankets" protect against anti-vehicle mines.
Reality Ballistic blankets, fitted inside many aid-agency vehicles only reduce the risks associated with certain small anti-personnel mines – they offer no protection against an AVM.

Myth A mine protected vehicle is the same as an armoured vehicle.
Reality Customised armoured vehicles may provide protection if small arms fire is a serious risk but evidence from Afghanistan suggests that these vehicles are still very vulnerable to anti-vehicle mines.

Mine protected vehicles, on the other hand, have special protection on the underside of the vehicle. This might be a ‘blast plate’ fitted to a regular vehicle (such as a Land Rover) or it may be a specialist vehicle with a v-shaped hull designed to provide this protection.

Myth Using a mine protected vehicle makes people take more risks.
Reality One of the most common arguments against using mine protected vehicles was that such protection made drivers more reckless. However, such arguments are not generally based on any evidence. The use of mine protected vehicles, as with any technical response to security management, needs to be accompanied by training, standard operating procedures and management oversight.

Myth Roads used by local people are safe.
Reality Organisations working in an AVM contaminated environment should respect local fears but question local confidence. Roads that are not trafficked by local people should clearly be avoided; but don’t assume that roads that are being driven by local people are risk free or ‘safe’. Whilst evidence of local opinions and practice is an important part of an effective risk assessment it needs to be compared with other background information and evidence.
3.0 Understanding AVM incidents

- AVMs have been used in numerous countries and conflicts, but their impact is very different between these locations.
- AVM incidents usually involve people travelling in a vehicle and result in multiple casualties.
- AVM incidents can cause a range of complex and serious injuries. Mortality rates examined here are between 20–40%.
- There is a lack of data on AVM casualties. Available data examined here records more than 1,500 casualties from 5 countries/areas over the last 5 years.
- In post-conflict environments the great majority of casualties are civilians.
- The great majority of casualties are men (over 90% in the countries examined here for which data was available).
- Only a small proportion of casualties are children.
- Personnel from a range of international humanitarian organisations have been amongst the casualties.
- Incidents increase during periods of post-conflict normalisation, when other security threats allow people to travel more freely.
- Incidents often increase in the wet season.
- It is important to distinguish between incidents caused by new mines and incidents caused by old mines. This distinction should be approached with great caution; it is vital to developing a good risk-management response but strongly held local opinions may result from different agendas.
- Above all else, AVMs are particularly problematic where they have been used on roads.

3.1 Why do we need to understand AVM incidents?

Understanding AVM incidents is critical to evaluating the likely impact of such incidents and to identifying certain common trends that suggest when and where AVM incidents are more likely. Both of these are vital to effective risk management.

3.2 Where have AVMs been used?

A global survey of anti-vehicle mine impact undertaken by Landmine Action and partners for the period 2002–2003 reported that AVM use was suspected or confirmed in the following areas:

- Afghanistan, Albania, Angola, Azerbaijan and Nagorno Karabakh, Belarus, Bosnia and Herzegovina, Burundi, Cambodia, Chad, Chechnya, Chile, DR Congo, Croatia, Djibouti, Ecuador, Egypt, Eritrea, Estonia, Ethiopia, FYR Macedonia, Georgia and Abkhazia, Greece, Guatemala, Guinea Bissau, Honduras, Hungary, India, Iran, Iraq, Israel, Jordan, Kenya, South Korea, Kosovo, Kuwait, Lebanon, Libya, Lithuania, Mauritania, Mongolia, Mozambique, Morocco, Myanmar, Namibia, Nepal, Nicaragua, Nigeria, Oman, Pakistan, Palestinian Territories, Philippines, Poland, Russian Federation, Rwanda, Serbia and Montenegro, Somalia, Somaliland, Sri Lanka, Sudan, Syria, Tajikistan, Thailand, Tunisia, Turkey, Uganda, Ukraine, Vietnam, Western Sahara, Yemen, Zimbabwe.

The nature of AVM contamination is very different between these different countries. In some, AVMs are a long-standing historical problem from World War II. In others AVMs are strictly limited to specific border minefields. Some countries experience ongoing use of AVMs as a deliberate strategy for disrupting national infrastructure. The impact of AVMs can range from almost negligible to very severe depending on a wide range of factors.
3.3 Direct impact: deaths and injuries

The direct and immediate impact of AVMs is death and injury. In this section we draw on sets of casualty data regarding AVM incidents in order to identify common features of such incidents. It should be noted that these data sets are compiled in different ways and none of them is likely to capture the full level of casualties even within the areas that they cover. However, an examination of such data allows us to identify certain key issues which are important to understanding both the direct and the structural impact of AVMs.

Anti-vehicle mine accidents usually occur when a vehicle in motion drives over a mine. The likely effects of an anti-vehicle mine strike were described by the UN Department of Safety and Security (UNDSS) as follows:

The large blast from an AVM will destroy most light vehicles... If struck in the front, the engine may be displaced completely, flooring and firewall will be destroyed, and the vehicle will be lifted off the ground. Severe fragmentation from metals and plastic will occur and the vehicle will roll over or crash if in motion. Personnel not wearing seatbelts will be driven up by the blast into the roof of the vehicle, causing severe, if not fatal, head and neck injuries. Some AT mines have a shaped charge, which is designed to penetrate the armoured steel plating of main battle tanks.

The forces involved in such incidents are extreme. The effects combine those of a road traffic accident with the blast and fragmentation of the mine, and an increased likelihood of the vehicle being thrown in the air, landing on its roof or rolling.

3.3.1 Multiple casualties

As a result of these powerful forces acting on a vehicle multiple deaths and injuries are common in a single incident. This is made more likely in countries where large numbers of people may crowd onto a single vehicle. As was noted in Afghanistan:

"It is not unusual to read about a single incident with a minibus going over an AVM and 12 people dying." Data from Afghanistan, Cambodia, Eritrea and south Sudan all points to an average number of casualties per incident that is greater than two. In all of these locations incidents had occurred with 10 or more casualties.
3.3.2 Types of injuries and mortality rates

AVM incidents can cause a wide range of complex traumatic injuries. These can include multiple traumatic amputations, internal injuries caused by blast including damage to hearing, puncture wounds caused by fragmentation, whiplash injuries, severe burns and eye injuries. An analysis of AVM casualties during the conflict in Croatia, published in the journal *Military Medicine*, found the following injuries:

- massive tissue destruction and traumatic amputation of the upper leg... traumatic amputation of both upper legs as well as a ruptured liver.
- traumatic amputation of the lower leg accompanied... by fractured [heel bone] of the opposite leg, and... eye injury.
- the driver... lost both of his eyes.

One of these injured underwent [abdominal surgery] because a large stone crashed into his abdomen, [causing internal injuries].

[Heel bone] fractures... fractured tibia... fracture of the femur... fractures of both [heel bones].

- fractured [jaw]... a fractured [upper jaw]... cranium fractures... brain prolapse.

Of 42 patients sustaining antitank mine injuries, 12 died (29%). Drivers, as well as the person sitting beside them, were most frequently among the dead... cause of death was a cranium fracture with prolapse of the brain in six patients and a massively crushed chest in two patients. One victim with a thorax wound died because of [blood loss] from the ruptured thoracic aorta. Two died due to [blood loss] after severe injury and traumatic amputation of both lower limbs, and one died due to [blood loss] after a traumatic femoral amputation.

There are numerous factors that can affect the chances of survival of individuals involved in an AVM incident in a vehicle. These include the type of vehicle (including whether it has any purpose-built mine protection), whether the detonation is on the inside or the outside of the wheel, whether it strikes a front wheel or a back wheel, whether the vehicle is travelling into or away from the blast.

Also important are first aid received at the scene of the incident, ability to call for assistance, the location of the incident in relation to emergency health-care and the quality of any such care that might be available. In many post-conflict environments the standards of healthcare in remote locations are very low.

The following table gives an indication of the proportion of casualties that died as a result of AVM incidents in different environments:

<table>
<thead>
<tr>
<th>Country</th>
<th>Mortality rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>31%</td>
</tr>
<tr>
<td>Cambodia</td>
<td>38%</td>
</tr>
<tr>
<td>Croatia</td>
<td>29%</td>
</tr>
<tr>
<td>south Sudan</td>
<td>47%</td>
</tr>
<tr>
<td>Eritrea</td>
<td>22%</td>
</tr>
</tbody>
</table>

By comparison anti-personnel mines in the same data for Afghanistan present a mortality rate of 18.7% and south Sudan 22%. 


3.3.3 How many people are being killed and injured directly each year?

The table below compiles data on AVM casualties (killed and injured) for a small selection of countries. Given weaknesses in data gathering on this issue in these countries, such figures can only be used as a very rough indication of the minimum numbers of casualties.

<table>
<thead>
<tr>
<th>Country</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>71</td>
<td>152</td>
<td>117</td>
<td>41</td>
<td>87</td>
</tr>
<tr>
<td>Cambodia</td>
<td>N/A</td>
<td>77</td>
<td>117</td>
<td>80</td>
<td>85</td>
</tr>
<tr>
<td>south Sudan</td>
<td>51</td>
<td>27</td>
<td>23</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Eritrea</td>
<td>42</td>
<td>23</td>
<td>39</td>
<td>9</td>
<td>28</td>
</tr>
<tr>
<td>Angola</td>
<td>270</td>
<td>72</td>
<td>132</td>
<td>38*</td>
<td>38*</td>
</tr>
</tbody>
</table>

* data from Angola 2004–2005 is from Landmine Impact Survey two-year data split equally across the two years.

3.3.4 Who are these accidents happening to?

Some of the data sets drawn upon here include both civilian and military casualties (though the military are not necessarily involved in combat operations at the time.) The proportions of civilian and military casualties as recorded in this data are as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage of casualties reported as non-national military</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>82%</td>
</tr>
<tr>
<td>Cambodia</td>
<td>97%</td>
</tr>
<tr>
<td>south Sudan</td>
<td>58%</td>
</tr>
<tr>
<td>Eritrea</td>
<td>78%</td>
</tr>
</tbody>
</table>

Although the south Sudan data includes a significant proportion of military casualties (this data includes more incidents during periods of ongoing conflict), it can be quite clearly seen that civilians make up the great majority of casualties in these countries over the last five years.

Perhaps slightly surprising is that the casualties are overwhelmingly men – over 90% in each of the three data sets that allowed this analysis.
This predominance of men amongst the casualties is even more marked than has been noted regarding unexploded ordnance casualties and it suggests that gender has a strong role in conditioning road use and, perhaps particularly with the data from Cambodia, with the use of agricultural equipment.

It is also noticeable that most of the casualties are adults rather than children.

### Comparison of adults and children amongst AVM casualties

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage of casualties reported as children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>18%</td>
</tr>
<tr>
<td>Cambodia</td>
<td>12%</td>
</tr>
<tr>
<td>south Sudan</td>
<td>6%</td>
</tr>
</tbody>
</table>

The following international humanitarian organisations are reported to have suffered AVM incidents:

- World Food Programme, World Vision, HALO Trust, International Organisation for Migration, Austrian Relief Program, International Rescue Committee, European Union Monitors, Caritas, CARE–Canada, Oxfam, DanChurch Aid, Save the Children UK, Norwegian People’s Aid, MSF Switzerland and the International Committee of the Red Cross.

#### 3.3.5 Travelling in vehicles

Perhaps unsurprisingly, casualty data suggests that the majority of people are killed and injured whilst travelling in vehicles.

### AVM casualties: activity at the time of incident

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage reported as travelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>71%</td>
</tr>
<tr>
<td>Cambodia</td>
<td>72%</td>
</tr>
<tr>
<td>south Sudan</td>
<td>83%</td>
</tr>
</tbody>
</table>

It was noticeable in Cambodia that some 16% of casualties were recorded as “farming” at the time of incidents – which may also involve vehicles (though likely ox-carts or ox-driven ploughs.) However, the great majority of civilian AVM incidents occur on roads or tracks.

Data from Eritrea listed the types of vehicles involved in AVM incidents. These different types and the resulting data can be summarised as follows:
Without being able to compare this with data regarding the prevalence of certain vehicle types on the road it is not possible to draw conclusions about some vehicles being more likely to detonate AVMs than others. However, all of the detonations in this Eritrea data involved people travelling in vehicles.

3.3.6 When are these incidents occurring?

Macro level: post conflict population movements

During periods of fighting, movement by both the civilian population and humanitarian agencies tends to be curtailed. With peace the general security situation makes movement a possibility once more. As a result, anti-vehicle mines laid during the conflict come to the fore as a threat. Incidents initially peak and then may decline as awareness of the threat grows, bypasses are developed around high-risk areas and mine action process start to address the problem.\(^a\)

For example, in many areas of rural Angola the nature of the war and resultant security situation meant that vehicle travel by road in many provinces was severely restricted. Peace in 2002 resulted in an upsurge in movement through the provinces and this in turn produced a rapid rise in AVM incidents.\(^a\)

It has also been noted that the expansion of population movement in the post conflict environment, as well as presenting an increase in traffic, may see new road users coming into areas they have not travelled before, and where they are ignorant of local warning signs (such as stones in the road).\(^a\)

A similar general pattern was noted in Afghanistan. An ICRC Mine Risk Education representative reported that:

"... frontline areas opened up to civilians after 2001 and incidents started to rise until 2003. The Shomali plain area around Bagram was suddenly opened and for the first 12 months (2002–03) there were lots of incidents because awareness was low. Then mine action agencies started to do more mine awareness, including specialist information for drivers. In addition most of the trafficked road network was being cleared."\(^a\)

Some have warned that the real extent of the AVM threat in Afghanistan is yet to be realised. It has been suggested that the greatest levels of AVM use were on the village level roads. These areas are not yet being reached by aid agencies because the general security situation makes these locations too difficult.\(^a\)

"The main roads have never really been the issue, it's the smaller ones, especially those that didn't see much in the way of Kabul government / Soviet control. On these roads they used AVMs as a nuisance, for protection, to deny them to the enemy."\(^a\)

Annual patterns: the wet season

In addition to the factors noted above, it has also been identified that seasonal changes can make a significant difference to the pattern of incidents. In data from Cambodia and Afghanistan incidents seem to be more common during the wet season and less common during the dry season.\(^a\) It has been noted in Angola that AVM incidents rise significantly in the wet season. The graph below, from the Geneva International Centre for Humanitarian Demining (GICHD)\(^b\) publication on *The Humanitarian Impact of Mines Other Than Anti-personnel Mines*\(^b\) gives a clear indication of this pattern, with the Angolan wet season running from around October through to March.

That report presents the following suggestions as to why road users become more vulnerable to AVMs in the wet season:

- During the dry season, the baked hard soil hinders the transfer of pressure onto the mines, and good driving conditions make it easier for vehicles to stay on the well-used tracks of the road.
- During the wet season, pressure is transferred more easily onto the mines. Rains may also wash away topsoil, bringing more deeply buried mines closer to the surface.\(^a\)
- When vehicles get stuck on the road or flooded pot-holes develop, other vehicles drive onto the more dangerous road margins or verges in order to get around them.

\(^{a}\) Anti-Vehicle Mines

\(^{b}\) The Humanitarian Impact of Mines Other Than Anti-personnel Mines

\(^{c}\) The Geneva International Centre for Humanitarian Demining

\(^{d}\) GICHD
Policy note: AVMs and the Mine Ban Treaty

There has sometimes been a tendency for organisations concerned with the humanitarian impact of mines, and particularly the legal control of mines, to express particular concern at AVMs that are capable of being detonated directly by a person.

However, it is important to note that the great majority of civilian casualties from AVMs come not because these mines are sensitive to contact by people, but because they are sensitive to detonation by civilian vehicles. Similarly, it is the threat presented by such mines to vehicles that creates the structural impact that we discuss later in this report.

Focusing on AVMs that are sensitive to the contact of a person is an important part of monitoring the existing Mine Ban Treaty. However, such concerns should not mask the real threat that these weapons pose to civilians.

3.3.7 New or old mines?

The section above relates primarily to incidents caused by old abandoned mines that have remained in place since they were deployed in a conflict. However, AVMs can be used as part of an armed attack. Such incidents raise very different concerns regarding security management which makes assessment of whether it is an old or a new mine of critical importance (see section 5.5.6 for more detailed analysis of the issues that this question raises.)

For example, it was noted in Afghanistan that AVMs were used to target members of the International Security Assistance Force (ISAF) and that multiple AVMs have also been used as part of improvised explosive devices (IEDs). Some considered the re-use of anti-vehicle mines as components of IEDs as the primary problem associated with these weapons in Afghanistan. In this context the need to destroy stockpiles of AVMs in the ‘post-conflict’ period was considered to be an important lesson.

Set against this, it is not uncommon for incidents with old AVMs to occur on stretches of road that have been travelled many times. We explore some of the reasons for this in more detail in the section that follows. Such circumstances may prompt cries that new mines are being laid – but there may well be a reasonable explanation for how an old mine had remained un-detonated for so long.
Case study: incident on a travelled route, Sudan

At 1000hrs on 29 October 2003, Ahmed Yassir, 55, and Fatima Mohamed, 35, were driving a tractor which hit a landmine with its front left wheel. The driver suffered fragmentation and secondary fragmentation injuries to his head and back, whilst the passenger suffered fractured ribs, a fractured tibia and fractured left leg, but was otherwise in a stable condition. Local workers rushed to the scene and rendered assistance until a Joint Military Commission (JMC) medical team arrived on site. JMC evacuated the injured persons to the Kadugli hospital. A mine clearance team and Technical Advisor arrived on scene and assisted in securing the incident area and with the investigation, which revealed the driver had driven the route to the river twice during that morning, and was undertaking the third trip when the vehicle hit the landmine.

3.3.8 Where are these accidents happening?

Roads

Above all else, AVMs are particularly problematic where they have been used on roads. The great majority of civilian casualties from AVMs result from these weapons being used on and around roads. The significance of this can often become lost because it is assumed that this is where AVMs would necessarily or always be used. However, most of the strategic explanations of AVM use put forward by state’s militaries do not highlight their use on roads. Rather they are presented as ‘shaping the battlefield,’ or providing a protective barrier around key points.

Some reasons for the particular problems caused by AVMs on roads are as follows:

- This is where the vehicles are – and vehicles detonate AVMs.
- Because the road forms a continuous entity, an incident in one location can make people suspicious of many kilometres of road, if not closing off an entire section."
- The use of AVMs for route denial or ambush is not necessarily linked to any other geographical features and so there might be no clues as to where the mines were laid.
- Because much of the road is between populated areas, local people may not know the history of mine use in those areas.
- Blockage to a road can affect a great array of services and social functions (as we examine in more detail later.)
- Roads represent very large suspect areas and as a result they are very difficult if not impossible for mine action agencies to clear.
**Road-side verges**

It is often highlighted that the roadside verges may continue to pose a threat even if the main road surface continues to be used. In both Afghanistan and Angola, for example, it was noted that the sides of the roads are particularly dangerous and accidents usually occur when vehicles move onto the verges when avoiding obstacles or overtaking.  

Another problem is the capacity of the road-surface to move over time as repeated vehicles carve dirt tracks into a slightly new course.

Quite a common pattern of mine laying, especially for ambushes, has been to deploy AVMs off the main route. Then if one vehicle in a convoy hits an AVM on the track, following vehicles are likely to move off the route onto the verges in any subsequent exchange of fire. Alternatively, vehicles are channelled off the main track by another obstruction such as a crater of felled tree. In the post-conflict period it may be that the mines on the track detonated some time in the past but the mines on the verges remain. Whilst the remnants of destroyed vehicles may provide an indicator of the threat in such a location, such relics may also be lost – leaving little to indicate the threat.

An additional problem arises because many of the mine action sector’s tools for reducing the threat of AVMs will only cover the surface proper of the road. Thus the road-side verges can remain a high risk even after mine action teams have worked on a route (this depends very much on the type of process carried out).

For example, a HALO Trust monthly report from Angola for August 2005 documents an incident with a truck on a road in Bie Province that killed 1 and injured 8. The detonation had taken place about 1 metre onto the verge, but the truck had driven over it as a result of ‘creep’ of carriageway due to the poor quality of road surface. This section of road had been ‘threat reduced’ by the HALO Trust. Their report of 2005 noted:

> ... the mine was located under the verge of the road. However the edge of the verge had crept further into the side over time... It is clear to see that many vehicles have driven over this verge and turned it into the same state as the rest of the road... i.e. the road has clearly widened over time since HALO’s original work was done.

> ... HALO has always insisted that verges stay suspect and educate all drivers to stay off them... Sadly many local drivers do not heed this advice and still drive on and use the verges regularly in an attempt to negotiate a smoother route. It was this action that was the direct cause of this accident. Drivers should always use common sense and be wary of areas where the road edge has crept outwards (due to an obstacle such as a deep hole or puddle)...

