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Permanent Secretariat

# Finabel



Promulgation of report Finabel MAN.1.R

**LOGISTIC SUPPORT IN URBAN AREAS**

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<b>10. <u>Summary</u>:</b> <p>The important increase of megalopolis will have a strong effect our future world. (In 2021, 80% of the world population will be concentrated in cities). In this area, “the weak” will be able to force the “strong”. In this so complex and so typical urban environment, any type of military action and its support will need a precise planning and a strict conducted operation. This survey aims to enable all the countries of Finabel to have the largest knowledge of this field, the threats and the courses of action to be set up in order to support as efficiently as possible the troops committed in the urban area.</p>	
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“The soldier cannot be a fighter and a pack animal at one and the same time, any more than a field piece can be a gun and a supply vehicle combined. »  
J.F.C. Fuller, c. 1948

## INTRODUCTION

During the last world war, the urban area had been the theatre of violent actions and the forces were severely hit. These battles are sometimes considered as turning points in the evolution of the war (Stalingrad 1942-1943, Berlin 1945) but they haven't got the same current rules of commitment of the forces.

The fights in urban area became more and more frequent in the conflicts starting at the end of the 20<sup>th</sup> century. (Sarajevo, Belfast, Mogadishu...)

The city has always been a target as it concentrates power, resources and the population without forgetting the symbol of its capture especially if it is a capital. Today; actors such as robbers or terrorists also contest for control of the city; it may also become a field for ethnic, religious, ideological and social fights.

This phenomenon is strictly linked to the growth of urbanization. According to the UN, in the year 2025, 60% of the world population will be concentrated in cities and 70% of the cities will be located at the coast.

The urban areas are becoming the field of asymmetric conflicts. In a very recent past, Grozny and Mogadishu were typical examples of the fights between units and irregular forces. Fighting in urban areas can be, for opponent forces, the way to counter an otherwise unfavourable balance of power.

It's necessary to prepare specifically for such a type of commitment including logistics, which require an adaptation to this particular context.

The urban area is characterized by its complexity, linked to the combination of the physical and human factors in a possible context of stabilization. These features define the role of the forces and their actions.

Thus, the issue of peace nowadays inevitably includes the urban space and, unless we completely abandon the idea of operating in a built-up area, no army can continue to ignore the need to prepare specifically for this type of conflict.

**The principles exposed in this study are based on the supply of an EU BG (European Battle Group) committed in an urban area action.**

### Attempt at a definition

An "urban operation" is understood as an operation in which the main theatre is a town or a built-up area, which is carried out by a combined arms force of brigade<sup>1</sup> level or higher, facing one or more enemies operating in a conventional or an asymmetric way and for which

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<sup>1</sup> It is generally considered that a brigade has as its area of action a town of 20 to 80,000 inhabitants for violence control but only 5,000 inhabitants for force coercion. To render Basra ineffective (approx. 400,000 inhabitants) during the Iraq War, the British Army committed the bulk of its force (30,000 m).

this town or built-up area constitutes a political, demographic, economic or strategic, or even media goal, justifying the use of force.

## 1 THE URBAN AREA ENVIRONMENT

### 1.1 Physical description

The urban area is characterized by partitioned sites. The town is made of a great number of large constructions, with various structures (buildings, roads, canals and monuments).

The town is separated by means of communication that can either contribute to the closing of the town or on the contrary facilitate the movement.

The often anarchic expansion of urbanism, the complexity, especially mixing on the borders, living areas, power, industrial and commercial sites are representing a technological risk for the military forces and the population.

- Outskirts;
- Periphery;
- Downtown.

The outskirts of European towns are made of small towns and villages.

It's a zone of transition which includes roads and railways as well as open spaces. Airports are sometimes set up there.



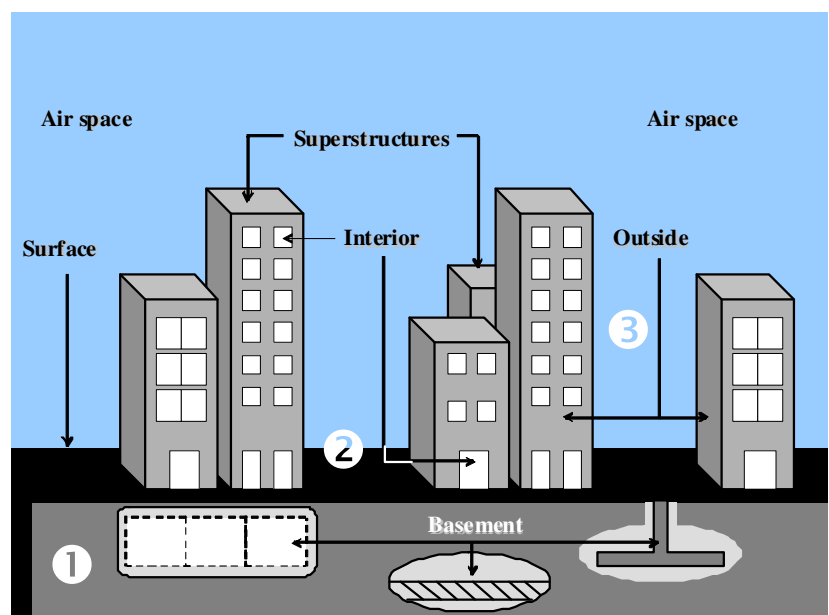
The Periphery of the town is very permeable and heterogeneous with a high density of population.

The road network is made of a geometrical frame of quite large ways. This part of the town includes residential areas, vertical buildings, commercial and industrial areas which leave big unoccupied open spaces between them.

Downtown represents a deep, homogeneous and not very permeable place. The network may be very narrow and irregular. In modern cities, downtown is made of high buildings, skyscrapers where offices and commercial sites are located.

The “urban battle field” is also equally represented in a vertical way which involves higher floors (trapping, snipers) which are very difficult to secure.

The urban area can be divided into 3 areas



Because of this discontinuity of space, units committed in an urban environment experience difficulties in finding their bearings and are hindered in their observation, deployments, advance and manoeuvring, by a multitude of impassable obstacles.

**However, the forces are now committed in several environments which included different types of housing (African type of town, Asian structures...)**



## 1.2 The Human environment

The town is a potential source of conflicts due to its cosmopolitan aspect, the cohabitation of the different ethnic groups, ideological confrontations due to the crossroad of communication and the areas of expression offered.

Generally speaking, the inhabitants remain on their sites of life where institutions and organizations of diverse types also work.

