Emergency Response Planning for Community Events

2013

ALBERTA EMERGENCY MANAGEMENT AGENCY

Municipal Affairs

Government of Alberta

Alberta Emergency Management Agency

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Executive Summary

The Emergency Response Planning for Community Events was developed to assist emergency managers and event planners in communities across Alberta. The guide provides tools and strategies to assist with every stage; from concept through to completion of the event.

Recent events in Alberta, throughout Canada and internationally have heightened the need to provide event planners with the tools and processes to guide them in recognizing, mitigating and respond to incidents during an event. The guide is not intended to replace the Municipal Emergency Management Program but rather to complement the MEMP by:

- Identifying the need for a joint municipal/event planning group
- Assessing risk prior to the event and linking mitigation efforts to the MEMP or establishing hazard specific plans as identified
- Establishing the linkages between the event and community emergency managers
- Providing a process to exercise and develop a cycle of continuous improvement through the lessons learned process

Best practices information was gathered from the two major municipalities of Calgary and Edmonton, alongside federal and provincial government departments. The intent was to build a guide that can be used by any community, event planner or venue operator to develop an event Emergency Response Plan that will ensure the safety of the public has been addressed and planned for.

Acknowledgements

Working Group

The working group would like to thank the following for their assistance in the preparation of this document:

(the organizations listed reflect their employer at time of contribution)

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Message from the Working Group

The most recent version of the guide will be available on the AEMA website at http://www.aema.alberta.ca/. The intent is to provide a version that can be downloaded and modified as necessary in order to adapt to the needs of the user. The document will also be referenced and attached to the Municipal Emergency Management Program in MileNet.

The working group welcomes comments, feedback and lessons learned from planning groups that have used the document for incorporation into future versions of this guide. It is our hope to continually improve the material provided here and work to incorporate all information and feedback provided.

Please forward any feedback or suggestions for improvement to any one of the AEMA Emergency Management Field Officers.

FOIP Disclaimer

The Emergency Response Planning for Community Events is administered by and housed at Alberta Emergency Management Agency (AEMA).

Municipalities and Event Organizers in Alberta may make free use of the contents of this document or parts thereof to facilitate their Event Safety Plans.

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Definitions and Acronyms

AEMA: Alberta Emergency Management Agency

AHS: Alberta Health Services

Consequence Management: Actions taken for mitigation, preparedness, response and recovery with regard to emergencies, except human-induced intentional threats, and for response and recovery in respect of human-induced intentional acts;

Disaster: An event that results in serious harm to the safety, health or welfare of people; or in widespread damage to property.

Duty to Warn: A concept that arises in the law of torts in a number of circumstances, indicating that a party will be held liable for injuries caused to another, where the party had the opportunity to warn the other of a hazard and failed to do so.

Emergency Response Action Plan (Emergency Response Plan, ERP or Emergency Action Plan/ EAP): A formal planning document that outlines roles, responsibilities, contacts, planned actions, and procedures to be followed in the event of a major emergency or disaster at an event (planned or un-planned).

Emergency Coordinator (EC) (ICS: Incident Commander): Once position is activated, has authority for all emergency response operations within venue. This could be the producer, event organizer, appointed First Responder or other. This position can change as the incident expands or contracts.

EOC: Emergency Operations Center

Event Incident Response Team: Consists of EC, command post staff of fire, police, medical agency representative, event staff (ICS: Incident Commander may also act as Planning Section Chief, Operations Section Chief responsible for ops and agency communications, Logistics Section Chief is responsible for resource requests and allocation) and command staff of information officer, safety officer and liaison officer as activated by EC.

Hazard: A potentially damaging physical event, phenomenon or human activity that may result in loss of life, injury, property damage, social and economic disruption or environmental degradation.

ICS: Incident Command System – A systematic framework of procedures and policies used for the command, control, and coordination of emergency response. It provides a flexible, scalable response organization providing a common framework within which people can work together effectively. These people may be drawn from multiple agencies that do not routinely work together. ICS is designed to give standard response and operation procedures to reduce the problems and potential for miscommunication on such incidents.

Mass Gathering*:* A congregation of people at an event or activity, where there is potential to place exceptional demands on, or have impact on, the community, its services and resources. These events can be pre-planned or spontaneous, attracting a relatively large number of people in a confined area (either indoors or outdoors).

Mitigation Strategy*:* The Canadian Standards Association (CSA) Z1600-08 document defines mitigation as "actions taken to reduce the risks and impacts posed by hazards". The document provides examples of mitigation strategies including: adopting current building codes in development proposals; recognizing, removing or reducing the potential consequences of the hazard; and reallocating resources to deal with these strategies. It is recommended that the event emergency planning group incorporate strategies such as: up to date site plans, defined access and egress routes, mutual aid agreements and multi-agency response coordination plans.

Municipal Emergency Plan (MEP) - (MEMP, Municipal Emergency Management Program):
The formal emergency response plan required by legislation of all local governments that includes activation, notification, roles and the responsibilities in the event of a major emergency or disaster; and typically requires the declaration of a State of Local Emergency (SOLE) and/or a coordinated response by a number of emergency management agencies.

Risk: A measure of the probability and severity of adverse effects that result from exposure to a hazard or hazards.

SIP: Shelter in Place – as opposed to evacuation. Taking immediate shelter in a location at or readily accessible to the site such as using a building to take shelter from the wind.

Threat: The presence of a hazard and an exposure pathway; threats may be natural or human-induced, either accidental or intentional.

Authorities and Responsibilities

At all times, local authorities in Alberta's municipalities are responsible for managing the first response to an emergency event through their routine emergency services protocols, the appointed site manager (ICS: Incident Commander), or local EOC: Municipal Director of Emergency Management.

When an emergency event exceeds the capabilities of a municipal response or there is a significant threat to life and property, the Alberta Emergency Management Agency coordinates the Government of Alberta's support to the municipality by linking them with resources to help manage the event.

If criminal activities are suspected or confirmed, the police of jurisdiction will guide those response activities that may impact the investigation.

Objectives

Purpose of this Guide

This guide is a working document to be used as an annex to the Municipal Emergency Management Program. It was designed to address and mitigate hazards specific to a large gathering of persons at an indoor or outdoor venue. The document is not to be considered comprehensive but does endeavour to address the event planning needs for communities and events of all sizes in the province of Alberta.

It is recognized that the breadth and detail of this document may be overly detailed for the majority of small local events in Alberta communities, yet it is intended that municipalities, associations or organizers will use it as a reference to consider and determine the most appropriate elements to include in their plan. A Workbook is included to assist as a *starting point* in helping event planners build their own Emergency Response Plan tailored to their community and event types.

Assumptions and Limitations

***This document is not intended to be a one-size-fits-all Event Safety Plan document*.**

There are many types of events held in Alberta's communities ranging from small town parades involving a few hundred people to major events covering hundreds of acres with over a hundred thousand attendees. They may occur in the heat of summer or the cold of winter, outdoors or indoors, in the prairies, the mountains, or next to lakes or rivers, in cities or in rural areas.

This document ***is descriptive, not prescriptive***. It will hopefully alert event planners to what ***may*** be important, but only people with the local knowledge of their community, its facilities, local resources and the event itself can recognize what ***is*** important to safely host a particular event in their community. While we are aware of an appetite for a 'simple' guide or checklist for smaller local events, no single document can hope to give proper authoritative guidance to such a range of events. Any attempt to do so will result in a plan that contains unnecessary content or overlooks important aspects of your community or event.

The included 'Summary of a Plan' is intended as a *starting point* to assist municipalities and event planners in designing Emergency Response Plans appropriate for events in their community.

Creating Emergency Response Plans for your Event(s)

A good Emergency Response Plan is a balance between thoroughness and simplicity. Certainly many small events should not be required to develop plans that go to the same level of detail as a major event, however many of the same considerations apply and should at least be thought about.

Determining what should be in your Emergency Response Plan can be a daunting task for the overburdened municipal or organization employee who may be untrained in this area and has suddenly been given the task to create it.

To assist you, the following chapter is the Summary of a Plan. This Summary describes each section of an Emergency Response Plan. Not all sections will apply to the needs of your event. Example templates and formats are provided to help but as always, local needs and knowledge and event complexity should dictate the structure and detail of your Emergency Response Plan.

Each section has a banner referring you to a more detailed chapter on this topic that will provide background and detail. These chapters are divided into 3 parts:

Objectives you should be trying to achieve. For many small community events these will be very simple to achieve. For others they may need varying degrees of detail planning.

Considerations listing some of the particular items you may have to plan for. Many will not be applicable to your event(s), many others will. Again it must be cautioned that these should not be considered comprehensive and event planners should always be aware of additional or unique considerations regarding their event.

Background section will give you a more in-depth explanation of some of the issues and strategies on this topic and may give you additional clarity on what is important and strategies that could be used.

Municipalities and Associations in Alberta are encouraged to use the material in this document to create Emergency Response Plans tailored to their event requirements. Remember that your community may need a selection of different event plans given that many events are very small and low risk while some others may be more complex.

Each section that follows has a banner referring you to a more detailed chapter on this topic if you are unfamiliar with it.

APPROVAL PROCESS

You should have a written policy for your community addressing the governance and approval process of events. This should be coordinated with your Municipal Emergency Management Program (MEMP).

You should keep an index of events in your Community which will allow you to determine which types of Emergency Response Plans you may require. It will also assist in keeping a record of past events that will guide you in planning future events.

Example :

Typical Events in _ (community) _ that Require an Emergency Response Plan

Typical Community Event List			
Event	**# of Attendees**	**Date(s)**	**Contact**
Annual Rodeo	500	2nd weekend in August	John Doe
Santa Claus Parade	3000		
Jamboree			
Cultural Special Event			
Annual Hockey Tournament			

Build yourself simple checklists for different types of events to ensure all pertinent approvals and processes are identified and will help indicate who should be included in the Planning Group. Modify as required to suit your municipal operating requirements and bylaws. Don't forget to consider Provincial and Federal laws and regulations. Over time, this list will streamline your planning process.

Example (data is example only)

Event Type Approval Checklist

Event Type - Parade			
Req	**Organization**	**Requirement**	**Document(s) Req**
Y	City Council	Approval at Council	ERP Application Form
Y	City Manager	Approval	Copy of ERP
N	Building Inspector	No temp structures	-
Y	Transportation Manager	Approval	Parade Map
Y	City Legal	Review of Liability Ins	Insurance Documents
Y	City Police	Approval	Letter of Approval
N	City Fire		-
Y	EMS	Consultation in Planning, Approval	Medical Emergency Plan
Y	Liquor Control Board	Liquor Permit	Permit
N	Power Company	Electrical Inspection	Permit
Y	Alberta Health Services (Environmental Public Health)	Consultation in Planning, Approval	Approvals/Permits in accordance with Public Health Act and relevant Regulations
	….. other		
Event Type – Outdoor Music Festival >500 people			
	…….		

Have a process that will follow to ensure your events are properly planned for and assumptions and oversights do not occur. The following is an example of a typical Emergency Response Plan cycle.

A summary of the event including a basic outline of events and activities. Modify and design a summary that meets your community's (or event's) needs. (partial example)

Applicants Information: (name, phone numbers, address; event website, facebook, twitter)

Date / Time / Duration:

_____ to _____

Event Type:

- ☐ Parade
- ☐ Special Event
- ☐ Festival
- ☐ Run / Walk
- ☐ Sporting Event
- ☐ ….

Event Venue:

- ☐ Park
- ☐ Roadways
- ☐ City Plaza
- ☐ Arena
- ☐ Other Building
- ☐

Event Activities include:

ACTIVITY	TEMPORARY STRUCTURE	SPECIFICS
Beer Garden	50' x 100' Festival Tent	Confined to SW corner of park, fenced, max. 50 people

Emergency Response Plans will evolve during the planning process. It is important to ensure that everyone is operating off the correct version of the plan.

Amendment #	Issued Date	Page(s) Replaced	Amended By	Date

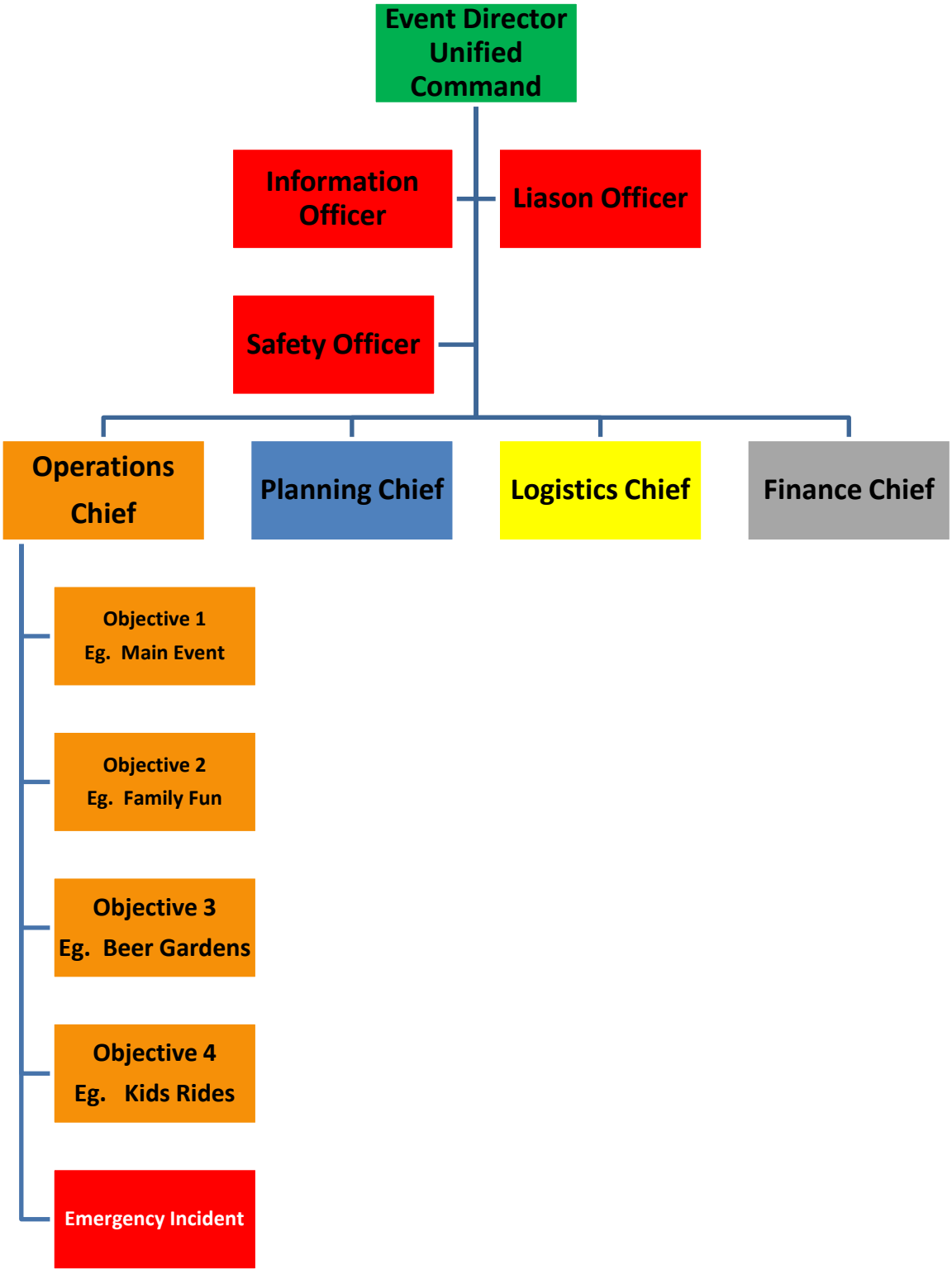
Ensure everyone who needs to be aware of the Emergency Response Plan and event details are included in the distribution of updates or revisions.

Name / Agency	Location	Copy #

You should develop a typical organization chart to ensure clarity on the management and authority structures of the event.

It should be clear that this organizational chart is for normal operations. In the event of an emergency, an emergency command structure would take precedent which may involve a different team often including the emergency responders.

The Emergency Command structure used by most emergency response agencies in the Province as well as with Alberta Emergency Management Agency and other government ministries is the Incident Command System (ICS). It is strongly encouraged that to operate efficiently with them, members of the emergency incident teams for large events understand the Incident Command System.


Event Director
Unified
Command
Information
Officer
Liason Officer
Safety Officer
Operations
Chief
Planning Chief
Logistics Chief
Finance Chief
Objective 1
Eg. Main Event
Objective 2
Eg. Family Fun
Objective 3
Eg. Beer Gardens
Objective 4
Eg. Kids Rides
Emergency Incident

EVENT CONTACT LIST

EVENT:_____ **DATE:**_____ **Updated By:**_____**on**_____

AGENCY	CONTACT PERSON	TITLE	CELLULAR	RADIO
EVENT ORGANIZER				
EMERGENCY				
DIRECTOR				
DIRECTOR				
DIRECTOR				
EVENT STAFF				
SECURITY				
ADMISSIONS				
FIRST AID				
COMMUNICATIONS				
FOOD SERVICES				
VENUE MANAGER				
GATES				
RESPONDERS				
POLICE				
FIRE				
EMS				
EMERGENCY MNGT.				
PUBLIC WORKS				
PUBLIC INFO				

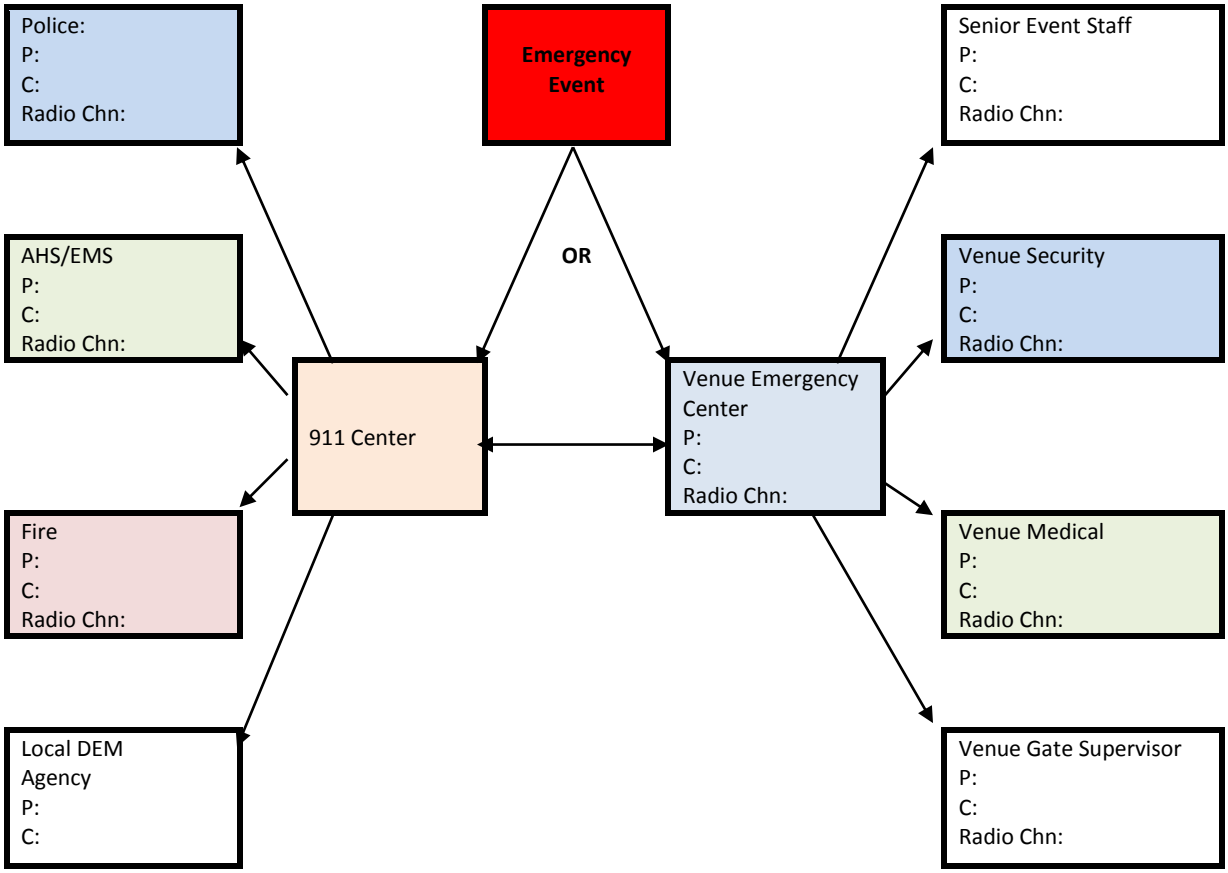
Can include others as applicable such as Transit, Bylaw, etc.

