

Appendices

Appendix A **Workshop Materials**

Agendas for February 7, 2019 and March 20, 2019 Workshops

Introductory Presentations for February 7, 2019 and March 20, 2019 Workshops

MEETING DATE: February 7, 2019

MEETING TIME: 9:00 AM to 1:00 PM

MEETING LOCATION: Room 204, Chelmsford Town Hall
 50 Billerica Road, Chelmsford, MA

REFERENCE: Municipal Vulnerability Preparedness
 Stakeholder Workshop #1
Chelmsford, Massachusetts
 B+T Project No. 3055.00

PREPARED BY: Beals and Thomas, Inc.

COPIES TO: Attendees

AGENDA ITEMS:

| <u>Time</u> | <u>Activity</u> | |
|-------------------------|---|-------------------------------|
| 8:45 – 9:15 AM | Sign-in / Priority Exercise | |
| 9:15 – 9:25 AM | Welcome, Workshop Overview, and Introductions | Evan Belansky |
| 9:25 – 9:40 AM | MVP Overview | John Gelcich |
| 9:40 – 10:00 AM | Science and Resources | Nick Santangelo |
| 10:00 – 10:30 AM | Large Team Exercise | Stakeholders and Facilitators |
| 10:30 – 12:00 PM | Small Team Exercises | Stakeholders and Facilitators |
| 12:00 – 12:15 PM | Break and Lunch | |
| 12:15 – 12:35 PM | Small Group Report Outs | Small Group Representative |
| 12:35 – 12:55 PM | Summary Discussion | Eric Las |
| 12:55 – 1:00 PM | Workshop #1 Conclusion and Introduction to Workshop #2 | John Gelcich |

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MEETING DATE: March 20, 2019

MEETING TIME: 9:00 AM to 1:00 PM

MEETING LOCATION: Room 204, Chelmsford Town Hall
50 Billerica Road, Chelmsford, MA

REFERENCE: Municipal Vulnerability Preparedness
Stakeholder Workshop #2
Chelmsford, Massachusetts
B+T Project No. 3055.00

PREPARED BY: Beals and Thomas, Inc.

COPIES TO: Attendees

AGENDA ITEMS:

| <u>Time</u> | <u>Activity</u> | |
|-------------------------|---|---------------------------------------|
| 8:45 – 9:15 AM | Sign-in and Breakfast | |
| 9:15 – 9:20 AM | Welcome and Introductions | Evan Belansky |
| 9:20 – 9:35 AM | Workshop #1 Recap and Workshop #2 Overview | John Gelcich, Mary Kate Schneeweis |
| 9:35 – 11:35 AM | Small Team Exercises | Stakeholders and Facilitators |
| 11:35 – 12:05 PM | Break and Lunch | |
| 12:05 – 12:20 PM | Small Group Report Outs | Small Group Representative |
| 12:20 – 12:55 PM | Large Group Discussion | Stakeholders and Facilitators |
| 12:55 – 1:00 PM | Wrap-Up and Next Steps | John Gelcich |

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Community Resilience Building Workshop 1

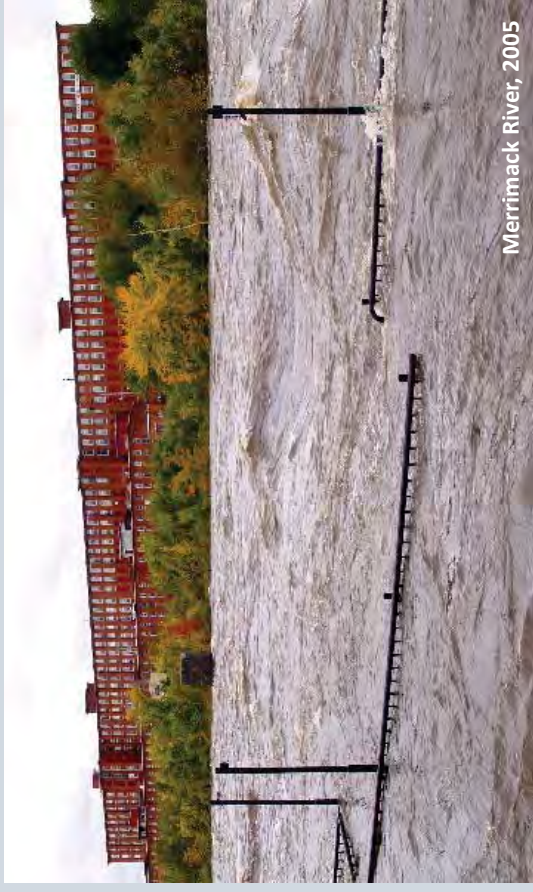
Presented by:



BEALS + THOMAS



February 7, 2019



Merrimack River, 2005

Welcome and Introduction



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Team Members

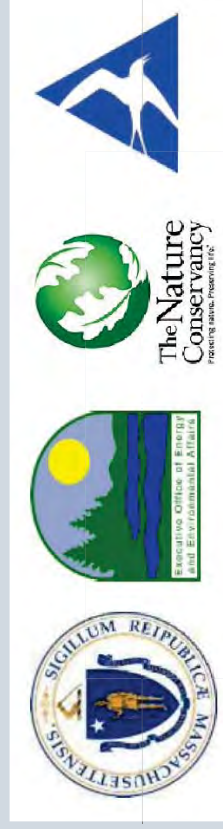
Town of Chelmsford Coordinator

- Evan Belansky, Community Development Director

Beals and Thomas (B+T) Facilitators

- Eric Las, PE
- John Gelcich, AICP
- Mary Kate Schneeweis
- Nick Santangelo, EIT

Roundtable Stakeholder Introductions



www.CommunityResilienceBuilding.org

Municipal Vulnerability Preparedness (MVP) Program Overview



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Executive Order 569

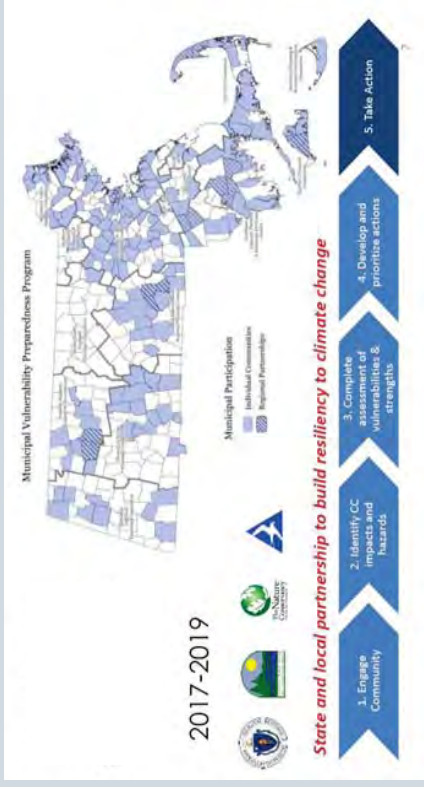
Issued by Governor Baker in September 2016

- Tasked Executive Office of Energy and Environmental Affairs (EEA) with creating two frameworks to assess vulnerabilities and adaptation strategies related to climate change

- MVP Office
- Resilient MA website
- State Hazard Mitigation and Climate Adaptation Plan

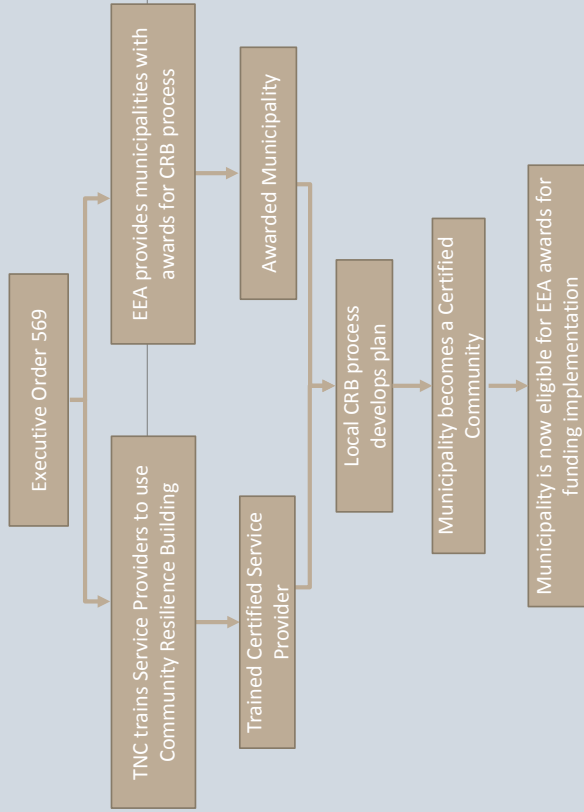


State's Vision for MVP Program



Chelmsford MVP Designation Schedule

- Receipt of planning grant: June 2018
- Core team established approach: Late 2018
- Workshop #1: February 2019
- Workshop #2: March 2019
- Public listening session: Spring 2019
- Final report: June 2019



Mitigation Planning Benefits

A process for communities to identify policies, activities and tools to implement mitigation actions

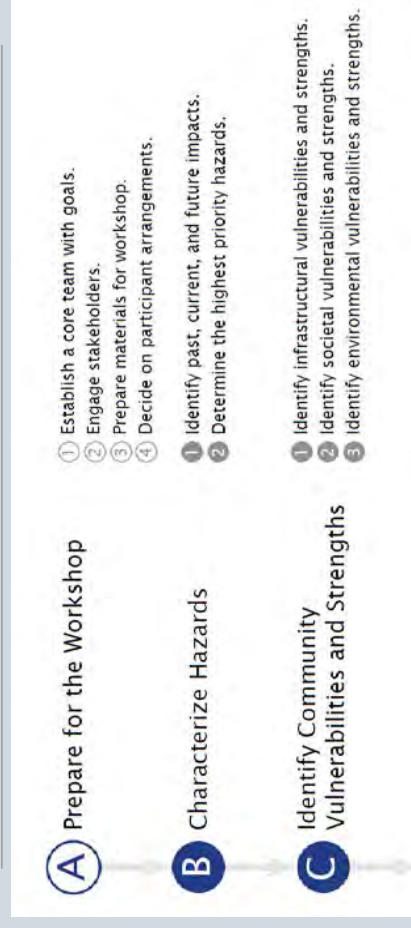
- Increases awareness of vulnerabilities
- Promotes safety and welfare of communities and citizens
- Cultivates community commitment to mitigation

Lack of hazard awareness and mitigation plan could lead to unnecessary losses to infrastructure and critical facilities and potential human casualties



