



Annex 1

Community Risk Profile

County of Dufferin and Member Municipalities
Emergency Management Plan

December 2011

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Introduction

This community risk profile examines the highest risk hazards identified in the HIRA (Hazards Identification and Risk Assessment) with regards to community vulnerabilities and capacities. The highest risk hazards were found to be severe snowstorms, tornadoes, human health emergencies, power outages, and flooding. The following topics are explored for each hazard, where possible:

Vulnerabilities- Aspects of a community that makes it more likely to be impacted or more severely impacted by a hazard.

Vulnerable populations-This section identifies which populations or areas are the most vulnerable to the specific hazard

Critical Infrastructure- Discusses what critical infrastructure is likely to be impacted by the hazard. Critical infrastructure is a collection of resources required for a community's functioning and may include electricity and utilities, communications systems, transportation, health care, economy, and natural environment.

Capacity- This section refers to resources the County of Dufferin has to help provide an effective response to the specific hazard.

Emergency management actions- These actions are taken before, during, and after a hazard occurs to preserve human health, continue with the delivery of critical services, reduce economic impact, and return the community back to normal. The phases of an emergency are listed below and discussed for each hazard, though there are not always viable actions for each phase of a hazard.

Mitigation and prevention-Mitigation and prevention are proactive measures meant to take place before the hazard occurs. Mitigation aims to reduce the impact the hazard has, while prevention aims to prevent the hazard from occurring in the first place.

Preparedness-Preparedness occurs when the County is getting ready for a hazard. This may include public warnings, resource positioning, and putting staff on standby.

Response and recovery- The response phase occurs directly after the emergency has happened. It involves activating emergency services and the emergency plan and providing for citizens' immediate, emergent needs. Recovery is what occurs after the threat is responded to. Recovery aims to restore a community affected by a hazard back to normal.

Legal Authority

"In developing its emergency management program, every municipality shall identify and assess the various hazards and risks to public safety that could give rise to emergencies and identify the facilities and other elements of the infrastructure that are at risk of being affected by emergencies."

-Emergency Management and Civil Protection Act R.S.O. 1990, c.3, s.5.1(2)

Overview: Risk Assessment Grid

Probability	4	-Fog	-Flooding - Thunderstorms -Wind storm -Extreme cold -transportation incidents -Oil/natural gas spills	-Power outage	-Severe snowstorm
	3		-Extreme heat -HAZMAT- transportation		-Tornado -human health emergencies
	2		-Drought -structural collapse		-Ice storm
	1		-Explosions and fires	-Forest fire -HAZMAT- fixed site -Dam failure	
		1	2	3	4
Consequence					

Probability

- 1= No incidents in the last 15 years.
- 2= More than 5 years since the last incident.
- 3= One incident in the last 5 years.
- 4= Several incidents in the last 5 years.

Consequence

- 1= Negligible impact
- 2= Limited (injuries, localized damage)
- 3= Substantial (widespread injuries and damage, temporary disruption of basic services)
- 4= High (fatalities, widespread and severe damage, disruption of essential services)

Natural Hazards Profiles

N1: Extreme Heat

Vulnerabilities

Vulnerable Populations	<ul style="list-style-type: none"> • Elderly, infants and those with pre-existing medical conditions • Citizens without access to air conditioning systems • Outdoor workers
Critical Infrastructure	<ul style="list-style-type: none"> • Industry, especially companies that involve labour outdoors. • Potential for rolling brownouts.
Capacity	<ul style="list-style-type: none"> • Emergency services • Social services • Community centres • Environment Canada • NGOs and service clubs • CCAC (Community Care Access Centre)

Emergency Management Actions

Mitigation and Prevention	<ul style="list-style-type: none"> • Consider extending public pool hours and lowering fares on high Humidex days.
Preparedness	<ul style="list-style-type: none"> • Heat advisory public awareness campaigns and public education on how to prevent heat-related emergencies • Encourage outdoor workers to take frequent breaks.
Response and Recovery	<ul style="list-style-type: none"> • May need to open a cooling centre. • Cold water may need to be delivered to vulnerable populations.

