

Preparing for Extreme Weather Events

Presentation of the City's Natural Hazard Mitigation Plan



March 11, 2019



**CDM
Smith**

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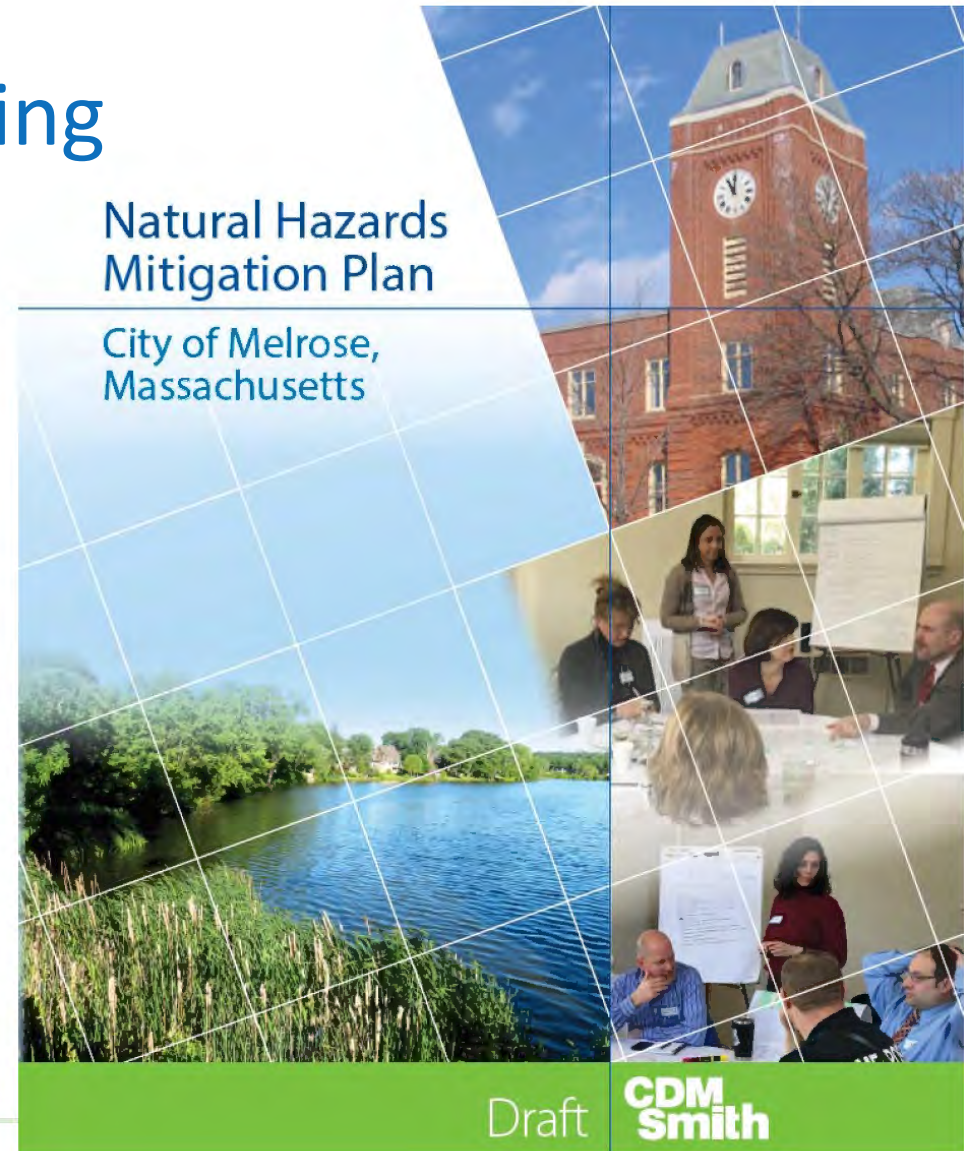


Welcome and Meeting Purpose

Purpose of Tonight's Meeting

To present the final draft of the Natural Hazard Mitigation Plan, which represents a year of resilience planning for the City of Melrose.

