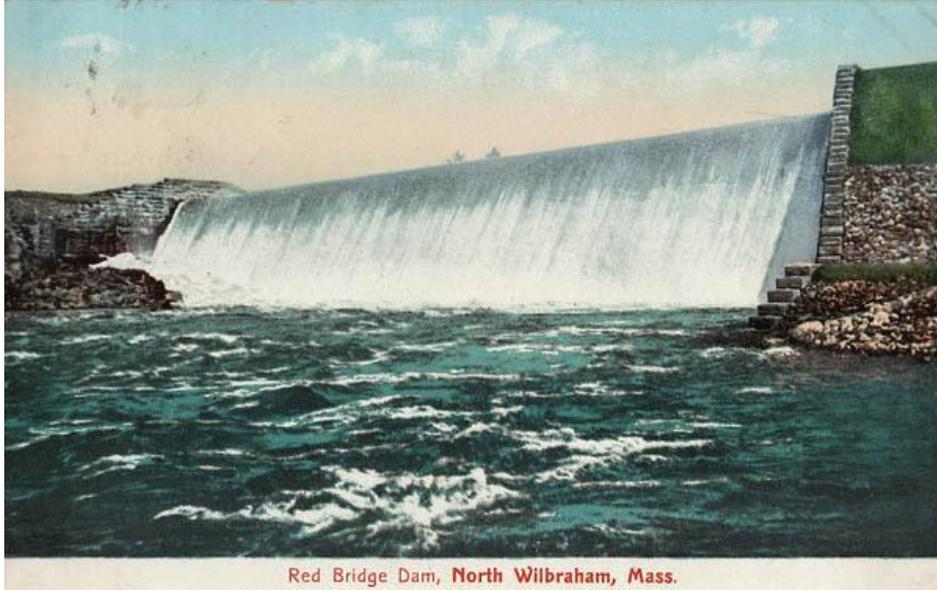


# THE TOWN OF WILBRAHAM HAZARD MITIGATION PLAN



**Adopted by the Wilbraham Board of Selectmen**

**Prepared by:  
The Wilbraham Hazard Mitigation Planning Workgroup**

**and**

**The Pioneer Valley Planning Commission**

60 Congress Street  
Springfield, MA 01104

(413) 781-6045

[www.pvpc.org](http://www.pvpc.org)

*This project was funded by a grant received from the Massachusetts Emergency Management Agency (MEMA) and the Massachusetts Department of Conservation Services (formerly the Department of Environmental Management)*

## Table of Contents

<b>1: PLANNING PROCESS .....</b>	<b>2</b>
Introduction .....	2
Hazard Mitigation Workgroup .....	2
Participation by Stakeholders .....	4
Select Board Meeting.....	7
<b>2: LOCAL PROFILE.....</b>	<b>8</b>
Community Setting .....	8
Neighborhood Characteristics .....	12
Infrastructure.....	15
Natural Resources.....	20
<b>3: HAZARD IDENTIFICATION &amp; RISK ASSESSMENT .....</b>	<b>26</b>
Natural Hazard Analysis Methodology .....	26
Floods.....	30
Severe Snowstorms / Ice Storms .....	36
Hurricanes.....	40
Severe Thunderstorms / Wind / Tornadoes .....	44
Wildfire / Brushfire .....	49
Earthquakes .....	53
Dam Failure.....	57
Drought.....	60
Other Hazards .....	63
<b>4: CRITICAL FACILITIES .....</b>	<b>64</b>
Facility Classification .....	64
Category 1 – Emergency Response Services.....	65
Category 2 – Non Emergency Response Facilities .....	67
Category 3 – Facilities/ Institutions with Special Populations .....	68
<b>5: MITIGATION STRATEGIES.....</b>	<b>71</b>
Overview of Mitigation Strategies by Hazard .....	72
Existing Mitigation Strategies .....	74
Existing Resources.....	80
Potential Improvements to Existing Capabilities and Resources .....	80
Deleted Mitigation Strategies.....	82
Previously Identified and New Strategies.....	83
Prioritization Methodology.....	83
Cost Estimates.....	84
Project Timeline .....	84

**6: PLAN REVIEW, EVALUATION, IMPLEMENTATION, AND ADOPTION.....94**

**7: APPENDICES .....98**

- Appendix A – Technical Resources ..... 99
- Appendix B – Documentation of the Planning Process ..... 103
- Appendix C – List of Acronyms ..... 135
- Appendix D – Past and Potential Hazards/Critical Facilities Map..... 136

## **Acknowledgements**

The Wilbraham Board of Selectmen extends special thanks to the Wilbraham Natural Hazards Mitigation Planning Workgroup as follows:

Tonya Basch, Assistant Town Engineer

Dena Grochmal, Town Engineering Assistant

Francis Nothe, Emergency Management Director

William Sperrazza, Highway Superintendent

Lance Trevallion, Building Inspector

Edmond Miga Jr., Department of Public Works Director

The Wilbraham Board of Selectmen offers thanks to the Massachusetts Emergency Management Agency (MEMA) for developing the Commonwealth of Massachusetts Natural Hazards Mitigation Plan (<http://www.state.ma.us/dem/programs/mitigate/index.htm>) which served as a model for this plan. In addition, special thanks are extended to the staff of the Pioneer Valley Planning Commission for professional services, process facilitation and preparation of this document.

### **The Pioneer Valley Planning Commission**

Catherine Ratté, Principal Planner/Co-Project Manager

Josiah Neiderbach, Planner/Co-Project Manager

David Elvin, Senior Planner

Todd Zukowski, Principal Planner/GIS-Graphics Section Head

Jacob Dolinger, GIS Specialist

# 1: PLANNING PROCESS

## Introduction

---

The Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA) define Hazard Mitigation as any sustained action taken to reduce or eliminate long-term risk to people and property from natural hazards such as flooding, storms, high winds, hurricanes, wildfires, earthquakes, etc. Mitigation efforts undertaken by communities will help to minimize damages to buildings and infrastructure, such as water supplies, sewers, and utility transmission lines, as well as natural, cultural and historic resources.

Planning efforts, like the one undertaken by the Town of Wilbraham and the Pioneer Valley Planning Commission, make mitigation a proactive process. Pre-disaster planning emphasizes actions that can be taken before a natural disaster occurs. Future property damage and loss of life can be reduced or prevented by a mitigation program that addresses the unique geography, demography, economy, and land use of a community within the context of each of the specific potential natural hazards that may threaten a community.

Preparing a hazard mitigation plan before a disaster, can save the community money and facilitate post-disaster funding. Costly repairs or replacement of buildings and infrastructure, as well as the high cost of providing emergency services and rescue/recovery operations, can be avoided or significantly lessened if a community implements the mitigation measures detailed in the plan. FEMA requires that a community adopt a pre-disaster mitigation plan as a condition for mitigation funding. For example, the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance Program (FMA), and the Pre-Disaster Mitigation Program are programs with this requirement.

## Hazard Mitigation Workgroup

---

In 2013, the Town of Wilbraham completed an update of their 2008 Hazard Mitigation Plan, in collaboration with the Pioneer Valley Planning Commission. All portions of the plan were reviewed and updated as necessary. Planning for hazard mitigation in Wilbraham involved a five-member workgroup:

- Tonya Basch, Assistant Town Engineer
- Dena Grochmal, Town Engineering Assistant
- Francis Nothe, Emergency Management Director
- William Sperrazza, Highway Superintendent
- Lance Trevallion, Building Inspector
- Edmond Miga Jr., Department of Public Works Director

The hazard mitigation planning process for the Town included the following tasks:

- Reviewing and incorporating existing plans and other information.
- Identifying the natural hazards that may impact the community.
- Conducting a Vulnerability/Risk Assessment to identify the infrastructure at the highest risk for being damaged by the identified natural hazards, particularly flooding.
- Identifying and assessing the policies, programs, and regulations the community is currently implementing to protect against future disaster damages.
- Identifying deficiencies in the current strategies and establishing goals for updating, revising or adopting new strategies.
- Adopting and implementing the final Hazard Mitigation Plan.

The key product of this process is the development of an Action Plan with a Prioritized Implementation Schedule.

### **Workgroup Meetings**

Meetings of the Hazard Mitigation Planning Workgroup, all of which took place at Wilbraham Town Hall, were held on the dates listed below. Agendas for each meeting are included in Appendix B. Meetings held in 2013 included a review of the entire Hazard Mitigation Plan and updates to the document. After the October 2013 meeting, the plan was then submitted to MEMA for initial review. After MEMA reviewed the document and provided feedback, another set of meetings was held in 2014 to further update and edit the Hazard Mitigation Plan to meet FEMA and MEMA requirements.

**July 10<sup>th</sup>, 2013, 2:00 p.m.**

Workgroup meeting included review of Hazard Mitigation Planning process, Planning Process chapter, Local Profile chapter, hazard identification analysis, and critical facilities and infrastructure map.

**September 16<sup>th</sup>, 2013, 1:30 p.m.**

Workgroup meeting included review of current and future mitigation strategies, how to incorporate plan with other Town documents, procedures for adoption and implementation of plan, and review of edited version of critical facilities and infrastructure map.

**October 23<sup>rd</sup>, 2013, 2:00 p.m.**

Workgroup meeting included review of edits to plan, prioritization of implementation strategies, and review of critical infrastructure and hazard identification map.

**January 23<sup>rd</sup>, 2014, 10:00 a.m.**

Work group meeting included hazard mitigation planning overview and identify and organizing of the planning team. Marybeth Groff, Hazard Mitigation Planner at the Massachusetts Emergency Management Agency, was present and facilitated the meeting.

**March 19<sup>th</sup>, 2014, 2:30 p.m.**

Work group began process of hazard identification and risk assessment. Discussion included critical facilities and evacuation routes potentially affected by hazards, history of specific hazard events, vulnerability assessment methodology, and the evaluation of the Town's vulnerability to each hazard.

**March 20<sup>th</sup>, 2014, 10:00 a.m.**

Work group reviewed current mitigation strategies and the status of each strategy, evaluated effectiveness of current strategies, and determined potential changes to current mitigation strategies.

**March 24<sup>th</sup>, 2014, 11:00 a.m.**

Work group discussed new proposed mitigation strategies for addressing hazards, including estimating the cost of each strategy, the responsible entity, a timeline for completion, and the priority of each strategy.

**March 27<sup>th</sup>, 2014, 10:00 a.m.**

Work group discussed process for adoption and maintenance of the plan, procedures for routine updates, incorporation of the plan into other municipal planning documents and operations, and a review of the overall plan and all sections.

Agendas and sign-in sheets for each meeting can be found in Appendix B. While not all members of the Hazard Mitigation Workgroup were able to attend each meeting, all members collaborated on the plan and were updated on progress by fellow Workgroup members after meetings occurred as necessary.

## **Participation by Stakeholders**

---

A variety of stakeholders were provided with an opportunity to be involved in the development of the Wilbraham Hazard Mitigation Plan. The different categories of stakeholders that were involved, and the engagement activities that occurred, are described below.

### **Local and regional agencies involved in hazard mitigation activities and surrounding community engagement and input**

The Pioneer Valley Planning Commission is a regional planning agency for 43 towns and cities in Massachusetts' Hampden and Hampshire Counties. PVPC regularly engages with the Town of Wilbraham as part of its regional planning efforts, which include the following:

- Developing the Pioneer Valley Regional Land Use Plan, Valley Vision 2, which advocates for sustainable land use throughout the region and consideration for the impact of flooding and other natural hazards on development.

- Developing the Pioneer Valley Climate Action and Clean Energy Plan, which assesses the impact that climate change will have on the region and recommends strategies for mitigation that can be implemented by local municipalities and businesses.
- Collaborating with state agencies, such as the Department of Conservation and Recreation, to maintain inventories of critical infrastructure throughout the region.

All of these PVPC initiatives considered the impact of natural hazards on the region and strategies for reducing their impact to people and property through hazard mitigation activities. The facilitation of the Wilbraham Hazard Mitigation Plan by PVPC ensured that the information from these plans was incorporated into the Hazard Mitigation Planning process.

In addition, the Pioneer Valley Planning Commission and several representatives from the Town of Wilbraham (Fire Chief Francis Nothe) are actively involved in the Western Region Homeland Security Advisory Council (WRHSAC). WRHSAC, which includes representatives from Western Massachusetts municipalities, Fire Departments, Public Works Departments, Police Departments, area hospitals and regional transit from throughout the four counties of western Massachusetts, is responsible for allocating emergency preparedness funding from the US Department of Homeland Security. The representatives of these disciplines who serve on the WRHSAC are charged with sharing the information discussed at meetings with their colleagues at their regular meetings. PVPC staff and the Fire Chief from Wilbraham attend all WRHSAC meetings and all WRHSAC members are aware of the fact that Wilbraham was updating its Hazard Mitigation plan. Meetings of WRHSAC regularly involve discussion about how to improve emergency preparedness in western Massachusetts, and hazard mitigation activities are included in this discussion.