N1: Extreme Cold

Vulnerabilities

Vulnerable Populations	<ul style="list-style-type: none"> • Elderly, infants, those with existing medical conditions • Outdoor workers • Citizens with poorly-insulated homes.
Critical Infrastructure	<ul style="list-style-type: none"> •
Capacity	<ul style="list-style-type: none"> • Emergency services • Social services • Environment Canada • NGOs and service clubs • CCAC

Emergency Management Actions

Mitigation and Prevention	<ul style="list-style-type: none"> • Provide assistance/incentives for residents with drafty homes to improve their home's heat retention.
Preparedness	<ul style="list-style-type: none"> • Initiate windchill advisory public awareness when extreme cold is forecasted. • Ensure vulnerable populations are safe.
Response and Recovery	<ul style="list-style-type: none"> • Warming centre may need to be opened. • Several 'out of the cold' programs are already in place. • Alert local schools to decrease the exposure of children to extreme cold.

N2: Fog	
<u>Vulnerabilities</u>	
Vulnerable Populations	<ul style="list-style-type: none"> • Drivers
Critical Infrastructure	<ul style="list-style-type: none"> • Roads • Potential delay in emergency service arrival
Capacity	<ul style="list-style-type: none"> • Emergency services • Environment Canada • CANWARN
<u>Emergency Management Actions</u>	
Mitigation and Prevention	<ul style="list-style-type: none"> • Consider the installation of yellow fog lights on higher traffic roads.
Preparedness	<ul style="list-style-type: none"> • Public notification and education (encourage drivers to avoid driving in heavy fog if possible).
Response and Recovery	<ul style="list-style-type: none"> •

N5: Ice storms	
<u>Vulnerabilities</u>	
Vulnerable Populations	<ul style="list-style-type: none"> • All
Critical Infrastructure	<ul style="list-style-type: none"> • Electricity and communications structures • Road closures • Delayed access to emergency services
Capacity	<ul style="list-style-type: none"> • Emergency services • Public works • Social services • Environment Canada • CANWARN • ARES • Hydro companies • NGOs
<u>Emergency Management Actions</u>	
Mitigation and Prevention	<ul style="list-style-type: none"> • Establish redundant electricity sources for critical infrastructure. • Ensure communications structures and power lines meet or exceed CSA standards
Preparedness	<ul style="list-style-type: none"> • Roads are salted or brined in advance of predicted snow or ice storms.
Response and Recovery	<ul style="list-style-type: none"> • Consider opening a shelter for longer-term events. • Food and medication may need to be delivered to vulnerable populations through longer-term events. • Be prepared for a power outage. • Debris Management Contingency Plan may need to be activated.

N6: Flooding

Vulnerabilities

Vulnerable Populations • Residents of low-lying areas, areas near bodies of water

Critical Infrastructure • Transportation
• Road access for emergency services
• Potable water

Capacity • Emergency services
• Conservation authorities
• Public works
• NGOs
• Restoration contractors

Emergency Management Actions

Mitigation and Prevention • Water level monitoring (already being maintained by conservation authorities)
• Rain barrel usage decreases the amount of water after heavy rainfall that drains into the watershed.
• Limiting construction in floodplains
• Building dykes and water blocking structures near vulnerable buildings.

Preparedness • Sandbagging buildings when floods are likely or imminent.
• Public education and awareness
• Issuing early warnings where possible.
• Specific plans are in place with the conservation authorities.

Response and Recovery • May need to open a shelter for displaced citizens.
• Evaluate structural safety of affected buildings; allow citizens to return home where safe.