An example of a very simple emergency notification chart for a small and simple event.

You may need different charts for different operational periods such as set-up, operational, tear down.

Emergency Notification Chart

Date From: _____ to _____



Having a structured approach to identifying and examining the Hazard and Risk level is critical. This table can be used for simple or small events to get a general indication of the risk level of an event and focus attention on the areas that need specific attention.

General Risk Evaluation Table

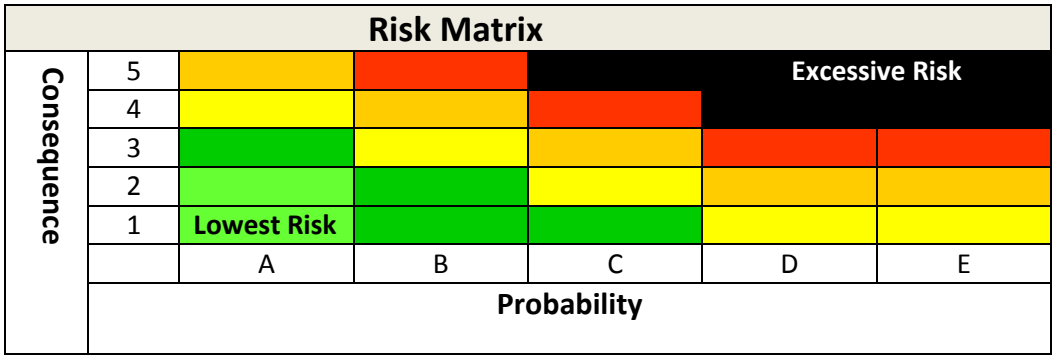
RISK FACTOR	1 Low	2 Medium	3 High	4 Extreme	SCORE
EVENT and ACTIVITY INFORMATION					
Type	Planned Events • Community and family based	Planned Events • Sporting Events • Runs/Walks • Concerts	Planned Events • Rallies • Demonstrations • Protests	Unplanned Events Any spontaneous event	
Duration	Up to 3 hours	Up to 10 hours	Up to 24 hours	Over 24 hrs - Unkn	
Infrastructure and Equipment	No structures Low to the ground such as tables, chairs	Soft structures such as small or moderate sized tents	Hard, Tall or Heavy structures (stages) Power cables and electrical equipment	Uncontrolled or non-permitted structures and equipment	
Alcohol	None	Confined Controlled Limited access	Uncontrolled Unconfined Moderate to high use	Excessive use Uncontrolled Unconfined Movement through public areas	
Criminal Activity	None expected	Potential bylaw infractions	Criminal acts Minor property damage Potential assaults	Life/safety issues Excessive property damage	
VENUE					
Type	Parks and public spaces that are non-confined	Buildings or parks with controlled or confined access (Plazas, theatres)	Buildings with uncontrolled access	Streets	
Route Safety	Paths and sidewalks No police assistance needed	Planned street route with some traffic control and signage	Un-escorted Un-marked with no police or safety controls	Varied route Un-planned Un-controlled Interacts with other users	

ORGANIZATION AND PLANNING					
Organizers	Well-organized Compliant Experienced	New group May be in-experienced	History of uncooperative behaviour Non-payment	Defiant Violent	
Event History	No problems No police interventions	Minor incidents Minimal police interventions	Major incidents Arrests, charges Some impact on city systems	Critical upset to city systems History of violence	
Event Planning	Maximum preparation time	Limited Preparation Plans	Minimal preparation time	No preparation time	
Security	None needed or Trained Paid Sufficient numbers	Needed but Limited training Volunteers Insufficient numbers	Needed but No training Insufficient numbers	No Security	
Emergency response planning	Have Emergency response plans including medical, security, evacuation, communications	Adequate emergency response plans and warning/notification system(s)	Inadequate emergency response plans and/or warning/notification system(s)	No emergency response plans and/or and warning/notification system(s)	
CROWD ASSESSMENT					
Crowd Type	Family Corporate Business Elderly	Young adults Persons of interest	Disruptive Rebellious Criminal	Radical	
Crowd Size and capacity	Small size High capacity venue for size of crowd	Moderate numbers Up to maximum capacity of venue	Large numbers Exceeds capacity	Critical density Uncontrolled venue	
Crowd Dynamics	Calm Cooperative Peaceful	Celebratory	Anxious Aggressive	Violent	
Community Resource and Impact					
Time, Day, Season	Weekday	Weekend or weekday evening	Fri or Sat evening, or Holiday, or other events in region, periods of strained servicing capacity	Periods of strained emergency capacity (Weekend evening, Holiday, other major events, times of high alcohol consumption.)	

This Matrix can be used for establishing the risk of specific threats and threats of high consequence. It can be used in conjunction with, or in place of the General Risk Evaluation Table. Results are entered in the Risk Assessment Table (next page). The Priority level can be color coded for clarity.

Special Risks Assessment

Risk Matrix*



*This is for example only. The Event Organizers, Local Authorities and other Government regulators are the ultimate arbitrators of Risk Rating Levels and the acceptable levels of Risk they are willing to permit.

Consequence

Level	Rating	Description
1	Insignificant	No injury, minor and routine issue
2	Minor	Very minor injury and/or temporary disruption of event
3	Moderate	Medical treatment required, temporary halt of events. Outside assistance required (ie. Police or EMS)
4	Major	Serious injury and/or system failure. Complete halt of event. Outside assistance and investigation required
5	Disastrous	Death, outside assistance and investigation required. Complete halt of event

Probability

Level	Rating	Description
A	Rare	Could occur in exceptional circumstance
B	Unlikely	Could occur but unlikely
C	Possible	Might occur
D	Likely	Often occurs
E	Near Certain	Expected to occur

Risk Assessment Table

Specific (or unusual) threats and threats of high consequence should be entered in the Risk Assessment Table along with the rating from the Risk Matrix. This ensures everyone understands the potential risks, focuses the planning on the threats of highest priority and ensures plans, roles and responsibilities have been made. – The following table contains example entries.

Hazard	Person/Loc	Rating	Risk Control Plans	Who I/C
Hazard: Stunt Vehicle Demonstration **Risk:** Vehicle may flip on jump. Driver could be injured from impact or fire. Public on west end could be endangered from flying debris.	**P:** 1-Driver 2-Public **Loc:** West grounds.	5B	-Stunt crew experienced. Have protocol and safety equipment. -Fire truck on standby with charged hoses and extrication equipment. -West side fencing to catch debris, roped off and signed. -Security guards posted on west side to keep people out. -Safety announcements will be given over PA System. -EMS crew on location.	Site Mngr - i/c setup. Stunt Crew Chief - i/c event activity. Fire Capt will support.
Hazard: Controversial Exhibit **Risk:** Protesters may try to disrupt exhibit, potential for hostilities between protesters and public	**P:** ABC Inc vs Freedom Org – **Loc:** Booth 14 Exhibition	C2	ABC Inc has been advised not to confront protesters. Police have met with Chair of Freedom Org and advised of potential for arrest. He has agreed to being allowed a 1 hr protest and flier handout, not more than 20 persons and will provide their own marshal.	Security Manager will supervise.
Hazard: **Risk:**	**P:** **Loc:**			

While planning for a large event it is not enough to just be focused on the event and venue. Large events can have unwanted effects on the community and congest, strain or collapse the infrastructure in the community or region. Services that the event planners expect may not be available as a result. These issues must be considered for events of unusual size for the community or region.

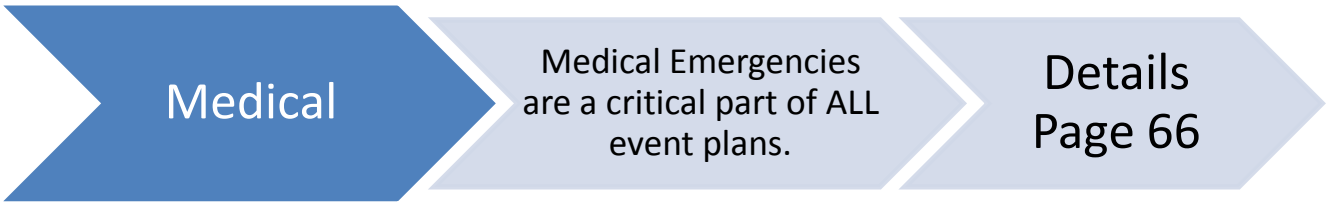
Infrastructure Capacity Issues			
0=No Impact 1=Good 2=Tolerable 3=Strained 4=Unable			
Infrastructure	**Capacity to Cope**	**Capacity in Emergency**	**Mitigation Steps**
Police Staffing	3	3	2 members will work OT
Hospital / EMS Staffing	2	3	Staff available on call-out
Roadways	2	3	As per Event Traffic Plan
West Neighborhood Parking	3	3	Extra bylaw attention
Cell towers	1	4	Landlines, radios avl. as backup

Some venues are already designed for events and have well established *Emergency Response Plans* in place. Others are not designed for the event. In all cases the event planner must review the plans for the venue to ensure it is appropriate and all safety needs of the public and performers at the event are met.

Site Plan / Map

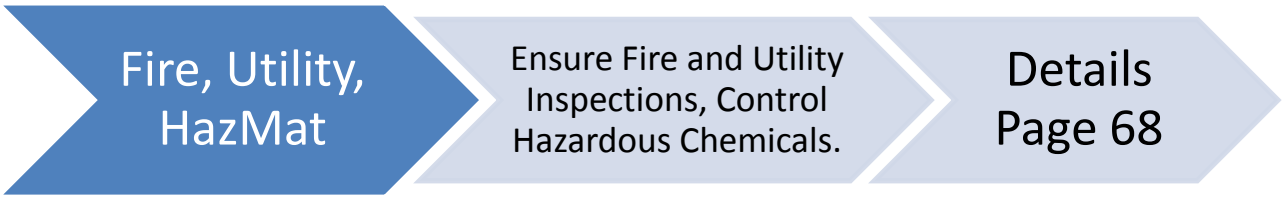
As part of the planning and/or permitting process there should be a site map or plan provided for each event/venue. Site plans, route maps and supporting diagrams and drawings should be submitted in both an electronic and paper format. Plans and maps should include but not be limited to:

- North direction
- Direction of travel - if event is a parade, race, walk, etc
- Names of adjacent avenues, streets and roads
- Emergency access routes
- Access and egress routes clearly labeled with numbers/letters matching those on the gates
- Location of temporary and permanent fencing, barriers or barricades set up for the event
- Parking facilities
- Generators and other electrical sources
- Fuel / chemical storage (if required for the event)
- Temporary and fixed event facilities including stages, seating (bleachers and grand stand), bridges, platforms, trailers, tents, amusement rides and vendor sites
- Staging and holding areas
- Location of vendor sites with cooking activities that involve flammable gases or open flames
- Location of first aid facilities
- Layout of permanent or temporary camping facilities if provided as part of the event



A medical plan is a CRITICAL component of any *Emergency Response Plan* no matter how small, even if it consists of only a few basic steps such as knowing addresses and having phones to call for an ambulance.

Proper Medical Event Plans can be technically complex and Alberta Health Services should be consulted for guidance on developing this part of your plan to ensure that sufficient medical services are provided to the public and that they are able to provide any services expected from the plan.



Properly identify the various fire, building and utility inspectors in the EVENT TYPE APPROVAL CHECKLIST (included in the POLICY, GOVERNANCE and LEGAL Worksheet) will ensure that the appropriate Subject Matter Experts have the opportunity to examine the *Emergency Response Plan* for these relevant issues.

Local Fire Services can provide guidance on the types and storage requirements of various chemicals in different venues. They can also give guidance on the types and amounts of chemicals that they would want to be made aware of (and marked on the site map) in case they need to respond.

Depending on the size of the event, the venue and expected weather conditions that historically occur, weather plans may require significant attention and planning. A simple check-sheet can be used to ensure weather events have been considered. Other examples are in the Mass Gathering Weather Readiness Guide. Refer to Appendixes 1-5.

WARM SEASON				
Weather Element	Impact: H=High M=Medium L = Low N=Not Aplc	Historical Probability; H= 3+/mo M= few/yr L < 1/yr R = Rare	Event Specific Critical Threshold Values triggering Action	Emergency Mitigation and Response Plans including who is responsible.
Tornado				
Thunderstorm				
Lightning				
Hail				
Humidex				
Extreme Temperature				
Rain or Showers				
Wind				
Dust Storm				
Fog				
UV Index				
Air Quality				

COLD SEASON				
Weather Element	Impact Level: H=High M=Medium N=Not Applc	Historical Probability; H= 3+/mo M= few/yr L < 1/yr R = Rare	Event Specific Critical Threshold Values triggering Action	Emergency Mitigation and Response Plans including who is responsible.
Snow /Flurries				
Blowing Snow				
Blizzard				
Winter Storm				
Wind Chill				
Extreme Temperature				
Freezing Rain				
Flash Freeze				
Rain				
High Wind				

Planners of events involving large crowds should be familiar with how and why past crowd-related tragedies have occurred. Many of these could easily have been prevented had their planners understood and properly planned for large crowd behavior. Reports and information on many of these incidents can be readily found on the Internet.

The following documents in particular should be read:

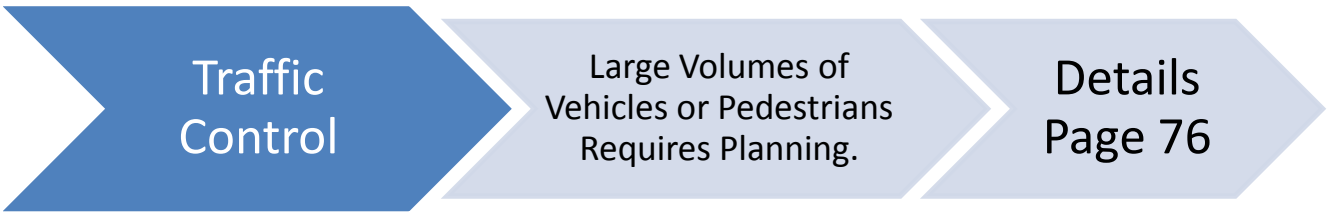
- Emergency Preparedness Guidelines For Mass, Crowd-Intensive Events – Government of Canada – Office of Critical Infrastructure and Emergency Preparedness
- The Cause and Prevention of Crowd Disasters: Paper by John Fruin (1993 – revised 2002)

Crowd Disaster Incidents

The following are significant crowd disasters that have occurred and have important learning points:

- Hillsborough Stadium Disaster – Sheffield, England – April 1989
- Nat Holman Gymnasium Tragedy - City College of New York – December 1991
- Great White concert - Station Nightclub Fire, West Warwick, RI – February 2003
- Love Parade – Duisburg, Germany – July 2010
- Sugarland concert – Indiana State Fair – 2011
- Luzhniki Disaster - Grand Sports Arena, Moscow – October 1982
- Wal-Mart Black Friday – Valley Stream, New York – November 2008
- The Who concert – Riverfront Coliseum, Cincinnati, OH – December 1979
- Pearl Jam concert – Roskilde, Denmark – June 2000

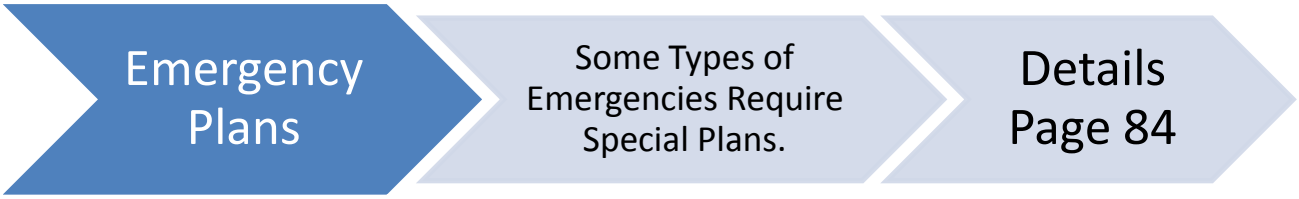
Specific references are not included as there are many articles, reports and publications on each of these incidents. They can be easily found by cutting-and-pasting the above lines into Internet Search Engines.



The event planners should work with the municipal bylaw enforcement and local police to ensure traffic issues and vehicle/pedestrian/cyclist separation are properly recognized and planned for. The Event Site Map should contain information detailing any mitigation steps regarding traffic.

Security is a very important aspect of an event. It may be as simple as having occasional presence of local law enforcement or be a very complex under-taking. While organizers can do a lot of things to enhance security, it is important that event planners do not attempt to do security plans in isolation. Even if they have experience they may not be aware of current criminal intelligence that may affect the event. Always engage local Police when deciding the levels of security required and what strategies should be undertaken.

It is important that staff understand their role in security and what the limits of their involvement should be to protect themselves.



A separate chart should be done for incidents of high consequence, where speed and accuracy is important, or for consistency of a re-occurring incident. These may not be needed for small events.

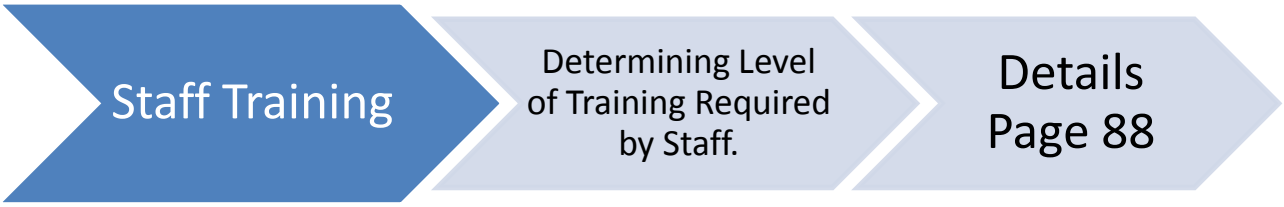
See the example in the following page for a step-by-step plan detailing the roles and contact information for each person / group involved in an emergency event. Each has specific tasks to do in specific orders.

Emergency Incident Plan for (Incident type xxx) – (example)

Plan should step through 5 stages

1. Report / Alert (Details Required)
2. Decision(s) responsibility
3. Notifications- Sequence, Timing, Methods
4. Staff Actions
5. Monitoring – loop back to step 2

	Incident Type XXX	
Time Done	**To be executed when (…. Conditions …)**	**Contact Info**
	Incident Reported	
	Dispatch Center	Channels 1-3 111-555-0000
	Obtain Key Information Points: - Location - Color - … etc …	
	Request Police response, provide details	911
	Notify Supervisor AAA by phone	111-555-1111
	Dispatch Units BBB and CCC	Radio Channel 3
	Supervisor AAA	111-555-1111
	Contact Main Gate Advise whether or not to close access	111-555-2222 or Radio Channel 2
	Report to Guardhouse	
	Set up Incident Command Post, Determine response level	
	Monitor radio, provide updates to incident Commander as required	111-555-3333
	Unit BBB	Radio Channel 3
	Respond to Scene and begin ….	
	Provide update to AAA	Radio Channel 3
	Unit CCC	Radio Channel 3
	Proceed to Gate 2, notify Dispatch on arrival, unlock and wait for Police	
	Upon police arrival notify Dispatch, escort them to scene.	
	Units DDD to GGG	
	Conduct Grid search of your assigned zone & report result to Dispatch	



Plans are only as good as the ability of Staff and/or Volunteers' ability to carry them out. *Event planners* must consider the skill requirements they delegate to them and be aware that some tasks may exceed their ability, training or legal authority to carry out. Larger and more complex events may require some training to be done, especially for more senior staff. At a minimum, staff and volunteers require various degrees of briefings or handouts to ensure they understand the event plans and their roles and responsibilities.

Staff Roles and Training			
Position	**Skill Requirements**	**Person**	**Training Requirements**

Consider having "tail-gate" meetings at the beginning of a shift. This is a brief and informal meeting with front-line workers and volunteers to reinforce previously taught safe work practices, new information, review protocols, ensure everyone has the proper equipment and allow them to raise any questions or concerns they may have.

Post Event

Post Event Procedures are Often Overlooked.

Details Page 93

Even a small event should have at least a basic debrief. Larger events should have a more thorough debrief and report. This is often neglected but is a very important document to assist in the planning of future events.

