

# **The Emergency Site Management (ESM) System: A Doctrine Paper**

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## Introduction

Canadians have traditionally been relatively fortunate with regard to the frequency of disasters and the impact of their damage. Nevertheless, we have had our share of community-wide catastrophes, which caused significant damage and overwhelmed existing emergency-response resources. Numerous disasters from the Halifax, NS, explosion of December 1917, to the more recent (1997) 'flood of the century' in southern Manitoba serve as a reminder of Canada's experience with disaster.

During the last eighty years Canadians have experienced a wide range of disasters. They include weather related events (e.g., floods, tornadoes, severe snowstorms, forest fires), accidents (e.g., train derailment, air crash, ship/ferry sinking, explosions), as well as incidents of sabotage and civil disorder (e.g., riots and armed confrontation).

Decades of dedicated and successful effort by all orders of government, industry and non-government organizations (NGOs) have resulted in the implementation of many effective emergency preparedness and response measures across Canada. A significant component among these measures is the Emergency Site Management (ESM) System which has been developed through the Canadian Emergency Preparedness College at Arnprior, ON.

The aim of this document<sup>1</sup> is to describe the Emergency Site Management (ESM) system within the context of disaster response by Canadian local authorities (e.g., municipalities).

## Disasters and crises described

Incidents, emergencies, crises and disasters have been defined from a variety of perspectives and within different contexts. (For the definition of other terms please refer to Appendix A.)

Unfortunately, these definitions do little to clarify the events that they describe. One way to better understand these events is to view them as points along a spectrum, or a measure, of two factors:

1. The impact the event has on the community.
2. The resources available to respond to each event.

Events defined as 'incidents' are, therefore, located at one (less complex) end of this spectrum, emergencies somewhere in the middle and crises or disasters at the other end representing an

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<sup>1</sup> This document was prepared at the request of, and with funding from, Emergency Preparedness Canada, an agency of Canada's Department of National Defence. It is a discussion paper and does not necessarily reflect the policy point of view of the federal government.

extremely complex response effort.

Each municipality has its own resources and unique capability to respond to these events. This 'capability' varies from one municipality to another. Therefore, each event must be defined (e.g., as an 'incident' or a 'disaster') in the context of the community in which it occurs. In other words, an event that may be deemed relatively easy to manage by a municipality with sufficient response resources may be seen as more demanding by another.

The term 'incident' is often used to describe events which occur rather commonly in day-to-day life and for which response organizations (e.g., Fire, Police and Emergency Medical services) are well prepared. These events may include single-house fires, single-car accidents or armed incidents (e.g., homicide or domestic violence). 'Incidents' are relatively straightforward events for which response agencies often have standing operating procedures (SOPs) and sufficient resources. (SOPs may address such topics as the deployment of key resources, desired response activities, as well as communications or reporting procedures.) Moreover, response organizations easily manage these events using available resources without necessarily resorting to other agencies or mutual aid partners.

The events that are classified as 'emergencies' are less common than 'incidents' but are still within the capability of responders and their organizations. Emergencies may include large (e.g., apartment) fires, multi-vehicle accidents, and hostage-taking or shooting incidents. Response organizations ordinarily handle these events using extra (i.e., off-shift) resources or mutual aid partners. Other agencies may be involved in the response but these normally include the traditional response agencies (i.e., Fire, Police and Emergency Medical Services).

**Crises and disasters** are defined as abnormal and unique events that occur with some degree of surprise to demand unusual, extensive and taxing response effort.

'Crises' and 'disasters' are defined as abnormal and unique events that occur with some degree of surprise to demand unusual, extensive and taxing response effort. These events are, in fact, 'turning points' in the life of individuals, family units, organizations, businesses, communities (e.g., municipalities), and nations with a potential for affecting them in both the short and the long term. They are events which, by their definition, overwhelm any one response organization and demand a multi-organizational and multi-jurisdictional response.

The response to disasters and crises as a rule involves the three 'traditional' response functions: Police, Fire, and Emergency Medical Services. Invariably, it also involves a myriad of other organizations: various government (i.e., municipal, provincial and federal) agencies, non-government organizations (NGOs), industry and many more.

The research and the various publications on 'crises' and 'disasters' are very confusing especially on the issue of definition of the two terms. In essence, these two terms define the same environment with generally the same requirements for response.

## **Disasters: Impact and consequence**

**This document focuses on municipal response to community-based crises and disasters. It uses the terms crises and disasters interchangeably.**

There is much research to provide responders and their organization with a likely scenario of disasters and their impact on responders and response agencies. Key highlights are briefly presented below for two reasons. One is to provide a context for emergency preparedness and response. The other is to emphasize the need for a system to effectively manage disaster situations.

One of the first ‘truths’ or realities of disaster situations is that they are extremely stressful for both individuals and organizations. Being unique (i.e., uncommon) and always involving real or perceived risk to life, limb, property and the environment, these events often demand an extensive response effort within compressed time lines. Moreover, traditional approaches and day-to-day practices must often be modified to accommodate these unique events.

Another ‘truth’ of disaster response is that its effectiveness is directly related to the emergency preparedness effort that precedes it. In other words, effective response is no accident and often requires the cooperation of various organizations and jurisdictions. Disasters also represent a complex multi-jurisdictional operational environment that demands unique individual skills and organizational structures.

It is also true that often the first to respond to disasters and crises are the individuals who are at or near the disaster scene. However, while their effort is valuable during the immediate post-impact period, sustained and extensive disaster response must quickly become the responsibility of accountable public officials at municipal, departmental and Board levels.

Not surprisingly, the success of all disaster response operations is dependent primarily upon the ability of individuals to communicate well despite two obstacles: the stress imposed upon them by the disaster, and the lack of clarity regarding the situation they confront or their role within it. Effective communications must be achieved at five levels: intra-organizational, inter-organizational, between response organizations and the public, between the public and response organizations, as well as among the various systems that respond to the disaster.

The success of the response effort is also dependent upon the ability of responders to effectively make decisions and to coordinate their response effort with others. However, decision making in disaster situations is significantly more complex than in day-to-day environments. Numerous reasons are at the basis of this added difficulty. They include the tremendous stress inherent to disasters; the reduction in the time available to gather and analyze information; the overall reduced capacity to respond effectively; and, the interdependency inherent to multi-jurisdictional and multi-organizational response effort. Responders are suddenly caught in a situation where they

are unable to undertake unilateral action and are obliged to consider the jurisdiction, needs and capabilities of other response organizations.

The coordination required during disasters is also distinct from day-to-day operations. This coordination--of information, resources, decisions and activities--becomes critical particularly when one realizes that, to some degree or another, all response organizations or agencies depend on one another to effectively respond to the situation. In short, no agency is likely to have all the resources and information needed to unilaterally and conclusively deal with the disaster scenario.

### **Why bother with this system?**

Emergency response in Canada is based upon an escalated (i.e., gradual) and controlled application of resources to meet the needs of each situation and its unique requirements. Emergency response is founded on the following general concepts:

- Individual citizens are responsible to prepare themselves for emergencies.
- Sustained disaster response is the purview of larger entities (i.e., response agencies, local authorities).
- Disaster response is ORDINARILY the responsibility of local authorities (i.e., municipalities).
- When appropriate, provincial and federal resources may be offered in support of the response effort by the affected local authority. (This would be achieved gradually to meet the escalating needs of the situation.)

Each province and territory in Canada has laws mandating its municipal elected officials to effectively prepare for and respond to disasters. Moreover, Canadian municipalities are expected to undertake an on-going emergency-planning effort that often involves a variety of emergency response organizations.

The stakes during disaster periods are very high; time is short; and, the consequence of error is tremendously high. In disasters, the 'field of operation' is often out-of-the-ordinary, the 'game' (or operation) unique, the players often form an emergent organization, and many of the rules of the game are often formed on the go.

In managing such an environment one could fly by the seat of one's pants. Some do; few succeed. Public safety demands better! Moreover, the consequences and the inherent liability of poor or inappropriate response are forcing local authorities and response organizations to adopt a more systematic way to manage disasters.

A number of 'systems' currently exist to guide emergency response operations. Most of these systems (e.g., Incident Command System) were introduced by the Fire Services to assist them in their unique role. To that end, these systems are effective. However, they miss the linkage to the larger response effort, which, in Canada, is the purview of elected officials at the local authority.

The Emergency Site Management system builds on the presence of organization-specific disaster management processes (or systems) to provide a broad approach to the management of disasters

at local authority level.



## **The key principles of disaster response**

Disaster response in Canada is based upon a number of key principles. These form the basis of the Emergency Site Management system and are represented by the following:

- Appropriate response to unique situations
- Consistency with day-to-day operations
- Designated responsibilities
- Flexibility and adaptability
- Cooperation across organizations and jurisdictions
- Accountability of elected officials
- Escalation to Provincial and federal governments support
- Coordination of the planning and response effort
- Enhancement of the flow and distribution of information
- Availability of a functional EOC
- Disaster site management through team effort

### **Appropriate response to unique situations**

To be effective, disaster management systems must be designed in a manner that will permit their application to a wide range of unique situations. They must facilitate and encourage appropriate emergency management actions in an environment where knowledge about what happened and what needs to happen is incomplete.

Because outcomes vary significantly from one disaster to another, such systems must concentrate on the **process** rather than on well-defined **outcomes**. Unlike day-to-day management activities where the outcome of one's actions is often pre-designed and predictable, in disasters these are often unknown or beyond one's control.

### **Consistency with day-to-day operations**

Effective disaster response operations should mirror day-to-day operations. That is not to say that they are identical. They are not. However, disaster operations must be a smooth, predictable and planned continuation (e.g., escalation) of day-to-day procedures. This practice develops a 'learned response' by the response organization's personnel and reduces some of the trauma involved in shifting from 'normal' to crisis mode.

### **Designated responsibilities**

Organizations often respond to a disaster with either pre-designated or assumed responsibilities. These may result in conflict, where two organizations expect to perform similar roles, or in a gap where a desired role/function is inadvertently ignored. To be effective, the disaster response effort must rapidly integrate and focus these potentially diverse responsibilities, and their corresponding assumed roles, into a concerted plan of action.

Naturally, each organization needs to focus on its own particular expertise and mandate. The success of any emergency management system is dependent upon the removal of redundancies and the maximization of effort by all response organizations and systems.

It follows, therefore, that key disaster roles and responsibilities should be determined PRIOR to any disaster-response effort. This is best achieved through emergency planning.

### **Flexibility and adaptability**

The disaster environment is always 'fluid' (or ever-changing), unpredictable and often demands an immediate response. Responders and disaster managers often lack experience with the disaster and are initially overwhelmed by its onset and its outcome. While they are encouraged to be persistent in their effort, they cannot remain rigid in their approach. Flexibility and adaptability are critical to the successful management of these unique events.