N7: Snow storms

Vulnerabilities

Vulnerable Populations	<ul style="list-style-type: none">• All
Critical Infrastructure	<ul style="list-style-type: none">• Risk of building collapse under snow load.• Hazardous road conditions and road closures can cause delayed emergency response.• Electricity and communications systems.
Capacity	<ul style="list-style-type: none">• Emergency Services• Public Works• Environment Canada• CANWARN• ARES• Snowmobile clubs• NGOs
<h3><u>Emergency Management Actions</u></h3>	
Mitigation and Prevention	<ul style="list-style-type: none">• Early public alerting• Have redundant power sources available to critical buildings• Ensure building codes regarding snow loads are met or exceeded in County-owned buildings, and encourage residents to do the same.• Roads are closed if they are deemed to present hazardous driving conditions.
Preparedness	<ul style="list-style-type: none">• Ensure an extra supply of salt, sand, and snow plows are available.• Salting and brining of the road in advance of snowfall.• Initiate school closures if hazardous road conditions are likely
Response and Recovery	<ul style="list-style-type: none">• Continuous plowing and salting of the road• Consider delivering food and medications to vulnerable individuals in longer length emergencies (perhaps through liaisons with snowmobiling clubs).• Monitor water levels as the snow begins to melt.

N8/N9: Tornadoes and wind storms

Vulnerabilities

Vulnerable Populations	<ul style="list-style-type: none">• Trailer park/campsite visitors and residents• Outdoor enthusiasts• Those unable to seek shelter• Residents of homes that do not meet the building code.
Critical Infrastructure	<ul style="list-style-type: none">• Electricity and communications structures• Road access• Building damage
Capacity	<ul style="list-style-type: none">• Emergency services• Environment Canada• CANWARN• Social services• Public works• Hydro companies• ARES• NGOs and volunteers

Emergency Management Actions

Mitigation and Prevention	<ul style="list-style-type: none">• Encourage schools and businesses to practice tornado drills• Encourage campgrounds and trailer parks to have a warning system and a secure structure residents and guests can take shelter in.
Preparedness	<ul style="list-style-type: none">• Advise residents to shelter-in-place when a tornado warning is issued, and to be ready to shelter-in-place when a watch is issued.• Public education and awareness will likely decrease losses.• Advise residents to secure loose items outdoors in advance of a wind storm if it is safe to do so.
Response and Recovery	<ul style="list-style-type: none">• Address emergency health and safety issues• Remove debris from roadways to allow for emergency response• Open a shelter and provide temporary housing• May need to initiate Debris Management Contingency Plan.

N13: Drought

Vulnerabilities

Vulnerable Populations	<ul style="list-style-type: none">• Residents in higher elevation locations or areas with sandy soil• Agricultural communities more vulnerable to financial impact.
Critical Infrastructure	<ul style="list-style-type: none">• Crops and livestock• Potable water• Fire-fighting capabilities
Capacity	<ul style="list-style-type: none">• Farmers' and livestock associations• CDAMP• OMAFRA

Emergency Management Actions

Mitigation and Prevention	<ul style="list-style-type: none">• Water conservation measures should be taken during summer months• Encourage the use of rain barrels by citizens.• Early alerting will increase water conservation efforts by communities.
Preparedness	<ul style="list-style-type: none">• Public awareness/education campaigns on water conservation.
Response and Recovery	<ul style="list-style-type: none">• If water pressures reach low enough levels, evacuation may be required• Potable water may need to be provided to citizens with dry wells.• Farmers may need financial assistance, depending on the severity of the drought.

N15/N3: Severe thunderstorms and hail

Vulnerabilities

Vulnerable Populations	<ul style="list-style-type: none">• People that are stuck outside with nowhere to take shelter• Trailer parks and campsites• Property owners
Critical Infrastructure	<ul style="list-style-type: none">• Crop, building damage• Power and communication systems outage
Capacity	<ul style="list-style-type: none">• Emergency services• Environment Canada• Public works• Hydro companies• ARES

Emergency Management Actions

Mitigation and Prevention	<ul style="list-style-type: none">• Communicate storm warnings to the public
Preparedness	<ul style="list-style-type: none">• Public education can decrease the risk of personal injury or property damage.
Response and Recovery	<ul style="list-style-type: none">• Debris Management Contingency Plan may need to be initiated. Continue monitoring water levels in case of flash flooding.• County-owned facilities may need to be repaired after hail storms.

