



# 2018 Hazard Mitigation Plan Update Montgomery County



Strategy and Solutions Meeting  
April 16, 2018

- Welcome and Introductions
- Recap - Risk Assessment Meeting
- Mitigation Strategy
  - Mitigation Techniques
  - Mitigation Ideas: A Resource for Reducing Natural Risks
  - Historic and Cultural Resources
  - Exercises
    - Exercise 1: Evaluation of the 2012 Mitigation Strategy
    - Exercise 2: Mitigation Action Project Development
- Next Steps and Action Items



Hello  
my name is





- Discussed changes in risk since 2012
- Discussed hazards to profile in the 2018 HMP
- Ranked hazards based on risk
- Discussed Plan goal and objectives

## High-Ranked Hazards

- Severe Storms
- Winter Storm
- Extreme Heat

## Moderate-Ranked Hazards

- Flooding
- Hurricane/Tropical Storm
- Fire
- Water Shortage/Drought

## Low-Ranked Hazards

- Tornado
- Earthquakes
- Land Subsidence/Karst

<b>Conclusions on Hazard Risk: Results from Risk Assessment Meeting</b>	
<b>HIGH RISK RATING (3.0 or higher)</b>	
<b>MODERATE RISK RATING (2.0 – 2.9)</b>	Severe Storm, Winter Storm, Extreme Heat, Flooding, Hurricane/Tropical Storm, Fire, Water Shortage/Drought, Tornado, Earthquake
<b>LOW RISK RATING (0.1 – 1.9)</b>	Land Subsidence/Karst
<b>Conclusions on Hazard Risk: Results from Local Jurisdiction Survey</b>	
<b>HIGH RISK RATING (3.0 or higher)</b>	Severe Storm
<b>MODERATE RISK RATING (2.0 – 2.9)</b>	Winter Storm, Extreme Heat, Flooding, Hurricane/Tropical Storm, Fire, Water Shortage/Drought, Tornado, Earthquake
<b>LOW RISK RATING (0.1 – 1.9)</b>	Land Subsidence/Karst



## High-Ranked Hazards

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## Moderate-Ranked Hazards

- Winter Storm
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## Low-Ranked Hazards

- Land Subsidence/Karst

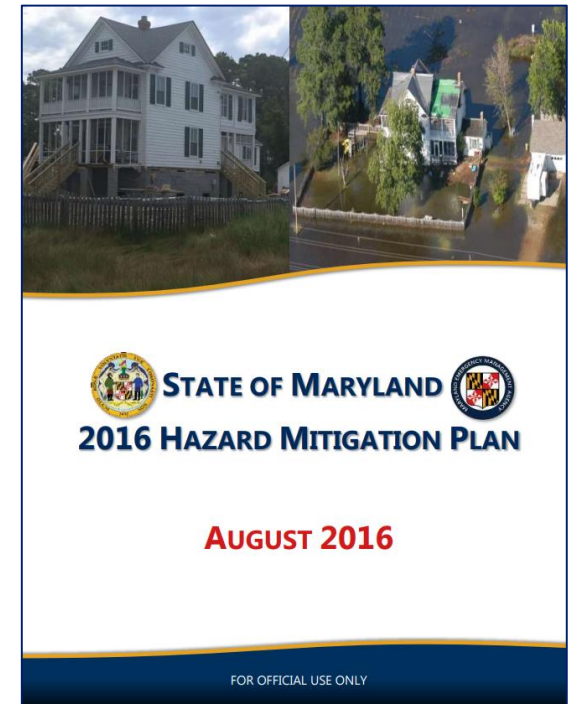
## Proposed Goal

Efficiently use County resources needed to minimize the losses of life and property from natural hazards and protection of County assets, infrastructure, and critical facilities.