Consider:

- Before – Mitigation and Preparations
- During – Response
- After: De-activation, Recovery and Future Mitigation Efforts

Think About:

- What went right (and why): Things that need to be emphasized and continued
- What went wrong (and why): Things that will caused problems and need corrective actions
- Ideas for improvements: New concepts and ideas

Stage	Contributor	Observation and Comments	Recommended Actions Assigned to / Diary Date	Critical, Important, or Desired

Distribution List

- Municipal - (person I/C Event Plans) – copy to Event Emergency Response Plans binder
- Police
- City Fire
- Alberta Health Services
- Others ??

<<<<<<<<<<<<<< END >>>>>>>>>>>>>>

• Governance, Policy and Legal

Objectives

- Every municipality should have guiding principles for the planning, implementation, management and emergency response for all mass gatherings, including festivals and events.
- Accountability for the outcomes of the event should be clearly identified.
- An approval process for emergency response plans should be determined.
- Legal ramifications of risks and threats should be understood.
- An approval process for identifying required permits and licenses.

Considerations

- Does the event align with and enhance community values and benefits.
- Research and identify Municipal bylaws, Provincial and Federal laws and regulations requiring compliance:
    - Health and Food
    - Liquor Permits
    - Fire / Hazardous Materials / Pyrotechnics
    - Building Inspection
    - Traffic laws for parades and road closures
    - Public Health
    - Animal Protection, Care, Facilities Compliance and Inspection
    - Transport Canada (airspace)
    - Other
- Liabilities – ownership and insurance coverage
    - Injuries
    - Actions or omissions
    - Damages, environmental clean-up
    - Financial obligations
- Fee structures or charges for external services of Municipality / Province
- Third party services and guarantees of performance / liability

Background

Legislative Requirements of Municipalities

The Province of Alberta has an Emergency Management Act which under section 11.2(1) requires that,

> A local authority:
>
> (a) shall, at all times, be responsible for the direction and control of the local authority's emergency response unless the Government assumes direction and control under section 18;
> (b) shall prepare and approve emergency plans and programs;
> (c) may enter into agreements with and make payments or grants, or both, to persons or organizations for the provision of services in the development or implementation of emergency plans or programs.

Under the *Act* all municipalities must be responsible for ensuring that emergency response plans are developed.

Liabilities, Due Diligence and Obligations to Public Safety

"If you think safety is expensive, try having an accident." – Common Workplace Safety phrase.

Due diligence is the level of judgment, care, prudence, determination, and activity that a person would reasonably be expected to do under particular circumstances. As applied to an emergency program, due diligence means that all reasonable precautions are taken to address public safety risks, including during response to an emergency. This duty also applies to situations that are not addressed elsewhere in the occupational health and safety legislation.

Due diligence in planning is important as a legal defense. If charged, a defendant – who could be YOU! - may be found guilty if he or she cannot prove that due diligence was exercised. In other words, a defendant needs to prove that all precautions, reasonable under the circumstances, were taken to provide the necessary services and procedures in prevention, mitigation, emergency response and recovery.

It should be noted that most Criminal and Civil litigation are not based on the incident itself or the response to it, but on what was NOT done PRIOR TO the incident – ie. lack of planning in preventing, mitigating or response planning to a foreseeable incident.

Municipal Event Emergency Response Plan Policy

Municipalities should consider developing an Event Planning Policy that officially supports and endorses the value and benefit to the community of hosting safe and well planned community events. It should also align with other significant municipal policies.

The policy should support a legal agreement with the event organizer that provides a clear understanding of indemnification, insurance obligations, agreement to comply with all bylaws, and requirements for on-going communication of changes to scope and risk of the event. It will also help

identify roles and responsibilities for employees who are responsible for community events and who work with community organizations. It is recommended that policy include sections on:

- the purpose of hosting and supporting special events
- definitions designed for the particular municipality which also align with industry standards
- definitions for municipal hosted events, community events, co-sponsored events and subsidy requests
- guiding principles
- outcomes and benefits that support the value of community special events
- roles and responsibilities
- management framework/ process for approvals

A good example of municipal festival and event planning guidelines, incorporating agreements and checklists for the event planner is shared by the Town of Cochrane at: http://www.cochrane.ca/municipal/toc/webcms.nsf/AllDoc/0FC7457977C1AFE28725746D00785907/$File/Event%20Guidelines.pdf

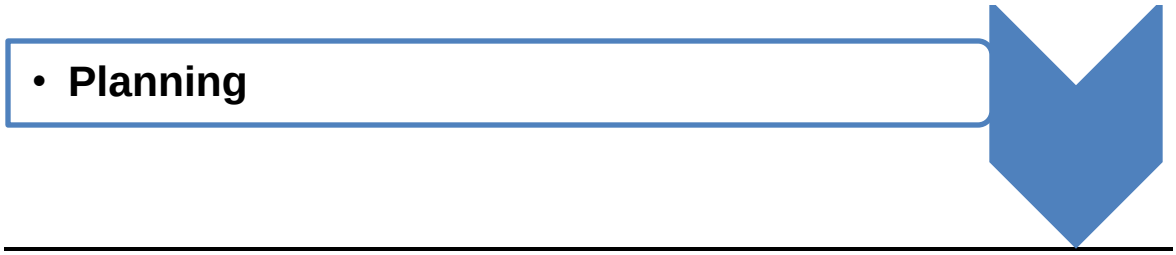
Bylaw, Regulatory and Inspection Compliance

All pre-planned mass gatherings or special events must adhere to all Approvals, Permits, Regulations, Bylaws, Inspections and Standards. Requirements should be set out to ensure the organizers can demonstrate their compliance with these.

Event Application Process (Event Plan)

Every municipality should have an event application form(s) that all event organizers complete and an approval process to ensure that all services that may be called upon to assist or respond are aware of the event details. The application form requires the event organizers to develop and document more detailed information about their event including the Emergency Response Plan detailing how they will manage security and what they will do in the event of an emergency. By using this guidebook, the Event Plan may be tailored to include requirements for different types of events in their community including the portions required for an Emergency Response Plan. The following are examples of some common requirements:

- Type of event
- Event details
- Event organizer contact information
- Site and/or route maps including access and egress
- Command and control structure and activation
- Communications procedures during the event and for emergencies including media management
- Contingency plans for weather
- Evacuation and shelter in place plans
- Transportation and parking plans
- Security and attendance control
- Medical and lost person procedures



Objectives

- Create a properly represented Planning Team
- Create a proper planning process and structure for this and future events
- Identify laws, regulations, inspections and bylaws impacting the event
- Identification of roles and responsibilities of event organizers and staff
- Establish a systematic approach to identifying, mitigating and response to potential hazards
- Develop procedures for the response to expected or high consequence events identified in the risk analysis as well as strategies for seamless coordination of response between staff and external response services that may have to attend
- Help your community and its citizens by hosting well organized and safe community events

Considerations

- Prevention and mitigation must be an attitude that needs to permeate every aspect of the event and requires the participation of all staff as well as the public
- Representation/consultation from primary emergency services and medical facilities
    - Police
    - Fire
        - Prevention
        - Suppression
    - EMS
    - Hospital
- Representation from governments of jurisdiction
- Representation from applicable service delivery areas of government
- Representation from contractors / performers of event
- Representation from any utility companies / inspectors involved
- People with experience hosting this or similar events
- Do previous or existing plans exist and if so, when were they last updated or reviewed
- What were the lessons-learned from previous similar events

Background

Benefits and Prevention Aspect of Having a Plan

Developing an Emergency Response Plan allows the organizers, local authorities, emergency services and other service providers the opportunity to think through and recognize the safety issues and service demands they will need to contend with. Group input and review will identify safety issues and dangers that might otherwise be overlooked. This will also be critical to demonstrating your due diligence should a legal issue arise from the event.

The planning process allows everyone time to develop a working relationship, identify where they can assist each other, or have conflict. This allows for resolving issues early on instead of trying to do so in the midst of handling an emergency.

Level of Planning Detail

A *balance must be attained* between the detail and thoroughness of the planning process against the probable risks of the event to avoid quashing community events through excessive planning requirements. The detail to which it must be developed will depend on the size and complexity of the event and the type and degrees of risks that are identified by the planning team. Local authorities and stakeholders are usually in the best position to achieve this balance bearing in mind their obligation to the public's safety.

Depending on the complexity of the event, planning may begin several weeks or months in advance. It is important that Emergency Response Plans are considered and built concurrently with all other event planning. As decisions are being made related to the what, where, when, why and how of the event, an on-going dialogue should include what are the hazards, risks, threats, mitigations and contingencies that impact the safety and security of people, property and the environment.

ID Stakeholders – Create a Planning Team

It is critical that all pre-planned events have a Planning Team with some degree of experience, expertise and/or training, the degree to which is dependent on the type and size of the event. Small community events may consist of a few people with some experience organizing community-based events and representation from emergency services while larger events may have numerous levels of organizational structure and may require people with specific expertise.

The Planning Team must ensure it has representation from all appropriate community organizations that could be impacted or required to provide services as well as people who have experience with that type of event. All plans should include local emergency response personnel from emergency management, Police services, Fire services, EMS and AHS. Several of these organizations may have laws or regulations that they are required to enforce or will have limitations on their capacity and include groups such as Health Inspectors, Parks and Recreation, Transportation and Building Inspectors. There may be several more depending on the nature and circumstances of the event.

• Documentation

Objectives

- Process for monitoring planning process and timelines
- Record of decisions, agreements and responsibilities
- Record of legal agreements and permits
- Final Report, closing documents

Considerations

- Begin to develop a library of Event Plans. These will assist you in developing future plans and templates
- Ensure you have proper distribution and tracking lists and version control
- A closing report is important to capture lessons learned and ideas for improvement
- Proper documentation can be very important to defend yourself if legal issues arise
- Keep a record of important meetings, planning sessions, decisions made and keep notes or a log of any incidents or concerns that arise during an event

Background

Record Keeping

It is essential that key information be documented and activities logged during the planning and running of an event. While it may be bothersome and incur costs to maintain accurate records, they are necessary to improve and reduce the work required for developing future plans.

Good records are important to maintain a clear and accurate record for many other reasons such as wage disputes, injury lawsuits, Workers Compensation, employee misconduct, criminal acts, legal or regulatory compliance or other types of litigation. If there are areas where such claims may be expected it may be worth considering enhancing records with technologies such as video-taping.

Consultation with legal staff should be considered concerning the policy for the type and detail of record keeping as well as the storage and retention of these records.

Plans Amendment Record and Distribution Control

Emergency Response Plans may be for an event held only once within the community or an annual event held at the same venue (i.e. a rodeo, parade, race or fair). Good records will allow a plan to be re-used but organizers must ensure it is reviewed to check for any changes to the venues, event activities, regulations, etc. Resources and contact lists need to be reviewed and updated annually. The Distribution List and Amendment List are tools that will ensure that all parties are working from the most current plan.

Scribe

Important meetings should have minutes taken. During large events or when significant incidents happen, staff and key decision makers will be very busy and should have a good note taker assigned to them to record the situation details, information, decisions and when they were known/taken. Accurate notes can be very important when a post event analysis is done and they can be critical in defending yourself from allegations.

Closing Report

A closing report is useful should there be any controversy arising from the event and also if this or similar events are to be held again.

The Closing report is covered in more detail in the section – "Post Event".

• Command Structure

Objectives

- Command structure determined and positions confirmed
- Internal reporting and communication lines documented and charted
- Agreement on authorities and responsibilities
- External communication and assistance protocols with emergency and other services established,
    - When to call
    - Who authorizes call
    - Who calls whom
    - Information required
    - Actions and expectations of all parties

Considerations

- The speed of the information loop; information - analysis – decision – instruction – action – feedback, can be crucial and should be optimized
- Expect that your plan needs to be flexible and anticipate having to make repeated adjustments to it as dictated by the situation
- Encourage or require staff (especially decision makers and supervisors) to take appropriate training courses such as Basic Emergency Management (BEM), Incident Command System (ICS-100) and Exercise Design (ED-100) courses offered at no cost by Alberta Municipal Affairs http://apsts.alberta.ca/online-courses/
- Monitor the event and attendees using appropriate methods and ensure good communications from staff to continually monitor what is happening prior to and during the event

Background

Decisions, Authorities and Responsibilities

During an event people can become confused about who is in charge and what roles and responsibilities all of the various agencies play during normal operations and during different phases of an emergency. Disorganization can become compounded if there are multiple incidents occurring at the same time. There must be some structure for the key agencies to work together to coordinate an effective response and communicate it to others. Even for small community events, someone needs to be "in-charge" and making the critical decisions during an incident response.

ICS – Incident Command System

There must be a determination in advance of the event on what type of command and control will be used in the event of a serious incident or disaster.

There are a number of disaster management systems that can be used and adapted to even the smallest number of people. Currently the Incident Command System (ICS) is being adapted by many organizations across the province and country. This system works especially well for larger responses when there are several agencies involved in response such as police, fire, EMS, bylaw, animal services, utility and energy companies, transportation, social services etc.

An overview of the Incident Command System including function roles and responsibilities can be found in the I-100 self study guide at http://apsts.alberta.ca/online-courses/ics-100 .

• Communication

Objectives

- Contact lists and communication lines established
- Proactive pre-event public media strategy and messaging established
- Public media strategy and messaging during event established
- Communication technologies determined
- Alternate and backup plans established
- Emergency communication steps mapped (see Emergency Plans section)
- Event delay / cancellation policy, protocols and notification determined
- Emergency broadcast process / approval established
- Public incident reporting process facilitated
- Monitoring and feedback strategy for situational awareness

Considerations

- Can you protect yourself against allegations that you did not fulfill your “duty to warn”
- Contact lists and numbers are readily available for all event organizers, as well as emergency coordination, response personnel and other (potential) assisting organizations
- Contact lists have been updated and checked for accuracy
- Don’t neglect pre-event and during-event communication with the public
- Strategy on how and who will manage the media if present
- Identify what public communication systems will be used and how emergency communications will be delivered to event attendees (including pre-scripted messaging to be delivered in the event of an emergency)
- What are your backup technologies or manual systems, do you need backup power
- Clearly identify the roles and responsibilities of event and municipal public information (media) staff, including: strategies on media releases, triggers to engage a media center & opportunities for event and municipal communications staff to work together to insure accurate and timely information flows
- Monitor the event and attendees using appropriate methods and ensure good communications from staff to continually monitor what is happening prior to and during the event
- Enable feedback and reporting by the public
- The speed of the information loop; information - analysis – decision – instruction – action – feedback, can be crucial and should be optimized
- Expect that your plan needs to be flexible and anticipate having to make repeated adjustments to it as dictated by the situation

Background

Large and small events are held in communities of varying sizes across Alberta, each with their own sets of risks and response capacities on and off site. A means of communicating with staff, external partners and the public is essential for every size of event.

For events in small or confined spaces, an air horn or microphone system as well as a phone to call local emergency services may be all that is needed. For larger events spread over a wide area, there may be a need to establish multiple communications systems to enable messages to be delivered to different sections of a crowd or different indoor/outdoor facilities. Some consideration should also be given to extend the ability to communicate just beyond the controlled venue boundaries or the surrounding area.

A central communications area adjacent to or part of the command post area should be considered for larger or higher risk events.

Internal Communication (Staff)

Determine how staff is going to communicate. Develop a reporting structure and ensure everyone is aware of it. Staff should know who to call for what incidents and what key information bullets will be needed. Ensure you have and maintain accurate contact lists and have a check-in – check-out system for staff and volunteers.

Do not over-extend the span of control of supervisors.

Use staff to monitor the event and provide regular situational awareness back to the command center. Larger events should have someone designated to monitor this information and provide updates to the Management Team at regular intervals.

When an emergency occurs, there will be little if any time to pass along lengthy instructions. Staff must know their pre-defined roles and act quickly keeping the communication channels free of unnecessary chatter. Larger events with lots of staff may consider a set of keywords to trigger a response for specific incidents.

(*This is covered in more detail in the section – "Emergency Plans")*

External Organizations (Partners)

Communications systems between event organizers, security and emergency response personnel should be interoperable so that during an incident or disaster all parties are able to communicate efficiently and effectively. Ensure that key organizers and security personnel in control of event activities have the ability to communicate with an identified emergency coordinator so that changes to the event and public notification can be made quickly.

Emergency Notification

The event Planning Team should work with the local authority(s) to develop a mutually acceptable set of notification/activation triggers based upon risk and response capability. Notification procedures should be developed to ensure the timely notification of persons responsible for taking emergency actions. The procedures for activating this group of people should be brief and easy to implement.

The best way is by developing an event notification chart. A notification chart is a diagram of the hierarchy for notification in an emergency, including WHEN to use it, WHAT are the key pieces of information needed, WHO is to be notified, by whom and in what priority and HOW are they notified. Phone calls, emails or radios can be used depending on the size of the event and the number of people that need to be contacted in a given period of time.

There may be different communications that go to different groups of people. There may be one notification list for key responders, another for senior municipal personnel and another for elected officials.

External Communication (Public)

Duty to Warn

Duty to Warn is a concept that arises in the law of torts in a number of circumstances, indicating that a party will be held liable for injuries caused to another, where the party had the opportunity to warn the other of a hazard and failed to do so.

Prevention and Mitigation

Most safety plans focus on the response to an incident and what the staff should do. Often overlooked is the role of the attendees to self-organize and self-manage. Treat the public as *partners* in the event safety plan.

Most attendees at an event are both motivated and compliant to safety practices if they understand the 'what and why' and are treated in an honest, open and respectful manner. Use multiple forms of communication if possible including social media both prior to and during the event. Attendees should know the 'House Rules' be reminded that their actions can enhance or jeopardize the safety of the group as a whole and they *have a personal role in their own safety*.

Good signage, handouts, safety messaging and emergency instructions should be blended into all aspects of the event and be posted in conspicuous areas throughout the venue, especially at entrance. Ensure attendees know how to respond to potential hazardous events. Inform them where to get various forms of assistance, how to report issues, the location of shelter and safety facilities, where emergency routes are and what the various safety hazards may be.

If the event has professional performers, utilize them into your prevention and messaging. Performers are usually skilled in communicating and influencing a crowd's behavior. Involve them in your communication planning to deliver key messaging and establishing positive outcomes.

Special Needs

Be sure to consider the needs of people with language, health or mobility issues that may affect their ability to access, understand or follow safety guidelines or emergency procedures.

Updates and Warnings

Keep the public well informed. Live updates throughout the event on developing situations such as weather conditions can be given through various media including public announcements and social media. If attendees are expecting there may be delays, disruptions or changes, and understand the reason why, they are more prepared and accepting of them.

Communication Technologies and Methods

Communications systems can include portable radios, telephones, cellular telephones, social media, public address systems, etc. Make use of multiple communication technologies based on their strengths and weaknesses. With large crowds spread over a large area or still enroute to an event, consider using social media such as Twitter.

Also consider how the public communicates with the organizers. How do they report problems? Is there intake capacity?

Be aware of limitations. Large crowds can overload cell towers, especially in an emergency. Venues can be too noisy to hear a ringer or speak/listen to a voice call. Some areas may have reception dead spots. Texting often continues to work after voice lines become jammed. Because a single system can fail, the communications system should be multi-modal and a back power supply may be prudent. Don't overlook simple fail-safes such as having 'runners' available to courier messages. Ensure you have backup plans and that staff knows what they are.