Effective disaster management systems must encourage, therefore, both operational and organizational flexibility. Such systems must be designed to allow for variations in resource availability, jurisdictions, operational requirements, and organizational structures. Ad-hoc organizations and operational networks that are the norm in disaster operations must be incorporated into the overall effort and be well managed.

### **Cooperation across organizations and jurisdictions**

As noted above, disasters demand a multi-organizational and multi-jurisdictional response. No single organization can respond unilaterally and the response of one organization influences the outcome of the response of others. In such an environment, it is critical for emergency management systems to encourage and facilitate inter-agency cooperation. Moreover, this cooperation should exist throughout the emergency management process: from the start of pre-disaster planning to the end of post-disaster recovery.

### **Accountability of elected officials**

As noted above, the responsibility for organized disaster response in Canada begins with elected officials at a local authority level. Stated differently, elected officials at municipal level are responsible by law to prepare for and effectively respond to disasters, which might affect their public. Nested within that broad responsibility are various other authorities and jurisdictions: Police, Fire, Emergency Medical Services, various other health officials, dangerous goods specialists, members of the local industry, and officials from provincial and federal government departments.

The rare exceptions to the above-stated municipal responsibility relates to disasters which have a broad geographical impact (i.e., those affecting a number of municipalities or Districts), or those which impact specific provincial or federal areas of responsibility (e.g., parks, military bases, First Nation reserves). As a rule, these are managed--separately or jointly--by provincial or federal

officials as is deemed appropriate.

The maintenance of the jurisdiction of the local authority, even during periods of local crises and disasters, emphasizes the responsibility of its elected officials to their constituents. It also maintains that responsibility with those who have the best knowledge of their community: Its hazards, resources and capabilities. By necessity, this also implies the involvement of all key players (including industry) in the disaster planning and response processes.

Moreover, it is worthy of note that disasters rarely destroy or disrupt a whole community forcing it to completely shutdown its day-to-day operations. More likely, a community's general population continues with its daily routines while those living in the area affected by the disaster struggle to return to normal. Both segments of the community require attention. Both are the responsibility of the elected officials of that local authority.

An effective disaster management system must, therefore, permit a team effort on the one hand and integrate the jurisdictional needs of the municipality's elected officials on the other. The system must provide for the involvement of elected officials and must ultimately lay the responsibility for effective response on their shoulders. While focusing on the affected area, these officials must not neglect the rest of their community.

### **Escalation to Provincial and Federal governments' support**

As noted above, disasters affecting a local authority are expected to be managed by that authority. However, it is conceivable that the disaster response effort may require resources beyond those of the affected local authority. In such circumstances, the local authority may ask for resources from its Province or Territory. It may or may not be granted these resources.

When provided, the resources from other orders of government are offered on a graduated or escalated manner. In other words, these resources are offered to meet the needs of the current situation. Additional resources may be provided at a later date following a real or perceived escalation in the demand for them. Moreover, when the Province or Territory deems it necessary, it may request assistance from the federal government.

Provincial, Territorial and federal governments may support the affected municipality by providing the resources and distinct competencies of the members of the 'local state'. These are the other government agencies and departments which are located within the municipality. Members of the 'local state' may perform a number of crucial disaster response activities. These may include various inspections (e.g., health, dangerous goods, environment, structural) and a broad range of other services (e.g., communications, transportation, shelter). These agencies may also provide resources such as bridging equipment, telecommunication centers, power generators, airplanes, and much more.

In Canada, when such services and resources are offered they are as a rule provided in support of the municipal effort. In other words, the involvement of provincial or federal resources does not automatically mean a shift of overall jurisdiction away from the municipality's elected officials.

These elected officials remain in control of their response effort.

### **Coordination of planning and response efforts**

Disaster response situations demand a level of coordination more significant, intense and complex than the one practiced during day-to-day operations. Limited time and the risk to life and limb dictate that things be done quickly and correctly the first time. This requires that the various response efforts be coordinated so as not to create dangerous operational gaps, or result in work performed at cross-purposes.

The element of 'coordination' should not be confused with the term 'command'. The para-military structure, with its centralized command system, is not practical as the primary system with which to manage peacetime municipal disasters. [This is supported by numerous researchers: Auf der Heide (1989); Drabek (1981, 1987); Drabek and Hoetmer (1991); Dynes (1970); Quarantelli (1985).]

Effective disaster response is best achieved through coordinated planning involving all key players. The disaster management system must permit this on-going planning effort and a collaborative approach that is critical in disaster response.

## **Enhancement of the flow and distribution of information**

Accurate and timely information is the lifeline of any management system. For the reasons mentioned above it is particularly critical in disasters. Disaster management systems must enhance existing organizational structures and communication patterns. However, they must not stop there. Effective disaster management systems must also facilitate the flow of information across organizational boundaries as well as between the response agencies and the public.

## **Availability of a functional Emergency Operations Center (EOC)**

The perception is that disaster response operations can occur independently of municipal coordination. A prevalent attitude among response agencies is that they 'can handle it.' Fire departments can and do suppress fires without being overseen by municipal officials. The same applies for Police officers who respond to hostage taking situations; Emergency Medical Services staff members who respond to multi-casualty incidents; and, industry personnel who respond to on-site chemical spills.

However, a disaster situation creates an entirely new operation; involves the rapid activation of all response agencies; and, requires the coordination of their resources and activities. The environment of the disaster situation often raises public concerns and media attention, making the situation a pressing problem for communication personnel. Moreover, a new need emerges to coordinate the resources provided by those from outside the immediate disaster area or the municipality.

An effective disaster management system requires a local authority to have a nerve center or a focal point for its response operation. This is best achieved through an EOC. The system must also acknowledge that other agencies, government departments, and industrial sites may operate their own emergency operational centers. These separate EOCs must be linked to the municipal EOC to permit the rapid exchange of information or resources, and facilitate a single coordination point for the municipal response effort.

The manner in which the EOC Control Group and the Site Team operate and interrelate is discussed below. It suffices to say, that the role of the EOC is to support those who operate at the 'sharp end'--the site.

## **Disaster Site Management through team effort**

Response effort at the disaster site--the impact area of the disaster--can and should be managed by those who are there. In short, these responders are physically located at the disaster site. They have the best view of local conditions, are best able to notice and adapt to changing conditions at the site, and are best equipped to take immediate action as necessary.

Disaster responders at the site are likely to represent a broad range of organizations and jurisdictions. As mentioned above, their efforts should be coordinated--NOT commanded. The

management system best suited to their needs is one, which encourages and permits a 'team' approach to disaster response under the leadership of a 'site manager'. (The site manager's role is discussed below.)

## **The Emergency Site Management (ESM) system**

The ESM system is based on a multi-tiered framework for communications, joint (or coordinated) decision making, and the coordination of activities or resources. It does not intend to undermine, usurp or interfere with the command and control, or the reporting structures of the various response agencies. In fact, the system facilitates the interaction among the various emergency response organizations at two primary locations: the emergency site and the municipal EOC.

The system designates the responsibility for managing the emergency site to a Site Manager and a Site Team of senior representatives from each of the key emergency response organizations at the site. The team's main task is to return the situation at the site to normal as soon as possible.

**The ESM system does not intend to undermine, usurp or interfere with the command and reporting structures of the various response agencies. It is designed to facilitate inter-agency communications and coordination**

The response effort at the site must rely upon support from and through the Municipal EOC. That EOC should serve as the focal point, or as a funnel, to channel all needed response resources to the site. Additionally, the Municipal EOC should concentrate on the immediate day-to-day needs of the Municipality and the recovery needs of its members (i.e., individuals, businesses).

The ESM system assumes and accepts the presence of other EOCs and the application of other single service command/management systems (e.g., Incident Command System, Fireground Command) or more comprehensive variants such as the Unified Command System. However, the system's main focus is to provide one framework to integrate and coordinate **municipal** emergency response operations.

### **Activation of the system**

The ESM system should be activated when there is a need for any of the following:

- More complex response **systems and procedures** than are used in 'normal' day-to-day operations.
- Critical **resources** beyond those available within the municipality.
- **Greater coordination** of the activities of the diverse response organizations within the municipality.
- **Extra legal powers** (always gained through a 'declaration of a state of local emergency').

The ESM system may be activated in a variety of ways depending on the circumstances relating to the disaster situation. The system is normally initiated as an escalation of the normal response

procedure of the local response organizations (e.g., Fire, Police, and Emergency Medical Services). In other words, disaster response commonly begins when Fire, Police or EMS resources are dispatched to what is believed to be an 'incident.' When these responders arrive at the scene and realize the magnitude of their task, they often ask their dispatch/communication center for additional resources and immediately begin their own response effort. These notification and response activities are likely to be repeated by representatives of all response organizations at the emergency scene.

At some point, municipal response organizations begin to realize that they are dealing with a 'disaster site' and not an 'incident scene'. This occurs when the resources available to them are stretched to the limit, or when they realize that their organization is facing a task beyond its mandate or capability. This observation, which naturally leads to the need for a concerted effort, may be made by a number of people including:

- Field personnel, as they rapidly band together for a more concerted and coordinated effort)
- Senior members of the various response agencies who are located at the scene
- Other key municipal officials (e.g., elected officials, directors of disaster services, city manager, town clerk, or other appointees).

When the need for concerted effort is confirmed at municipal level the ESM system must be put into action as quickly as possible. That implies the following:

- A Site Manager must be appointed and dispatched to the disaster site. (In many municipalities the organization that is to provide the Site Manager is pre-designated in the Municipal Emergency Plan. All that is left to do then is to nominate or appoint the individual.)
- The Site Manager should determine the location of the Site Command Post.
- All senior representatives of the response agencies at the emergency site should be advised of the appointment of the Site Manager and the location of the Site Command Post.
- The emergency site should be defined (i.e., given geographical boundaries or outer perimeter) by the Site Manager and those at the Municipal EOC.
- All agency/department command posts should, where possible, be co-located with the Site Command Post.
- The Municipal EOC, if available, should be opened and staffed. (The degree of its staffing should reflect the needs of the situation.)
- A declaration of a 'state of local emergency' should be made, as appropriate.

From this point on, the emergency site should be under the direct management of the Site Manager and the Site Team. They, in turn, should be supported by the Municipal EOC. Let us then look at the membership and roles of the Municipal EOC Control Group and the Site Team (including the Site Manager).