## Proposed Objectives

- Encourage building and land use regulations that increase safety and resiliency and reduce risks posed by natural disasters.
- Protect public health, safety, and welfare by increasing public awareness of existing natural hazards and by fostering individual and public responsibility in mitigating risks caused by those hazards.
- Ensure that infrastructure is adequate and properly maintained to provide continued functionality of all critical services necessary to protect residents, and property.
- Improve communications and increase natural hazard awareness through education and citizen participation.
- Enhance the capabilities of local jurisdictions to identify and mitigate natural hazards.
- Participate and comply with the National Flood Insurance Program (NFIP) through floodplain identification, mapping and floodplain management.
- Promote actions that protect historic and cultural resources, while enhancing hazard mitigation and community resiliency.

- To protect life, property, and the environment from hazard events through:
  - Increased public awareness of hazards, mitigation, preparedness, and resiliency.
  - Enhanced coordination with local jurisdictions and linkages between state and local mitigation and resiliency efforts.
  - Protection of State assets, infrastructure, and critical facilities.
  - Promote actions that protect natural resources, while enhancing hazard mitigation and community resiliency.
  - Efficient use of State resources.





- Mitigation Techniques
- Mitigation Ideas: A Resource for Reducing Natural Risks
- Historic and Cultural Resources
- Results from Local Jurisdiction Survey
- Mitigation Action Exercises
  - Evaluation of 2012 Mitigation Strategy
  - Mitigation Action Project Development







## Local Plans and Regulations

- Government authorities, policies, or codes that influence the way land and buildings are developed and built such as:
  - Comprehensive Plans
  - Subdivision Regulations
  - Building Codes and Enforcement
  - Capital improvement Programs
  - Stormwater Management Plans
  - Emergency Operations Plans





## Structure & Infrastructure Projects

- Modifying existing structures and infrastructure to remove them from a hazard area
- Construction of new structures to reduce impacts of hazards

## Natural Systems Protection

- Actions that minimize damage and losses and also preserve or restore the functions of natural systems
  - Sediment and erosion control
  - Stream corridor restoration
  - Forest management
  - Conservation easements
  - Wetland restoration and preservation





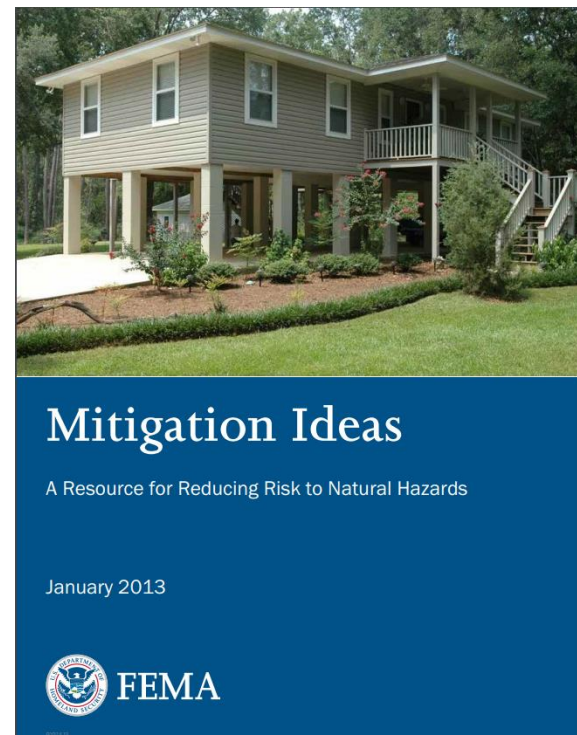
## Education & Awareness Programs

- National preventative programs
- Mailings to hazard-prone communities
- Websites with maps and information
- Presentations to community groups
- Radio or TV spots