For the update of this Hazard Mitigation Plan, PVPC provided feedback from WRHSAC on regional mitigation activities and natural hazards pertaining to Wilbraham. This was the method through which WRHSAC was engaged in the planning process.

In addition, PVPC staff regularly present to their Executive Committee and Commission (representatives from the 43 cities and towns that comprise the Pioneer Valley, when new projects are launched and when funding opportunities are available). As result, all the communities in the region were informed of Wilbraham's Hazard Mitigation Plan update process and encouraged to comment.

PVPC staff included a summary article on the status of Hazard Mitigation planning in the region in the quarterly Regional Reporter that is mailed to area Chambers of Commerce, all member municipalities, area colleges and universities and other key stakeholders in the region. In this way, businesses, educational institutions and other key stakeholders were educated about and informed of Wilbraham's hazard mitigation planning work.

## **Agencies that have the authority to regulate development**

There are several Town commissions, boards, and committees within the Town of Wilbraham that have the authority to regulate development. These entities are:

- Public Works Commission
- Conservation Commission
- Historical Commission
- Planning Board
- Open Space and Recreation Committee
- Local Emergency Planning Committee
- Capital Planning Committee

Feedback from the stakeholder agencies listed above was ensured through the participation of the Hazard Mitigation Workgroup members, who regularly meet and collaborate with members of these entities and town staff that regularly staff meetings of these commissions, boards, and committees.

In addition, the Pioneer Valley Planning Commission, as a regional planning authority, works with all agencies that regulate development in Wilbraham, including the municipal entities listed above and state agencies, such as Department of Conservation and Recreation and MassDOT. This regular involvement ensured that during the development of the Wilbraham Hazard Mitigation Plan, the operational policies and any mitigation strategies or identified hazards from these entities were incorporated into the Hazard Mitigation Plan.

## **Participation by the Public, Businesses, and Neighboring Communities**

Two public planning sessions were held as part of the development of Wilbraham plan – on Thursday, March 20<sup>th</sup>, 2014 at 9:00 a.m. and Thursday, March 27<sup>th</sup>, 2014 at 9:00 a.m. Both meetings occurred after the Hazard Mitigation Workgroup had provided input on hazards and mitigation strategies relevant to the community. Notice of both public meetings was posted at Wilbraham Town Hall in compliance with the Commonwealth of Massachusetts’ open meeting law. Public meeting agendas and notices can be found in Appendix B.

On Monday, March 24<sup>th</sup>, the Pioneer Valley Planning Commission sent a press release to all area media outlets to inform the public that a draft of the Wilbraham Hazard Mitigation Plan had been placed on PVPC’s website. The release also indicated that hard copies were available at PVPC’s offices and at Wilbraham Town Hall, and that all residents, businesses and other concerned parties of Wilbraham and adjacent communities were encouraged to comment on the plan by e-mailing or calling staff contacts at PVPC or the Town of Wilbraham.

The press release and a screen shot of PVPC’s website showing the link to the press release can be found in Appendix B.

A list of media organizations that were sent all press releases is included in Appendix B, which are the television stations, radio stations, and newspapers located in western Massachusetts, northern Connecticut, and southern Vermont.

The Hazard Mitigation Workgroup determined that the most effective outreach strategy for engaging with the public, businesses and neighboring communities was through the media, and so this was the outreach strategy employed for reaching out to all three groups of stakeholders. The press release indicated that residents of Wilbraham were invited to attend the event, which was also intended to include representatives of businesses in Wilbraham and residents of neighboring communities.

Businesses and neighboring communities were also provided with an opportunity to provide feedback through the Pioneer Valley Planning Commission. PVPC is regularly involved in land use, transportation, and environmental planning initiatives in Wilbraham and surrounding communities. Regular feedback received from these other initiatives were incorporated into the hazard mitigation planning process. Neighboring communities that were provided with an opportunity to comment included municipalities that directly border Wilbraham, which are: Springfield, Ludlow, Palmer, Monson, Hampden, and East Longmeadow. All of these municipalities are part of the PVPC region.

Additional outreach to surrounding communities occurred through the regular quarterly newsletter that PVPC sends out to its member communities about its recent activities. In these articles, adjacent municipalities were encouraged to reach out to PVPC about hazard mitigation plans by e-mailing or calling staff contacts at PVPC. These notices are included in Appendix B.

No feedback was received from the public, businesses, or neighboring communities during the planning process. Any future input received from the public, as well as any other stakeholders, will be incorporated into the plan during future regular updates.

## **Select Board Meeting**

---

In 2013, the Select Board agreed to begin the process of developing a Hazard Mitigation Plan. Once the plan was provisionally approved by FEMA, the Select Board held a public hearing on the plan and adopted it.

## 2: LOCAL PROFILE

### Community Setting

---

Wilbraham occupies an area of 22.3 square miles in the eastern Connecticut River Valley of Western Massachusetts. The town is a residential suburb of Springfield and is located within the Springfield-Chicopee-Holyoke Standard Metropolitan Statistical Area. Wilbraham is 87 miles southwest of Boston, 30 miles north of Hartford, and 144 miles from New York City.

Wilbraham has convenient access to the regional transportation network. The Massachusetts Turnpike (I-90) traverses the northeastern section of town. Although there is no access to I-90 in Wilbraham itself, there are entrances and exits in nearby Ludlow and Palmer connecting the town to I-91 and I-291, both of which connect to I-90. This access to the regional highway system allows residents to live in a rural setting while enjoying access to the medical services, shopping and institutions of higher education that are located in nearby larger communities. The Five-College Consortium (including the University of Massachusetts at Amherst) is less than 25 miles away via local routes through Ludlow and Granby. Both Worcester and Hartford are less than one hour away for most Wilbraham residents.

Wilbraham lies within two major topographical features that bisect Massachusetts north to south. The first are the Wilbraham Mountains, which are part of the Central Upland of Massachusetts; the second are the Connecticut Valley Lowlands to the west. Notable natural features include the Chicopee River and the escarpment that marks the eastern ridge of the valley.

Wilbraham acquired its southern border and present geographical size and shape in 1878, when the South Parish of Wilbraham became the Town of Hampden. The western border is shared with the Sixteen Acres and Indian Orchard neighborhoods in the City of Springfield, while the eastern part of town abuts Palmer and Monson. The Chicopee River marks the town's northern boundary with Ludlow. At the northernmost border, the Red Bridge hydro-station forms a large impoundment area of enormous recreational value and year-round scenic beauty. It is accessible to the public by way of a boat launch maintained by the Department of Environmental Management (DEM). An established trail exists on the Ludlow side of the impoundment.

### Government

The Town of Wilbraham was incorporated as a town in 1763. The Town is governed by an Open Town Meeting form of government in which any registered voter may participate. Acting as the legislative branch of local government, the Town Meeting enacts bylaws, appropriates the operating budget, and makes other important decisions about the Town's resources and services. An elected three-member Board of Selectmen act as the Town's chief executive officers. A Town Administrator appointed by the Board of Selectmen supervises day-to-day municipal services and activities of Town staff. A variety of appointed volunteer committees are responsible for budget preparation, policy development, town bylaws, and state codes and regulations, and advisor responsibilities.

## **Population Characteristics**

There are currently 14,219 Wilbraham residents in approximately 5,309 households, according to the 2010 US Census. The median family income is \$101,862, with 3.1 percent of residents living in poverty, according to the Census.

## **Development and Land Use**

According to 1999 MacConnell land use data, the total land area of Wilbraham is approximately 14,244 acres (22.3 sq mi). Of this, roughly 39 percent is developed. The remaining land is classified as undeveloped, with forest as the largest category (56 percent) with 7,938 acres (12.4 sq mi). Crop land is the second largest category of undeveloped land with 446 acres (0.7 sq mi) and pastureland is the third largest amount of undeveloped area, with 239 acres (0.4 sq mi).

Significant residential development in Wilbraham began in the early 1900s when bungalows and cottages were laid out around Nine-Mile Pond. More homes were built in the 1920s, leading to the establishment of a municipal fire department about 1920, a town water system in 1926, a zoning bylaw and planning board in 1928, and a police department in 1954. Since the late 1940s, commercial agriculture in Wilbraham has virtually disappeared and housing developments have taken its place.

The explosion of residential growth after World War II did much to transform Wilbraham into a suburban “bedroom” community. As a result, the town’s current tax base is predominately residential. In 1963, Wilbraham performed its first assessment of property values. Based on full and fair market value, the assessments significantly raised the value of what was then called “idle and waste land.” This prompted many owners of open space to sell to the highest bidder rather than pay the new and higher property taxes. (History of Wilbraham, 1964)

Today the town is predominantly residential, with agriculture limited to a few specialized farms. Business and industry are located mainly along Boston Road in the north end of town.

Since the previous version of this Hazard Mitigation Plan was developed, Wilbraham has seen two new subdivisions - Washington Heights, which contains 27 lots adjacent to Seneca Street and Washington Road, and a 5 lot subdivision called North Hills Lane. The Hazard Mitigation Workgroup determined that neither of these new developments are located in areas that are particularly hazard prone (other than the hazards that have been identified in Chapter 3 as affecting the entire town equally). For this reason, development has not affected Wilbraham's overall vulnerability to hazards.

## **Economy**

The majority of Wilbraham’s workforce works at jobs outside the town, traveling an average of 24.9 minutes to work each day. It is also likely that increasing numbers of Wilbraham residents are working out of their homes, whether in their own businesses or for the convenience of their employers. Total employment within the Town of Wilbraham is approximately 3,329 persons, with a per capita income of \$39,372.

## **Zoning and Planning**

By adopting local zoning relatively early and maintaining a long-standing community interest in rational land use planning, Wilbraham has succeeded in maintaining a semi-rural character, which contributes to its desirability as a residential community. Approximately 90 percent of the town is zoned for residential use (Figure 1, Zoning Map). Residents are attracted to the town's convenient location, excellent schools and small-town character. Because of the relatively small amount of commerce and industry within Wilbraham, most working residents commute to jobs outside the town.

Like many suburban towns in the Pioneer Valley, Wilbraham has experienced rapid growth since 1950. With large houses in many subdivisions, Wilbraham is sometimes perceived as an affluent community. In general, the cost of new real estate excludes homebuyers of modest means. As in other desirable suburban communities, young adults who grew up here usually cannot afford to live here once they have left home. Approximately 88 percent of homes in Wilbraham are single-family dwellings, and attempts to encourage different housing types have met with mixed degrees of success.