---

*Photo © Halo Trust Afghanistan*
Bridges

Along with roads, bridges are often high risk areas for AVM contamination. The 1993 Human Rights Watch report Landmines in Angola, noted that:

"Most of the damaged or destroyed bridges are surrounded by minefields, that must be cleared before the bridge can be repaired." 42

As a result of this pattern of mine-laying, AVM incidents around bridges are relatively common. For example:

On 8th February [2006] a truck belonging to a construction company was travelling from Tchivaulo to Andulo. [...] this truck had made this trip three times already that day. At 1740 the truck was making its fourth trip with 67 people in the back. While crossing the bridge about 10km NE of Tchivaulo it initiated an AVM that blew the truck across the road. At the time of this report over 5 people have died and many are injured. 43

Where bridges have been destroyed during conflict it is quite common for an alternative crossing to be developed. However, such routes also can present a high risk of being mined if they cut into minefields that were established to defend the bridgeheads.

Early in 2004, a mini-bus struck an AVM to the south of Kuito town, as it attempted to take an alternative crossing to avoid a broken bridge. Seven people died. Shortly, afterwards a military truck anxious to complete its journey overtook the wrecked mini-bus, a manoeuvre that forced it to go further onto the verge. It too initiated an AVM. 44

3.4 Conclusion

This breakdown of information on individual AVM incidents provides a base for risk management regarding this issue. It allows us to appreciate the likely impact of an incident, at least on the personnel directly involved. It also allows us to understand more about where and when such incidents tend to occur. However, efforts to avoid such incidents have in turn had a serious effect on post-conflict populations. As the ICRC have noted:

"... the most severe effects of AV mines are the long-term denial to already vulnerable populations of food, medicines, vaccines and shelter. The effects are seen in the attempts at post-conflict recovery which are crippled by the limitations of movement and therefore on the resumption of economic activity. The results are hunger, disease and poverty." 45

It is this issue of risk avoidance and denial of access that we examine in more detail in the following section.

One of 14 destroyed bridges on the main road from Luena to Lumbola Nguimbo, Moxico Province, Angola. Several sections of the road and all of the area around the bridge were considered contaminated by AVMs, and route assessments, threat reduction activities and demining was required before they could be accessed and reconstructed.
4.0 Avoiding AVMs: The impact of access denial

- Efforts to avoid AVM incidents can result in suspect roads being considered unsafe to use. As a result communities dependent upon those routes can be cut off from other centres of population and from services provided by humanitarian organisations or government bodies.

- Where AVM contamination is widespread this can dominate the planning and direction of humanitarian assistance.

- When agencies make decisions regarding road use and threat from AVMs, they are often balancing risk to staff and future operations against the humanitarian imperative of undertaking the project.

- In some cases where agencies are working under a collective security mechanism, they may be prevented from undertaking humanitarian activities in areas due to decisions made by the central security body.

- AVM contamination has blocked critical forms of humanitarian assistance, including:
  - water and sanitation
  - food security
  - primary healthcare
  - landmine clearance and risk education

- AVM contamination has increased operational costs for humanitarian projects and reduced humanitarian monies available to provide assistance.

- For communities isolated by AVM contamination externally sourced goods are more expensive whilst local produce can only be sold at lower prices.

- AVMs can leave communities politically and socially isolated.

- AVMs can impede return of IDPs and refugees.

- AVMs can add substantially to the complexity, cost and time required for infrastructure rehabilitation.

- Such problems of access denial caused by AVMs and attempts to manage the threat they pose have been experienced particularly acutely in Angola – these problems have not been experienced at the same level in other environments (though examples of blocked access do exist.)

"The actual number of AVMs is much smaller than their role in creating risk in Afghanistan"*4

Risk Education Advisor, UNMACA, Afghanistan

Some AVM affected communities [in Angola] have "never been assessed, and have absolutely nothing, no schools or clinics. People are dying because of the lack of access."*5

Country Director, World Vision, Angola

AVMs have been identified as contributing to 'structural vulnerability' – worsening "those deep-rooted vulnerabilities that cause other problems to persist or to reoccur."*6 AVMs exacerbate these structural vulnerabilities when, out of a fear of AVM contamination and a determination to avoid casualties (direct impact), certain suspect roads are considered unusable by humanitarian agencies and access to vulnerable populations is blocked as a result.

There is currently no way for mine action organisations rapidly to determine for certain if suspect routes are actually safe – or to rapidly find and destroy mines where suspect routes are dangerous. As a result organisations need to find ways to work in environments where AVM contamination persists – closure of routes should be seen as an option available as part of that process, but not as an automatic reaction to the suspected presence of AVMs in a given area.

Where humanitarian organisations work under collective security rules the decision that a route should not be used due to the perceived threat level may be determined externally. Otherwise, different humanitarian organisations would almost certainly make different choices on the basis of how 'life-saving' or urgent they consider their work to be and what risks they are prepared to accept in order to undertake that work. Similarly, between humanitarian
organisations and commercial companies different perspectives on risk and the benefits that result from using the road might produce alternative judgements. Between two individuals, economic circumstances and issues of personal psychology might hold sway. The decision not to use a certain road because it is considered too dangerous is a choice made by balancing certain perceived risks (the likelihood of an incident and the potential impact) and certain rewards (which vary from one road user to another.)

As we will explore in this section, the effects on local populations of humanitarian organisations choosing not to use a route can be very great. This section looks at some of the costs that result from collective decisions not to use roads because of the perceived threat of AVMs.

These problems of structural impact have been most acutely experienced in Angola. It is noticeable that in other countries even though AVMs may present a significant threat (as evident in the number of casualties) problems of blocked access have not arisen on the same scale. So whilst the possible impact of AVMs is well illustrated by some of the examples presented here, this does not mean that all instances of AVM use will produce such problems. This is very important and we conclude this section by suggesting some of the reasons behind this.

**Case Study: Access denial and humanitarian impact**

The Head of Office for the World Food Programme (WFP) in Huambo, central Angola, points to the severity of impact that not accessing populations can produce:

“There is a clear correlation between the most vulnerable populations and the areas which are hardest to access. These areas have the toughest roads and are lying in the red (inaccessible) zones of the province. The WFP school feeding programme, for example, can only work in areas accessible by green (open) roads, according to the UNDSS classifications, and governmental counter-parts are questioning why they don’t give food to the most needy. Its because the access is not there. And school feeding is important and has a direct link to attendance… there is also a lack of primary health centres for people in these remote locations, and because it so hard to travel people won’t leave home until they are very sick, too sick, and many die unnecessarily as a result.”

### 4.1 Restrictions to aid and humanitarian support

There is currently no way of documenting the full extent to which AVMs have blocked access and denied communities humanitarian assistance internationally. The examples presented here are put forward as indicative of the services that can be denied to populations as a result of AVMs blocking access.

In the most extreme cases suspected AVM contamination has dominated not just the implementation of specific projects but also the overall planning and direction of humanitarian assistance – dictating which populations are considered for and receive assistance and which receive nothing. Referring to central Angola, the Acting Head of Office for UN’s Office for the Coordination of Humanitarian Affairs (OCHA) noted:

“AVMs have more or less directed humanitarian operations.”

If access is denied then it can be difficult to even establish what humanitarian problems may exist within a given area. Reports and rumours of food shortages and outbreaks of diseases are difficult to confirm using second-hand reports, and without comprehensive needs assessments agencies are unable to define appropriate responses and access donor funding. In February 2004, almost two years after the end of the conflict in Angola, the Humanitarian Aid Committee reported that up to 100,000 had unconfirmed critical needs but were isolated due to a lack of access for humanitarian agencies.

The following examples provide a brief indication of the more specific types of impact that may result from such blocked access.
4.1.1 Water and sanitation

In central Angola, following AVM incidents in late 2002, the International Committee of the Red Cross (ICRC) was forced to suspend and relocate a large water and sanitation programme designed to provide emergency support to returnee communities.

"It’s hard to measure the impact of this, but it was clearly large, and we have never returned to those communities."[52]

In Sudan, an incident to a Government water and sanitation truck highlighted the risk to implementation of projects, but also an evaluation (by one official) that the danger from the mines did not outweigh the need for work to be conducted:

On 4th April, 2003, a convoy of three vehicles was driving from Kudru to Suguli to drill a water pump. The lead vehicle in the convoy A WES (Water Engineering and Sanitation) drill rig truck struck a mine at approximately 1600hrs. The other vehicles were undamaged and returned to Kadugli.

Local villagers and a RONCO mine clearance moved to the incident site to render assistance. Upon arrival they found that whilst the lead vehicle had detonated a mine, no one was injured as a result of the incident. A preliminary investigation was conducted at the site... and it was discovered that a number of small vehicles had driven the same route to Suguli previously and on the day of the incident itself. These vehicles were confirmed as belonging to WES technicians and the Ministry of Health vaccination team working in the region... An official from the Ministry of Health advised UNMAS that they had sent a vaccination team to Suguli due to a Meningitis outbreak in the region. He stated they were aware that there was a mine threat but believed that the risk was less than the requirement to vaccinate the villagers at Suguli against meningitis.[53]

4.1.2 Food security

The Angola Operations Director for World Vision (undertaking seeds, tools and food distribution amongst other activities) noted that the AVM threat in some areas meant that beneficiaries had to come to receive assistance, rather than the assistance being delivered to them. Beneficiaries would “walk in for three or four days to reach accessible distribution points”, in some places. “Of course, if you are weak and sick then you physically can’t walk that sort of distance to receive aid”. In areas like this, the most vulnerable were therefore excluded from receiving the assistance that was specifically designed for them.

“You can’t officially go to these areas, so you can’t take senior agency staff there even if you yourself take those risks. You can’t verify these needs to the donors, because their security rules won’t let them travel in. Without donor visits and monitoring possibilities there is no funding possibility. We have therefore ignored pockets of major food insecurity, and its ‘easy’ to ignore because you can’t go there. The biggest root problem for these communities is lack of security and access.”[54]

Similar assessments have been made regarding the impact of blocked access on isolated populations elsewhere in Angola.[55]

According to the ICRC, the World Food Programme (WFP) have reported AVMs blocking their ability to provide food aid in Angola, Rwanda, Kosovo, Sudan.[56]

4.1.3 Primary healthcare

According to managers overseeing USAID’s road reconstruction programme in Afghanistan, one of the key reasons cited for prioritising road reconstruction was that previously from some locations it would take 2 weeks to get to hospital.[57] In Angola, further examples were provided of populations who could only access health care by making
arduous journeys on foot and health care implementing agencies that continue to report constricted access to populations and continuing concern for the safety of their staff.\

4.1.4 Landmine clearance and risk education

If roads are not considered safe to use because of the AVM threat then it will likely not be possible to respond to reports of mines or UXO, or conduct clearance activities in support of community priorities in villages that are accessed via these roads.

Mike Kendellen of the Survey Action Centre (SAC) noted that 419 communities were inaccessible (for a range of reasons) during the Landmine Impact Survey of Angola. However, he also noted that this was only a small proportion of the overall number of communities surveyed (2.4% of the total) and that AVMs were not the primary cause of blocked access. He went on to state:

“We have not found blocked roads to be a major hindrance in conducting the LIS in other countries. Angola stands out among all surveys. Afghanistan identified many [suspected hazard areas] near roads but few, if any, hindered movement... We just finished surveying Eastern Equatoria state in Sudan with MAG and accessibility was not a problem... The weather is the main obstacle in Sudan as far as we can tell... In Somaliland the majority of [suspected hazard areas] were blocking roads but there was always an alternative to use.”\

It has also been noted that AVM contamination can result in a focus of mine action resources onto access issues in support of international organisations and government bodies and away from community driven priorities. It was noted in Afghanistan that where mine action priorities are set by the local community roads may not come to the fore as requiring clearance. This may be because people in one village do not feel a sense of ownership over the road some distance away. It may also be that unless the road threat is currently blocking significant external assistance then little relative value is perceived from addressing that threat. Similar issues were raised in Sudan where some suggested that demining (of anti-personnel and well as anti-vehicle mines) was not viewed by key local actors as being prioritised appropriately.

The UN should make the civilians living in the countryside the main priority but its not their priority: they are focusing on roads. There is a failure of the link between humanitarian need and demining. Roads alone are not enough.

4.1.5 Increased operational costs

As a result of AVM contamination, many vulnerable civilian populations are receiving no assistance from humanitarian organisations. Assistance has been directed towards less vulnerable populations, because the communities most in need can not be safely reached. The overall cost per beneficiary of humanitarian projects has been increased, resulting in fewer people receiving assistance.

As a result of blocked access due to AVM contamination humanitarian operations can become more expensive to implement. This can result from a combination of increased prices (due to the effects of access problems on the general economy) and specific additional costs resulting from structures of work that are designed to get around the AVM threat (such as greater reliance on air-transport for the movement of people and goods). For infrastructure projects such as road reconstruction the requirement to include AVM survey and removal as part of the project can also be a significant additional cost.

The WFP in Sudan is expecting to significantly reduce its operating costs by being able to switch from air to land based operations. A situation report of early 2006 which reported that:

“... roads have been closed to UN movement since December due to the threat of landmines in the area. The re-opening of these roads is expected to greatly increase the efficiency of humanitarian operations in the region...”
Phase III of WFP’s emergency road repairs and mine clearance project in South Sudan faces a funding shortfall of US$79.7 million. In the absence of funding, the project is now missing the beginning of the dry season for works under Phase III contracts.47

4.1.6 Expenditure on mine action may deplete other humanitarian funding

A further impact of anti-vehicle mines on the economy of aid is that funding efforts to reduce the threat of AVMs may mean that less money is available for other forms of humanitarian assistance. In 2003 in Angola, the European Community Humanitarian Office (ECHO) estimated that 90% of its projects were affected by difficulties with gaining access to their target populations and “the extent of this problem led ECHO to fund de-mining activities with a particular focus on securing access.”48 Roughly one tenth of UK’s Department for International Development (DFID) £16 million budget for Angola was committed to demining of roads and bridges.49 Whilst it may be that these funds are being drawn from central ‘mine action’ funds rather than country-specific budgets, the general point must hold true: if donors were not spending this money addressing AVMs on roads they would be able to spend it on something else.

It should also be noted that if humanitarian organisations simply accept the constraints of AVM contamination and fail to articulate to donors where and how this contamination has resulted in them ignoring the needs of inaccessible populations then mine action responses to this issue may not be given the priority they might otherwise be held to deserve.50

4.2 Increased prices and limited markets

Beyond the specific problems caused by lack of humanitarian or development assistance, AVMs can have a significant impact on the local economy. A limited inflow of traders and products can raise the costs of those basic commodities that are available, and limited access to markets reduces economic opportunities for the sale of products and goods.

In Afghanistan, it was noted that opening provincial roads were seen as essential for commerce – facilitating the export of cotton, wheat, fruit etc.51 In Angola, such stifled markets have been identified as a serious impediment to the return of displaced people52 with huge transport costs pushing the price of basic commodities and medicines beyond the reach local populations.53 The economic impact of opening roads is well illustrated in the text below from a Technical Field Manager of MAG:

Our first major assessment... produced some very surprising results. After this route was opened a restaurant was established... and the market grew extensively... By opening up Cangamba [the NGO] Medair was able to conduct operations there and [at the] time of writing there is vastly increased trade... I have been told a bag of Maize meal before the opening was 2,500kz in Lumbala, now it is 1800kz, this shows [the impact of] competitive market trading.

Also along this route there are a number of villages. On my first trip on this road I met a local leader of one of these villages. On my next trip to Lumbala I asked the village leader if the route opening had benefited his village, and he stated that it had a very beneficial impact. They are now able to trade vegetables, charcoal and other items with the traders using this route. In short, he was very pleased.54
4.3 Restrictions to political and social integration

Lack of access can also inhibit the social, economic, cultural and political integration of isolated locations into the broader flow of national life. It was noted in Angola that some provinces contain municipalities that have never been visited by representatives of Provincial authorities. Others have suggested that elections might not be possible in many areas because of access problems – leaving AVM affected communities disenfranchised.

4.4 Impact on IDPs and refugees

In many cases formal refugee or IDP repatriation is carried out by UN agencies such as IOM and UNHCR, supported by international and local partner organisations. In these circumstances formal repatriation can only take place to areas that are accessible. If areas cannot be accessed then refugees or IDPs may be forced to resettle in areas other than their original homes. This leads to problems of overcrowding, placing pressure on resources such as land for houses, water, pasture and agricultural land, and on services, such as health and education.

Such problems, as well as political pressures from national and local government, may lead agencies involved in the formal repatriation to seek out extreme solutions to get the people to their homes, including air operations or repatriation by river. In Sudan it was noted that large-scale humanitarian actors, including UNHCR, had changed the way in which mine action was being conducted – producing a much greater emphasis on opening access so as to facilitate the return of refugees and IDPs. In other cases, refugees and IDPs may choose to return to areas that are formally inaccessible to the international community, in part due to the pressures outlined above and also for cultural or social reasons. On returning to such isolated areas these people find themselves in a position where they are prone to all the impacts of AVM contamination outlined previously – lack of access to markets, lack of adequate NGO, UN and governmental support, and an inability to be integrated into wider political and social developments such as electoral processes.
**Case study: Political pressure for refugee return**

On 10th November 2005 a two lorry convoy, contracted to the International Organisation for Migration (IOM), returning 24 Angolan returnees to Mungo commune in the north of Huambo province hit an anti-vehicle mine on a road that was off limits to UN agencies and their contractors. The front wheel detonation destroyed the cab of the lorry. An official from the local social services ministry, MINARS, died later in hospital. The driver and his assistant survived with minor injuries; none of the returnees were injured.

The UN Department of Safety & Security (UNDSS) approved route from Bailundo to Mungo was impassable due to wet season conditions and a broken bridge. The state of the Mungo road had resulted in the convoy turning back to Bailundo where the Secretariat Chief for the local administration informed the convoy leader and driver of an alternative ‘bypass’ track that was, however, classified as a ‘red’ (no go) route. Realising that this would breach the UN security rules under which sub-contractors work, the driver phoned his boss in Huambo. An IOM incident report states that both the truck owner and IOM officials in Huambo told the driver to wait in Bailundo. Ultimately though, the advice of local officials won out: the road was well-trafficked by local vehicles he argued. Subsequent investigation of the route by the HALO Trust revealed that the convoy had already passed several previous AVM incident sites.

**4.5 Impact on infrastructure reconstruction**

In most countries that have experienced prolonged or intense conflict there are likely to be serious problems of collapsed infrastructure. In Angola, Sudan and Afghanistan the rehabilitation of the primary road network has been a key element in the overall plans for post-conflict reconstruction activities and in both countries there has been a need to take into account the AVM situation when planning and implementing road reconstruction activities.

Road reconstruction presents particular demands on the mine action sector because construction crews are very likely to encounter almost all mines that are present, and their work takes them onto the roadside verges as well as the main carriageway.

**4.5.1 Afghanistan**

For Afghanistan, the focus has been on the construction of the ‘ring road,’ a series of highways which circles the country joining all major population centres in each region. The total estimated cost of this project is in the region of $2billion, with significant amounts of work being conducted presently on the Kandahar-Herat section of the road, funded and managed by USAID. This road is “critical to the development of the Afghan economy”. 80

The USAID releases regular reports on the status of the road reconstruction project, in which it shows the ‘construction flow’:

<table>
<thead>
<tr>
<th>Guide for the Non-Road Engineers: Construction Flow</th>
</tr>
</thead>
</table>

Demining/Survey ➔ Culvert/Drainage Work ➔ Earthworks/Embankment ➔ Base Course Laying ➔ Asphalt Paving ➔ Finishing Work

Mine action is therefore a pre-requisite for road reconstruction in Afghanistan, and has involved a range of UN, national NGOs and commercial operators working in support of the ring road project. Exact figures for the cost of mine action within the road budget are not available, but clearly substantial resources have been dedicated to supporting the activity, using a variety of methods including assessment, manual clearance, dogs and mechanical support.
Armoured plant working on the HALO Trust's road threat reduction and clearance operations, southern Kabul, July 2006

4.5.2 Sudan

The importance of reconstructing the road network in Sudan has been highlighted by the UN. WFP have stated that they will significantly reduce costs through being able to switch from air to land based operations. In addition to this, WFP noted that reconstruction of the road network would support access to Juba, which would become a “vital lynch pin for (humanitarian) programmes bringing commodities in from northern Kenya and Uganda, as well for civilian traffic and commercial re-integration of south Sudan.”

UNHCR have also noted that road access and reconstruction is vital to the repatriation of refugees. There are, however, very different priorities between UN bodies with regards to the deployment of mine action assets in support of road reconstruction. One UNHCR staff member noted that they had only one road which overlaps with WFP priorities.