### **The (Municipal) EOC Control Group**

As noted above, disaster situations may likely result in the activation of a variety of emergency



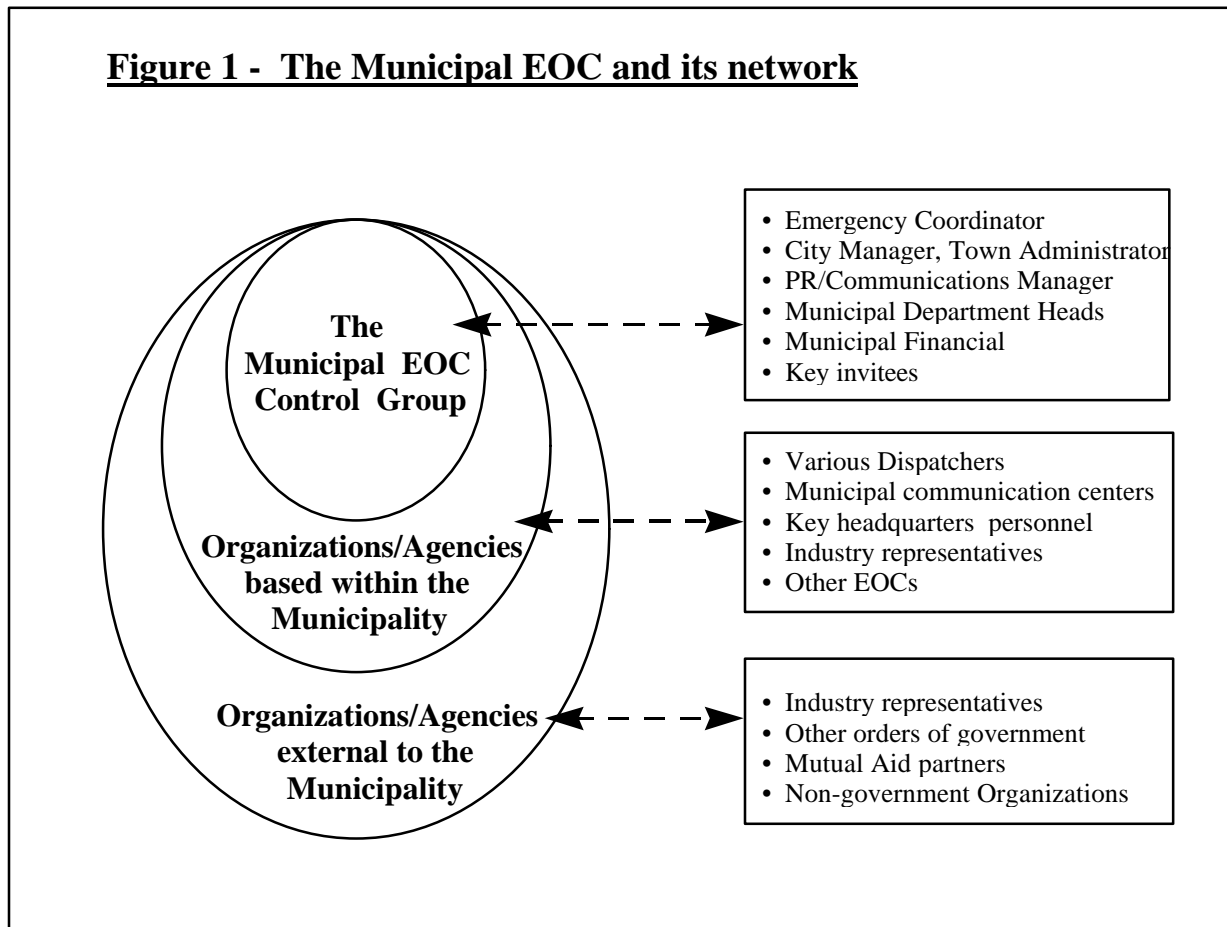
operation centers. However, the key one from a municipal perspective is its own EOC that may be located at City Hall or at another public facility.

The municipal EOC is staffed and managed by the Municipal EOC Control Group. Figure 1 illustrates the general composition of the municipal EOC Control Group and the network of organizations that are linked to it. Note that it contains three broad and distinct organizational 'circles'. These represent varying accountabilities and interests. The first and inner circle represents the members of the local authority (i.e., municipal) EOC Control Group and often includes the following:

- City Manager, Town Clerk, or another municipal administrator. (This person is normally the one in charge of the municipal EOC's operations).
- Municipal Emergency Measures Coordinator (e.g., Director of Disaster Services) who in general reports to the City Manager or Town Clerk.
- Heads/Chiefs of key municipal Departments Agencies or Boards (e.g., Fire, Police, Emergency Medical Services, Social Services, Public Works, Transportation, and School).
- Municipal Emergency Public Information Officer (where one exists).
- The Chief Financial Officer for the municipality.
- Key representatives of industry or other orders of government whose inclusion, when necessary, in the EOC Control Group may be temporary or permanent depending on the situation.

[Note: Some local authorities may not staff each of the above positions. However, each of the functional areas MUST be addressed.]

**Figure 1 - The Municipal EOC and its network**



The primary role of the EOC Control Group is to strategically manage the disaster response effort by addressing broad community-wide issues and requirements as opposed to ‘tactical’ (i.e., site- and response-specific) matters. The EOC Control Group should achieve its role by:

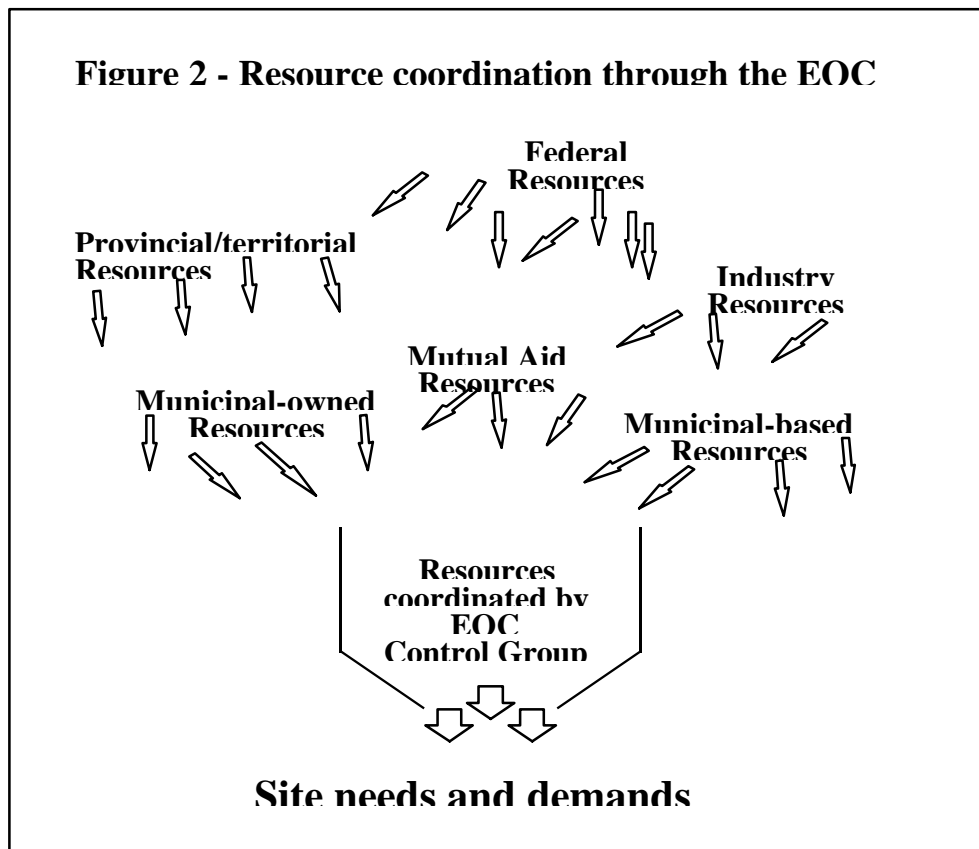
- Initiating the ESM system (as noted above).
- Providing on-going support (e.g., resources, media relations, and coordination with external agencies) to the Site Manager and Site Team.
- Ensure, where appropriate, continued operations in the unaffected area of the municipality.
- Coordinate with other EOCs or agencies from within the municipality and external to it.
- Coordinate, as requested by the Site Manager and Team, the flow of resources into the emergency site. (Once at the site the Site Manager or the appropriate senior representative of the response agency at the site will manage these resources.)
- Track and record the costs incurred by the operation.
- Document the operation through various event logs and expenditure ledgers.

It is important to note at this point that municipal elected officials are key players in their municipality’s disaster response operations. However, these elected officials should not be an integral part of the EOC Control Group. Instead they should have their own room somewhere in close proximity to the municipal EOC. The reasons are two fold. One is the need to separate the municipality’s ‘executive’ and ‘operational’ functions. The other is the unique public relations or

political role of elected officials. This role is best performed away from the municipal EOC so as not to distract from its operation. These elected officials should visit the EOC, remain current with the situation, and maintain the communication flow. However, they are also advised to allow the EOC Control Group to manage the disaster response effort.

The municipal EOC Control Group is connected to two other operational spheres: One is internal to the municipality; the other external to it (see Figure 1.) The former represents municipal agencies or other organizations within the municipality. They are represented by various dispatchers, key headquarters personnel, crisis managers, and key service providers located throughout the municipality. These are often located away from both the emergency site and the Municipal EOC, but are available to support the Site Manager and Team as required. They often represent a mix of operational as well as liaison functions.

The latter group represents a wide variety of organizations, agencies, services and resources that are physically located outside the municipality. These may include mutual aid partners,



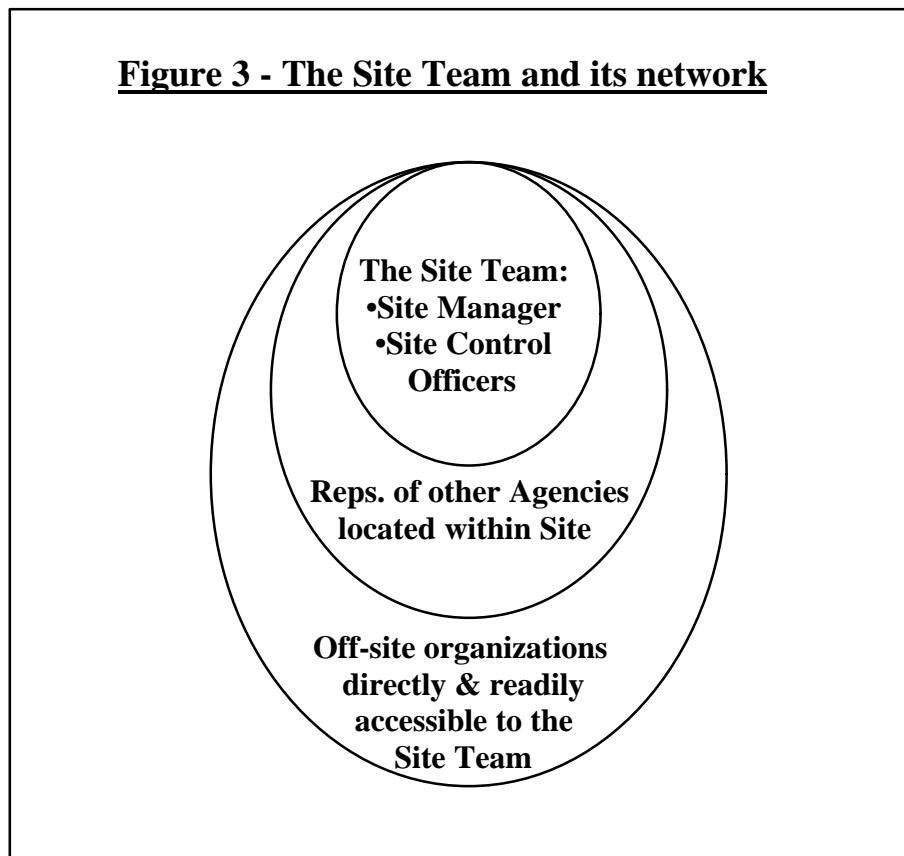
representatives of other orders of government (some actually located within the municipality), volunteer groups, and the media (e.g., national, international). These organizations may offer needed resources and skills, provide liaison to resources on stand-by, and help meet regulatory requirements, or simply monitor the situation.