The urban area is also characterized by a high density of population (except for some rare cases when the population has fled or has been evacuated) and their presence in the area represents a risk and constraints for the committed forces.

- Impediment to deployment and manoeuvre;
- Less than ideal use of the weapons as the civilians must be protected;
- Risk of an opponent infiltration and difficulty to identify the infiltrated elements;
- Inevitable danger of an overlap between the forces and the population. In fact, a part of the population can be hostile or can be used by opponents to put pressure on the forces through actions from simple urban demonstration to harassment, even to urban guerrilla fighting.

Lastly, there are other actors to be taken into account such as the public institutions, non governmental organisations, media, or private companies in the framework of outsourcing contracts.

## **1.3 Planning factors**

### ***1.3.1 Environment***

The main concern of a force committed in an urban environment is therefore to maintain its freedom of action in spite all the constraints to which it is subjected.

The experience of commitments in an urban environment shows that it is extremely difficult for a modern force (which is the case of a force armed by the FINABEL countries) to use its technological advantages in such an environment and in the face of such threats. As a result, commitment in an urban environment relies to a great extent on the human potential and the combatant is worn out much more quickly than the equipment.

Consequently, it is necessary to:

- Find the right compromise between a sufficient autonomy for units who are generally cut and a necessary contact lightning to remain very flexible.
- Keep the right balance between maintaining the agility associated with autonomous logistic troops and providing protection for fragile support units, especially on the axis of communication.
- Consider the needs of the population during planning as well those of the fighting troops. This is particularly relevant during the stabilization phase.

The resulting constraints in this field on the committed units are increased but the logistic units, naturally less mobile and protected need space and stability in a field where all the movements are difficult and spaces reduced.

On the contrary, the numerous infrastructure in the city outskirts (car parks, hangars, warehouses, railways) represent an important asset for stationing heavy logistic assets, the transportation of resources, maintenance operations and storage. Commercial and industrial buildings provide storage and concealment for vehicles, protecting them from light weapons and bursts.

The use of Engineer units is of paramount importance for guaranteeing the force's mobility (clearance of axes or fields of fire, destruction of obstacles, rubble clearance, mine clearance and removal of booby traps), countermobility vis-à-vis the enemy (setting up of obstacles, check-points, etc.), the protection of friendly troops and their material condition. It often requires specialised teams to set up specific work, explosives, and other assets.

### ***1.3.2 Population***

Radical population growth may create overcrowding and generate or aggravate resource and quality of life issues. Intense and destructive competition for employment, housing, and social status may develop in this climate of economic deprivation.

Urban areas with a large youth population may also help to generate conditions for instability. Young urban populations generate enormous demands for social resources, primarily



education and jobs. Even a strong urban economy may fold under the economic expectations of a tremendous influx of young migrants. Disorder and violence may result as hostiles (often not state actors) easily mobilize and manipulate the idle young to act politically and criminally. Urbanization and population growth are more dangerous when they combine to produce a cohort of young urban dwellers separated from traditional social controls, such as village elders and clan leaders.

Ethnic, religious, and other social issues may become the vents for anger and frustration produced by the high tension of urban life.

The crowd manipulated or not, can be either an obstacle (by its presence or inertia) or a threat by its importance and behaviour such as: refugees running away from fights, parts of the populations resisting public authority, and unexpected gatherings.

The different types of action of the crowd are:

- Attacks ;
- Intimidations ;
- Demonstrations ;
- Obstructions ;
- human shield;
- protection of the opponent;
- Hiding the opponent.

## **1.4 Actors and Factors**

In an urban zone, the threat is multiple and comes from many different directions. The degree of intensity is various, complex, often invisible and unpredictable. The opponent can be conventional as well as asymmetric. The opponents described below involve the combat units like logistics units particularly convoys.

### ***1.4.1 Adversary***

#### 1.4.1.1 Conventional forces

Generally speaking, the opponent is known; conventional forces have at their disposal military skills which allow them combined actions.

In a defensive action, they can look for the destruction of the elements of the forces surrounding them in the town using many types of defence.

***The classical action is very tricky in an urban area. The opponents are vulnerable as their elements can easily become isolated.***

However, if they have got a moral strength which is sufficient and the support of the local populations, they can represent a very serious threat with reduced military means.

Their very good knowledge of the field and the immersion in the zone are their main assets.

#### 1.4.1.2 The para-military forces or safety forces

Organized by the political power or by ideological or religious movements, the para-military forces are made of militia whose preferred place of action is the urban area.

Mainly as big as a group or a section, they are very mobile but lightly armed. They can compensate for their unfavourable balance of power by constantly moving, using their knowledge of the zone and the possible support of the population.

In some cases, however, the para-military forces are made of true parallel forces which have heavy weapons and do not answer to any governmental authority or organizations. Some private forces, who obey local power, may count thousands of under-equipped men.

They strongly avoid direct fighting but they lead localised, targeted and coordinated actions of harassment. Their actions can target the forces, the population or symbols and may have a suicidal aspect (martyrs). They are most likely to conduct ambushes and to carry out raids. Without any links with or regard for the government, they do not respect the international conventions.

#### 1.4.1.3 Guerrillas and terrorist movements

Guerrilla warfare, characterized by its subversive aspect, is the fact of uncontrolled units by official structures. They can spread themselves to political fields (kidnapping or assassination), economic fields (sabotage) and psychological fields (reprisals against their assistants).



#### 1.4.1.4 Competing Power Structures

Many groups can exist that become strong enough to rival the power of the governing officials and eventually turn the urban area into a system of divergent and competing power structures. These groups can consist of insurgent forces, a merchant class or economic elite, criminal organizations, or some other significant source of power such as religious organizations, clans, or tribes. In the absence of a legitimate authority, armed factions headed by "warlords" may vie to fill the power void. Sometimes these groups or organizations, normally at odds with each other, may form alliances to achieve specific goals.

#### 1.4.1.5 Criminal Organizations

Organized criminal groups have grown common in urban areas; have also become an important part of the urban social structure (gangs for example); and can exert considerable influence on governments, people, and military forces conducting urban operations. Some large criminal organizations relying on international connections often have better resources and equipment. Their large financial resources, long-reaching connections, and ruthlessness provide them the means to corrupt or intimidate local officials and government institutions. In any operation, but especially support operations, they may violently confront and oppose Army forces during mission execution.