In total, WFP have stated that the funds required to support road reconstruction is $130million, of which $25million is required for mine action activities. As in Afghanistan, this is dependent on the support of mine action agencies providing assistance in the form of road survey and clearance. In one initial road section, between Yei and Juba, mine action activities were undertaken by four different operators prior to the reconstruction being completed.

4.5.3 Angola

As for both Sudan and Afghanistan, infrastructure rehabilitation is a key component of post-conflict reconstruction. UNDP’s Draft Country Programme Document for Angola (2005–2008), reflects key areas identified in Angolan government policy frameworks and its Poverty Reduction Strategy. Outputs for the mine action sector are described both in terms of area cleared, but also “kilometres of roads cleared in priority access areas.”

In more general terms, a report by the International Crisis Group stated that:

Not enough can be said about the urgency of addressing the landmine problem. De-mining opens roads, which in turn frees up commercial traffic, which promotes agricultural development, which improves food security, while at the same time facilitating further political outreach, which supports the transition to democracy, and undergirds the reconciliation process.”
The amount of funds provided by the international community in support of infrastructure rehabilitation in Angola falls far short of that available in Afghanistan, and to a lesser extent, Sudan. WFP has a budget of approximately $7.5 million for bridge reconstruction, which it states is a small but necessary project in terms of facilitating WFP’s ability to access remote populations.** However, the WFP’s bridge building teams can only operate on roads and bridge sites that have first been demined.** Therefore, WFP works in close co-operation with demining agencies such as MAG, NPA and the HALO Trust, whose donors – especially the European Commission – are also funding WFP’s bridge project:

We are complimentary operational partners – there is no possibility of doing this work without the close integration of demining services, it’s the foundation of this work.**

However clearance of bridgeheads and mine action activities along the road between the bridges greatly extends the time required for reconstruction. In Moxico, a major road required 14 bridges to be reconstructed. The total time taken for the demining and reconstruction activities is estimated at nearly 24 months, which contrasts to only 10 months if no demining activities were required.

Mine action activities are a pre-requisite for infrastructure rehabilitation in countries which are impacted by AVMs. This is particularly true for facilitating road and bridge reconstruction, which in turn improves access for humanitarian organizations, government and civilian traffic. However it dramatically increases the cost of the project, and the length of time that the reconstruction process takes, and takes mine action resources away from other priorities which provide direct support to mine-affected communities.

### 4.6 Why does access denial occur?

The multiplier effect of AVM contamination on structural vulnerability (which can be massive and wide-ranging) results directly from individual or collective efforts by humanitarian agencies to avoid the direct impact of AVMs (to avoid being killed or injured.)

This has very serious implications because it means that the response of organisations to suspected AVM contamination can have serious and sometimes fatal consequences for vulnerable populations. Over-estimating the direct threat of AVMs, or failing to adopt measures that would enable risk to be reduced to tolerable levels, can result in populations being denied critical humanitarian assistance and a massive inflation of the overall cost of aid. Under-estimating that threat, or again failing to adopt measures to reduce the impact of an AVM incident, can result in the death of key staff, and the possible closure of operations.

We have noted that whilst these problems have been clearly evident in Angola they have not been experienced on the same scale in other environments. In the light of this it is very important to give some consideration here to why such differences should arise.

### 4.6.1 Physical

Some of the reasons why structural impacts result from AVM contamination lie in the nature of contamination and the physical environment. Some necessary conditions are as follows:

- **There must be suspected AVM contamination on roads or tracks**
  As we have noted, it is suspected AVM contamination on roads or tracks that produces both the majority of civilian casualties from these weapons and the broader problems of blocked access. There is currently no way for mine action organisations to determine rapidly and with adequate certainty if suspect routes are actually free from mines – or rapidly to find and destroy mines along suspect routes.
There must be a limited road network, reducing the number of alternative routes between locations
In the post conflict environment the road network, including bridges, might be severely damaged as a result of fighting and neglect. Severe weather may also make roads unreliable and unsuitable for motor vehicles.

It must be difficult to safely establish bypass routes
The capacity of local people to establish bypass routes is very important to stopping AVMs from impeding access. This is often related to specific circumstance of local geography – where the land is open, alternative routes can be created.\(^9\)

By comparison with the scale of the problem, the mine action resources for opening roads must be limited
Given the cost of mine action operations, the limitations of available techniques, and the scale of road network that might need to be addressed, it is not difficult for this criterion to be met.

4.6.2 Attitude based

Whilst certain physical conditions might be necessary, other requirements for blocked access relate to the potential road users. Most importantly:

Humanitarian agencies must determine that the risk to their staff from using the roads is too great
Either as a result of specific incidents or based on an evaluation of the threats and related risks, humanitarian organisations must determine that certain suspect routes are unsafe to travel.

The perception of the risk amongst humanitarian agencies (and most particularly amongst expatriate staff) is often very different to the perception of the risk amongst the local population. This is related to how the AVM risk appears when put in the context of other risks to which the individual feels exposed (which are often very different between expatriates and local people.)

In part this relates to individuals’ willingness to expose themselves to risk in order to accomplish a specific objective, which is dependent on the character of the individual, the culture of their organisation (including its competence in security management) and the level of importance attached to achieving project goals (in part related to the relationship with and understanding of the donor). Crucially, it is also a function of the context in which individuals and organisations understand themselves to be working. An expatriate aid worker who has accepted a posting in Iraq or Afghanistan understands that they are entering a hostile environment that is highly unstable. The likelihood of being involved in a major security incident is far higher than if they were working in, for example, Tanzania. If a security incident occurs in a high risk environment it can easily be rationalised as an inevitable product of the environment and is therefore less likely to result in a change of attitude of the individual or a change in working procedures of the organisation.

Working in Angola, which has had a very low level of security incidents since the end of the conflict in 2002, the risk from the residual AVM threat therefore assumes a dominant position in the collective and individual psyche of humanitarian workers. The perception that they are working in a relatively stable environment with few violent security threats means that if an AVM incident occurs, it is noted as an exceptional and unexpected event. Therefore individuals and organisations are likely to respond in a more dramatic manner (withdrawing staff, suspending operations, closing projects in certain locations etc) than if the same incident had occurred in a more volatile context.

Accurately communicating the AVM situation, and managing people’s perceptions in an appropriate way, can be very difficult. It was identified as a serious problem in Afghanistan that early in the recent expansion of humanitarian activities many people considered the whole country to be mined. Against such a perception people felt that they inevitably had to take risks in order to get things done. When fewer incidents occurred than were initially expected people assumed that the threat had been overstated.\(^9\) Such a process suggests excessive swings in appreciation of the threat that may indicate shortcomings in risk management.
Furthermore, tensions can exist with regard to access restriction imposed on individual organisations by collective security management processes, even within the UN family of agencies. The key issues here relate to a reasonable balance of programming returns and security risks being run, and the location of managerial decision making on security issues. In Angola, and elsewhere, access decisions are controlled by UNDSS whose responsibility appears to begin and end with staff and asset safety. This can lead to a different set of perceptions (as well as sense of accountability) between the staff of UNDSS and those of, for example, UNHCR and WFP. The latter also have a different set of priorities: they are concerned both with staff safety, but also with achieving the programme mission. For this reason the ultimate location of responsibility for security must lie within the line management of the operational agency, with security specialists such as UNDSS, providing advisory, rather than executive, risk management services.

The purpose of the next section of this report is to support implementing agencies in evaluating and managing risks for themselves, in effective partnership with others.
5.0 Managing the threat to humanitarian agencies

5.1 AVM threat assessment and risk management

In this section we look at the AVM problem from the perspective of the wider humanitarian community, for NGOs, international organisations and UN Agencies, and see how they can effectively manage the threat posed by AVMs and ensure that key programme decisions are made within a framework of tolerable and appropriate risk.

The key challenge relates to how organisations balance the implications of a major accident against the humanitarian imperative of their work. Risk management should provide the tools and processes to do that an effective and accountable manner.

For managers and organisations working in an AVM contaminated environment, reliable and good quality information is of primary importance; good information about the mine threat, good information about the options available to reduce risk, and good information about what the mine action sector and other bodies are doing to manage the threat.

The objective of this chapter is to provide information, analysis and case studies that taken together will help organisations manage the threat posed by AVM contamination in an effective and accountable manner. The chapter is structured as follows:

5.2 Security management good practice

This short section highlights key issues in general security management and notes that an organisation’s approach to security management in general will have an important role in the management of AVMs as a specific threat.

5.3 Evaluating the risk from AVMs

This section discusses indicators regarding the threat of AVMs and the vulnerability of an organisation. It provides suggestions for the sorts of information that might inform a risk assessment in relation to AVMs.

5.4 Reducing the risk

We then look at some practical measures that can be taken to reduce risk. These include general operating procedures, possible specialist vehicle protection and considerations regarding restructuring operations to avoid areas of threat.
In the event of an AVM incident
This final information box provides some practical advice and guidelines on what to do if your vehicle, or a vehicle with which you are travelling in convoy, is involved in an AVM incident.

5.5 External assistance: working with security coordination bodies and the mine action sector
This section provides advice on working with security coordination bodies and specialist mine action organisations. In many environments these bodies may be a key source of advice and guidance. However, organisations need to take responsibility for the risks to which they expose their staff. This means being able to ask the right questions of external bodies – and evaluating whether the answers received are adequate.

Old mine or new mine?
This information box looks at some of the issues surrounding the reporting of AVMs as ‘new mines.’ It highlights some of the reasons why this claim may be more prevalent than the reality, and present some specific options for reducing risk if new mine laying is a possibility.

5.6 Decision making and accountability
This final section concludes the report and reiterates some important considerations regarding who is responsible for making decisions about acceptable levels of risk.

5.2 Security management good practice
Good management for security treats each distinct threat separately – but it uses common analytical tools to ensure it treats them effectively. This report is not intended as an introduction to security management and this section should be understood in the context of the established models of security management ‘good practice.’ Whilst most of this section is focused on issues that are specific to AVMs it is very important to recognise that an organisation’s general approach to security management will be one of the single biggest factors in whether or not they manage the AVM risk effectively.

The ability of agencies to manage the AVM threat is closely related to their overall competence in security management. In the fieldwork for this report there was a marked difference between the agencies that seemed to have taken on board the implications of security management good practice and those that had not. Some key elements of good security management include:

Context knowledge having an appreciation of the environment in which you are working is vital for good security management – a knowledge of the history of the context, particularly as it relates to the conflict, main sources of social tension, the political structures of government and non-government actors and so on is vital to being able to make good risk assessments

Coordination Although many good security practices are internal, there is a huge benefit to be gained from working closely with security bodies, either formally or informally. Information sharing is a critical aspect of good security management.

Prioritising security It was noted that several agencies were unable or unwilling to prioritise security within the organisation, despite working in hostile environments where a dedicated security function was justifiable. Frequently security is subsumed within a logistics position, a dual role that sees the immediate demands of logistics often override the more structural and strategic issues of security.

Mainstreaming good institutional practice Where some agencies that had worked in Angola had developed good practice with regards to the management of the AVM threat, it was noticeable that very little of the good practice had been transferred within the same organisation to another context. Identifying and mainstreaming good practice is a key element of good security management
Proactive risk management Although not all risks can be forecast, good security management is about assessing potential risks, and taking efforts to reduce them. Although incident analysis following security incidents is important, anticipating risk is more likely to successfully prevent incidents happening.

It is important to recognise that effective security management is about more than having a set of procedures and policies in place, or “ticking the box” of security in an annual plan. Just as it is common to ask “how much will it cost” and “who will it benefit” when looking at any activity or project, the question “what are the risks” should be automatic. Good security management is about identifying risks on an ongoing basis, placing security and safety at the heart of organisational decision making, and empowering staff to manage their own risks on an ongoing basis rather than prescribing a list of “dos and don’ts”.

5.3 Evaluating the risk from AVMs

Whilst AVM incidents are relatively rare in the experience of aid agencies, when they do occur they have a disproportionately high impact in terms of deaths and injuries, and usually in terms of project implementation. In the worst case scenario, a single incident could raise concerns that an agency had failed in its ‘duty of care.’

In this section we will suggest some practical and specific guidelines that should first assist managers and staff in evaluating the risk of anti-vehicle mine incidents and then help in developing measures to reduce that risk (hopefully to a level where project goals can still be met.)

A key source of general information on risk management is:


The purpose of this section is to highlight some key issues when undertaking risk assessments with specific reference to anti-vehicle mines.

RISK LEVEL: Each threat to which an agency is vulnerable will generate a degree of risk. Risk can be seen as the product of external security threats and the degree of organisational vulnerability – or exposure – to these threats. The overall level of risk for each threat is generated by the likelihood of an incident occurring and the impact of any such incident should it be encountered.

Assessing the level of risk from the AVM threat in any given context requires first making an assessment of the perceived physical level of external threat, and the degree of internal vulnerability to this threat environment. In some contexts it may be possible to request specialist advice on the external threat environment from mine action operators working in the region, or from UN agencies responsible for the coordination of mine action or security. Later we will look at how best to maximise the benefits of those relationships.

However, even if specialist advice is available, it is important for managers and organisations to have an understanding of the factors that are or, crucially, should be used in any AVM threat assessment. Clearly, it is only the individual agency which can assess its vulnerability to the threats believed to be in the environment, although even here specialists can assist in the process. Ultimately though each organisation needs to take responsibility for how it configures its operations, and seeks to minimise risks, in relation to the safety of its staff.

In the sections immediately below we look first at tools for assessing the level of the external threat of AVMs and then at internal factors that contribute to vulnerability.
5.3.1 Assessing the AVM threat

**Note:** Detailed AVM threat assessment should be undertaken by specialist organisations wherever possible. Driving a road whose status is unknown in order to assess threat is likely to be a high risk activity.

Route assessment and survey is a specialist activity and if conducted by trained staff using established guidelines and procedures provides a good basis for making decisions about the potential threat level on a given road. If there is no mine action agency available to provide route assessments, some basic knowledge of what indicators can be used to identify AVM use and make a judgement about the possible threat level are as follows:

**Reports of AVM Usage**

This information can be gathered from key informants such as the military, ex-combatants, demobilised soldiers, local authorities, hospitals and local communities without actually travelling a road. By asking some basic questions, it is possible to get an idea if AVMs were used on a given road. These questions focus on:

- Confirmed mine incidents involving vehicles, including animal carts
- Confirmation of mine usage by military actors
- Confirmation that armoured vehicles (tanks, armoured personnel carriers) were used in the area during the conflict

**Indicators of AVM Usage**

Local knowledge obtained prior to travel may not always confirm that AVMs were used on a given road, but indicators observed during travel may suggest the opposite. These include:

- Evidence of mine strikes – destroyed vehicles, mine craters or mine fragments
- General battlefield indicators – trench lines, destroyed buildings, gun positions etc
- Suspect Areas – dangerous areas may be identified along or near the road, such as marked minefields or bridges
- Low vehicle usage levels – communities not using the road, or the road having no clear evidence of vehicle tracks
- Bypasses – local people may choose not to use the existing road, and have established alternative routes. This can be suggestive of AVM use

A set of suggested practices for route assessments can be found at Annex D. It is not recommended that non-mine action specialists undertake assessments, but the information above and in Annex D can be used in two ways:

1. It shows the type of information that mine action operators should themselves be using to make assessments as to the threat level from AVMs on a given road
2. If no mine action agency is available to provide assessments, this information can be used to make decisions about the appropriateness of using certain roads.

5.3.2 Assessing vulnerability

An assessment of internal vulnerability should look at factors that can affect the likelihood of an AVM incident occurring and affect the impact of such an incident if it should occur.
It is important to note that some of these factors relate to the overall capacity or vulnerability of the organisation whilst others relate specifically to the use of particular stretches of road. This highlights that some specific risk assessment needs to be undertaken for every route or area of operations.

The above indicators look at issues regarding the immediate impact of an AVM incident. Other key issues that can increase the impact, and therefore the overall level of vulnerability and risk, include:

- **Insurance** Is the organisation adequately insured to cover the liabilities involved when staff and vehicles are involved in an AVM incident? The less adequate the insurance, the greater the potential impact to the organisation.

- **Duty of care** Can the organisation demonstrate adequate duty of care in the event of staff or staff families initiating litigation against the organisation? Lack of evidence demonstrating adequate duty of care can increase the potential impact of an AVM incident for the organisation as a whole. Duty of care can be understood in terms of having implemented all risk management (reduction) plans that can reasonably be expected of the organisation in the context, given its available resources. Beyond this it is essential that staff have been fully informed about the level of residual risks to which they are exposed within risk management arrangements: in other words, that they have explicitly given their informed consent to work under such conditions.

- **Programme activities** Will any AVM incident result in operations being suspended or terminated? If so, the costs associated with the following issues need to be assessed:
  - Failure to deliver services or resources to target communities
  - Fulfilment of contractual obligations
  - Donor relationships and future funding.
Human resources  Other costs include less quantifiable but no less real issues such as levels of staff morale, retention of national and expatriate staff, diversion of time and energy onto incident fall-out and away from project management etc. These all increase the level of impact of an AVM incident.

Other agencies  Are there any localised or even country-wide security measures that may be implemented by other agencies following an AVM incident? This may include suspension of the use of the road on which the accident occurred, or even blanket suspension of operations, all of which have an impact on those organisations and their beneficiaries. Such considerations should serve as a reminder that the impact might not be restricted only to the agency directly affected.

Many of the above issues are applicable not only to AVM incidents, but to a wide range of programme issues when working in remote and/or hostile environments. They are by no means exhaustive, and each context and every organisation will have its own indicators and issues that feed into the measure of vulnerability.

5.3.3 Balancing risk against humanitarian imperative

Based on an assessment of the threat and an assessment of the organisation’s vulnerability to that threat, decisions need to be made about whether the resulting risk is ‘tolerable’ or if further adjustments need to be made to operating procedures, contingency plans or even the whole structure of operations. In making such decisions the following need to be taken into account:

The humanitarian or developmental imperative of the operation  The risk to which staff are exposed is balanced against the expected humanitarian or developmental benefits of undertaking operations. How much confidence do staff have in the level of benefit that the project activity will provide? Is this based on concrete evidence or assumptions? What are the costs of not undertaking this activity at this time or in a specific location?

Who should evaluate the risk and who should decide what is acceptable?  It is vital that those people most likely to be exposed to risks are involved in the risk assessment and evaluation process. These processes should be undertaken as a team and assumptions and decisions should be explicitly documented. However, it is important to remember that broader institutional risks may be at stake in such decisions – differences of opinion between field staff and HQ need to be discussed and resolved.

The following hypothetical example suggests how some of the issues discussed in the sections above might be considered and acted upon:

**Case study: Evaluating the risk from AVMs**

**Situation**
The NGO “Feed-A-Kid” (FAK) is working on an emergency food distribution programme in the east of a post-conflict country. It wants to reach the town of Luwaka to distribute food to an estimated 3,000 refugees who have returned spontaneously.

There is a mine action agency in the area that has confirmed that the road is suspect, and that AVMs have been located on several other roads in the area. However there have been no reported incidents in the preceding 12 months along this specific route. The local army commander has confirmed independently that AVMs were used around two bridges along the road. Some civilian vehicles do reportedly use the road, including a small trucking company.

FAK are well established in the region, and have in place tried and tested medevac procedures, with air evacuation available from the World Food Programme. They operate in two-vehicle convoys, one an unarmoured Toyota Land Cruiser and one a 10-tonne truck. These vehicles are well maintained and fitted with VHF and HF Radios, medical kits and adequate spare parts. The drivers have received dedicated 4WD training, and all staff including the driver have
received mine awareness training from the mine action operator in the last 12 months. The teams deploy with 5 people in the Toyota and 2 people in the truck, and have route plan and journey procedures.

Risk assessment

Threat Assessment

- AVMs have been confirmed as being used along the route. INCREASED THREAT
- AVMs have been used in the surrounding area. INCREASED THREAT
- No AVM Incidents have been reported in the recent past. DECREASED THREAT
- Vehicles are using the route. DECREASED THREAT

Vulnerability Assessment

- No protected vehicles available INCREASED VULNERABILITY
- Good journey planning procedures DECREASED VULNERABILITY
- Driver training in place DECREASED VULNERABILITY
- Low passenger numbers DECREASED VULNERABILITY
- Medical evacuation procedures in place DECREASED VULNERABILITY

Humanitarian Imperative

- No confirmation that there is a food emergency in the target location.