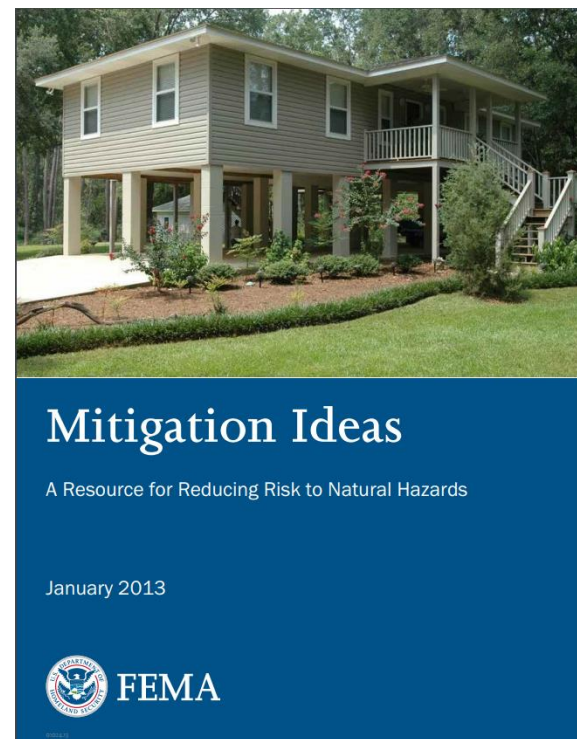
## Severe Wind Actions

- Local Planning and Regulation
  - Adopt and Enforce Stronger Building Codes - Requiring or encouraging wind engineering measures and construction techniques (Resources: FEMA P-85, P-804)
- Structure and Infrastructure
  - Retrofit Public Buildings and Critical Facilities - Retrofitting buildings with load-path connectors to strengthen the structural frames (Resources: FEMA 361, P-499, 550)
- Education and Awareness
  - Increase Severe Wind Risk Awareness - Educating design professionals to include wind mitigation during building design (Resources FEMA P-431, P-804)



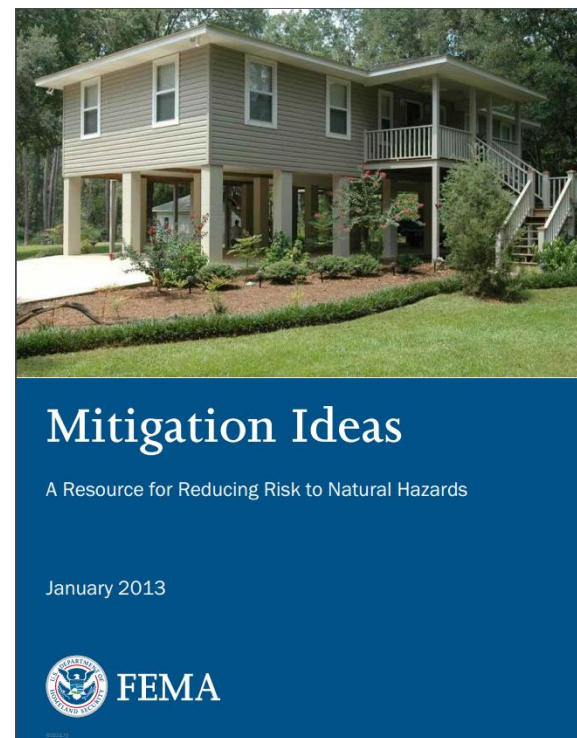
# Winter Weather Actions

- Local Planning and Regulation
  - Adopt and Enforce Stronger Building Codes for roof snow loads
- Structure and Infrastructure
  - Protect Power Lines by installing redundancies and loopfeeds
- Education and Awareness
  - Assist Vulnerable Populations - Organizing outreach to vulnerable populations, including establishing and promoting accessible heating centers in the community



# Extreme Temperature Actions

- Local Planning and Regulation
  - Reduce Urban Heat Island Effect - Encouraging installation of green roofs, which provide shade and remove heat from the roof surface and surrounding air.
- Education and Awareness
  - Increase Awareness of Extreme Temperature Risk and Safety



# Flood Actions

- Local Planning and Regulation
  - Adopt Policies to Reduce Stormwater Runoff - Encouraging the use of permeable driveways and surfaces to reduce runoff and increase groundwater recharge.
- Structure and Infrastructure
  - Protect Infrastructure - Floodproofing wastewater / water treatment facilities located in flood hazard areas. (Resources FEMA P-259, 345, 543, B-797)





## Flood Actions (Cont.)

- Natural Systems Protection
  - Protect and Restore Natural Flood Mitigation Features - Developing a land banking program for the preservation of the natural and beneficial functions of flood hazard areas. (Resources FEMA 100, 268)
  
- Education and Awareness
  - Educate Property Owners about Flood Mitigation - Encouraging homeowners to install backflow valves to prevent reverse-flow flood damages.