We will discuss our City's readiness to handle natural hazards, climate-related events and emergencies and how we can become more prepared.



Natural Hazards
Mitigation Plan

City of Melrose,
Massachusetts

Draft

CDM
Smith

March 2019

Agenda

- 6:30 – 6:45 Welcome and review the meeting purpose
- 6:45 – 7:15 Presentation on the Natural Hazard Mitigation Plan
 - Drivers and goals of the Plan
 - Review of hazards
 - Vulnerabilities and hazard mitigation strategies to improve resilience to hazards
 - Next steps for plan adoption
- 7:15 – 8:00 Solicit community questions and comments on the Natural Hazard Mitigation Plan

Presentation on the Natural Hazards Mitigation Plan



What is a Natural Hazards Mitigation Plan?

- Planning process to reduce the risk of loss of life and property by lessening the impact of disasters
- Developing hazard mitigation plans enables state, tribal, and local governments to:
 - Increase education and awareness around threats, hazards, and vulnerabilities;
 - Build partnerships for risk reduction involving government, organizations, businesses, and the public;
 - Identify long-term, broadly-supported strategies for risk reduction;
 - Align risk reduction with other state, tribal, or community objectives;
 - Identify implementation approaches that focus resources on the greatest risks and vulnerabilities; and
 - Communicate priorities to potential sources of funding.



FEMA

Drivers and Goals of the Plan

1. Identify both known and potential risks from current and future natural hazards
2. Develop, through the community planning process, actions to reduce the risk from these hazards
3. Enable the City to take action to protect and manage the community in the occurrence of a natural hazard
4. Make Melrose eligible for non-disaster funding and assistance from FEMA to implement actions

This plan serves as the primary resilience planning document for the City of Melrose.

Process for Public Input and Feedback

- Municipal Vulnerability Preparedness workshops: April 2018
- Community Input and Public Listening Session: June 2018
- Regional Input Meeting: September 2018
- Public Meeting: March 2018



Definitions

- **Hazard:** A physical process or event (hydro-meteorological or oceanographic variables or phenomena) that can harm human health, livelihoods, or natural resources.
- **Risk:** The potential for consequences where something is at stake and where the outcome is uncertain.
- **Vulnerability :** The potential effects of hazards on human or natural assets and systems. These potential effects, which are determined by both exposure and sensitivity, may be beneficial or harmful.
 - **Exposure:** The presence of assets in places that could be adversely affected by a hazard
 - **Sensitivity:** The degree to which an asset may be affected, either adversely or beneficially, when exposed to climate variability or change or geophysical hazards
- **Hazard Mitigation Strategies or Actions** reduce vulnerability and increase resilience to hazards.

A hazard is like the sun. The risk is sunburn. The vulnerability includes the length of exposure to the sun, how sensitive the skin is to it.

The actions to address vulnerability of a sunburn include staying in the shade or wearing sunblock.

What are the Natural Hazards of Concern in Melrose?

Natural Hazard of Concern	Natural Hazard Detail
Flooding	Flooding (<i>see "high hazard areas"</i>)
	Dam Failure
	Landslide
Severe Weather	High Wind
	Thunderstorm
	Tornado
	Hurricane and Tropical Storm
	Snow & Blizzard
	Nor'easter
	Ice Storm
	Extreme Temperatures
	Drought
Fire	Major Urban Fire
	Wildfire
Earthquake	
Invasive Species	

Sources of hazard risk:

- 2013 Massachusetts Hazard Mitigation Plan
- MVP Workshops
- Public Meeting
- City's institutional knowledge



Photo credit: NBC News, "Mother's Day Storm" 2006:

<http://www.nbcnews.com/id/12786790/ns/weather/t/new-england-hit-more-rain-river-flooding/#.XIA8F8BKJUI>

What are Vulnerabilities and Hazard Mitigation Strategies?