Conclusion

Although reaching the town of Luwaka without incident is highly probable and the agencies vulnerability to an incident is relatively low due to good procedures, it is decided that this does not mitigate the two key facts: first, AVMs have been confirmed on the route and in the surrounding area – without a full road assessment the route should be assumed to be suspect; second, they do not have the mine protected vehicle that would increase staff chances of survival if an incident did occur. The decision to not undertake the journey is further strengthened by the lack of knowledge about the humanitarian situation in Luwaka.

Planned actions

- FAK will request a specialist team from the mine action agency to conduct a Route Assessment and make concrete and first-hand recommendations as to the level of threat associated with travelling the road.
- Attempts will be made to obtain more information regarding the situation in Luwaka from people travelling to or from the village. If a food emergency is suspected, then alternative means of food distribution will be explored, including air operations, use of the trucking company or use of protected vehicles to access the population.
- The route will not be travelled by FAK at this time.

It is important to note, finally, that it can be extremely difficult to ‘quantify’ risk in any meaningful sense. Ultimately the decision making process relies on weighing a variety of factors, not all of which are measurable. In this process subjective perceptions are critical, but it is important that individuals and organisations are aware of this subjectivity and question what factors underpin individual’s risk perceptions. It also needs to be appreciated that the relationship between threat, vulnerability and response is constantly changing depending on circumstances. This fluidity needs to be understood by those in the field as well by their managers further up the chain.

However in volatile, hostile environments organisations are duty bound to attempt to analyse and evaluate risks, including those from AVMs. A structured, inclusive, participatory and documented approach to this task provides a reasonable mechanism for engaging the fears of individuals, the imperative of the operation and the available evidence whilst supporting managerial accountability.
The following section looks at the variety of options available to respond to that evaluation and try to reduce risks to a tolerable level.

5.4 Risk reduction options: reducing the threat and reducing vulnerability

In this section we look at possible mechanisms for reducing the risk from AVMs. We look first at the mechanisms that can reduce the external threat, which are essentially limited to the response of mine action operators, and we then look at mechanisms for reducing agency vulnerability.

5.4.1 Reducing the threat

Reducing levels of physical threat largely requires a technical response by specialist operators. However it is important for non-mine action agencies to understand the types of activities, and their limitations, that mine action agencies can utilise for that purpose. By engaging in a dialogue with these mine action agencies, NGOs can better understand these procedures and thereby develop a more accurate appreciation of any residual risks to which they might be exposed.

Understanding the mine action response

There are a wide variety of options available for the technical treatment on a suspect road, including manual deminers, mechanical excavators, dogs, vehicle mounted detectors, rollers, flails, fillers, ploughs and other large machines and so on. No single system is both 100% reliable and practical over the whole of a suspect road network, and a combination of tools will normally be required. In nearly all cases, some residual risk will remain even after technical responses have been undertaken. It is very difficult, therefore, to say that roads are 'cleared' of AVMs, and that they are 'safe'. Instead mine action agencies may choose to say that the road has been 'threat reduced'. Similarly, a road that has been assessed as 'low threat' may be 'verified' by a technical process that confirms this assessment.

For a non mine-action specialist key points are:

- Broadly speaking, the level of threat is most completely removed by manual deminers or mechanical excavation, but that vehicle mounted detection systems, pressure systems and other armoured plant have all proved reliable threat reduction tools in a number of contexts.

- A mine action agency conducting technical operations on roads should generally be utilising at least two different technical processes, and should be doing this based on a thorough threat assessment. If this is not the case, it is reasonable to question the effectiveness of the operation.

Example 1

A 10km road that is defined as “suspect”, meaning there is likelihood that AVMs have been used on and alongside the road at various locations, is treated using a combination of a pressure system, a vehicle mounted detector and manual clearance at several points that are considered particularly high risk, including some sections of the verge. During this process two AVMs are located in the body of the road, and one additional device is located on the verge. Although this road cannot be defined as ‘cleared’; the relative confidence in the combination of the roller and vehicle mounted detection systems, along with the manual clearance procedures that have been implemented would allow the road to be changed to ‘low risk’ for the purposes of urgent humanitarian access. This would require users to continue following the basic guideline that the verges remain suspect, but allow the road to be opened for humanitarian activities.

Example 2

A 10km road that is defined as “suspect” as there is one vulnerable point along the road near to a bridge. The road is well used by local vehicles, and there have been no reports of mine incidents or of mine use on the remainder of the road. Manual clearance is undertaken of the road 500 metres either side of the bridge, and around the bridgehead itself. No mines are discovered on the road, although mines are taken from either side of the bridge. This activity allows the road to be defined as now having “no evidence of mines”, and reconstruction of the road can take place.
The important thing is to ensure that the technical treatment applied, both in terms of what type of asset is deployed and where on the road it works, is defined in accordance with the findings of the assessment AND is able to meet the basic needs of the end-user. This is not to say that the above examples show the full extent of treatment that could be applied if there were adequate resources. In Example 1, the objective is to open access for standard vehicle traffic, not to make the road suitable for road reconstruction, and therefore the technical treatment outlined is appropriate. However if assets are available, it would clearly be advantageous to clear the verge for the full length of the road. In Example 2, it may be that additional confidence would be required by a road contractor despite there being no evidence of mines. In this case some form of additional verification tool could be applied to the road itself and to the land required on either side.

In both cases, the key need is for the mine action operator to explain clearly what activity has taken place, why, and what this means in terms of the level of residual risk and the limitations of any particular treatment that have been applied.

For more information on the range of possible mine action responses see Annex B.

5.4.2 Reducing vulnerability

As we have seen, vulnerability in the language of risk management refers to the likelihood of a security incident occurring, and the possible impacts of that incident. In this sense, impact is used to mean both immediate and longer term effects. In the section above we have looked at some of the factors that can increase vulnerability. In defining these vulnerabilities, the options for reducing them become more clear. Below are some practical guidelines on what actions may be implemented at an organisational level to reduce vulnerability, and therefore risk, to a tolerable level.

a. Driver training

This refers to training for drivers for the vehicles they use. Frequently drivers are given a relatively low status within NGOs, and very rarely is time taken to ensure they are capable and competent for handling the large, powerful vehicles that NGOs generally deploy. Driver competence plays a major role in reducing vulnerability by ensuring that the driver is able to handle the vehicle on roads where leaving the main track and going on to the verge, whether by accident or deliberately, can be a fatal mistake.

Ensuring that all drivers receive adequate training and are tested for core competencies reduces the vulnerability to AVM incidents, but also to road traffic accidents in general. Beyond this, drivers are a key security management asset who should be fully involved in broader security management planning and training. They should be fully aware of all AVM-related and travel security plans, ideally because they have been involved in developing these plans as members of the team. Drivers equally have a crucial role to play in managing a whole range of security threats in the field such as defusing hostility or negotiating hostile checkpoints. Typically, they are an under-utilised asset.
It is essential that all within an organisation respect the role of the driver. Drivers can be pressured into bad practice by other staff, who may be in a hurry to reach a destination, or return home from a day in the field, or wish to take a trip off the planned route to visit friends or family. It is important for reducing risks from AVMs and road traffic accidents that drivers have the institutional support to resist these pressures and drive according to the agency guidelines. Managers need to ensure that:

- Drivers understand the responsibility they have for the vehicle and vehicle occupants.
- Other staff understand that when in the vehicle, the driver is there to enforce rules and regulations.
- That international staff do not exhibit bad practices, such as driving at high speeds or failing to undertake standard vehicle checks.
- That drivers feel confident to make decisions about route safety based on their appreciation of changes in the local context. Drivers need to be supported to assess risk and to act on that assessment.

One leading UK NGO established clear rules that whatever the status of passengers in the vehicle, practical command of the vehicle on field trips remains with the driver, including the authority to abort a mission on security grounds, no matter how important that mission might be.

**b. Landmine safety training**

More specifically and not just aimed solely at drivers, landmine safety training with specific reference to safe use of roads is a key element in reducing vulnerability to AVMs. This training will include identifying threat indicators, and give basic guidelines and procedures for using roads in AVM contaminated environments.

For example, the most important procedures identified in the MAG Angola Road Usage Guidelines are:

- Always remain on the main body of the road, and in the existing vehicle tracks as far as possible.
- Ensure staff have the confidence and ability to make a decision to stop and turn back if they feel that the road is being dangerous to use for any reason – this may include deteriorating road conditions, heavy rain, or previously unidentified information regarding the mine threat along the road.

The availability of this training is to some extent an indicator of the severity of the threat level and agency vulnerability to it. Such training (for agency staff, taxi, bus and lorry drivers) was made available by specialist agencies (MAG, HALO Trust and ICRC) in both Angola and Afghanistan, and such training was being developed and implemented by the UNMAS in south Sudan throughout 2006.

**c. Journey procedures and vehicle regulations**

Effective procedures for journey planning, good communication procedures and vehicle use guidelines are three key elements in reducing vulnerability to AVMs and security threats during travel on roads more generally.
Journey planning includes elements such as confirmation of road status, route planning, and contingency planning. It is particularly important to check road status prior to travel along routes being used for the first time, or that have not been used for several months. Route planning should be based on confirmed knowledge of the status of roads, and include details of start times, stopping points and estimated arrival times for various locations.

Communications procedures should ensure at a minimum that:
- The vehicle has working HF/VHF radios and preferably a secondary communications system such as a satellite phone
- The agreed journey plan that is known by key personnel at the Operations Base, such as the Radio Operator and the Senior Manager. The journey plan will include expected travel times, routes to be used, and return times.
- There are agreed contact times between the vehicle and the base
- There are agreed procedures for what happens if contact times are missed
- Contact details (e.g. radio frequencies) of mine action agencies operating in the region are held within the vehicle in the event of a mine incident

Vehicle use guidelines should include procedures for safe storage of equipment such as fuel, maintenance plans, equipment lists, and directives for passengers and so on. By having such procedures and guidelines, and ensuring that they are enforced within the organisation, vulnerability to the AVM threat is reduced.

Measures specifically relevant to AVMs include:
- Following the main road carriageway – driving in the tracks of previous traffic
- Wearing seatbelts
- Not carrying spare fuel inside the vehicle.
- Not carrying sharp items loose within the vehicle.
- Having appropriate vehicle medical kits

d. Staff numbers
Put very simply, the more people per vehicle, the greater the impact in the event of an AVM incident. If possible reducing the number of staff to the minimum required for all journeys undertaken decreases overall levels of vulnerability, to both AVM incidents and road traffic accidents.

e. First aid training
A study of AVM casualties during the conflict in Croatia, undertaken for the Journal Military Medicine, concluded that:

“... although injuries from antitank mines are ravaging, and frequently fatal, a significant number of patients survive.”

Immediate first aid is one of the key links in any ‘chain of survival.' Blocked airways or excessive bleeding can easily kill before any specialist medical care can be summoned or can reach the site of the incident. First aid training amongst agency staff increases the likelihood of someone in a convoy being able to respond the immediate needs of casualties and keeping them alive until additional medical assistance can be provided.

f. Vehicle protection
Vehicle protection options include:
- Ballistic blankets (NO PROTECTION AGAINST AVMs)
- Customised armoured vehicles (NO PROTECTION AGAINST AVMs)
- Blast plates
- Mine protected vehicles.
Levels of protection and the type of weapon they provide protection from differ widely, so a key factor in deciding whether to utilise a protected vehicle is to determine what type of threat it is designed to provide protection against. For the purpose of AVMs, blast plates and mine protected vehicles are the only types of armouring that can provide significant additional protection. An more detailed analysis of this issue can be found at Annex A.

If an organisation chooses to deploy mine protected vehicles, a number of factors need to be considered on an ongoing basis:

Training  How will the organisation train drivers in the use of the vehicles? Drivers need to be familiar with the handling characteristics of protected or armoured vehicles, and understand their limitations in terms of speed and weight restrictions.

Road Usage  Are protected vehicles being used to further reduce risks on roads currently travelled or are they for use on roads that would otherwise be off-limits?

Emergency Access  Are there specific circumstances when the vehicle would be used to provide urgent humanitarian support in areas that are otherwise off-limit due to the mine threat? What are these circumstances and what is the decision making procedure to approve use of the vehicle?

g. Choice of vehicles

Even for unprotected the vehicles the choice of vehicle may increase or decrease protection. The following specific points have been suggested:

- The greater the distance from the wheel points to the personnel inside the vehicle the better.

- Wheels outside the main body work of the vehicle provide better protection (as the blast causes more damage when it gets ‘trapped’ under the vehicle instead of being dispersed away from the body of the vehicle). This can be achieved by removing the wings on standard aid vehicles such as the Toyota Land Cruiser.

Two photographs that illustrate damage sustained by HALO Land Rovers after anti-vehicle mine strikes. In the first (top) five staff died when their un-protected vehicle reversed on to an AVM in an area which had been ‘cleared’ by another agency using mine detection dogs. In the second (bottom), all staff walked away with only minor injuries when this vehicle fitted with anti-vehicle mine blast protection plates hit an AVM during a survey in a frontline area.
- Vehicles with a roll cage or roll bar provide better protection.
- Vehicles fitted with specialist, four point seat belts (over both shoulders) and seats. Even wearing regular 3 point seat belts substantially reduces the impact of an incident (many injuries and deaths result from victims being driven by the blast into the roof of the vehicle, resulting in neck injuries). Seat belts also provide additional protection in the event of the vehicle being flipped or rolled after an AVM incident. The wearing of seat belts is obviously a cross cutting element of good practice.  

5.4.3 Restructuring in the face of excessive risk

If after examining the measures suggested above an organisation still cannot practicably reduce risk to a level that is considered tolerable then they probably need to restructure their operations to address this problem. Restructuring may still allow the same planned beneficiaries to be reached or it may mean the planned humanitarian inputs are directed elsewhere. Failure to restructure in these circumstances may leave the agency vulnerable to allegations that it has failed to meet its duty of care, should an AVM incident subsequently occur in the course of the operation. Some security management experts believe that law suits on such a basis could present serious financial risks for an entire agency. Conversely, the risk assessment and management processes undertaken which left the agency feeling its residual risks were unacceptable need to be fully documented and communicated with its stakeholders: staff, management, beneficiaries and donors.

a. Assistance is diverted elsewhere

If an area becomes inaccessible after assistance has been planned it may be necessary to divert this assistance elsewhere. The ability of an organisation to make such a decision is likely to be dependent upon how much geographical flexibility it has in its obligations to donors. Additionally such decisions need to communicated to any beneficiary groups who are already expecting assistance to be forthcoming. This situation can again create difficulties of communicating different perspectives and responsibilities regarding the threat.

b. Activities are deferred

The threat from AVMs is generally considered to be greater in the wet season. Evidence from Afghanistan, Angola and Sudan strongly suggests that AVMs pose a higher threat when roads are inundated or sometimes degraded by heavy rains. This is a function of several factors and applies mostly, but not exclusively, to rough un-surfaced roads common in rural areas:

- Rains can create 'high risk points' around enlarged pot holes in broken tarmac and/or muddy-bog patches, forcing vehicles onto high risk verge areas.
- Deeply buried mines can become an active threat. Such mines may be encased in hard baked soils during the dry season stopping pressure being transferred to them. The wet soil transfers sufficient pressure to initiate even the deeply buried mine.

Designating some roads “Dry Season Only” can therefore reduce the overall level of threat from AVMs.”

Alternatively activities may be deferred if it is known that some additional mine action treatment will be performed on the route in the foreseeable future.

c. Contracting out or remote management

Some international NGOs and IGOs will use local commercial companies or local NGOs to travel routes that their own staff are not allowed to use. Such an approach has advantages in that it allows beneficiaries to be reached who would otherwise go without assistance. However, this approach may also raise moral concerns because it seems to bring to the fore different valuations of life and exploit different perceptions of risk and return.
It can be argued that if these commercial companies or local NGOs are using these roads anyway then working through them is not substantially increasing their exposure to risk. Indeed it is not uncommon in such circumstances that the local bodies will be bemused and perhaps frustrated by the perceived risk aversion of the international organisation.

On the other hand it would clearly raise serious concerns if an international organisation were to contract a local partner to drive a road where the risk of having an accident was known to be very high.

Finding the boundary between these two formulations is not easy. However, it should be recommended as good practice that if an organisation chooses to contract local partners to access areas where it cannot travel then this decision should be made explicitly and an explanation documented for why it is considered acceptable.

More complex than simply the movement of goods, implementing project activities in such circumstances may require remote management. This involves services and activities being undertaken on behalf of an organisation without that organisation’s own staff being able to access the area to ensure management oversight. This can create challenges of accountability for the senior agency with respect to its donors.

Excerpt from a letter sent by a local NGO to the HALO Trust in Angola:

The Commune of Chilata... holds a population of about 36,000 inhabitants, according to the vulnerability studies and report released by WFP, this is one of the most vulnerable communes in Huambo Province. It does not have access to hardly any basic services, at the moment the population is surviving on unripe sweet potatoes plus some few items distributed by WFP. [We] will implement food security programs in this area, however, donors are reluctant to finance projects where they have no possibility to visit... We eagerly trust that the plans to carry out mine clearance of this road will be executed soon and smoothly, bringing about positive changes in the commune of Chilata.

d. Air delivery of supplies
In cases of known and extreme need, air delivery of supplies might be the only way of overcoming the risks associated with land travel. This option will require significant additional funds and logistics resources and is likely to be an option only for the largest aid delivery institutions.

The following is an excerpt from correspondence in Angola in 2002, raising the possibility of air-dropped food in response to an emerging AVM threat:

... Secondly, it means the communities in Likua and Rivungo will be cut off from food and health aid, and they face the most serious problems in the province that I have seen so far. I have discussed with WFP the possibility of sending a team in by helicopter and doing food drops by Hercules (we did this successfully in the past in Sudan and Somalia) with a three month ration.

e. Closing a project: liaising with donors
Ultimately if the risks cannot be worked around in a practical way it may be necessary to close a planned project. This clearly has implications in terms of the non-delivery of service to people who are apparently in need. Furthermore, it may have implications for an organisation’s relationship with its funders. Whilst the mainstreaming of security management good practice is still an ongoing challenge, being able to present to donors evidence of a well documented and accountable risk assessment process is likely to be very valuable in such circumstances.

It is also important that individual organisations communicate what has caused these difficulties for project implementation so that the problematic nature of AVMs is well documented. Such documentation should help to inform discussion of these weapons in fora of international law.
A Risk management process for AVMs

STEP 1
Activity: Risk assessment
Objective: To determine the current level of risk associated with travel on a given route
Includes:
- Threat assessment.
- Vulnerability assessment.

STEP 1a
Activity: Threat assessment
Objective: To determine the level of threat associated with travel on a given route
Includes:
- Inputs from mine action agencies and mine action coordination bodies.
- Inputs from agency staff and from local key informants.
- Assessment of the conflict in the area.
- Assessment of the history of AVM incidents in the area.

STEP 1b
Activity: Vulnerability assessment
Objective: To determine the level of vulnerability associated with an AVM incident
Includes:
- Assessment of likely immediate impact of AVM incident on agency staff.
- Assessment of wider structural impact of AVM incident on organisation.
- Assessment of wider structural impact on other organisations of an AVM incident.

RISK LEVEL

KEY QUESTION
Is the level of risk above or below what the organisation considers tolerable in relation to the humanitarian needs associated with the project?

Proceed with activity
1. Ensure staff are aware of existing risk level and of any specific procedures that have been put in place.
2. Ensure plan is in place for undertaking ongoing risk assessments.
3. Determine what would trigger a review of risk, e.g. an AVM incident on the road, discovery of a mine on a road being used etc.

Do NOT proceed with activity
1. Explain to staff, authorities, communities and donors why the decision has been taken not to undertake the project.
2. Determine what must happen to decrease the risk and bring it to a tolerable level. This may include internal or external inputs to reduce the level of threat, or vulnerability or both.
3. Determine if it is possible to achieve project goals using alternative methods.
IN THE EVENT OF AN AVM INCIDENT

Whatever steps are taken to assess and reduce the level of risk from AVMs, there is always the possibility that a vehicle may be involved in an AVM incident.

In such cases, there is a reasonable chance that one or more people will survive the initial blast. The decisions that are taken at that point are critical to minimising impact of the incident and saving lives. Whilst the advice below can be considered ‘good practice,’ clearly each situation is different and no procedures or guidelines can fully account for such extreme situations. Individuals must be free to choose to act as they think appropriate in a given set of circumstances, which may not always be in accordance with the ‘standard procedures.’

It is important to note that there may be a serious threat from anti-personnel mines in the immediate vicinity of an AVM incident.

First steps

If you are in the vehicle

The first step is to assess whether there is any further danger from remaining in the vehicle. The most likely threat is from fire. If there does not appear to be any danger from fire, then the second step is to assess and stabilise any casualties. The third step would be to attempt communication from within the vehicle with your operations base and/or any agency providing a general security network such as the UN, stating full details of the incident (name, organisation, summary of the incident, location, and casualty information). If possible, after these steps have been taken, the best option is to remain in the vehicle.