Members of each of the three general groups are usually supervised and managed by their respective chain of command or reporting lines. The ESM structure provides an additional framework that is specifically aimed at the coordination of information and resources between response organizations at the site and the organizations that can support it. One of the main functions of the municipal EOC Control Group is to organize the flow of needed resources to the site (see Figure 2). The EOC Control Group must, therefore, have influence on the type, quality, and quantity of these resources.

### **The Site Team and its network**

Because of its location at the disaster site, and the more technical ‘hands-on’ aspect of its role, the Site Team usually has a more diverse membership than that of the EOC Control Group. However, the two groups have a number of similarities. Both are multi-tiered; both include senior members of the response agencies; and, both link to organizations at and outside the site.

The Site Manager heads the inner circle of the Site Team (see Figure 3). This individual is appointed in advance by policy, local Bylaw, or ultimately by the EOC Control Group to **manage** the overall operation at the site. This person is often a member of the municipal Fire or



Police service, but on occasions may be a representative of the Emergency Medical Service, industry, or another order of government.

The inner circle of the Site Team includes the most senior member of each response agency at the emergency site. Together these individuals represent the primary response organizations at the site and, therefore, can quickly share information and coordinate their response efforts. The Site Manager's role, then, is to facilitate that interaction and move the process along by leading the group step-by-step towards the ultimate return of the emergency site to pre-disaster normal state.

Not all agencies at the emergency site need to be DIRECTLY represented through membership in the Site Team. The inclusion of all organizations at the site in the Site Team would make it rather unwieldy and its progress slow. However, every effort should be made to include all KEY organizations and agencies.

The following criteria may be used to decide whether an organization should be directly included (instead of being represented) in the Site Team and present at the Site Command Post:

- The degree of the organization's involvement at the site (i.e., size of its operation, resource commitment, specialized equipment).
- The impact its activities have on the operation of the other response agencies at the site.
- The degree of demand for the organization's specialized equipment and skills by other response organizations at the site.
- The degree its input is needed during the decision making process at the Site Command Post.
- The space available to accommodate the Site Team.

The Site Manager and the other members of the Site Team need to be in a safe area as close as possible to the actual disaster area. Their Site Command Post may include the core team, with a number of support teams being located in adjacent Command Posts (CPs).

In any case, the Site Command Post is one of the critical components of decision making, coordination and communication at and from the emergency site. It is often relied upon to communicate with the other (two) tiers of the emergency site. Moreover, the importance of coordination and communication within the Site Command Post necessitates an advance understanding of who shall be allowed access to it and how it is to operate.

The second tier at the emergency site includes those who provide supplemental response resources at the site. These may include various volunteer organizations, non-government organizations (e.g., the Red Cross, Salvation Army), and local contractors. Some organizations (e.g., Red Cross) provide direct response effort while others (e.g., heavy equipment suppliers and operators) support the effort of the response organizations. Regardless, although potentially valuable to the overall response effort, these organizations are not the primary decision-makers at the site. Moreover, these organizations are best coordinated by the Site Team through a number of liaison officers (LOs) whose primary role is to facilitate the flow of information and to coordinate activities.

The third organizational tier at the emergency site includes all other response-related agencies, organizations or businesses that are available off site. They might be placed on 'standby' (e.g., be pre-positioned at the staging area), or be called upon to provide a specific service at the emergency site. When deployed or dispatched to the emergency site, these individuals are registered at the site and are then coordinated by the Site Manager or his/her delegate. They may then join the inner circle of decision-makers at the site, or continue to serve in their support role.

### **Who is in-charge?**

This question seems to perplex disaster responders at the worst possible time--in the early stages of disaster response; and often at the worst possible place--at the emergency site. The problem is that everyone usually approaches the scene from his/her unique departmental perspective, and often, from a culture which promotes 'command and control' style of practice. The ideal 'solution', of course, is to resolve this dilemma through the emergency planning process long before the onset of disaster.

Numerous researchers (Auf der Heide, 1989; Drabek, 1981, 1987; Drabek and Hoetmer, 1991; Dynes, 1970, Quarantelli, 1985) have concluded that the para-military structure, with its centralized command system, is not practical as the primary system with which to manage peacetime municipal disasters. At the heart of the ESM system is a structure which is managed at both its ends by a specific individual whose primary role is to focus on the PROCESS not the outcome.

The EOC facility and the EOC Control Group are often managed by the City Manager, Town Clerk or another pre-designated senior municipal administrator. (The Municipal Emergency Measures Coordinator generally reports to the Municipal EOC and supports the City Manager.) Similarly, the Site Manager manages the emergency site and leads the Site Team.

Having said that, each response agency and organization is managed/commanded by its own senior representative (i.e., the Agency Site Control Officer). For example, the senior Fire Officer at the Site is a member of the Site Team and is also the Fireground Commander. This individual's role is to 'fight the fire' and neither the Site Manager nor the Team should interfere with that function. However, they must be able to provide input when it comes to coordinating their activities and resources with those of the Fire Services at the site.

On the other hand, when an Agency Site Control Officer is assigned to the role of Site Manager, he or she must relinquish the Agency role and assume fully the Agency-neutral role of the Site Manager. All too often, the failure to 'change hats' results in discord among response agencies at the site, as well as long-term mistrust within the response community.

Similarly, members of each response organization at the emergency site must continue to report to their respective managers/officers using their pre-disaster reporting line. The coordination of their activities is achieved through the deliberations and collaboration of the Site Team members.

## **The communication component**

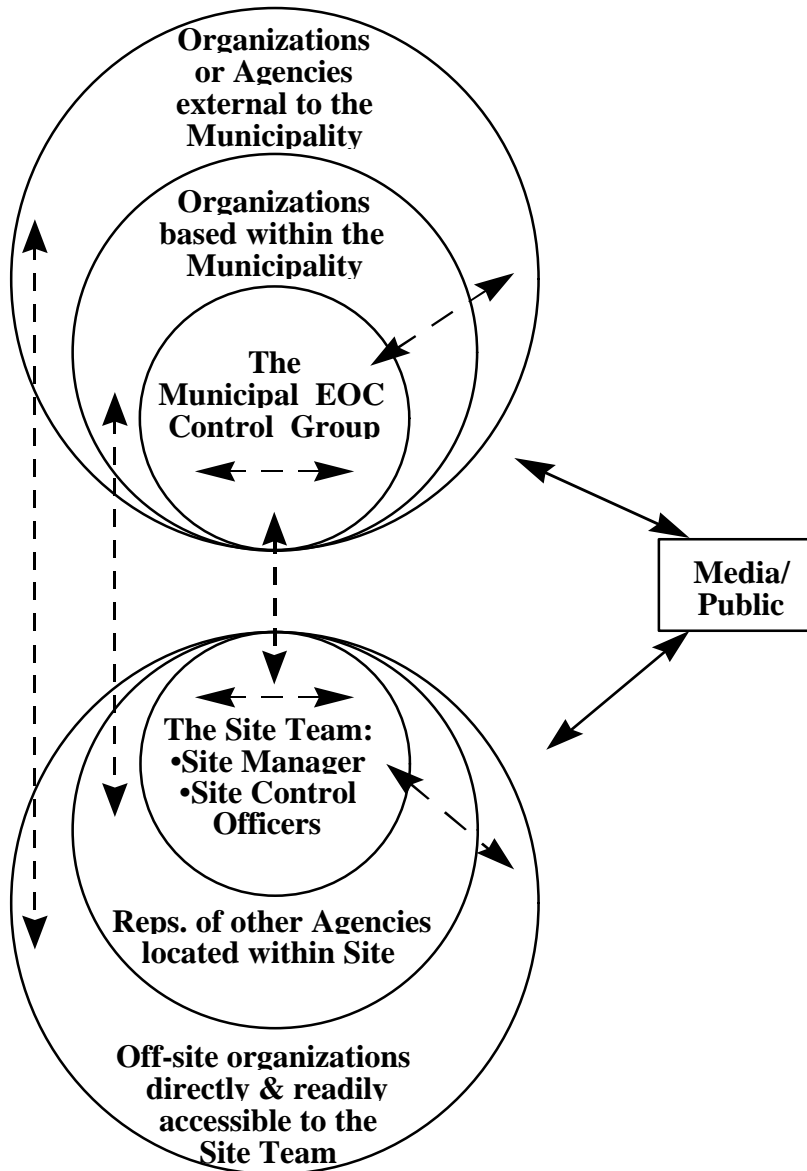
Effective communications requires both an informational component (i.e., the message) that is understood correctly by its recipient(s) as well as a physical medium (i.e., the hardware) to relay it. Both are important; however, the former, which is discussed below, is more 'critical'.

Communications is a critical ingredient of successful emergency response and management. It is often one of the first casualties of an ill-prepared response effort and results in potentially catastrophic consequences. The ESM system is designed to enhance the capability of the communication network by developing a structure for the passage of information among the various agencies involved in the response effort. In essence, the ESM system provides conditions that help overcome breakdowns of communication channels and ensure the passage of vital information.

The ESM system enhances communication through a web of networks (see Figure 4) which relays information from one agency to another through various pathways. These are:

- Within each organization regardless of its location.
- Between members of the EOC Control Group.
- Between organizations linked to the EOC and the EOC Control Group.
- Between organizations at the emergency site.
- Between the manager of the EOC and the Site Manager (at the Site Command Post).

**Figure 4 - The Communications flow**





The communication link between the EOC and the Site Command Post is particularly important because of the need for fast and accurate communications between decision-makers at the two sites. This link should involve a variety of tools (e.g., landline phone, cellular phone, and radio, facsimile) supporting and complementing each other. These tools should be dedicated for the use of the Site Manager and the EOC Control Group and provide them with the ability to communicate easily, reliably, directly, quickly and with much versatility (e.g., also have imaging capability).

Using these diverse networks everyone involved may be kept aware of the latest information. Moreover, should a communication channel or contact become inoperable, individuals could then use the other communication channels to maintain the flow of information.

As an example consider the need of the Fire Chief, who is located at the EOC, to contact the senior fire officer (Fire Ground Commander) at the emergency site. Contact may be made in any of the following ways:

- A direct call to the Fireground Commander (i.e., senior Fire officer) at the emergency site.
- A call through Fire Dispatch.
- A message relayed through the City Manager to the Site Manager.
- A message relayed through any of the agencies with a representative at both the EOC and the emergency site.