The tactics of urban criminal groups parallel those of insurgents. They have developed an intuitive cultural understanding of slum neighborhoods and the ability to lure civilians into criminal activities. They have also mastered the management of mobs. They recruit teenagers and young adults in their efforts against rivals and authorities, just as insurgents muster armies from the youth of rural villages. In many developing nations, there exists an alliance between insurgents and organized criminal groups. In these alliances, the insurgents defend the criminals and the criminals fund the insurgents. During many urban operations, particularly during or following combat, civil disturbances, or large natural disasters, looting

(organized or unorganized) may become of critical concern. Therefore, urban operations may often require a combined law enforcement and military response.

#### 1.4.1.6 Warlords

A characteristic of many recent stability operations and support operations has been the deterioration or complete collapse of political authority in the country or urban area in crisis. In some cases, warlords have attempted to fill the power vacuum. These individuals often have no particular claim to legitimacy. Their power issues from their weapons, not necessarily from their political skills, human services provided or popular consent (although they have some popular support to remain in their relative position of authority). In dealing with these urban warlords during support operations or stability operations, it may appear that there are two options: either ignore them completely or work with them visibly or regularly.

Refusal to acknowledge warlords may increase the threat to Army forces and NGOs (Non Governmental Organizations). Their militias may attack Army forces to achieve recognition or simply due to misunderstanding or inherent friction between armed forces. On the other hand, dealing with them may provide legitimacy to the exclusion of other elements of the urban population such as professional groups (for example, doctors or teachers), religious groups, and traditional clan or tribal chiefs—which may have a greater claim to legitimacy and better form the foundation for a reconstituted urban society.

#### 1.4.1.7 Merchant Class

Urban areas normally possess a merchant class or economic elite as part of their social structure. In some urban areas, they may carry more power than the local or central state government. They may isolate themselves physically and socially from the sprawling poor yet wield enormous power over the country's political and economic activities. The degree of economic separation between the merchant class and the poor may be small but still socially or politically significant.

In a vastly impoverished area where the economy of the urban area is severely disrupted, the merchant class will often continue to operate and function and, as a result, achieve a measure of influence. To continue to operate under acute economic turmoil, they may form alliances in criminal organizations and secure loyalties within the government. Outside resources introduced into a crisis area (such as food, water, fuel, and pharmaceuticals) takes on increased value, may replace currency as the medium for exchange, and often become the means to amass and hold wealth. One of the primary ways to obtain wealth may be to steal it.

#### 1.4.1.8 Disease and pollution.

Urban areas frequently spawn epidemics; therefore, widespread disease may pose a significant threat to Armed forces that operate there. In many developing nations, rapid urbanization has occurred without a corresponding upgrade, expansion, or even development of adequate sewage and water systems. In urban areas lacking adequate trash and waste management infrastructure, insect-spread diseases proliferate. Mosquitoes that breed in polluted water, open water tanks, and irrigated urban gardens carry malaria and dengue fever. The problem compounds with growing numbers of bacteria resistant to various antibiotics, a shortage of trained medical personnel, inadequate or insufficient medical facilities and supplies, and unclean agricultural and food-processing practices.

Pollution also creates critical health problems in developing areas and a potential health risk for intervening Armed forces. Pollution may cause immediate health problems but more often, the insidious effects appear months or years after exposure.

Destruction of industrial complexes that use, produce and store hazardous material may endanger the health of troops by biological, chemical or other toxic substance.

### ***1.4.2 Actions of adversary***

Without reinforcement, the logistic units are particularly vulnerable during operations in an urban area especially in terms of deployment and moving.

They become an interesting target:

- For the conventional opponents: destruction or neutralisation of heavy logistic means and cutting of Main Supply Roads (MSR).
- For the para-military forces and the guerrillas: harassment of fleeting targets in order to destroy or to take resources and equipment. This type of enemy can be motivated by the effect on the media;
- For the population: pillaging, robbery of resources and equipment, blocking the major roads and/or accesses to logistic units;
- Blocking and ambushes are common in the streets;
- The vehicles are often heavy and not very easy to move. Use of trailers should be avoided.

#### **1.4.2.1 Improvised explosive device IED**

The use of IED (improvised explosive device) is a very high threat against the logistic convoys especially in an urban zone. This system permits the potential enemy to stay back and exfiltrate swiftly. About 50% of the attacks against allied convoys in Iraq start with the use of IED. The explosion is often followed by direct shots, even when the tendency is only to use the IED. In this context, the logistic units will have to reinforce their weapons (add on armoured, sand bags, anti-mine mats) as well.

#### **1.4.2.2 The nuclear, radiological, biological and chemical threats**

Whatever the type of the opponent, paramilitary, terrorist, nuclear, radiological, biological and chemical threats must be taken into account.

In the periphery of the towns, the building of industrial sites increases the risk of deliberate or inadvertent NRBC hazards (building destruction can generate toxic smokes, dangerous leaks etc...).

### **1.4.3 Force protection**

“A fighter sustains a fighter”.

Combat Service Support fighter should be considered as a real fighter. It means that he must be trained and equipped like forward units.

He must be able to properly manage his military equipments (trucks, specific materials...).

He must specifically be trained for the assigned mission and be able to commit it in urban area.

CSS fighter need to have the appropriate reaction facing the different threats (ambushes, IED...).

During urban operations, logistic troops must constantly monitor the tactical situation, assess risk, and be prepared to deviate from plans when the situation demands.

For the combatant, individual protection (ballistic protection clothing/equipment) and collective protection of personnel (armoured vehicles) is essential for all of the units committed. During stationing, the use of terrain-organising materials (bastion-walls, "ribards", sandbags, caltrop barriers, etc.) is widespread and concerns all units equally. Individual and collective protection, as well as decontamination and firefighting assets, must be provided and be ready for use without delay, both in the face of enemy action and to guard against a technological accident.

Next to these direct passive measures, in the near future there must be also direct active protection systems that prevent projectiles from striking their target. For comprehensive force protection it is also necessary to take indirect protection measures long before a possible action by the enemy. Intel and CIMIC are two possibilities to prevent attacks on our armed forces.

Lastly, the high level of intermingling will make identification of the enemy very difficult, and hence make night operations particularly tricky. Nevertheless, it is essential that combatants and vehicles are equipped with a sufficient quantity of night vision equipment, which can give them technological superiority over a less sophisticated enemy.