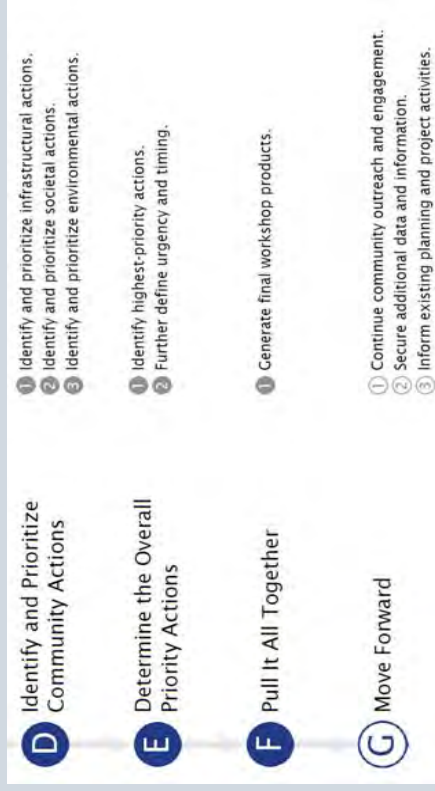
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MVP Process



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MVP Process



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Hazard Mitigation Plan Update

Required for municipalities to receive FEMA funding for on-emergency disaster assistance

- Updates required every 5 years
 - Effective regional plan prepared by Northern Middlesex Council of Governments in 2015
- Additional EEA funds for communities with expiring hazard mitigation plans who are undertaking MVP process
- Similar public input process to MVP program
 - Submission of MVP final report to Massachusetts Emergency Management Agency June 2019



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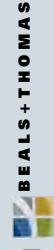
Workshop Objectives

Workshop 1

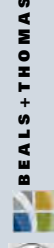
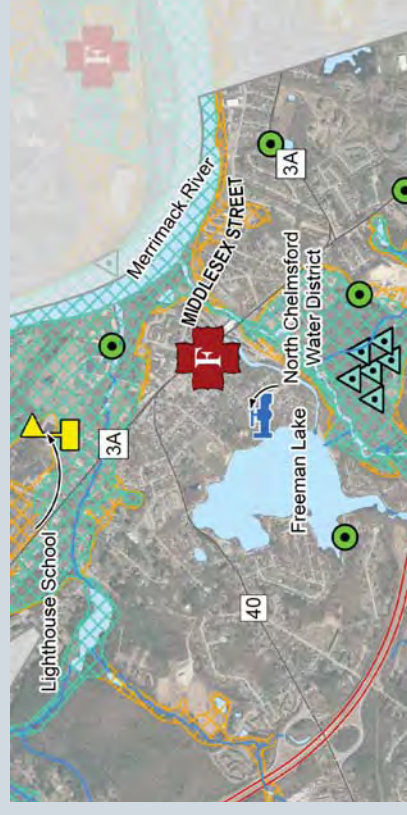
- Define extreme weather and natural and climate-related hazards
- Identify existing and future vulnerabilities and strengths

Workshop 2

- Develop and prioritize actions for the community and broader stakeholder networks
- Identify opportunities for the community to advance actions to reduce risks and build resilience.



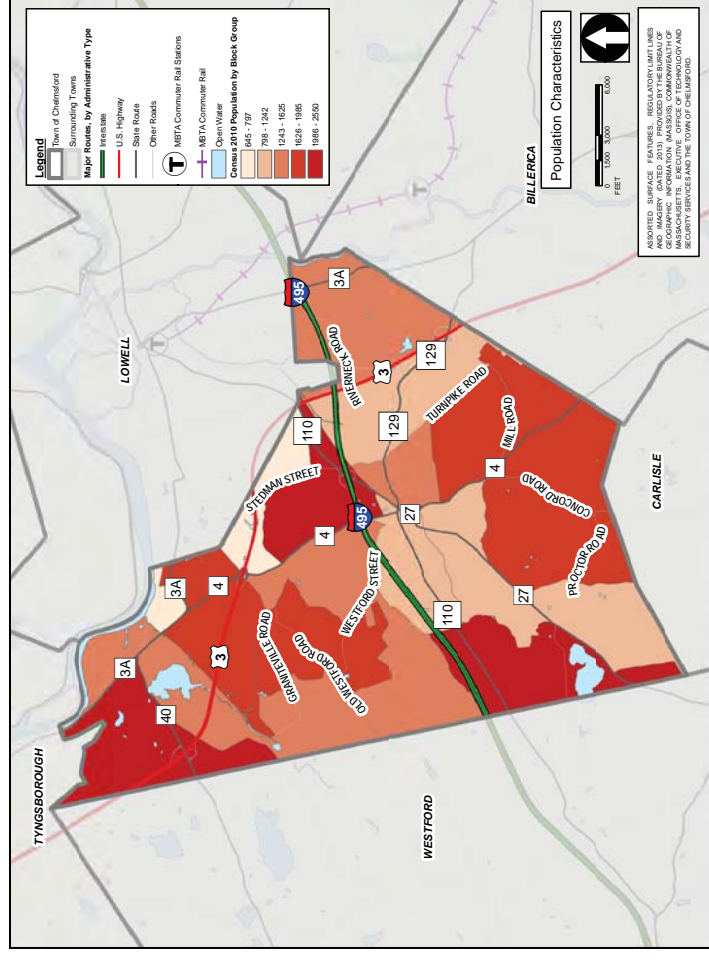
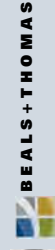
Science and Resources



Chelmsford Demographics

- Total Population: 35,067
- Potential Vulnerable Populations:
 - Age 65+: 18%
 - Persons with disabilities: 10.3%
 - Speak language other than English at home: 13.8%
 - Below poverty line: 2.3%

Source: American Community Survey, 2017



Hazard Mitigation Plan Update

Recommendations to address natural hazards

- Identified as high hazards:
 - Severe storm events (e.g. Nor'easter, hurricanes, ice storms, snow storms, blizzards)
 - Flooding
 - Wildfires
 - Earthquakes

Prioritized mitigation based on anticipated area of hazard impact, expected benefit, and cost



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Severe Storms

Hurricanes – heavy rain, high wind

- 41 hurricanes in New England since 1938
 - 2011 Hurricane Irene most recent

Winter Storms – heavy snow, freezing rain, extreme wind, extreme cold

- Severe winter storm: 6 inches or more of snow in 24 hours
 - Regional record for winter snowfall: 126.5 inches in 1995



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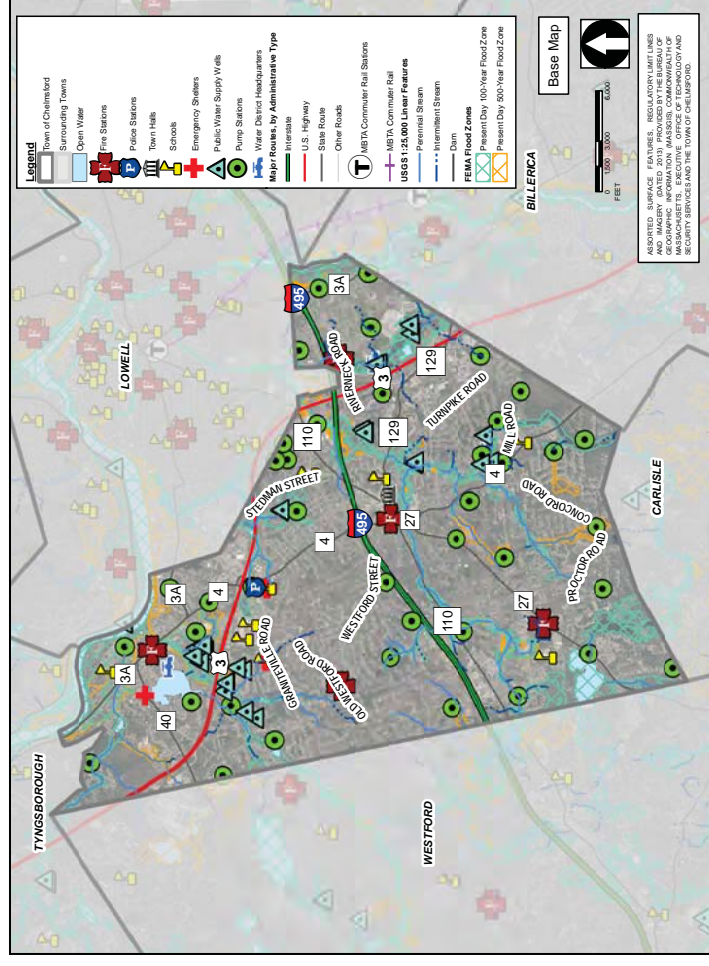
Vulnerability to Flooding

- Tributary to two sub-watersheds
 - Merrimack
 - SuAsCo
- 11 named streams run through the Town
- 2.3% of Town's total area is comprised of Surface Water
 - 7 dams retain water
- 9.3% of Town's total area is mapped as Floodplain

Source: Hazard Mitigation Plan for the Northern Middlesex Region



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Massachusetts Climate Change Projections (Merrimack Basin)

Temperature

- Increased average temperatures and number of days with maximum temperature above 90°F
 - Annually – 11 to 33 more days with temperatures above 90°F by 2050s
- Decrease in number of days with minimum temperature below 32°F
 - Winter – 3 to 12 fewer days with temperatures below 32°F by 2050s

Precipitation

- Increase in number of days with greater than 1" precipitation and total precipitation
 - Seasonally – approximately 1 more day with precipitation greater than 1" by 2050s

Drought

- Increase in consecutive dry days
 - Summer – potential increase of 2 more days with less than 1mm of precipitation



Workshop Exercises



Summary of Workshop 1 Exercises

- Develop and prioritize list of **Hazards**
- Identify community **Strengths** and **Vulnerabilities**
 - Infrastructural
 - Societal
 - Environmental
- Begin thinking about opportunities for mitigation and solutions to addressing vulnerabilities



Definitions

Hazard – cause of negative impacts to community

Risk – potential result from hazard

Vulnerability – feature (societal, environmental, or infrastructural) that is susceptible to risk

Action – addresses vulnerability



Hazards vs. Vulnerabilities

Hazards

- Flooding →
- Drought →
- Wind →
- Wildfire →

Vulnerabilities

- Residences in flood zone
- Water supply
- Overhead power lines
- Dry vegetation



10-Minute Break

When you return, please sit at the table that corresponds to your nametag color



Risk Matrix Columns 1-4

List top **hazards** for community in top row

For each sector (infrastructure, societal, environmental)

- Identify **vulnerabilities** and **strengths**
 - Determine location
 - List on Risk Matrix
 - Mark on Base Map
 - Identify ownership of issue or place.
 - Identify if feature/asset is a strength and/or vulnerability



Small Groups: Complete Risk Matrix



Lunch Break

Please help yourself to the lunch provided.

We will conduct the Report Outs after everyone has had a chance to get food.



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Report Out

Identify team spokesperson

Report findings to the whole group

- 3-5 minute summary
- What Risks were identified?
- What were the top priority Hazards identified?
- Were there any other items of discussion worth noting?