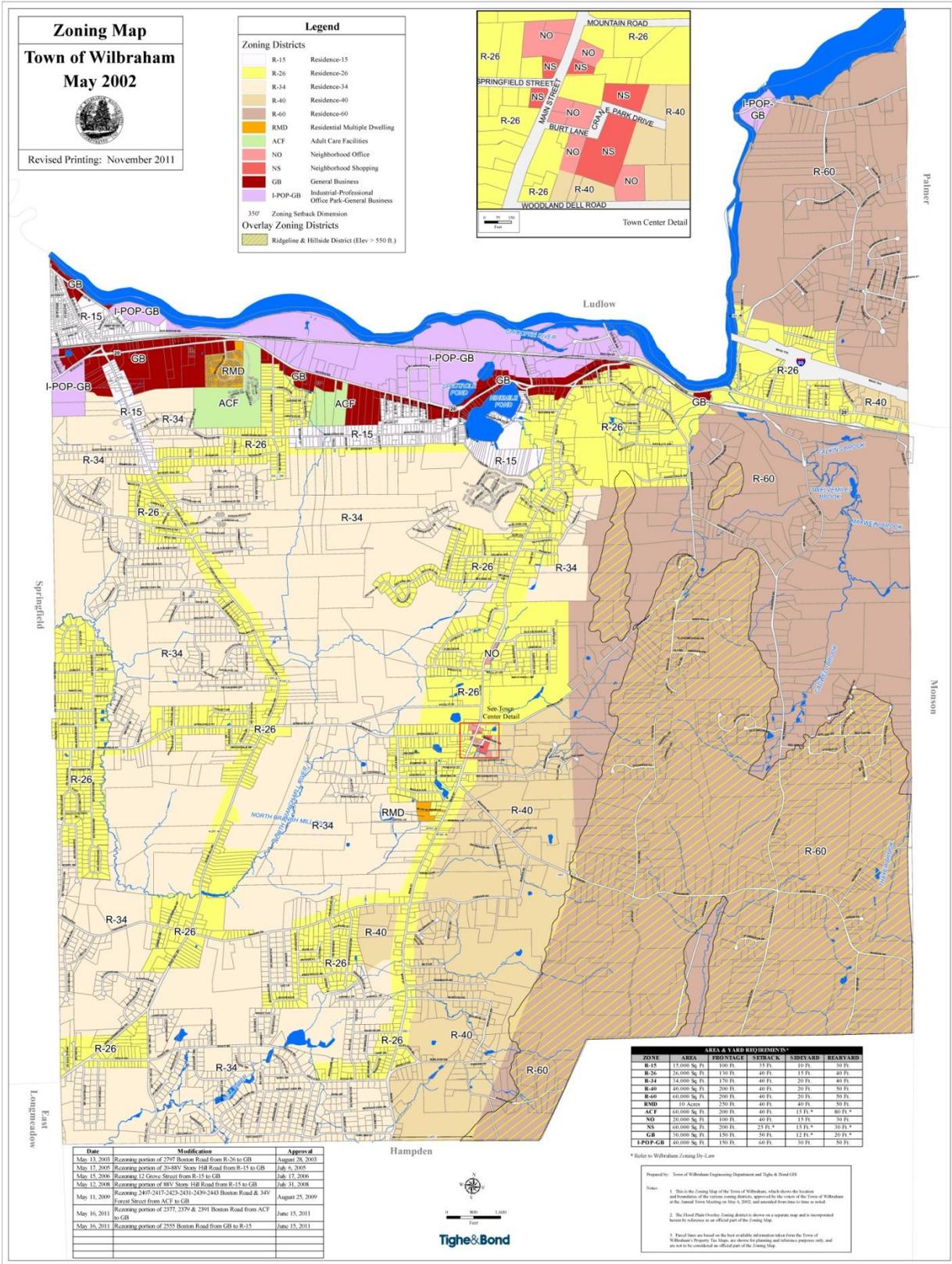
There is little mixed-use development in Wilbraham. There is a small business district in the village center and one farm store operating year round on the southern portion of Main Street. Major commercial growth, however, has occurred in the Boston Road corridor, which is zoned for commercial development. In 1988 Home Depot opened a Wilbraham store on Boston Road that has acted as an economic magnet, attracting additional business development. Additional stores near this location are Big Y, Red Robin, Lumber Liquidators, and Johnny Block Bistro and Grill.

## **Climate**

Wilbraham is located in central Hampden County, where annual rainfall averages 44 inches and is distributed throughout the year. Precipitation is usually adequate for all types of crops in New England; however, brief droughts occasionally occur in sandy soils with lower water capacity. In addition to rain, snowfall averages 40 inches per season. Prevailing winds from the south (and from the north/northwest to a lesser extent) reach their highest average speed during the month of April.

Since 1948, incidents of extreme rainfall events (large amounts of rain in a short period of time) in the U.S. have increased 30 percent. However, New England states have experienced a far greater increase than the national average. In Massachusetts, the increase is 81 percent; upstream on the Connecticut River, New Hampshire is up 115 percent and Vermont is up 84 percent. (Source: Environment America Research & Policy Center, 2012). Extreme rainfall is a cause of flooding, which is a major concern of this plan. In the last five years, there has also been an increased occurrence of tornadoes and large storms that generate strong wind gusts.

**Figure 1: Zoning Map**



## **Neighborhood Characteristics**

---

Wilbraham has many distinct neighborhoods, which are described below.

### ***The Village Center/Academy Historic District***

Wilbraham's village center historic district is the home of Wilbraham & Monson Academy. The school acts as a neighborhood anchor and owns numerous historic buildings and a significant amount of tax-exempt open space. The center is a mix of residences and small businesses. In close proximity are two churches, the Mason's Hall and a satellite fire station. In the center, and further north on Main Street, several old houses have been converted to attractive professional office space. The historic Grange Hall has been sold by the Town and is being converted to private residences.

The view of Crane Park from Main Street includes the old post office building and the town library. A Civil War memorial stands in Crane Park, and the private Woodland Dell Cemetery is located behind the library. The center is served by both the municipal water and sewer systems. Recreation resources within walking distance include Bruuer Pond, Crane Park, Gazebo Park, the Wilbraham Public Library and Wilbraham & Monson Academy. Many residents see the village center as representative of Wilbraham's community character.

### ***The Pines***

One of the early growth centers of town, the northwest section of Wilbraham borders neighborhoods in Ludlow and Springfield's Indian Orchard. This area was settled largely by Polish immigrants who worked across the Chicopee River at the Ludlow Manufacturing Company. (This building still stands and is easily viewed from The Pines). High density and small lots characterize the area, which is served by both town water and sewers. Much of Wilbraham's multifamily housing stock is located here, where some of the old mill housing has been updated.

Important cultural and recreational fixtures of The Pines neighborhood include the Polish American Veteran's Club, senior center, preschool and elderly housing, two neighborhood markets, a small playground and athletic field behind The Pines building, and the all-purpose room/gym at the Wilbraham Community Center.

### ***The "Patch"***

The Patch is a neighborhood of narrow streets in the area of Ripley Street and Hunting Lane. Developed in the 1920s, it was Wilbraham's first modern subdivision, and consists of small to medium sized houses on tree-lined streets. The area is within walking distance of the center, Bruuer Pond and Wilbraham & Monson Academy, and is served by town water and private septic systems.

### ***Manchonis/Brainard Road Area***

This area consists of single-family housing developments in an area defined by Brainard Road, Manchonis Road and Glen Drive. The neighborhood is densely populated and served by municipal sewer service and town water. It is located on the gently sloping hills north of Wilbraham Middle School. A small park on Manchonis Road was recently renovated after years of disuse. Until 1997, non-functional utility poles bisected this open space, known as Brainard Park, preventing its use as an athletic field. It was recently updated to include small playing fields for soccer and T-ball.

### ***The Flats***

This area, primarily in the southwest portion of Wilbraham, was rapidly developed into residential subdivisions during the building boom after 1950. Some residents here are within easy walking distance of the Green Acres farm stores on lower Main Street. Near the corner of Tinkham Road and Main Street, the Merrick family farm sells corn and other vegetables on the traditional honor system.

The Mill River runs through the southwest section, which is served by a combination of private wells and town water. There is no municipal sewer service. Recreation resources include the Sawmill Pond and Pesky Sarpent Conservation Areas, the Wilbraham Children's Museum, several school properties and the State game farm.

### ***Red Bridge Area***

The Red Bridge area of Wilbraham is in the northeast part of town to the north of Boston Road, beyond the "elbow" where the Chicopee River turns to the west. It is named for the nearby Red Bridge dam. Many travelers have associated Wilbraham with the topiary sign maintained by Friendly's Ice Cream on the south side of the Massachusetts Turnpike (which traverses this area just north of Boston Road.)

Marked on historical maps as "The Elbows," the Red Bridge area is a mix of residential subdivisions, forestland and open space. Along with several streets in adjacent Ludlow, an area near the Red Bridge dam is part of the Ludlow Village Historic District. Residents here have identified several important sites for protection, including the wildlife habitat at the impoundment at Red Bridge. The dam, adjacent to the DEM boat launch, produces hydroelectric power. Although the impoundment area offers significant recreation potential, excessive jet ski traffic seems to be disturbing wildlife and restricting passive recreational pursuits such as fishing and canoeing. The Red Bridge area is not served by town water and sewer.

### ***Decorie Drive Area***

The Decorie Drive area is just north of the Memorial School. Developed between 1955 and 1970, it extends from western Main Street to the eastern edge of the White Cedar Swamp. Despite their geographic proximity to Wilbraham Middle School, junior high school students from this neighborhood cannot walk to school because there is no formal road or path. An informal trail network exists nearby in the conservation area and utility corridor, and Main Street sidewalks connect this neighborhood to Memorial School and the town center. The Old Spring Hill Conservation Area is also nearby. The

neighborhood is not served by town sewers but it is connected to town water. To the north the Wilbraham Woods condominium project has added 150 condominium units to the neighborhood.

### ***Boston Road Corridor (State Highway Route 20)***

This corridor contains the majority of Wilbraham's commercial property. There has been a deliberate effort to confine commercial and industrial development to this area, where it is thought to have less impact on the overall rural feeling of the town. (Survey responses clearly indicate that residents favor this approach to protecting community character.) Wilbraham's sand and gravel industry developed between Boston Road and the Chicopee River. Friendly Ice Cream Corporation opened its plant and home offices on Boston Road in 1959, and State Line potato chips were made here for many years until the plant closed down in the early 1990s.

The Boston Road corridor is currently experiencing rapid growth. A Home Depot store opened near the Springfield line in May of 1998, and other long vacant properties are now being developed. In 1994, Wilbraham and Springfield collaborated to develop land use and transportation recommendations in the Boston Road Corridor Study.

Except for a stretch near the Palmer line, there are relatively few single-family residences in this part of Wilbraham, but the Woodcrest Condominiums are a prominent part of the western portion of the corridor, and a major adult care facility is presently being developed directly to the south of Woodcrest. A number of small service businesses, retail establishments and restaurants operate on Boston Road, along with several recreation-based businesses. Recreation resources include the Spec Pond Recreation Area and the beach at Nine-Mile Pond. Town sewers and water serve most of Boston Road.

### ***Mountain Area***

The Mountain Area is located to the east of Main Street with a ridgeline trending north-south between Ridge Road to the west and Glendale Road to the east. The upland area is characterized by steep slopes and stunning views. Residential development in this part of Wilbraham is served by private wells and septic systems which translates into larger minimum lot and frontage requirements. However, subdivisions and frontage lot development on scenic roads have interrupted the rural feeling in some places, and had a dramatic effect on the area's character. On the rolling terrain east of the ridge there are still large tracts of undeveloped land. At one time, several dairy farms operated in this part of Wilbraham, which is the home of many historical sites.

In response to wish of residents to protect the ridgeline—which is prominently visible from many locations in town—from further harm, the 1991 Town Meeting adopted a Ridgeline and Hillside Overlay Zoning District, which regulates all land development in Wilbraham above 550 feet in elevation. Recreation resources include the 12-Mile Brook Conservation Site, the Ridgeline hiking trail, and the Wilbraham Community Garden, which is located on the Thayer Brook Conservation Property.

### ***Maple Street Historic District***

Maple Street intersects Main Street near Boston Road. With its view of the Chicopee River in early Wilbraham, Maple Street was home to mill owners and local businessmen. There are numerous historic structures in the area, including the Grace Union Church and several Victorian houses, one of which houses a nursery school. Some of the houses are listed on the National Register of Historic Places. The old white church at the corner of Maple and Main was recently renovated for professional office space. Wingate at Wilbraham, a long-term care facility, is hidden behind a stand of pines and the Police Station (which was formerly the town hall and originally an old school house). Maple Street runs east into the north end of Mountain Road, which continues along the mountain before it descends to Main Street near the village center.

Just south of Maple Street, St. Cecilia's recently added a new church complex that connects the older structure to the new, creating a focal point along northern Main Street. The inside of the former church has been renovated for use as a social center and small gymnasium. The Maple Street neighborhood is served by town sewer and water. Nearby recreation resources include Spec Pond, Nine-Mile Pond, and the Chicopee River.

## **Infrastructure**

---

### **Roads and Highways**

There are approximately 115 miles of functionally classified roads in Wilbraham. The road network includes 1.1 miles of interstate highway (I-90 Massachusetts Turnpike) under the jurisdiction of the Massachusetts Department of Transportation, 5.1 miles of principal arterial (State Route 20, Boston Road) under the jurisdiction of Mass Highway Department, 92 miles of local roads maintained by the Wilbraham Highway Department and 13.4 miles of unimproved, private roads. Like many suburban communities, Wilbraham's transportation infrastructure reflects a sprawling, auto-oriented land development pattern. Not unexpectedly, Wilbraham residents are experiencing greater traffic congestion, increased vehicle miles traveled, longer commuting travel times, and higher single occupancy rates, while carpooling frequency is declining.