### Mitigation Ideas

A Resource for Reducing Risk to Natural Hazards

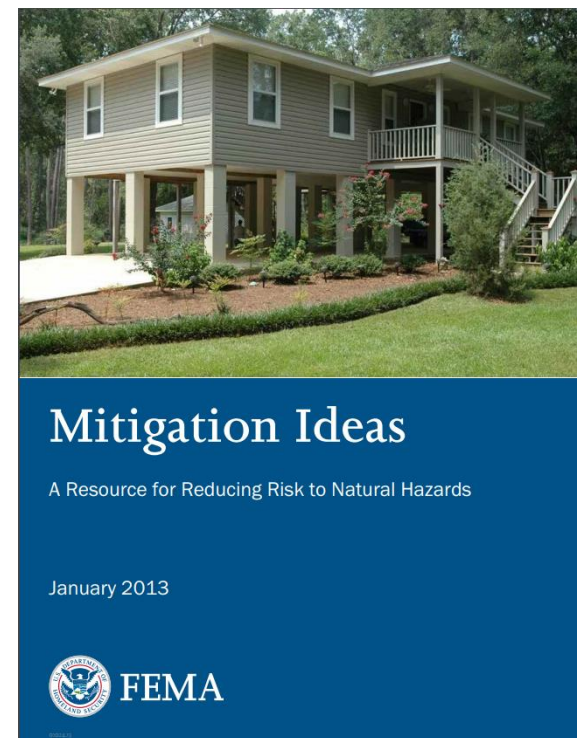
January 2013



FEMA

# Drought Actions

- Local Planning and Regulation
  - Developing a drought communications plan & early warning system to facilitate timely communication of relevant information.
- Structure and Infrastructure
  - Retrofit Water Supply Systems to accommodate drought events.
- Natural Systems Protection
  - Enhance Landscaping and Design Measures - Incorporating drought tolerant practices into landscape ordinances.
- Education and Awareness
  - Educate Residents on Water Saving Techniques - Installing rain-capturing devices for irrigation (rain barrel incentive program)



# Tornado Actions

- Local Planning and Regulation
  - Require Wind-Resistant Building Techniques (Resource: ICC-600 Standard for Residential Construction in High-Wind Regions)
- Education and Awareness
  - 3 Conduct Tornado Awareness Activities in schools and public buildings



## Mitigation Ideas

A Resource for Reducing Risk to Natural Hazards

January 2013



FEMA

## Earthquake Actions

- Local Planning and Regulation
  - Incorporate Earthquake Mitigation into Local Planning, codes and ordinances (Resources: FEMA 83, 224, 232, 254, 266, 313, 349, P-749, P-750)
- Structure and Infrastructure
  - Protect Critical Facilities and Infrastructure - Requiring bracing of generators, elevators, and other vital equipment in hospitals.
- Education and Awareness
  - Conduct Outreach to Builders, Architects, Engineers, and Inspectors - Conducting information sessions or other forms of outreach on seismic code provisions for new and existing buildings