If you are accompanying the vehicle

If a vehicle with which you are in convoy is involved in an apparent AVM incident, then the first step is to stop your own vehicle and remain still. You should try to assess the situation in the incident vehicle from within your own vehicle. You should try to communicate with your operations base and any agency providing general security coverage, providing as far as possible the information mentioned above. If you can confirm that the casualties in the incident vehicle are stabilised and that assistance is on its way, then the best option is to remain in the vehicle.

Second steps

At this point, it is hoped that all vehicles have stopped moving, contact has been made with base, casualties are stabilised and a medical evacuation plan is being implemented. This should include the involvement of a mine action agency able to come and make an immediate assessment of any additional risk to the vehicle occupants, and have the resources available to enact any emergency clearance required to evacuate the occupants.

This, however, is an ideal situation. Four critical problems are likely to be encountered:

a. The vehicle presents a danger

If the vehicle represents a continuing source of danger, the goal should be to evacuate the vehicle, from the rear if possible, and move from the vehicle to a safe area. This safe area would be the body of the road. Any movement on the road should be undertaken along vehicle tracks. If the vehicle has been blown into an area adjacent to the road, then this area should be considered suspect for anti-personnel mines and additional AVMs. Movement should be undertaken only to get away from the immediate danger presented by the vehicle itself.

b. The casualties are not stabilized

If the casualties cannot be stabilised, or are in need of urgent medical attention, then they should be evacuated to any accompanying vehicle. The accompanying vehicle should make its way to the nearest medical facility, keeping to the tracks of the road on which it is travelling. It may be that someone from the accompanying vehicle needs to access the casualties on foot in order extract them, in which case the guidelines outlined above should be followed – as much as possible, stay on probable safe ground, e.g. the tracks of the road.
c. **Communications cannot be established**  
Communications may not be possible from the damaged vehicle, or due to problems with radio coverage. In this case, depending on the seriousness of the casualties, a decision must be made on the ground about going to get assistance using the accompanying vehicle. Factors to consider include the time of day, any local ‘patterns’ with radio coverage, distance to the nearest point of assistance and so on.

d. **Mine action agency support is not available**  
If there is no mine action agency to assist in the evacuation, then movement will have to be undertaken from the incident vehicle to the accompanying vehicle, remaining as much as possible in the probable safe area – e.g. in the tracks of the road.

**Summary**

i. In the event of an AVM incident, remember the following:

- **STOP all movement**  
do not run from the vehicle, or if in another vehicle, do not attempt to reach the other vehicle. Stop and think.

- **ASSESS the situation**  
continuing dangers, status of casualties, status of vehicle etc

- **STABILISE the casualties**  
Determine the seriousness of any injuries.

- **COMMUNICATE**  
with your operations base, security network, or a mine action agency.

This can be remembered easily as the STOP AND STAY CALM acronym.

ii. Minimum movement reduces risks. Avoiding the further movement of people and vehicles until a mine action agency arrives, reduces the likelihood of being involved in a secondary incident. If a mine action agency is not available to assist with evacuation then movement should be made as far as possible along probable safe ground, namely the tracks of the road. All other areas, particularly the land adjacent to the road, the verges and the centre of the road should be considered HIGHLY SUSPECT, regardless of any previous assessment information.
5.5 External assistance: working with security coordination bodies and the mine action sector

In conditions of risk and uncertainty, good information is crucial to responsible and effective decision-making. A key element of security management good practice is good communication with, and in some cases integration within, existing security frameworks. This has the benefits of:

- Providing a forum for open exchange and dissemination of information regarding specific and general security issues that could threaten project implementation and staff well-being.

- Allowing for organisations facing the same threats to develop joint security procedures, such as communication protocols, evacuation procedures and so on.

- Permitting agencies to make decisions about existing and future projects through reference to documents and reports produced by coordinating bodies.

- Allowing the sharing of assets, such as communication networks, security personnel and aircraft.

- Providing access to (and influence with) provincial or national authorities, or with key members of opposition groups or factions, that may allow for improved access and security through commonly negotiated agreements.

Despite security receiving more attention within NGOs and the UN in recent years, there do remain difficulties with regards to effective coordination. It is telling that even within two organisations that have a strong security culture, CARE and the ICRC, neither has a section on coordination within their otherwise excellent field manuals on security. Yet clearly “there is significant scope for, and important cost-benefits to be had, from much more interagency collaboration.”

Security coordination within the UN is the responsibility of the United Nations Department for Safety and Security, with NGOs increasingly liaising with DSS in a formal or informal manner. In other cases, NGO bodies may exist who play a role in security coordination.

5.5.1 Coordination with regard to AVMs

There are three main options for securing information regarding the AVM threat from within the humanitarian community, and each has its strengths and limitations:

- Security Coordination Mechanisms (UN or non-UN)

- Mine Action Coordination Bodies

- Mine Action Operators

Ideally, any organisation operating in a conflict or post-conflict environment, where unexploded ordnance, APMs and AVMs represent a potential threat should be liaising with all of the above structures wherever possible. In the following section we will look at how to maximise the information from these bodies, and how best to ensure that the liaison is meeting organisational needs. We look particularly at how NGOs can ensure they are asking the right questions, and make judgements as to the quality of the answers they are receiving.

5.5.2 Security coordination mechanisms

Security coordination mechanisms are very important for general security management, usually providing regular security meetings, security situation reports, facilitating communication between security representatives of a wide range of organisations, and the co-ordination of humanitarian air operations and medical or security evacuations.

With regards to the AVM threat specifically, the following questions are relevant:
Does the security mechanism analyse AVM incidents as a distinct threat?

Effective security management requires distinct threats to be analysed separately. It is important to check that any security management structure is distinguishing between AVMs and other explosive threats such as anti-personnel mines, road side bombs (IEDs) and unexploded ordnance.

Who has responsibility for determining the trafficability of roads?

In many contexts the UN DSS will have responsibility within the UN for determining if roads can be used by all UN agencies. Formal implementing partners must adhere to these classifications, but other organisations must decide to what extent they follow UN road classifications.

What system of classification is used?

For example, open/closed, red/yellow/green. No classification system is ideal, as it implies it is possible to quantify risk exactly. However some form of classification is generally required by the UN, and it is important to know what this system is.

Who is responsible for conducting assessments and determining road classification?

It may be that assessments are conducted by members of the security body itself, or by staff from other UN agencies. The procedures should be clear and transparent.

What factors go into defining road status?

Again, the specific factors may differ between countries, but the primary concern for NGOs is to understand how road status is determined and if the specific threat they are concerned with is included in the assessment procedure. Factors may include, for example, general road and bridge conditions, and specific security threats such as mines, banditry, and targeting of agencies.

Are any reports on specific roads available? How are they distributed?

If assessments are conducted, it may be possible to obtain the reports that are generated from these assessments. This allows agencies to get the full set of information regarding the road, and make a determination as to how adequate they feel the assessment procedure is for their own purposes.

Are any maps showing the road network and the relevant classifications available? How are they distributed?

Maps may be generated showing the status of roads in terms of trafficability, on a regional or national basis. They may be overlaid on digitised maps, or be representative diagrams. They can be an easy, first-look reminder for use in operational planning.

Are AVM incidents and road status included in security meeting agendas and security situation reports?

It is important to know if AVM incidents and road status can be monitored through the general security briefings and reports, or if information needs to be specifically obtained from liaison with other structures or agencies.

If a road status is changed, how are organisations informed?

Road status can change for a variety of reasons, and the documentation for doing so would normally be a revised assessment. For NGOs, the first concern is to know how they will be kept informed as to changes in road status.

How does the security body work with mine action operators?

If there is a specific AVM threat, then it is useful to know how the UN DSS or the security body works with mine action operators to include their expertise within the assessment procedure.

Any security body responsible for assessing the status of roads should be able to provide comprehensive responses to the above questions, and in doing so ensure that there is both a practical and wide-ranging set of information available about road status for NGOs, and that there is a written record that supports decision-making processes. This information can be very useful for threat assessments, operational planning, project design and proposal writing. However, security coordination bodies are not usually experts on mines and unexploded ordnance, and as such should not be considered the sole source of information when conducting a risk assessment with regards to AVMs; at least one of the two following bodies should also be involved.
5.5.3 Mine action coordination bodies

The structure and organisation of mine action coordination institutions vary from country to country, with some being run by the UN and some by governmental bodies (potentially supported by the UN). The mine action coordination body will generally be responsible for working with technical mine action implementing agencies (both commercial and not-for-profit organisations, national and international), and for liaison both with the host government and within the UN family on issues regarding mines and UXO. As such there is often a link between the UN DSS and the MACC, as there is significant overlap in terms of their collation of data regarding mines and UXO as a security threat.

Mine action coordination bodies vary significantly from one country to another in terms of the quality of information available, the accessibility of the institution, and how proactive it may be in terms of providing information to NGOs. Overall, however, the mine action coordination unit, at a national level should be a good source of macro-level guidance regarding the overall threat from AVMs.

For NGOs, the mine action coordination unit should be able to provide specific information about the following:

■ Mine action operators The coordination unit should be able to provide information, including contact details, locations of work and so on about mine action operators working in specific areas.

■ Dangerous area information If the coordination body is running a database, and particularly if detailed survey work has been undertaken it should be possible for it to provide detailed information about locations of suspect areas, including roads, to end-users.

■ Mine awareness and landmine safety In some countries the mine action coordination body will provide landmine safety briefings directly to NGO staff, and may undertake nationwide publicity campaigns on issues such as road safety.

■ Briefings and updates In emergency situations, the mine action coordination unit may undertake briefings and provide written updates regarding the mine threat, particularly with regards to suspect dangerous areas. The UN DSS may refer NGOs directly to the mine action coordination body for further information.

■ Provincial liaison offices In some countries, the mine action coordination body will have regional representatives who NGOs can go to for location specific information. NGOs can also submit information they may obtain regarding the mine threat, such as reports of mines on roads.

5.5.4 Mine action operators

The third key source of information regarding the AVM threat are the technical mine action implementing agencies. There are a few key factors to remember when liaising with these agencies in terms of the AVM threat:

■ The nature of AVM contamination on roads differs from APM contamination, and not all mine action operators or staff have experience of dealing with this problem.

■ Not all mine action agencies are of equal standard, and variations in quality of information exist both between organisations and within the same organisation in different contexts.

■ The language used by mine action operators to describe the levels of risk and threats from AVMs on roads is not standardised, and so it is important to ensure that you are clear on how different agencies describe and define threats.

It is important to approach mine action agencies with a clear sense of what information is required and what questions need to be asked to obtain it. The following set of questions and answers is an example of how a dialogue with a mine action operator can be effective for an NGO seeking to understand the AVM threat:
**QUESTIONS** | **POSSIBLE ANSWER** | **RELEVANT ISSUES**
--- | --- | ---
Do you have a system for defining the level of risk from AVMs and other explosive devices on roads? | We define roads as “mined”, “suspect” and “low risk”. We advise against travel on the first two categories. | Different agencies define risk in different ways. It is useful to get a written statement as to how definitions of risk are formulated.

How do you conduct assessments of roads? | We do assessments in two phases: 1. Information gathering from key informants prior to travel 2. Visual inspection of road. | A guide to what types of indicators and elements that should be contained in a good quality road assessment can be found at Annex D.

Who conducts your road assessments? | We have a specialist team who do most of the assessments, but several staff are trained to do them. | Ideally, a specially trained team should be conducting assessments, but this is not always feasible. The main thing is that procedures are in place and the people conducting the assessment are trained in the process.

What factors do you use to determine the level of risk? | We use a range of factors based on the findings of the assessment, and then a discussion amongst senior staff on these findings. | Although it is difficult to ascribe exact risk “weights” for all the information gathered, there should be a standard procedure for examining the findings of the assessment.

Do you provide any reports on your road assessments? | We have a standard report format that we distribute to the UN, local authorities and all local NGOs. | A standard report format is a good way for a mine action agency to provide information and recommendations following a route assessment, and provides a written record that helps document decision making processes.

Is it possible to see the supporting documentation from your road assessments? | We can provide detailed briefings for agencies wishing to use the road. | Some documents are always for internal use only, but a detailed briefing should be available if needed.

How does your assessment relate to the UN classification of roads? | We submit our reports to the UN, and sometimes we do the initial assessment at the request of UN agencies. However they have their own system for classifying roads and ours are independent. | Generally the UN will have a set of internal procedures to follow to set or change road classifications. Whether an NGO wishes or needs to follow the UN system or take the advice of a mine action operator alone is an organisational decision.

Can we request assessments of specific roads and how fast can you do them? | You can provide a written request for a road assessment, and include why you need it and what the expected benefits are. We will prioritise it alongside our other activities. | If no route assessment has been conducted, then it is reasonable to expect a mine action agency to be able to conduct an assessment. The timeframe should be open to discussion, but clearly there is a limit to how many effective assessments an agency can do given the specialised nature of the task.
By utilising the above questions and observing the guidelines for what type of information should be included in the response, it is possible to determine whether a mine action agency is following reasonable procedures for road assessments, and is able to provide additional support to an NGO wishing to use the road. This information can be thought of as local-level guidance for road usage, and provides information about specific roads with definite start and end points for road users.

If the mine action agency considers that the road should not be used, a different set of questions become relevant. These would focus more on what actions are being taken, how long these are going to take and whether any report will be available when the technical responses are completed.

A final question that might be asked of mine action operators regarding such assessments is:

“Does your organisation accept any legal responsibility for the assessment you provide?”

The answer to this question is almost certainly NO. Words to this affect are also likely to be included in any formal route assessment written by a mine action operator. For this reason the duty of care for an NGO needs to extend beyond mindlessly following external advice and include asking the sorts of questions detailed above. Ultimately each individual organisation must take responsibility for the risks to which it exposes its staff.

### 5.5.6 Risk classification systems

In many environments security coordinating bodies or mine action agencies may use a risk classification system to communicate their opinion of the threat on particular routes. Such systems are useful because they provide a simple basis for decision making. However, they are problematic because they tend to assume all road users have the same level of vulnerability and the same level of humanitarian imperative.

A number of different systems have been used, as per the table below. Each uses different terminology and presents recommendations in a slightly different way:

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Classification system</th>
<th>Road status</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN DSS (Angola)</td>
<td>Red</td>
<td>Should not be used</td>
</tr>
<tr>
<td></td>
<td>Yellow</td>
<td>Should be used only with approval</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>Can be used freely</td>
</tr>
<tr>
<td>MAG (Angola)</td>
<td>Not trafficable</td>
<td>Should not be used</td>
</tr>
<tr>
<td></td>
<td>Trafficable</td>
<td>Can be used for access, with reference to specific guidelines for road use</td>
</tr>
</tbody>
</table>
As can be seen, the different systems do not all approach the issue in the same way. For example, out of the systems here only the guidelines from Sudan make it clear that travel is not recommended on roads that have not yet been surveyed. It raises a key question though of how organisations perceive the risk in their environment:

- Are all roads considered useable unless some specific evidence of mines is identified?
- Or are all roads considered high risk unless some evidence is produced to the contrary?

In any specific context humanitarian organisations need to ask questions of the bodies that produce these guidelines to find out how they work. Humanitarian organisations need to understand the implications of the different terms used, recognising for example that “trafficable” does not mean the same as “no evidence of mines.”

It is not uncommon for some agencies to consider that umbrella systems of classification are too risk averse (particularly UN systems). Such differences of opinion can create significant frustrations. The decision to operate independently of such collective systems (if agencies have that option within their mandates) likely requires additional investment of time and energy in security management functions. However, it should also be noted that collective systems might have serious shortcomings in how they analyse threats – resulting in classifications that expose organisations to excessive risk.

Ultimately, individual organisations need to evaluate the processes that underpin external advice and assess whether following these guidelines serves their best interests and the best interests of the populations to which they are providing assistance.

### OLD MINE OR NEW MINE?

In all contexts the identification of an AVM, either found and reported, or else detonated, is a cause for alarm. One of the key questions that arises is “was the mine a remnant from a conflict that took place some time previously, or was it newly laid?” The determination of whether a mine is new or old is crucial for several reasons and can change the specific actions taken by agencies in response to the incident.

#### Why call it new?

In all countries surveyed, it was not uncommon for AVMs to be discovered on routes that were in regular use, and in many cases this had led different people to make statements suggesting that the mine was “new”, even prior to a full investigation having taken place. It is important to understand that these statements may be being made without full knowledge of the situation, or due to existing vested interests, as outlined here:

- **Conflict tensions** In some cases there may be existing conflict related tensions that are unresolved and lead to different sides claiming that the mines have been newly laid by the opposition.
b. Political tensions Closely related to conflict related tension, it may be in the political interests of specific groups to claim that mines are “newly laid” in order to achieve political advantage and marginalise political opponents. For example, claiming that mines are newly laid can help one actor demonstrate to local populations that they are still being targeted by the opposition group, or can be used to prevent aid agencies from accessing certain areas and potentially diverting aid and support to other, more politically advantageous, locations. This is especially true in contexts where the discovery of an AVM leads to roads being immediately reclassified under existing security procedures.110

c. Professional denial In some cases the discovery of a mine on a road that has been assessed or treated by a mine action operator can call into question the quality of the work, or choice of process that was applied. In these circumstances it is not surprising if some agencies or coordinating bodies prefer to assert that any mine identified must be “new” rather than undertake an examination of procedures or undergo any external investigation.

d. Basic ignorance The temptation to throw out the words “new mine” can result from ignorance of the limitations of mine action processes and lack of understanding of the impact that this can have in areas of political tension and with fragile ceasefires.

In Angola, whether an AVM was newly laid or not was almost always the first question that local authorities would ask mine action agencies, despite the conflict having been over for some three years and UNITA effectively having been wiped out as a military force. In 21 mine incidents investigated by MAG between November 2003 and February 2005, all mines were found to be “old”, even though the majority had been discovered along well-travelled roads.111

However, despite this, it is also the case that mines have been laid after assessments have been undertaken and/or technical treatments applied. These mines have been laid in order to achieve military or political objectives, and thus represent a very serious security threat to humanitarian actors. This is particularly true in Afghanistan, where the ongoing conflict has resulted in an ongoing and serious threat from newly-placed roadside IEDs and AVMs.

Key Point: Whilst determining whether a mine is newly laid or a remnant of conflict is vital to assessing the risk, it is important to be aware that there may be pressures to declare the mine “new”, and that this judgment should be reserved until a complete investigation has been conducted.

The limitations of mine action processes

As stated above, mine incidents do occur along roads that have been assessed by mine action agencies, and in some cases treated with some form of technical process. Some key facts to remember in these cases are:

- Route assessments, and the conclusions made based on these assessments, rely on obtaining information and making professional judgments about that information. This information can be direct (from visual inspection of the road) and indirect (from key informants, local communities and so on). However there is no assessment procedure that can simply identify all mines along a given road. Assessments are intrinsically limited, and even when done well can only highlight potential high-risk areas or suggest that there is “no evidence of mines”.112

- There are no technical treatments that can completely guarantee the clearance of all mines and other devices from a road. This is particularly the case with regards to the verges of roads, with mines that are deeply buried, or with minimum metal mines. Therefore it is always a possibility that mines may be located in areas that have already had technical processes applied. This is not necessarily due to a failure of the process, but a result of the limitations of any given technical response.

Key Point: Understanding that mine action process, both assessments and technical treatments, have limitations is crucial to realizing that not all mines on roads are automatically “new”, and for understanding that risks remain even on roads that have been assessed and treated.
If new mines are a realistic possibility

New AVM use on roads should be considered an armed attack and assessed accordingly as a security threat. Assuming that ongoing security management assessments confirm that operations should continue, there are a number of specific actions that can be taken to reduce the risk:

- Ensure that you are not the first vehicle to travel the road in the morning
- Remain a safe distance behind the vehicle in front, approximately 200 metres
- Be aware of any changes to the road surface, particularly if it seems to have been disturbed
- Maintain regular contact with security coordination networks and obtain updates on security status prior to travel
- Review journey plans and procedures before each trip.

5.6 Responsibility and accountability

The purpose of this report is to provide information, analysis and tools that should allow people and organisations working in areas contaminated by anti-vehicle mines to understand and manage the threat that these weapons pose.

We have seen that AVMs pose a particular threat on post-conflict environments when they have been used on or along roads. When civilian vehicles detonate an AVM, it usually results in significant loss of life and severe injuries for survivors. We have also seen that many aid organisations have themselves been involved in AVM incidents resulting in death and injuries to their staff, and indeed many more than have had staff killed or injured by anti-personnel mines or other unexploded ordnance. The threat from AVMs is made worse by the fact that there is no methodology available for mine action agencies to identify and remove this threat in a timely manner.