In order to reduce the risk of attack, logistic support in urban areas must pay particular attention to an accurate planning of logistic movements and must guarantee a high degree of flexibility, necessary to adapt available resources to possible quick changes in the operational scenario. Risk management must facilitate a trade-off between logistic resources and operational goals. Providing logistic troops with the same force protection measures as combat units (in particular armoured vehicles) is crucial to reduce risks. Combat troops also contribute to logistic support in the following ways:

- engineers contribute to improve the safety of Logistic deployments. In addition, they facilitate convoy movements by restoration of the axis blocked by rubble, obstacles and traps;
- traffic control units facilitate the convoy's movement and could escort them depending the threat level (according the tactical and technical capabilities);
- dedicated combat units protect the Logistics deployments by reinforcing the safety measures, escorting the convoys and using their armoured vehicles to carry supplies.
- Army aviation by providing information and fire support.

**In any case, Logistics means security and security of bases must be taking in account, by adapted means dedicated for this specific mission, from the Force generation establishment.**

## 1.5. The operational context

### 1.5.1 *Desired end state*

The end state is to restore peace and create the conditions for a return to normal life. The aims to be reached to achieve this mean ensuring control of the physical and human elements that constitute an obstacle. Different types of objectives may then be pursued, simultaneously and successively.

In an initial phase, it is a question of removing the factors which stand in the way of a return to peace:

- seize key points which enable the town to be controlled;
- neutralise hostile or antagonistic elements;
- protect sensitive points and the population.

In a second phase, we then have to create the factors making it possible to maintain and consolidate the peace:

- ensure order
- restore the material conditions of life and the functioning of public institutions.

### 1.5.2 *Continuum of the operations*

The new context of commitment defines 3 phases in the operations which can overlap and so create a continuum of operations.



#### 1.5.2.1 The intervention phase

In this initial phase of operations, forces are committed in order to first solve the military and safety aspects of a crisis, then to defeat the opponents, to stop fighting and to lower the level of violence. Sometimes, this phase is rather easy for mobility and manoeuvre.

#### 1.5.2.2 The stabilization phase

This phase aims at creating (in the shortest possible deadline) the conditions of normalisation through a progressive transfer of the responsibilities to a military or civilian legal authority. Started during the planning of the operation, this phase can combine at the same time the support of the military and civilian authorities, military, humanitarian and environmental actions.

#### 1.5.2.3 The normalisation phase

This is the final phase of an operation which starts with the transfer of responsibilities to the civil authority. This phase consists of many actions aimed at returning to a normal way of life with the possible support of the military forces.

Each of these phases is characterized by 2 particular types of operations (these types are domineering and complementary).

#### 1.5.2.4 Coercion

This operating mode of forces requires the capacity to design and to lead operations in order to destroy or to neutralize the opponent forces. It requires a local operational superiority in military conventional weapons.

#### 1.5.2.5 Violence control

This requires the capacity to design and to lead coordination between diplomatic, economic, communication and military actions to solve and to stabilize a situation of crisis. This mode combines safety rules and measures of confidence, assistance to other organisations, and control. This can possibly lead to constraints, actions or coercion.

This is totally possible in an urban operation. The forces can be facing a combination of operations which can be of different natures and intensity in the same operational sector.

The diversity of the threats and of the contexts is not very easily managed and is highly likely to be unstable. This requires an important capacity of intelligence, an extreme flexibility of the system and wide ranging but clear rules of engagement.

### ***1.5.3 Rules of action***

The interrupted urban zone implies many difficulties for the units to observe, to orientate, to move, to deploy, to manoeuvre and to guarantee a good coordination.

The experience of operations in this field show that it's extremely difficult for a modern force to gain the maximum advantage from its technological assets in an environment where the soldier is the main actor.

Thus, when facing this complex environment, simple but unavoidable rules of actions have to be defined.

#### 1.5.3.1 A multi-dimensional coordination

The strategic, diplomatic, humanitarian and multi-media aspects in a multinational and international framework oblige the commanding officer of the forces to coordinate with the main actors: military personal in charge, local forces, police and state structures.

#### 1.5.3.2 Joint and combined cooperation

Due to its specific features, the urban action requires a joint combination of the units. The mounted and dismounted actions led by battle groups involve supporting, fires, protection and intelligence elements. At the level of small battle groups, it may be necessary to create small units articulated around the combination of infantry, engineers and armour. High level joint cooperation mainly consists of intelligence and data exchange. However, for the direct fires support, the army aviation, air force and the navy may be involved.

#### 1.5.3.3 Intelligence

Intelligence gathering is essential in logistics operations planning.

The potential for sudden changes or even complete reverses in situation requires a constant maintenance of situation awareness from the planning phase through to the withdrawal of the force. Support forces and combat units as well as traditional forces are responsible for information / intelligence gathering.

Deployment of forces in a built-up area is characterised by the fact that units have to improvise and use existing infrastructure, of varying quality, depending on the location and the kind of the conflict. Reactive support systems have to be developed by improvised logistic units created specifically for the operation to sustain self-sufficiency of a small task group.

#### 1.5.3.4 Violence control

In order to facilitate the return to normalization and to get the support of the population and the local authorities, the force needs to carefully preserve goods and people.

Structures at risk, sustainment flows, health structures and if possible, data structures must be safeguarded.

Specific rules of engagement and behaviour must take account of and respect civil losses, collateral damage, the safety and the life of civilians living in the zone, as well as the provision of elementary needs.

#### 1.5.3.5 The decentralisation of the manoeuvre

Actions in urban zones require a high autonomy of the subordinates in order to react to a sudden and violent crisis.

The plan must establish a logical general manoeuvre and a decentralized operation which allows junior commanders to take urgent decisions in reaction to unpredictable events.

#### 1.5.3.6 The reversibility of the mode of action

In a stabilization phase, the force can at the same time lead humanitarian actions in quiet zones, control operations and fighting in near zones. Thus, the neighbour units can lead actions of different intensity. In order to avoid colateral damages in the force, coordination of action is necessary in this close environment.



#### 1.5.3.7 The combination of the effects

Dissuasion, prevention, deception and psychological actions offer the force a great number of possible solutions in order to fight the opponent. Led on reactive joint structures, these actions require a high degree of initiative at all levels.

#### 1.5.3.8 The logistic self-sufficiency

To the requirements of the actions (important losses, health, increasing consumption and fragility of the convoys), it is necessary to take into account assistance to the local population and the re-establishment or maintenance of public services.

This aspect of logistic support must be taken into account as soon as the initial planning is started and will become increasingly important as the operation transitions towards stabilisation and normalisation.