A similar process could easily be used to call mutual aid partners, extra resources or outside help. The bottom line is that critical messages get through and on time to their intended recipient. It is imperative, therefore, that a clear process be established for the communications between the EOC and the Site Manager. (Problems often arise when everyone tries to communicate with the Site Manager, or when responders at the Site attempt to communicate directly with the EOC.)

### **Termination of the ESM process**

As the disaster site stabilizes and the emergency response effort begins to wind down the EOC Control Group may likely scale down its own operation and have a number of its less critical members return to their normal duties. A similar process occurs at the emergency site.

This is a critical time for the Site Manager and the Site Team. Despite the temptation to watch the mass exodus, the Site Team must continue to manage the scene until it is declared officially closed. Therefore, the Site Team must know which organizations and key resources are at the scene till its closure.

The EOC Control Group (and the EOC) may likely be closed down first. Regardless, the ESM system is deemed 'terminated' when the function of Site Manager is no longer operational at the emergency site. This action implies the following:

- A declaration is made by the person who manages the EOC that the response operation at the

emergency site is now officially closed down.

- Each response organization at the scene reverts to its normal operational procedures.
- The Site Command Post is closed down and moved out of the site.
- The Site Manager returns to his/her regular duties.
- Logs, records and documents are completed/compiled as necessary.
- Preparations are made for an operational debriefing.
- Appropriate action should be taken to ensure the recovery of the community.

A post-incident analysis (i.e., operational debriefing) should be considered as an integral component of the ESM system. It needs to be held as soon as possible following the end of the operation, and involve representatives of as many of the response organizations involved in the operation as possible.

The post-incident analysis is the reconstruction of the response effort to assess the chain of events; methods used and results gained. (It is NOT to be confused with post-traumatic stress debriefings.) It is a tremendous learning opportunity that should not be missed. It is also an important emergency preparedness activity for the next disaster.

Although recovery operations are not really part of the ESM system, the end of the ESM process also contains the beginning of the recovery process. The response effort thus changes shape and looks at returning life to normal for the community as a whole (not just at the site).

## **The Municipal EOC: Facility, roles and operation**

The municipal EOC is a facility that may be located anywhere within the municipality. It is often at or near City Hall or in another prominent public building. Municipal EOCs reflect a wide range of uses from those fully dedicated to emergency response to others which, between disasters, are also used for other purposes (e.g., meetings, training, storage, office space).

Municipal EOCs vary in size, layout and content. These variations reflect a number of ‘realities’: the financial/resource capability of each municipality and its commitment to the emergency management process.

Two points are worthy of note. One is that an EOC can greatly enhance the capacity of a municipality to respond to disasters. Part of that increased capacity is the fact that an EOC draws people together during the planning process and especially during the response period.

The other point is that there are many ‘correct’ ways to set up an EOC. Ultimately, the best measure of a municipal EOC is its ability to enhance inter-jurisdictional communication, decision making and coordination during a disaster. However, there are a number of principles that need to be considered and a number of valuable pointers about the layout and content of successful EOCs. These are addressed below.

### **The EOC layout: Principles and components**

EOC operations are best understood through the lessons learned from the disaster-response experiences of numerous municipalities, organizations and agencies. Although their EOCs varied in content, layout and operational procedures, they met the functional requirements of multi-jurisdictional coordinated response and brought to light a number of valuable lessons. These lessons emphasize the need for all EOCs to satisfy a number of fundamental operational needs. The keys among them are listed below.

**Sufficient space.** The EOC must accommodate at least the members of the municipal EOC Control Group. Ideally, the space should also be able to accommodate some support staff and select ‘visitors’ (i.e., needed specialists, key stakeholders, or mutual aid partners).

**Accessibility.** The EOC must be easily accessible especially during disasters that result in a disruption to the municipal transportation routes.

**Availability: Immediate and for the duration of the disaster.** The municipal EOC must be made operational quickly and its needs must take immediate priority over all else except the needs of the emergency site.

**Security and protection.** The EOC facility and its operations must be secure from disruptions such as power failure, flooding, or windstorms. Back-up systems are, therefore, a must. Obviously the EOC must be established in a facility which would withstand the disaster(s) most

likely to affect the municipality.

**Privacy.** The EOC must be located and configured in a manner that will allow its members total privacy to conduct their business. It must be secured from interruptions by outsiders and uninformed municipal officials alike.

**Sufficient and secure communications.** An EOC without effective communication resources is worse than no EOC! This facility **MUST** have the appropriate resources to effectively communicate with the emergency site, as well as external agencies.

**Inclusive configuration.** The configuration of the EOC should permit and enhance dialogue or interaction among EOC members. Where possible, the EOC configuration should allow its members to face each other across a conference table or a map board. (These enhance the exchange of information).

**Proximity of like agencies.** Agencies with similar practices, resources or interests (e.g., Fire and Police) should be located next to each other at the EOC to allow their representatives rapid and frequent contact.

**Proximity to support resources.** The EOC organization must have sufficient administrative support and should be easily accessible to the support staff. It should also include key reference materials that may be required during the response effort.

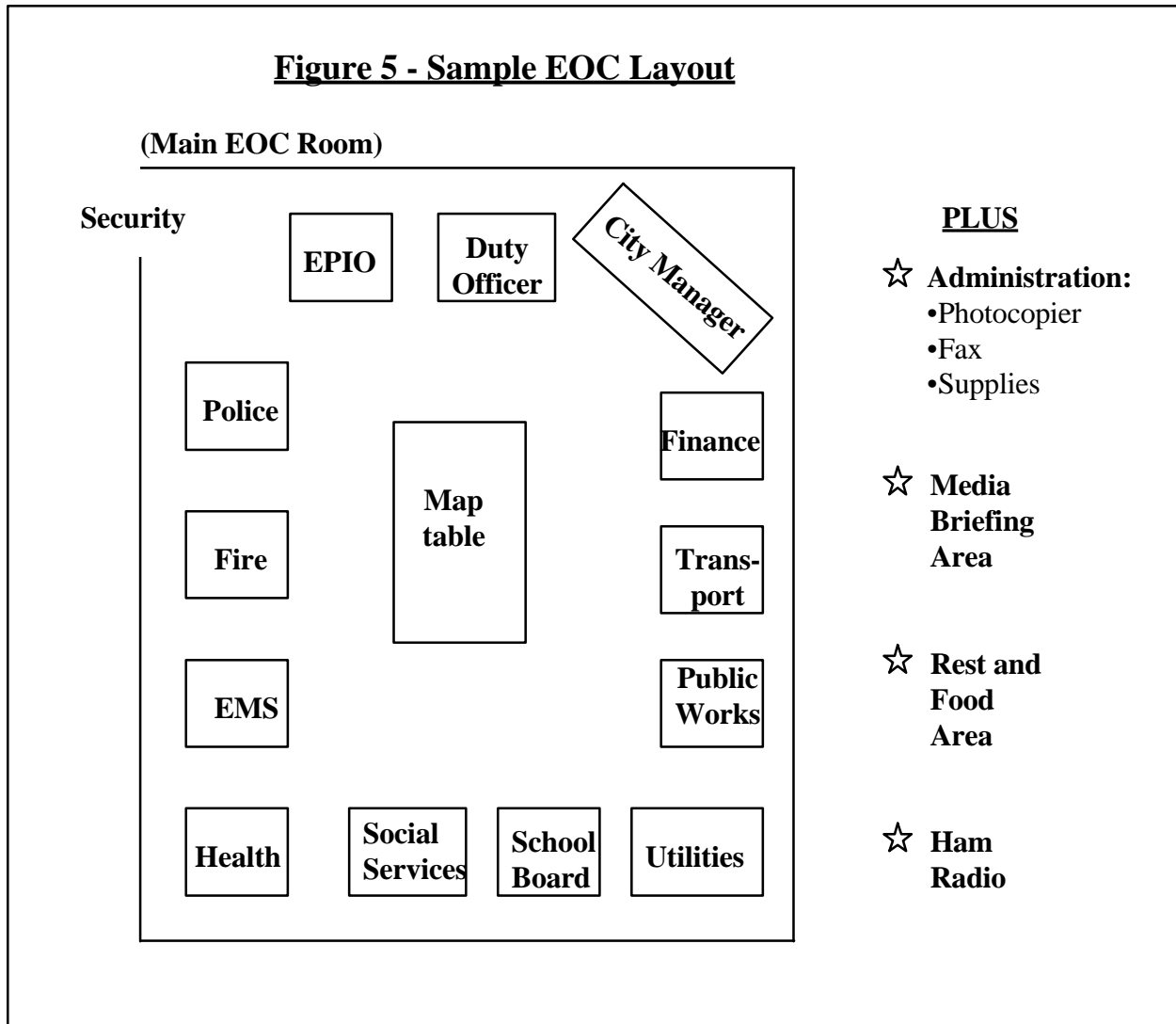
**Comfort.** Disaster response is stressful and often lasts longer than expected. The EOC should be a comfortable facility with sufficient 'creature comforts' within it or sufficiently close to it. This requires such things as temperature controls, adequate lighting, comfortable furniture (i.e., chairs and tables), and washroom facilities. Also needed are special areas for food preparation, eating, and resting/sleeping.

The layout of an EOC is generally driven by the space (i.e., location, size, configuration) made available for it. Listed below are a number of space requirements that EOCs should typically include. Figure 5 provides an example of an EOC layout with various rooms allocated for the separate operational requirements. In some circumstances (i.e., limited resources), however, a municipality may be forced to satisfy these requirements from one large room.

EOCs should ideally include the following rooms or 'space allocations':

- A main room for the various 'operational desks'.
- A meeting/conference room.
- A telecommunications/radio room.
- A media briefing facility (may be located away from the EOC).
- A Public and Media Inquiry Room (PMIR).
- Administrative/resource room.
- Sleeping quarters (optional).
- Washrooms (handy and near by).

- Parking.



**The main EOC** room is where the representatives of the EOC Control are located. Each agency usually has an ‘operational desk’ from which it links to its representative at the emergency site, its dispatch/communication center, mutual aid partners and a host of other agencies as necessary. It is also the location to which the other members of the EOC Control Group would go for information or other resources.

The main room often contains a variety of much needed visual aids such as: status boards, various maps/charts (e.g., the municipality, the emergency site), phones, hand-held radios, television monitor(s), facsimile phone(s), or a photocopier. (Some of these resources may be located in other parts of the EOC facility depending on the available space.) The main purpose of these resources is to facilitate better communications, and help coordinate decision making and

resources.

**A meeting/conference room.** There is tremendous value to the presence of a separate room that is designated as a meeting or conference room. Such a room allows key decision-makers the opportunity to exchange information and coordinate decisions with as little interruption and diversion as possible.