N17: Forest Fire

Vulnerabilities

Vulnerable Populations	<ul style="list-style-type: none">• Outdoor enthusiasts• Residents in close proximity to forests
Critical Infrastructure	<ul style="list-style-type: none">• Roads• Natural environment
Capacity	<ul style="list-style-type: none">• Emergency services• Ministry of Natural Resources• Dufferin County Forest staff• Ontario Parks staff• Nearby fire departments
<h4><u>Emergency Management Actions</u></h4>	
Mitigation and Prevention	<ul style="list-style-type: none">• Public education on forest fire prevention.• Consider MOUs with neighbouring Counties' fire departments.
Preparedness	<ul style="list-style-type: none">• Monitoring dead fuel moisture or implementing a similar dryness index monitoring system.
Response and Recovery	<ul style="list-style-type: none">• Consider ecosystem restoration efforts, as required.

N18: Human Health Emergencies

Vulnerabilities

Vulnerable Populations	<ul style="list-style-type: none">• Locations with higher population densities• Health care professionals• Elderly, infants, those with pre-existing medical conditions
Critical Infrastructure	<ul style="list-style-type: none">• Health care• Industry• Public services
Capacity	<ul style="list-style-type: none">• Emergency services• Hospitals and health laboratories• Public Health• Ministry of Health• National Emergency Stockpile System
<h4><u>Emergency Management Actions</u></h4>	
Mitigation and Prevention	<ul style="list-style-type: none">• Public education regarding hygiene and infectious disease prevention (which is done successfully by Public Health)• Continuing education courses for health care providers regarding emerging infectious diseases and best practices.• Enforcement of quarantines.
Preparedness	<ul style="list-style-type: none">• Keep the public aware of the current situation and means of preventing transmission.
Response and Recovery	<ul style="list-style-type: none">• Ensure quarantine measures are effective and deliver essential items like food and medication to individuals who are quarantined.• Request access to the National Emergency Stockpile System if local resources are overwhelmed.• Provide follow-up treatment to health care professionals.

Technological Hazards Profiles

T1: Structural Collapse	
<u>Vulnerabilities</u>	
Vulnerable Populations	<ul style="list-style-type: none"> • Individuals in buildings that are at risk • Buildings in high-wind, heavy snow areas • Older buildings that have been ‘grandfathered’ over through the building code • Agricultural buildings, where the building code may not be followed.
Critical Infrastructure	<ul style="list-style-type: none"> • Road access • Services, businesses and residences
Capacity	<ul style="list-style-type: none"> • Emergency services • Public works • HUSAR (Heavy Urban Search and Rescue) teams from EMO for larger building collapses, if local resources are overwhelmed. • Construction and demolition contractors
<u>Emergency Management Actions</u>	
Mitigation and Prevention	<ul style="list-style-type: none"> • Consider providing assistance for people building agricultural structures in locating, understanding, and complying with building codes. • Consider providing structural inspections for old buildings that have been ‘grandfathered’ past the building code.
Preparedness	<ul style="list-style-type: none"> •
Response and Recovery	<ul style="list-style-type: none"> • May need to provide temporary shelter if collapsed structure is a residence. • May need to bring in additional resources such as an USAR (Urban Search and Rescue) team from EMO for larger building collapses. • May need to initiate the Debris Management Contingency Plan.