Auto-oriented sprawl development tends not to be particularly bicycle or pedestrian friendly. Improving and expanding the sidewalk infrastructure remains a top priority of concern and the Town has been exploring innovative ways to address this need in light of current budgetary constraints. The Planning Board has established a sidewalk gift fund account exclusively dedicated to improving existing public sidewalks and constructing new public sidewalks in Wilbraham. Generous developers and residents have already pledged donations totaling almost 100,000 dollars into the sidewalk fund to specifically address this issue. The Planning Board and the Department of Public Works are developing a sidewalk improvement plan and sidewalk improvements funded through the Sidewalk Gift have been performed by Wilbraham Department of Public Works employees or put out to bid and performed by private contractors. A major state-funded road improvement on Springfield and Faculty Streets completed in 2003 includes sidewalks around the inner "loop" of these busy roadways near the center of town. This has proved to be a very popular circuit for many walkers.

At the present time, the town does not have any formal bikeways, although plans have been formulated to install a bike trail as part of improvements to the Spec Pond Recreation Area. It is hoped that this trail might link in the future to a bike trail along the banks of the Chicopee River.

## **Rail**

A rail line runs through Wilbraham along Route 20.

## **Public Transportation**

Public transportation options in Wilbraham are limited to a single fixed bus route with a limited service schedule—Pioneer Valley Transit Authority’s (PVTA) Red 27 Route. While actual figures for Wilbraham patronage are not available for this route, frequent users of the service report that it is grossly underutilized. In addition to fixed route service, the PVTA offers on-demand paratransit service throughout the community for specific population groups. Paratransit service includes special van ADA transportation as well as dial-a-ride service for the elderly and disabled.

## **Schools**

Public schools serving Wilbraham include Soule Road School, Stony Hill School, Mile Tree Elementary, The Kids Place, Inc., Wilbraham Middle School, Wilbraham and Monson Academy and Minnechaug Regional High School. A new high school is currently being constructed next to the existing school, with the existing school scheduled for demolition.

## **Water Infrastructure**

About two-thirds of Wilbraham residents receive their drinking water from the town water supply, which comes from the Quabbin Reservoir via the Chicopee Valley Aqueduct (CVA) under a long-term contract with the Massachusetts Water Resources Authority (MWRA). The remaining third is supplied by private wells. The area of the community served by the public water supply system is shown on Figure 2.

Wilbraham used approximately 440 million gallons in 2012, or 1.205 million gallons per day. Town-supplied water has consistently earned high marks in the Commonwealth’s Public Water System Award Program. The Wilbraham Water Department’s Corrosion Control Program (CCP), which began in 1997 as mandated by state and federal guidelines, eliminates excessive amounts of lead and copper in the water by controlling its corrosiveness. The Corrosion Control Facility on Miller Street in Ludlow, which injects sodium silicate into the water, continues to operate successfully. Regular maintenance duties by the MWRA recently have included cleaning and exercising of water main valves, replacement of fire hydrants, and inspection of the Corrosion Control Facility and water booster stations.

## **Wastewater**

The Wastewater Division maintains eight pumping stations and 24 miles of sewer main, which service approximately 1,000 customers. The duties performed by staff are the cleaning of main sewer lines, replacing and repairing electrical pumps, adding lift station chemicals, reading meters, building maintenance, responding to sewer breaks, as well as blockage. The Wilbraham Wastewater Department is operated as an enterprise fund servicing approximately 33 percent of the town. The area of the community served by the public wastewater treatment system is shown on Figure 3. There are a total of eight pumping stations that direct wastewater to the main River Road Pump Station. At the River Road Pump Station the flows are monitored as well as sampled for Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS). Wastewater is pumped from the River Road Pump Station to the City of Springfield's gravity system for eventual treatment at the Springfield Regional Wastewater Treatment Facility (SRWTF) operated by the City of Springfield on Bondi's Island in Agawam.

In the Boston Road area—which is already built up and experiencing development infill—sewer expansion should not have any immediate effect on open space goals. The existing sewer system has been expanded in the last 5 years, south along Main Street from the current terminus at Memorial School to serve the Wilbraham Monson Academy, the Village Business District and the Minnechaug Regional High School.

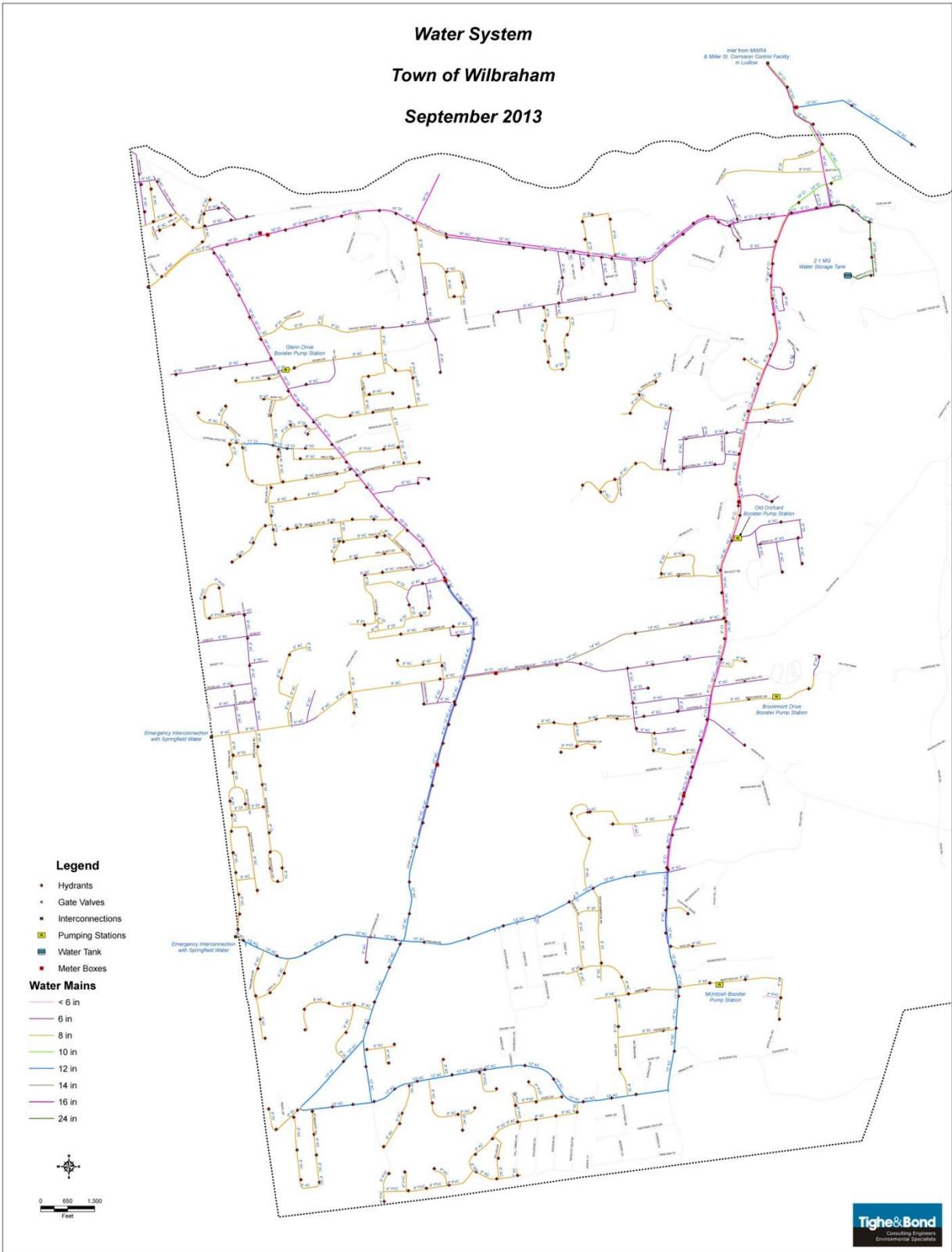
Private soil absorption (septic) systems serve about 70 percent of the town's homes and businesses. For the most part, private soil absorption systems in Wilbraham discharge to soils that developed on parent materials deposited by glacial activity. Such parent materials may have limitation for use as soil absorption facilities. Coarse and extremely permeable sand and gravel deposits underlie the valley areas. The higher elevations east of Main Street are underlain by dense, stony glacial till. The low northeast to southwest trending hill, from the Old Boston Road dry bridge in the north to the golf course clubhouse in the south, is also underlain by glacial till deposits.

To overcome the limitations of poor soil conditions, advanced and/or alternative systems designs are often necessary. Many homeowners have installed costly replacements to bring their old systems up to current septic system regulations (310 CMR 15.00), which are collectively and commonly known as "Title 5."

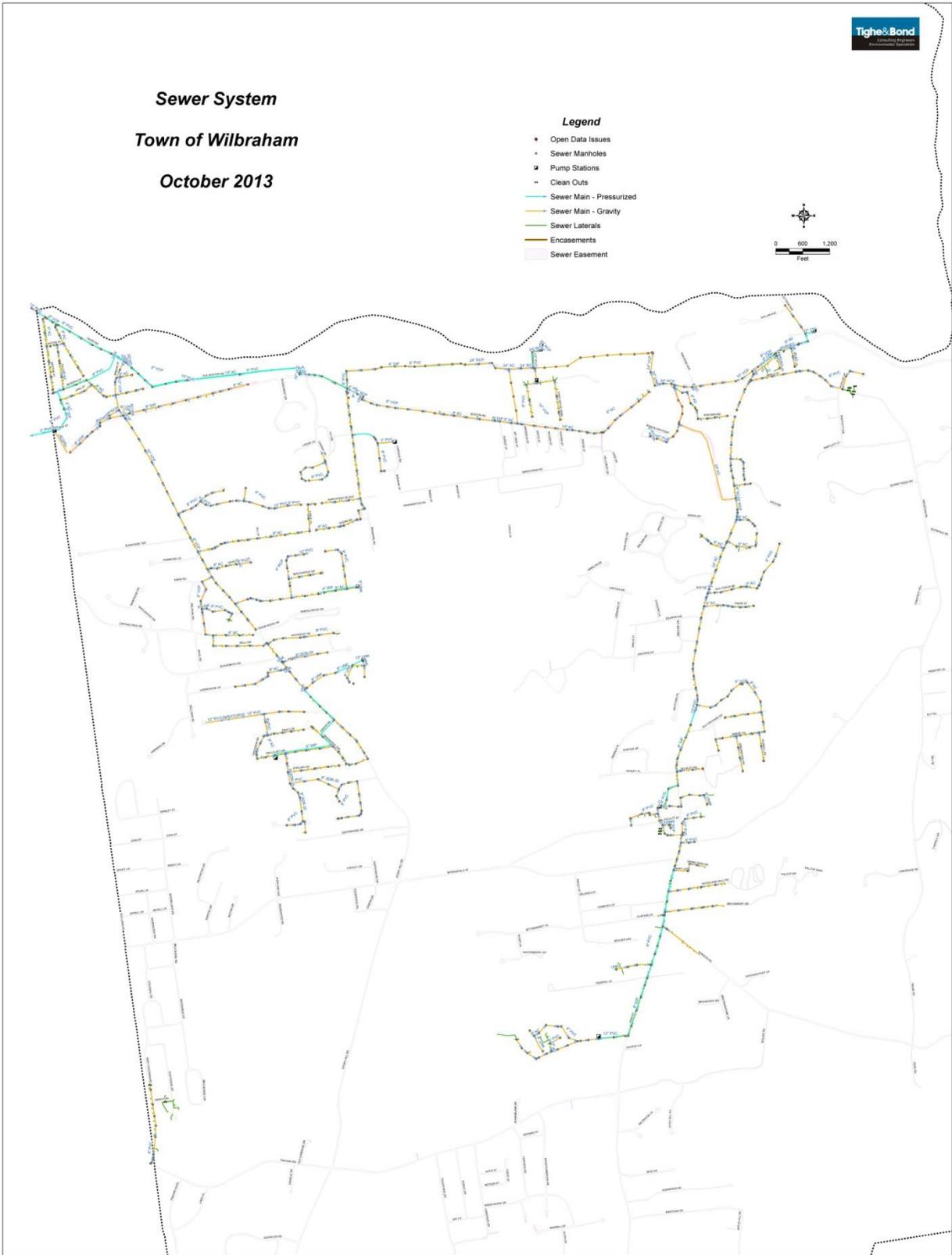
## **Solid Waste**

The Wilbraham town landfill was closed and capped in 1995. The transfer station and recycling center continue to operate, and residents pay "by-the-bag" for trash disposal.

Figure 2: Wilbraham Water System



**Figure 3: Wilbraham Public Wastewater**



## **Natural Resources**

---

Wilbraham shares several major natural resources with surrounding communities. A portion of the Mill River Watershed lies within its boundaries, and the town is represented in a watershed protection partnership established with East Longmeadow, Hampden and Springfield.