Begin thinking about potential action items that may address the hazards and vulnerabilities identified by your team and the other teams.



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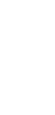
Next Steps

Workshop 2: Identify and Prioritize community actions based on Strengths and Vulnerabilities from Workshop 1

- Infrastructural
- Societal
- Environmental



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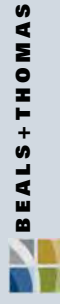


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Community Resilience Building Workshop 2

Presented by:



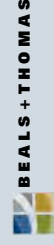
March 20, 2019

Workshop #1 Recap

- Conducted initial priority exercise
- Reviewed Background on climate change data
- Reached Agreement on hazards facing Chelmsford
- Discussed vulnerabilities and strengths
- Completed first part of risk matrix



Welcome and Introduction



Workshop Objectives

Workshop 1

- Define extreme weather and natural and climate-related hazards
- Identify existing and future vulnerabilities and strengths

Workshop 2

- Develop and prioritize actions for the community and broader stakeholder networks
- Identify opportunities for the community to advance actions to reduce risks and build resilience



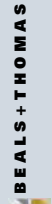
Definitions

Hazard – cause of negative impacts to community

Risk – potential result from hazard

Vulnerability – feature (societal, environmental, or infrastructural) that is susceptible to risk

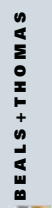
Action – addresses vulnerability



Summary of Findings from Workshop #1

Top Hazards

- Severe Storms
- Flooding
- Extreme Temperature
- Wind
- Pollution



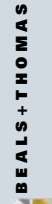
Summary of Findings from Workshop #1

Strengths

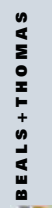
- Stormwater management systems/MS4
- Communication within Town
- Emergency shelters

Vulnerabilities

- At-risk populations (e.g. elderly, Williamsburg)
- Utilities
- Roadway infrastructure

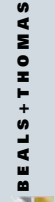


Workshop Exercises



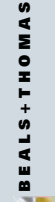
Small Group Exercise

- Revisit top hazards
- Revisit vulnerabilities and strengths
- Determine actions
 - Identify the actions needed to reduce the vulnerability or reinforce the strength represented by each feature/asset.
- Prioritize
 - Priority (high, medium, low)
 - Timeframe (ongoing, short-term, long-term)



Examples of Ecological Restoration

Dam Removal



If Possible: Use Nature Based Solutions

Use or mimic natural systems to address hazards

- Ecological Restoration
- Green Infrastructure
- Low-Impact Development (LID)

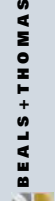


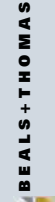
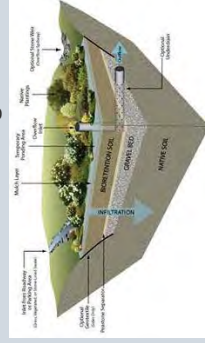
Image Source: Nature-based Solutions to address global societal changes, Cohen, et al. 2016

Examples of Green Infrastructure/LID

Stormwater Management with Green Roofs



Stormwater Management with Bioretention Areas and Rain Gardens



Small Group Report Out

- Small group spokesperson
 - 3-5 minute summary to present completed matrices



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Lunch Break

- Please help yourself to the lunch provided.
- Review final risk matrices and mark your top three priorities



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Large Group Discussion

- Identify top 3-5 priority actions
- Further refine timeframe(s)



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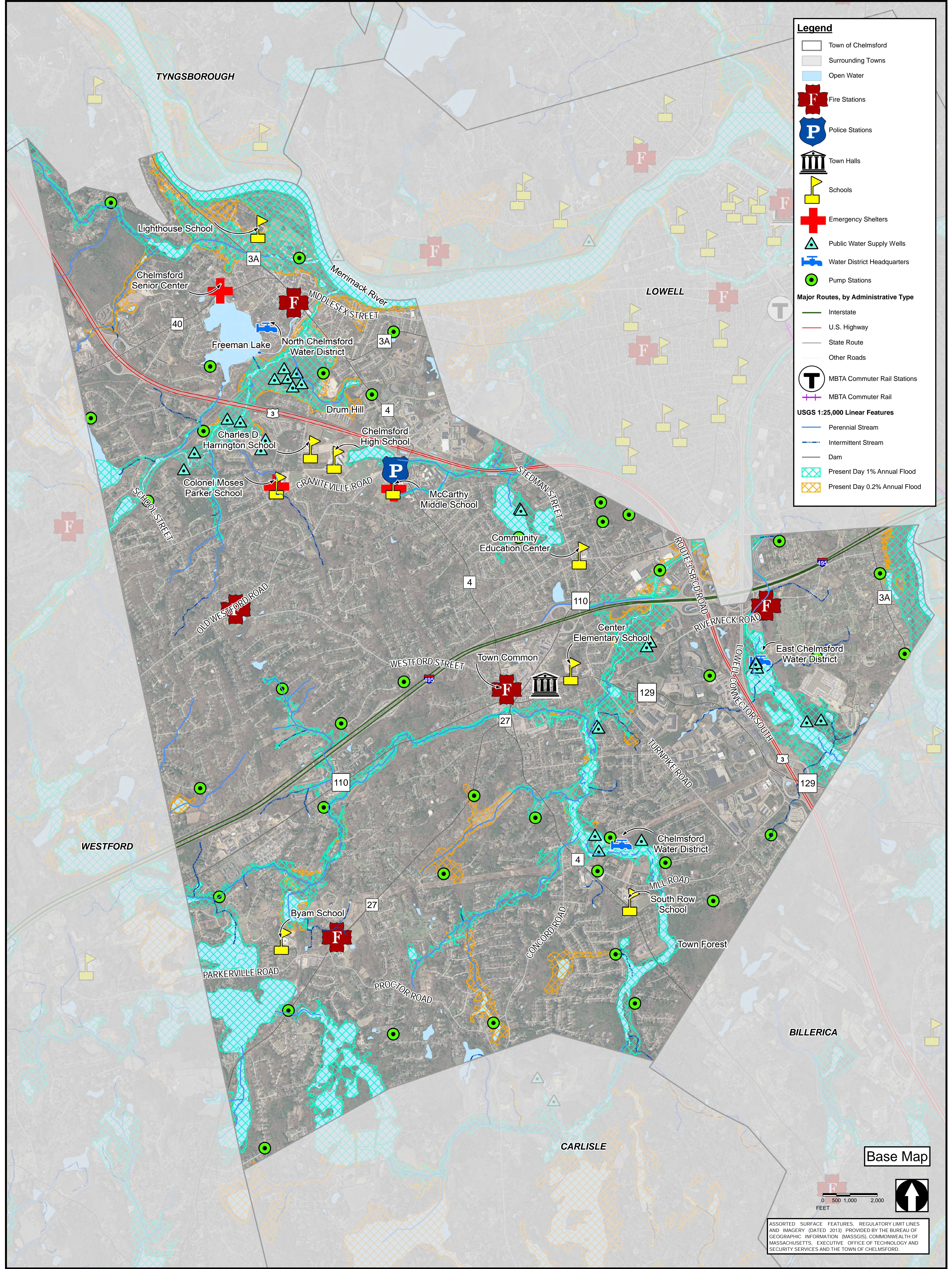
Next Steps

- Town and B+T to compile results of workshop into summary report
- Listening session to be scheduled to gather public input
 - Present list of priority actions and how to implement
- Submit final report to EEA to receive MVP designation



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Appendix B
Base Map



Legend

- Town of Chelmsford
- Surrounding Towns
- Open Water
- Fire Stations
- Police Stations
- Town Halls
- Schools
- Emergency Shelters
- Public Water Supply Wells
- Water District Headquarters
- Pump Stations

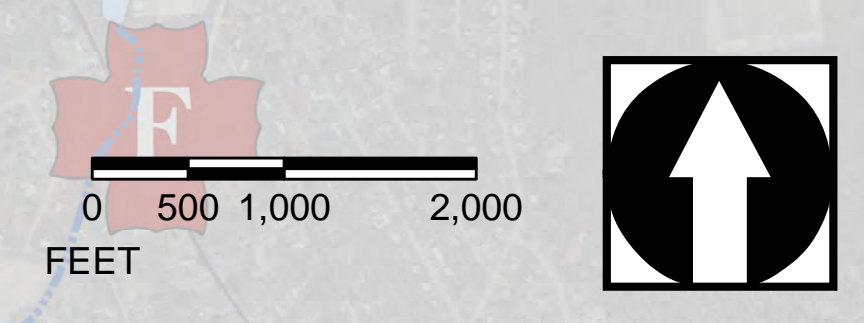
Major Routes, by Administrative Type

- Interstate
- U.S. Highway
- State Route
- Other Roads
- MBTA Commuter Rail Stations
- MBTA Commuter Rail