### Mitigation Ideas

A Resource for Reducing Risk to Natural Hazards

January 2013



## FEMA Grant Program Eligible Activities (as of June 20, 2017)

Mitigation Activity	HMA Program		
	HMGP	PDM	FMA
<b>1. Mitigation Projects</b>	✓	✓	✓
Property Acquisition and Structure Demolition	✓	✓	✓
Property Acquisition and Structure Relocation	✓	✓	✓
Structure Elevation	✓	✓	✓
Mitigation Reconstruction	✓	✓	✓
Dry Floodproofing of Historic Residential Structures	✓	✓	✓
Dry Floodproofing of Non-residential Structures	✓	✓	✓
Generators	✓	✓	
Localized Flood Risk Reduction Projects	✓	✓	✓
Non-Localized Flood Risk Reduction Projects	✓	✓	
Structural Retrofitting of Existing Buildings	✓	✓	✓
Non-structural Retrofitting of Existing Buildings and Facilities	✓	✓	✓
Safe Room Construction	✓	✓	
Wind Retrofit for One- and Two-Family Residences	✓	✓	
Infrastructure Retrofit	✓	✓	✓
Soil Stabilization	✓	✓	✓
Wildfire Mitigation	✓	✓	
Post-Disaster Code Enforcement	✓		
Advance Assistance	✓		
5 Percent Initiative Projects	✓		
Aquifer and Storage Recovery	✓	✓	✓
Flood Diversion and Storage	✓	✓	✓
Floodplain and Stream Restoration	✓	✓	✓
Green Infrastructure	✓	✓	✓
Miscellaneous/Other	✓	✓	✓
<b>2. Hazard Mitigation Planning</b>	✓	✓	✓
<b>3. Technical Assistance</b>			✓
<b>4. Management Costs</b>	✓	✓	✓



## Integrating Historic Property and Cultural Resources

Identified priorities:

- Stormwater management and drainage improvements in flood-prone historic districts.
- Conduct targeted outreach to historic property owners about mitigation techniques and recovery.
- Further evaluate specific sites for property improvements.



### Integrating Historic Property and Cultural Resource Considerations Into Hazard Mitigation Planning

State and Local Mitigation Planning How-To Guide

FEMA 386-6 / May 2005



FEMA

## Integrating Historic Property and Cultural Resources

The Planning Process:

1. Organize your efforts to develop a mitigation plan;
2. Identify hazards and assess losses to your community;
3. Set mitigation priorities and goals and write the plan;
4. Implement the mitigation plan, including project funding and other considerations.



### Integrating Historic Property and Cultural Resource Considerations Into Hazard Mitigation Planning

State and Local Mitigation Planning How-To Guide

FEMA 386-6 / May 2005



FEMA



# Organize your efforts to develop a cultural resource hazard mitigation plan

Map designated historic districts & individually listed historic & cultural resources in the identified hazard area



# Organize your efforts to develop a cultural resource hazard mitigation plan

Identify & engage historic property owners, cultural resource site managers, cultural and historic preservation agencies, institutions and organizations with a vested interest in properties in the hazard area



# Identify hazards and assess losses to your community

Conduct a historic property risk assessment to determine level of risk for each district, site or contributing historic property