The southern end of the mountain ridge extends into Hampden, where rural roads continue their street names across the town line. The Ridge Trail—part of the longer Shenipsit Trail—runs from North Wilbraham to Hampden, where it continues into Connecticut. Contiguous utility corridors may provide other greenway linking opportunities for the town.

The following in the Natural Resources section include excerpts from the Wilbraham Open Space and Recreation Plan.

### **Watersheds**

Wilbraham lies within two major watersheds. The northernmost section of town lies in the Chicopee Watershed, while the majority of town is downstream in the Lower Connecticut Watershed. Both are considered to be highly vulnerable to quality problems.

The Mill River Watershed is a sub-basin of the Connecticut River Watershed which encompasses 31.8 square miles within the communities of Springfield, Wilbraham, East Longmeadow and Hampden. The Mill River Watershed region is unique due to its mixed urban and forested contexts. Originating in the hills of Wilbraham, a significant portion of the Mill River Watershed is located in Wilbraham including the headwaters of the primary tributaries of the Mill River, the North and South Branches. The Mill River Watershed has been designated as an area of critical environmental concern by the Wilbraham Conservation Commission and the Mill River Watch Program is tracking several testing sites in town.

### **Rivers and Streams**

The Chicopee River, North Branch Mill River, South Branch Mill River, and Twelve-Mile Brook are the major flowing water resources in the town of Wilbraham. The Chicopee River is primarily an undeveloped, riparian corridor in Wilbraham and much of the bank is not accessible to the public. The Wilbraham stretch of the Chicopee River is impounded by three dams – Red Bridge, Cottage Street and Putts Bridge, listed in order of travel downstream from east to west. The upper reach of the Chicopee River in Wilbraham may be accessed upstream of the Red Bridge impoundment at the Red Bridge Landing a boat launch facility owned and operated by the Massachusetts Department of Environmental Management. The middle reach of the Chicopee River may be accessed downstream of the Red Bridge impoundment on property owned and operated by the Massachusetts Department of Environmental Management and at a boat launch located at the rear of the City Tire property at 2380 Boston Road. The lower reach of the Chicopee River may be accessed from River Road in the northwest section of town upstream of the Putts Bridge Dam. All of these sites are thought to be underutilized by Wilbraham residents. A popular access point to the middle reach located on Boston Road near the intersection with Maynard Road has been blocked off by Mass Highway in response to complaints by the abutting landowner about littering. A new recreation access site for the same stretch of river is planned for the

John & Blanche Fernbank Conservation Area riverfront property located off of King Drive which is being developed by the Town of Wilbraham.

Access to the Mill River and its branches is more limited because it is surrounded by wetlands. Twelve-Mile Brook—an important tributary to the Chicopee River—flows through seventy-five acres of conservation property.

## **Lakes and Ponds**

Wilbraham has two major pond systems. Spectacle Pond and Nine-Mile Pond (once known as Manchonis Pond) are kettle hole ponds. Spec Pond has been operated as a recreation facility since 1959, when it first opened under the management of the local Lion's Club. The pond was named after the bird's eye view of Spec and Nine-Mile ponds, in which they resemble a pair of eyeglasses. Houses of varying style surround Nine-Mile Pond. It is accessible to the public only at a very small public beach from the state highway where Nokomis Road intersects Boston Road.

Other ponds of interest include those in and around the grounds at Wilbraham & Monson Academy, as well as the Sawmill and Bennett Ponds near Soule Road. Although it is dry at certain times of the year, the Bruuer Pond area stores groundwater and provides habitat for a variety of wildlife. Located on Main Street near the center, the Bruuer Pond is a pleasant rest area for cyclists and walkers.

The Recreation Department is aware of the hazards of large numbers of waterfowl near any swimming area. Although other ponds in the region have been closed when their coliform levels exceeded allowable limits, Spec Pond has remained clean. It is tested regularly throughout the summer beach season, and the Recreation Department continues to monitor the waterfowl population.

Spec Pond was tested during the "Great American Secchi Dip" of 1998. Secchi depth is a good indicator of clarity and nutrient enrichment of a waterbody. As reported by the Massachusetts Water Watch Partnership, Spectacle Pond scores were among the highest in the state and well above safe swimming standards.

## **Forest Land**

There are several distinct forest types in Wilbraham, but almost the entire town exhibits second growth forest in various stages of succession. It is said that Native Americans often burned sections of forest to facilitate their hunting, and much of the land area was cleared for pasture or crops in the early to mid-nineteenth century.

Wilbraham is mostly forested, which provides opportunities for recreation, wildlife habitat, the benefits of climate moderation, and the protection of water quality. The forest and intermixed agricultural land also provide a visually pleasant landscape for residents and visitors too. The town's forests are mainly closed-canopied and middle-aged, having a great diversity of species, but no diversity of horizontal or vertical structural. Interestingly, the town is 56 percent forested.

Blocks of contiguous forestland such as those that exist in sections of Wilbraham are important resources for several reasons. First they represent an area with a low degree of fragmentation. Wildlife

species that require a certain amount of deep forest cover separate from people's daily activities tend to migrate out of fragmenting landscapes. New frontage lots and subdivisions can often result in a widening of human activity, an increase in the populations of plants and animals that thrive alongside humans (i.e. raccoons and squirrels) and a reduction in the species that have larger home ranges and unique habitat needs. Large blocks of forest provide clean water, air, and healthy wildlife populations.

## **Geology and Topography**

The Connecticut River Valley was formed some 200 million years ago during the Paleozoic Era. During that time in the area of present-day Wilbraham, the land situated along the east side of Main Street was uplifted abruptly, forming the ridge that seen today. This uplift was the result of movement along a major fault known as the Triassic/Jurassic Border Fault, which forms the eastern edge of the valley and can be traced from Long Island Sound to New Hampshire.

The Wilbraham Mountains are underlain by dense crystalline metamorphic and igneous rocks that are believed to have been formed during the Ordovician and Devonian Periods of the Paleozoic Era some 400 to 500 million years ago. Bedrock underlying this region is comprised of mica schists inter-layered with granite gneiss, and amphibolites. Bedrock can be seen at the surface in areas of steeply sloping terrain or along the edges of town roads, such as Mountain Road or Monson Road, that traverse the ridge.

The present height of the Wilbraham Mountains represents only a very small fraction of their original elevation. Today we see the worn down roots of mountains that are believed to have been as high and rugged as the present day Rocky Mountains. Since their formation 200 million years ago, the original mountains have undergone erosion, filling the initially formed valley lowland with layer upon layer of sediment. Sand and silt washed down from the mountain area were deposited across the valley floor where they eventually turned from sediment to rock.

Throughout the valley portion of Wilbraham, extensive organic muck swamp deposits can be found. Their location is restricted mainly to the flood plains and wetland areas of the North and South Branches of the Mill River. The actual width of these deposits is typically 100-200 feet on either side of the Mill River branches (it is as much as 500 feet wide in some places.) These deposits are located at elevations near or below 250 feet above sea level, in the lowest and more poorly drained areas of town. Here, wetland areas serve as the collectors for surface drainage flowing off the ridge. Groundwater in these areas is at or within the root zone of the land surface.

These wetland areas provide important disaster mitigation benefits because during floods they like large sponges that slow, absorb, and filter storm waters. Wetlands also recharge aquifers, from which drinking water is drawn, and provide important wildlife habitat.

## **Soils**

Wilbraham soils began forming with the end of the ice age in New England. Because weathering, leaching and accumulation of organic material in the soil profiles has occurred only over the last 14,000 years, the soils found in some areas of Wilbraham are very recent and thus of relatively poor quality for

plant growth. They are also very acidic. Soil profiles in other areas generally include a dark brown A (or Ap) topsoil horizon, underlain by a light brown or yellowish-brown weather Bw horizon subsoil. Beneath the subsoil a C-horizon exists, which is the unweathered parent material on which the soil developed. The parent material consists of unconsolidated glacial till; or sand and gravel kame, delta and outwash deposit.

## Topography

Much of the rural beauty of Wilbraham results from the meeting of the town’s lowlands and the prominent ridge of the Wilbraham Mountains. This north-south trending ridge provides outstanding views from below, and across the Connecticut Valley from above. Individual peaks—such as Rattlesnake Peak, Wigwam Hill, Mount Chapin, Mount Marcy, and Sunset Ridge—rise steeply along the eastern side of Main Street to form the eastern edge of the Connecticut River Valley. Topographic elevations along the ridge range from 640-940 feet above sea level, roughly 650 feet higher than the western valley floor, where elevations range between 230-350 feet above sea level. On a clear summer day, the Holyoke Range and the Berkshire Highlands are easily viewed in a 180-degree western panorama from various vantage points along local roads.

Forest Types in Wilbraham			
Association	Typical Canopy	Typical Understory	Typical Litter Layer
Upland Deciduous Forest	Red/white oak; gray/paper/ black birch; beech, cherry, hickory	Mountain laurel, flowering dogwood	Ground pine, spotted wintergreen, snowberry, wintergreen, lady slipper
Upland Evergreen Forest	White/red/pitch pine, eastern hemlock	Evergreen saplings, ferns	Spotted wintergreen, needles
Upland Deciduous Evergreen Forest	White/black/red oak, hickory, black birch, sugar maple, cherry, White/red/pitch pine.		
Deciduous Forested Wetland	Swamp white oak; red maple; white, pin/red/black oak; hemlock; gray/yellow birch; Weeping willow, hickory, butternut.	Highbush blueberry, speckle alder, common privet, viburnum, swamp azalea, button bush, swamp loosestrife, poison sumac	Pink lady slipper, trailing arbutis, marsh marigold, skunk cabbage, jack-in-the-pulpit, purple aster, cattails, reed grass.
Evergreen Forested Wetland	Southern white cedar, larch, white pine, black spruce, hemlock, red maple	Swamp azalea, highbush blueberry, sweetgale, wild raisin, speckled alder	Common cattail, sphagnum, pitcher plant, violets, sensitive fern, tussock sedge, cranberry

## **Beaver Dams**

Beaver activity has been increasing over the past decade. Several wetland areas have been flooded by beaver dam construction. As a result, their vegetation has changed from forested wetland to marshy habitat. Sometimes beaver activity is detrimental to property, causing problems for local land owners (e.g., flooding of wells, septic systems, lawns, out-buildings, and roadways). Affected individuals must contact the Board of Health and Conservation Commission for advice and permission to alleviate the beaver problem.

## **White Cedar Swamp**

In 1969 the Town of Wilbraham purchased with Self-Help Funding 175 acres of land located east from the Wilbraham Middle School, west from Main Street, and surrounded on three sides by the Decorie Drive residential area. The Decorie Drive residential area was largely built in the late 1950s on an upland peninsula that juts into the center of the property from the east. Known as the White Cedar Swamp Conservation Area, this purchase included a major central area of the swamp and abutting upland areas on the west. Remaining portions of a much larger wetland system extend outside of this parcel northerly toward Nine Mile Pond and toward and beyond Faculty Street in the south. For the most part the swamp surface elevations are below 250 ft above sea level. Standing water in the swamp flows southerly forming the source of the North Branch of the Mill River, and to a lesser extent northerly into Nine Mile Pond. The standing water in the swamp is fed from higher terrain along the Wilbraham Mountains located east of Main Street. Much of the standing water in the swamp represents the local ground water surface in this area of the town.

## **Aquifers**

The town's groundwater supply is produced mainly from aquifers associated with three major drainages: the Chicopee River, Cedar Swamp and the North Branch of the Mill River, Twelve Mile Brook and its tributaries. These basins cover about one-half of the town's land area and have the best potential for producing public water supplies in the future. In 1980, the town of Wilbraham recognized the importance of these drainages by establishing them protection districts within town. The Town's zoning bylaw was amended to limit development in significant areas.

## **Floodways**

Floodways include the watercourses (rivers and streams) and adjacent relatively low-lying areas subject to periodic flooding (the 100-year flood zone and 500-year flood zone). These adjoining lands are flood hazard zones and they vary in their predicted flood frequency. The 100-year flood zone has a one in 100 statistical probability (or one percent chance) of being flooded in a single year or is predicted to be flooded one year out of a 100-year period; while the 500-year flood zone is based on a 500-year period. Most of the floodways in Wilbraham are narrow because the town's hilly topography and rocky terrain do not permit the formation of broad floodplains. Wilbraham's floodways are corridors that pass flowing water downstream, eventually into the Chicopee River.

The following areas have been designated as floodways in Wilbraham:

- (1) Chicopee River;
- (2) North Branch Mill River;
- (3) South Branch Mill River;
- (4) Areas around Nine Mile Pond.