Moreover, this report has found that when AVMs have presented a direct threat to humanitarian agencies, the response is often one of either avoiding the risk altogether, or ignoring it. Neither response is appropriate if humanitarian organisations are to ensure that they are able to respond in a sustainable and effective manner to the needs of vulnerable communities. By seeking to avoid the risk and declare large parts of the road network ‘off limits’, there is very real danger that humanitarian agencies exacerbate existing structural vulnerabilities within populations that are cut off from humanitarian support.

This report has therefore attempted to provide guidance for humanitarian organisations in terms of managing the risk from AVMs in a more effective manner. In doing this, we have provided advice and suggested some methods for firstly assessing the risk that AVMs pose, and for reducing an agencies vulnerability to this threat. By adopting a risk management approach to the problem of AVMs, this report believes that humanitarian agencies can both reduce the direct risk to their staff and maximise the likelihood of being able to continue providing support to vulnerable populations.

Finally, this report has indicated that good quality liaison and coordination with regards to the threat from AVMs, and indeed from all security threats, is a key factor in effective security management. This process is not simply about passively obtaining information from ‘specialist’ agencies, but about developing a culture that seeks to analyse and assess the information being received. If humanitarian agencies do not place their own needs at the forefront of the dialogue regarding security threats, such as that from AVMs, there is a danger that they will be forced into adopting risk avoidance measures that prevent them from delivering much needed humanitarian assistance. Equally, if humanitarian agencies fail to liaise in an effective manner with security bodies they place their staff and the organisation in a vulnerable position.
Humanitarian agencies best positioned to effectively manage the threat from AVMs using the information and tools contained in this report will most likely already have well-established security management procedures. For others, it is hoped this report indicates an approach to security management that encourages managers to empower staff, question received information and prioritise the management of different security threats at all organisational levels.

The ultimate goal of security management for humanitarian agencies is to enable work to continue, despite the very real threats that exist, without placing their staff in positions of unnecessary and excessive danger. It is hoped that this report on the management of the threat posed by AVMs demonstrates how this may be achieved.

- General security management good practice is proactive and should help to identify AVMs as a specific threat. Where AVMs are a threat they need to be evaluated and addressed through specific mechanisms.
- Every organisation needs to take responsibility for the risks to which it exposes its staff. Even if working under collective security arrangements individual organisations have a responsibility to have scrutinised the processes used and evaluated that the advice being given is appropriate.
- It is important to consider the effects of any risk management decisions on the local population. Good security management on this issue is not only about reducing risk to agency staff – it is also about avoiding unnecessary suffering for the civilian populations aid agencies are trying to assist.
- Although AVMs are often addressed by specialist mine action agencies this does not mean humanitarian organisations do not need to evaluate the risks for themselves. Seeking advice is vital – but managers need to evaluate the quality of the advice they are being given.
- When evaluating the possible impact of an incident it is important to look beyond immediate casualties and understand wider ramifications: impact on morale of all staff; possible suspension of activities by other organisations; possible legal scrutiny of how the accident happened.
- Risk assessments and risk management responses need to be undertaken as a team, they need to be documented and staff need to explicitly understand any residual risks that are being accepted.
- Although every effort can be taken to limit risks, there is always the possibility that an incident will occur. Agencies need to be prepared for the worst case scenario, which means ensuring training has been given and procedures are in place and fully understood with regards to what to do in the event of an AVM incident. It is important to remember that such preparedness needs to be put in place for new staff and practiced for all staff.
Annex A: Vehicle protection against AVMs

An AVM incident is likely to exert extreme forces on people involved. It should be noted that 'protection' as described here refers to improved chances of survival – not avoidance of injury.

The use of certain types of protected vehicle can significantly reduce the impact of an anti-vehicle mine detonation. If managed appropriately, this can reduce the level of vulnerability, and therefore risk, that an organization faces when working in an AVM-contaminated environment. However it is vital that organisations understand the key differences between various protection options, and the limitations and advantages of each option.

This annex can only provide a general summary. More information should be sought if making vehicle protection choices for a specific environment.

Four options

Options for increasing vehicle protection from explosives blasts include:

■ Ballistic blankets: Lightweight material blankets fitted underneath the internal floor and door trim of a standard vehicle

■ Customised armoured vehicles: Ordinary vehicles modified to be fitted with all-round armoured protection on doors, floors, windows, fuel tanks and so on.

■ Blast plates: Reinforced steel fitted to a standard vehicle underneath the chassis to provide specific protection against mine detonations

■ Mine protected vehicles: Specially constructed vehicles with all-round armouring and strengthened armouring underneath the chassis to protect against mine detonations

There are, therefore, two types of “protected” vehicles: standard vehicles such as Toyota Land Cruisers or Land Rovers that are modified, either with ballistic blankets, blast plates or all-round armouring; and specially designed vehicles that have armour integrated within the design. The characteristics of each type of protection option are as follows:

Protection option 1: ballistic blankets

a. General characteristics Ballistic blankets are fitted into standard vehicles, such as a Toyota Land Cruiser, underneath the internal floor and door trim. They are made of special material, such as Kevlar, which is the same as is used for items such as flak jackets, and is therefore lightweight.

b. Protection level A ballistic blanket will provide limited protection against some but not all anti-personnel blast mines and small explosive weapons such as grenades detonated under the floor of a vehicle. They will provide little protection against larger anti-personnel blast mines and no significant protection against anti-personnel fragmentation mines, anti-vehicle mines, mortars, rockets and large explosive devices.104

c. Key issues To be used correctly they must be fitted professionally, and training must be provided in terms of maintenance, limitations, general characteristics and so on.

d. Availability It is possible to purchase Toyota Land Cruisers pre-fitted with ballistic blankets from two major suppliers of vehicles to the aid world, Toyota Gibraltar and Bukkehave.

e. Overall Ballistic blankets provide extremely limited protection against small explosive blasts, and no protection against blasts from AVMs. They are, however, unobtrusive, lightweight and relatively low-cost.
Protection option 2: Customised armoured vehicles

a. General characteristics This refers not to specially designed armoured fighting vehicles, such as tanks or personnel carriers, but to armoured versions of standard vehicles including Nissans, Toyotas and Mercedes. These vehicles will have all-round armouring, including protection on the windows, doors, roof, fuel tanks and floors, generally using ceramics, plated steel and ballistic glass.

b. Protection levels The general level of protection available from armoured vehicles is classified as CEN Level B6\textsuperscript{115}, or STANAG III.\textsuperscript{116} This means that the vehicle is considered to be protected against small arms fire, explosions from artillery rounds at 80 metres, and fragmentation from hand grenades at 5 metres. However, higher levels of protection are available.\textsuperscript{117} The majority of armoured vehicles are not designed to mitigate specifically against AVM blasts, although they can offer some limited protection against AP mine blasts.

c. Key issues All armoured vehicles are heavy and require specialist training to drive, and the additional weight will have an impact on vehicle maintenance. They are also relatively expensive, costing more than $100,000.

d. Availability Customised armoured vehicles are widely available from commercial suppliers.\textsuperscript{118}

e. Overall An armoured vehicle has the advantage of not looking different to an ordinary vehicle, and offers protection against a range of ballistic threats. However the protection against AVMs is negligible, and limited against AP blast mines.

Protection option 3: blast plates

a. General characteristics Blast plates can be fitted beneath the chassis of some, but not all, vehicles. Land Rover Defenders are able to be fitted with external V-shaped steel blast plates after purchase.\textsuperscript{119} Studies have shown that V-shaped blast plates would be difficult to fit to Toyota Land Cruisers due to differences in the chassis design.\textsuperscript{120}

b. Protection levels The exact level of protection afforded by blast plates is difficult to define, as it depends on the manner in which the vehicle is modified, and the type of armouring used. However V-shaped blast plates fitted to Land Rovers have provided improved protection from AVM blasts, and would generally provide significant protection from all AP blast mines.

c. Key issues Blast plates must be fitted by professional armourers. The vehicle will require heavy-duty shock absorbers, can carry smaller loads, and will be more difficult to drive due to the weight of the armour. However the cross-country capability of the vehicle is not necessarily limited.\textsuperscript{121} Driver training is essential.

d. Availability The Land Rover can be modified after purchase by specialist armourers in the United Kingdom. The cost of the latter is far lower than the purchase of a customised armoured vehicle.\textsuperscript{122}

e. Overall Armour fitted underneath vehicles in the form of blast plates can be effective in significantly reducing the impact of AVM and APM blasts. However it is not possible to undertake this form of armouring on all type of vehicles, and there are very limited number of companies able to undertake the work.\textsuperscript{123}
Protection option 4: mine protected vehicles

a. General characteristics  Mine-protected vehicles are a specially designed type of armoured vehicle that focuses on strengthening the floor of the vehicle against landmine blasts. These vehicles are large and heavy, and although sometimes based on, for example, commercial truck chassis, require specialised maintenance and spare parts. The hull is designed with a v-shape to deflect the blast from AVMs.

b. Protection levels  Levels of protection differ from vehicle to vehicle, but the majority of mine protected vehicles will be able to withstand the blast from between one and three AVMs. They offer significant protection against AVMs and APMs, and will also be armoured on the side and windows, and therefore offer protection against other ballistic threats.

c. Key issues  Mine-protected vehicles require specialist training for both use and maintenance. They look like military vehicles, and as such might cause problems for humanitarian agencies in conflict or post-conflict situations.

d. Availability  Mine-protected vehicles are available from various suppliers, particularly in South Africa. The South African Military Industry Services (SAMIL) are specialists in the manufacture of mine-protected vehicles, and it is possible to get second-hand vehicles relatively easily. They can cost upwards of $90,000.

e. Overall  Mine-protected vehicles offer significant protection against AVMs and other explosive devices, but are specialist vehicles with all the associated issues of training and maintenance. They also can be mistaken for military vehicles.

Summary

1. Ballistic blankets offer extremely limited protection against small explosives blasts directly underneath the vehicle, and no protection against AVM blasts or other ballistic threats such as roadside IEDs, small arms fire and so on.

2. Customised armoured vehicles can provide some protection from general ballistic threats, but are limited against APM blasts and negligible protection against AVMs. However they offer some all-round security against ballistic threats.

3. Vehicles fitted with specially designed blast plates, particularly those developed by the HALO Trust and Penmans, an armouring company, offer a relatively cheap option for obtaining a mine-protected vehicle that can provide limited protection against AVM blasts and significant protection against APM blasts. However they are designed specifically to mitigate this ballistic threat and the remainder of the vehicle is un-armoured.

4. Specialist mine-protected vehicles offer substantial protection against AVMs as well as other ballistic threats, and can be obtained at a similar cost as a customised armoured vehicle. However they are specialist vehicles and therefore have issues regarding spare parts and maintenance. They also have the potential to be confused with military vehicles.

5. With both blast plates and mine protected vehicles, there is an increase in the likelihood of surviving an AVM incident. Death and injuries can still occur, and the vehicle may be destroyed beyond repair. An AVM incident, whether in a normal or a protected vehicle, remains a physically and mentally traumatic event.
<table>
<thead>
<tr>
<th>Ballistic blankets</th>
<th>All-round armouring</th>
<th>Blast plates</th>
<th>Mine protected vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modification or integral?</td>
<td>Modification</td>
<td>Modification</td>
<td>Integral</td>
</tr>
<tr>
<td>Protection against APMs</td>
<td>Limited/Negligible</td>
<td>Limited</td>
<td>Significant</td>
</tr>
<tr>
<td>Protection against AVMs</td>
<td>Nil</td>
<td>Nil</td>
<td>Limited/Significant</td>
</tr>
<tr>
<td>Protection against small arms</td>
<td>Nil</td>
<td>Significant</td>
<td>Nil</td>
</tr>
<tr>
<td>Protection against other blasts (e.g. mortars, grenades)</td>
<td>Nil</td>
<td>Limited</td>
<td>Negligible</td>
</tr>
<tr>
<td>Approximate cost</td>
<td>$7,500 (cost of ballistic blanket and fitting)</td>
<td>$130,000 (total vehicle purchase price)</td>
<td>$12,000 (cost of modification)</td>
</tr>
</tbody>
</table>

**Important:** Note that the levels of protection cannot be exact due to the variables involved, including type of weapon detonated and its general condition, location of detonation, distance of detonation from the vehicle, type of protection used, quality of fitting, condition of vehicle armouring and so on. However this table provides a quick summary of the relative levels of protection afforded by each type of protection option.

**Conclusion**

Based on the above information and on research and findings from operational environments, there are two main options for mine protecting a vehicle: the purchase of a specially designed armoured vehicle such as a Casspir or Mamba, or the fitting of a V-shaped blast plate to the chassis of a standard 4WD vehicle, which is possible with Land Rovers.

**Important note**

Use of protected vehicles only reduces risk as part of an overall process of security management.
## Annex B: Mine action options for reducing the threat of AVMs

<table>
<thead>
<tr>
<th>Type of asset</th>
<th>Description</th>
<th>Advantages</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual clearance</td>
<td>Manual clearance procedures can achieve an almost total elimination of the threat from AVMs at least down to a certain depth. Although no procedure can ensure all mines are located, current experience suggests that manual clearance is the process that comes closest.</td>
<td>■ High level of confidence in procedure.  ■ Relatively low capital start-up costs.  ■ Relatively few equipment maintenance issues.  ■ Large numbers of experienced personnel available.  ■ Training of national staff easy to achieve.  ■ Asset transferable to other tasks.  ■ Can achieve various objectives simultaneous to clearance of the road, such as clearance of adjacent areas, ordnance disposal tasks, bridgehead clearance and so on.</td>
<td>■ Slow clearance rate.  ■ Operating in areas of low mine density can result in low staff morale and procedural problems.  ■ Extensive administrative and support issues, especially if clearance teams are camping.  ■ Higher staff numbers can lead to increased human resource problems.</td>
</tr>
<tr>
<td>Mechanical excavation</td>
<td>Mechanical excavation can be used to dig up the road surface and locate mines with a strong degree of confidence down to a specified depth. Depending on the urgency and end-users for the task, soil that is removed can either be processed to identify the mines (by sieving or passing through a crusher) or can be left as soil heaps (fenced off and clearly marked) for processing in the future.  A wide variety of plant has been used in relation to treatment of roads, including graders, front end loaders, bulldozers and backhoes, all fitted with armour and ballistic glass.</td>
<td>■ Depending on the process used, mechanical excavation can provide a high level of confidence in the clearance process.  ■ can be developed based on existing machines already in use in the country.  ■ Low cost compared to specifically developed tools  ■ Simple to operate machinery</td>
<td>■ Some processes may be slow to apply over a whole road network.  ■ Systems can sometimes be difficult to trial and accredit due to wide variety of tools and processes.  ■ Large plant equipment can present logistical problems in wet conditions over poor infrastructure.</td>
</tr>
</tbody>
</table>
In several countries mine action operators have used a detection system mounted on the front of a mine protected vehicle to traffic suspect roads and identify locations where there is a possibility of a mine being buried beneath the road surface. The detector is mounted on the front of the vehicle, with an operator in the body of the vehicle able to pick up readings through headphones.

Certain types of minimum metal AVMs cannot be consistently detected with vehicle mounted detectors. All signals require investigation by a manual deminer.

**Type of asset**  
**Description**  
**Advantages**  
**Limitations**

**Vehicle mounted detection systems**  
In several countries mine action operators have used a detection system mounted on the front of a mine protected vehicle to traffic suspect roads and identify locations where there is a possibility of a mine being buried beneath the road surface. The detector is mounted on the front of the vehicle, with an operator in the body of the vehicle able to pick up readings through headphones.

This process sees a vehicle traffic a road using a system of weights to exert pressure on the road surface sufficient to detonate active AVMs. These pressure systems have been widely used in Angola and include rollers, weighted trailers and armoured vehicles with adapted wheels. In the case of the roller, this is generally fitted to the front of an armoured tractor or large excavator, while the trailer is towed by a mine protected vehicle. This reduces the impact of a mine incident for the operators should the vehicle itself initiate a detonation.

Pressure systems are limited to the width of the road itself, and cannot guarantee that every part of road has received equal pressure. They are not always able to exert sufficient force to ensure that all mines would be detonated, which has been particularly reported with the use of rollers. The condition of the road at the time the pressure system is deployed may also have an impact, as mines may not detonate when roads are extremely hard and dry.

Pressure systems

- Relatively quick and effective method of identifying the majority of targets on a road (depending on context).
- Protected vehicle provides a level of security for the operator.
- The audio alarm detection system requires little operator training.
- Reasonable initial capital outlay required.
- Proven system used by a number of operators in differing environments.

- Cannot consistently find minimum metal AVMs or APMs.
- Limited to use on the main body of the road and immediate verge.
- Cannot be used in areas with heavy vegetation on or alongside roads.
- Requires support of a manual demining team to investigate targets.

**Mine detecting dogs and explosive vapour systems**  
Dogs have also been used in a variety of ways to identify suspect areas, either by direct deployment along a road or by sending samples of air from along a road to a separate location for analysis by dogs, known as an explosive vapour detection system. There is a diversion of opinions within the mine action community regarding the effectiveness of dogs and of remote sampling, but they have been able to identify areas that are not contaminated by mines in certain conditions. The use of dogs requires good quality handlers, training and support services for them to remain effective.

Dogs have also been used in a variety of ways to identify suspect areas, either by direct deployment along a road or by sending samples of air from along a road to a separate location for analysis by dogs, known as an explosive vapour detection system. There is a diversion of opinions within the mine action community regarding the effectiveness of dogs and of remote sampling, but they have been able to identify areas that are not contaminated by mines in certain conditions. The use of dogs requires good quality handlers, training and support services for them to remain effective.

- Able to quickly identify “mine free” and “suspect” areas if conditions are appropriate.
- Many variables that can effect reliable and consistent performance.
- Requires specialised training, and well developed support systems.
- Lack of strong evidence base indicating that dogs, whether directly deployed or used remotely, are consistently reliable as a primary tool.
## Annex C: Non-technical assistance the mine action sector can provide

<table>
<thead>
<tr>
<th>Landmine safety briefings on road use</th>
<th>A landmine safety briefing on road use can focus on general issues of good practice when driving in potentially AVM contaminated environments and specific issues of roads in the immediate operational area. It is important that this information contains at a minimum:</th>
</tr>
</thead>
<tbody>
<tr>
<td>■ Clear definitions of road status: Regardless of the system used, it is important that the status is defined in terms of how it represents risk – ‘no evidence of mines’ does not mean ‘no mines’, ‘trafficable’ does not mean ‘cleared’ etc.</td>
<td></td>
</tr>
<tr>
<td>■ Specific route information: There are frequently multiple roads between locations, and it is important that the specific road is well defined in briefings. This should include the coordinates of the start point, village names along the route with coordinates, distances and travel times, and information regarding any bypasses.</td>
<td></td>
</tr>
<tr>
<td>■ Threat assessment: The mine action operator is in a unique position to offer specific details of the threat along a given route in terms of highlighting which sections present a higher risk. This may include bypasses, approaches to bridges, sections of the road in poor condition and so on.</td>
<td></td>
</tr>
<tr>
<td>■ Maps: If possible, good accurate road maps showing route status should be distributed.</td>
<td></td>
</tr>
</tbody>
</table>

| Targeted mine risk education | Specific mine risk education (MRE) messages and campaigns have been developed that address the threat from AVMs. Examples using poster campaigns, radio messaging, popular songs, vehicle stickers and billboards exist in several countries. These messages usually focus on the message of “stay on the tracks”, and showing examples of dangerous situations, vulnerable points and suspect areas. Effective MRE messages can raise awareness of the threat from AVMs amongst local populations, particularly when focused on at–risk groups. For example, a key target audience in the UNICEF–CNIDAH “Stay on the Right Path” campaign in Angola was taxi drivers, who carry large numbers of people between towns and cities in small vans. As with all MRE, these campaigns can only be effective if they engage with risk–taking behaviour and find ways to change it, but in raising the profile of the problem they also present ongoing pressure for further actions to be taken to remove the threat. |

| Responsive incident investigations | Investigations into AVM incidents are a key part of the ongoing management of this threat. Such investigations should determine if an incident challenges or accords with previous assessments of a particular route. For example, if a detonation was found to have occurred on the road verge in an area where only the road surface had previously been considered trafficable then the incident does not change the previous assessment. Similarly such investigations should try to tell if it was an old or new mine (and thus whether the problem is one of historical contamination or, for example, ongoing political violence.) |

| Updates on technical activities | There are a number of technical options available to reduce the AVM threat on roads, using assessments, machines, manual clearance and dogs. These have a different impact on the assessed level of risk on the road, and it is important that this is communicated clearly to the wider humanitarian community. Whilst there is currently no quantifiable mechanism for measuring and comparing the ‘amount’ of risk that is removed by various methods, it is possible to say whether the road status is changed by the application of a given treatment. |
Close interaction with security mechanisms

Whilst humanitarian agencies may come to mine action operators directly for information on the mine threat, it is likely that they have established contacts with any existing general security networks. It therefore makes sense for mine action operators, and particularly any body responsible for mine action coordination, to integrate external reporting within existing security mechanisms. This may include regular coordination meetings or the distribution of security reports. Having a focal point within the mine action organization that is responsible for liaison with and information flows between the security body and the mine action organization can ensure that information about the mine situation, particularly with regards to its impact on access, is more widely available.