• Hazard Vulnerablility and Risk Assessment

Objectives

- Obtain group input into identifying hazards
- Identify all of the hazards that may be associated with the event and what level of risk they represent
- Prioritize the hazards based on the level of risk they represent
- Focus efforts on the highest priority risks first
- Develop mitigation plans to eliminate or reduce the level of risk for each element as much as possible
- Determine if the level of risk remaining is acceptable or if additional mitigation efforts are required
- Those who are in approval positions should be provided a clear understanding of the risks and Mitigation Plans to support their decisions
- It should be clear 'who owns' a risk

Considerations

- Ensure you have proper representation in the Planning Team
- Encourage open discussion to identify and prioritize risks
- Get broad input for ideas on mitigating hazards
- Consider risk against the things you wish to protect. Protection of life is the most important but you also need to protect other things including property, community interests, environment, financial interests, legal obligations, reputation and infrastructure
- With every risk identified you must not only consider how to respond to it, but how it might be prevented or minimize its effects – it is better to not have a victim than to treat one
- Ensure roles and responsibilities are assigned
- Know the audience demographics and plan for expected behaviour (e.g. alcohol availability)
- Establish the level of security and medical services required
- Establish the level of other support services required
- Develop procedures for the response to expected or high consequence events identified in the risk analysis as well as strategies for seamless coordination of response between staff and external response services that may have to attend
- Risk can never be eliminated entirely. Discretion is required to avoid becoming too risk-adverse

Types of Hazards

- Audience / Participants
    - What ages (or range of ages) are anticipated to attend
    - Is there any process to limit numbers of attendees/participants? (ticket purchase, etc.)
    - Are there adequate facilities/equipment for the expected age groups
    - Are there identifiable portions of the attendees who may be challenged to take actions for self-preservation with or without directions? This could include children, those with physical and/or cognitive challenges and persons with service animals
    - Are there risks from crime / protests / fights / lost or missing persons
    - Will there be participation of or attendance by any VIP(s)
- Activities
    - Does the setup, maintenance and/or take down of equipment for the event pose any specific or general hazard (use of forklift, installation of temporary electrical cables, refueling of generators, propane tanks, etc.)
    - Is there preparation of food (or other products) on site
    - Does the event bring outdoor equipment into an indoor space
    - Are there dangers inherent to the activities (sports, rodeo, auto racing, etc)
    - Are there best practices or professional standards for these activities and are those standards being adhered to / inspected / enforced
- Venue
    - Is there a danger of overcrowding or are there crush zones
    - Is it well maintained, are staff professional and are general safety practices followed
    - How flammable is the structure or items within it
    - Are there security threats
    - What are the access and egress areas
- Infrastructure and Services
    - Will emergency, municipal, commercial, telecommunication or other services and infrastructure be able to support the number of attendees
    - Are there issues with vehicle and pedestrian traffic
    - Will emergency services be able to efficiently respond to and cope with the types of emergency situations that can be reasonably expected might occur
- Environmental
    - Are there risks with the venue such as lakes, rivers, rough terrain, etc
    - Are there exposure hazards from sun, heat or cold
    - What is the possibility of extreme weather events
- Special Risks
    - If alcohol is served are there anti-impaired driving strategies
    - If animals are involved:
        - Is their standard of care specified / supervised / inspected
        - Are there adequate safety measures to prevent injury from and to them
        - If one is injured are there protocols in place to treat / transport / euthanize

Background

Need for Risk Assessment

Hazard and Risk Assessment is the heart of an event plan from which all other planning is based upon. There will always be some level of risk to any event. You should not expect to achieve a risk-free event; but strive to reduce and managed the risks. We do this all the time both consciously and unconsciously during the course of a day and when we plan events. The problem is everyone has a different ability to recognize hazards and each has a different tolerance for risk. *(You only have to think of how different people drive to appreciate this.)* It is therefore important to follow a clear and defined process to ensure all significant hazards have been identified and there is clarity for everyone on the level of risk they pose. Without this clarity, decision makers are unable to make reliable decisions and organizers will not focus their attention and planning on the most important issues.

General vs Specific Hazard Vulnerability and Risk Assessment

For many smaller community events a General Risk Evaluation Table (see page 26-27) may be all that is required*. (Note – this table does not contain some risk elements that may need to be considered such as weather. You may wish to modify this for your local needs.)* Events should also be examined to identify any specific risks that might be associated with it and if so use a more detailed Hazard Vulnerability and Risk Assessment process.

Hazard Vulnerability and Risk Assessment

Every type of event, facility, location and activity present a different set of hazards and risks. With larger events or those that present unique hazards, the General Risk Evaluation Table may not suffice and a more specific Hazard Vulnerability and Risk Assessment (HVRA) should be done. There are many methods of doing this such as the example is on pages 28-29. It is important to involve people with both the local knowledge and those with experience in the type of event to ensure these are properly identified and understood. Planners should be familiar with the municipal HVRA and consider resources availability and event requirements, to ensure capacity to respond is maintained through mutual aid and/or contract services as required.

Risks to Community

When completing the HVRA it is important to remember that mass gatherings are by definition “a congregation of people at an event or activity, generally a high concentration of the local and visiting population in a limited area of the community”. Therefore consideration must be given to all the response agencies’ capacity to respond not just to the event, but also all the other concurrent events and usual service demands in the rest of the community and the effect the increase population might have on them.

Activities

Some types of activities at the event will have inherent hazards. It is important to know the details of what the activities are planned for to understand the potential risks. Ensure your Planning Team has representation from someone who has in-depth knowledge of the event activities.

Risk Assessment Process

Risk Identification

The first step is to compile a list of the various types of hazards that may pose a risk. This is where people with experience are critically important. Hazards can often be grouped into four categories;

- **Human**
- **Mechanical or Technical**
- **Venue** (including weather for outdoor events)
- **Activities** that are taking place.

It is also important to examine the whole event, including set up and take down. Done properly, the number of risks identified may be large and seem overwhelming. It is important however to be thorough.

Risk Control

When a Risk is identified, the second step is to use the following hierarchy of controls to see if it can be reduced or eliminated altogether. Do these in order and don't just 'make a rule' for everything.

- **Eliminate** – Can the item or process be eliminated or done differently
- **Substitution** – Is there an alternative with less risk that can be used
- **Design** – Can the hazard be redesigned, contained, secured, or enclosed
- **Administrative** – Are there rules, training, operating procedures in place
- **Protective Equipment** – Can people be protected with items such as hearing protectors, gloves, hats, eyewear, safety vests, etc.

Risk Prioritization

The third step is to prioritize the hazards to ensure you are focusing your limited resources on the most important risks. Prioritization is a combination of the probability that something will occur, combined with the severity of the consequences if it does. Use the Risk Matrix chart (page 28) to apply a consistent priority rating. (You may wish to adjust the values of the matrix to reflect your community and its tolerance for risk)

Once the hazards have been prioritized, chart them (page 29) and begin working through them in order of priority. With each risk your planning team should develop mitigation strategies and assign roles and responsibilities.

Once completed, the people with approval responsibility will be able to have a clearer understanding of the level of risk they are undertaking and what resources are required for the event.

• Impacts to Infrastructure and Community

Objectives

- Determine the types of resources and services that will be required by the event and its attendees
- Assess the capacity of your local infrastructure and service capacity
- Identify services and infrastructure gaps that will require additional capacity or where other mitigation efforts are required - ensure they are consulted
- Identify areas where the additional strain on services and infrastructure may reduce or prevent services to the event or the community
- Identify the ability of the infrastructure to function in various emergency scenarios

Considerations

Consideration must take into account the capacity of the local services and infrastructure and how an event can impact the surrounding communities;

- Policing / Other enforcement
- Hospitals
- Fire / Rescue
- Inspection staff
- Traffic control / Road closures
- Transportation Corridors / Non-paved roads and surfaces, especially during rainy weather
- Parking / Public Transportation / Towing
- Neighboring properties and businesses (access, disruption, litter, etc)
- Food / Water / Sanitation
- Communication availability and capacity (ie. cell tower capacity, especially in emergencies)
- Accommodation / Shelter / Campgrounds
- Water pressure
- Commercial supplies / Food services
- Recycling / Trash and sanitation services / Sani-dump and sewage capacity
- Noise / Smoke
- Criminal or Disruptive behavior

- Electrical capacity
- Banking Machines
- Potential environmental impacts
- Repairs to infrastructure / Site clean-up

Background

Event planners must be cognizant that infrastructure is generally built to service a 'normal' population. Events will often draw populations that are far greater than the 'normal' population of a community or specific location. Emergency Response Plans must not be based on the assumption that regular services and infrastructure will automatically be available at their usual level.

Most often these impacts will only be an inconvenience; however they can be critically important in an emergency. Are towing services available to quickly remove vehicles blocking traffic or emergency access, will traffic jams delay the response times of emergency vehicles, do police and hospitals have sufficient staff, would infrastructure be damaged by the emergency incident itself, would communication be jammed from overuse, can utilities and sanitation handle the capacity, etc.

A critical element of infrastructure capacity is to consider the behavior of people in emergency situations; many will begin using cell phones jamming cell towers, people fleeing could jam roadways, in poor weather people could rush for shelter exceeding capacities, etc.

• Venue - Indoor and Outdoor

Objectives

- Determine if the venue is designed for this activity and meets all inspection requirements
- If it is a licensed event has Alberta Gaming and Liquor Commission approved the venue
- Determine if venue already has event safety plan in place and that it is adequate
- Is the venue able to handle / control capacity
- Determine what if any additional services the venue will require from the municipality
- Are maps / blueprints and other documents sufficient for the needs of emergency responders
- Are venue hazards identified and mitigated in the planning
- Is the venue safe and able to protect the attendees in the event of foreseeable emergencies

Considerations

- Site Plan Required
- What is attendance capacity
    - Is this an open or closed event
    - What is the plan if over-attended
- Are there modifications or temporary structures requiring permits or inspections
    - Stages
    - Hot tubs
    - Food establishments
    - Temporary gas / electrical
    - Mobile concessions
    - Amusements rides
    - Enclosures, fences, barricades
- Are water requirements addressed
- Are garbage/recycling bins and pickup addressed
- Is there sufficient sanitation facilities (restrooms, hand sanitation, etc)
- Lighting requirements
- Secure areas for supply storage
- Banking machines / financial booths (availability and security)
- Other specific requirements (for infants, children, handicapped, others)
- Fuel storage
- Back-up power supply

Venue – Indoor specific

- How compatible is the building design with the intended use
- Do building permits, inspections and emergency plans already exist
- Capacity and seating limits approved
    - Method and means to control capacity
    - What is the maximum density desired (refer to chart in Critical Crowd Density)
- Are there alteration to typical designed use and seating
    - If so are new inspections and permits done
    - Is there danger of crowding or potential crush zones? If yes, what is control plan
    - Is there assigned seating
- Is there equipment being introduced that is not normally present
    - Do these affects air quality
    - Do these introduce fire/flammability dangers
    - Do these introduce other dangers (tripping, falling, etc)
- Is the building part of larger indoor / outdoor event
- Is there capacity control if the exterior crowd rushes in for shelter (i.e. escaping rain)

Venue – Outdoor specific

- What if any barriers exist to separate the event area from surrounding area
- Is attendance going to be controlled and if so how
- Are there any hazards (natural or human caused) that exist on or around the grounds
    - Overhead power lines
    - Water hazards, cliffs, other natural dangers
    - Environmentally sensitive areas
    - Areas sensitive to wildfire
- Are there on site vehicles (delivery, ATVs, power carts, snowmobiles)
    - What is the plan to control movement & speed of them?
    - How is vehicle / pedestrian separation maintained?
    - Are pathways all-weather (rain=mud?)
    - Are road/pathways capable for vehicles (width, turning radius, weight, etc)
    - Can vehicles get past each other if one is parked (ie. delivery), 1 or 2 way travel
- Is there seating areas and what is the capacity
- Poor weather contingency plans
- Is an Extreme Weather Plan require (see section on weather)
- Fire hydrants/emergency water supply
- Shelter from extreme weather events (hail, lightning, wind, tornado)
- Extreme temperature plan required
    - Water distribution
    - Patrols to monitor for people at risk
    - Cool off / warm up facilities

Background

Events can be held indoors or outdoors, each of which presents its own challenges. An evaluation of the venue must consider how to best protect the health and safety of participants and staff in the event of any emergency. Some key considerations are capacity limitation and control, emergency egress and ingress and types of structural threats (flammability, wind tolerance, etc).

Unless a facility is specifically designed for the type and size of event being planned, for example auditoriums, grandstands, stadiums or convention centers; there will be a need to evaluate its suitability and safety. This will normally require a variety of inspections and permits.

Building Codes

Existing permanent structures may require a permit if the use or occupancy of the building is going to change (even if just temporarily) as a result of the event. This may include events where the occupancy is not changed but the location of the occupants is moved such as using an arena's ice surface for a ceremony, seating or dance floor. Even if permits are not required, there may be additional planning such as widening access to the area by removing boards, removing the glass off the boards, etc.

Organizers need to consider what performance facilities and special structures are needed. Consider Alberta's safety codes system when the infrastructure (temporary or permanent) is being put in place at the site of an event. In some cases permits for the construction of these structures are required. The requirement for permits is largely in place to insure the involvement of a safety code officer. The Safety Code Officer will determine if things like load bearing capacities, occupant loads, evacuation or egress routes, fire and emergency plans, barrier free access, sanitation facilities and access for emergency vehicles have been addressed. The Safety Services Branch of Municipal Affairs administers the *Safety Codes Act* (SCA), and issues advisories pertaining to the safety of Albertans.

Examples of temporary structures that may be regulated by the Safety Codes Act include:

- Stages (with platforms more than 1200mm higher than adjacent surface on any side or overhead structures that are used in conjunction with the stage). See http://www.municipalaffairs.alberta.ca/documents/ss/StagePermitNotice.pdf for stage and tent permit information
- Pools / Hot tubs
- Temporary Gas and Electrical systems
- Mobile Concessions (including fuel, electrical and fire protection systems)
- Amusement rides (see AR-99-002 at http://municipalaffairs.alberta.ca/documents/ss/STANDATA/ar/ar-99-002.pdf)
- Enclosures, including fences around events where access is restricted to persons due to the requirement for admission to be paid, that liquor is sold, games of chance take place within the enclosure or safety of event participants and staff are a consideration.

Facilities / Building / Equipment

- Is the event taking place in a facility normally used for assembly type purposes
- Is the event similar to the activities which normally take place within the occupancy
- Does the event involve placement or erection of temporary equipment or structures
- Have occupant loads been determined in terms of the Building and Fire Code and possibly the Liquor Control Act by the appropriate authority
- If some or all the event takes place out of doors are there provisions for the potential movement of people into other buildings, which may already be occupied, in situations of inclement weather or emergency
- Are the facilities, buildings, structures, places or equipment complaint with the applicable codes, standards, regulations and permits under Alberta legislation

By answering these questions, and taking appropriate measures, the owners, operators and regulators will have conducted much of the risk analysis that should be expected at mass gathering events.

Organizers should contact the local municipality, including the fire department and those who deal with building, electrical and gas permits, well in advance of the event to ensure that all regulatory matters have been identified and addressed. Participation of these groups in the planning of events has proved itself of value repeatedly, reduces potential for conflict at the last moment and improves any required emergency response.

Public Health

Under the Alberta Public Health Act, there are health considerations that apply to mass gatherings for which approval is required (e.g. food premises); therefore, early notification of an event to your local Public Health Inspector/Environmental Health Officer is key. Examples of areas requiring inspections/permits are the provision of washroom facilities, handwash stations, food preparation and drinking water. Relevant regulations, including the Food Regulation and the Nuisance and General Sanitation Regulation, can be found at - http://www.qp.alberta.ca/574.cfm?page=2006_031.cfm&leg_type=Regs&isbncln=9780779730148

Special Needs

Special spectator areas (close to washrooms, shelter areas and expedited emergency evacuation routes) should be considered for special needs and otherwise handicapped attendees, their caregivers and any service animals they may have.

• Medical

Objectives

- Identify the potential risks and medical needs based on type of activities, the environment and the demographics and special needs or the attendees
- Ensure an appropriate level of medical services are available on-site based on the size and particulars of the event
- Ensure that adequate emergency medical response from Alberta Health Services (AHS) is available if required
- Ensure that emergency medical support is able to efficiently respond to and egress from the venue if required
- Have a plan for a Mass Casualty Event or ensure the community has one
- Ensure all event staff know their roles, responsibility and communication procedures in the event of individual or mass casualty medical emergencies

Considerations

- Has the general medical requirements of the expected demographics been determined
- Has response level expertise suitable for event-specific hazards been determined
- What steps can be taken to keep people healthy or identify those in an early stage of distress such as heat stroke
- Is a first aid station required and if so is it identified with proper signage/notification
- Is weather protection available for patients while they recover or wait for transportation
- Are emergency access route(s) identified and known to AHS/EMS
- How will patients who can't walk be moved to triage / treatment areas (distance, terrain, stairs)
- Access through Crowd – Is there a plan and means to be able to transporting medical staff, equipment and a stretchered patient through heavy crowds and clear a working area for them
- Evacuation by Ambulance – Is there a staging area(s) for ambulances
- Evacuation by Air - Is the landing area sufficient and secured? Are the GPS coordinates known
- Is a triage area identified and secured in case of a mass casualty
- Is the event plan compatible with your Emergency Responder's Mass Casualty Event Plan
- If animals are involved are there protocols to deal with an injured animal

Background

Any event must consider the risks for both routine individual medical emergencies (cuts, heart attacks) as well as the risk of a mass casualty incident (explosion, fire, collapse). It should also look at mitigation measures to prevent serious medical problems from occurring.

Medical Response Plans for events can be complex, requiring the specialized knowledge of people in the medical profession. Guidance from these professionals should be sought in developing this part of the Emergency Response Plan.

Contagious Disease

During periods of contagious disease outbreaks or pandemic concerns, high consideration must be given to health risks. Organizers should work in close collaboration with public health officials and/or emergency management personnel to assist with risk assessment and mitigation for large events.

Medical Mitigation

Some medical problems take time to develop and can be avoided by early intervention. Types of medical problems that may be expected with your event and demographics should be identified and strategies developed for their mitigation. Staff can be briefed on how to recognize the early signs of such problems and what to do. For instance, if an event is being held in hot weather, teams can distribute water and watch for people in the early stages of heat stroke; if there is partying you can develop strategies for youth who are getting too drunk, having a drug problem, or preventing/recognizing young women getting surreptitiously drugged.

On-Site Medical Aid Services

It will be important to consider the many medical/first aid services options you may have to provide at the site of an event. This can reduce the strain on ambulance services by dealing with minor matters on site. It also provides quicker response to serious medical emergencies. Consultation with AHS/EMS providers will assist organizers in determining the appropriate on-site medical service delivery options. Volunteer organizations such as the Red Cross and St. John Ambulance or private EMS services can also be considered to enhance first aid care to people who are injured or ill at an event.

Medical Aid Response

Event Planners must be aware that EMS responders are part of a large and integrated provincial medical system. The medical response needs of a large event require consultation with Alberta Health Services well in advance of the event so that they can adjust service levels as required. They should also review and be aware of the layout of the venue, especially emergency access routes and staging areas.

• Fire, Utility, Hazardous Materials

Objectives

- Ensure fire hazards to staff and attendees is minimized through proper inspection, recognition and mitigation of hazards, ensuring emergency exits are sufficient and establish safe occupancy limits
- Minimizing the risk of fire to the venue, neighboring property or adjacent wild land
- Clarify the permission, prohibition or restriction of pyrotechnics, open fires, or other fire hazards
- Protect people and the environment from hazard chemicals using a HazMat Safety Policy
- Have clear protocols on who is equipped / will respond to a fire or chemical / fuel spill
- Ensuring that existing utilities are not interfered with, damaged or present a hazard to the public on site

Considerations

- Determine occupancy limits as required by Provincial Codes
- Are all necessary inspection authorities identified and consulted
- Will utilities be used or modified (ie. temporary electrical outlets)
- Is there a need to identify overhead or underground utilities (ie. using large tent stakes – utility location services available at http://www.alberta1call.com Call Before You Dig)
- Have you ascertained what fire sources will be used/allowed on site such as cooking equipment, pyrotechnics, fire pits, barbeques, propane, heaters, off-road vehicles, etc
- Do you have a HazMat Safety Policy, is the organizer aware of it and how will it be enforced
- Certain fuel and chemical storage locations should be marked on the site map
- Are you maintaining material safety data sheets (MSDS) information on the on-site chemicals so it is available to responders
- In the event of a chemical spill, is it clear who is responsible for the clean-up and costs
- Have you developed mitigation strategies for known fire hazards
- What fire equipment is needed on site for immediate use (ie. fire extinguishers)
- Is there appropriate water source for fire response or is there a need to pre-stage water
- Is there a need to have other equipment pre-staged at the site due to response times
- Are access routes sufficient for the size and type of responding vehicles
- Are there dangers of starting a wildfire, is the hazard level monitored
- Have you entered the various responders on your Emergency Contact List

Background

Fires

The fire department should be consulted about any types of open flames, pyrotechnics, flammable fuels or open fires. They will have the knowledge to provide advice or inspect the venue, its emergency procedures and evacuation plans. Permits may also be needed from them.

Fire departments can also determine the safe limits of occupants for a venue.

With outdoor events consideration must also be given to the potential of an accidental wildfire by smokers, campfires or ATV's. Fire officials must also assess if they have appropriate equipment and vehicles available for fire suppression in outdoor venues. Water sources could also be a problem and may need to be pre-positioned.