## **2 GENERAL LOGISTIC PRINCIPLES**

### **2.1. Commanding**

As a preliminary, it is necessary to reaffirm the essential nature of real and effective coordination, at all the levels of command and as far upstream as possible, between the tactical manoeuvre and logistic support. This coordination must be evident through the operation orders which must routinely include the logistic aspect.

Logistic planning must develop a simple C2 system that gives subordinate levels the minimum of restrictions. It is essential that logistic support focuses on enhancing the performance of the tactical mission, which will be very sensitive to logistic performance.

All that obstructs and weighs down the units must be moved to the rear. However, the latter must have good autonomy.

### **2.2. Task organisation**

The support elements are deployed in order to limit the delivery deadlines between the supported units and their logistics bases taking into account the constraints of the urban field. The logistic support of a joint brigade can be affected as follows:

- Combat service support group level Division or Brigade depending of the intervention level;
- Temporary combat service support group depending of course of action (attack, raid, population protection...);
- Combat Train 2 for EUBG;
- Combat Train 1 for combined arms team level coy.

The Task organisation of logistic forces should enable them to react to changing situations. It must also be able to support actions of a different nature at the same time, particularly during stabilisation. The composition of the logistics elements at different levels must be a compromise between lightness which permits quick manoeuvre and the necessary autonomy in case of a temporary disruption in the logistic flow.

In an offensive action, an organised and centralized support is the most adapted. In fact the field held by the enemy makes the combat train 1 deployment more risky. The logistics links remain possible for the force thanks to the logistics corridors and escorts.

In a defensive situation the support will be decentralized in order to limit the logistics links ensuring the autonomy for the units. This is made possible using set resources and means in the organisation.

Thus, the support of the units of the Battle Group can be centralized at its level or possibly decentralized to the DIA. In the first case the combat trains 1 are colocated with the combat train 2, in the second case, they remain deployed with their units.

### **2.3. Deployment**

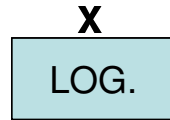
During an intervention or stabilization phase, the deployments guarantee a permanent support whatever the evolution of the situation.

The temporary divisional support base can be deployed either in the outskirts of the town, next to an airport for example, or in an industrial or commercial suburb.

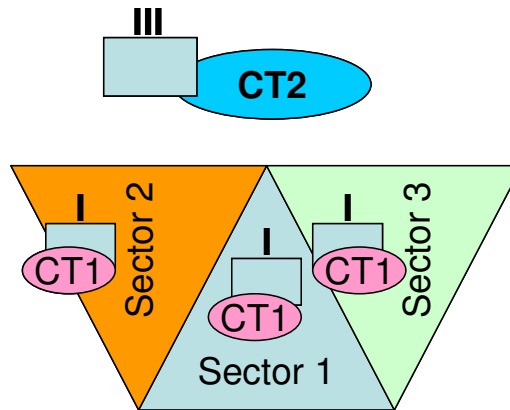
They will try to take benefit from the existing structures such as:

- stabilized zones easily used for stationing vehicles and maintenance operations
- buildings to store all the resources and operate maintenance
- major roads to get easily and quickly to the logistic base and to the supported units.

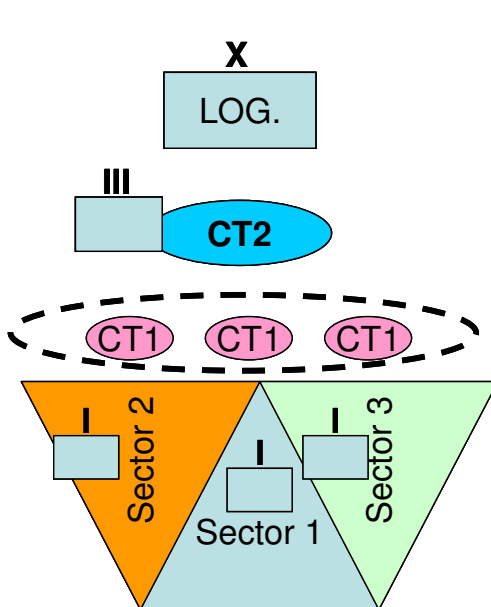
The combat train 2 (CT2) in the suburbs of the town. cases are possible



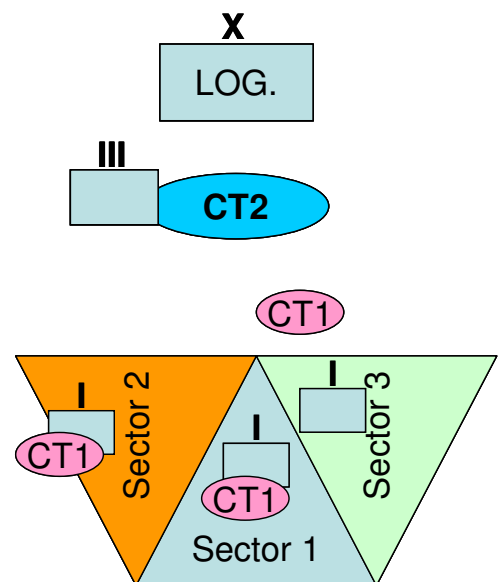
is always deployed  
The three following



**Decentralized layout**



**Centralized layout**



**Mixed layout**

In all the cases, the logistic levels are linked to the logistic corridors. The choice of centralized organisation of combat trains 1 reduces their vulnerability. They can be regrouped in the same zone and colocated with the CT2.

The combat trains 1 are normally deployed in the units and they ensure the logistic sufficiency and enable them to cope with a temporary isolation.

If the situation requires it, they can be regrouped with the combat train 2

The normalisation phase can if necessary, require a geographical logistic deployment up to the end of the commitment. However, large logistic bases should not be set up in city centres, because the situation may change for the worse at any time.

## 2.4. Protection

The logistic vehicles do not offer any protection equipment to the crew. They are not always equipped with auto-defense weapons. Although they haven't got any specific protection the armoured trucks are privileged.

The difficult navigation or a sudden change in the tactical situation can lead a convoy to cross a zone which is held by the opponent.

## 2.5. Initial autonomy

As a principle, operations should start with a high level of self sustainability for all combat units, whilst being prepared to give full spectrum follow on support and remain flexible to adapt the logistic lines and chain by reinforcing or removing intimate logistic support elements from the combat units.

The initial autonomy is defined according to the intensity of actions in urban areas and the obligation to take into account the possible needs of the civilians.