- Vulnerability Assessment:
Identify how natural hazards may impact the City
- The assessment considers the exposure and sensitivity of an asset to the natural hazards to determine the vulnerability.
- Hazard Mitigation Strategies:
Identify ways to preemptively take appropriate actions to reduce the severity of the impact of natural hazards.
 - Reduce the susceptibility of Melrose to a natural hazard
 - Better prepare the City to protect and manage the community in the occurrence of a natural hazard.
 - Implementing these actions can reduce the risk of loss of life and property in Melrose

Three “asset” categories:

1. Society
2. Infrastructure
3. Environment

Societal Vulnerabilities to Natural Hazards

Vulnerable Asset	Applicable Hazards				
	Flooding	Severe Weather	Fire	Earthquake	Invasive Species
Emergency Management Planning	X	X	X	X	
Senior / Aging Population	X	X	X	X	X
Chronically Ill / Disabled Population	X	X	X	X	
Non-English Speaking Population	X	X	X	X	
Low-Income Population	X	X	X	X	
Faith Based Organizations	X	X	X	X	
Pet Owners	X	X	X	X	

Societal Hazard Mitigation Strategies to Improve Resilience

■ **Emergency Management Planning:**

- ✓ Create a dedicated emergency management director position
(hired February 2019)
- Update emergency and evacuation plans, including communication protocols, evacuation routes, shelter planning
- Develop individual emergency and evacuation plans
- Continue to update, track progress, and participate in emergency management planning programs
- Provide training on implementation of plans

Societal Hazard Mitigation Strategies to Improve Resilience

■ **Vulnerable Populations:**

- Education and outreach about emergency response and evacuation – including in different languages as appropriate
- Obtain, leverage, update, and/or expand the National Grid utility life support contact list
- Install a back-up power generator at City shelters and the senior center for power and air conditioning during outages
- Identify public spaces with air conditioning that residents may go to
- Ensure emergency shelters have appropriate accommodations for this population
- Explore the possibility of a cooling assistance program and programs that would help low-income populations cover replacement costs for essential needs

Includes seniors, the chronically ill or disabled, non-English speaking, and low income people in Melrose.

Societal Hazard Mitigation Strategies to Improve Resilience

■ **Faith Based Organizations:**

- Educate faith-based organization leaders about emergency response and evacuation plans
- Install back-up generators to maintain power supply during an outage to use of such facilities as a safe refuge during a disaster

■ **Pet Owners:**

- Develop a list of possible locations for pets to go during an emergency (e.g., local animal shelters or pet-friendly emergency shelter locations)
- Include the Animal Control Officer in appropriate hazard mitigation training and planning activities

Infrastructure Vulnerabilities to Natural Hazards

Vulnerable Asset	Applicable Hazards				
	Flooding	Severe Weather	Fire	Earthquake	Invasive Species
Transportation Infrastructure	X	X		X	
Residential and Commercial Properties	X	X	X	X	
Fire and Police Stations	X	X		X	
City Hall	X	X	X	X	
Memorial Hall	X	X		X	
Emergency Shelters	X	X		X	
Schools / Child Care Facilities	X	X	X	X	
Melrose-Wakefield Hospital	X	X	X	X	
Pharmacies	X	X	X	X	
Gas Infrastructure	X	X		X	
Electrical / Power Infrastructure	X	X	X	X	
Fuel Sources	X	X	X	X	
Food Sources					
Communications Infrastructure	X	X	X	X	
Sewer Pump Stations	X	X		X	
Water and Sewer Pipelines	X	X		X	
Stormwater Drainage Infrastructure					

Infrastructure Hazard Mitigation Strategies to Improve Resilience

■ Stormwater Drainage Infrastructure:

- Conduct stormwater drainage studies to address flooding that results from insufficient capacity or other deficiencies in the drainage system
- Dredge stormwater outfalls in areas prone to flooding
- Keep stormwater infrastructure mapping up-to-date
- Coordinate with neighboring communities and state agencies when sending drainage downstream and monitor associated infrastructure issues.