A key sign that a crowd is getting out of control is when people begin lighting fires. Be careful about permitting camp fires or bonfires as part of the venue if alcohol is available as fires plus alcohol seem to trigger a primeval response in people to behave rowdy. If an illegal fire is started it is important to get it put out immediately such as by using mobile teams with fire extinguishers. Waiting for a large pumper truck to get through a crowd will allow their momentum to increase and the large truck will only act as a focal point for their unruliness. This may require pre-planning by the fire and police to ensure coordinated teamwork.

Hazardous Materials (Hazmat)

The organizer, set-up crews, vendors, exhibitors or others may bring various fuels or chemicals onto the event site. You must consider their potential to cause fire, explosions, injury and health effects, or damage to property or the environment. You should have a 'safe-list' of such fuels and chemicals that will be allowed, specifying the quantity, storage, handling, disposal and required marking. Any other fuels / chemicals should require special permission.

The location of fuels or dangerous chemicals should be known and the information readily available to emergency responders. This may include maintaining MSDS information for responders.

Be aware that depending on the material or utility involved, different responders may be needed as some hazardous materials require specialized training and equipment to clean up that could exceed the ability of your local responders. Some materials may also require a medical response or evacuation. Be sure to understand who needs to be called for different materials and be sure they are on your Emergency Contact List.

Some types of spills may be very costly to clean up and could incur significant liabilities such as damage to property, regulatory fines and personal injury claims. These responsibilities and liabilities must be clearly addressed in the agreement between your municipality and the organizer.

Your local Fire Services or other professionals should be consulted for expert advice and guidance on developing a HazMat Safety Policy for your community's Event Plan(s).

• Weather

Objective

- Understand the potential for weather events and their potential severity
- Identify any health conditions of your attendees that could be aggravated by certain weather effects
- Determine how weather will be monitored
- Determine the weather condition thresholds for postponing / reactivate the event
- Determine the weather threshold for cancelling the event
- Establish who has authority and responsibility for deciding to postpone or cancel the event
- Establish how weather updates / postponements / cancellation notifications are made to public
- Develop emergency protocols to deal with sudden / extreme weather events

Considerations

- Some attendees may have health problems that will be inordinately aggravated by certain weather conditions. (e.g. heat on elderly, air quality on those with respiratory illness). Do you understand the health profile of the attendees and have you mitigation plans for these occurrences
- Has an historical weather assessment been conducted
- How closely do the weather conditions need to be monitored, what expertise is needed
- Have you established roles and responsibilities in relation to monitoring weather
- Is there clearly established consensus on the weather condition threshold for postponing / reactivate the event
- Is there clearly established consensus on the weather event threshold for cancelling the event
- Are roles and responsibilities established for approving postponement or cancellation
- Does your Communication Plan detail how weather updates / postponements / cancellation notifications will be made to the public
- Have you developed emergency protocols for sudden / extreme weather events that may occur
- Are all staff aware of their role and responsibility in the event that an emergency plan is activated – how will they be trained
- Are you going to provide the public with regular updates in relation to weather and potential postponements/cancellations and if so how
- Does the public know how to react to an impending weather event, where do they seek shelter

Appendix 1 – 5 contains a

Mass Gathering Weather Readiness Guide

Event organizers should be familiar with this and use it when planning any outdoor event.

Background

Impact

Weather can have a significant impact on any community event. Weather planning and weather safety preparedness are important components in a Emergency Response Plan, especially with outdoor venues. Proper planning can significantly minimize or mitigate weather related event impacts.

Historical Weather Risk Assessment

Well before the event, potential weather elements should be fully analyzed for probability, potential impact and event specific critical thresholds. Mitigation plans must be developed and known by event staff. Even weather events that do not meet the criteria for an Environment Canada Weather Warning may require emergency or other event mitigation plans.

See Appendix 1 to 5 for more detail

Prediction and Monitoring

When weather conditions are important, ensure someone is specifically assigned to maintain regular updates to the event managers and staff. Weather conditions and forecasts must be attentively monitored from pre-event facility set-up right through to post-event take down, especially during seasons of peak storm activity or outdoor events of significant size.

There are a number of choices with respect to weather forecasting and weather monitoring services. Multiple means of weather monitoring is strongly encouraged. Whether you choose Environment Canada as a reference source for weather information or services from other weather providers, weather forecasts and observations need to be properly interpreted. Event organizers should consider hiring the services of a private meteorological consultant for specialized weather information, location specific weather forecasts and on-site weather observations.

See Appendix 1 to 5 for more detail

Weather Delays

Ensure the attendees know of possible weather delays or hazards and what your contingencies are; for example will a performance continue later? Provide them with information on what they should do and where they can go during a delay or weather event. Give them time to think about and develop their own personal contingency plans. The more they are kept in-the-know, the more understanding and cooperative they will be.

• Crowd Management and Capacity

Objectives

- Ensure crowds do not get unruly or engage in dangerous behavior
- Control capacity and density of crowds
- Use preventative strategies to manage crowd behavior
- Reduce potential for panic in crowd
- Prevent zones where people can get trapped and crushed
- Manage flow of people to safe volumes especially in restricted areas
- Provide safe exit routes in the event of an emergency
- Have strategy for staff to communicate and control large crowd movements

Considerations

- Determine capacity levels of the venue and any sub-venues
- Ensure capacity levels are monitored and enforced, is ticketing necessary
- Have plans for over-attendance at open events
- Do you need queuing control and if so how will it be done
- Is seating safely established, reserved seating will avoid rushes
- Can timings of event activities be adjusted to reduce peak volumes of movement
- Examine layout/conduct walkthroughs and look for areas where people could be trapped or crushed in the event of a crowd surge or narrow passageways such as entrances and stairwells
- Will security be needed to slow the flow of people moving through constricted areas especially during intermissions or end of event
- Consider what emergencies may cause the crowd to panic and which way they would go
- Are ‘break-away’ exits or barriers required
- Can other exit doors/gates be opened quickly/by whom
- How will staff be briefed on strategies or concerns regarding crowd management
- Have performers been involved in planning and are they aware of their responsibilities

Background

Crowd Management

Many of the principles in crowd management may seem simple and common sense, and perhaps because of this they can easily be overlooked during the planning. Despite the small effort that may be required, they can yield big dividends when the unexpected occurs. Event organizers are encouraged to avail themselves to ample literature that exists on this topic (much is freely available on the Internet) review past examples of such tragedies or consult with those who have expertise in this field. Doing so will not only enable them to host a safer event, but one that is more enjoyable for the attendees.

Types of Crowd Dangers

Dangerous crowd situations usually occur in one of three ways:

- **Crowd Congestion** – a large number of people in a congested area can cause bumping, wave surges or momentum in a direction of travel. These can result in people tripping or being knocked off balance, getting trampled or crushed together resulting in asphyxia. It is important to recognize that this can be an involuntary effect and occur in an otherwise well behaved and orderly crowd
- **Crowd Agitation** – deliberate or unintentional agitation that builds up within the crowd caused by members in the crowd (anarchists, protesters, drunks) , people external to the crowd (security, organizers, performers, etc), by environmental conditions (heat) or by a single or series of aggravating human or environmental factors (crowding, impolite staff, broken promises, etc) or a combination of these factors
- **Panic** – a sudden and unexpected event such as a fire, storm, infrastructure failure, fight or other event that is immediate and causes confusion or panic. Panic can be reduced or controlled with immediate, clear and authoritative information or direction

Crowd Types

Events can be classified into types which help identify the level of risk expected. Community based family events are unlikely to create disturbances leading to an emergency or crisis situation whereas a political rally over controversial issues creates an emotional environment of dissatisfaction. There are several factors that need to be considered to evaluate the level of risk for event type including:

- Age and type of groupings (families, youths, seniors etc.)
- Is the crowd homogeneous or is there a variety of groups whose behaviour may conflict
- Potential criminal or protest activity
- Alcohol either sold at the event or there is a risk of it being brought into an event

Environmental Influence of Crowd Behavior

People's behaviour is influenced by their environment. A crowd will inevitably develop an organic behavior as a result of the 'social signals' they perceive consciously or unconsciously in their internal environment, external environment, the general behavior of others, sudden or unexpected events, rumors and key influencers within or external to the crowd.

Most crowds consist of three subgroups:

- Those who will always try to behave in a positive manner
- Those who will always look to cause trouble
- Those (usually the majority) who will go with the lead of those around them

Allowing the group's behavior to take on a life of its own, without the planning or ability to guide, escalate or de-escalate it; is a recipe for disaster. It is important to empower those who want to do the right thing, prevent or emasculate the effect of the troublemakers, and influence the rest into a positive course of behavior and action.

Attendance Control

Careful thought must be given to the expectant attendance to 'open' or non-ticketed events. Many community events and festivals fall into this category and care must be taken to ensure the venue is appropriate for the expected or potential attendance. Whenever possible a means to cap attendance should be required as part of the event permit, or when not possible, it is important to have a contingency plan for higher than anticipated attendance.

In 2010 at Duisburg Germany, city officials permitted the hosting of the prestigious "Love Parade" in a venue for 250,000 with no plan to control over-attendance. Over a million arrived and when the venue filled, people at the front of the queue were trapped in a tunnel while thousands behind pressed forward. The crush resulting in 21 deaths and over 500 injuries in an otherwise well behaved crowd.

Critical Crowd Densities

A research paper by John Fruin "Causes and Prevention of Crowd Disasters" gives the following information about crowd densities and their effects.

Ft^2/Person	Effect
25+	People can walk at a normal pace and avoid contact with each other
10	Walking becomes significantly restricted and speed is noticeably reduced
5	Maximum capacity of a corridor. Movement at a shuffling gait and possible only as a group
3-5	Involuntary contract occurs, ie crowded bus. Uncomfortable behaviour generally avoided
< 2	Dangerous crowd forces occur and strong psychological pressures develop
The combined pressure of massed pedestrians and shock-wave effects that run through crowds at critical density levels produce forces which are impossible for individuals or even small groups of individuals to resist.	

… (crowd) members do not have a broad view of what is occurring in the crowd. …

… communication can occur, often with the spread of rumors and incorrect information, potentially inciting inappropriate behavior. Most crowd incidents exhibit a lack of front to back communication. People in the rear of the crowd press forward while those in front experience severe distress. This is due in part to the flow process itself. The lighter densities in the rear allow freer movement, while those in front are immobile and under great pressure. The collapsing of front ranks gives a false perception of forward movement. Security personnel often attempt local control of the crowd from the front, urging people not to push. However, this type of control is ineffective during a serious crowd incident in progress - John J. Fruin PhD - The Cause and Prevention of Crowd Disasters.

Crushes during Stalin's funeral procession were reportedly powerful enough that the horses of mounted police "were lifted off their feet and crushed to death."- Pozner, Vladimir- Parting With Illusions. Atlantic Monthly Press, 1990, 324pp.

Crush Zones

Special attention must be paid to identifying potential crush zones where people in a crowd can become trapped.

People queuing for a basketball game at the City University of New York became trapped in a congested stairwell killing 9 (1991) and in Sheffield, England 95 died when trapped in an enclosed terrace at a soccer match (1995).

Also be aware of locations or activities that may create a suddenly draw crowds towards a certain point, such as a stage.

Crowds pushing to the stage injured approximately 60 teens at a 1985 Platinum Blonde concert in Edmonton and killed 3 teens at a 1991 AC/DC concert in Salt Lake City.

Monitoring and controlling movement and density in these areas is critical. There must be means to stop the crowd's movement or momentum through environmental design (such as barricades) or some means of communication. Be aware the while crowds are crushed at the front, they are push from the rear so that is where control needs to be focused.

Examine the potential for emergency gates that can be opened if a crush begins to develop. Some events have break-away stage fronts so that if people are pushed against the stage they will go under it as opposed to being crushed.

• Traffic Control - Vehicle and Pedestrian

Objectives

- Establish the volume vs. capacity of vehicle, pedestrian and non-conventional traffic
- Ensure safe separation of vehicles and pedestrians and control at points of intersect
- Establish emergency access routes
- Establish routes for service vehicles
- Efficient traffic flow in and around the venue
- Parking is controlled and restrictions enforced
- Rapid removal of vehicles blocking critical routes
- All relevant signage is legal, sufficient and clearly posted
- Control special areas such as drop-off/pickup areas, bus lanes, handicapped parking

Considerations

- Has traffic impact been determined for event and surrounding area
- Is the route to and within the venue well known to the attendees or is extra signage required
- Will there be a need to alter usual traffic patterns and what barricades, signage, etc is required
- Is there adequate separation between vehicles, pedestrian, bikes, etc
- Has non-traditional traffic (ie. bikes, horses, wheelchairs, golf carts) been taken into account
- Will traffic control officers be needed, if so where and how many
- Are traffic officers needed at large volume pedestrian/road crossings
- Are traffic control staff sufficiently trained and properly equipped (Safety vests, etc)
- Is public transit being utilized and is their movement been planned for
- Control and traffic plan for designated pick-up/drop-off zone
- Traffic control for mass egress at closing
- Parking
    - Parking lots made available, control needed
    - Street parking bans required
    - Signage sufficient or required, enforcement and towing arranged
- Emergency Ingress and Egress routes marked and enforced

Background

Vehicle Traffic Control

At venues where traffic flow, parking entrances and exits are not clearly established signed, congestion and negative impacts could occur to the surrounding community.

Supply, service and emergency vehicles may have come and go during the event. Determine how access will be maintained and monitored to ensure access routes do not get blocked or misused.

Public transportation can provide quick and easy access to and from the venue. Have a contact with public transit or contracted transportation services to ensure availability of additional transportation resources if required.

Drop-off Pick-up Zones

Some types of events, particularly ones attended by youths will have a large number of people being dropped off and later picked up with vehicles. This can cause congestion as drivers wait around or drive in circles trying to find someone or stopping in traffic lanes as people get in or out of cars. It can also cause a dangerous mixing or pedestrians and moving vehicles. Consider the need for established drop-off zones where vehicle and pedestrian traffic can be safely managed and where people will have a safe and easily identifiable place to wait for their rides.

Parking

The parking area is often the first exposure the public has with the event. The adage “you only get one chance to make a good first impression” applies here. If the public is met with well organized and professional traffic control and security, it will help set the tone of behavior. The impression of an orderly and well managed event will increase their confidence in staff and they will be more relax and likely to follow rules and direction.

Pedestrian Traffic Control

There must be strategies for the safe and efficient movement of people both during normal and in times of emergency. Ensure there are safe routes for pedestrians and separation and/or control in areas where there is vehicular traffic.

Planners must consider the existing structures or terrain and identify areas where congestion may occur and people could be trapped. Many tragedies have occurred because large numbers of attendees were funneled into a restrictive path and the back of the crowd pressed forward unaware of a problem further along. This can occur even at small events during an emergency.

Managing Crowd Flow

It is important to regulate the flow or people. Areas where flow is funneled are particularly important to consider. Other areas include those where there are tripping or falling hazards such as stairs or areas of poor footing, areas where people cannot always control their forward movement such as downslopes or escalators and areas where the crowds at the back do not have good forward vision such as zig-zag corridors and stairwells.

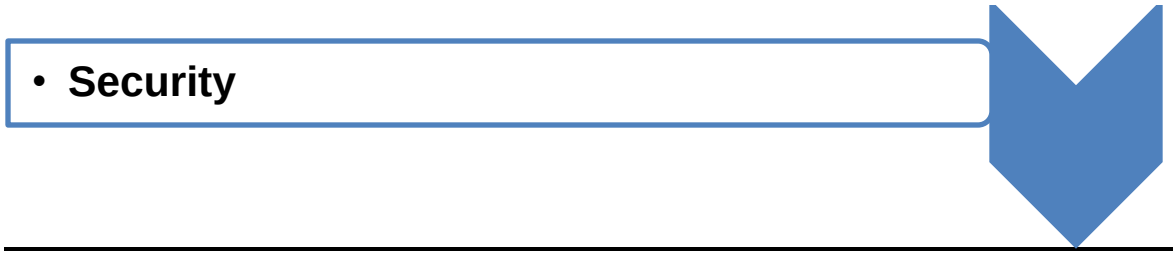
Such areas may need barriers before them to restrict the flow going through them or staff able to monitor them closely and alert other staff further back to stop the traffic quickly. Warning signage before the entrance may also be warranted.

Other ways to ease congestion is to stagger the timing of events if possible.

In Moscow a crowd was leaving a sporting event and going down a stairway to a subway when a young girl lost her shoe and bent to grab it. People behind were being forced forward by the crowd momentum and tripped over her and then each other in a domino effect due to the crowd momentum. Unaware of the problem, people continued flowing into the stairwell adding to the crush. By the time the flow was halted 66 people were crushed to death.

Emergency Access

Areas identified with restrictions for parking or access must be analyzed to determine the appropriate amount of patrol and enforcement. There should be a clear understanding of the level of enforcement and action taken against violations such as having a towing company pre-arranged for rapid removal of offending vehicles. Ensure signage is present and complies with local laws.



Objectives

- Set the tone of the event from the outset by pre-event announcements and first impressions
- Provide safe, secure and orderly arrival, queue and departure areas
- Effective and efficient screening/searching and ticketing
- Establish tolerance levels of behavior allowed
- Develop strategies for types of public disorder
- Develop strategy and means of monitoring of venue
- Determine appropriate staff training levels
- Identify security needs of perimeter and special zones

Considerations

- Are there specific security risks associated with this event (protests, terrorism, criminal activity, VIPs, other known threats)
- Methods and strategies to establish early tone
- House rules established
- Crowd profile / disposition known, potential security risks and level known
- Responsibility and liability (local police / volunteer / private security)
- Authority levels, mandate and supervisory responsibilities understood by management
- Security and patrol of parking (theft)
- Queue control strategy
- Admission screening; training / legal search / identify contraband / amnesty bins
- Perimeter and access to secure area control required
- Crowd monitoring, patrol and public visibility
- Lost and found property protocols
- Lost / missing person protocols
- Public disorder strategy
- Special security concern plan requirement (VIPs, cash offices, beer gardens, etc)

Background

Organizers must ensure that a safe and secure environment is provided for all people from the general public to performers and workers. Potential problems and concerns must be anticipated and mitigated. Organizers should inform the local police service about potential problems and consult with them about the best ways to handle safety and security. For larger and higher risk events hiring a Security company may be the best option as they are already trained and knowledgeable in providing safe and secure environments.

Anticipate

Prior to the event monitoring rumours and sources such as social media can often provide organizers good information about the size of crowds anticipated, the atmosphere and demographics that can be expected and can give valuable lead time to prepare. With large events things such as hotel reservations can provide insight.

Set the Tone Early

Setting the environmental tone of the event at the beginning can have a lasting impact throughout the event. Immediately upon arriving people should see good security, efficient queuing, good signage of important information, well maintained and orderly grounds and a friendly, firm, professional attitude from the staff.

Staff Identification and Visibility

Staff must have a means to recognize who is permitted into restricted areas and the public must recognize that people screening, controlling access or giving instructions are acting with some type of authority. This may be done in a variety of methods such as by name lists, uniforms, vests, badges or other identifiers depending on the nature and level of security required.

Queue Control

Queuing – Long queues can be very frustrating and lead to conflicts unless properly managed. It can also result in more serious consequences. If queuing is required, attendees should be made aware in advance to expect it. Queue lines must be well managed and every effort made to deal with them in a rapid and efficient manner. Lines must be well supervised to prevent queue jumping, over-crowding, surging and shoving. The comforts of the attendees waiting should be considered such as in regards to weather. Efforts made to provide some distractions and entertainment while in queue and the efficient movement of attendees will reduce the anxiety and stress of the queue. Reserved seating or ticket-controlled admission can also reduce crowd surges and the aggression in queuing.

In 2008 crowds waiting for a Black Friday Wal-Mart opening in Long Island began degenerating into disarray. When family members were allowed to queue-jump past the crowd, people pushed past the barriers. Those at the front began getting crushed against the store-front and when the doors opened people began getting trampled. An employee trying to save a downed pregnant woman was crushed to death in the melee. Similarly 11 teenagers died at a concert entrance in Cincinnati in 1979.

Admission Security Screening

Prohibited Items – Security checks for prohibited items may be considered. Besides alcohol and drugs, consideration to other threats that could cause panic should be considered. Some venues have "Amnesty Bins" located prior to the entrance allowing people to dispose of drugs, prohibited or illegal items without consequence.