T2: Power Outage

Vulnerabilities

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| Vulnerable Populations | <ul style="list-style-type: none">• Those requiring medical appliances that run on electricity• Homes with poor temperature regulation and retention• Farmers (specifically those with livestock) |
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| Critical Infrastructure | <ul style="list-style-type: none">• Road delays• Fuel• Food and medications• Livestock• Industry• Communications systems |
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| Capacity | <ul style="list-style-type: none">• Emergency services• Generator share programs• Social services• ARES• NGOs and service clubs• Hydro companies |
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Emergency Management Actions

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| Mitigation and Prevention | <ul style="list-style-type: none">• Ensure power lines and associated structures are appropriate for the climate.• Ensure alternate redundant energy sources for essential buildings such as the EOC, dispatch centers, and hospitals.• Establish generator share programs (especially in agricultural communities)• Encourage citizens to have a 72-hour kit. |
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| Preparedness | <ul style="list-style-type: none">• Have extra generators and fuel available. |
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| Response and Recovery | <ul style="list-style-type: none">• May need to open a shelter for longer term outages, especially if temperatures are extreme. |
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T3: Dam Failure

Vulnerabilities

Vulnerable Populations	<ul style="list-style-type: none">• Downtown Orangeville, East Luther Marsh• Anyone downstream from a dam, publicly or privately-owned
Critical Infrastructure	<ul style="list-style-type: none">• Road access• Electricity and communications systems• Industry and residences• Hospitals, schools, and other important public buildings.
Capacity	<ul style="list-style-type: none">• Emergency services• Conservation authorities

Emergency Management Actions

Mitigation and Prevention	<ul style="list-style-type: none">• Regular dam structure inspections and water level monitoring is already being done by conservation authorities.• Develop standards for and records of privately-owned dams.• Ensure citizens who are at risk in the event of a dam failure are aware of the risk and actions to be taken in the event of a breach (already in place for Island Lake)
Preparedness	<ul style="list-style-type: none">• Public education regarding safe maintenance of privately-owned dams.
Response and Recovery	<ul style="list-style-type: none">• Conduct evacuations if required, and take care of the immediate needs of evacuees.• Ensure that dam is rebuilt to prevent similar failures in the future.

T5: Explosions and Fires

Vulnerabilities

Vulnerable Populations	<ul style="list-style-type: none">• Those in close proximity to the incident
Critical Infrastructure	<ul style="list-style-type: none">• Nearby residences, businesses and services• Natural environment
Capacity	<ul style="list-style-type: none">• Emergency services• CBRNE team from EMO if local resources are overwhelmed.

Emergency Management Actions

Mitigation and Prevention	<ul style="list-style-type: none">• Encourage heavy industry to maintain and share an emergency plan, consider audits of emergency plans by Fire Prevention Office
Preparedness	<ul style="list-style-type: none">• Consider CBRNE training for firefighters and awareness-level training for other emergency responders.
Response and Recovery	<ul style="list-style-type: none">• CBRNE teams may need to be called in from EMO if local resources are exceeded.• Inquiries/investigations should be initiated as required.

T6: Hazardous Materials- Fixed Site

Vulnerabilities

Vulnerable Populations	<ul style="list-style-type: none">• Site employees• Residents in close proximity to the incident
Critical Infrastructure	<ul style="list-style-type: none">• Industry• Local residences• natural environment• 911 dispatch centre and hospital are in close proximity to heavy industry• Road and railway access
Capacity	<ul style="list-style-type: none">• Emergency services• CBRNE (Chemical, Biological, Radiological, Nuclear, Explosive) teams from EMO if local resources are overwhelmed.

Emergency Management Actions

Mitigation and Prevention	<ul style="list-style-type: none">• Encourage heavy industry to create and share emergency plans.• Consider audits of heavy industry emergency plans by the Fire Prevention Office• Consider 'buffer zones' between heavy industry and residential areas
Preparedness	<ul style="list-style-type: none">• . Public education of residents near sites, including evacuation and shelter-in-place actions.• Consider training more first responders to a hazardous materials awareness level.• Regular training for health care professionals in decontamination procedures (such as in 2011's exercise).
Response and Recovery	<ul style="list-style-type: none">• Ensure mandatory reporting takes place, may need to access Emergency Management Ontario's CBRNE (chemical, biological, radiological, nuclear and explosives) team if local resources are overwhelmed.• An inquiry into the cause and means to prevent similar events in the future may be required.

