



# TOWN OF LUDLOW MUNICIPAL VULNERABILITY PREPAREDNESS PLANNING AND HAZARD MITIGATION PLAN UPDATE

Committee Meeting 3 / Public Meeting  
February 17, 2022



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## Welcome & Introductions



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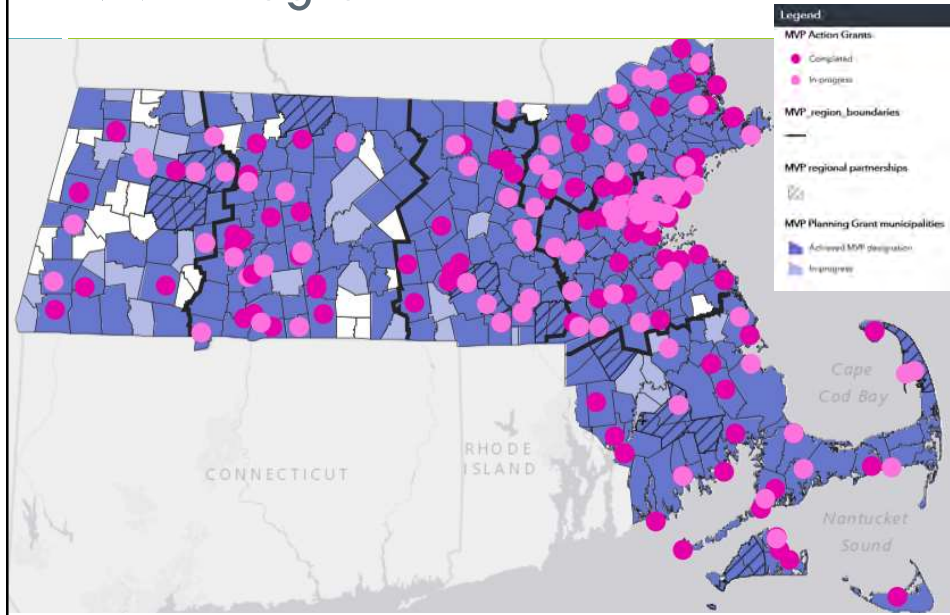
## Agenda

- Overview of MVP/HMP planning processes, timelines, and requirements
- Climate change: national, state-wide, and local trends
- Natural hazards risk assessment for Ludlow
- 2016 HMP review and updates: critical facilities, mitigation actions, capabilities assessment
- Next steps: public engagement, CRB workshops, preliminary thoughts on strengths & vulnerabilities