**A telecommunications/radio room.** Since the ability to communicate is so critical during disaster response, the EOC should have close control over its communication resources. Moreover, it should have back-up resources on hand. Therefore, consideration should be given to placing one or more Ham radio operators near the EOC main room.

**A media briefing area.** The requirement for a separate area to brief the Media becomes evident very quickly during disasters and crises. Upon hearing about a disaster or a crisis, Media representatives nearly always begin an intense search for information. They are not likely to 'go away' without a story and may go to extremes to get that story. They may, for example hound EOC officials for information, or, camp-out at the EOC's doorsteps to be readily available for news.

A Media briefing area (e.g., room, trailer, tent) needs to be established as early as possible in the response effort. This area should be staffed and coordinated by representative(s) of the Municipal Media Relations unit. It should also be located away from the EOC to remove an unnecessary stressor from the EOC operation. However, it should be connected to the EOC by phone and facsimile so that the information relayed through it to the Media (and the public) is current and accurate.

**A Public and Media Inquiry Room (PMIR).** The PMIR is a critical link between the EOC Control Group and the public. It is invaluable in relaying information directly to those who are concerned about the event, its consequence or the action(s) that they should take. It is also a valuable channel for members of the public to relate valuable disaster-related information to municipal officials.

The PMIR requires a battery of phones and phone takers. It should be located near to but separate from the EOC main room. Regardless, the operation of the PMIR should not hamper the operation of the EOC.

**Administrative/resource room.** This is the workspace of the EOC support staff. It holds the stationery, references and other administrative resources required to operate the EOC. Space permitting, the photocopier, facsimile and other noisy machines should all be located in this space

**Sleeping quarters.** Disasters and crises may unfold over lengthy period of time and may, therefore, require response effort beyond the initial 24-hour period. The demands of these events on EOC staff and the stress they create can severely hamper effective communication and rational decision making. EOC members should have a space where they could, if necessary, catch a brief rest.

**Washrooms.** Suffice it to say that the EOC must be well equipped with washroom facilities that are near by and restricted to the EOC staff. Shower facilities and change rooms are an added and welcome bonus.

**Parking.** Parking space is necessary for those who occupy the EOC as well as for designated visitors. These spaces need to be available as close as possible to the EOC to minimize frustration, minimize travel time, and increase accessibility to the EOC by those who are needed there.

### **Key roles and functions**

The operations of a municipal EOC are depended upon many individuals. Key among them, of course, are the members of the EOC Control Group. While the titles may change from one jurisdiction to another, the following positions or functions are often included:

- City Manager, Town Clerk, or another municipal administrator. (This person is usually the one in charge of the operations of the municipal EOC).
- Municipal Emergency Measures Coordinator (sometimes referred to as the Director of Disaster Services).
- Heads/Chiefs of key municipal departments (e.g., Fire, Police, Emergency Medical Services, Transportation, Public Works, Social Services).
- Heads of key municipal Boards (e.g., school).
- Municipal Emergency Public Information Officer (where one exists).
- The Chief Financial Officer for the municipality.
- Key specialists
- Representatives of industry or other orders of government whose inclusion, when necessary, in the EOC Control Group may be temporary or permanent depending on the situation.

**The primary role of the EOC Control Group is to support the Site Team while ensuring the continuity of municipal operations.**

**City Manager, Town Clerk, or another municipal administrator.** This person is always a key senior administrator who has been assigned the task for emergency preparedness and response on behalf of the municipality. This person's key functions during the disaster response stage are:

- Manage (i.e., be in charge) of the operations of the municipal EOC.
- Appoint the Site Manager.
- Keep the municipal elected officials advised of the situation and refer appropriate matters to them.
- Maintain contact with the Site Manager.

- Coordinate the municipality's support to the Site.
- Ensure the continuity of day-to-day municipal services to the unaffected portion of the municipality.

**Municipal Emergency Measures Coordinator.** This person is often the administrator or coordinator of the municipal emergency preparedness program. He or she may have another title or may wear a number of hats (e.g., Town Clerk). Regardless, during the disaster response period, this person reports to the City Manager or Town Clerk, and has the following key functions:

- Provide linkage between the EOC and the Site.
- Provide technical assistance about the Municipal Emergency Plan, its procedures and resources.
- Coordinate resources, as required, on behalf of the EOC Control Group.
- Manage special projects on behalf of the EOC Control Group.

**Heads/Chiefs of key municipal departments** (including Fire, Police and Emergency Medical Services). These are the Chiefs of the various municipal departments that are involved in the response. Key among their functions are:

- Continue to maintain operational control over their respective department, organization or agency including that segment of it which is located at the Emergency Site.
- Support their personnel at the Emergency Site through their senior person there.
- Share relevant information with their colleagues at the municipal EOC.
- Coordinate resources and activities, as appropriate, with their colleagues at the EOC.
- Link to and secure out side resources (e.g., mutual aid) as appropriate.

**Municipal Emergency Public Information Officer** (where one exists). As a rule, this person is the key spokesperson for the municipality. In many cases he or she is the ONLY Media contact person. This person is a link to the public through various Media outlets. He or she performs the following key functions:

- Compile available information for internal dissemination (i.e., to the EOC Control Group, the Site Team and elected officials).
- Front all requests for information thus relieving some stress from key municipal personnel.
- Verify the information prior to its release to the public.
- Disseminate information to the public through the Media.
- Manage the activities of the PMIR--Public and Media Inquiry Room (where one exists).

**The municipality's Chief Financial Officer.** This person is responsible for the financial affairs of the municipality. During disaster response period his or her key functions are:

- Keep a running record of the cost of the operation.
- Monitor operational expenses and recommend ways to cut unnecessary cost (e.g., the release of unnecessary stand-by resources).



- Begin, as soon as possible, the process of emergency relief funding from other sources (i.e., provincial).

**Others.** These individuals may include key representatives of industry or other orders of government. They may be invited by members of the EOC Control Group to provide technical expertise, operational advice or linkage to other organizations or systems. They may remain involved with the EOC for a short period or, because of their affiliation or expertise, remain there till the end of the operation. In any case, their key function is to assist, advise and support the emergency response effort.

## **The municipal EOC operations: Process and tips for success**

The municipal EOC should be activated as soon as it becomes apparent that the operation at the Emergency Site is overwhelming existing resources and procedures. The EOC should continue in operation only for as long as the situation warrants it and be deactivated (i.e., closed-down) as soon as possible thereafter.

While it is operational, the municipal EOC must be made secure from intrusion of and interruption by any one NOT directly related to the response effort. The EOC should be staffed, and operational on a continuous basis (i.e., 24 hours a day, 7 days a week). Operations longer than one day should result in EOC members working in shifts that will permit continuity while NOT extending EOC personnel beyond their limit.

As noted earlier, the effectiveness of the EOC is heavily dependent upon its ability to effectively maintain communications with a host of agencies, but especially with those at the emergency site. Therefore, the activation of the municipal EOC demands the immediate activation of all available communication resources. It also necessitates the beginning of a long and difficult task of information gathering, analysis, processing and distribution. It is a process that must be well managed despite the apparent lack of solid information and the chaos inherent to disasters.

Information processing begins immediately and involves the collection and analysis of information about the event and its consequences. This also requires the establishment of systems to quickly share that information among the EOC Control Group members. Some of these systems include the creation of a central map/situation board, the posting of key data in visible locations at the EOC, the distribution of printed updates, and frequent verbal briefings.

Equally important is the recording of all key decisions (e.g., resource expenditures, activities), and communications in an 'event log'. This MUST be done by representatives of each of the key agencies represented at the EOC. They perform this task each for their own organization or agency. The person in charge of the EOC (e.g., City Manager) should appoint someone to perform the log-keeping function on behalf of the EOC Control Group (or, the municipality).

**Event logs are particularly important because they often represent the ONLY documented and, therefore, credible account of events, decisions and activities. They could help dispel allegations of negligence, failure to act, impropriety, responsibility for damages and much more.**

The EOC need not be activated by its full staff. Instead, it may be opened by a skeleton staff that rapidly grows to meet the needs of the disaster (and the Site Team).

Regardless, as soon as it is activated the EOC Control Group should quickly assume responsibility for managing the response effort beyond the outer perimeter of the emergency site. (The area inside the outer perimeter should be under the direct control of the Site Team and the Site Manager.)

In some circumstances, the EOC Control Group may have to establish and support more than one emergency site. This often occurs when one disaster site is too big for one Site Team to manage, or when various disaster sites are dispersed over a large area. Naturally, the establishment of more than one site further complicates the situation for the EOC Control Group. However, the process remains the same as if there is only one site. The key differences in the approach of the Control Group are the need to create separate information/resource list for each site, and the requirement to clearly identify in the various Logs the exact site in question.

Regardless of the number of sites being operated at any one time, there are many factors that lead to the success of EOC operations. The following are key lessons for operational success:

- Appoint a Site Manager as soon as possible and communicate the decision (with name and location at the Site) to all major agencies involved at the Site and at the EOC.
- When an EOC is necessary, immediately activate it.
- Where necessary, explain in detail the process of the EOC operation (i.e., how it works) to those who will take part within it.
- Establish and maintain frequent communications with the Site Manager and the Site Team.
- Establish and continue to enhance the flow of information at three levels: within the EOC, between the EOC Control Group and the Site Team, as well as between the EOC Control Group and the public.
- Immediately begin a log of events for each operational desk at the EOC and maintain this log throughout the operation.
- Secure the EOC from unnecessary interruptions and disruptions.
- Immediately begin to display (and share) key information that may be of value to other members of the EOC Control Group.
- Begin, as soon as possible, to activate back-up systems and mutual aid resources to prepare for the potential escalation in the need for resources.
- Keep the EOC area but especially the main room as quiet as possible.
- Strive to reduce the stress level by communicating necessary information, identifying roles, clarifying key operational processes, ensuring reasonable shift duration, and providing creature comforts.
- Keep the Public (through the Media) regularly appraised of the situation, its consequences, and the actions required by the residents.
- Be open and cooperative with the Media.
- Where appropriate, ensure that EOC Control Group members have dealt with the effect of the disaster on their family members, home and place of work. (This is an often forgotten factor that can have long term damage.)

## **The Emergency Site: Layout, roles and process**

### **The principles and components of Site layout**

One of the greatest tools of effective site control and management is an effective site layout. Each emergency site requires a unique site layout, as does each disaster even those affecting the same site. However, the principles affecting site layout are similar and bear attention.

**Each emergency site requires a unique site layout.  
However, all site layouts are guided by similar principles.**

There are a number of key factors that could have significant impact on the site layout and the overall response effort. These are listed below and should be viewed both on their own merit and in the context of the impact the disaster will have on each.

- Terrain type (e.g., rugged, mountainous, marshy, sandy).
- Lay of the land (e.g., closed-in versus open).
- Environmental constraints (i.e., weather, season).
- Accessibility to the site and access routes.
- Land ownership and jurisdiction.
- Communications needs and available resources.
- Space requirements and availability.
- Available structural resources (i.e., buildings, warehouses, shelters).
- Safety (i.e., from the elements, disaster agents).
- Availability and proximity to water, power, and sanitation resources/services.