T7: Hazardous Materials- Transportation Incident

<u>Vulnerabilities</u>	
Vulnerable Populations	<ul style="list-style-type: none"> • People in proximity to incident
Critical Infrastructure	<ul style="list-style-type: none"> • Road access • Natural environment • Nearby services, businesses and residences
Capacity	<ul style="list-style-type: none"> • Emergency services • Public works • CBRNE team from EMO if local resources are overwhelmed.
<u>Emergency Management Actions</u>	
Mitigation and Prevention	<ul style="list-style-type: none"> • Consider establishing trucking bypass routes that avoid high density residential areas. • Ensure citizens are aware of shelter-in-place and evacuation procedures.
Preparedness	<ul style="list-style-type: none"> • Consider training more first responders to at least a hazardous materials awareness level. • Regular training for health care professionals in decontamination procedures (such as in 2011's exercise).
Response and Recovery	<ul style="list-style-type: none"> • Ensure mandatory reporting takes place • Road closures may need to be coordinated. • Ensure spills are cleaned up in such a way that protects human health and the environment.

T10: Oil/Natural Gas Spills

<u>Vulnerabilities</u>	
Vulnerable Populations	<ul style="list-style-type: none"> • Residents and citizens within close proximity to bulk fuel retailers.
Critical Infrastructure	<ul style="list-style-type: none"> • Hospital and 911 dispatch centre are near a bulk fuel retailer • Road closures • Potential loss of heating due to ruptured natural gas lines. • Natural environment
Capacity	<ul style="list-style-type: none"> • Emergency services • Hydro, natural gas, and oil companies. • Ministry of Environment for larger spills
<u>Emergency Management Actions</u>	
Mitigation and Prevention	<ul style="list-style-type: none"> • Signage and public education reminding citizens not to dig where there is potential to rupture natural gas lines. • Teach public (especially in vulnerable areas) how to shelter-in-place.
Preparedness	<ul style="list-style-type: none"> •
Response and Recovery	<ul style="list-style-type: none"> • May need to evacuate or advise residents to shelter-in-place, depending on situation. • Natural gas companies will need to be contacted to shut off the gas • Restoration of services to community by hydro company.

T13: Transportation emergencies (Vehicle collisions, road closures, and plane incidents)	
<u>Vulnerabilities</u>	
Vulnerable Populations	<ul style="list-style-type: none"> • Drivers
Critical Infrastructure	<ul style="list-style-type: none"> • Road access • Debris • Natural environment (fuel damage)
Capacity	<ul style="list-style-type: none"> • Emergency services • Towing companies • Public works • Hotels
<u>Emergency Management Actions</u>	
Mitigation and Prevention	<ul style="list-style-type: none"> • Ensure road signage is clear • Public education campaigns on safe driving habits (some campaigns such as R.I.D.E have been greatly successful at reducing risks associated with impaired driving). • Road closures help reduce the risk of driver injury when road conditions are hazardous. • Enforce road closures.
Preparedness	<ul style="list-style-type: none"> • More reliable notifications from the Greater Toronto Airport Authority when planes with mechanical issues are circling over the county to burn off fuel would help increase the County's response capacity to an incident.
Response and Recovery	<ul style="list-style-type: none"> • Fuel spills may need to be reported and cleaned up in such a way that human health and the natural environment are protected. • Public notification is required if roads will remain closed for longer periods of time for investigations.

Conclusion

Because of the unique climate, geography, and industry the County of Dufferin and its Member Municipalities have, there are a variety of hazards that are possible or likely to occur. It is essential to understand not only the probability and consequences of each hazard, but to also understand that each hazard brings unique challenges to the table in how it impacts vulnerable populations and critical infrastructure, as well as the challenges associated with prevention, mitigation, preparedness, response, and recovery.

By analyzing vulnerabilities and current response capacity, The County of Dufferin and its Member Municipalities can more effectively plan and respond to emergencies, and as a result build safer, more resilient communities.