FLOOD HAZARD MATRIX											
#	Street	OBJECT ID	SDAT	MHT Inventory	Date of Construction	Use	First Floor Elevation	Lowest Opening Elevation	Total Square Footage	Number of Stories	Basement
142	DOCK ST	115	20600007808800	AA-548	1880	Attached Com	3.74	3.74	5720	2	No
126	DOCK ST	113	20600006983200	AA-1239	1875	Commercial			6026	3	No
136	DOCK ST	71	20600008109313	AA-457	1850	Commercial	1.76	1.76	4320	3	No
132	DOCK ST	70	20600005295300	AA-457	1825	Commercial	3.17	3.17	2340	2	No
130	DOCK ST	73	20600001160625	N/A		Commercial	2.06	2.06	780	1	No
124	DOCK ST	153	20600006983200	AA-455	1900	Commercial	2.16	2.16	6026	3	No
122	DOCK ST	152	20600006983200	AA-1239 AA-456	1875	Commercial	2.16	2.16	6026	3	No
120	DOCK ST	151	20600001157800	AA-456	1916	Commercial	2.04	2.04	1612	2	No
118	DOCK ST	150	20600001160700	AA-455	1891-1897	Commercial	2.04	2.04	3542	2	No
110	DOCK ST	110	20600000142123	AA-455	1930	Commercial	3.22	3.22	11446	2	No
12	DOCK ST	144	20600090019164	N/A	1960	Commercial	1.48	1.48	4550	2	Yes
10	DOCK ST	138		N/A		Commercial			10556	2	No
6	DOCK ST	124		AA-455	1940's	Commercial	3.03	3.03	3246	3	No
4	DOCK ST	80	206000006384160	AA-455	1974	Commercial	2.62	2.62	3950	3	No
1	DOCK ST	17		N/A		Commercial	3.57	3.57		2	No
8	DOCK ST	41	20600003321968	N/A	1960	Commercial			10556	2.5	No
13	EAST ST	44	20600002427600	N/A	N/A	Other	8.53	8.53	3078	1	NO
16	EAST ST	20	20600002844800	AA-1803	1891-1897	Residential	9.61	7.86	2114	2	NO
6	FLEET ST	6	20600004692602	AA-1265	1885-1889	Commercial	6.96	6.96	2751	2	No
14	FLEET ST	50	20600000051400	N/A	1636	Commercial	10.00	10.00	6000	2	No
10	FLEET ST	6									
8	FLEET ST	12									
12	FLEET ST	6									
193	GREEN ST	8									
195	GREEN ST	13									
151	KING GEORGE ST	2									
149	KING GEORGE ST	2									
147	KING GEORGE ST	2									
145	KING GEORGE ST	2									
143	KING GEORGE ST										
139	KING GEORGE ST										

**147 Properties**

- Property Vulnerability (High, Med, Low)
- Loss to Structure (\$)
- Loss to Contents (\$)
- Loss of Function / Use (\$)
- Displacement Cost (\$)

**Total Projected Loss/Cost - \$288.5 million**

# Identify hazards and assess losses to your community

Develop a public awareness program to promote awareness of risk to historic properties and cultural resources and promote preservation sensitive mitigation & adaptation strategies



# Set mitigation priorities and goals and write the plan

- Prioritize publically-owned historic assets and cultural resource sites for mitigation or adaptation
- Identify non-publically-owned historic properties or cultural sites with high community value to serve as adaptation models



# Implement the mitigation plan, including project funding and other considerations

Incorporate stormwater management and drainage improvements in flood-prone historic districts.





## Local Jurisdiction Survey: Purpose

- Goal of the survey was to ensure that every community in the County had an opportunity to participate in the planning process and benefit from the outcome of the hazard mitigation plan.
- Important that the community be involved in the planning process as FEMA's Hazard Mitigation Assistance (HMA) is supported by the plan.

“Do something about the risk”



## Local Jurisdiction Survey: Results

- Discussion Summary
  - How has the nature of hazard risk changed in the last five years? Are there new hazards and is there new development pressure?
    - More frequent and severe storms
    - Drought and water shortage concerns
    - No recent development (exception - Gaithersburg)

- Discussion Summary
  - Are the current resources to implement mitigation actions sufficient? Do you have enough staff and do you have the knowledge, experience and tools?
    - County reliance
    - Limited part-time / full time town manager
    - Contract dependent

- Discussion Summary
  - Are the fiscal, administrative, political, public support, capability, etc. sufficient?
    - Generally good impression and well supported
    - County reliance
    - Limited capabilities of National Park Service – funding support
    - Emergency support staff & funds are needed

## ■ Discussion Summary

### Resources

- County reliance
- Access to available resources known

### Obstacles

- Lack of funds
- Time constraints
- Out of sight out of mind
- Arborists and funding for maintenance
- Lack of front end loader for snow removal
- Stormwater response time

### Opportunities

- Tree survey for health of trees & Pepco response
- Gap analysis
- Educate purpose of plan
- Need for County Liaison
- Neighboring community support
- Impervious surface plan

- Discussion Summary

- Do you know of a severe flood related hazard that has occurred since 2012 that should be highlighted in the 2018 plan?
  - Barnesville: 4 main road sections flood during heavy rains and prevent movement through town
  - Gaithersburg: storm drain failure and flooding at Clopper & Firstfield
  - Glen Echo: Watermain break – WSSC
  - Kensington: Silver Creek storm drain failure at Frederick St. & Kensington Pkwy.
  - Martin’s Addition: End of Deerfield failing storm drain
  - Washington Grove: Drainage issue around CSX at Railroad St.