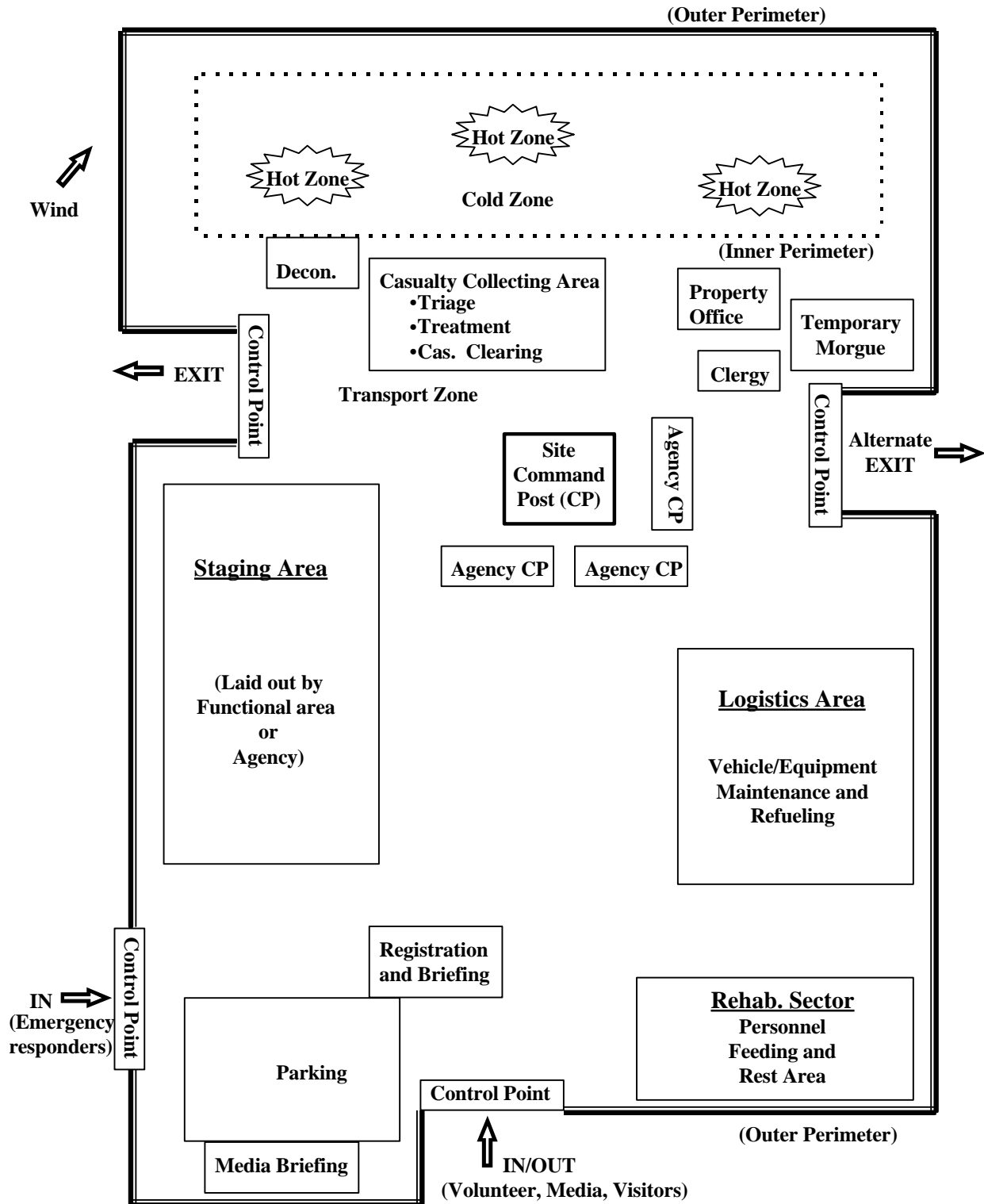
Emergency sites may contain unique components that reflect the nature of the disaster, the resource capacity of the municipality, or the topography of the site. However, generally speaking, most emergency sites have similar components. These are listed below (refer to Figure 6).

**Inner perimeter** with designated and secured entry/exit points.

**Outer perimeter** with designated and secured entry/exit points.

**Traffic control points.** These include well marked primary and alternate in/out routes. They also include specific points along these routes where traffic can be controlled and security measures implemented as appropriate.

**Figure 6 - An Emergency Site Layout**



**Site command post.** This command post is often accompanied by Agency/Department command posts. It should be located centrally as close as possible to the primary area of the inner perimeter. It should also be easily identifiable (i.e., flagged) and connected to as many communication media as possible. Given sufficient space it should include all agency Site Control Officers.

**Command Post (CPs)** for each of the major response agencies.

**Triage area.** If necessary, this is an area where the injuries are categorized for the purpose of treatment and transportation to health care facilities. It needs to be close to the inner perimeter yet secure from danger. It should also be large enough to accommodate various responders and injured persons, and be near in/out transportation route(s). This area may include the treatment area.

**Treatment area.** When required, this area should be established in a safe zone outside the inner perimeter. It should be well marked and be close to the in/out transportation route(s). When the treatment process is expected to last a long time, or when weather dictates it, the Site Team may wish to establish large tent(s) within which to conduct the treatment. To avoid congestion, ambulances must be dispatched to the treatment area from the staging area.

**Casualty Collecting Area.** The area from which the casualties are taken away to the various health care facilities for treatment.

**Staging area.** Located within the outer perimeter, or some times just outside of it, the staging area contains all resources dispatched to the site but yet unused. The area must have in/out routes and its entry points secured. It should be near the rest and feeding areas. It is managed by the Staging Area Coordinator (and, where available, Staging Officers). It must be in close communications with the Site Command Post.

**Parking area(s).** These areas are intended to reduce traffic congestion within the site. They may be used to keep response vehicles that may not be required for lengthy period of time. Response agencies may be assigned their own specific parking lot/sector and tasked with the management of its use and the security of its content.

**Temporary morgue.** This will not be required in all disaster situations. However, when required it should be established within the outer perimeter away from the rest of site operations to secure it from interference. When established, it requires round-the-clock access control and may require counseling/clergy staff nearby to assist the bereaved. (A separate facility/tent may be established near the temporary morgue for that purpose.) The temporary morgue should also have a property office to preserve the belongings of the deceased and coordinate their release as appropriate.

**Logistics area.** This area is designed for vehicle repair, equipment servicing, fueling, distribution/allocation of equipment, and the storage of dangerous goods. It should be near the main access routes and within the outer perimeter. Moreover, the area should be near the

Rehab.Sector but must be both upwind and far enough from it to reduce the presence of noise and fumes in the Rehab. Sector.

**Rehab. Sector (or, Rest and feeding area).** This area is particularly important for operations which last for lengthy periods. It needs to be near access route(s) but should be located in a less busy (i.e., quiet and isolated) area of the site.

**Decontamination Area.** This is a relatively small area which, when required, should be located just outside the Inner Perimeter as near as possible to the hot zone. It should be available to decontaminate both responders as well as casualties being evacuated from the hot zone.

**Media center** or access point. Wherever possible, members of the Media should be allowed controlled access to the site and key site personnel (e.g., Site Manager, Agency Site Control Officers). The Media center may be a tent or other structure where Media representatives are briefed verbally, provided news updates, or gather for site tours. It should be easily identifiable, near access routes, and away from the key site operations.

**Helibase.** When required, and depending on the topography of the site, the helibase should be located near the Site Command Post. The helibase operations may require fuel supplies and lighting.

**Volunteer coordination point.** This area should be established at a key entry point through the outer perimeter. It should contain a facility (e.g., tent) in which to carry volunteer registration and briefing. Ideally located near the rest and feeding area.

**Entry points.** The site should have two entry points; one for emergency response personnel and equipment, the other for volunteers, the media and visitors. The access through these points must be controlled.

**Exit points.** There should be a primary and an alternate exit points. Both should be controlled and, ideally, at opposite ends/sides of the site.

Many factors should be considered when designing or 'laying out' the emergency site. As noted above, there are no precise formats or one single workable layout. However, the layout of any site has a direct bearing on the flow of communications among the agencies operating within it. The communication flow will be influenced by the following considerations:

- Related functions and agencies should be co-located and grouped into operational task groups.
- Major response organizations/agencies (e.g., Fire, Police) should be isolated and given a functional lead role (see Section below). (That role needs to be identified to all key organizations at the site.)
- The various components should be positioned in the site along the main transportation routes.

- All command posts (CPs), but especially the Site Command Post, must be easily identifiable (e.g., flagged, strobe lit, brightly colored), readily accessible, and within view of the major action.
- The layout and its transportation pattern must allow for the smooth in/out flow of personnel and resources.
- The layout of the site and the location of all functional areas must be communicated to all agencies at the site.

### **Key roles and functions**

The ESM system, integrates the various roles and functions of response organizations and their key personnel. In doing so it provides a number of benefits. Key among them is the ability to effectively:

- Provide for the safety of emergency personnel and the general public.
- Remove and treat injured or threatened patients.
- Protect and conserve property.
- Perform recovery and reconstruction tasks.

The activities by members of response organizations at the emergency site may be divided into five categories:

- Strategic (e.g., site management) roles.
- Command Post functions.
- Control point operations.
- Tactical activities.
- Tasks in support of the main operation.

**Site Manager.** Appointed by the EOC Control Group, the Site Manager is responsible for the management of the site until its closure. The Site Manager must:

- Establish the inner and outer perimeters.
- Designate the location of the Site Command Post.
- Lay out the site and all its components.
- Manage the flow of information through the Site Command Post to members of the Site Team and the EOC Control Group.
- Coordinate key response activities (i.e., those activities/operations that would affect more than one agency or the overall outcome of the response effort at the site).
- Communicate with the Media.

**Staging area coordinator.** The person occupying this role may be appointed by the Site Manager to perform the following functions:

- Establish and lay out the staging area.



- Establish the flow pattern for vehicle movement.
- Account, at any given point, for the resources within the staging area.
- Maintain contact with the Site Manager or Site Team.
- Maintain contact with the Logistics Area to facilitate repairs or fueling as appropriate.
- Deploy resources requested by the Site Manager or Site Team.
- Alert the Site Manager of resources that may be discharged from the staging area.
- When directed by the Site Manager, discharge unnecessary resources.

**Liaison officer (LO).** This person is designated by the Site Manager to help coordinate key functions in and around the Site Command Post. The LO should perform the following functions:

- Assist with the lay out of the site.
- Maintain the event log.
- Assist with the flow of information within the Site Team.
- Undertake responsibility for specific tasks assigned by the Site Manager.
- Act as alternate Site Manager (if so directed).