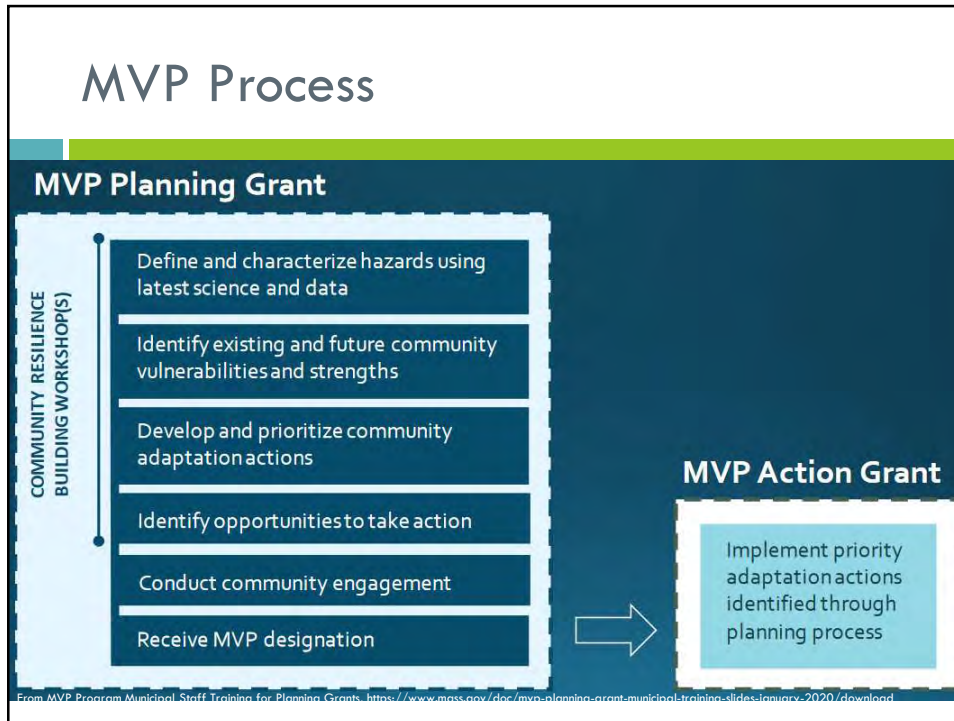


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## MVP Program



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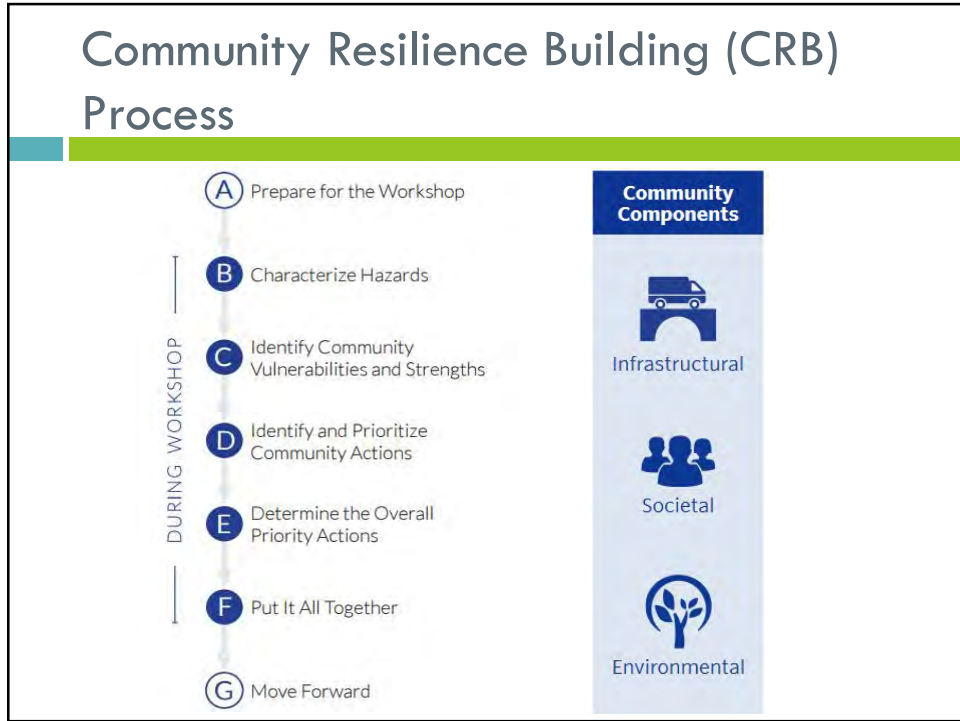