- Community Resiliency Capability – Consequence Analysis**
  - Community capability to recover after an event can be measured by considering consequences of an event on several community systems.
  - Uses an impact score from 0 to 5 to describe how the community system would be impacted after a significant hazard event.



Impacted System	Jurisdiction															Impact Average
	Barnesville	Brookeville	Chevy Chase	Chevy Village	Chevy Sec 5	Gaithersburg	Garrett Park	Glen Echo	Kensington	Martins Add	Poolesville	Rockville	Somerset	Takoma Park	Washington Grove	
Public	4	2		3		5	4.00	5	4	2		5		2		3.2
Responders				5		5	3.5	4	4			3.5		2		2.7
Continuity of operations/Delivery of services	0	0		5		3	2	4	4	2		2		1		2.3
Property, facilities, and infrastructure	2	2		3		2	4	3	4	3		1		1		2.3
Environment	0	4		5		0	3	3	3	2		1		3		2.4
Economic condition of the jurisdiction	0	0		1		2	1	3	4	1		3		2		1.7
Public confidence in the jurisdiction's governance	0	2		1		1	1	2	3	4		1		1		1.6
<b>Total</b>	<b>6</b>	<b>10</b>		<b>23</b>		<b>18</b>	<b>18.50</b>	<b>24</b>	<b>26</b>	<b>14</b>		<b>16.5</b>		<b>12</b>		<b>16.2</b>
<b>Coments:</b>																
Public has lost confidence in power company																
Dependent upon hazard																
Totally reliant on County for everything																





## Exercise I: Evaluation of 2012 Mitigation Strategy

- This exercise allows you to evaluate and provide the status of actions that were identified in the previous plan.



- Status, progress, and notes on actions from the 2012 HMP.
- Can be completed and emailed by April 30, 2018.

## Montgomery County 2018 Hazard Mitigation Plan Update

<b>Municipality/Agency</b>	
<b>Name and Title</b>	

Please complete this worksheet for each previous Action. This document is located in the resource section of the project website.

HAZARD STRATEGIC ACTION ITEMS	PREVIOUS PLAN STATUS	INCLUDE IN CURRENT PLAN		Completed / Ongoing/ Deferred/ Not Applicable	COMMENT / ADJUSTMENT
		YES	NO		
<b>THUNDERSTORMS</b>					
Install uninterruptible power supplies on critical electronic equipment in county and municipal facilities					
Provide backup power/generators for ten (10) traffic signals					
Educate the public on how to protect property and residential electrical systems					
Purchase an early warning system to alert the public to take shelter					
Purchase emergency generators for critical facilities					
Tree branch/brush clearance and limit how close vegetation can be planted near/beneath power lines					
Develop a public awareness campaign informing residents of the potential impact of high winds due to severe thunderstorms					
Public outreach for the use of the Alert Montgomery System					
<b>WINTER STORMS</b>					
Provide shelters for both residents and animals during severe winter weather					
Provide 4WD vehicles for law enforcement personnel during heavy snow activity					
Continue to research and provide alternative measures to notify individuals with disabilities of winter emergencies (Deferred)	Deferred				
<b>EXTREME HEAT</b>					
Provide relief for those highly impacted by heat by opening cooling centers that also account for special needs populations and conduct education and outreach regarding special needs populations.					
<b>FIRE</b>					
Develop a public awareness campaign to heighten awareness about brush fires and preventative maintenance for homeowners					
<b>FLOOD</b>					
Create a flood risk public awareness campaign for the residents of Chevy Chase, Section 5					
Develop a storm drain evaluation program designed for future improvements and hazard mitigation					
Reconstruct undersized storm drains throughout Garrett Park					
Amend zoning requirements to include floodplain language into conservation easements					

## Exercise II: Mitigation Action Project Development

- This exercise allows you to identify new action items .
- Assess hazard mitigation goals, objectives, and actions as they relate to reducing loss of life and property from natural hazards.