### **National Flood Insurance Program (NFIP)**

The National Flood Insurance Program has produced maps that identify floodways across America. Wilbraham is a participating member of the National Flood Insurance Program, and had the following NFIP policy and claim statistics as of October of 2013:

- Flood Insurance Maps (FIRMs) are used for flood insurance purposes and are on file with the Wilbraham Planning Board.
- FIRMs have been effective since May 17, 1974 with the current map in effect since July 16, 2013.
- Wilbraham has 46 in-force policies in effect for a total of \$11,400,100 worth of insurance.
- There have been a total of 18 NFIP claims for which \$469,761 has been paid.
- As of 2013, there has been one Repetitive Loss Property in Wilbraham. The property is classified as residential.
- The Town will maintain compliance with the NFIP throughout the next 5-year Hazard Mitigation Planning cycle by monitoring its Flood Plain Overlay District and ensuring that the district accurately reflects the 100-year flood plain and FEMA Flood Insurance Rate Map (FIRM).

## 3: HAZARD IDENTIFICATION & RISK ASSESSMENT

The following section includes a summary of disasters that have affected or could affect Wilbraham. Historical research, conversations with local officials and emergency management personnel, available hazard mapping and other weather-related databases were used to develop this list. Identified hazards are the following:

- Floods
- Severe snowstorms / ice storms
- Hurricanes
- Severe thunderstorms / wind / tornadoes
- Wildfires / brushfires
- Earthquakes
- Dam failure
- Drought

### **Natural Hazard Analysis Methodology**

---

This chapter examines the hazards in the Massachusetts State Hazard Mitigation Plan which are identified as likely to affect Wilbraham. The analysis is organized into the following sections: Hazard Description, Location, Extent, Previous Occurrences, Probability of Future Events, Impact, and Vulnerability. A description of each of these analysis categories is provided below.

#### **Hazard Description**

The natural hazards identified for Wilbraham are: floods, severe snowstorms/ice storms, hurricanes, severe thunderstorms / wind / tornadoes, wildfire/brushfire, earthquakes, dam failure, and drought. Many of these hazards result in similar impacts to a community. For example, hurricanes, tornadoes and severe snowstorms may cause wind-related damage.

#### **Location**

Location refers to the geographic areas within the planning area that are affected by the hazard. Some hazards affect the entire planning area universally, while others apply to a specific portion, such as a floodplain or area that is susceptible to wild fires. Classifications are based on the area that would potentially be affected by the hazard, on the following scale:

Location of Occurrence, Percentage of Town Impacted by Given Natural Hazard	
Location of Occurrence	Percentage of Town Impacted
Large	More than 50% of the town affected
Medium	10 to 50% of the town affected
Small	Less than 10% of the town affected

### Extent

Extent describes the strength or magnitude of a hazard. Where appropriate, extent is described using an established scientific scale or measurement system. Other descriptions of extent include water depth, wind speed, and duration.

### Previous Occurrences

Previous hazard events that have occurred are described. Depending on the nature of the hazard, events listed may have occurred on a local, state-wide, or regional level.

### Probability of Future Events

The likelihood of a future event for each natural hazard was classified according to the following scale:

Frequency of Occurrence and Annual Probability of Given Natural Hazard	
Frequency of Occurrence	Probability of Future Events
Very High	70-100% probability in the next year
High	40-70% probability in the next year
Moderate	10-40% probability in the next year
Low	1-10% probability in the next year
Very Low	Less than 1% probability in the next year

## Impact

Impact refers to the effect that a hazard may have on the people and property in the community, based on the assessment of extent described above. Impacts are classified according to the following scale:

Extent of Impacts, Magnitude of Multiple Impacts of Given Natural Hazard	
Extent of Impacts	Magnitude of Multiple Impacts
Catastrophic	Multiple deaths and injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of facilities for 30 days or more.
Critical	Multiple injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 week.
Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 day.
Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of facilities.

## Vulnerability

Based on the above metrics, a hazard index rating was determined for each hazard. The hazard index ratings are based on a scale of 1 through 5 as follows:

- 1 – Highest risk
- 2 – High risk
- 3 – Medium risk
- 4 – Low risk
- 5 – Lowest risk

The ranking is qualitative and is based, in part, on local knowledge of past experiences with each type of hazard. The size and impacts of a natural hazard can be unpredictable. However; many of the mitigation strategies currently in place and many of those proposed for implementation can be applied to the expected natural hazards, regardless of their unpredictability.

### Hazard Identification and Analysis Worksheet for Wilbraham

Type of Hazard	Location of Occurrence	Probability of Future Events	Impact	Vulnerability
Floods	Large	Moderate	Limited/Critical	1 – Highest risk
Severe snowstorms / Ice storms	Large	High	Limited	2 – High risk
Hurricanes	Large	Low	Limited	4 – Low risk
Severe thunderstorms / wind / tornadoes	Large	Moderate	Limited	2 – High risk
Wildfires / brushfires	Medium	Low	Minor	3 – Medium risk
Earthquakes	Large	Low	Limited	4 – Low risk
Dam failures	Medium	Very Low	Minor	5 – Lowest risk
Drought	Large	Low	Minor	4 – Low risk

Source: Adapted from FEMA Local Hazard Mitigation Planning Handbook (March 2013) Worksheet 5.1; Town of Holden Beach North Carolina Community-Based Hazard Mitigation Plan, July 15, 2003 and the Massachusetts Emergency Management Agency (MEMA).

## Floods

---

### Hazard Description

There are three major types of storms that can generate flooding in Wilbraham:

- Continental storms are typically low-pressure systems that can be either slow or fast moving. These storms originate from the west and occur throughout the year.
- Coastal storms, also known as nor'easters, usually occur in late summer or early fall and originate from the south. The most severe coastal storms, hurricanes, occasionally reach Massachusetts and generate very large amounts of rainfall.
- Thunderstorms form on warm, humid summer days and cause locally significant rainfall, usually over the course of several hours. These storms can form quickly and are more difficult to predict than continental and coastal storms.

A floodplain is the relatively flat, lowland area adjacent to a river, lake or stream. Floodplains serve an important function, acting like large "sponges" to absorb and slowly release floodwaters back to surface waters and groundwater. Over time, sediments that are deposited in floodplains develop into fertile, productive farmland like that found in the Connecticut River valley. In the past, floodplain areas were also often seen as prime locations for development. Industries were located on the banks of rivers for access to hydropower. Residential and commercial development occurred in floodplains because of their scenic qualities and proximity to the water. Although periodic flooding of a floodplain area is a natural occurrence, past and current development and alteration of these areas will result in flooding that is a costly and frequent hazard.

Floods can be classified as one of two types: flash floods and general floods.

- **Flash floods** are the product of heavy, localized precipitation in a short time period over a given location. Flash flooding events typically occur within minutes or hours after a period of heavy precipitation, after a dam or levee failure, or from a sudden release of water from an ice jam. Most often, flash flooding is the result of a slow-moving thunderstorm or the heavy rains from a hurricane. In rural areas, flash flooding often occurs when small streams spill over their banks. However, in urbanized areas, flash flooding is often the result of clogged storm drains (leaves and other debris) and the higher amount of impervious surface area (roadways, parking lots, roof tops).
- **General floods** may last for several days or weeks and are caused by precipitation over a longer time period in a particular river basin. Excessive precipitation within a watershed of a stream or river can result in flooding particularly when development in the floodplain has obstructed the natural flow of the water and/or decreased the natural ability of the groundcover to absorb and retain surface water runoff (e.g., the loss of wetlands and the higher amounts of impervious surface area in urban areas).

## Location

The percentage of the Town impacted by flooding is estimated to be “high,” or more than 50 percent. Wilbraham has four major waterways that have been designated as being prone to flooding. These are the Chicopee River, the North Branch of the Mill River, the South Branch of the Mill River, and the area around Nine Mile Pond. Based on the Town's Flood Insurance Rate Maps, there are approximately 770 acres of land within the FEMA mapped 100-year floodplain and 1,138 acres of land within the 500-year floodplain within the Town of Wilbraham.

In addition, the Wilbraham Hazard Mitigation Workgroup identified the following locations as parts of town that have had issues with localized flooding. All of these locations were previously identified as locations of localized flooding in the previous version of this plan and as shown in Chapter 6, several mitigation strategies have been identified to reduce these issues. The Hazard Mitigation Workgroup did not find that there are not any new locations for flooding since the last version of this plan was created 5 years ago.

### Main Street – Woodland Dell to Hunting Lane

This section of town contains residential uses, commercial uses, the Town Fire Station and a day care facility, all of which are subject to recurring flooding. The Town is applying for a FEMA Hazard Mitigation Planning Grant to mitigate flooding at this location. Culverts are not designed to handle additional runoff at this section of town. Portions of Main Street are in the 100-year floodplain. Regular flooding causes a health hazard. Pipes reach capacity and are not capable of handling volume of water generated from recent storms.

### Soule Road / Sawmill Pond-Mill River

This section of town has a culvert that blocks frequently. Damage to Soule Road occurs when floodwaters are high and adjacent properties are damaged. Additionally septic system damage is a potential issue.

### Boston Road at Twelve Mile Brook

This section of town contains commercial and residential properties. When flooding occurs, two undersized culverts at the Knox Trail Landmark cannot handle the volume of water traveling through them. This results in blockages to Route 20, damage to the road infrastructure and damage to property.

### Eight Hundred Feet west of Maynard Road

Spear Brook floods this section of town, damaging the road itself. The gas line that runs under this section of town and Route 20 are also potentially affected.

### Mountain Road / north of Sunset Rock

This is an agricultural and residential area, where development in the larger Sawmill Brook watershed has reduced the amount of storage available for high-volume rain events. This sends large quantities of water into a streambed that is too fragile to handle the resulting storm surge, resulting in erosion and washouts. In a period of 12 years, four wash outs have occurred in this area because existing culverts are not large enough to handle the flow of water.

### McIntosh Brook Tributary

This is a residential neighborhood, and development has reduced natural flood storage during high-rain events. For this reason, the brook walls have eroded and a gully has developed. Stream bank stabilization, water storage features, such as natural wetlands and retention ponds, and expanded culverts could prevent water backup. Existing culverts become highly sedimented in high-rain events, resulting in blockage.

### Crane Hill/Silver Street

In 1955, three houses were destroyed when Twelve Mile Brook flooded.

### Federal Lane

Two houses have been damaged as a result of flood waters in this section of town. This occurred in 2006.

### Bruer Road and Bruer Pond

Sedimentation has resulted in a pond that is less able to store flood waters during peak rain fall events. This results in flooding of surrounding areas, and can be mitigated through the targeted dredging of this water body.

### Boston Road / Brainard Road

This is a steep road in an area that experiences heavy drainage after storms. This results in fast-moving water that quickly overruns drainage facilities and causes washouts along this section of Boston Road.

### Stony Hill Road / Rail Road under pass

This section of Stony Hill Road, located in the northern section of Wilbraham, is a low-lying spot that dips below a 19<sup>th</sup> Century Rail Road line. Frequent flooding occurs on an annual basis, limiting the response time of emergency service personnel and isolating sections of Wilbraham.

### Brookmont

An inadequate culvert in this section of town results in frequent blockages and inadequate flow capacity. A proposed culvert and water diversion project are proposed, but this will redirect water to sections of town that are downstream. For this reason, the Town is seeking to design a project that addresses the demands of the town's topography, most specifically the precipitous decline in less than a mile from 800 feet to 140 feet. Erosion from the rain has undermined the culvert.

### Woodland Dell

492 Main Street floods every year. This is an historic property that was constructed in the floodplain. In past years, the entire basement of this structure was flooded, knocking out the house's heating system and causing thousands of dollars worth of damage. Mitigation could occur at this site in a manner that removes this structure from the path of floodwaters.

### Stony Hill Road / YMCA Camp

The access road to the YMCA camp gets blocked during heavy rainfall on a regular basis.

### Crane Park

Commercial Buildings and town buildings are located in this area, and flooding places these structures at risk.

### **Extent**

The average annual precipitation for Wilbraham and surrounding areas in western Massachusetts is 46 inches.

Water levels in Wilbraham's rivers, streams, and wetlands rise and fall seasonally and during high rainfall events. High water levels are typical in spring, due to snowmelt and ground thaw. This is the period when flood hazards are normally expected. Low water levels occur in summer due to high evaporation and plant uptake (transpiration). At any time, heavy rainfall may create conditions that raise water levels in rivers and streams above bank full stage, which then overflow adjacent lands.