A flare set off at a Madrid Halloween concert resulted in a panic leaving several dead and injured. Pepper spray to break up a fight at a Chicago nightclub resulted in a stampede and crush that killed 21.

Perimeter Security, Access Control to Venues and Areas

Most events will require at least some access control to venues, specific areas, dangerous equipment, animal pens, emergency and evacuation routes, command and other specific areas. Ensure these are clearly identified and there are proper barricades and/or signage as required. Ensure staff know who is and who is not permitted in what areas. Some form of ID credentials or name-list may be required.

House Rules

Attendees should be aware of the 'house rules' at an event and the types of behaviors that are and are not allowed. These rules should be made known in advance of an event to discourage the attendance or expectations of those whose behavior is otherwise. House rules should be readily evident throughout the event (including signage) and security should be highly visible at the point of arrival as well as throughout the event. Ensure the public have a means of reporting violations.

Staff Role & Attitude

Polite yet firm and consistent enforcement of the house rules must be readily evident to the attendees. Staff and security should try to engage individuals in the crowd in a friendly and personal manner which will assist in keeping them on 'their side' should incidents with trouble-makers occur. Staff should be well briefed on how to encourage and enforce the house rules, but also cautioned against over-zealous enforcement of minor matters. They must also understand when to let professional security or police to handle a matter and be able to summons them quickly.

Monitoring

As the event is running ensure you have sources of information reporting situational awareness to the planners and managers. Consider having staff report in on a regular basis from throughout the venue to keep the Planning Team aware of the mood and activities of the crowd, crowd density and potential problems. Avoid having blind spots and ensure all areas are checked on a regular basis. Provide a means for the public to report issues and problems in a fast convenient manner. Monitoring social media can be a useful tool.

<u>Keep your plan flexible and keep modifying it as intelligence becomes available.</u>

Peer Security

Groups or individuals from the peers of the audience can be highly effective in acting as a go-between and buffer between the officials and the groups in the crowd. Enlisting clubs, organizations and prominent members of these groups in the planning and running of events enhances the rapport between the officials and attendees. This is especially effective with youth and teens or other groups that may be hostile to authority.

Rumor Control

While rumors may seem trivial, they can set off a chain of misinformation or behavior that can have tragic consequences in a large crowd. Ensuring a reliable source of information for the crowd and having staff attuned to listening for and rapidly correcting rumors is important.

In 2001 almost 1000 people died during a parade in Bagdad when a rumor of a bomb caused panic and the resulting crowd surge forced people off a bridge.

Lost Person Services

Establish a lost person station(s) and ensure that attendees are aware of the location(s). The loss of a child can cause a great deal of panic which can be dispelled quickly if loved ones know where to go to retrieve a child or get help locating a child. This service should also be able to rapidly communicate missing person information to staff throughout the venue and exit gates.

Also consider having clearly marked 'rendezvous points' to provide a pre-arranged location where parents and children can meet up if they get separated. These also serve as a general convenience for friends and families to have a place to meet up with each other.

Public Disorder and Early Intervention

Criminal / Protest

Any potential for criminal activity at an event or protesters should be anticipated and police or other security personnel need to be involved in the planning process so they can ensure there is adequate security. Any emergency response actions need to be undertaken separately from criminal activity response and there should be some degree of knowledge about criminal investigations to reduce the likelihood of destroying evidence. If a protest is expected it is advantageous to meet with protest group leaders in advance and include them in developing plans that would minimize injury and conflict.

Key Influencers

Crowds can be swayed by the high profile actions of just a single or small group of individuals. Staff must be trained and prepared to act quickly to identify and de-escalate these actions before they can gain the crowd's momentum.

Mobile Rapid Response Teams

Ensure security, medical, fire and other teams can move through crowds quickly, efficiently and without attracting a lot of attention. Large vehicles can have difficulty moving through congested areas. This is especially important when the crowd is in an excited state. Large emergency vehicles can quickly become a focal point for trouble-makers.

Dispersal

When the event concludes, pedestrian and traffic patterns must flow from an event venue and parking lots in an orderly and non-aggressive manner.

• Emergency Plans - When Things Go Bad

Objectives

- Establish the incident types that require Emergency Response Plans
- Each staff member involved should have clear and specific tasks
- Reference information such as contact numbers must be instantly available
- Staff members should hold at least a table top exercise to ensure they understand their role
- Emergency Response Plans must be written in-sync with local emergency response plans
- Advanced agreement should be in place for outside resources that may be needed

Considerations

- Common incident types that should be considered for an Emergency Response Plan:
    - Evacuation / Shelter in place
    - Medical Emergency (individual)
    - Mass Casualty
    - Lost Child
    - Severe Weather
    - Bomb Threat
- Include a site map identifying areas of access and evacuation routes
- Identify roles and responsibilities of event organizers and response personnel before, during and after an emergency or disaster
- Determine an evacuation and sheltering plan including muster points in consideration of weather, risk and type of emergency
- Identify the Incident Command and Control and how emergency responders will communicate
- Have a medical and mass casualty plan or identify an existing one that will be used
- Ensure monitoring of weather, news, social media and other factors where applicable
- List emergency equipment available on site, and provide resource lists from mutual aid or supporting agencies
- If people have to evacuate, they may need a close place to go to. Are there nearby locations that are prepared to act as an evacuation/aid centers on short notice
- Outline a summary of notification and activation criteria including main contacts

Background

An analysis of many tragic large-crowd incidents will show that they can occur with little if any advanced warning giving organizers very little time to intervene and control before they pass a critical state and become unmanageable and deadly. Many lives were lost because the crowds lacked some very basic information and simple prevention steps were not taken to allow staff to manage, alter, or de-escalate the crowd's behavior at a very early stage of the incident:

- Organizers had no effective means to broadcast or give direction to them
- Organizers were themselves confused and wasted valuable time determining on how to react
- Staff reaction was uncoordinated, often giving confusing or conflicting direction and instruction

For this reason it is critical that High Impact Hazards (at a minimum) should have a *prepared response for immediate intervention*. Staff should know what, where and how to do their part with little more than an alert as there will rarely be time to explain details and instructions. A tabletop exercise will often help to develop these plans. Local Emergency Services (Police, Fire, EMS) will be of particular assistance in developing these and ensuring they are interoperable with their procedures.

Organizers may consider specific signals or keywords that will alert staff to different types of emergencies to allow them to get positioned and prepare before the crowd is alerted.

At a minimum all events should have:

- An Evacuation / Shelter-in-Place Plan
- Medical Emergency Plan (individual)
- A Mass Casualty Plan
- Lost Child Plan
- Severe Weather Event Plan (when applicable)
- Bomb threat

When making these plans, be sure to remember that these incidents are often fluid and decisions makers must monitor and adjust the response as the incident progresses. Proper decisions can only be made if they know what is happening.

Ensure you build loop-back status reporting into the plans.

Evacuation / Shelter in Place

The event Planning Team should consider both evacuation and shelter in place (SIP) strategies when developing the Emergency Response Plan. A review of the event risk analysis document will identify threats that may require either or both strategies. The Planning Team can then plan towards a strategy that will insure the health and safety of event responders, participants, attendees and employees. Any strategies developed should complement and support the municipal emergency plan. Considerations for both strategies include:

- Who will make the decision to evacuate or SIP
- How will that decision be communicated and to whom? (Part of Communication Plan)
- Who will lead the evacuation/SIP efforts i.e. event security
- Have the evacuation/SIP requirements of persons with special needs been addressed
- Where will people go if evacuated? Are there other shelters nearby prepared to accept them
- Have clear, concise public messages been prepared based on the probably of occurrence identified in the local hazard vulnerability and risk analysis
- Will an evacuation/SIP exercise be conducted as part of the pre-event planning process
- Will all staff be trained and aware of their roles and responsibilities during an evacuation/SIP

Shelter in Place

Considerations include:

- Can the venue facilities accommodate a shelter in place strategy? A building may be adequate shelter during a severe weather event but not during a hazardous materials event or vice versa
- Have building staff been trained in their duties during a shelter in place event? i.e. managing building ventilation systems
- Is there adequate space to accommodate the crowd without the danger of crushing
- Are those shelter-in-place structures identified on the site plan and is there adequate ingress/egress capacity

Evacuation

Considerations include:

- Responding emergency vehicles will be going against the flow, can they have reserved routes
- Can the venue infrastructure accommodate a timely evacuation of all attendees
- What is the evacuation traffic control and management strategy
- Will additional transportation resources (busses etc.) be required? Who will be the lead on additional transportation equipment? Have resource lists been developed
- Can additional emergency gates be put in fencing and barriers to prevent crushing and can they be opened by staff
- Will the local authority's emergency social services team engage? What will their role or function be? i.e. inquiry line
- Are evacuation routes clearly identified and marked for the public and on the site plan

Evacuation Routes and Control

In the event of a mass evacuation, transportation corridors must be managed. Traffic must flow quickly from an event venue and evacuations from parking lots must be kept orderly and non-aggressive. Ensure traffic doesn't jam at intersections in the surrounding community backing up traffic.

Medical Emergency

See the Medical Chapter for details on your medical plan.

Key considerations for your emergency response to a person with a medical emergency are:

- Rapid obtaining and reporting of key information and request of EMS (Alberta Health Services (AHS) can guide you on what information they will want on the initial call.)
- Response by on-site persons with First-Aid, CPR or other medical training or equipment
- Securing an interference-free work space for EMS and provide privacy for the patient
- Ensure a clear pathway for responding vehicles / responders and maintain the egress route

Mass Casualty

A mass casualty event may by its very nature involve multiple response agencies to support the treatment and or transport of persons from the scene. It is essential that the planning team includes Alberta Health Services in the planning process to ensure:

- Health care facilities and AHS/EMS are aware of the event for logistical purposes, including dates/times of the event
- Seamless transfer of patients from event EMS (if not provided by AHS/EMS) to AHS
- Communications and command structures are defined prior to an incident
- Access/egress and staging/triage areas are established prior to an incident (in consultation with AHS/EMS)
- A suitable landing zone for Air Ambulance is identified and kept clear. The GPS location may be needed if the venue is in a rural area
- The development of a Medical Site Management Plan

Lost Child

Ensure reports of lost or found children are handled thoroughly and expeditiously. Consult your security provider and local police for guidance on the best policy. (See Security Chapter)

Severe Weather Plan

- Ensure weather monitoring information gets to the right decision makers in a timely manner
- Ensure clarity on who is responsible for making what decisions and what the triggers and threat levels are
- When decisions are made, ensure the roles, responsibilities, notifications and actions required are clear

Criminal Incident

Criminal incidents can be common at any type of event. It is important that staff know the proper and safe way to deal with various criminal matters from minor to serious. Local police can provide guidance on developing some basic protocols and safety procedures as well as help them properly obtain and preserve evidence and information they need.

• Staff and Volunteer Training - Exercising

Objectives

- Assess the skill and knowledge level required for each type of task
- Ensure skill levels of those assigned to the tasks are appropriate
- Identify gaps or problems with your Emergency Response Plan through exercising it
- Ensure staff and volunteers have appropriate knowledge. Consider briefings, handout sheets, guidebooks, etc.
- Encourage municipal staff and event organizers to increase their skill levels such as by taking courses in planning, exercising, and the Incident Command System (offered online)

Considerations

- Is staffing professional, volunteer, experienced or inexperienced
- What roles will be required and what experience/training is required for these
- Encourage or require staff to take appropriate training courses such as Basic Emergency Management (BEM), Incident Command System (ICS-100) and Exercise Design (ED-100) courses offered at no cost by Alberta Municipal Affairs http://apsts.alberta.ca/online-courses/
- Practical discussion, table tops or functional exercising of event coordinators and coordination response personnel prior to the event will familiarize people with emergency response plans and identify operational gaps
- How will staff be briefed and/or trained
- Are senior decision makers familiar with the Incident Command System
- What is the maximum number of staff that a supervision should have given their experience
- How will all staff be familiarized with the Emergency Plans and their roles

Background

It is important that all staff and volunteers have a clear understanding of their roles and expectations as well as how to handle various situations, what the limits of their roles are, who to contact or escalate matters to, key contact lists and accurate information for matters the public may ask them about. This is particularly important with large events that have a large number of staff and/or volunteers.

Staff/Volunteer Orientation Guides

In the event of emergencies, they should have pre-assigned tasks and reporting stations both to ensure they can be accounted for and to provide immediate aid to the crowd in the emergency - similar to a lifeboat drill on a ship. Having staff that appears organized and providing calm, coordinated instructions will provide a significant reassurance to the crowd and reduce panic.

Having a written guide (even a page or two) for staff and volunteers will ensure consistency. Remember, your event's reputation could be at risk and you could face various legal liabilities for their actions.

Managers and Supervisors

At a minimum, managers and key responders must receive training in how to use the Incident Command System. ICS 100 is a free online course offered by AEMA at http://apsts.alberta.ca/online-courses/)

Exercising

It is essential that all persons or agencies with an identified role in an Emergency Response Plan are trained to and familiar with that role or function. Training should include simulated incident exercising to clarify procedures. Even for small events, organizers should discuss how they would respond to a couple of different scenarios that could occur at their event.

The Exercise Design 100 course is a free online course offered by AEMA at http://apsts.alberta.ca/uploads/1106/exercisedesign100sel64016.pdf

It is recommended that the event Planning Team review the course to assist in establishing an exercise cycle and policy.

What is an exercise?

An exercise is a simulated emergency, in which members of various agencies perform the tasks that would be expected of them in a real emergency. They provide an opportunity to test their plan against the worst possible scenarios that the event may be exposed to in a safe environment to ensure: interagency understanding of the needs, roles, responsibilities and processes particular to the event, the plan adequately addresses the identified risks and improve overall comfort and performance levels.

Why are exercises so important?

To exercise due diligence, a plan needs to identify possible hazards and carry out the appropriate corrective action. In an emergency program, this includes the training programs and exercises for employees and other persons who provide necessary services. Training tests the procedures to be followed in emergency response and recovery activities. Exercises should be considered as part of a

continuous improvement cycle, wherein a part of the Emergency Response Plan is developed, exercised, evaluated and reviewed to capture observations and convert them to lessons learned.

Exercises are an essential component of an emergency management program and have three main functions:

- **Validation** - To validate plans, protocols, and procedures and demonstrate resolve to prepare for emergencies
- **Training -** To develop staff competencies, to give staff practice in carrying out their roles in the plans, and to assess and improve performance
- **Testing** - To test well-established procedures and reveal gaps that may exist

Types of Exercises

There are basically three types of exercise, although there are variations on the theme of each of them.

Tabletop Exercise

A tabletop exercise will usually involve internal and/or external key staff with emergency management responsibilities gathering in a round-table setting to discuss simulated emergency situations:

- This type of exercise is conducted in a non-threatening, low stress environment to maximize learning and sharing of knowledge and skills
- Tabletop exercises are a very cost-effective and efficient method of testing plans and procedures
- Participants have the opportunity to interact with and understand the roles and responsibilities of the other agencies taking part, and to get to know the people they may be working with in an emergency response
- Participants discuss and walk through the actions and decisions they would make in response to a scenario, inputs and situation reports/updates. Generally, participants will consider such issues as coordination, assignment of responsibilities and communication. It is an excellent format to use in familiarizing newly assigned/appointed emergency management personnel and senior officials with established or emerging emergency management concepts and/or plans, policies, procedures, systems and facilities

Functional Exercise

The functional exercise is more complex than a tabletop exercise:

- Unlike the usual conference room setting typical of a tabletop exercise, the functional exercise will take place in an emergency operations centre (EOC), simulated field environment, or a combination of the two. For example the exercise location could be an EOC with simulated sites and resources. For exercise purposes, the EOC and simulated site are often in close proximity
- Inputs, in the form of messages to simulate emergency events and activities, are provided from personnel in a simulation room. The messages (inputs) may be in written format or via

telephone, radio, fax or computer (email, intranet, and internet). The simulation room may also respond to requests, reports, etc. from the EOC and the simulated site(s)

- Visualization of the event is achieved by using maps, charts, video clips or models
- Exercise activities are usually speeded-up (not in 'real time') and there is likely to be a time constraint
- Several functions of the municipal emergency plan, the plans of mutual aid partners, as well as supporting provincial government emergency plan(s), may be tested and evaluated
- A typical functional exercise might be designed to test or evaluate individual and organizational capabilities, multiple functions, or activities within a function or interdependent groups of functions. For example, the EOC, emergency site management and telecommunications could be tested and evaluated. Annexes of the municipal emergency plan, i.e., disaster health or disaster social services (mass casualty response and/or evacuation of residents), school or industry plans could be included

- No resources are deployed and no actual disaster site is established
- Debriefing sessions are held at the end of the exercise

Live (Field) Exercise

The live exercise (sometimes called a *mock disaster)* is the largest and most complex of the three types of municipal exercises and may involve participation by provincial and federal government as well as industry, the health care system and other organizations. It creates an environment as close to an actual event as possible:

- The live exercise can be used to evaluate the operational capabilities of emergency management systems, interactively, over a period of time in a realistic environment. Live exercises range from a test of one component of the emergency plan, such as mass casualty incident response, through to a test of the whole plan
- Live exercises may provide the best means of confirming the satisfactory operation of emergency communications systems and equipment as well as arrangements for public information and media relations
- An actual disaster site is setup and perimeters established. Roads may be blocked and there may be simulated casualties with triage and transportation of the casualties to a hospital. Actual mobilization and deployment of personnel, equipment and resources are required to demonstrate coordination, response and recovery capability
- Normally the EOC is activated, an Incident Commander is appointed and communication and co-ordination are practiced and tested
- Exercise activities are usually under a time constraint and debriefing sessions are held at the end of the exercise

NOTE: An **Orientation/discussion seminar** is generally considered to be an individual training activity rather than an exercise. A **drill** develops, maintains and tests skills in a single emergency response procedure, i.e., building evacuation.

Training Resources

Alberta Emergency Management Agency (on-line)

Additional information: http://apsts.alberta.ca/online-courses/

Basic Emergency Management - This course provides an overview of emergency management in Alberta including the systems and processes for preventing, mitigating, preparing for, responding to and recovering from emergencies and disasters. You will learn about the key provisions of the Emergency Management Act and have the opportunity to identify the roles and responsibilities of various levels of government and other key organizations involved in emergency management.

Exercise Design - This introductory self-study program will provide you with the basic concepts of exercise program management, including key terms and an overview of the exercise design process. Upon successful completion, you will be able to actively participate as a member of an exercise design team or program committee member.

ICS 100 - The Incident Command System is a standardized management system used to organize and manage a scaleable response to emergency incidents of any magnitude. ICS 100 (Module 1) is intended as an introduction and overview of the ICS. It is intended for people who may be assigned to incidents in non- supervisory roles and as a prerequisite for students continuing on through other levels.

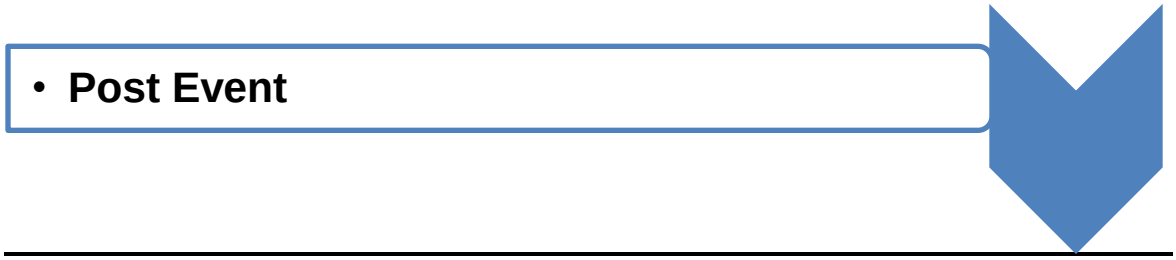
Emergency Social Services (Basic) - This course was created by the Public Health Agency of Canada's (PHAC), Centre for Emergency Preparedness and Response (CEPR) in collaboration with the Council of Emergency Social Services Directors.