High flood hazard areas:

- Ell Pond
- Downtown/City Hall Parking Lot
- Lower Spot Pond Brook
- South Washington Street
- Wyoming Cemetery
- Long Pond
- Ashburton Place
- Bellevue Golf Club
- Swains Pond Avenue
- Lincoln Street
- Conant Park/Martin Street
- Bay State Road

Infrastructure Hazard Mitigation Strategies to Improve Resilience

■ **Critical City-Owned Buildings:**

- Install back-up power at City Hall and other locations where deemed necessary and feasible
- Ensure appropriate storage is available for food and other supplies with power supply as needed
- Elevate or relocate critical mechanical, electrical, or emergency response equipment above flood levels
- Secure critical City records, by scanning and storing in multiple locations including offsite electronic storage

*Critical City
Buildings include:*

- *City Hall*
- *Memorial Hall*
- *Police Station*
- *Fire Stations*
- *Schools*
- *Council on Aging*
- *Other Shelters*

Infrastructure Hazard Mitigation Strategies to Improve Resilience

- **Melrose-Wakefield Hospital:**
 - Coordinate and cross-train emergency management personnel
 - Investigate if the hospital could act as a 24-hour pharmacy to the public before, during, and/or after an emergency
- **Food Sources and Pharmacies:**
 - Designate secure food storage locations away from flood prone areas to house food reserves
 - Store in-demand or difficult to acquire medications outside future flood prone areas
 - Extend hours of operation prior to an emergency for opportunity to acquire food and medications

Infrastructure Hazard Mitigation Strategies to Improve Resilience

- **Residential and Commercial Properties:**
 - Consider stricter ordinances for new and existing development to protect from flood damage
 - Train/certify contractors and developers on appropriate resilience measures with natural hazards in mind
 - Continue to ensure that existing building codes are being strictly followed
- **Schools/Child Care Facilities:**
 - Consider upgrading HVAC systems, adding generators, implementing green infrastructure (e.g., green roofs, tree planting, etc.)
 - Enforce building codes on fire prevention and elevator maintenance
 - Improve school and child care facility preparedness including training and drills for students and teachers

Infrastructure Hazard Mitigation Strategies to Improve Resilience

■ **Communications Infrastructure:**

- Close the City's fiberoptic loop and implement a voice over internet protocol system
- Provide backup power at City Hall to maintain critical communications equipment
- Implement new emergency notification system (e.g., Reverse 911, CodeRed)
- Maintain and restore damaged communication infrastructure
- Elevate critical communication equipment, or relocate equipment away from future flood prone areas
- Ensure access to portable cell towers and generator systems
- Ensure information technology (IT) equipment has redundancy, uninterrupted power supply, and other similar precautions
- Provide training on emergency response communications

Infrastructure Hazard Mitigation Strategies to Improve Resilience

- **Transportation Infrastructure:**
 - Ensure that existing evacuation routes allow for fast movement and avoid locations prone to flooding.
 - Educate City emergency and DPW personnel on route locations and maintenance
- **Fuel Sources:**
 - Designate secure fuel storage locations for fuel reserves away from flood prone areas
 - Partner with gas stations across the City to extend hours of operation prior to an emergency event

Infrastructure Hazard Mitigation Strategies to Improve Resilience

- **Energy Infrastructure (gas and electric):**
 - Regularly maintain, restore, or upgrade damaged power and gas line infrastructure
 - Use appropriate resilient design and materials
 - Train/certify gas infrastructure contractors and National Grid personnel on resiliency protocols
 - Implement and construct alternative energy systems and microgrids where feasible
- **Electrical/Power Infrastructure:**
 - Maintain a buffer zone between edge of power lines and adjacent treed areas
 - Elevate critical electrical equipment in future flood prone areas
 - Develop list of available “on call” electricians that can connect National Grid power lines
 - Develop procedures and plans for when peak power demand exceeds capacity during an extreme heat event
 - Develop and implement high temperature design standards for electrical equipment