USGS 1:25,000 Linear Features

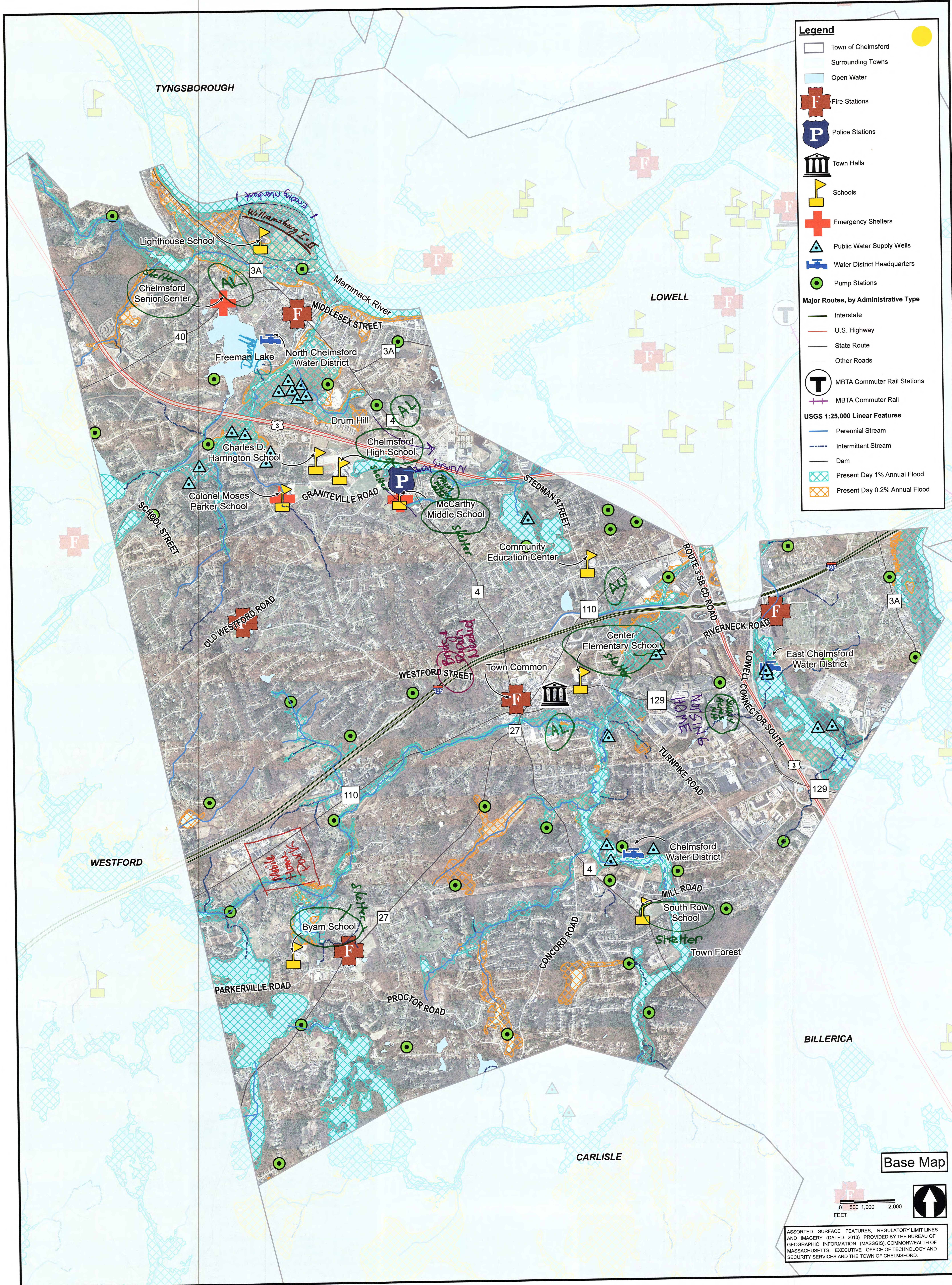
- Perennial Stream
- Intermittent Stream
- Dam
- Present Day 1% Annual Flood
- Present Day 0.2% Annual Flood

Base Map



ASSORTED SURFACE FEATURES, REGULATORY LIMIT LINES AND IMAGERY (DATED 2013) PROVIDED BY THE BUREAU OF GEOGRAPHIC INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS, EXECUTIVE OFFICE OF TECHNOLOGY AND SECURITY SERVICES AND THE TOWN OF CHELMSFORD.

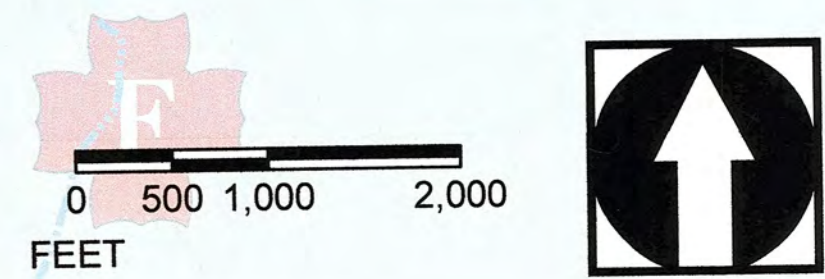
Appendix C Participatory Mapping



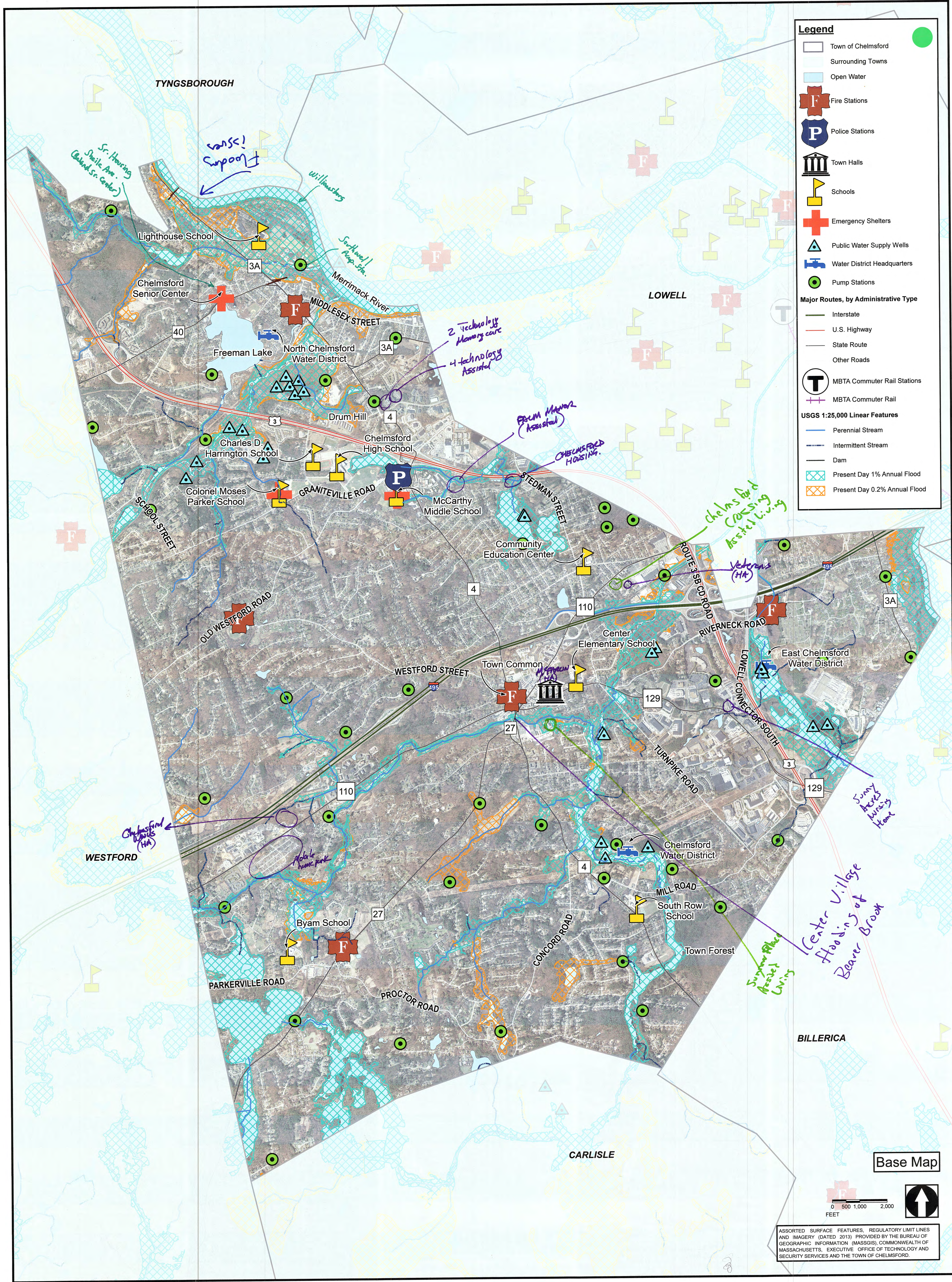
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Base Map



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- P Police Stations
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- 🚩 Schools
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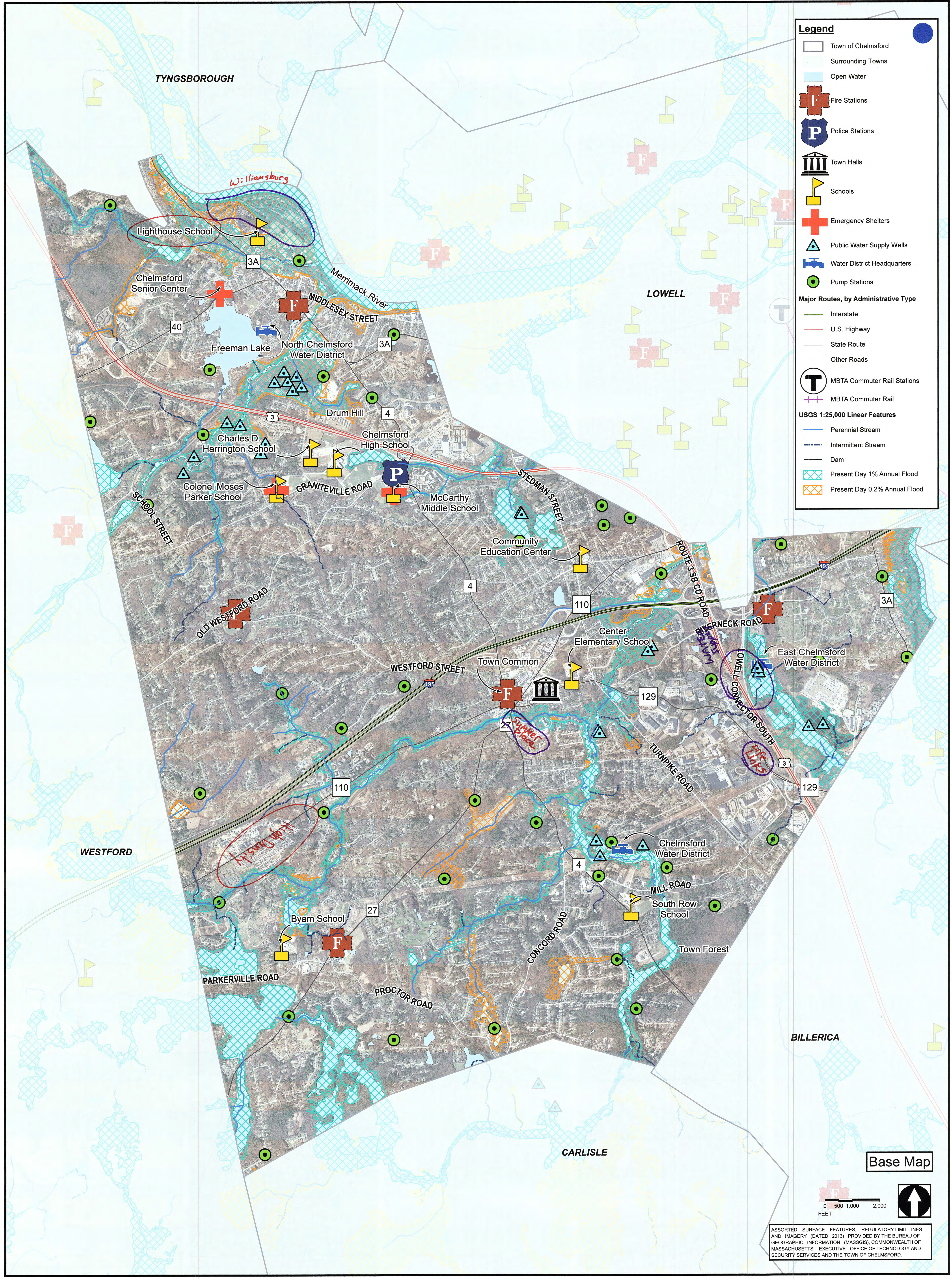
Other Symbols

- T MBTA Commuter Rail Stations
- MBTA Commuter Rail

Base Map

0 500 1,000 2,000
FEET

ASSORTED SURFACE FEATURES, REGULATORY LIMIT LINES AND IMAGERY (DATED 2013) PROVIDED BY THE BUREAU OF GEOGRAPHIC INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS, EXECUTIVE OFFICE OF TECHNOLOGY AND SECURITY SERVICES AND THE TOWN OF CHELMSFORD.