Accurate record keeping and information management

A final area that is critical for mine action organisations in terms of understanding and reducing the risk from AVMs on roads is effective collation and management of information. This cuts across several areas, including incident reporting, assessment records, road status and technical activities. Whilst IMSMA is able to collate and manage some of this information, there is not at present a dedicated format for capturing information about roads. Effective information management allows for the following:

- Effective incident data analysis.
- Ability to represent road status.
- Record of mine action activities.
Annex D: Route assessment for mine action operators – suggested practices

MAG and HALO Trust have developed strong route assessment procedures based on their work in Angola. In Sudan also standardised route assessment procedures have been developed (though in a context of greater central coordination.) This Annex brings together suggested practices from some of these different approaches:

A route assessment is composed of five main elements:

- defining the purpose of the assessment,
- a phase of pre-inspection information gathering,
- a visual inspection of the route,
- an internal process of quality assurance
- an external route assessment report for presentation to end-users.

1. Defining the purpose of the assessment

Route assessments can serve a variety of different purposes in different contexts. Although the findings of the assessment may be used by a wide range of individuals and organisations, it is suggested that mine action agencies consider:

- who are the primary end-users of the route assessment?
- what decisions do these organisations need to make and why?

Different end-users might be:

- **mine action in support of road reconstruction:** in which case the assessment might need to consider both the road surface and the roadside verges. The purpose of the assessment might be to determine locations where mine clearance assets and reconstruction teams should or can begin work.

- **securing emergency humanitarian access:** in which case only the road surface may need to be assessed in detail. The purpose might be to confirm that the risk on the route is low enough for humanitarian teams to travel with a reasonable level of confidence. It might be recognised though that some level of risk remains.

Thinking about these different end-users can help to inform how assessment findings are summarised. Some of the different classifications used in different contexts are summarised in section 5.5.6 of this report.

There is no perfect way of summarising such information – different levels of risk will anyway be judged differently by different end users. The main requirement is that the system used meets the needs of those it is intended to serve and that all end users understand the basis upon which a classification has been made and any limitations inherent in that process.
2. Pre-inspection information gathering

Prior to conducting an assessment, it is necessary to obtain information regarding the route. This includes but is not limited to:

- History of mine-laying in the area;
- History of fighting in the area;
- Use of armour (tanks etc);
- Incidents of anti-tank mine detonations/discoveries/reports;
- History of demining or threat reduction;
- History and levels/types of road use;
- Other information about the condition of the road;

Pre-inspection sources of information should include:

- Any existing maps; any previous assessment reports; interviews with military (ideally ex-combatants in the area), police, local administration, local community leaders, commercial drivers and organisations using the route.

Other sources of information might be:

- Satellite or aerial photographs; hospital records

3. Visual inspection of the route

Following the information gathering phase, it is necessary to conduct a visual inspection of the route itself. Information to be gathered includes:

- **GPS Coordinates**: given that many roads have not been used for many years, and that some do not appear on any maps, it is critical that regular GPS readings are taken. It is also important that roads are broken down into smaller sections, perhaps based around natural breaks such as rivers or bridges, or between villages that can be found along the road. These can be named and coordinates taken. In Sudan, the route assessment system was based on dividing all routes into 100m blocks and recording key data for each of those stretches. Such an approach has the advantage of ensuring detailed coverage throughout the route.

- **Bypasses**: Clear descriptions of locations where bypasses are put in place. Bypasses in this context mean a temporary or expedient road which acts as an alternative to an existing road, either in whole or in part, and usually constructed or created by traffic because a) the existing road surface renders it not usable or b) to avoid a hazard on the existing road, such as broken bridges, fallen trees, large holes, landmines etc. Such bypasses can extend for several kilometres, often running in parallel to the existing road, and can even come to act as the road on which formal rehabilitation or reconstruction work takes place.

- **Battlefield indicators**: coordinates taken for all noticeable battlefield indicators, and basic descriptions recorded. This includes things such as visible trench lines, destroyed military vehicles, and probable military barracks or strong points.

- **Mine indicators**: any evidence of detonations, such as craters, mine fragments etc, and once again with coordinates taken.
■ **Suspect areas**: details and coordinates taken of any suspect areas that are identified adjacent or proximate to the road itself.

■ **Road conditions**: a description of the type of road (tarmac, laterite, dirt etc) and its general condition.

■ **Bridge conditions**: a description of any bridges along the road, including structure (wood, metal, concrete) and condition. Name of river and coordinates.

■ **Vulnerable points**: any points along the route which may require vehicles to leave the main body of the road, such as large pot holes or very poor road conditions.

■ **Communications**: noting any points at which radio communications are poor or erratic, and general reception levels along the route.

■ **Road usage levels**: any indication of the regularity and amount of vehicle traffic using the road. This may be indicated by a lack of overgrowth in the centre line, multiple vehicle tracks etc.

■ **Community interviews**: a basic interview form can be used to question communities living along the road, or any road users that may be encountered during the assessment itself. Using a structured form makes sure consistent questions are asked.

The collection of this data, particularly when GPS coordinates are taken, allows for a high-quality visual representation to be made following the assessment, and allows data to be cross-referenced with the information gathered prior to the assessment. Various formats are possible to collect this information, but the main requirement is that it be consistent, complete and clear.

### BOX: ROUTE ASSESSMENT SAFETY PROCEDURES

Route assessment presents a risk of having a mine incident. Mine action operators need to take specific steps to limit the likelihood of that happening and of reducing the impact of the event should an incident occur. Clear guidelines and safety procedures should be in place prior to any route assessments being undertaken, addressing issues such as:

■ The number of vehicles that should be undertaking the assessment, usually not less than two, appropriately equipped with winches, ropes, spare parts etc.

■ Medical needs – including a trained medic, medical evacuation procedures and appropriate medical kits and supplies

■ Communication procedures – including redundancy measures and radio checks, as well as contingency plans if communications are not received

■ A serious consideration should be given to use of mine protected vehicles for this specialist task.

■ Clear guidelines on road usage, including not driving on verges, use of bypasses and conditions under which the route assessment should be suspended if the road becomes impassable or highly suspect.

Even when not conducting route assessments, it is important to remember that mine action operators using roads in a potentially AVM contaminated environments are themselves vulnerable to the same threats as any other road user.
4 & 5. Quality assurance and reporting

Conclusions and recommendations need to be compiled first into an internal report. Producing an *internal* report should include an element of quality assurance, usually through a presentation of the report findings and conclusions to peer-group, with the option of questioning and critiquing the process. A final level review by senior management is essential, with approval of the final *external* report being the responsibility of the senior manager.

Route assessments can leave individuals and organisations open to criticism if an incident occurs on a route that has been declared ‘trafficable’ or ‘low risk.’ Senior management sign-off ensures that the organisation rather than the assessment supervisor is responsible for the findings and helps to build confidence in the ‘product’, namely the report and its findings, amongst end-users.

The external report should be:

- Clear in its statements regarding the findings of the assessment without over reliance on technical language;
- Consistent with previous reports in format and language;
- Transparent as to the limitations of the assessment procedures.

As risk levels can vary greatly on different sections of the same route, and as road users need to be constantly sure they are on the correct road, the clear break down of the route into separate sections, with GPS coordinates and an electronically generated map, can greatly enhance the likelihood of other organisations understanding the assessment and following its findings.

Other considerations are:

- translation into local language(s);
- does the report and its findings need to be presented to local authorities prior to general release? Roads are a public asset, and as such any declaration as to the status of the road can have major implications for the movement of humanitarian and other traffic.

**When a mine incident occurs: re-evaluating the threat**

In terms of managing the risk from AVMs, there is one key question to ask when a mine incident occurs along a road that has been assessed or had some technical treatment applied: does the incident change the level of risk of travelling on the road?

- **Was the mine old or newly laid?** This is one of the first questions that needs to be considered. As we have noted previously in this report, a wide range of factors can promote claims that it was a new mine and these must be treated with great caution.

If the incident has resulted in a detonation it can be extremely difficult if not impossible to determine conclusively if the mine was old or newly laid. If the mine has not detonated, then it may be easier to determine if the mine is newly laid or a remnant of the conflict.

If the detonation strongly appears to be the result of a new device then this should be considered as an armed attack – raising wider security issues.

If the mine is old, then a series of specific questions need to be asked to determine if the risk of travelling the road has increased. These include:
- Was the mine located in an area previously identified as a 'danger point,' for example approaching a bridge or near to a strategic military position? If the mine was found near an existing danger point then this area needs to be reemphasized to road users as a high risk area and potentially some assets should be deployed to conduct additional clearance.

- Was the mine located on the track or on the verge of the road? If located on the verge this reinforces the need for following road usage guidelines and ensuring drivers do not leave the tracks.

- Had the mine been driven over and if so why had it failed to function? If a mine has been repeatedly driven over and failed to function it is useful to understand why. Critically, a mine that has been repeatedly driven may indicate a lower level of risk along the road, as it can be more confidently stated that any active mines would also have been driven over and therefore detonated.

- Had any technical treatments been applied to the road, and if so, why had they failed to locate the mine? Certain technical treatments, such as pressure systems, are not designed to locate every mine and others are limited by various factors. Understanding why it was not located can help determine if it was an anomaly or if it should have been expected to be found during the treatment.

By answering these questions, it should be possible for a mine action operator to make a statement about whether the level of risk has increased. In all the incidents investigated by MAG in Angola mentioned three resulted in a recommendation that the road be closed while specific technical actions were taken, and the other 18 resulted in a recommendation that there was "no increase in the level of risk."  

Key point: A good investigation will determine not just if the mine is new or old, but will be able to draw conclusions about the level of threat on the road and any changes that result from the incident.
van Brabant, K. (2000)  

van Brabant, K. (2001)  


ECHO (2004)  

ECHO (2004)  

ECHO (2004)  
*Report on security of humanitarian personnel: Standards and practices for the security of humanitarian personnel and advocacy for humanitarian space*, Brussels.

*The Humanitarian Impact of Mines Other Than Anti-Personnel Mines*, Geneva


*A Study of Mechanical Applications in Demining*, Geneva. See Chapter 5: The protection of vehicles and plant equipment against mines and UXO which contains much of the science base surrounding armouring of vehicles against landmines.

International Committee of the Red Cross (2006)  

Human Rights Watch (2006)  

McGrath, R. (1994)  

Radonic et al (May 2004)  
14 Not therefore concerned with issues like road traffic accidents or illness, which are considered health and safety issues, but which nonetheless can

13 Germany (2002),

12 GICHD (2004),

24 Email from Gerhard Zank, Programme Manager, HALO Trust, Huambo, Angola, 8th April 2006

8 One operator reports having to revert to a full “excavation drill” in Angola, as the two type of anti-vehicle mine that had been used on a road, the

9 In some conflicts AVMs are buried relatively deeply and designed to be triggered by a stick or branch buried vertically on top of the mine.

10 In Afghanistan, many secondary roads in mountain areas were mined with AVMs. The roads were then abandoned, and subsequent landslides

22 ICRC (2002),

20 Paul Davies interview with Susan Helseth, MRE Advisor UNMACA, 18th July 2006

18 The data used in the statistical analysis is drawn from the following sources: Afghanistan – UNMACA casualty data for 2003-2004, ICRC casualty


16 Typically, perceptions of risk – and their acceptability – will vary between the team in the field, the management of the country programme (if located elsewhere), and management in any regional and international HQ. This needs to be negotiated between these different levels of

15 The dual conceptualisation of risk – as being a function of both vulnerability (exposure) and impact is uniquely helpful in planning both aid agency

14 However, most of the casualty data sets do not capture this directly – instead it can be inferred from other elements of data. For example, where

24 Email from Gerhard Zank, Programme Manager, HALO Trust, Huambo, Angola, 8th April 2006


26 Paul Davies interview with Bob Gannon, Ronco, Afghanistan, 20th July 2006

Notes

1 Sudan, – Incidents and Lessons Learned, 12/01/06, UNMAS paper

2 U.S. Army (2000), Mine and countermine operations in the battle of Kursk: Final report, prepared for U.S. Army Communications-Electronics Command, Night Vision and Electronic Sensors Directorate. “The Battle of Kursk also supported the concept of laying mines during the fighting in the path of an advancing enemy ... Soviet military writers have estimated that ‘two-thirds of all enemy tanks destroyed by obstacles blew up in the minefields laid during the battle.’” [emphasis added]

3 See for example U.S. Army (2000), Mine and countermine operations in the battle of Kursk: Final report, prepared for U.S. Army Communications-Electronics Command, Night Vision and Electronic Sensors Directorate: “Since they were laid in front of a German advance, these mines were much more effective than those laid before the battle, even though in many cases there was no time even to bury the mines.”


5 Interview with Peter Dougo. SLIRI, Juba, 25th October 2005

6 Interview with Alex Van Roy, Programme Manager & Michael Storey, Operations Officer, FSD(UNOPS) Survey Project Sudan Khartoum, 17th February 2006

7 Col. Bashir Hassan Ahmed, Commander of First Engineer Brigade (SAF), Juba, 25th October 2005.: This situation is further complicated by the fact that mines may have been laid, removed, and re-laid again, either to conserve weapons which are heavy and difficult to carry in large numbers by hand, or if ambushes have failed when vehicles didn’t strike the target. This adds to the general confusion when discussing with ex-combatants where mines were laid and which ones, if any, were removed.

8 One operator reports having to revert to a full “excavation drill” in Angola, as the two type of anti-vehicle mine that had been used on a road, the South African No.8 and the Chinese Type 72A, could not be detected using either the vehicle mounted Ebinger Large Loop detector, or a handheld Schiebel detector. A full excavation drill requires deminers to physically dig up the entire suspect area to locate the mines. Interview with John McFarlane, Road Technical Field Manager, MAG Angola. 23 October 2006.

9 In some conflicts AVMs are buried relatively deeply and designed to be triggered by a stick or branch buried vertically on top of the mine.

10 In Afghanistan, many secondary roads in mountain areas where mined with AVMs. The roads were then abandoned, and subsequent landslides were never removed. Overtime, the AVMs on many sections of road have ended up deeply buried.

11 Light sensitive switches have been attached to AVMs in Angola. MAG lost a deminer on the Luena to Lucusce road in Mexico province as a result of such a booby trap

12 GICHD (2004), Study of Mechanical Application in Demining, Geneva.


14 Not therefore concerned with issues like road traffic accidents or illness, which are considered health and safety issues, but which nonetheless can be conceptualised and managed in similar ways to security issues. Typically, it is the human agency behind the threat that defines a hazard as being a security, rather than a health and safety, issue.

15 The dual conceptualisation of risk – as being a function of both vulnerability (exposure) and impact is uniquely helpful in planning both aid agency security and general operations, and understood by a growing body of aid workers as standard good practice. Significantly, many within the humanitarian mine action community are unaware of this conceptual approach, but given their backgrounds and experience instantly understand and appreciate the value once explained.

16 Typically, perceptions of risk – and their acceptability – will vary between the team in the field, the management of the country programme (if located elsewhere), and management in any regional and international HQ. This needs to be negotiated between these different levels of


18 The data used in the statistical analysis is drawn from the following sources: Afghanistan – UNMACA casualty data for 2003-2004, ICRC casualty data for 1998-2005; Angola – Landmine Monitor reports 2002-2004, Landmine Impact Survey data; Cambodia – CMVIS data 2002-2006; Eritrea – UNMEE MAC data from UNMEE MACC mine action threat assessment for UNMEE, February 2006; south Sudan – SLIRI data for W Bahr Al Ghazal. In Afghanistan some mine action managers noted that problems of data transmission that mean national level statistics do not fully represent the picture on the ground (Paul Davies interview with Andrew Lyons, HALO Trust.) With respect to AVM incidents it was specifically suggested in Afghanistan that casualties may be under-reported because in cases of multiple deaths and injuries those killed may be taken away for burial rather than being logged by medical staff (Paul Davies interview with Susan Helseth, MRE Advisor UNMACA, 18th July 2006).


20 Paul Davies interview with Susan Helseth, MRE Advisor UNMACA, 18th July 2006


22 ICRC (2002), Anti-vehicle mines: effects on humanitarian assistance and civilian populations, International Committee of the Red Cross, July 2002 CCW/GGE/II/WP.9 and other additional sources.

23 However, most of the casualty data sets do not capture this directly – instead it can be inferred from other elements of data. For example, where people’s activity at the time of accident is recorded as travelling this is likely to suggest vehicle use.

26 Paul Davies interview with Bob Gannon, Ronco, Afghanistan, 20th July 2006
**ANTI-VEHICLE MINES**

**74**

Paul Davies interview with ICRC Mine Awareness Officer, Kabul, 20th July 2006.


In Afghanistan this pattern was also raised by Sandy Powell, Chief of Operations for UNMACA. Paul Davies interview with Sandy Powell, Chief of Operations, UNMACA 19th July 2006.

http://www.gichd.ch/


As commented by Sandy Powell, Chief of Operations UNMACA: “[AVMs accidents used to be more common] in wet conditions when the ground is softer. Normally such items are too deep, but when the rains comes they become active. Obviously this is no longer a threat on the reconstructed roads” (Paul Davies interview with Sandy Powell, Chief of Operations, UNMACA 19th July 2006).

Often in a command detonated mode but under the belly of the vehicle in an effort to defeat Level 6 armour (which had been relatively effective against road-side bomb attacks from the side).

Paul Davies interview with Elizabeth de Benedetti, Denise Duclaux and Mohammed Sidique Khan, UNMACA, Kabul Afghanistan, 17th July 2006.


Conversation with Ally Batten, HALO Huambo, Road Team, 30th Jan 2006. Also cited at p.20,

ICRC (2002), Anti-vehicle mines: effects on humanitarian assistance and civilian populations, International Committee of the Red Cross, July 2002 CCW/GGE/II/09

Paul Davies interview with Susan Helseth, MRE Advisor UNMACA, 18th July 2006

Human Rights Watch (1994) Landmines in Angola, p43

GICHD (2004), Humanitarian Impact of Mines Other Than Anti-Personnel Mines, Geneva

Jerry Bailey, Head of Office, WFP, Huambo, 31st January 2006

Paul Davies interview with Craig Harrison, Information Analyst, UNDSS, Kabul, 20th July 2006.

ICRC (2004), Humanitarian Impact of Mines Other Than Anti-Personnel Mines, Geneva

Jonathan White, Operations Director, World Vision Angola, Luanda, 2nd February 2006


Paul Davies interview with Rebecca Thomson, Delegate (Mine Action), ICRC Angola, Luanda 3rd February 2006

Sudan, – Incidents and Lessons Learned, 12/01/06, UNMAM’s paper

Conversation with Jonathan White, Operations Director, World Vision Angola, Luanda, 2nd February 2006

An assessment of Cuando Kubango Province (‘Current Vulnerability’, Report on the Joint UTCAH and OCHA/TCU Mission to Kuando-Kubango April 18th-27th 2005, UN Transitional Co-ordination Unit) highlighted problems of serious food insecurity amongst populations that could not be accessed by humanitarian assistance: 

"According to a rapid vulnerability assessment carried out by NRC in June 2004, most of the food supply in Rivungu is being purchased in Xangombo, in Zambia, which entails hiring a canoe for 300 kwanzas to cross the river, an option only available to a small percentage of the population. Due to the low purchasing capacity of the population, the local market has very few goods to offer. Most of the people live off wild fruits and water roots. Other essential items like oil and salt are practically non-existent and people have no access to soap, clothes, blankets or cooking tools. The number of meals a day vary according to the season and ranges from one to two meals a day for adults and children alike. Water is consumed directly from the river without undergoing any type of treatment. 

In the municipality of Mavinga the vulnerable population is estimated at 50,000. The most food insecure communities are Luengue, Kutuilo, and Kunjamba. A rapid vulnerability assessment carried out in August 2004 by NRC in Luengue (120 km South of Mavinga) revealed that the main source of food supply of the community are wild fruits. Gathering these fruits requires often a 2-3 hour walk. There are no markets in Luengue. Income-generating activities are limited to some fishing and the brewing of homemade beverages. 30% of the children do not have any clothes to wear. [...] The CRN team witnessed four adults and various children with a physical appearance indicating malnutrition."