The needs of the fighters are characterized by a high consumption of:

- Small calibre ammunitions for flat trajectory fire weapons, anti-tank ammunitions, grenades and artifices
- Food and drinkable water;
- batteries for night actions and the means of transmissions;
- building materials for protection.

The table below shows the overconsumption rate identified by the last Lessons Learned.

Resources	Ratio	Remarks
Class I (drinking water and food)	X 1.5 to 2.	
Class III - POL	X1.	Depending on commitment of tanks.
Class V - Ammunition	X3 for small calibre (till 20 mm) and X5 for grenades and flares.	
Batteries	X5.	
Class II – Spares etc	X1 to 1.5. Running gear X3.	For EU BG size, 1 Tonne/Day.

Moreover, the units to be supported often consist of isolated modules at the level of the section and the group who need to be totally autonomous.

The initial autonomy is divided between the different levels of the force according to the situation which allows the logistics deployment and the convoys.

The Iraqi-US lessons learnt show that the logistics units must have pre-loaded flat racks to cope with any problems in short times.

For example, an armoured-coy committed in Bagdad during the stabilization phase had the following logistic capability:

- 6 engineering flat racks with 120 rolls of concertina each, 20 piquets, 2 rolls of barbed wire, and 2 concrete barriers used on highways;
- 2 packaging POL flat racks and sub-calibre ammunitions;
- 2 water and individual rations flat racks;
- 1 flat rack with chemical toilets and waste container;
- 1 flat rack of humanitarian daily rations;
- 1 flat rack with a 10m<sup>3</sup> water tanker.

## **2.6. Digitization**

Network enabled operations provide rapid information about the allied tactical situation, the logistic s needs to provide demand, and the means available to provide them. In the specific case of the urban area, the permanent exchanges of data decrease the vulnerability of the support units.

In fact, thanks to the battle-space digitization, the support staff can increase its theoretical knowledge of the field. It allows better understanding of the human, allied or enemy environment.

It offers a proper knowledge of the possible roads and structures to be used, as well as an updated map of the tactical and logistical deployments.

Furthermore, improving the unit's capabilities, battle space digitization enables planners to forecast the necessary resources to be delivered in order to limit the number of convoys.

### **3 CONSEQUENCES OF LOGISTIC FUNCTIONS**

#### **3.1. Forwarding**

**The “pulled” system must be used.**

The resources stored in temporary divisional logistic bases are delivered to combat train 2 of the battle group. They are then delivered from the combat train 2 to the contact units with the means of the combat units:

Either the transport vehicles of the combat train 1 or if it’s necessary, the armoured vehicles of the supported units.

The contact elements must have access to enlarged stocks in order to minimise the exposure of vulnerable logistic troops.

Supply flows should be flexible. The pulling principle should normally be used so that combat units can fit their stocks and demands to their needs and tasks. In a high intensity phase with a high DOS the pushing principle might be the better solution to ease the burden on combat units.

The resources are re-calculated and given to the combat train 2 in order to take into account the limited pay load and handling capacities of the supported units.

The fuel delivery of the contact units is made by the combat train 2 during the rotations of the vehicles to be delivered or by packaged petrol for the vehicles which can’t move.

Supply by air will be very rare as aircraft are vulnerable in urban areas. However, aviation units can sometimes be used to supply units that are otherwise hard to reach.

#### **3.2. Health support**

The urban action is characterized in the health field by alternating phases of low and high intensity.

Thus, the health losses can be unlimited under the effects of direct weapons or under secondary effects such as (collapsing).

There are many risks:

- The health units can be suddenly overwhelmed;
- One of the units can be temporarily surrounded and isolated;
- The casualties can’t be evacuated by air because there is no landing area or sufficient helicopters are not available and evacuations by roads are not safe.

For these reasons, the health needs must be calculated to cope with high losses. This will often require reinforcement at the superior level.

Moreover, casualty evacuations in or near unsafe areas are tricky. The situation is the same for evacuation from the forwarded aid posts of the units to the medical services of the brigade and/ or division.

The dispersion of the soldiers on the battlefield and damage to the infrastructure can delay their treatment. It may be necessary to reinforce the forward aid points with the following resources from the higher level support base in order to ensure life saving surgery can be provided within the 1<sup>st</sup> hour (known as the Golden Hour).

- armoured ambulances to evacuate the casualties;
- supplementary medical teams for forward medical care;
- reinforcement by medical helicopters MERT (Medical Emergency Response Team).

The logistic deployment must give the health support the capacity to make forward surgery in secured places very close to the contact units. This point must be taken into account when the operations are planned regarding the deadline of the redeployments of field medical units.

The types of injuries experienced will be linked to:

- The weapons used;
- Grenades can provoke internal injuries due to the stress in the rooms. Eyes are particularly vulnerable to the effects of bursting objects of any type. Wearing protecting glasses can really be efficient to avoid this type of injury;
- The burning risk is also very high. The auditive trauma by explosion in a confined place occurs more frequently. Ear-protectors are particularly useful; especially those designed to protect against violent shock whilst allowing normal voice communications.
- Buildings and equipments crashing;
- Movements in the infrastructure (broken legs or arms, cuts and bruises).

The equipment of the dismounted soldiers as far as protection is concerned (knees and elbow protectors) can help to reduce this type of injury.

Most of the injuries are due to natural disasters. Moreover, a high proportion of health losses in an urban area are linked to very low health conditions that lead to infections. The spread of contagious diseases is increased by overcrowding. Prevention plays an important part to avoid the epidemiological risks.

In order to prevent our troops from drinking or using contaminated water for their hygiene, the provision of water must always be kept in mind. Providing 10 litres/Soldier/Day is a minimum rate.

At last, stress pathologies are typical of fighting actions in urban areas. In a period of intensive actions, the threat is dual, each window, each door can hide an ambushed enemy. Constantly, the enemy is hiding in the middle of the population. He's invisible and agile, he can hit at any time. In order to avoid the spread of combat stress reactions, the losses of this type must be treated immediately.

The reinforcement of health units level 2 by medico-psychological cells enable people to return to fighting quickly. Combat unit staff must be trained to recognise early symptoms and to react appropriately so that that case can be treated quickly and more easily.

**It is also vital to have people from soldier to commander who are very well trained and qualified to give first aid.**

### **3.3 Personal Service Support (PSS)**

The quarter master will receive many requests from both the committed forces and the civilians that the command chain must take into account during emergency situations. Fighting in an urban area is characterized by a high consumption of food and drinking water due to the high efforts made, the stress endured and dehydration of the fighters.