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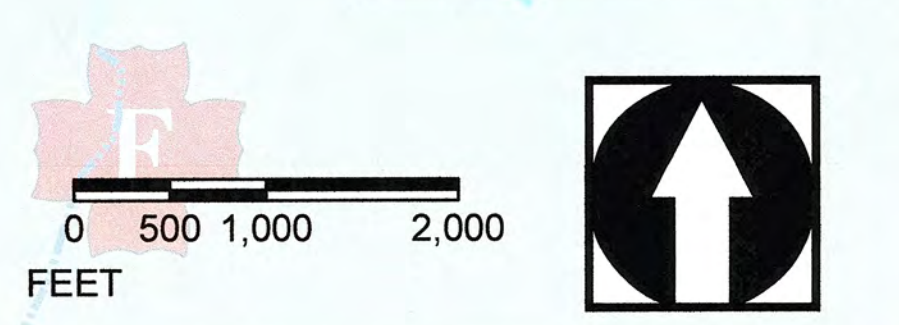
MBTA Commuter Rail Stations

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- MBTA Commuter Rail

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Appendix D
Completed Risk Matrices

Community Resilience Building Risk Matrix



Green Group
Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Green Group

www.CommunityResilienceBuilding.org

H-M-L priority for action over the **S**hort or **L**ong term (and **Q**ngoing)
V = Vulnerability **S** = Strength

| Features | Location | Ownership | V or S | Flooding | Wind | Extreme Temperature | Severe Storms | Priority | Time | |
|---|----------------------------|-----------------|--------|---|--|---|---|-----------|--------------------|--------|
| | | | | | | | | H - M - L | Short Long Ongoing | |
| Infrastructural | | | | | | | | | | |
| Utility Infrastructure (water lines, pumping stations, gas) | Town-wide | Town | V/S | | Move utilities underground | | Move utilities underground | L | L | |
| | | | | Repair gas leaks and understand major users | | Repair gas leaks and understand major users | M | O | | |
| | | | | | Continue existing Hardy Tree Program | | | H | O | |
| Public Facility Infrastructure (schools, pump stations, Senior Center, cooling systems, generators) | Town-wide | Town | V/S | | Install generator at Adams Library | | | H | S | |
| | | | | | Town-wide improvements to generator system | | | M | O | |
| | | | | | Improve communication regarding hazards, such as enrollment of vulnerable populations in the Reverse 911 program | | | H | S | |
| Roadway Infrastructure (culverts, bridges, drainage, downed trees, roadway improvement projects) | Town-wide | Town | V/S | Assess local bridges, culverts, and dams | | | | H | S | |
| | | | | Inspect existing stormwater infrastructure | | | | H | S | |
| | | | | implement roadside low-impact development in an effort to mitigate flash flooding | | | | H | S | |
| Water Conservation Program | Town-wide | Water Districts | S | | | Establish LID bylaw incorporating or requiring strategies such as green roofs, porous pavement, cistern irrigation, and drought-tolerant plants | | | M | S to L |
| Hardy Tree Program | Town-wide | DPW | S | | | Secure additional funding for existing Hardy Tree Program | | | M | O |
| | | | | | | Construct additional landscaped islands in areas such as Center Village and Vinal Square | | | M | O |
| | | | | | | Establish dedicated funding for invasive species removal and public education | | | H | O |
| Traffic Safety During Events | Town-wide | Police/DPW | S | | | Improve education and signage related to evacuation routes | | | L | L |
| Societal | | | | | | | | | | |
| Public Awareness and Expectations | Town-wide | Public | V | | Establish Twitter or other social media accounts with Town official support and dedicated management | | | H | S | |
| | | | | | Purchase additional sign boards for posting during emergencies | | | M | S to L | |
| Economic Loss due to Event | Town-wide | Private | V | | Encourage use of generators for private development | | Encourage use of generators for private development | L | L | |
| Increased Coordination and Communication | Town-wide | Public/Private | S | | Establish mobile data terminal with GIS-based information from multiple Town departments | | | M | S to L | |
| Bacteria/Algae as Health Issue | Recreational Water Sources | Town | V | Improve geese management | | Improve geese management | | L | L | |
| | | | | Install water aerator at Town beaches | | Install water aerator at Town beaches | | M | L | |
| | | | | Conduct chemical application for invasive species management | | Conduct chemical application for invasive species management | | M | S to L | |
| | | | | Improve abutter education regarding stormwater management (e.g. lawn fertilizer, pet waste) | | Improve abutter education regarding stormwater management (e.g. lawn fertilizer, pet waste) | | M | S | |
| At-Risk Populations (elderly, homeless, | Town-wide | Public | V | | Hire a Town social worker and enhance volunteer-based programs for vulnerable populations | | | H | S | |
| | | | | | Establish staffing for 24-hour emergency shelter | | | L | L | |
| Proactive Safety Centers (cooling, misting, heating) | Neighborhood | Town | S | | Communicate with public regarding expectations for pets in emergencies | | | M | S | |
| | | | | | Establish pet-friendly emergency shelters | | | L | L | |
| | | | | | | | | L | L | |
| Environmental | | | | | | | | | | |
| Mosquitoes/Rodents | Town-wide | Town | V | Establish an awareness/education program related to dog licenses regarding pests | | Establish an awareness/education program related to dog licenses regarding pests | | | M | S |
| Erosion/MS4 | Vulnerable Areas | Public/Private | V/S | | Develop a stormwater management bylaw that requires post-construction monitoring and maintenance agreements for private property | | | M | L | |
| | | | | | Coordinate with state regarding maintenance of state-owned drainage infrastructure | | | M | L | |
| | | | | | Improve forest management operations | | | M | L | |
| Water Supply/Access for Brush Fires | Open Space | Town | V | | Support open space stewardship | | | M | O | |
| | | | | | Coordinate with state regarding maintenance of brush along state highways | | | M | O | |
| | | | | | Develop management plans for individual wildlife habitat areas | | | L | L | |
| Habitat Loss | Habitat Areas | Town | V | | Conserve existing open space | | | M | O | |
| | | | | | Establish Smart Growth bylaw to reduce suburban sprawl | | | M | S to L | |
| | | | | | Improve public awareness and education regarding shifting habitat | | | M | S | |
| | | | | | | | | M | S | |
| Community Brush Disposal | Town-wide | Town | S | | Increase public awareness of existing programs | | Increase public awareness of existing programs | M | S | |
| | | | | | Establish municipal brush disposal facility | | Establish municipal brush disposal facility | L | L | |
| | | | | | Support composting to reduce landfill use | | Support composting to reduce landfill use | L | O | |



H-M-L priority for action over the Short or Long term (and Ongoing)
 V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