Alberta Emergency Management Agency (classroom)

The following courses are conducted by AEMA training officers. Municipalities wishing to arrange for courses should contact their AEMA field officer. Courses are provided at no cost to the municipality; however, the municipality is asked to provide a classroom and refreshments:

- Including People with Disabilities in Emergency Plans (1/2 day)
- Municipal Elected Officials (1/2 day)
- Disaster Social Services (DSS) Planning (1 or 1.5 days)
- Registration and Inquiry (1/2 day)
- Emergency Public Information (1 day, additional day if required)
- Emergency Operations Centre (1 day)
- Emergency Management (3 days)

Additional course information: http://apsts.alberta.ca/training-opportunities/direct-delivery/



Objectives

- Identify what went well
- Identify what didn't go well
- Capture new ideas for future event plans
- Provide a close-out report documenting what happened

Considerations

- Have supervisors hold 'Hot Washes' – informal 'no fault' debriefing with their staff
- After significant incidents or at the close-out the management staff should have a de-briefing where all the hot-washes and other matters are brought forward, discussed and recommendations sought
- Have debriefing with any external partners involved (e.g. police, fire, EMS)
- Notes of the debriefing should be used to file a close-out report including recommendations for future such events
- Post event reports along with the plan and other documents related to it should be filed to be available for future planning reference

Background

Post Event Review

Every emergency offers operational and resource challenges, particularly those requiring coordination of multiple agencies. Some of these challenges may not have been considered or known prior to the event. Debriefing after the event provides an opportunity to capture those experiences and learn from the event.

Hot Wash

'Hot Washes' are feedback sessions for those involved in an exercise, event or an incident. It is conducted by supervisors immediately following it. They give those involved a chance to voice concerns and offer potential improvements while the experience is still fresh.

Debriefing

Debriefings are virtually the same thing as Hot Washes except they are for the supervisors and management team and can take place on the same day or days later.

Post Event Report

Post Event Reports may occur at the end of an event, but planning for it occurs at the beginning. This is especially important for events which are going to be held again, such as annual festivals. This Post-Event Report is more than just a summary of what occurred at the event, but is also an analysis of each portion of the event and how the planning fulfilled or needs improvements in dealing with it. Writing such a report requires good analysis of the Hot Washes and Debriefings and should be written in a fact-based manner.

If there was a controversial incident or allegation it is important that this report be available as soon as possible. The absence of factual information post-event will be quickly filled by those with an agenda and once stated, can be hard to correct. Having a factual record which others (including media) can refer to will mitigate bias and distortion of such claims.

Such a document will serve several purposes:

- It reduces the planning workload for subsequent events by capturing organizational memory
- It allows for continuous improvement and safety planning of subsequent events
- It establishes the record of what happened for third parties such as the media
- It can document how successful the event was in relation to fulfilling its community goals and help in the decision to hold future events

Recommended Policy

In reality, very few of these valuable insights are captured and applied as debriefs are seldom held despite good intentions. To ensure this valuable portion of the Emergency Response Plan is not neglected, it is recommended to include a “Lessons Learned” procedures in the Event Plan including ‘hot washes’, debriefings and a Post Event Report.

This debrief procedure should outline when the general (all agencies present) debrief is done, who participates and how to follow up on recommendations resulting from the debrief. The procedure should also require or encourage every participating agency to do an additional internal agency review of the event response and to document the debrief, recommendations and follow-up.

Example

To ensure all participating agencies review the overall event response whenever the plan is activated, a debrief procedure shall be included in the emergency plan requiring a debrief meeting of all agencies involved, soon after the emergency is concluded. The meeting shall be recorded, lessons learned documented and follow-up recommendations reported to the planning committee. The procedure shall also require municipal agencies involved in the event response to do a formal internal agency debrief and to document agency recommendations and follow-up. A sample worksheet used to capture observations from the event is located in the appendices of this document….

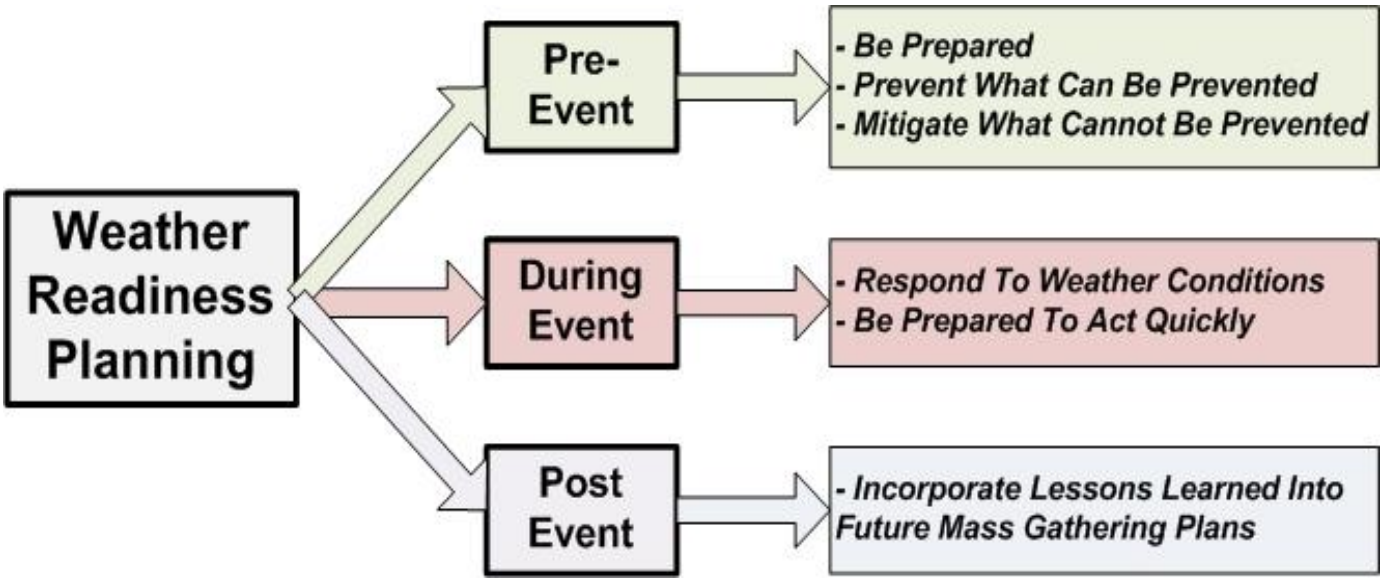
Appendix

1. Mass Gathering Weather Readiness Guide - Introduction
2. Mass Gathering Weather Readiness Guide - Weather Element Hazard Assessment
3. Mass Gathering Weather Readiness Guide - Alberta Weather and Natural Hazards
4. Mass Gathering Weather Readiness Guide - General Weather Information
5. Mass Gathering Weather Readiness Guide - Deaths Caused by Force of Nature

Appendix #1 – Mass Gathering Weather Readiness Guide Introduction

Mass Gathering Weather Readiness Guide

(Photo courtesy Pat McCarthy Environment Canada)


Weather Readiness Planning
Pre-Event
- Be Prepared
- Prevent What Can Be Prevented
- Mitigate What Cannot Be Prevented
During Event
- Respond To Weather Conditions
- Be Prepared To Act Quickly
Post Event
- Incorporate Lessons Learned Into Future Mass Gathering Plans

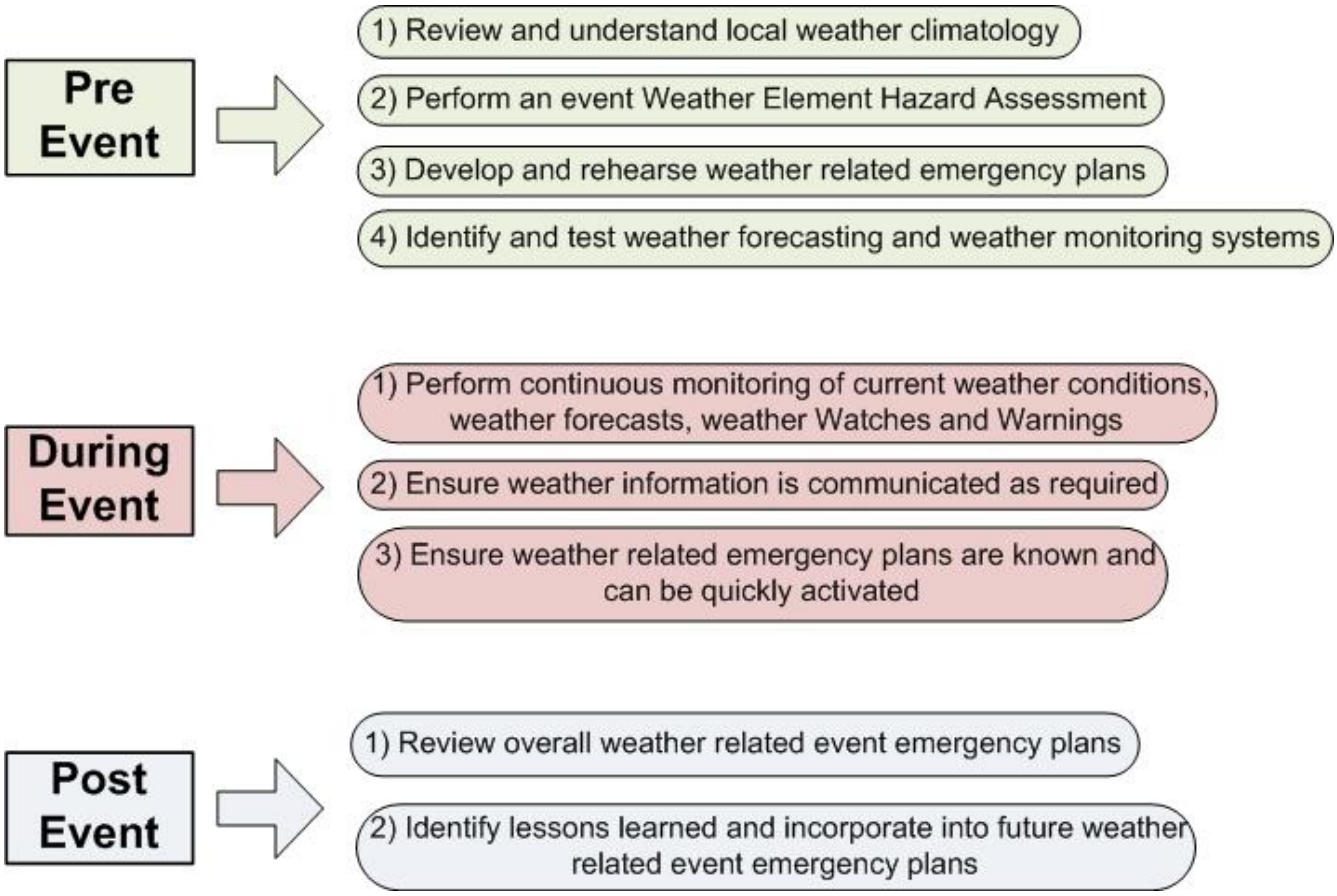
Introduction

This Appendix on Weather Readiness is intended to offer some advice or guidance on weather safety planning for mass gatherings. There is no way this Appendix can be all encompassing, but there are many things that can be done to reduce potential risks associated with weather.

Whether done by a professional meteorologist or a lay person with a basic knowledge of weather, interpretation and forecasting of weather conditions is always done with some level of uncertainty. Weather systems can be large or small and may develop slowly or quickly. There are many factors that contribute to the challenges in determining weather that is happening now and that which may develop in the near future.

While Environment Canada does have rigid definitions for "Severe Weather", it is important to understand the various other types of weather that may affect locations where mass gathering activities are planned. It is also important to understand how all weather types may affect those mass gathering activities and what should be done if or when critical weather strikes. People need to be clearly identified with respect to accessing, interpreting and communicating weather information.

Weather Readiness Planning



Pre Event:

1) Review and understand local weather climatology

Event organizers need to be familiar with the weather climatology for the appropriate season and location. Weather climatology knowledge should include both typical weather conditions and the range of extreme weather conditions.

Try to avoid or minimize weather threats in the first place by carefully considering and choosing times and locations for mass gathering events. This includes assessment of: the type of possible weather hazards, historical weather events, time of day/year for the specific weather hazards, site location, , a good view in the direction weather hazards are most likely to approach from (storms usually approach from the southwest, west, or northwest), etc. If required, private sector meteorologists may be able to provide specialized, tailored, event specific weather services.

There are many sources of local historical weather information. The following two web sites are examples of freely available climate and extreme weather information for Canadian locations:

- Environment Canada Canadian Climate Data:

www.climate.weatheroffice.gc.ca/climateData/canada_e.html

- Environment Canada Climate Normals and Averages:

www.climate.weatheroffice.gc.ca/climate_normals/index_e.html

- General Information - Alberta Weather and Natural Hazards:

(See Appendix #3)

- General Information – A Few Significant Historical Alberta Weather Events:

(See Appendix #4)

2) Perform an event Weather Element Hazard Assessment

To whatever extent possible, activities should be planned around possible weather.

The purpose of a Weather Element Hazard Assessment is to get mass gathering organizers to recognize the various weather elements that could affect the planned event, associated infrastructure and availability of appropriate evacuation routes and shelters. Event organizers or designates need to identify and understand probabilities, impacts and critical thresholds for the various potential weather elements. A Weather Element Hazard Assessment should reflect the uniqueness of the specific mass gathering event. Event organizers need to be fully aware of event specific weather element critical thresholds. Once the probabilities, impacts and critical thresholds have been identified, it is necessary for event organizers to recognize the need to create mitigation and emergency response plans to minimize the weather element impacts. Safety strategies are an integral part of any mitigation plan.

Weather threats your event may be vulnerable to may not necessarily meet the criteria for an Environment Canada Severe Weather Bulletin or perhaps not even meet the criteria to be included in the regular daily Environment Canada Public Weather Forecast. Since many outdoor events occur during the summer thunderstorm season, it is worth noting here that not all thunderstorms meet defined Environment Canada Severe Thunderstorm Warning criteria, but **all** thunderstorms produce lightning and are dangerous.

Weather elements to be considered depend on the event location and time of year. Elements to be considered for a Weather Element Hazard Assessment include but are certainly not limited to: thunderstorms, tornadoes, lightning, hail, strong winds, dust storms, extreme heat, extreme cold or wind chill, high humidex values, rain, freezing rain, freezing drizzle, fog, frost, snow, blowing snow, blizzards, ultraviolet radiation (UV Index), air quality, etc.

Two sample Weather Element Hazard Assessment templates have been included in the appendices. One template is created for the “warm” season and the other is created for the “cold” season. These templates are recommended for general guidance only and should be modified appropriately for each unique mass gathering event. The templates are to identify potential weather threats that need to be covered under subsequent, more detailed weather plans.

- Weather Element Hazard Assessment template:

(See Appendix #2)

The following is an example of a partial Weather Element Hazard Assessment:

Weather Element	Environment Canada Warning Threshold Values (Alberta Specific)	Environment Canada Day 1 to 7 Public Forecast Threshold Values (Alberta Specific)	Potential Event Impact (Yes or No)	Historical Probability of Occurrence (Low to High)	Event Specific Critical Threshold Values Identified (Yes or No)	Emergency Mitigation Plan Identified (Yes or No)
Tornado	- A credible report of ongoing tornado - Forecaster assessment of data	- Not specifically included - Identified in Watch or Warning	**Yes**	**Low**	**Yes**	**Yes**
Thunderstorm	- Hail ≥ 20 mm diameter and/or - Wind gust ≥ 90 km/h and/or - Rain ≥ 50 mm in ≤ 1 hour	- Chance of thunderstorm is ≥ 30% - "Risk of Severe Thunderstorm" included when Watch or Warning is in effect	**Yes**	**Moderate**	**Yes**	**Yes**
Lightning	- No specific Warning	- Not specifically included but always implied when thunderstorms are forecast	**Yes**	**Moderate**	**Yes**	**Yes**
UV Index	- No specific warning	- UV Index ≥ 3, Day 1 only	**Yes**	**High**	**No**	**No**

Other useful web links:

- Environment Canada Hazardous Weather Information:

www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=15E59C08-1

- Environment Canada Public Weather Alerting Criteria:

www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=D9553AB5-1

- Environment Canada weather forecast element inclusion information:

www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=2D8EBDE4-1

- Environment Canada Summer Hazards and Safety Tips:

www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=6C5D4990-1

- Environment Canada Winter Hazards and Safety Tips:

www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=46FBA88B-1

- Statistics Canada Table 102-0540: External Causes of Morbidity and Mortality:

www5.statcan.gc.ca/cansim/

(See Appendix #5)

3) Develop and rehearse weather related emergency plans

Failing to plan may be viewed as planning to fail. Emergency plans need to be developed to address and mitigate the identified weather element risks. Plans should include clearly defined criteria for modifying, delaying or cancelling event activities based on forecast and actual weather conditions, whether or not official Environment Canada Warnings have been issued.

To keep the overall mass gatherings emergency plan consistent and concise, the weather component should be paralleled with or incorporated into the overall event emergency plans. Preparation and response actions for weather hazards may be very similar to other potential event related hazards. Ensure the developed emergency plans are known by the identified officials and are practised well in advance of the event.

4) Identify and test weather forecasting and weather monitoring systems

There are many choices with respect to weather forecasting and weather monitoring services. Whether you choose Environment Canada as a reference source for weather information or services from other weather providers, weather forecasts need to be properly interpreted and may not necessarily have the level of detail you require for a particular event. Also, due to the fact that weather conditions can quickly change, weather monitoring needs to be continuous.

Environment Canada provides a host of freely accessible internet real time weather information. Environment Canada can also provide limited weather services in the days leading up to and including the event via a 1-900

pay per use phone consultation service. The Environment Canada 1-900 pay per use phone consultation phone service is not available 24 hours a day (see Environment Canada Telephone Services web link for more details). Environment Canada does not provide a dedicated on-site employee presence for mass gathering events or produce event specific specialized weather products. . Organizers may however consider hiring the services of a private meteorological consultant to supply event and site specific weather planning and monitoring needs.

Ensure weather monitoring can be maintained for the event location and surrounding area. Weather forecasts for the immediate and surrounding area should be monitored for several days leading up to the scheduled event. The individuals tasked with monitoring the current weather conditions need to be able to identify and spot storms or rapidly changing weather conditions. Environment Canada Weather radio can be an effective means to receive real time Weather Watches and Weather Warnings.

It is important to understand the difference between an official Environment Canada “Weather Watch” and a “Weather Warning”. Weather Watches indicate the potential for severe weather development and require you to be ready for the real possibility of severe weather. Weather Warnings indicate that severe weather is occurring or is imminent (perhaps only a few minutes away for short lived events such as thunderstorms) and may require immediate action. Summer Severe Weather Watch areas often cover significantly larger geographic areas than do Summer Severe Weather Warnings. In Canada, the sole authority to issue “official” Weather Warnings and Weather Watches resides with Environment Canada.

The following is an example of a “Tornado Watch” versus a “Tornado Warning”. A Tornado Watch is issued when weather conditions are favourable for the development of tornadoes. In fact, skies could be completely clear for hours immediately after a Tornado Watch is issued. When a Tornado Watch is issued, event organizers should start preparing for the real possibility of a tornado and enhance weather monitoring and preparedness efforts. A Tornado Warning is issued when a tornado has been sighted in the immediate area or weather information such as weather radar indicates a tornado may be in progress or about to occur. When a Tornado Warning is issued, event organizers need to take immediate action to ensure the safety of event attendees and staff. Severe Thunderstorm Watches and Severe Thunderstorm Warnings follow a similar forecast issue process. Due to the nature of tornadoes and severe thunderstorms, warning lead times are often limited to only minutes. Depending on the weather situation, forecasters may go straight to a Warning Bulletin. In Alberta, the Alberta Emergency Alert is activated for all issued Tornado Warnings.

There are many options with respect to receiving current weather conditions, weather forecasts, weather watches and warnings. Some of these options are:

- Alberta Emergency Alert (Province of Alberta Emergency Alert Notification System):

www.aema.alberta.ca/ea_index.cfm and www.emergencyalert.alberta.ca

- Environment Canada Weather office main web site:

(hourly observed weather, 7 day weather forecasts, satellite, radar, lightning, etc.:

www.weatheroffice.gc.ca/canada_e.html

- Environment Canada current weather watches, warnings and special weather statements:

www.weatheroffice.gc.ca/warnings/warnings_e.html

- Environment Canada Weatheradio (check for local coverage):

www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=792F2D20-1

- Environment Canada Special Weather Statements explained:

www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=3579ED05-1#c2

- Environment Canada "How to use Environment Canada public forecasts":

www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=4D51ECA8-1

- Environment Canada Public Forecast regions:

www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=D805AD6A-1

- Environment Canada Telephone Services:

www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=5DCDEFB5-1

- Canadian Meteorological and Oceanographic Society private sector meteorological consultants:

www.cmos.ca/Privatesector/indexe.html

During Event:

1) Perform continuous monitoring of current weather conditions, forecasts, weather Watches and Warnings

Event organizers need to ensure that a comprehensive continuous weather forecast and weather monitoring plan has been created and followed as required. Know what to look for and continuously monitor the sky. Weather can change quickly and this is especially so for summer thunderstorms.