The stocks kept by the PSS in the temporary division logistic base and the initial stocks given to units will have to be sufficiently calculated and written in the administrative and logistic order. The fighter will be able to have them very close, if possible in his vehicle.

To cope with the stress during long operations, the units should organize areas protected from the enemies, where soldiers can rest and recuperate.

Once they are secure, these areas will be equipped with cooking, health and camping equipment. However, the deployment of this equipment is only possible if the PSS can provide a great quantity of water.

The human losses can be significant and thus the provision of post-mortem equipment must be provided to the units. The human losses due to fighting will be dealt in priority order by the health service. PSS will need fig-shrouds and post-mortem containers. Depending on national policy, units must be prepared to repatriate the bodies to the home base, usually by air, and to complete the necessary administrative formalities, usually including the registrar, medical and provost authorities.

On order of the Commander, logistic units must be prepared to provide the population with food, drinking water and or camping elements in a safe area.

During a phase of stabilization, catering units must be prepared to expand from providing food at company level to a full field kitchen catering for 500 men or more and will probably include a field bakery unit.

Supporting the force that will be responsible for looking after detained people will require significant planning at an early stage. They will require food, shelter and hygienic in increasing numbers as the campaign progresses, and has the potential to overwhelm the supply system if not adequately planned. Legal advice as to the minimum requirements is essential.

### **3.4 Maintenance and recovery**

Before the operation, the non-armoured vehicles must be adapted locally in order to increase protection of the crews (adding armoured plates, ammunition containers filled with sand, armoured glass on the windscreen). Grilles, boxes and diverse fixing systems may be used outside to reinforce the protection of the vehicles.



The employment rate for the vehicle is very high, the means of the armoured vehicle is more important in open spaces (technical and tactical falls).

Urban crews should take a very simple set of self help maintenance items including light adapted means for operations in the field. It completes the vehicles unit's sets. It is composed of ingredients and of common spare parts (filters, barbed wire and tape) for emergency operations.

Each vehicle and its crew should be capable of towing a device of the same weight. Crews can generally evacuate the vehicles in their unit to a recovery point without any dedicated recovery assets or tradesman.

For longer and more intensive operations, the maintenance will cover most of the time reduced to recovery or evacuation operations to a recovery base where the mechanics will be able to intervene. This means the setting up of many armoured means of recovery and evacuation from the combat train 1 to the temporary divisional logistic base.

Where possible, towing operations should be conducted in a safe and secure environment to protect the engineers from fire threats, although armoured recovery may be required to extract vehicles under fire.

In any case, the use of Heavy Equipment Trailers (HET) is must be avoided because of their high turning circle.

Battle damage repair<sup>2</sup> must be controlled in a strict framework, under the commander's responsibility. A balance must be maintained between keeping the equipment operationally fit whilst ensuring that legal and safety constraints are appropriate to the nature of the fighting. For example, during high intensity operations it will be appropriate to take risk with emergency repairs in order to keep the equipment in the battle. However, during normalisation operations, legal roadworthiness and safety must take priority. Finally, if the evacuation or the recovery is not possible, the vehicle will be destroyed on order of the commander and all the sensitive materials withdrawn.

In addition to battle damage repair (BDR) maintenance, units should be able to send forward repair teams (FRT) to support the BDR and upgrade the combat unit's maintenance capabilities. So only for heavily damaged vehicles/material - when BDR and FRT are not suitable anymore - efficient maintenance units in the suburbs or industrial areas should be established. Although a forward repair policy should be foreseen the capabilities and capacities of the maintenance units should be optimized to a high amount of load.

### **3.5 Engineering support**

Engineering support is necessary in order to make a zone which is already taken and affected, adapted to stationing and traffic of the units in acceptable conditions of health and safety.

Close to host nation, the engineering support is mainly different from the deployment support because civil companies are mainly requested for the achievement of the works. In urban areas, the capabilities of the engineering support chain are mostly employed at the end of the intensive fighting phase to permanently optimize sites.

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<sup>2</sup> Essential repair which can be improvised and/or temporary preformed rapidly in combat conditions in order to restore to service damaged or immobilized items of equipment. It consists of emergency or makeshift repairs.

At the beginning of the stabilization phase, the forward posts are at the infantry group size (10 people and the rear command posts can shelter 100 people.)

The support of the engineering support chain is mainly based on:

- The hardening of the protection of the posts, particularly in order to prevent unauthorised access by individuals and crowds, to reduce the efficiency of enemy snipers in and around the buildings, to avoid the attacks of vehicle borne IEDs in front of the main entrance, for example Drakkar 1983 in Lebanon
- The works which guarantee the forces to be able to live in self-sufficiency during a few days in case of increasing violence;  
(Generators for electric supply, food and drinking water). Drinking water production for important sites;
- Sites with gas, water and electricity installed in order to restore the drains of waste water;
- The capacity of some sites to be used as a regrouping zone in case of disengagement of the force or the evacuation of civilian people. Especially, the possibilities of car parks and containers storage will have been taken into account in the choice of sites, which are not very easy to be found in urban areas.

### **3.6 Local contractors**

As for any type of operation, the force will have an interest in using, as far as possible, the support that can be provided by the host nation or existing local businesses.

In an urban environment, this may be the case in particular for the technical or accommodation infrastructure installations, which are usually plentiful if they have not been destroyed during fighting.

The services that may preferably be subcontracted by the force concern the supply of food, the removal of waste, cleaning and washing linen and clothing, medical support for the civilian population, and some infrastructure work.

### **3.7. Movement and transportation**

“The most important thing was to keep moving, one of the hardest things in the world to hit a moving target”. Mark Bowden- Mogadishu, Somalia 1993.

#### **3.7.1 Operational convoys**

The convoys between the divisional logistic base and the combat train 2 are organized as operations which need:

- Information about the tactical situation and the state of the itineraries possibly completed with recce;
- A mobility support provided by the engineering;
- A movement support to improve the fluency of the convoy and to avoid stopping on the way;
- An escort which is adapted to the threat and the environment through which the convoy will pass;
- A coordination between the units in the areas through which the convoy will pass.



Movement has to be controlled and organised from one hand by a **“Movement Control Element” like an MCC**. It is from uppermost importance to coordinate movement from and to all directions.

Routes for logistic movement have to be identified, cleared and secured.