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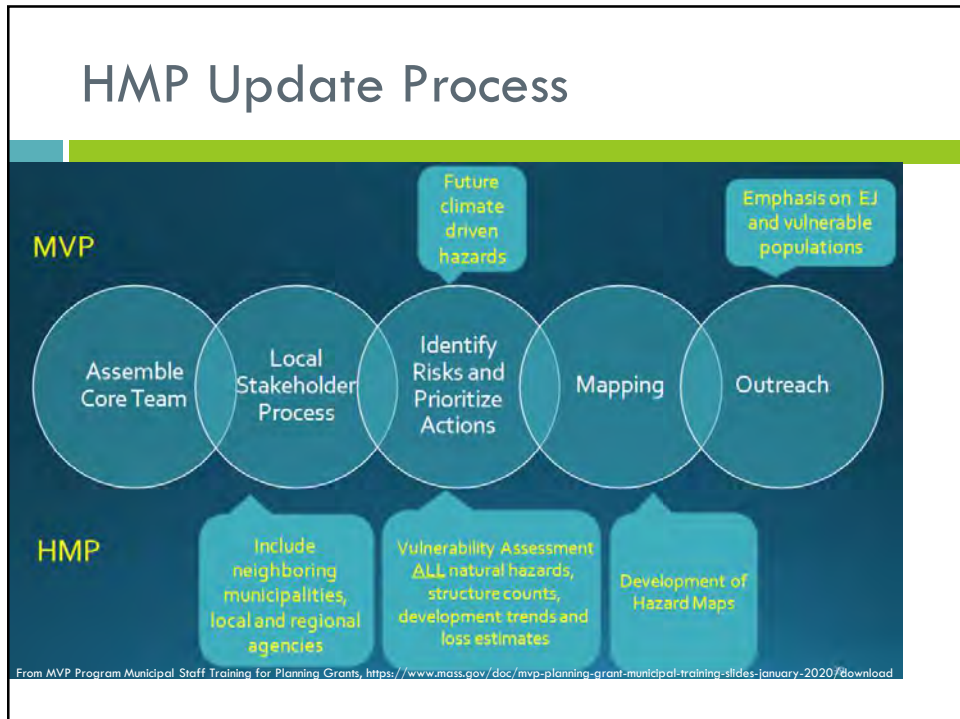
## Town of Ludlow MVP/HMP Planning Grant

Task Name	December	January	February	March	April	May	June	Next SFY
Core Team Meetings	x	x	x			x		
Quarterly Reporting	x			x			x	
Set up community email	x							
Community survey?	x	x						
Information sharing events	x	x	x	x				
Data gathering and stakeholder interviews	x	x	x					
MVP CRB Workshop/s				x	x			
Draft Summary of Findings Report								
Community Listening Session/s						x	x	
Finalize Summary of Findings Report							x	
Submit Final Materials to EEA							x	
<b>Hazard Mitigation Plan Update</b>								
Meetings to review draft updates	x	x		x	x		x	
Submit to MEMA for submission to FEMA							x	
FEMA Approval								x
Local Adoption								x

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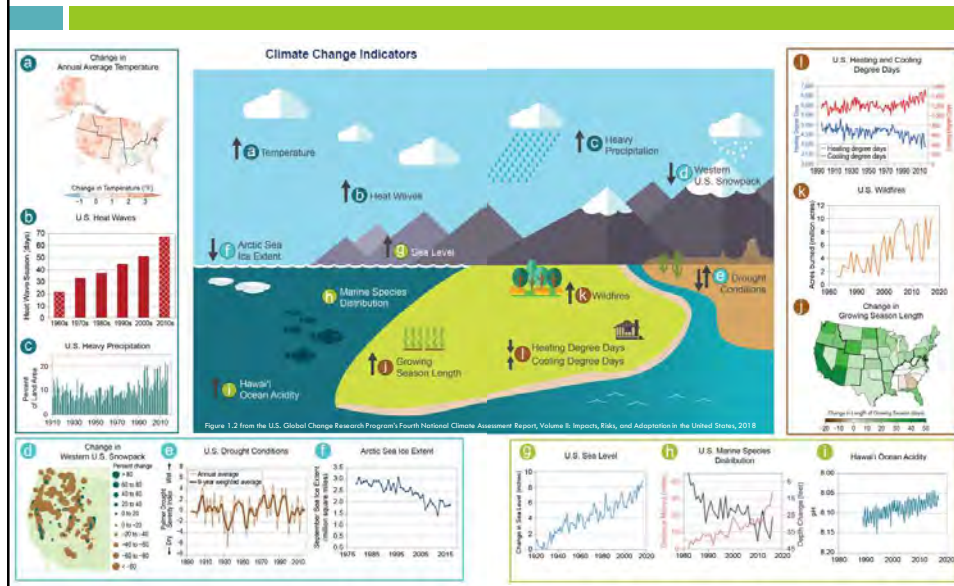