| Features | Location | Ownership | V or S | Severe Storms | | Flooding | | Extreme Temperature | | Pollution | | Priority | Time |
|--------------------------------|-----------|----------------|--------|--|--|---|--|--|--|-----------|---|-----------|--------------------|
| | | | | | | | | | | | | H - M - L | Short Long Ongoing |
| Infrastructural | | | | | | | | | | | | | |
| Williamsburg | Specific | Private | V | Hire a consultant to prepare an alternative access study for the Williamsburg condominium complexes | | | | | | | | H | S |
| | | | | Conduct Merrimack River bank stabilization project at Williamsburg | | | | | | | | H | S |
| | | | | Facilitate coordination between Williamsburg condominium associations for emergency flood management | | | | | | | | M | O |
| Transportation/Highway Network | Town-wide | Public | V/S | Create landscaping and maintain trees along roadways | | | | Create landscaping and maintain trees along roadways | | | | H | O |
| | | | | Conduct maintenance of streams and waterways | | | | Stream and waterway maintenance | | | | M | O |
| | | | | Hire a Consultant to create an Evacuation Routes Plan and associated planning study | | | | Hire a Consultant to create an Evacuation Routes Plan and associated planning study | | | | M | L |
| | | | | Install additional electric vehicle charging stations | | | | Install additional electric vehicle charging stations | | | | M | S |
| | | | | Improve access to and use of public transportation | | | | Improve access to and use of public transportation | | | | M | O |
| Drinking Water Distribution | Town-wide | Private | V/S | Evaluate existing culverts in the Farms Neighborhood in particular | | | | Evaluate existing culverts in the Farms Neighborhood in particular | | | | M | O |
| | | | | Install back-up power at pump stations | | | | Install back-up power at pump stations | | | | M | L |
| | | | | Incorporate LID/low water use appliances | | | | Incorporate LID/low water use appliances | | | | M | S |
| | | | | Strengthen existing water conservation program | | | | Strengthen existing water conservation program | | | | M | S |
| | | | | Conduct flood mitigation response training | | | | Conduct flood mitigation response training | | | | M | O |
| Gas/Electric Utilities | Town-wide | Private | V | Create landscaping and maintain trees along roadways | | | | Create landscaping and maintain trees along roadways | | | | H | O |
| | | | | Create an inventory of facilities with generators and a prioritized list of facilities that require generators or have undersized generators | | | | Create an inventory of facilities with generators and a prioritized list of facilities that require generators or have undersized generators | | | | H | S |
| | | | | Increase Emergency Shelters | | | | Increase Emergency Shelters | | | | M | O |
| | | | | Move utilities underground | | | | Move utilities underground | | | | M | L |
| Medical Facilities | Specific | Private | S | Maintain emergency action plans for medical facilities | | | | Maintain emergency action plans for medical facilities | | | | M | O |
| | | | | Facilitate the creation of additional walk-in clinics | | | | Facilitate the creation of additional walk-in clinics | | | | L | L |
| Back-Up Power | Town-wide | Public/Private | V/S | Create an inventory of facilities with generators and a prioritized list of facilities that require generators or have undersized generators | | | | Create an inventory of facilities with generators and a prioritized list of facilities that require generators or have undersized generators | | | | H | S |
| Societal | | | | | | | | | | | | | |
| Senior Community | Town-wide | Public | V/S | Maintain voluntary database for tracking elderly community in case of emergency situations | | | | Maintain voluntary database for tracking elderly community in case of emergency situations | | | | H | O |
| | | | | Streamline communication during extreme storm events | | | | Streamline communication during extreme storm events | | | | H | O |
| | | | | Maintain and create new heating/cooling shelters | | | | Maintain and create new heating/cooling shelters | | | | H | S |
| Disabled Population | Town-wide | Public | V | Maintain first responder action plan | | | | Maintain first responder action plan | | | | M | O |
| | | | | Maintain voluntary database for tracking elderly community in case of emergency situations | | | | Maintain voluntary database for tracking elderly community in case of emergency situations | | | | H | O |
| | | | | Streamline communication during extreme storm events | | | | Streamline communication during extreme storm events | | | | H | O |
| | | | | Maintain and create new heating/cooling shelters | | | | Maintain and create new heating/cooling shelters | | | | H | S |
| Religious Community/Outreach | Town-wide | Private | S | Increase frequency of religious leader meetings and create educational programming | | | | Increase frequency of religious leader meetings and create educational programming | | | | L | O |
| | | | | | | | | | | | | | |
| Emergency Shelters | Town-wide | Public | V/S | Create an inventory of facilities with generators and a prioritized list of facilities that require generators or have undersized generators | | | | Create an inventory of facilities with generators and a prioritized list of facilities that require generators or have undersized generators | | | | H | S |
| Language/Cultural Barriers | Town-wide | Public | V | Provide multiple language options for communication during emergency response situations | | | | Provide multiple language options for communication during emergency response situations | | | | L | O |
| Social Media | Town-wide | Public/Private | V/S | Purchase camera, repeaters, towers, etc. in support of the town microwave project | | | | Purchase camera, repeaters, towers, etc. in support of the town microwave project | | | | M | O |
| | | | | Streamline communication during extreme events | | | | Streamline communication during extreme events | | | | M | O |
| | | | | Utilize existing message boards throughout Town to spread information | | | | Utilize existing message boards throughout Town to spread information | | | | M | O |
| Environmental | | | | | | | | | | | | | |
| Public Beaches/Lakes | Specific | Public | V | Construct a boat ramp at Hart Pond for emergency response and evacuation | | | | Construct a boat ramp at Hart Pond for emergency response and evacuation | | | | H | S |
| | | | | Utilize dogs or swans to harass and deter geese from Freeman Lake | | | | Utilize dogs or swans to harass and deter geese from Freeman Lake | | | | M | S |
| Open Space | Town-wide | Public | V/S | Improve access to and maintenance of Town-owned open space | | Improve access to and maintenance of Town-owned open space | | Improve access to and maintenance of Town-owned open space | | | L | O | |
| Local Regulations | Town-wide | Public | S | Hire a consultant to review existing local regulations and create a new comprehensive Stormwater Management Bylaw | | | | Hire a consultant to review existing local regulations and create a new comprehensive Stormwater Management Bylaw | | | | H | S |
| | | | | Incorporate hazard mitigation into design criteria of local regulations | | | | Incorporate hazard mitigation into design criteria of local regulations | | | | M | L |
| Drinking Water Supply | Town-wide | Public | V/S | Hire a consultant to review existing local regulations and create a new comprehensive Stormwater Management Bylaw | | | | Hire a consultant to review existing local regulations and create a new comprehensive Stormwater Management Bylaw | | | | H | S |
| Tree Inventory | Town-wide | Public | V/S | Create a tree clearing bylaw to prevent new or greater heat islands | | Create a tree clearing bylaw to prevent new or greater heat islands | | Create a tree clearing bylaw to prevent new or greater heat islands | | | L | L | |
| Waterways | Town-wide | Public | V/S | Develop an invasive species mitigation program | | | | Develop an invasive species mitigation program | | | | M | O |

Community Resilience Building Risk Matrix



Blue Group¹

www.CommunityResilienceBuilding.org

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

H-M-L priority for action over the **Short** or **Long** term (and **Ongoing**)
V = Vulnerability **S** = Strength

| Features | Location | Ownership | V or S | Severe Storms | Flooding | Extreme Temperature | Wind | Priority | Time |
|---|-------------------------------------|--------------------------------|--------|---------------|----------|---------------------|------|-----------|--------------------|
| | | | | | | | | H - M - L | Short Long Ongoing |
| Infrastructural | | | | | | | | | |
| Power Grid (gas/electric/solar) | Town-wide | Private | V/S | | | | | | |
| Aging Schools | Multiple | Town | V | | | | | | |
| Bridges | Multiple | State/Town | V | | | | | | |
| Dams/Culverts | Multiple | Public/Private | V | | | | | | |
| Roads | Town-wide | State/Town | V | | | | | | |
| Water Districts/Water Supply | Town-wide | Semi-public (special district) | V/S | | | | | | |
| Pump Stations/Grinder Pumps | Multiple | Town | V/S | | | | | | |
| Relationship with Utility Companies | Town-wide | Public/Private | S | | | | | | |
| Societal | | | | | | | | | |
| NMCOG | Regional | Public | S | | | | | | |
| Williamsburg I/II | North Chelmsford | Private | V | | | | | | |
| Senior Center | North Chelmsford | Public | S | | | | | | |
| Nursing homes/assisted living/group homes/trailer park | Multiple | Private | V | | | | | | |
| Emergency Shelters/Medical Reserve Corps | Multiple/Regional | Public | S | | | | | | |
| Communicable Diseases (e.g. tick-borne illness) | Town-wide | Community | V | | | | | | |
| Town Communication (Reverse 911, social media, school outreach) | Town-wide | Public | S | | | | | | |
| Environmental | | | | | | | | | |
| Dams | Multiple (see HMP) | Public/Private | V | | | | | | |
| Hazmat Potential (including industrial properties) | Town-wide (Rt. 3, I-495, railroads) | Public/Private | V | | | | | | |
| Open Space (recreation and conservation) | Town-wide | Public/Private | V/S | | | | | | |
| Merrimack Riverbank Erosion Control Project | North Chelmsford | Public | V/S | | | | | | |
| Pests/Wildlife | Town-wide | Public/Private | V | | | | | | |
| Stormwater Management/MS4 | Town-wide | Town | S | | | | | | |
| Community Preservation Act | Town-wide | Town | S | | | | | | |

¹ Due to the number of available attendees, this stakeholder working group from Workshop #1 was combined with the Yellow Group for the second workshop.

Appendix E **Listening Session**

Agenda for May 20, 2019 Board of Selectmen Meeting

Summary of Findings Presentation for Listening Session

Public Comments Received



BOARD OF SELECTMEN MEETING AGENDA
May 20, 2019
Town Offices, 50 Billerica Road
Chelmsford, MA 01824
Dennis Ready Meeting Room 204

1. 7:00 PM CALL TO ORDER - NOTIFICATION OF LIVE BROADCAST

2. PUBLIC SERVICE ANNOUNCEMENTS

- Regina Jackson, Veterans Agent: Memorial Day 2019 Proclamation and Parade Information
- John Osborn, Parade Committee: July 4th Parade
- Proclamation: LGBTQ Pride Month, June 2019

Documents:

[MEMORIAL DAY 2019.PDF](#)
[PROCLAMATION LGBT PRIDE MONTH 2019.PDF](#)

3. OPEN SESSION

4. COMMITTEE VACANCIES

Documents:

[COMMITTEE VACANCIES AS OF 05-20-19.PDF](#)

5. PUBLIC HEARINGS

- All Alcoholic Beverages Restaurant License: Spicy Touch, Inc. DBA Bawarchi Biryani, 313 Littleton Rd., Units 10-12

Documents:

[SPICY TOUCH.PDF](#)

6. LICENSES

- Common Victualer and Entertainment License: Trailside Ice Cream Parlor LLC, 59-61 Central Square, Unit 5
- Change of Hours on All Alcoholic Beverages License: Sterling Golf Management, Inc. DBA Chelmsford Country Club, 66 Park Rd.
- Special License to Sell Wine at an Agricultural Event: House Bear Brewing LLC, Chelmsford Town Common Farmers Market - 6/15/19 to 9/14/19
- One Day Expansion of Entertainment License: Center Brickhouse Pizza, 1 Central Sq., 7/3/19

Documents:

[TRAILSIDE ICE CREAM.PDF](#)
[STERLING GOLF.PDF](#)
[HOUSE BEAR BREWING.PDF](#)
[BRICKHOUSE ENTERTAINMENT EXPANSION.PDF](#)

7. REPORTS AND PRESENTATIONS

- Chelmsford Water District Presentation
- 8:00 PM: MVP Grant Public Listening Session Presentation

Documents:

[MVP PRESENTATION.PDF](#)
[MVP SUMMARY OF FINDINGS REPORT DRAFT 2019-05-15.PDF](#)

8. TOWN MANAGER BID AWARDS

- School Parking Lots Expansion at Center School and Harrington School
- Town Offices Cleaning Services
- Natural Gas
- Golf Course 9th Hole Reconstruction

Documents:

[BID RESULTS SHEET -- PARKING LOT EXPANSION CENTER AND HARRINGTON 4.24.19.PDF](#)
[CLEANING BID -- BID RESULTS.PDF](#)
[NATURAL GAS SUPPLY.PDF](#)
[GOLF COURSE 9TH HOLE RECONSTRUCTION.PDF](#)

9. TOWN MANAGER REPORTS

- Age Friendly Community Certification
- June 12th Listening Session Regarding Town Traffic Issues
- Change in Town Offices Weekday Schedule of Hours of Operation
- BOS Meeting Schedule Milestones

Documents:

[AARP NAFC WELCOME LETTER 368 CHELMSFORD MA 5-10-19 UNSIGNED.PDF](#)
[ENROLLMENT CERTIFICATE 368 CHELMSFORD MA 5-10-19 UNSIGNED.PDF](#)
[TOWN OFFICES WEEKDAY HOURS OF OPERATION.PDF](#)
[BOARD OF SELECTMEN MEETING SCHEDULE MILESTONES 2019-2020.PDF](#)

10. TOWN MANAGER APPOINTMENTS

- Council on Aging, Associate Member: Ami Ogrady, unexpired 3-year term exp. 6/30/2020
- Council on Aging, Associate Member: Jennifer Hardy, unexpired 3-year term exp. 6/30/2020

Documents:

[TOC1184 AMI OGRADY.PDF](#)
[TOC1186 JENNIFER HARDY.PDF](#)

11. BOARD OF SELECTMEN AND TOWN MANAGER FY20 GOALS

Documents:

**FISCAL YEAR 2020 GOALS FOR THE BOARD OF SELECTMEN AND
TOWN MANAGER.PDF**

12. MEETING MINUTES

- BOS Regular Session Minutes 04-08-19
- BOS Regular Session Minutes 04-22-19
- BOS Executive Session Minutes 05-06-19

Documents:

BOS MINUTES 04-08-19.PDF
BOS MINUTES 04-22-19.PDF

13. SELECTMEN LIAISON REPORTS & REFERRALS

14. PRESS QUESTIONS

15. EXECUTIVE SESSION

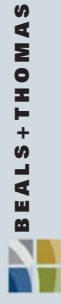
- Strategy with Respect to Pending Litigation from the Police Superior Officers (Sergeants) Union

NEXT REGULAR MEETING DATE: **June 3, 2019**

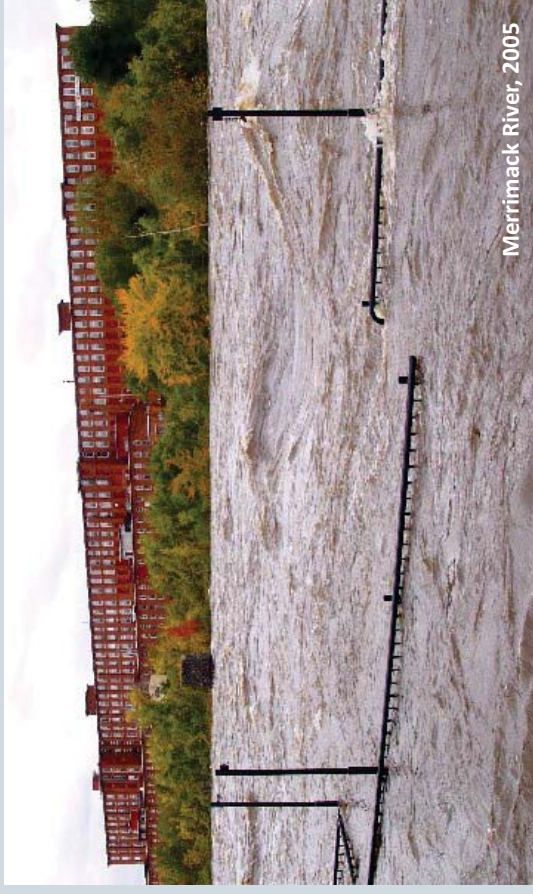


Community Resilience Building: Public Listening Session

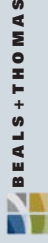
Presented by:



May 20, 2019



Welcome and Introduction



Team Members

Town of Chelmsford Core Team

◦ Evan Belansky, Community Development Director

Beals and Thomas, Inc. (B+T) Facilitators

◦ Eric Las, PE

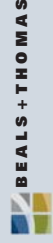
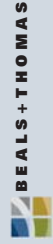


The Nature Conservancy
Protecting nature. Restoring life.



www.CommunityResilienceBuilding.org

Municipal Vulnerability Preparedness (MVP) Program



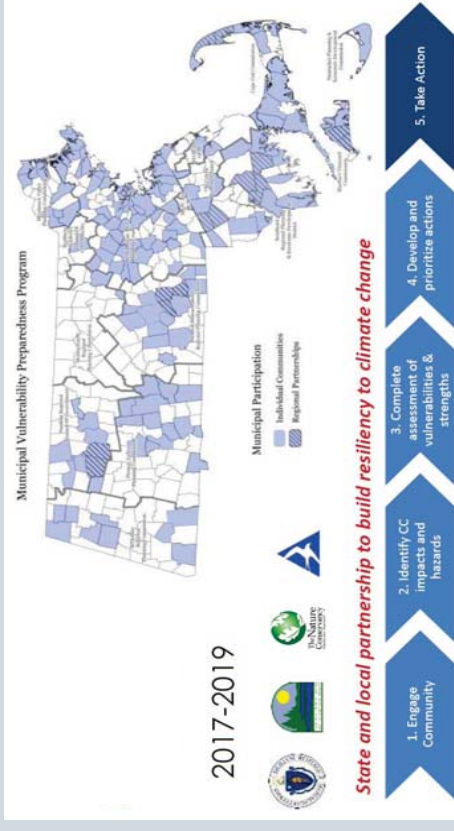
Executive Order 569

Issued by Governor Baker September 2016

- Tasked Executive Office of Energy and Environmental Affairs (EEA) with creating two frameworks to assess vulnerabilities and adaptation strategies related to climate change
 - MVP Office
 - Resilient MA website
 - State Hazard Mitigation and Climate Adaptation Plan

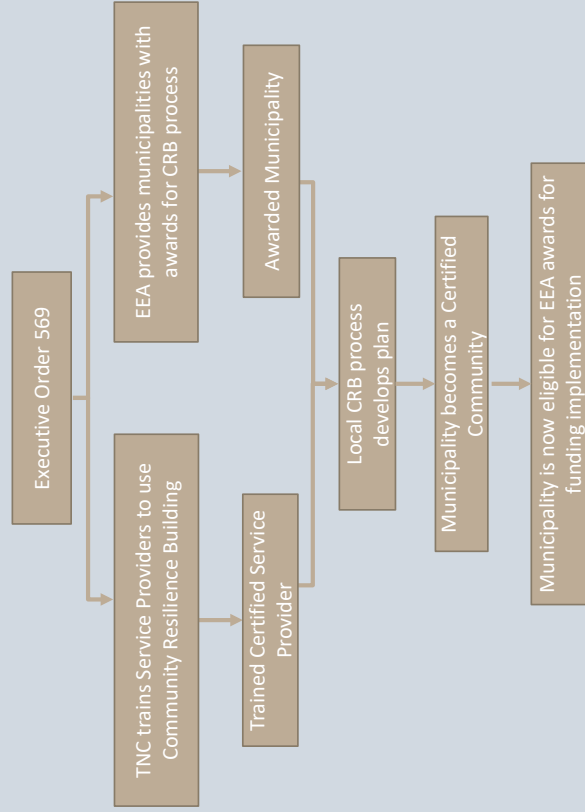


State's Vision for MVP Program



MVP Timeline

- Receipt of Planning Grant: June 2018
- Core Team Established Approach: Late 2019
- Workshop #1: February 2019
- Workshop #2: March 2019
- Public Listening Session: May 2019
- Final Report: June 2019



Listening Session Purpose

Present results of Community Resilience Building workshops to broader public

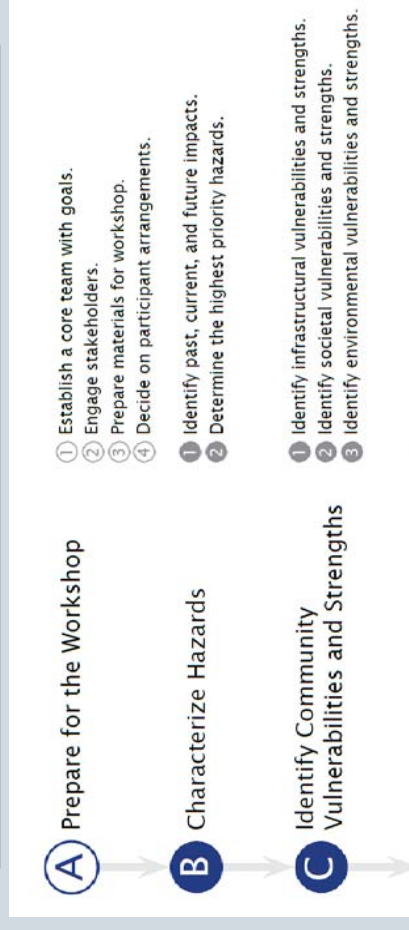
Provide forum for interested members to provide input

Make draft of Summary of Findings report available for written public comment prior to submission to the state



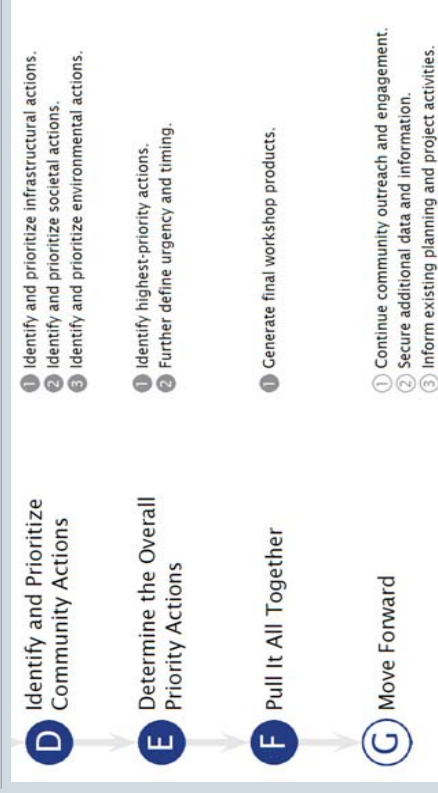
BEALS + THOMAS

MVP Process



BEALS + THOMAS

MVP Process



BEALS + THOMAS

Hazard Mitigation Plan Update

Regional plan prepared by NMCOG in 2015

Recommendations to address natural hazards

- Identified as high hazards:
 - Severe storm events (e.g. Nor'easter, hurricanes, ice storms, snow storms, blizzards)
 - Flooding
 - Wildfires
 - Earthquakes

Prioritized mitigation based on anticipated area of hazard impact, expected benefit, and cost



BEALS + THOMAS

Workshop Objectives

Workshop 1

- Define extreme weather and natural and climate-related hazards
- Identify existing and future vulnerabilities and strengths

Workshop 2

- Develop and prioritize actions for the community and broader stakeholder networks
- Identify opportunities for the community to advance actions to reduce risks and build resilience.