**In addition, the timetable and routes must be changed for every convoy operation in order to avoid the “routine”. Alternate routes and timetables must be used if possible.**

### 3.7.2. Characteristics of vehicles

Vehicles, including logistic vehicles, will therefore be chosen according to the degree of protection offered, their size, their turning circle and their flexibility in use. It goes without saying that the use of trailers must be avoided.

Generally speaking, it is desirable to provide add-on armour kits that are easily fitted to tanks and vehicles. This armour must protect at least against the projectiles of small-calibre weapons down to 12.7, mines and shrapnel. In towns, these protective systems must take into account not only the horizontal threat but also the vertical threat.

In order to be capable of carry out their mission, directly supporting units may have to use heavily armoured vehicles to remove simple obstacles to provide freedom of movement. These vehicles will also need to have the ability to protect against off-road mines.

**In principle logistic units should be equipped with the material they are trained and used to.**

In urban operation it will be necessary to have a feasible mix of different types of transportation vehicle and material handling systems so that means of supply can be tailored to the situation and the environment.

If the threat demands special equipment like road clearance packages, jammers, riot control capabilities or protected vehicles then logistic units should be equipped as per the combat troops so they can face the same risks and share the same burden to conduct a successful logistic operation.

### **3.8. Supply**

#### 3.8.1 Water

Experience shows that combat in urban areas uses a very high number of certain categories of resources, particularly food, and above all water, as well as ammunition.

The stress inherent in this type of commitment which requires constant attention, along with the dust and, in summer, the heat, causes dehydration which requires greater quantities of water.

#### 3.8.2. Ammunition

“If my men put any more ammunition into the city, we would have sunk it.” Major General William F. Garrison, Task Force Ranger Commander, Mogadishu, Somalia.

As far as munitions are concerned, the various lessons learned from the commitments in urban areas show that consumption is much greater than usual<sup>3</sup>. This is due to the particular conditions of the commitment in an environment where, on the one hand, it is more difficult to have good fire discipline and where, on the other hand, the enemy, being better protected, is less vulnerable and can often only be reduced by the combined cross-fire from several weapons firing at the same time from different positions. This over-consumption which involves mainly the small-calibre ammunition of individual and collective weapons, grenades and 20-mm ammunition therefore means that combat units should be issued in excess to requirement and they should be resupplied from stocks scaled upwards.

Not only will planners have to ensure that greater quantities of selected ammunition are stored in a theatre, they will also have to determine how this increased tonnage is to be moved forward and secured during urban contingencies.

Innovative ways to store, conceal and secure such caches will be called for.

Underground facilities such as parking garages, warehouses or stadiums might serve the need. Alternatively, positioning ammunition distribution points in the lee of tall buildings will make it difficult for a foe to hit them with indirect fire from any but a very limited number of points on a compass.

#### 3.8.3. Petroleum Oil and Lubricants (POL)

As far as delivery is concerned, the POL support of actions in an urban area is not very difficult. The needs of the units in fuel and lubricants are the same in this type of commitment despite the limitation of the tactical movements considering the consumption of static vehicles and generators. It is worth noting that whilst armoured vehicles powered by turbo diesel engines consume very little fuel whilst stationary, those powered by gas turbine engines can consume a significant amount of fuel even when stationary.

POL storage which requires space and particular safety measures is organized in forward divisional bases under ventilated warehouses protected from shots and sights.

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<sup>3</sup> From three to four times higher than GROZNY during the phases of intensive combat

For the delivery of the fuel to combat units, support units supply themselves from the forward divisional bases in tankers or in packaged petroleum products.  
The vehicles of the units fill in at combat train 2.  
The combat train 1 can get the petrol at combat train 2.

## 4 LOGISTIC SUPPORT TO OTHER ACTORS

Basically logistic support is to support own troops. In extremis or when a special task is given support can be given to civilians.

These needs, in the frame of civil-military actions may reduce a part of the initial capabilities of the forces, calculated on the principle of a strict sufficiency. This aspect must be taken into account as soon as the phase of generation of forces starts.

If the task is given to support a humanitarian mission the focus might switch to refugees or displaced persons.

Thus, the force needs to organize supply and health care for the population and even their transportation and evacuation and to facilitate these actions which are mainly led by non-governmental organizations.

Furthermore, the force must be involved in the restoration of the life in the city helping to re-establish the different networks and the rehabilitation of collective infrastructures.

Helping the population requires a specific staff as far as skills and people are concerned. This must be taken into account in the initial preparation of this operation.

For example, setting up the organization to deliver water and food for the population requires qualified staff in order to avoid any problems.

Thus, the crowd must be kept away from the point and a one-way road may be defined.

The delivery should be achieved by civilians in order to avoid that military people can be accused to favour one group or another. The in and out queuing areas and the delivery must be protected by armed soldiers, mainly with non-lethal weapons.

During operations in a built-up area, taking into account the fact that the non-combatant population is likely to become directly involved, it is considered essential to establish and maintain **close liaison between the tactical commander and the civilian authorities** in order to co-ordinate CIMIC tasks such as :

- Evacuation of the non-combatant population.
- Food and medical care.
- Public order and security measures.
- Protection against the immediate effects of military operations.
- Repair of installations and provision of crucial public utility services (water, electricity, heating, communications, and disposal of any type of waste).
- Restoring public buildings (hospitals, schools, etc.)

**Tactical commander**, due to his situation, is capable of carrying out a wide range of CIMIC related tasks and activities. It will therefore be very important for logistic support to maintain a close relationship with the local population which will not only create an environment more favourable to the accomplishment of the mission but also provide a reliable source of information, and intelligence.

When engaged in human life saving providing support to reduce or prevent suffering it should be understood that **military support must be considered as only temporary**. As soon as possible, the responsibility for providing humanitarian support should be transferred to relevant civilian actors. **Military forces are not a humanitarian organization** and as such are not properly structured and trained.

## CONCLUSION

Actions in a built-up environment are complicated and difficult to support.

Fractioning, partitioning and dispersion of units lead to a greater decentralization of logistic assets. In this perspective, modularity and fractioning of logistic assets must be looked for. An adequate balance between maintaining agility and creating self sustaining autonomy of units must be found. Needs pertaining to terrain organization and projection require constant significant efforts. Logistic units must have protected vehicles and be equipped with communication assets. Roughness of engagement conditions and significant probability of casualties leads to a requirement for medical support in contact.

Finally, the CSS soldier must be trained, battle-hardened, pro-active and cleaver in order to assume his mission for providing sustainment at the right place, the right moment and sufficient volume of resources.