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# Climate Change – National Trends



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# Climate Change – Statewide Trends

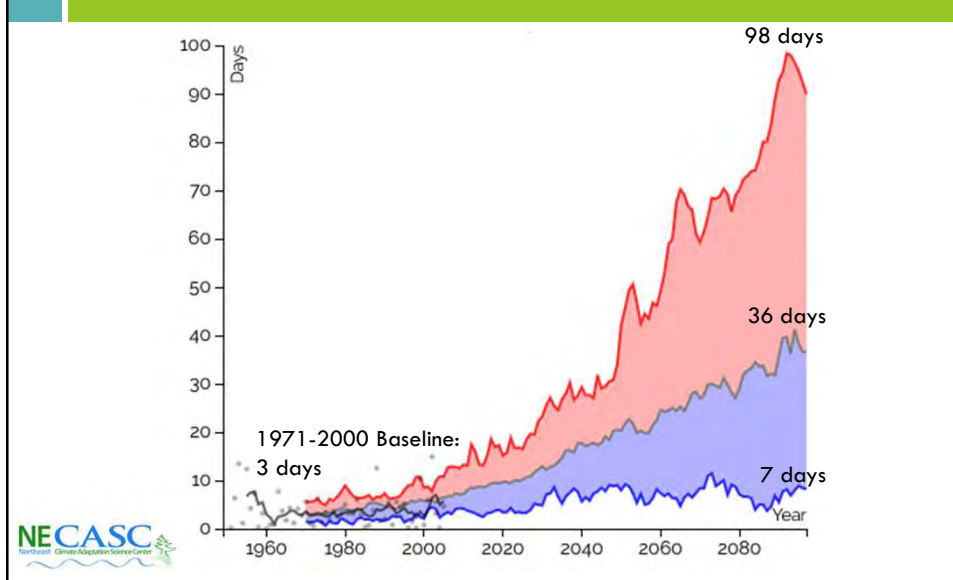
CLIMATE CHANGES	RELATED NATURAL HAZARDS	PROJECTIONS BY THE END OF THIS CENTURY
<b>Changes in precipitation</b> 	<ul style="list-style-type: none"> <li>Inland flooding</li> <li>Drought</li> <li>Landslide</li> </ul>	<ul style="list-style-type: none"> <li>Annual precipitation: Increase up to 16% (+7.3 inches)</li> <li>Days with rainfall accumulation 1+ inch: Increase up to 57% (+4 days)</li> <li>Consecutive dry days: Increase 18% (+3 days)</li> <li>Summer precipitation: Decrease</li> </ul>
<b>Sea level rise</b> 	<ul style="list-style-type: none"> <li>Coastal flooding</li> <li>Coastal erosion</li> <li>Tsunami</li> </ul>	<ul style="list-style-type: none"> <li>Sea level: Increase 4.0 to 10.5 feet along the Massachusetts coast</li> </ul>
<b>Rising temperatures</b> 	<ul style="list-style-type: none"> <li>Average/extreme temperatures</li> <li>Wildfires</li> <li>Invasive species</li> </ul>	<ul style="list-style-type: none"> <li>Average annual temperature: Increase up to 23% (+10.8 degrees Fahrenheit)</li> <li>Days/year with daily minimum temperatures below freezing: Decrease up to 42% (-62 days)</li> <li>Winter temperatures: Increase at a greater rate than spring, summer, or fall</li> <li>Long-term average minimum winter temperature: Increase up to 66% (+11.4 degrees Fahrenheit)</li> <li>Days/year with daily maximum temperatures over 90 degrees Fahrenheit: Increase by up to 1,280% (+64 days)</li> <li>Growing degree days: Increase by 23% to 52%</li> </ul>
<b>Extreme weather</b> 	<ul style="list-style-type: none"> <li>Hurricanes/tropical storms</li> <li>Severe winter storms/nor'easters</li> <li>Tornadoes</li> <li>Other severe weather</li> </ul>	<ul style="list-style-type: none"> <li>Frequency and magnitude: Increase</li> </ul>

Notes: This plan also assesses earthquakes, but there is no established correlation between climate change and earthquakes.  
 Source of Climate Change Projections: Northeast Climate Adaptation Science Center at the University of Massachusetts, Amherst.