Actual weather conditions need to be interpreted properly. Event organizers need to ensure that sensitive and high impact decisions can be made quickly. Weather forecasts for the immediate and surrounding area should be monitored for several days immediately leading up to the scheduled event.

2) Ensure weather information is communicated regularly

Event organizers need to ensure that the established communication plan is followed and the necessary weather information and updates are distributed as required to those that need to know. Weather information that should be regularly communicated includes and is not limited to; current observed weather conditions, weather forecasts, weather watches and warnings. The flow of weather information should be regular and **must** be maintained or enhanced with the approach of significant or severe weather.

3) Ensure weather related emergency plans are known and can be quickly activated

The best emergency plans developed are often rendered ineffective if they are not well known by those that need to know. Emergency plans are often required to be activated with very short notice and need to be effectively communicated to event staff and attendees (as per communication plan). Weather threats can evolve especially rapidly. All identified event staff or officials need to be fully aware of the weather emergency plans (roles and responsibilities) and have fully tested the plans during pre-event emergency simulations.

Post Event:

1) Review overall weather related event emergency plans

Emergency plans cannot cover absolutely every situation that could arise at a mass gathering event. As soon as practical after an event, existing emergency plans should be reviewed. Once a review of the plans is performed, it is important to identify what worked well and what did not.

2) Identify lessons learned and incorporate into future weather related event emergency plans

Emergency plans that had been invoked during an event may not always have had the expected outcome or results. It is important to identify lessons learned and incorporate that information into future emergency plans. This will assist in creating a better set of guidelines to follow for the next time the event or a similar event is held.

Appendix #2 – Weather Element Hazard Assessment

Warm Season (Alberta)

Weather Element	Environment Canada Warning Threshold Values (Alberta Specific)	Environment Canada Day 1 to 7 Public Forecast Threshold Values (Alberta Specific)	Potential Event Impact (YES or NO)	Historical Probability of Occurrence (HIGH to LOW)	Event Specific Critical Threshold Values Identified (YES or NO)	Emergency Mitigation Plan Identified (YES or NO)
Tornado	- A credible report of ongoing tornado - Forecaster assessment of data	- Not specifically included - Identified in Watch or Warning only				
Thunderstorm	- Hail ≥ 20 mm diameter and/or - Wind gust ≥ 90 km/h and/or - Rain ≥ 50 mm in ≤ 1 hour	- Chance of thunderstorm is ≥ 30% - "Risk of Severe Thunderstorm" included when Watch or Warning is in effect				
Lightning	- No specific Warning	- Not specifically included but always implied when thunderstorms are forecast				
Hail	- No specific Warning (see Thunderstorm Warning)	- Rarely mentioned but implied when thunderstorms are forecast				
Humidex	- Issued as Humidex Advisory when: Humidex ≥ 40 and Dewpoint ≥ 15°C	- Not specifically included in forecast - Included in current weather conditions when Humidex value ≥ 25				
Extreme	- Frost Warning for	- Daily maximum temperature included				

Temperatures	temperatures ≤ 0 °C (growing season only) - Otherwise no specific Warnings	- Daily minimum temperature included				
Rain or Showers	- ≥ 50 mm in ≤ 24 hours or - ≥ 75 mm in ≤ 48 hours	- Chance is ≥ 30%. Amounts mentioned when ≥ 5 mm in combined Day 1 and Day 2 only				
Wind	- ≥ 70 km/h or gusts ≥ 90 km/h or - ≥ 80 km/h or gusts ≥ 100 km/h (for some Alberta wind prone regions)	- Wind speeds ≥ 20 km/h for Day 1 or Day 2 - The term "Windy" used for Day 3 to 7 when winds ≥ 40 km/h				
Dust Storm	- Widespread visibilities ≤ 800 m - Duration ≥ 1 hour	- Visibilities approaching or ≤ 800 m in blowing dust Day 1 or Day 2 only				
Fog	- Widespread visibilities ≤ 1 km - Duration ≥ 1 hour	- Visibilities approaching or ≤ 1 km for Day 1 and Day 2 only				
UV Index	- No specific warning	- UV Index ≥ 3, Day 1 only				
Air Quality	- Bulletins from Alberta Environment	- Not included - See Alberta Environment website				

1. Except for Severe Thunderstorm and Tornado Warnings (short duration events), status of "Warnings in Effect" shall also be noted in the regular Environment Canada Public Forecast.
2. Weather Watches also issued for Tornadoes and Severe Thunderstorms.

Cold Season (Alberta)

Weather Element	Environment Canada Warning Threshold Values (Alberta Specific)	Environment Canada Day 1 Through Day 7 Public Forecast Inclusion Threshold Values (Alberta Specific)	Potential Event Impact (YES or NO)	Historical Probability of Occurrence (HIGH to LOW)	Event Specific Critical Threshold Values Identified (YES or NO)	Emergency Mitigation Plan (YES or NO)
Snow or Flurries	- ≥ 10 cm in ≤ 12 hours or - ≥ 25 cm in ≤ 24 hours	- Chance is ≥ 30%. Accumulation mentioned when ≥ 2 cm, Day 1 and Day 2 only				
Blowing Snow	- Visibilities ≤ 800 m and - Wind ≥ 30 km/h and - Duration ≥ 3 hours	- Visibilities at times ≤ 2 km				
Blizzard	- Visibilities ≤ 400 m and - Wind ≥ 40 km/h and - Duration ≥ 4 hours	- Visibilities approach Warning criteria, Day 1 and Day 2 only				
Winter Storm	- ≥ 25 cm in ≤ 24 hours or - criteria met for Snowfall Warning AND another type of winter Warning	- As described in Warning				
Wind Chill	- Wind chill ≤ -40 and - Wind ≥ 15 km/h and - Duration ≥ 3 hours	- Forecast wind chill ≤ -25 and wind ≥ 15 km/h, Day 1 and Day 2 only				

Extreme Temperatures	- Cold or Warm, no specific Warning	- Daily maximum temperature included - Daily minimum temperature included				
Freezing Rain	- Duration ≥ 2 hours or - Sufficient to pose significant hazard	- Chance is ≥ 30% for Day 1 or Day 2 - Day 3 to 7 if forecast amounts ≥ 5 mm				
Freezing Drizzle	- Persistent, duration ≥ 8 hours	- Chance is ≥ 30%, Day 1 or Day 2 only				
Snow Squall	- See Environment Canada Warning criteria website	- As described in Warning				
Flash Freeze	- See Environment Canada Warning criteria website	- As described in Warning				
Rain or Showers	- ≥ 25 mm in ≤ 24 hours	- Chance is ≥ 30%. Amounts mentioned when ≥ 5 mm in combined Day 1 and Day 2 only				
Wind	- ≥ 70 km/h or gusts ≥ 90 km/h or - ≥ 80 km/h or gusts ≥ 100 km/h (for some Alberta wind prone regions)	- Wind speeds ≥ 20 km/h for Day 1 or Day 2 - The term “Windy” used for Day 3 to 7 when winds ≥ 40 km/h				
Air Quality	- Air Quality Advisories issued by Alberta Environment	- Not included - See Alberta Environment website				

1. Status of “Warnings in Effect” shall also be noted in the regular Environment Canada Public Forecast.
2. Weather Watches also issued for Winter Storms.
3. Lightning and UV Index may also be considered during the cold season.

Appendix #3 – Alberta Weather and Natural Hazards

General Information - Alberta Weather and Natural Hazards

- **Thunderstorms and Severe Thunderstorms**
  - Hot humid summer days are "beneficial" but not necessary for thunderstorms
  - Thunderstorms and lightning can occur any time of the day, night or year
  - Severe thunderstorms (intense local rainfall, large hail, strong winds or tornadoes) mainly occur between early May and early September with a peak in July. Severe thunderstorms have been recorded as early as mid April and as late as October
  - During the summer season, peak activity is usually from late afternoon through late evening, but can occur at any time of day or night

- **Lightning**
  - Lightning causes more weather related deaths in Canada than do windstorms or tornadoes (Statistics Canada information from 2000 to 2008)
  - Environment Canada does not issue severe weather bulletins for lightning
  - All thunderstorms produce lightning, but most thunderstorms do not meet the criteria for an Environment Canada Severe Weather Bulletin
  - Lightning can strike as far as 25 km away from a thunderstorm which is much farther than thunder can normally be heard, especially in noisy environments
  - Lightning that is seen or thunder that is heard must not be ignored
  - Recent United States studies indicate that the vast majority of lighting caused fatalities in the United States were associated with "typical" thunderstorms that did not require weather warnings to be issued based on the National Weather Service warning criteria.
  - Recent studies also indicate that in the United States only 3 to 5% of lightning fatalities are caused by direct strikes to individuals. Ground currents account for 40 to 50% and side flashes account for 20 to 30% of lightning fatalities

- **Tornado / High Wind**
  - General public often misinterpret straight-line thunderstorm wind damage as tornado damage
  - While tornadoes can bring extreme winds, straight-line outflow wind events associated with thunderstorms tend to create more damage in Alberta per year than do tornadoes
  - Straight-line winds from thunderstorms can last hours and spread out across hundreds of square kilometres with brief local wind speeds well in excess of 100 km/h.
  - Most tornadoes are comparatively short lived and narrow (tornado widths larger than 1 kilometre is fairly rare)
  - Strong straight-line wind events not associated with thunderstorms can occur at any time of day, night or year. These types of straight-line winds are usually associated with cold fronts or Chinooks

- **Winter Storm / Blizzard / Ice Storm**
  - Heavy snowfalls can occur in any month from September through May and even during the summer months over higher elevations

- **Hail**
  - Hail can affect any portion of Alberta. The area between Edmonton to just south of Calgary, extending west from Highway #2 into the foothills receives more hail events than anywhere else in Canada
  - Golf ball sized hail is not uncommon with severe thunderstorms. On rare occasions, Alberta hail can reach tennis ball size. These types of storms are typically accompanied by very strong winds

- **Avalanche** http://www.avalanche.ca/cac

- **Rain / Flooding**
  - Heavy rains associated with thunderstorms can produce very significant rainfall amounts over very short periods of time. Slow moving thunderstorms can produce over 100 mm of rain in less than an hour over localized areas. Flash flooding can result. Prediction of the exact location for these types of local downpours is very difficult
  - Larger scale rain systems tend to produce rainfall amounts over larger areas and have a better tendency to be forecast days in advance

- **Temperature Extremes, Sun and UV Exposure**
  - Exposure to excessive natural cold and heat are consistently and respectively the #1 and #2 ranked causes of direct weather related deaths in Canada per year (Statistics Canada information from 2000 to 2008)
  - Cold / Wind Chill - temperatures in the minus 30's can occur in southern Alberta from November through March. Wind chills can reach into the minus 50's in mid-winter. Freezing temperatures can occur even in summer
  - Heat - most areas of Alberta experience a few days per year when temperatures exceed 30°C. On rare occasions overnight lows may stay above 20°C. Prolonged exposure to hot temperatures can create heat stroke or dehydration
  - On sunny, midsummer days, temperatures above paved surfaces can be 15°C warmer than the ambient temperature and pavement surface temperatures can be 30°C warmer than ambient. This can significantly affect people.
  - Sun exposure can significantly affect both temperatures and UV levels. How much shade is desirable and available for protection from both local heating and UV radiation are factors to be considered year-round, not just in the summer
  - UV radiation levels are not related to air temperature. UV radiation is increased near bodies of water, snow on the ground or partly cloudy skies where clouds act to reflect UV radiation back to the ground

- **Air Quality (smoke, smog, chemicals, volcanic ash)**
  - Smoke or other forms of atmospheric pollution can create air quality problems, particularly if a ground-based "atmospheric inversion" is present. This is a situation where the air temperature warms with increasing altitude above the ground which leads to trapping of pollution near the ground. The source of the smoke or other pollution can be relatively local or hundreds of kilometers away. Summertime inversions are most common in the overnight and early morning hours. Wintertime inversions can last for days or even weeks
  - Government of Alberta Air Quality Health Index current conditions: http://environment.alberta.ca/0977.html

Appendix #4 – Significant Historical Weather Events

General Information – A Few Significant Historical Alberta Weather Events

Alberta history is full of notable weather events. The following is a short selection of a few of the more recent and notable weather events and weather related impacts:

- **Tornadoes**
  - Edmonton Tornado, 31 July 1987, approximately 3 PM to 4 PM, Category F4, 27 fatalities, $558 million in damage
  - Pine Lake Tornado, 14 July 2000, approximately 6:55 PM to 7:20 PM, Category F3, 12 fatalities, $15.2 million in damage

- **Straight-line thunderstorm winds and other strong straight line winds**
  - On June 30, 2003, a thunderstorm produced severe straight-line winds which caused approximately $4 million damage to the community arena in the Town of Grimshaw. Wind speeds were estimated to be approaching the 150 km/h range
  - On December 19, 2004, a combination of weather factors came together to push strong winds (made even stronger by an extremely rare line of winter thunderstorms) across central Alberta. A kite surfer on frozen Lac Ste. Anne (west of Edmonton) was caught in the sudden winds and was unfortunately blown ashore into a structure and killed. An area weather station reported wind speeds of 117 km/h and winds in some areas were estimated to be near 130 km/h
  - On July 15, 2008 an intense thunderstorm moved from Taber towards Medicine Hat. Many communities were affected. Reports showed evidence of a significant straight-line wind event. Non-Environment Canada weather monitoring equipment (mounted on a communication tower 85 metres above the ground) indicated a wind speed of 216 km/h before the tower collapsed
  - On August 1, 2009 near 6 PM, outflow winds from a thunderstorm surfaced several kilometres ahead of the actual thunderstorm and moved across central Alberta through the Camrose Regional Exhibition Grounds during the Big Valley Jamboree Country Music Festival. The performance stage collapsed during this wind event. Tragically, there was one fatality and many injuries

- **Hail Storms**
  - In 2009, from late Sunday evening August 2 through the early morning hours of Monday August 3, a very large line of severe storms rumbled from the northwest to southeast across much of southern Alberta. These severe storms pummelled communities and their sleeping residents with golf ball sized hail and very strong winds. Damage to buildings in the Towns of Sundre and Carstairs was very extensive

- **Rains and Flooding**
  - On July 11, 2004 a weather pattern known as an "an upper low" was present across central Alberta. In the early afternoon, a series of nearly stationary thunderstorms developed over West Edmonton. In the space of an hour over 100 mm of rain likely fell, combined with large amounts of hail that clogged storm sewers. Portions of the Whitemud Freeway became completely submerged with water

- A series of multi-day rainstorms affected much of central and southern Alberta in June 2005. States of Local Emergency were established by various municipalities. Portions of the Town of Drumheller were nearly lost due to overland flooding
- June 2010 brought major rain to southeastern Alberta and southwestern Saskatchewan. Some communities were isolated. East of Medicine Hat a portion of the Trans-Canada Highway was completely washed away

- **Lightning**
  - Some thunderstorms can produce hundreds of ground strikes in the area the size of a major city. On average, Alberta experiences well over 300,000 ground strikes per year. Every lightning strike is potentially fatal

- **Heat and Cold**
  - In July 2006, sweltering weather affected a major weekend international outdoor auto race at the Edmonton City Centre airport. On Saturday July 22, the high temperature reached 35.1°C, the fifth warmest temperature ever recorded for the city since 1880 (the start of Edmonton weather records). The following day (race finals) the high temperature was 34.1°C. Medical personnel attended to fans of the race that suffered from the effects of the excessive heat
  - In February 2011, an outdoor ice hockey game set to raise funds for cancer and also attempt to break the Guinness Book of World Records for “longest ice hockey game” was played near Edmonton. The game ran day and night for over 241 hours (just over 10 days). During the game, the 40 players had to endure melting temperatures and poor ice conditions at the start and then bitterly cold temperatures for the latter stages. Some players received medical attention for cold-related injuries

- **Winter Storms**
  - The Blizzard of January 29-31, 1989. Alberta was experiencing a mild period in the days prior to the storm. However, cold air was poised in the Yukon and began its southward plunge on the 29th. The cold front was particularly vicious. It dropped temperatures from plus 2°C to minus 12°C in an hour as it charged through Edmonton during the morning of the 30th. Rain rapidly changed to heavy snow and the temperature was down to minus 25°C and still falling at noon. By late afternoon, the entire province was under the grip of the blizzard. The Edmonton area received snowfall amounts around 35 cm (an all-time January record). The effects of the storm lingered for days. Temperatures were in the minus 30's. In the Edmonton area alone, 7 deaths were directly attributed to the storm's fury
  - January 2011 saw a series of storms affecting much of the southern portions of the province. Snowfall amounts were well above normal and created significant concerns for spring flooding. Additionally, a number of roofs on buildings collapsed from the weight of the snow. Weight on roofs was made even worse by warming weather and rainfall which soaked into the snow already situated on the rooftops

- **Air Quality**
  - In February 2009 a persistent "temperature inversion" across much of central Alberta that lasted for over two weeks produced poor air quality as well as poor visibility in fog
  - In August 2010 smoke from British Columbia forest fires pushed eastwards across Alberta, Saskatchewan and Manitoba. The smoke produced poor air quality across large portions of the Prairie Provinces. There was discussion of cancelling a major outdoor running race in Edmonton, but the race eventually went ahead as scheduled
  - There are a number of dormant and active volcanoes in western North America, including several dormant volcanoes in British Columbia. Volcanoes can be dormant for centuries and erupt without warning. On May 18, 1980 Mount St. Helens in Washington State erupted violently. Mount Baker, also in Washington State, is currently deemed the greatest potential volcanic hazard to British Columbia. It is possible that an eruption could bring ash to Alberta

Appendix #5 – Death in Canada by Forces of Nature

Statistics Canada:

Deaths in Canada Caused by Exposure to Forces of Nature[1]

There are multiple sources of information on human mortality due to weather and other external forces of nature. These sources may use different data sources and analyze the data in different ways, leading to different results.

The table below includes Statistics Canada data on deaths in Canada caused by exposure to various forces of nature in each of the years 2000-2009. The average per year and % per year have been subsequently added to the Statistics Canada table. The Statistics Canada year by year numbers may differ from those appearing in other sources such as specialized medical studies and publications.

Cause of death (ICD-10)[2,3,4,5]	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Avg / Year	% Per Year
Victim of exposure to forces of nature	118	124	136	145	120	122	112	138	133	106	**125**	**-**
Victim of exposure to excessive natural heat	3	17	32	11	4	13	14	4	2	**4**	**10**	**8 %**
Victim of exposure to excessive natural cold	92	88	96	108	107	102	83	115	106	**83**	**98**	**78 %**
Victim of exposure to sunlight	-	-	-	-	2	0	0	0	0	**0**	**< 1**	**< 1 %**
Victim of lightning	3	8	1	1	1	1	4	7	4	**3**	**3**	**3 %**
Victim of avalanche, landslide and other earth movements	2	9	7	19	3	3	6	10	19	**12**	**9**	**7 %**
Victim of cataclysmic storm	12	0	0	1	0	0	3	0	2	**2**	**2**	**2 %**
Victim of flood	-	-	-	3	0	0	0	2	0	**0**	**<1**	**< 1 %**
Victim of exposure to other and unspecified forces of nature	6	2	0	2	3	3	2	0	0	**2**	**2**	**2 %**

Statistics Canada Footnotes:

1. Source: Statistics Canada, Canadian Vital Statistics, Death Database.

***CANSIM Table 102-0540 - Deaths, by cause, Chapter XX: External causes of morbidity and mortality*,**

http://www5.statcan.gc.ca/cansim/ **(accessed: February 7, 2013)**

2. World Health Organization (WHO), International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10)

“CD-10 Version 2010, Chapter XX, External Causes of Morbidity and Mortality” info at http://apps.who.int/classifications/icd10/browse/2010/en#/X30-X39

3. The cause of death tabulated is the underlying cause of death. This is defined as (a) the disease or injury which initiated the train of events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury. This underlying cause is selected from a number of conditions listed on the death registration form.

4. Counts in this table exclude deaths of non-residents of Canada.

5. To reduce the size of the table, only causes of death with a frequency of one or more in Canada are reported. Over the years, more causes of death will be added as needed.