Another mission (p.4, Report on Donors Trip to Mavinga, Cuando Cubango 17 June 2005, UN Transitional Co-ordination Unit, Angola) also encountered new IDPs, drawn to Mavinga in search of aid.

"...food insecure populations are drawn to Mavinga in the hope of receiving food assistance. The recent arrivals that the team saw, waiting in groups to receive their aid, must represent the most vulnerable population in Angola. It was clear that the recent arrivals had walked a great distance to reach Mavinga, they appeared exhausted, emaciated, and many wore rags and threadbare blankets instead of clothes. The recent arrivals seemed too tired to protest the slow, but well-organized distribution, and their physical condition suggested humanitarian conditions found usually in wartime or periods of extreme drought and famine."


Despite the severity of these conditions, a follow up report in September 2005 (Update on Mavinga and Rivungo, UN Transitional Co-ordination Unit, Angola) noted:

"WFP has had difficulties in funding the transport for the distribution of food outside of Mavinga. Most of the distribution is being carried out by their main partner CNR. One community though (Kunjambia), 60km from the town of Mavinga, is too mine-suspect for CNR to deliver until there, so the community members have been walking the 60km to Mavinga to receive their regular food supply."

56 ICRC (2002), Anti-vehicle mines: effects on humanitarian assistance and civilian populations, International Committee of the Red Cross, July 2002

57 Paul Davies interview with Ribby Hardy, Roads Programme, USAID, Kabul 19th July 2006

58 For example: Adelino Sanjome, SCF's Protection officer, noted that there were many villages the programme could not reach because of AVM contamination: ‘We can't reach M'afarib because of mines and we have to take a by-pass route, and we can't travel the 32km road from Sambo to Jamba Kassanje. There are absolutely no services there and over 500 people trying to survive. If you get sick there you have to be carried into the clinic in Sambo. There is another group of villages with around 500 people, called Ndolokua and they are cut off too. In Sambo commune we can only work in the township itself because everywhere else is suspect. Even to get to Sambo we have to go via Vila Nova and not directly through Tchilala, which adds an hour to the journey. (Conversation with Adelino Sanjome, Protection Officer, SCF UK, Huambo, 31st January 2006.)

59 For example, the NGO Medair reported that they had had concerns for their staff safety after AVMs turned up on roads they used to visit their project sites. They rely very heavily on MAG to advise them on the threat of the roads, and to determine which roads can be considered trafficable, and under what conditions or restrictions. Medair’s health programme in Lumbala Ngjumbo is restricted in terms of project sites it can access; these being areas where access has been opened by MAG. (Paul Davies interview with Joao Base Candala, Logistician, Medair, Luena, Mexico, 27th January 2006)

60 Email from Mike Kendellen (SAC) to Greg Crowther, 19 October 2006

61 This was noted with respect to UNMACA in Afghanistan working on community driven priorities.

62 Col. Bashir Hassan Ahmed, Commander of First Engineer Brigade (SAF), Juba, 25th October 2005

63 Col. Bashir Hassan Ahmed, Commander of First Engineer Brigade (SAF), Juba, 25th October 2005

64 GICHD (2004), Humanitarian Impact of Mines Other Than Anti-Personnel Mines, Geneva


66 Stephen Pantling, WFP Mine Action Officer, Nairobi, 24th November 2005


68 GICHD (2004), Humanitarian Impact of Mines Other Than Anti-Personnel Mines, Geneva p.25,

69 Calculation based on a Letter from The Rt Hon Hilary Benn MP, Secretary of State, DFID, dated 27th February to Tony Cunningham, MP. "We are providing MAG with GBP 1 million over the period 2005-07 for road and bridge demining in Moxico province, and the HALO Trust with GBP 400,000 for 2006/07 for road clearance in Cuando Cubango." In 2003, DFID’s entire country programme budget was only GBP 12 million, rising to GBP 16 million by 2006. Letter forwarded to Paul Davies by Tony Cunningham on 2nd March 2006.

70 Heather Hughes, Security Advisor of Oxfam GB, suggested that AVMs had not become an issue for the organisation because it may have simply 'screened out' from programming choices, areas which were rendered inaccessible by AVMs. Discussion with Paul Davies, August 2005

71 Paul Davies interview with John MacFarlane, Roads Technical Field Manager, MAG Angola, 13th March 2006

72 For example, a March 2006 article produced by the UN Integrated Regional Information Networks (IRIN) entitled "Lack of development in rural areas hampers repatriation," cited Enrique Valles, head of UNHCR’s Sustainable Reintegration Initiative (SRI), noting the lack in Angola of "micro-regions of economic development with three main components – health, education and income generation – so that it’s attractive to people to come back." According to Valles lack of investment in the Angolan interior was a major reason for the continued isolation of many of "displaced communities".

73 The article continued: "In a comment hinting that international NGOs often preferred to operate in places that were relatively well-connected, Valles said: ‘There is no-one in these municipalities at the moment except UNHCR and the churches – both Catholic and evangelical. Other NGOs are going to Benguela [in western Angola] or Planalto [central highlands] because the transport is better – but it is these areas that are really vulnerable.’ Later Valles also urges investment in local markets to enable agricultural development to flourish. However, at no point in the published article does Valles acknowledge that in many areas it is the presence of AVMs that is inhibiting the arrival of such badly needed investment, and indeed NGO activity. "ANGOLA: Lack of development in rural areas hampers repatriation", 31 Mar 2006 17:08:59 GMT, Source: UN Integrated Regional Information Networks (IRIN) accessed Friday 7th April 2006, http://www.alertnet.org/thenews/newsdesk/IRIN/d0021683506028.html


75 Email from John MacFarlane, Roads Technical Field Manager, MAG Angola, 13th March 2006

76 Core Humanitarian Issues in Moxico Province, May 2005, OCHA Angola states: "The province has nine municipalities and 29 communes. Eight of these communes have never been accessed by humanitarian partners and some of them by provincial authorities, due broken bridges and the mine threat."

77 Conversation with Joao Assuncacao, National Officer, UN Resident Co-ordinator’s Unit, Huambo, 31st January 2006. Also Francisco Cupidinama Gregorio, Base Manager, Norwegian People’s Aid, Luena, Mexico noted that: "In Luena, as in many other parts of the country, the main concern is freedom of movement, both of people and goods. Its good that the country is at peace, and as part of this there should be freedom of movement, but currently this is not the case. This is the driving force for our actions. We should open the roads and bridges in this province. Its important for rural development, to facilitate the return of refugees from Zambia and also politically its essential to ensure participation in this years’ elections."

78 The impact of AVM contamination on refugee return was noted in Landmine Action’s (2005) Global impact survey: "The presence of AVMs along the roads is hampering the return of Angolan refugees from neighbouring countries. The return of about 45,000,000 Angolans, of whom 220,000 were coming from DR Congo, Zambia and Namibia, was foreseen by the end of 2004. A further one million IDPs remain displaced, awaiting resettlement. AVM contamination has a direct impact on their return and reintegration. An UNMAS report of 2003 stated that “many of the IDPs and refugees spontaneously returning became victims while using AVMs contaminated roads. Thus, UNHCR was forced to delay organised repatriation of refugees, because roads could not be used before they were cleared”. In September 2004, a UNHCR spokesman reported that "Angolan roads are in a bad condition, bridges are broken and there are problems with landmines" and that two air routes had to be opened for areas not accessible by road."

79 Alex Van Roy, Programme Manager & Michael Storey, Operations Officer, FSTD(UNOPS) Survey Project Sudan Khartoum,17th February 2006
These communications procedures are based on the information contained in the MAG Angola Road Usage Guidelines, November 2004.

Interview with Paul Davies, WFP Mine Action Officer, Nairobi, 24th November 2005

Paul Davies interview with John Berry, Goal, Khartoum, 20th October 2005

For example, comments made by David Wightwick, Overseas Director of British medical relief agency Merlin, July 2005. Wightwick is one of several highly respected senior aid agency managers whose initial reactions fell into this category, including some within mine action agencies. For Merlin, excessive wear associated with wet season usage.


Evidence from the former Rhodesia revealed that the Police suffered fewer victims than the Army, even when using mine protected vehicles, due to the reluctance of the latter to wear seat belts. Cited in Peter Stiff, Taming the Landmine, (Galagge, 1986, RSA)

Paul Davies in discussions with aid agency security management experts at forums organised by RedR-IHE’s Security Programme in London (January 2006) and Washington DC (February 2006)

The British colonial regime in southern Sudan used to designate some roads as 'dry season only in order to protect the surface of the road from excessive wear associated with wet season usage.

100 p.24, The Humanitarian Impact of Mines Other Than Anti-Personnel Mines, October 2004 (Geneva International Centre for Humanitarian Demining)

For example, comments made by David Wightwick, Overseas Director of British medical relief agency Merlin, July 2005. Wightwick is one of several highly respected senior aid agency managers whose initial reactions fell into this category, including some within mine action agencies. For Merlin, and many others, there may be an element of denial here: a reluctance to engage in the issue for fear of finding yet another set of constraints on operations and demands on donor budgets which – although these same donors pay lip service to maxims of security good practice – are constantly cut back to the limit of what is possible, leaving the agency constantly trying to do more with less. The denial may be related to a kind of institutional exhaustion with trying to persuade donors to fund programmes appropriately. The idea of making this task still more demanding is understandably unappealing for someone in Wightwick’s position.


To manage AVM risks appropriately.

For example, collective aid agency security bodies, such as the Afghan NGO Security Office (ANSO) in Kabul is closely linked to the UNDSS network providing a one stop point of contact between the UN and complex NGO community in Afghanistan. ANSO works as an effective filter for a two way flow of information: down from the UN to the NGOs, and allowing information on security incidents affecting a wide number of aid agencies to flow up to the UNDSS.

102 The Humanitarian Impact of Mines Other Than Anti-Personnel Mines, October 2004 (Geneva International Centre for Humanitarian Demining)

The Humanitarian Impact of Mines Other Than Anti-Personnel Mines

There is an extremely useful overview of the UN structure and the various options for collaboration that might be available in the ECHO General Security Guide for Humanitarian Organisations at Annex 40 and 41.

103 Konraad van Brabant, Mainstreaming the Organisational Management of Safety and Security, HPG Report No. 9, February 2001

One example is the Consortium of Humanitarian Agencies in Sri Lanka, which provides coordination, information and monthly security situation reports for the humanitarian community, and another is the Afghan NGO Security Office (ANSO), which has been partially replicated in Iraq. In some circumstances, informal security coordination may be established between NGOs, particularly in the early stages of emergency situations. During the recent Lebanon crisis, for example, a group of NGO staff responsible for security within their agencies had established a regular coordination meeting, e-mail distribution list and website within a short time of the crisis commencing – see the interview with Michael O’Neill, the Security Director for Save the Children US at http://ngosecurity.blogspot.com/2006/08/interview-michael-oneill-save-children.html where he notes that by the end of August 2006, the INGO community was hoping to "develop a full-time security cell that will take up the logistical, communications and coordination functions of the current group and liaise with the UN security personnel" and that "member NGOs have already committed funds to get things started." In terms of funding these nascent bodies, ECHO is one donor that has taken progressive steps to provide security information to NGOs and also demonstrated a willingness to fund security coordination mechanisms.

104 Failure to differentiate between types of explosive incident in reporting and data management has important implications for the ability of agencies to manage AVM risks appropriately.

105 Mainstreaming the Organisational Management of Safety and Security, HPG Report No. 9, February 2001

For example, staff of the Afghanistan NGO Security Office’s (ANSO), and the data they recorded, conflated AVMs with all other classes of explosive remnants of warfare (ERW). In conversation staff used the term ‘AVM’ almost inter-changeably with ‘Improvised Explosive Device’ and ‘Roadside Bomb’. This is to some extent understandable, given the widespread use of AVMs in IEDs in Afghanistan: analysis of the UNDSS data base for incidents between July 2005 and July 2006 revealed that of 81 IED incidents, at least 63% and possibly as many as 75% of recorded IED incidents utilised AVMs as the main explosive. However, it can also be seen as a dangerous lack of clarity since it reflects a lack of understanding of the threat environment, something that is essential for good security risk management and advice.

106 Whilst UNDSS’s staff interviewed in Kabul clearly did understand the differences between items, both from a technical and impacts point of view, their incident data-base was equally confusing: DSS seemed to have no consistent methodology for breaking down the "type" of incident recorded. In total, they list 42 different types of incident, ranging from the simple (UXO) to the detailed (Mines Attached to Police Vehicle), making it difficult to conduct incident analysis and mapping without an additional effort to re-classify and group the raw data recorded.

107 Failure to differentiate between types of explosive incident in reporting and data management has important implications for the ability of agencies to manage AVM risks appropriately.

For example, staff of the Afghanistan NGO Security Office’s (ANSO), and the data they recorded, conflated AVMs with all other classes of explosive remnants of warfare (ERW). In conversation staff used the term ‘AVM’ almost inter-changeably with ‘Improvised Explosive Device’ and ‘Roadside Bomb’. This is to some extent understandable, given the widespread use of AVMs in IEDs in Afghanistan: analysis of the UNDSS data base for incidents between July 2005 and July 2006 revealed that of 81 IED incidents, at least 63% and possibly as many as 75% of recorded IED incidents utilised AVMs as the main explosive. However, it can also be seen as a dangerous lack of clarity since it reflects a lack of understanding of the threat environment, something that is essential for good security risk management and advice.

108 Whilst UNDSS’s staff interviewed in Kabul clearly did understand the differences between items, both from a technical and impacts point of view, their incident data-base was equally confusing: DSS seemed to have no consistent methodology for breaking down the "type" of incident recorded. In total, they list 42 different types of incident, ranging from the simple (UXO) to the detailed (Mines Attached to Police Vehicle), making it difficult to conduct incident analysis and mapping without an additional effort to re-classify and group the raw data recorded.

Of a total of 308 incidents listed for the year July 05 – July 06 in the UNDSS data base, 139 are recorded as involving ‘mines’, of which AVMs are the
single biggest type of mine incident (59), and a further 57 are unspecified mine incidents, a fair proportion of which can be assumed to involve AVMs. This together, with accident information from the ICRC’s database, reveals that AVMs are in reality a major security threat in their own right in the Afghan context. In July 2005, ANSO Operations Coordinator in an interview in Kabul explicitly stated that AVMs were “not an issue in the Afghan context, and were an issue only in as much as they were used in roadside bombs”, a bad misrepresentation of the reality of the threat environment.

108 The Landmine Impact Survey (LIS) is a community-based survey process that provides detailed countrywide information about the scale and location of the mine threat, and feeds it into a specialised database, the Information Management System for Mine Action (IMSMA). For more information see www.sac-na.org.

109 The road classification system used by the HALO Trust in Angola, as of July 2006. In the same country MAG, for example, defines roads as “trafficable” or “non-trafficable”, and provides specific recommendations for each route.

110 In Angola the discovery of a mine on or near a road led to the UN security body re-classifying the road as “red”, therefore blocking all UN traffic until a full assessment could be conducted. The process for re-classifying the road as “yellow” or “green” could take several weeks.

111 Interview with Greg Crowther, Country Programme Manager, MAG Angola. 2nd February, 2006.

112 This is the definition being adopted by UNMAS in Sudan to describe what in other contexts have been called “low risk” areas. Written response to questionnaire from Paul Heslop, Chief of Staff / Deputy Programme Manager, UN Mine Action Office, Sudan

113 See for example: Radonic et al (2004), Injuries from Antitank Mines in Southen Croatia, MILITARY MEDICINE, 169, 4;320, 2004

114 There is an excellent set of UN DSS guidelines regarding the use of Ballistic Blankets that outlines their limitations against various type of weapons.

115 This refers to the definitions of protection as defined by the European Centre for Standardisation (CEN)

116 STANAG refers to NATO Standardisation Agreements signed by member countries on various issues, such as definitions of “protection” levels.

117 There are several accepted international standards for protection levels with regards to body armour, and these are used to describe levels of protection provided by vehicle armour. The National Institute of Justice Standard 9010.1 established minimum performance standards for protective body armour, as did the CEN (Committee for European Normalisation) Standards for Ballistic Body Armour. Most vehicle armourers claim that the customized armoured vehicles are protected to CEN Level 6 / NI Level III (7.62 mm rifle bullets), although vehicles can be armoured to CEN Level 7 / NI Level IV (0.3 armour piercing bullets). This will provide protection against blunt blasts, although the weapons involved mean that it is difficult to state exactly what weapons they provide protection from and at what distance. It is frequently stated that this level of armouuring will provide protection against grenade blasts underneath the vehicle. It should be noted that vehicle armouuring is designed to protect against blasts and fragmentation. The damage from anti-vehicle mines is done by the blast effect rather than the fragmentation, which results in deformation of the vehicle body and


119 With the new Mark III armour, the HALO Trust and Pennmans, a company specialising in armouuring of vehicles, have been looking at the angles of the V Shaped hull, thickening the armour in crucial places (including so as to give extra protection to passengers travelling in the rear of the vehicle, especially in relation to rear wheel detonations), and putting more armour under the seats to reduce the blast effect. (Paul Davies interview with Tim Porter, HALO Trust Desk Officer Africa, HALO HQ Scotland, 17th November 2005)

120 Interview with Tim Porter, Desk Officer, HALO Trust. 17th November 2005.

121 Interview with Tim Porter, Desk Officer, HALO Trust. 17th November 2005

122 The approximate cost of adding blast plates to a Land Rover is $12,000. Interview with Tim Porter, Desk Officer, HALO Trust. 17th November 2005.

123 HALO Trust have worked for several years with a specialist company in the UK to research and develop armouuring for a range of vehicles and machines, including that described here, the V-shaped hull that has been developed and fitted to Land Rovers.

124 See for example http://www.armour.co.za/ and http://www.regis.co.za/

125 See http://www.umief.org/information/angola_23836.html for the press release on this campaign, which uses a case study of a mother killed when traveling in a taxi as an example of the dangers from AVMs on roads.

126 There is a need for data on incidents to be collated in a clear and consistent manner if any effective analysis is to be conducted. By way of example, an analysis of the UN DSS database of mine incidents in Afghanistan revealed serious weaknesses in the way in which records of explosive incidents were categorised, which led directly to incorrect assumptions being made about the nature of the threat on roads in Afghanistan. DSS seemed to have no consistent methodology for breaking down the “type” of incident recorded. In total, they list 42 different types of incident, ranging from the simple (UXO) to the detailed (Mines Attached to Police Vehicle), making it difficult to conduct incident analysis and mapping without an additional effort to re-classify the data recorded. For the purpose of this report, the data was re-classified and it found that of a total of 308 incidents listed for the year July 05 – July 06, 139 involved ‘mines’, of which AVMs are the single biggest type of mine incident (59). A further 57 are unspecified mine incidents involving vehicles, a fair proportion of which can be assumed to involve AVMs. Together with the information from the ICRC database, this reveals that AVMs are in reality a major security threat in their own right in Afghanistan. Despite this, the Afghan National Security Office (ANSO) Operations Coordinator explicitly stated that AVMs were “not an issue in the Afghan context, and were an issue only in as much as they were used in roadside bombs”, a misrepresentation of the reality of the threat environment. The interchangeable use of ‘AVM’, ‘Improvised Explosive Device’ and ‘Roadside Bomb’ is common in Afghanistan and to some extent understandable, given the widespread use of AVMs in IEDs in Afghanistan. However, failure to accurately and consistently record data on incidents has led to a mistaken assumption about what types of devices constitute a threat.

127 Good and up-to-date information on road status is required in order to produce accurate maps or provide tabulated information regarding the risk level of specific roads. Agencies seeking to access population plans or plan operations require accurate information about where they can and cannot travel. As threat levels on roads change in response to additional information or following route assessments and technical activities, this updated information must be made quickly and freely available to potential road users.

128 It is important that an accurate record of mine action activities be retained for future reference. This includes a record of route assessments, incident reports and technical activities. Although IMISMA is able to capture some of this information, it is focused on standard minefields rather than roads, and thus cannot capture all relevant information about the AVM threat. Even where data can be captured on IMISMA, such as incident reports or clearance activities, there is still a need to retain route assessment documentation in order for organizations to obtain in detail information about specific routes. Understanding why a road is open or closed and what specific residual risks remain, as well as how that decision was reached, is important for any organizations taking a proactive position with regard to security management of AVMs.

129 Interview with Greg Crowther, Country Programme Manager, MAG Angola.2nd February, 2006.