<https://resilientma.org/home.html>

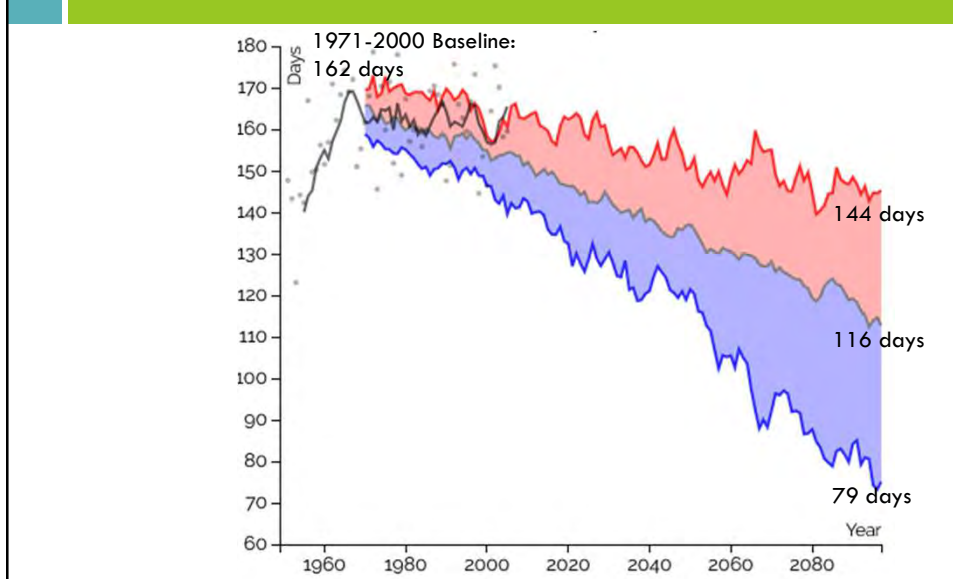
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## Climate Change – Chicopee River Basin, Annual Days Over 90° F



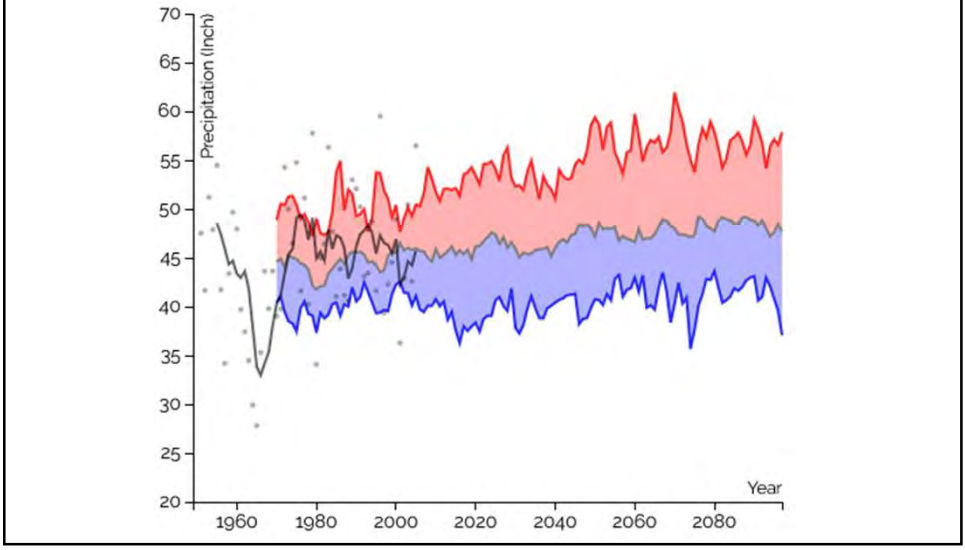
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## Climate Change – Chicopee River Basin, Annual Days Below 32° F