Invited Stakeholders

Chelmsford Town Manager
Chelmsford Board of Selectmen
Chelmsford Police Department
Chelmsford Fire Department
Chelmsford Engineering
Chelmsford Public Works
Chelmsford Energy Manager
Chelmsford Public Facilities
Chelmsford Highway Division
Chelmsford Sewer Division
Chelmsford Building Department
Chelmsford Board of Health
Chelmsford Emergency Management
Chelmsford Department of Community Planning
Chelmsford Conservation Agent
Chelmsford Conservation Commission
Chelmsford Information Technology
Chelmsford Land Conservation Trust
Chelmsford Senior Center
Chelmsford Council on Aging
Chelmsford School Administration

Chelmsford School Committee
Chelmsford Water District
North Chelmsford Water District
East Chelmsford Water District
Massachusetts Department of Transportation District 4
Chelmsford TV
The Trustees of Reservations
Chelmsford Community Exchange (Food Pantry)
Chelmsford Planning Board
Chelmsford Business Association
MA Department of Conservation and Recreation
Chelmsford Housing Authority
Chelmsford Board of Appeals
Historical Commission
Chelmsford Bicycle and Pedestrian Advisory Committee
Chelmsford Commission on Disabilities
Middlesex Canal Commission
Greater Lowell Chamber of Commerce
NIMCOG - Director
Chelmsford Finance Director



Definitions

Hazard – cause of negative impacts to community

Risk – potential result from hazard

Vulnerability – feature (societal, environmental, or infrastructural) that is susceptible to risk

Action – addresses vulnerability



Highest Ranked Hazards

Severe Storms

Flooding

Extreme Temperature

Wind

Pollution



Top Priorities to Improve Resiliency

1. Install generator at Adams Library
2. Assess local bridges, culverts, and dams, inspect existing stormwater infrastructure, and implement roadside low-impact development in an effort to mitigate flash flooding
3. Create an inventory of facilities with generators and a prioritized list of facilities that require generators or have undersized generators



Additional High Priority Actions

- Improve communication regarding hazards, such as enrollment of vulnerable populations in the Reverse 911 program
- Create landscaping and maintain trees along roadways
- Continue existing Hardy Tree Program
- Hire a consultant to prepare an alternative access study for the Williamsburg condominium complexes
- Conduct Merrimack River bank stabilization project at Williamsburg
- Establish dedicated funding for invasive species removal and public education



Additional High Priority Actions

- Maintain voluntary database for tracking elderly community members in case of emergency situations
- Streamline communication during extreme storm events
- Hire a Town social worker and enhance volunteer-based programs for vulnerable populations
- Create and maintain new heating/cooling centers
- Establish Twitter or other social media accounts with Town official support and dedicated management
- Hire a consultant to review existing local regulations and create a new comprehensive Stormwater Management Bylaw
- Construct a boat ramp at Hart Pond for emergency response and evacuation



Draft Summary of Findings Report

<https://www.townofchelmsford.us/DocumentCenter/View/9998/MVP-Summary-of-Findings-Report-DRAFT-2019-05-15-2>

Submit comments to EBelansky@TownofChelmsford.US by June 17, 2019.



Next Steps

- Incorporate feedback from listening session into final report
- Prepare updated Hazard Mitigation Plan
- Submit final MVP Summary of Findings report to state for designation as MVP community
- Submit HMP update to MEMA and FEMA for review and comment
- Incorporate MEMA/FEMA comments on HMP
- Final HMP approval from Board of Selectmen
- Prepare and submit MVP Action Grant application for Summer 2019 grant announcement



BEALS + THOMAS

MVP Action Grants

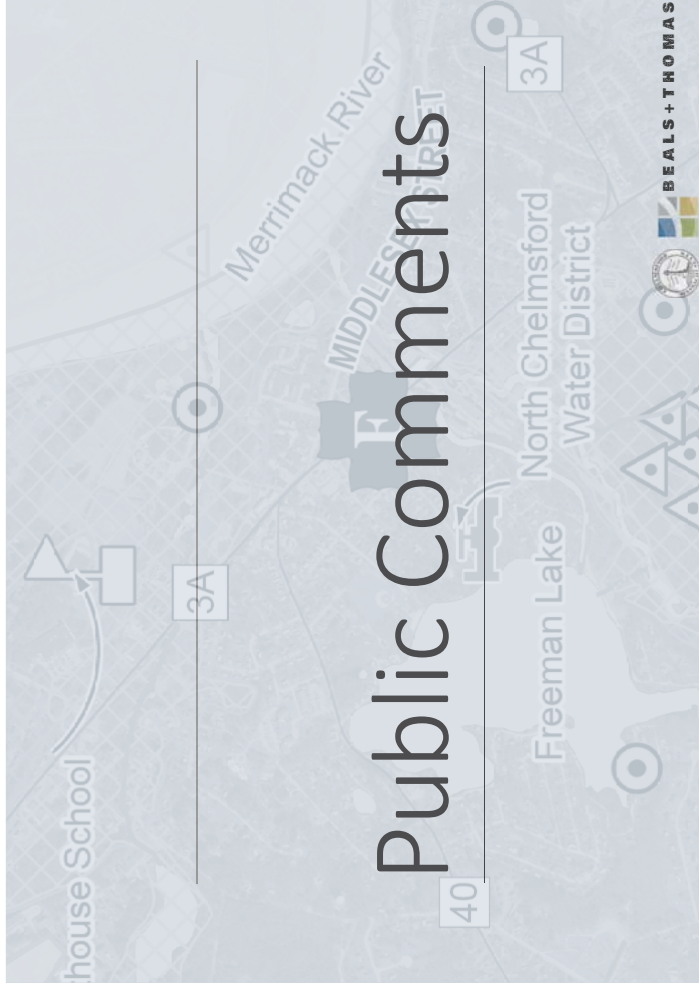
Project categories include:

- Detailed vulnerability/risk assessments
- Local bylaw and ordinance improvements
- Engineering and construction retrofits
- Ecological restoration projects
- Nature-based solutions to reduce vulnerability



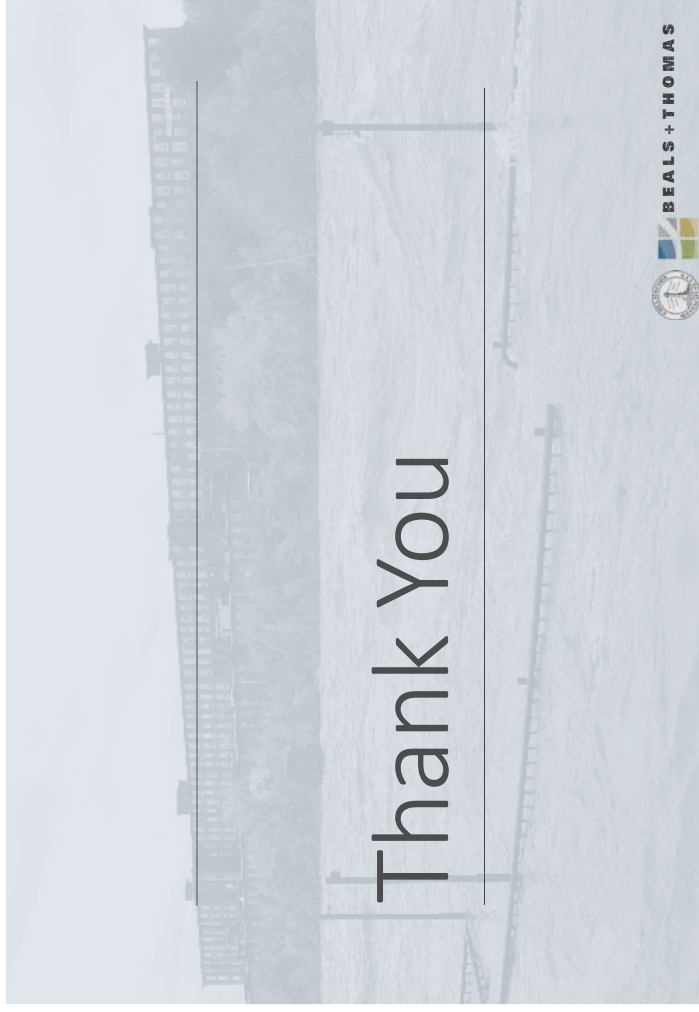
BEALS + THOMAS

Public Comments



BEALS + THOMAS

Thank You



BEALS + THOMAS



Chelmsford Water District

20 Watershed Lane • Chelmsford MA 01824-4884 • www.chelmsfordwater.com

June 13, 2019

Evan Belansky
Community Development Director
Town of Chelmsford
50 Billerica Rd
Chelmsford Ma 01824

Mr. Belansky,

I have finished the statement listing the facts and reasons supporting the Chelmsford Water District's list of water priorities to be included in the Municipal Vulnerability Preparedness report. Should you need any further information or any clarification of the information submitted please feel free to contact me.

Sincerely,

Todd A. Melanson

Environmental Compliance Manager

Chelmsford Water District

978-256-2381

tmelanson@chelmsfordwater.com

Commissioners

Bill Martin, Chairman
Ronald W. Wetmore
John G. Harrington

Operations

Robert J. Delaney, Superintendent
Tel: 978.256.2931
Fax: 978.256.7114
E-Mail: rdelaney@chelmsfordwater.com

Administration

Lisa M. Valcich, Business Director and Treasurer
Tel: 978.256.2381
Fax: 978.244.1434
E-mail: lvalcich@chelmsfordwater.com

Water Priorities for the Municipal Vulnerability Preparedness program:

The Chelmsford Water District in regards to planning for and accommodating operations to climate change face similar dangers and issues facing the Town of Chelmsford in the amounts of precipitation. In regards to flooding, the District's water resources and water production facilities all exist within the flood plain and are therefore susceptible to infrastructure dangers. In addition to the dangers posed by flooding too much precipitation can and does affect the water quality and overall chemistry of the watershed. These changes with an influx or overabundance of water make treating water, to the standards of drinking water, difficult since it can introduce new contaminants into the water resources or increase the quantities of existing contaminants.

In the case of drought, the District has already experienced the affects and repercussions of drought as recently as 2016. The stress on the system causes well sites to need expedited source maintenance and cleaning due to the decreased water quality. The risk from fire during these times of drought exasperates fire risk situations and the associated demands on a water system. The required and mandated actions associated with drought can cause fiscal issues for the District as well. The economic planning of the Town of Chelmsford is reliant upon the continued access year-round to safe and sufficient quantities of drinking water and fire protection.

An aspect unique to a water utility is the required legal adherence to the Water Management Act (WMA) and the formal inclusion of the Sustainable Water Management Initiative (SWMI) into the WMA. This put further regulatory stresses on the District and its abilities to adjust to climate changes associated with water. The two watersheds and the associated sub-basins that the District withdraws water from are categorized as depleted and both basins being stressed in terms of biological and groundwater withdrawal categories with at least one sub-basin containing a cold-water Fishery Resource within it. These factors can possibly put further regulatory restrictions on withdrawals due to factors centered on climate change.

Given these factors of infrastructure placement and the associated effects of climate change, there are a few priorities the District would like outlined for the MVP program report.

1. A large part of the answer for the District in cases of precipitation focuses on redundancies of sources, to protect from contamination and to balance the load of withdrawal. Therefore, the Chelmsford Water District would like to include water priority resources for wellhead protection through land purchases for wellhead protection or new sources.
2. The Chelmsford Water District would add to the stormwater section a local recharge program but it needs to have measurable quantities that could be associated with the SWMI process in terms of mitigation credits.
3. Monitoring of stormwater should also include the monitoring of stormwater quality, since its ability to transport and spread potential contaminants into wellhead protection areas. A program that highlighted the proper funneling of stormwater into areas without this risk and monitoring of the water quality contained in the stormwater should be considered.
4. Through the use of road treatment materials in our region salt concentrations have increased. Looking for an alternative to road salt and brine solutions would be a water priority as well. The increasing amounts of salt in the surface and groundwater resources of our region have been noted. Salinity Syndrome is highlighted in at least one major academic study/report.

In short, the Chelmsford Water District wants to highlight the need for redundancy in its water resources, further protection of its water resources and the need for local aquifer recharge as its main priorities to be included with the Chelmsford MVP report.