The following are the historical flooding crests, or highest recorded water levels, for the Chicopee River at the National Weather Service's Flood Gauge in Ludlow, MA. The River's major flood stage is 18 feet, a height which it has reached 2 times in Ludlow since 1936. The River's moderate flood stage is 16 feet, a height which it has reached 3 times in Ludlow since 1936. The River's minor flood stage is 12 feet, a height which it has reached 3 times in Ludlow since 1936. The River's action stage is 11 feet, a height which has been reached 6 times in Ludlow since 1936. The impact for these different flood stages can be found in the "impact" section.

#### **Historical Crests for the Chicopee River in Wilbraham**

9/21/1938	23.43	Major
8/19/1955	22.14	Major
3/19/1936	16.2	Moderate
5/31/1984	13.96	Minor
10/15/2005	12.92	Minor
3/7/1979	12.2	Minor
4/17/1996	10.74	None
3/9/1995	7.66	None

Source: National Weather Service,  
<http://water.weather.gov/ahps2/hydrograph.php?wfo=box&gage=INDM3>

In addition to this data for the Chicopee River, the Hazard Mitigation Workgroup indicated that all locations of localized flooding can receive high water marks of up to several feet during sufficiently large rainstorms.

## Previous Occurrences

The Hazard Mitigation Workgroup identified the locations listed under the “location” section as where previous occurrences of localized flash flooding have occurred. The one major general flood that has occurred historically in Wilbraham was the 1955 Twelve Mile Brook flood, when the Crane Hill neighborhood was flooded out. While no specific dollar figures are available for the damage, several homes were destroyed, the culvert system in the area failed, and the railroad track that runs through the neighborhood was severely damaged. There have not been any other major general floods in Wilbraham since this time.

## Probability of Future Events

Based upon previous data, it seems likely that there is a “moderate” chance of flooding, with a 10 to 40 percent probability in the next year. This is partly a function of the presence of the steep topography on the eastern side of Wilbraham that channels water down to settled areas.

## Impact

The impact to the Town is estimated to be “limited/critical,” with more than 10 percent or 25 percent of property in affected areas damaged or destroyed. There are approximately 32 structures within the Special Flood Hazard Area, designated as the 100-year floodplain, in Wilbraham. Utilizing the Town’s median home value of \$291,600 (2008-12 ACS), flooding could result in \$9,331,200 worth of damage to the town. Utilizing the average household size of 2.63 people, approximately 84 people would be affected by a 100-year flood.

In addition, Wilbraham has four bridges situated either in or near the 100-year floodplain, which could make evacuation efforts as a result of dam failure more difficult. Some of the roads that residents would most likely take to reach safety travel through flood-affected areas. The damage estimate is a rough estimate and likely reflects a worst-case scenario. Computing more detailed damage assessments based on assessor’s records is a labor-intensive task and beyond the scope of this project.

The National Weather Service maintains a water level gage on the Chicopee River in Ludlow, MA to monitor flooding. The NWS has various flooding classifications based on water level. These classifications and their definitions are:

**Action Stage** - the stage which, when reached by a rising stream, represents the level where the NWS or a partner/user needs to take some type of mitigation action in preparation for possible significant hydrologic activity. The type of action taken varies for each gage location. Gage data should be closely monitored by any affected people if the stage is above action stage.

**Minor Flooding** is defined to have minimal or no property damage, but possibly some public threat. A Flood Advisory product is issued to advise the public of flood events that are expected not to exceed the minor flood category. Examples of conditions that would be considered minor flooding include:

- water over banks and in yards
- no building flooded, but some water may be under buildings built on stilts (elevated)
- personal property in low lying areas needs to be moved or it will get wet
- water overtopping roads, but not very deep or fast flowing

- water in campgrounds or on bike paths
- inconvenience or nuisance flooding
- small part of the airstrip flooded, and aircraft can still land
- one or two homes in the lowest parts of town may be cut off or get a little water in the crawl spaces or homes themselves if they are not elevated

**Moderate Flooding** is defined to have some inundation of structures and roads near the stream. Some evacuations of people and/or transfer of property to higher elevations may be necessary. A Flood Warning is issued if moderate flooding is expected during the event. Examples of conditions that would be considered moderate flooding include:

- several buildings flooded with minor or moderate damage
- various types of infrastructure rendered temporarily useless (i.e. fuel tanks cannot be reached due to high water, roads flooded that have no alternates, generator station flooded)
- elders and those living in the lowest parts of the village are evacuated to higher ground
- access to the airstrip is cut off or requires a boat
- water over the road is deep enough to make driving unsafe
- gravel roads likely eroded due to current moving over them
- widespread flooding, but not deep enough to float ice chunks through town
- water deep enough to make life difficult, normal life is disrupted and some hardship is endured
- airstrip closed
- travel is most likely restricted to boats

**Major Flooding** is defined to have extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations are necessary. A Flood Warning is issued if major flooding is expected during the event. Examples of conditions that would be considered major flooding include:

- many buildings flooded, some with substantial damage or destruction
- infrastructure destroyed or rendered useless for an extended period of time
- multiple homes are flooded or moved off foundations
- everyone in threatened area is asked to evacuate
- National Guard units assist in evacuation efforts
- erosion problems are extreme
- the airstrip, fuel tanks, and the generator station are likely flooded
- loss of transportation access, communication, power and/or fuel spills are likely
- fuel tanks may float and spill and possibly float downstream
- ice chunks floating through town that could cause structural damage
- high damage estimates and high degree of danger to residents

## **Vulnerability**

Based on the above analysis, Wilbraham faces a vulnerability of “1 – Highest Risk” from flooding.

## Severe Snowstorms / Ice Storms

---

### Hazard Description

Severe winter storms can pose a significant risk to property and human life. The rain, freezing rain, ice, snow, cold temperatures and wind associated with these storms can cause the following hazards:

- Disrupted power and phone service
- Unsafe roadways and increased traffic accidents
- Infrastructure and other property are also at risk from severe winter storms and the associated flooding that can occur following heavy snow melt.
- Tree damage and fallen branches that cause utility line damage and roadway blockages
- Damage to telecommunications structures
- Reduced ability of emergency officials to respond promptly to medical emergencies or fires.

### Location

The entire Town of Wilbraham is susceptible to severe snowstorms, making the location of occurrence from this hazard “large.” Because these storms occur regionally, they would impact the entire Town.

The Town has had ice problems with the following roadways:

- South Mountain Road
- Burleigh Road - Between Powers & Branch
- Glendale Road Between Crane Hill Road and Monson Road
- Red Bridge Road
- Chilson Road
- Silver Street
- Ridge Road
- Monson Road
- Crane Hill
- North Mountain Road
- Sunset Rock

In addition, “The Hill,” an area east of Main Street, South of Boston Road and North of Tinkham Road, has been identified as an area where snow prevents access during winter storm events. In 1996, portions of The Hill were isolated for a week and a half.

While these locations were not included in the previous version of the Hazard Mitigation Plan, there has not been any changes to these locations in the last 5 years since the last plan was created. The Hazard Mitigation Workgroup did not find that there are not any new locations for ice storms since the last version of this plan was created 5 years ago.

## Extent

The Northeast Snowfall Impact Scale (NESIS) developed by Paul Kocin of The Weather Channel and Louis Uccellini of the National Weather Service (Kocin and Uccellini, 2004) characterizes and ranks high-impact Northeast snowstorms. These storms have large areas of 10-inch snowfall accumulations and greater. NESIS has five categories: Extreme, Crippling, Major, Significant, and Notable. The index differs from other meteorological indices in that it uses population information in addition to meteorological measurements. Thus NESIS gives an indication of a storm's societal impacts.

NESIS scores are a function of the area affected by the snowstorm, the amount of snow, and the number of people living in the path of the storm. The aerial distribution of snowfall and population information are combined in an equation that calculates a NESIS score which varies from around one for smaller storms to over ten for extreme storms. The raw score is then converted into one of the five NESIS categories. The largest NESIS values result from storms producing heavy snowfall over large areas that include major metropolitan centers.

Northeast Snowfall Impact Scale Categories		
Category	NESIS Value	Description
1	1—2.499	Notable
2	2.5—3.99	Significant
3	4—5.99	Major
4	6—9.99	Crippling
5	10.0+	Extreme

Source: <http://www.ncdc.noaa.gov/snow-and-ice/rsi/nesis>

## Previous Occurrences

New England generally experiences at least one or two severe winter storms each year with varying degrees of severity. Severe winter storms typically occur during January and February; however, they can occur from late September through late April.

Based on data available from the National Oceanic and Atmospheric Administration, there are 47 winter storms since 1958 that have registered on the NESIS scale. Of these, approximately 26 storms resulted in snow falls in the Pioneer Valley of at least 10 inches. These storms are listed in the table on the next page, in order of their NESIS severity.

**Winter Storms Producing Over 10 inches of Snow in the Pioneer Valley, 1958-2013**

<b>Date</b>	<b>NESIS Value</b>	<b>NASIS Category</b>	<b>NESIS Classification</b>
3/12/1993	13.2	5	Extreme
3/2/1960	8.77	4	Crippling
2/15/2003	7.5	4	Crippling
2/2/1961	7.06	4	Crippling
1/21/2005	6.8	4	Crippling
1/19/1978	6.53	4	Crippling
12/25/1969	6.29	4	Crippling
2/10/1983	6.25	4	Crippling
2/14/1958	6.25	4	Crippling
2/5/1978	5.78	3	Major
2/23/2010	5.46	3	Major
2/8/1994	5.39	3	Major
1/9/2011	5.31	3	Major
2/18/1972	4.77	3	Major
12/11/1960	4.53	3	Major
2/7/2013	4.35	3	Major
2/22/1969	4.29	3	Major
1/18/1961	4.04	3	Major
2/8/1969	3.51	2	Significant
2/5/1967	3.5	2	Significant
4/6/1982	3.35	2	Significant
3/4/2013	3.05	2	Significant
3/15/2007	2.54	2	Significant
3/31/1997	2.29	1	Notable
2/2/1995	1.43	1	Notable
1/25/1987	1.19	1	Notable

Source: <http://www.ncdc.noaa.gov/snow-and-ice/rsi/nesis>

## **Probability of Future Events**

Based upon the availability of records for Hampden County, the likelihood that a severe snow storm will hit Wilbraham is “high,” or between 40 and 70 percent.

Research on climate change indicates that there is great potential for stronger, more frequent storms as the global temperature increases. More information about the effect of Climate Change can be found in the Pioneer Valley Planning Commission’s Climate Action Plan, available at [www.sustainableknowledgecorridor.org](http://www.sustainableknowledgecorridor.org).

The Massachusetts State Climate Change Adaptation Report has additional information about the impact of climate change and can be accessed at [www.mass.gov/eea/air-water-climate-change/climate-change/climate-change-adaptation-report.html](http://www.mass.gov/eea/air-water-climate-change/climate-change/climate-change-adaptation-report.html).

## **Impact**

The impact to the Town is estimated to be “limited,” with more than 10 percent of property in affected areas damaged or destroyed.

To approximate the potential impact to property and people that could be affected by this hazard, the total value of all property in town, \$1,578,098,000 is used. An estimated 20 percent of damage would occur to 10 percent of structures, resulting in a total of \$31,561,960 worth of damage. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

## **Vulnerability**

Based on the above assessment, Wilbraham’s vulnerability from snowstorms and ice storms is “2 – High Risk.”

# Hurricanes

---

## Hazard Description

Hurricanes are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. The primary damaging forces associated with these storms are high-level sustained winds and heavy precipitation. Hurricanes are violent rainstorms with strong winds that can reach speeds of up to 200 miles per hour and which generate large amounts of precipitation. Hurricanes generally occur between June and November and can result in flooding and wind damage to structures and above-ground utilities.

## Location

Because of the hazard’s regional nature, all of Wilbraham is at risk from hurricanes. Ridgetops are more susceptible to wind damage. The location of occurrence is “large,” at over 50 percent of the Town affected.

## Extent

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Hurricane Wind Scale, which rates hurricane wind intensity on a scale of 1 to 5, with 5 being the most intense.

Saffir-Simpson Scale	
Category	Maximum Sustained Wind Speed (MPH)
1	74–95
2	96–110
3	111–129
4	130–156
5	157 +

Source: National Hurricane Center, 2012

## Previous Occurrences

Hurricanes that have affected the Pioneer Valley are shown in the following table.