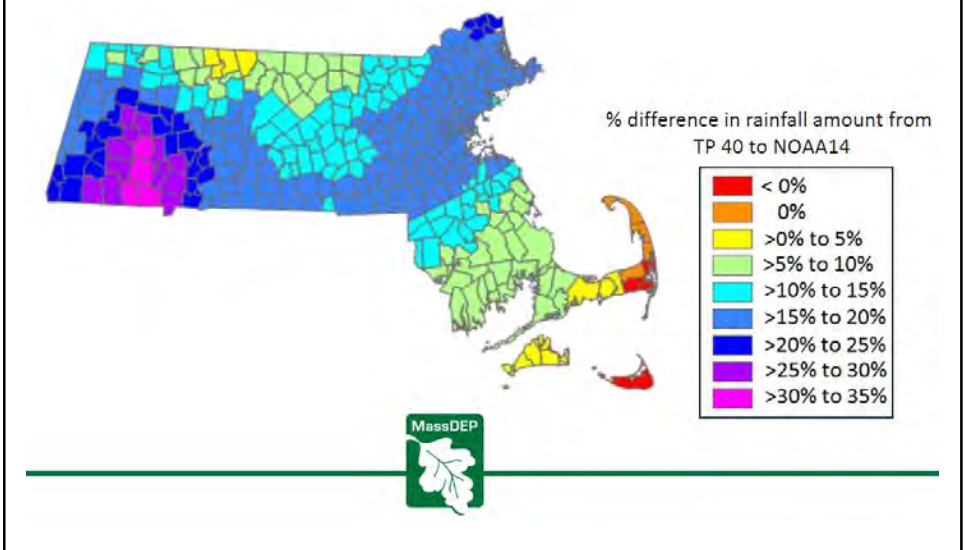
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## Climate Change – Chicopee River Basin, Annual Rainfall Amounts



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## 100-Year Storm Model Changes



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## Natural Hazards in Ludlow

Type of Hazard	Location of Occurrence <sup>1</sup>	Probability of Future Events <sup>2</sup>	Impact <sup>3</sup>	Vulnerability <sup>4</sup>
Hurricane / Tropical Storm	Large	High	Critical	1
Severe Winter Storm / Nor'easter	Large	Very High	Critical	1
Tornado	Large	Low	Catastrophic	1
Flood	Medium	Low	Limited	2
High Winds	Large	High	Limited	2
Wildfires / Brushfires / Urban Fires	Medium	Low	Limited	2
Drought	Large	Moderate	Limited	3
Extreme Temperatures	Large	Very High	Limited	3
Dam Failure	Medium	Very Low	Limited	4
Thunderstorms	Large	Very High	Limited	4
Earthquake	Large	Low	Critical	5

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## Critical Facilities

- **Critical Facilities:** Structures and institutions necessary for a community's response to and recovery from emergencies
  - **Essential Facilities**
  - **Transportation Systems**
  - **Lifeline Utility Systems**
  - **High Potential Loss Facilities**
  - **Hazardous Material Facilities**

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## 2016 HMP Review - Critical Facilities Category 1 – Emergency Response Services

- Emergency Operations Center (EOC)
  - Public Safety Complex
  - Highway Garage – Backup EOC
- Emergency Electrical Power Facility – Mass Municipal Wholesale Electric Company (MMWEC, Moody St)
- Transfer Station
- Westover Air Base



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## 2016 HMP Review - Critical Facilities Category 1 – Emergency Response Services