Infrastructure Hazard Mitigation Strategies to Improve Resilience

■ **Water and Sewer Pumping Stations:**

- Elevate equipment located within flood prone areas, where possible
- Regularly maintain and repair damaged infrastructure
- Continue infiltration and inflow (I/I) reduction measures in sewers to prevent backups and overflows during high flow events
- Install back-up power (either onsite or portable) and bypass capability at the five sewer pumping stations

■ **Water and Sewer Pipelines:**

- Identify areas of concern and prioritize repair and replacement efforts
- Regularly maintain and repair damaged infrastructure
- Develop ongoing training programs on appropriate emergency response actions
- Coordinate mutual aid water connections and potential sewer surcharge conditions with neighboring cities and towns
- Keep Water System Emergency Response Plan up-to-date and provide training

Environmental Vulnerabilities to Natural Hazards

Vulnerable Asset	Applicable Hazards				
	Flooding	Severe Weather	Fire	Earthquake	Invasive Species
Water Bodies: Lakes / Rivers / Reservoirs	X	X		X	X
Parks / Natural Areas / Open Space	X	X	X		X
Tree Canopy	X	X	X	X	X
Wildlife	X	X	X	X	X
Air Quality		X	X		

Environmental Hazard Mitigation Strategies to Improve Resilience

■ **Open Space and Wildlife:**

- Investigate and implement mosquito management measures
- Protect and expand vegetative buffers and stabilize river and stream embankments to reduce erosion
- Encourage green infrastructure
- Conduct routine maintenance of parks and natural areas
- Identify threats to vegetation and monitor for invasive species

■ **Water Bodies:**

- Install flood control gates to manage flows where appropriate
- Increase channel capacity within streams and rivers

Environmental Hazard Mitigation Strategies to Improve Resilience

■ **Tree Canopy:**

- Create a tree warden or certified arborist position (or train existing personnel)
- Conduct routine monitoring of street trees/trees in parks and natural areas
- Preserve and enhance tree canopy to reduce urban heat island effects
- Offer incentive programs or outreach to plant trees with high survivability and resiliency against extreme conditions (both City and private property owners)

■ **Air Quality:**

- Develop an air quality monitoring and alert system to notify the public of poor air quality events
- Continue to implement Complete Streets principles
- Enforce anti-idling laws for vehicles
- Encourage behaviors that decrease energy use and reduce emissions



Next Steps

Next Steps for Plan Adoption and Implementation


Incorporate
comments from this
meeting

Submit the plan to
the Massachusetts
Emergency
Management Agency

Submit the plan to
the Federal
Emergency
Management Agency

Formally adopt the
plan (Mayor / Board
of Aldermen)

- Implement the high priority mitigation strategies
- Communicate progress to the public and within City departments
- Monitor and re-evaluate the plan periodically
- Update the plan every five years



Community Questions and Comments

How to Provide Additional Comments

Please submit any additional comments on the Natural Hazards Mitigation Plan by **noon on Friday, March 15, 2019** to Elena Proakis Ellis, City Engineer at:

- Address: City Hall, 562 Main Street
- Phone: 781-979-4172
- Email: eproakis@cityofmelrose.org (please put “NHMP comments” in the subject line)



Preparing for
Extreme Weather Events:
Presentation of the City's
Natural Hazard Mitigation Plan



March 11, 2019

1. What action can the City take to make Melrose more prepared to natural hazards and climate-related events?

ACTION TITLE:
ACTION DESCRIPTION:
PRIORITY OF THIS ACTION: <input type="checkbox"/> Very high <input type="checkbox"/> High <input type="checkbox"/> Moderate <input type="checkbox"/> Low

2. What additional comments do you have on the Natural Hazard Mitigation Plan?

COMMENT:

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Thank you for your input!