**Agency Site Control Officers** (e.g., the senior representatives of each of the key response agencies at the site). These individuals need to:

- Assist, as appropriate, the Site Manager with site layout.
- Co-locate, as appropriate/directed, their command post with the Site Command Post.
- Command/control their agency's response effort at the site.
- Share appropriate information with the other members of the Site Team.
- Coordinate activities that may impact other agencies with the appropriate agency-representative.
- Be available to communicate with the Media, as appropriate. (This will be performed in support of the Emergency Public Information Officer, and in keeping with the concept of a single spokesperson for the municipality.)

More specifically, each of the major response agencies has a set of accepted 'traditional' roles. These are listed below by agency.

**Police.** Often, the roles assigned to the Police Services are the protection of life and property, as well as the control of traffic and crowd. Security of the site and the control of traffic within it should be a Police responsibility.

The Police Services have also been called out to conduct investigations (e.g., criminal or in case of fatalities), care for the dead, provide perimeter security, assist with or conduct an evacuation, and help maintain a record of events. They also have valuable communication equipment and a trained personnel pool that could be employed in a variety of roles at the Site Command Post.

**Fire.** The Fire Services are usually tasked with the suppression of fire, containment of dangerous goods, decontamination, search and rescue, as well as the provision of basic health care. They may also be involved in the evacuation of the site and the protection of site personnel (i.e., ensuring against structural collapse). Like the Police Services, they too have valuable communication equipment and trained personnel who could be employed in and around the Site Command Post.

**Emergency Medical Services (EMS).** The primary role of the EMS is to provide medical services (i.e., triage and treatment) and to transport the wounded to health care facilities as appropriate. If trained to do so, some members may be involved in structural rescue in support of the Fire Services. EMS personnel must also coordinate with the Site Manager the location of and resources for patient triage, casualty collecting area, and patient care or transportation.

**Public Works.** The primary role of Public Works departments/agencies is to provide the resources needed by the primary responders to perform their tasks effectively and safely. Services provided may include establishment of barriers, closure of transportation routes, provision of other needed resources (e.g., lighting or shoring equipment, heavy equipment), or the movement of resources. These individuals may work hand-in-hand with utility company personnel and transportation agencies.

**Transportation.** The primary task of transportation personnel is to move people from one location to another. This may involve the evacuation of people from the danger zone; the transportation of responders or volunteers to the site; or, in cases of mass casualties, to evacuate the wounded.

**‘Assistants’.** Each of the above mentioned positions, including that of the Site Managers are likely to have one or more people designated as ‘Assistants’ and tasked with various supportive duties. The person to whom they report must designate the details of their actual duties.

**Others.** Disaster sites are likely to involve a myriad of response agencies/organizations and representatives of many jurisdictions. Their primary role is to support the Site Manager and the Site Team. To that end they are to bring their expertise and specialized resources (if any) and must be willing to cooperate with the Site Manager to meet the needs and priorities established for the site. Failure to do so will only jeopardize the success of the overall effort.

### **Site operations: Tips for success**

Emergency sites are, by necessity, the focus of all disaster response effort. Nearly always, they are established in or around the area where the disaster inflicted its greatest damage. And, because of the inherent risks to life, limb, property and the environment, disaster response at the site must be quick, comprehensive and well managed.

The following are key lessons relating to successful operations at emergency sites regardless of their nature:

- Quickly establish and brief the Site Team.
- If a Site Manager is not appointed, establish one on an interim basis.
- Re-locate all agency command posts to the Site Command Post or, in its absence, a central location near the inner perimeter.
- Establish inter-agency communications (i.e., the process through which vital information is shared in a timely manner).
- Pool knowledge regarding the event, its consequence and the response effort.
- Anticipate required actions and resources.
- Adapt the response organization and its procedures to the changing circumstances.
- Be proactive in requesting resources or information. (For example, request area lights BEFORE it starts to get dark, or order food BEFORE shift changes.)
- Coordinate agency operations that may have a bearing on the operation of other response agency(ies) or the overall operation at the site.
- Establish a single Media representative (e.g., individual or group) for the operation.
- Advise the Media that they will be briefed only through that representative and that the information they seek will be provided only at or through the Media Center. (Site tour may be organized through the Center.)
- Manage resources efficiently (i.e., ensure proper feeding and rest of response personnel; ensure proper maintenance of equipment; avoid having unnecessary equipment on stand-by).
- Manage the staging area effectively right from the start.
- Identify staging area resources using three status conditions: ‘Assigned’ means the resource is performing an active role at the site; ‘Available’ means the resource is in the staging area ready for use; And, ‘Unavailable’ means the resource is not ready for use at this time.
- Plan for the operation to last longer than initially expected.
- Plan for an extremely stressful work environment.
- Communicate, communicate, communicate!!!

## Summary

The Emergency Site Management (ESM) system is a structure and a system for linking various management systems into a single disaster response framework at municipal level. The ESM system is based primarily on activities at and through, two physical locations: The municipal emergency operations center (EOC) and the emergency site. Both are important, however, the focus of the system is on the emergency site and its response personnel.

The emergency site is bounded by its outer perimeter. All activities within that perimeter are the responsibility of the Site Manager and the Site Team. The Site Manager, is the team leader whose primary role is to **manage** the Site Team comprised of senior representatives of the key response agencies at the site. Their role is to return life to normal at the site as soon as is reasonable.

The municipal Emergency Operation Center is operated by the municipal EOC Control Group that includes Department heads of the key municipal departments/agencies involved in the response effort. The EOC and the EOC Control Group are often managed by the City Manager or Town Clerk.

All activities outside the outer perimeter are the responsibility of the EOC Control Group. The group has a dual role. It supports the emergency site, as requested, with needed resources. And, it maintains or strives to maintain normal operations for the rest of the municipality. The municipal EOC is also the key channel for site-destined resources from other jurisdictions.

The ESM system contains a number of roles, general procedures and expectations. It is, by design, a flexible system that allows for the inclusion and integration of various agencies, jurisdictions, and systems into a municipal framework. The system assumes the continuation of pre-disaster organizational lines of authority. The only 'subordination' (if any) is to the officials of the local authority (i.e., municipality) and their legal responsibility to protect their citizens from harm.

## **Acknowledgment**

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## **Appendix A: Definitions**

**Agency Site-Control Officer.** This is the most senior ranking officer of each response agency at the emergency site. (In the case of the Fire Services it would be the Fireground Command.)

**Casualty Collecting Area (CCA).** The area identified by the Medical Sector, and reviewed with Command, that establishes the positioning and preparation for transportation of patients.

**Crisis.** An abnormal and unique event which occurs with some degree of surprise to demand unusual, extensive and demanding response effort.

**Disaster.** (See Crisis)

**Emergency.** A situation out of the norm which demands a comprehensive response effort by a significant segment of an organization. (This is a situation between an incident and a full-blown disaster.)

**Emergency Management.** The overall process which effectively guides and coordinates all functions of mitigation, preparedness, response and recovery as they relate to crises and disasters.

**Emergency Manager.** Any person with formal (i.e., designated) or informal (i.e., assumed) responsibilities for emergency event mitigation. Depending on the event, this could include First Responders (i.e., Police, Fire, or EMS personnel) to Chief Officers, City Managers or elected representatives.

**Emergency Operations Center (EOC).** A location, often within a facility, which serves as the primary headquarters of an organization for its effort to manage the response to a specific event (i.e., disaster, crisis).

**Emergency Planning.** The process involving activities undertaken by individuals and organizations prior to a disaster to enhance their ability to effective response to that disaster. (This term is occasionally used interchangeably with 'emergency preparedness'.)

**Emergency Preparedness.** The process which ensures that required resources are available, when needed, to effectively respond to disasters. It includes a range of activities from the identification of needed resources to their acquisition and pre-positioning. (The term is occasionally used interchangeably with 'emergency planning'.)

**Event.** A situation, either episodic or chronic, which demands a specific response. It is generally handled by Standard Operating Procedures (SOPs) and may also be called an incident or an occurrence.

**Fireground Commander.** Usually the most senior fire officer at a disaster scene with total control over all Fire Service resources at the scene.

**First Responder.** The first official responders to a disaster. (They are often the members of the Fire,

Police and Emergency Medical Services.)

**Hazard.** The Webster dictionary defines hazard as a "fortuitous event; chance; danger; peril; risk."

**Hot Zone.** This is an area deemed to be contaminated with dangerous goods, or otherwise dangerous for those without personal protective equipment (PPE).

**Incident.** See 'event.'

**Incident scene.** The location where activities related to a specific incident are conducted. It includes the entire area affected by incident-related hazards, and all adjacent areas used by responders and their equipment in response to the incident.

**Inner perimeter.** Often at the heart of each emergency site, it bounds the area where the greatest damage from the disaster agent exists, or is expected to exist.

**Logistics area.** An area within the emergency site for the maintenance of vehicles and equipment, storage of supplies, as well as refueling.

**Mitigation.** The Webster dictionary defines the verb mitigate as meaning "to alleviate or render less painful, rigorous, intense, or severe." Mitigation is a phase of emergency management. Its aim is to minimize the probability of an event or to reduce its negative impact.

**Mutual Aid Agreement.** Is a formal agreement between two or more entities (i.e., municipalities, Departments, Corporations) to be available to assist each other with specific resources during pre-specified situation(s).

**Outer perimeter.** The outer boundary of the emergency site, it delineates the responsibility of the Site Manager and the Site Team (i.e., inside this perimeter) from that of the EOC Control Group (i.e., outside the outer perimeter).

**Planning.** The Webster Dictionary defines planning as "to arrange the parts of; or to have in mind." Planning links knowledge to action.

**Recovery Planning.** The process which ensure the availability of critical resources so that the community could continue its operation(s) despite major disruptions or crises.

**Rehab. Sector.** An area within the emergency site where site personnel may be fed and rested.

**Risk.** It is the combined effect of the *probability* that a particular event will take place and the *consequence* of that event.

**Site Manager.** The person designated by a municipality to manage the overall operation at a specified disaster site.

**Triage.** The process of sorting patients by order of severity of injury and patient needs. The process involves the following activities:

- Establish Triage officers.
- Establish Transport officers.
- Scene triage.
- Establish Staging officers.
- Casualty Collecting Area.



- Management of deceased.
- Hospital triage.

**Triage Officer.** The first arriving or designated EMS attendant who assumes the responsibility for site triage under the direction of the Medical Sector. This person will sort patients (i.e., color code them) to match the casualty collecting area setup. The following colors are used:

- Red - high priority, those who require the most urgent care but who also have a high probability of survival.
- Yellow - Serious injuries that can wait for treatment.
- Green - Low priority; minor injuries; the “walking wounded”
- Black - Deceased (no pulse and no respiration) DO NOT MOVE; catastrophic injuries with little chance of survival.

## **Appendix B - List of figures**

- Figure 1 - The Municipal EOC and its network
- Figure 2 - Resource coordination through the EOC
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