- Emergency Shelters
  - Baird Middle School
  - Health South
  - Ludlow Senior Center
  - Chapin Street School
  - East Street School
  - Town Hall
  - Veterans Park Elementary School
- Dry Hydrants – Fire Ponds – Water Sources
  - Springfield Reservoir
  - Leland Drive (cistern)
  - Jared Drive (cistern)
  - Parker Lane (cistern)



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## 2016 HMP Review - Critical Facilities Category 1 – Emergency Response Services

### □ Utilities

- Bay State Gas LNG Plant
- Buckeye Pipeline (Tank Farm Road)
- Hydroelectric Dams
  - 1 Putts / Ludlow Bridge
  - 1 Miller Street
  - 1 Red Bridge
- MMWEC (Westover Industrial Park)
- Power Substation (Center Street)



### □ Communications

- Cell Towers
- Charter Communications Hub Site at Ludlow High School
- Public Safety Complex

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## 2016 HMP Review - Critical Facilities Category 1 – Emergency Response Services

### □ Primary Evacuation Routes

- |                        |                            |
|------------------------|----------------------------|
| □ Cady Street          | □ Pool Street              |
| □ Chapin Street        | □ Rood Street              |
| □ Church Street        | □ Route 21 (Center Street) |
| □ East Street          | □ Russell Street           |
| □ Fuller Street        | □ West Avenue              |
| □ Holyoke Street       | □ West Street              |
| □ Kendall Street       |                            |
| □ Mass Turnpike (I-90) |                            |
| □ Miller Street        |                            |

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## 2016 HMP Review - Critical Facilities Category 1 – Emergency Response Services

- Bridges on Primary Evacuation Routes
  - Collins Bridge / Miller Street
  - East Street – over Chicopee River
  - Fire Station Bridge
  - Holyoke Street – over Harris Pond
  - Mass Pike (I-90) – over Chicopee River
  - Putts / Ludlow Bridge
  - Red Bridge Road (Wilbraham) – over Chicopee River
  - West Street – over Chicopee River

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## 2016 HMP Review - Critical Facilities Category 2 – Non Emergency Response Facilities

- Water Supply (50% of Town on private well water)
  - Nash Hill Covered Reservoir – MWRA (Fuller Street residents)
  - Springfield Water & Sewer Commission (SWSC)
  - Ludlow Reservoir (back-up water supply)
  - Wilbraham Water line (Miller Street residents)
- Problem Culverts
  - Bondsville Road
  - Center Street & Alden
  - Piney Lane
  - Pool Street
  - Randall Road (beavers)
  - West Street / Brook Street



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## 2016 HMP Review - Critical Facilities Category 3 – Facilities/Populations to Protect

- Health South Rehabilitation Hospital
- Hampden County House of Correction
- Elderly Housing / Assisted Living
  - Keystone Commons
  - Chestnut Street Housing
  - Colonial Sunshine Manor
  - State/Meadow Street Housing for Elderly
  - Steven's Memorial Building
  - HAP Housing new facility at 188 Fuller Street
  - World Development Senior Housing building at Mill #10

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## 2016 HMP Review - Critical Facilities Category 3 – Facilities/Populations to Protect

- Recreation Areas
  - Camp White
  - Children's Playground across from 47 Sewell Street
  - Facing Rock Wildlife Management Area
  - Ludlow Country Club
  - Memorial Park
  - Springfield Reservoir
  - West Street Park
  - Westover Golf Course
  - Whitney Park



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## 2016 HMP Review - Critical Facilities Category 3 – Facilities/Populations to Protect

- Schools
  - Baird Middle School
  - Chapin Street Elementary School
  - Early Childhood Partnership & Integrated Preschool Program
  - East Street Elementary School
  - Ludlow Community Center / Randall Boys & Girls Club
  - Ludlow High School
  - St. John the Baptist School
  - Tiny Explorers Daycare
  - Veterans Park Elementary School

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## 2016 HMP Review - Critical Facilities Category 3 – Facilities/Populations to Protect