- Each municipality must have at least one new mitigation action.
- There must be at least one mitigation action for each profiled hazard.
- Mitigation actions should be realistic and assessed using STAPLEE.



- Determine additional actions based on current risk, vulnerability, and mitigation goals
- Evaluate each action using the STAPLEE.

## Montgomery County 2018 Hazard Mitigation Plan Update

<b>Municipality/Agency</b>	
<b>Name and Title</b>	

Montgomery County 2018 Hazard Mitigation Plan Update

Please complete this worksheet for each new Action. See Mitigation Strategy: Action Review Form for sample mitigation actions to reduce risks located in the resource section of the project website.

<b>Municipality/Agency</b>	
<b>Name and Title</b>	

<b>Mitigation Action Title:</b>	
<b>A. Assessing the Risk</b>	
Hazard(s) to be addressed by Action:	
<b>B. Describing the Action</b>	
Problem Description:	
Mitigation Action Type:	
Action Objectives:	
<b>C. Evaluating the Action</b>	
Estimated Cost:	
Estimated Benefits: Losses avoided Provide justification	
Cost Effectiveness: (benefit/cost)	
Priority (high, medium, low):	
<b>D. Implementing the Action</b>	
Responsible Party:	
Potential Partners:	
Potential Funding Sources:	
Timeframe for Completion: Short, Long, Ongoing – continuous with no end date	
Integration Opportunities: (Local, County, State)	
Worksheet completed by: (Jurisdiction, Name)	

### Mitigation Strategy: Action Review Form

Place each Action in the left Column and provide a 0-5 rating for each one of the STAPLEE factors and then total your score on the last (right column).

Action Title:	Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL





- Visit [www.montgomerycountymd.gov/OEMHS](http://www.montgomerycountymd.gov/OEMHS)
- Online home of the planning process



### Severe Storms

Severe weather, including lightning, hail, flooding, and strong wind, is most common during the spring and summer months. Occasionally, tornadoes and hurricanes can also occur.

**Remember:**

- A Severe Storm / Thunderstorm **Watch** means that there is a possibility of storm activity in the area.
- A Severe Storm / Thunderstorm **Warning** means that activity is occurring or will occur soon; take shelter immediately.

**Prior to the Emergency**

- Ensure that you have enough food, water, medication (if needed) and batteries. Because power is often lost during severe storms, food that does not require cooking should be considered.
- Check portable radios, smoke detectors, and flashlights to ensure they are properly operating and that the batteries are fresh.
- Stay tuned to local weather and news reports. If emergency officials tell you to evacuate, do so without delay.
- If you are located in a low-lying area and flooding is anticipated, remove furniture and valuables from the areas that are prone to water accumulation.

Tip: For more information on flood insurance, visit FEMA's Floodsmart website at <http://www.floodsmart.gov>

- If strong winds are predicted (in excess of 70 miles per hour), consider boarding up your windows to prevent breakage. Also, trash cans and other items around the yard should be taken indoors to prevent the wind from carrying them away.
- Run necessary errands before severe weather begins; don't wait until the storm begins to venture outside.
- Ensure that your vehicle is fueled. Don't drive during the storm unless it is necessary. If you must, stay away from roads near rivers and streams and areas where flooding may occur. **Never cross over a roadway that has flowing water.** If your vehicle stalls, abandon it immediately and seek higher ground.

**During the Emergency**

- Hazard Mitigation Plan Steering Committee:
  - Complete Exercise I: Evaluation of 2012 Mitigation Strategy
  - Complete Exercise II: Mitigation Action Project Development
  - Update project website with meeting materials
  - Distribute data requests

**Compile data and Complete Final Draft Plan  
Present to County Council**





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