- Churches
- Historic Buildings / Sites
  - 1<sup>st</sup> Meeting House
  - Clock Tower
  - Ludlow Center Historic District
  - Ludlow Village Historic District
- Mobile Home Parks
  - 229 Miller Street
  - 350 West Street



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## 2016 HMP Review – Mitigation Actions

Summary of 2016 HMP Mitigation Actions and Current Status					
Priority Rank	Mitigation Action	Responsible Dept/Board	Anticipated Timeline as of 2016 HMP	Mitigation Action Status as of February 2022	Keep Mitigation Action in 2022 Plan Update?
High	Replace Town emergency communication system	Town	March 2016 – April 2018		
High	Replace Green Town Bridge	DPW	April 2016 – March 2021		
High	Purchase a generator for the Town Hall	Town	April 2016 – March 2019		
High	Replace or Retrofit (based on current study determination) West Street Bridge	Town / City of Springfield	March 2017 – March 2021		
High	Upgrade generator at the DPW building	Town	April 2016 – March 2019		
High	Purchase generators for each elementary school	Town	April 2018 – March 2021		
High	Develop and implement a tree trimming and maintenance program	DPW / Eversource	April 2016 – March 2021		

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Summary of 2016 HMP Mitigation Actions and Current Status					
Priority Rank	Mitigation Action	Responsible Dept/Board	Anticipated Timeline as of 2016 HMP	Mitigation Action Status as of February 2022	Keep Mitigation Action in 2022 Plan Update?
Medium	Establish and maintain emergency access to right of way and easement areas	Fire Department	May 2016 – April 2021		
Medium	Clear sewer easement areas	DPW	May 2016 – April 2021		
Medium	Replace Putts Bridge	Town / DPW	April 2018 – March 2021		
Medium	Replace the Piney Lane Culvert	DPW	March 2016 – April 2018		
Medium	Replace, repair or upgrade priority culverts on the Stormwater Management Project List	DPW	March 2016 – March 2021		

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## 2016 HMP Review – Mitigation Actions

Summary of 2016 HMP Mitigation Actions and Current Status					
Priority Rank	Mitigation Action	Responsible Dept/Board	Anticipated Timeline as of 2016 HMP	Mitigation Action Status as of February 2022	Keep Mitigation Action in 2022 Plan Update?
Low	Review bylaws, zone districts and subdivision regulations on a quarterly basis to ensure hazard mitigation measures are up to date	Conservation Commission / DPW	March 2016 – March 2021		
Low	Maintain Beaver Management Strategy	Board of Health / Conservation Commission	March 2016 – March 2021		
Low	Participate in a regional effort to implement the Community Rating System	Board of Assessors / EMD / PVPC	March 2020-March 2021		
Low	Work with Eversource and communication companies to underground utilities on East Street and on Center Street	DPW	March 2017 - March 2021		

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## 2016 HMP Review – Mitigation Actions

Summary of 2016 HMP Mitigation Actions and Current Status					
Priority Rank	Mitigation Action	Responsible Dept/Board	Anticipated Timeline as of 2016 HMP	Mitigation Action Status as of February 2022	Keep Mitigation Action in 2022 Plan Update?
Low	Implement an outreach and education program for homeowner associations regarding maintaining culverts and retention ponds on their property	Conservation Commission / DPW	March 2018-April 2021		
Low	Educate home and business owners how to prepare and mitigate the hurricane and tornado risk	Fire Department	April 2018 – March 2021		

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# Capabilities Assessment

## Capability Assessment Worksheet

Jurisdiction: \_\_\_\_\_

Local mitigation capabilities are existing authorities, policies, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible. Complete one worksheet for each jurisdiction.

### Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year	Does the plan address hazards?
		Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan		
Capital Improvements Plan		
Economic Development Plan		

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## Next Steps

- Public engagement
  - Public survey on MVP page on Town website?
  - Stakeholder outreach
- Schedule workshop dates / times, send invitations
- Preliminary thoughts on infrastructure, environmental, societal assets

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QUESTIONS / DISCUSSION

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