Major Hurricanes in the Pioneer Valley		
Hurricane/Storm Name	Year	Saffir/Simpson Category (when reached MA)
Great Hurricane of 1938	1938	3
Great Atlantic Hurricane	1944	1
Carol	1954	3
Edna	1954	1
Diane	1955	Tropical Storm
Donna	1960	Unclear, 1 or 2
Groundhog Day Gale	1976	Not Applicable
Gloria	1985	1
Bob	1991	2
Floyd	1999	Tropical Storm
Irene	2011	Tropical Storm
Sandy	2012	Super Storm

Source: National Hurricane Center, 2012

## Probability of Future Events

Wilbraham's location in western Massachusetts reduces the risk of extremely high winds that are associated with hurricanes, although it can experience some high wind events. The probability of future events is estimated to be "low," or between 1 and 10 percent in any given year.

## Impact

A description of the damages that could occur due to a hurricane is described by the Saffir-Simpson scale, as shown below.

Hurricane Damage Classifications			
Storm Category	Damage Level	Description of Damages	Wind Speed (MPH)
1	MINIMAL	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage. An example of a Category 1 hurricane is Hurricane Dolly (2008).	74-95
	Very dangerous winds will produce some damage		
2	MODERATE	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings. An example of a Category 2 hurricane is Hurricane Francis in 2004.	96-110
	Extremely dangerous winds will cause extensive damage		
3	EXTENSIVE	Some structural damage to small residences and utility buildings, with a minor amount of curtain wall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland. An example of a Category 3 hurricane is Hurricane Ivan (2004).	111-129
	Devastating damage will occur		
4	EXTREME	More extensive curtain wall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland. An example of a Category 4 hurricane is Hurricane Charley (2004).	130-156
	Catastrophic damage will occur		
5	CATASTROPHIC	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required. An example of a Category 5 hurricane is Hurricane Andrew (1992).	157+
	Catastrophic damage will occur		

In the event of a tropical storm or hurricane, the greatest risk to Wilbraham will be flooding of the Mill and Chicopee Rivers. Wind damage will be limited, but widely spread, perhaps including downed power and communications lines, but flooding damage will be more severe and focused on residential properties and ailing factory buildings; the town's transportation infrastructure and evacuation routes could also be impacted, especially the Stony Hill Road/Rail Road Underpass, which is in a low-lying routinely flooded spot that also serves as a major evacuation route. Flooding of this and surrounding areas could result in difficulty moving populations out of harm's way.

The impact of hurricanes to the Town is estimated to be "limited," with more than 10 percent of property in the affected area damaged or destroyed.

For most hurricanes or severe wind events, the Town has experienced small blocks of downed timber and uprooting of trees onto structures. Using a total a value of all structures in town of \$1,578,098,000, and an estimated wind damage of 5 percent to all structures with 10 percent damage to each structure, an estimated \$7,890,490 damage would occur. Estimated flood damage to 10 percent of the structures with 20 percent damage to each structure would result in \$31,561,960 of damage. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

### **Vulnerability**

Based on the above analysis, Wilbraham faces a vulnerability of "4 – Low Risk" from hurricanes.

## **Severe Thunderstorms / Wind / Tornadoes**

---

### **Hazard Description**

A thunderstorm is a storm with lightning and thunder produced by a cumulonimbus cloud, usually producing gusty winds, heavy rain, and sometimes hail. Effective January 5, 2010, the NWS modified the hail size criterion to classify a thunderstorm as 'severe' when it produces damaging wind gusts in excess of 58 mph (50 knots), hail that is 1 inch in diameter or larger (quarter size), or a tornado (NWS, 2013).

Wind is air in motion relative to surface of the earth. For non-tropical events over land, the NWS issues a Wind Advisory (sustained winds of 31 to 39 mph for at least 1 hour or any gusts 46 to 57 mph) or a High Wind Warning (sustained winds 40+ mph or any gusts 58+ mph). For non-tropical events over water, the NWS issues a small craft advisory (sustained winds 25-33 knots), a gale warning (sustained winds 34-47 knots), a storm warning (sustained winds 48 to 63 knots), or a hurricane force wind warning (sustained winds 64+ knots). For tropical systems, the NWS issues a tropical storm warning for any areas (inland or coastal) that are expecting sustained winds from 39 to 73 mph. A hurricane warning is issued for any areas (inland or coastal) that are expecting sustained winds of 74 mph. Effects from high winds can include downed trees and/or power lines and damage to roofs, windows, etc. High winds can cause scattered power outages. High winds are also a hazard for the boating, shipping, and aviation industry sectors.

Tornadoes are swirling columns of air that typically form in the spring and summer during severe thunderstorm events. In a relatively short period of time and with little or no advance warning, a tornado can attain rotational wind speeds in excess of 250 miles per hour and can cause severe devastation along a path that ranges from a few dozen yards to over a mile in width. The path of a tornado may be hard to predict because they can stall or change direction abruptly. Within Massachusetts, tornadoes have occurred most frequently in Worcester County and in communities west of Worcester, including towns in eastern Hampshire County. High wind speeds, hail, and debris generated by tornadoes can result in loss of life, downed trees and power lines, and damage to structures and other personal property (cars, etc.).

### **Location**

As per the Massachusetts Hazard Mitigation Plan, the entire town is at risk of high winds, severe thunderstorms, and tornadoes. The location of occurrence for these hazards is "large," or more than 50 percent of the town affected.

## Extent

An average thunderstorm is 15 miles across and lasts 30 minutes; severe thunderstorms can be much larger and longer. Southern New England typically experiences 10 to 15 days per year with severe thunderstorms. Thunderstorms can cause hail, wind, and flooding.

Rainfall records for a 24-hour period and per month are listed below:

Rainfall Records for Wilbraham, MA		
Month	24-Hour Record	Monthly Record
January	2.8"	8.9"
February	3.23"	7.68"
March	2.8"	7.72"
April	3.55"	8.75"
May	3.62"	11.54"
June	3.74"	10.4"
July	4.33"	9.73"
August	7.56"	18.68"
September	7.68"	3.23"
October	3.39"	9.06"
November	2.44"	7.56"
December	2.99"	7.25"

[http://www.myforecast.com/bin/climate.m?city=19530&zip\\_code=01095](http://www.myforecast.com/bin/climate.m?city=19530&zip_code=01095)

Tornadoes are measured using the enhanced F-Scale, shown with the following categories and corresponding descriptions of damage:

Enhanced Fujita Scale Levels and Descriptions of Damage			
EF-Scale Number	Intensity Phrase	3-Second Gust (MPH)	Type of Damage Done
EF0	Gale	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	Moderate	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	Significant	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	Severe	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	Devastating	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

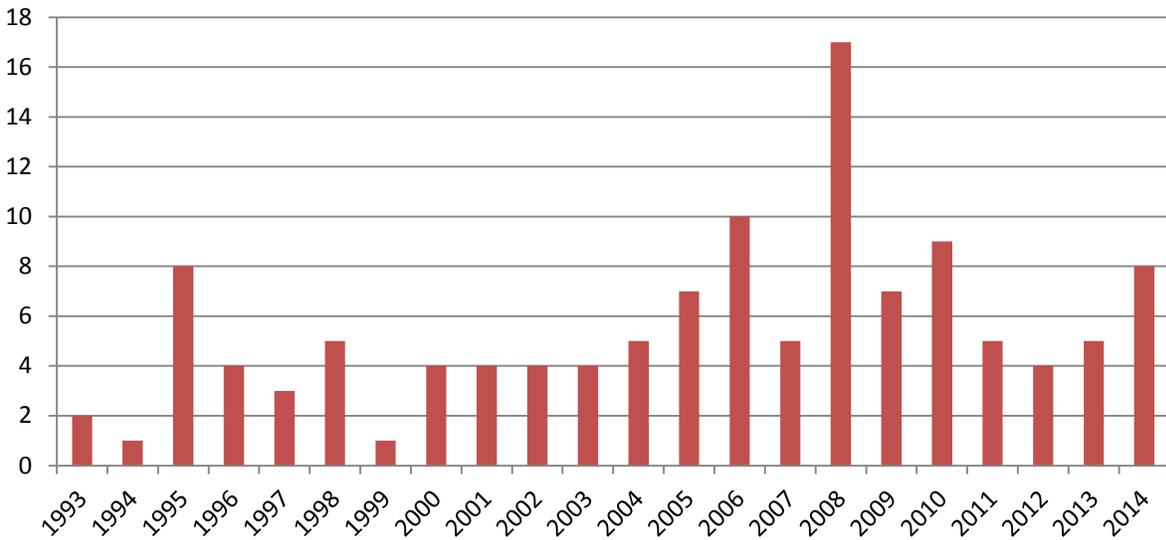
Source: NOAA

### Previous Occurrences

Between 1950 and 2013, several tornadoes have touched down in Wilbraham. Most recently, on June 1, 2011 Wilbraham was one of eight municipalities in Western and Central Massachusetts that were struck by an F3 tornado. There has also been a recent tornado in Agawam, which was an F1 tornado. A microburst also occurred approximately one month after the tornado and caused \$350,000 in damages. Annual statistics kept by the Town indicate that as a result of snowstorms, tornadoes, and microbursts, there were 180 roofs damaged in 2010, 358 in 2011, and 320 in 2012. This resulted in estimated damages between \$4 million and \$10 million to all property in town.

In western Massachusetts, the majority of sighted tornadoes have occurred in a swath east of Wilbraham, known as “tornado alley.” Sixteen incidents of tornado activity (all F2 or less) occurred in Hampden County between 1959 and 2014.

The number of severe thunderstorms that included winds over 50 miles per hour, since 1993, are included in the table below. On average, since 1993, there have been between 5-6 severe thunderstorms per year.



Source: NOAA Storm Events Database, 2014, [www.ncdc.noaa.gov/stormevents/](http://www.ncdc.noaa.gov/stormevents/)

### Probability of Future Events

One measure of tornado activity is the tornado index value. It is calculated based on historical tornado events data using USA.com algorithms. It is an indicator of the tornado level in a region. A higher tornado index value means a higher chance of tornado events. Data was used for Hampden County to determine the Tornado Index Value as shown in the table below.

Tornado Index for Hampden County	
<b>Hampden County</b>	138.23
<b>Massachusetts</b>	87.60
<b>United States</b>	136.45

Source: USA.com

<http://www.usa.com/hampden-county-ma-natural-disasters-extremes.htm>

As per the Massachusetts Hazard Mitigation Plan, there are approximately 10 to 30 days of thunderstorm activity in the state each year.

Based upon the available historical record, as well as Wilbraham' location in a high-density cluster of state-wide tornado activity, it is reasonable to estimate that there is a "moderate" occurrence of severe thunderstorms, wind, and tornadoes affecting the town in any given year.

## **Impact**

The potential for locally catastrophic damage is a factor in any tornado, severe thunderstorm, or wind event. In Wilbraham, a tornado that hit the residential areas would leave much more damage than a tornado with a travel path that ran along the town's forested uplands, where little settlement has occurred. Most buildings in the Town of Wilbraham have not been built to Zone 1, Design Wind Speed Codes. The first edition of the Massachusetts State Building Code went into effect on January 1, 1975, with most of the Town's housing build before this date.

The estimated impact from a severe thunderstorm, wind, or tornado is "limited," with over 10 percent of property in the affected area damaged or destroyed.

Using a total value of \$1,578,098,000 of all structures in Wilbraham, and an estimated 10 percent of structures damaged each by 20 percent, yields a total damage of \$31,561,960. This estimate does not include building contents, land values or damages to utilities.

## **Vulnerability**

Based on the above assessment, Wilbraham's vulnerability from severe thunderstorms, wind, and tornadoes is "2 – High Risk."

## **Wildfire / Brushfire**

---

### **Hazard Description**

Wildland fires are typically larger fires, involving full-sized trees as well as meadows and scrublands. Brushfires are uncontrolled fires that occur in meadows and scrublands, but do not involve full-sized trees. Both wildland fires and brushfires can consume homes, other buildings and/or agricultural resources. Typical causes of brushfires and wildfires are lightning strikes, human carelessness, and arson.

FEMA has classifications for 3 different classes of wildland fires:

- Surface fires – the most common type of wildland fire, surface fires burn slowly along the floor of a forest, killing or damaging trees.
- Ground fires burn on or below the forest floor and are usually started by lightning
- Crown fires move quickly by jumping along the tops of trees. A crown fire may spread rapidly, especially under windy conditions.

### **Location**

Hampden County has approximately 273,000 acres of forested land, which accounts for 67 percent of total land area. However, wildfire is unlikely to affect large areas of Wilbraham as most forest areas are fragmented.

Areas on or near Provin Mountain and Robinson State Park are most at risk. Due to the amount of timber within Robinson State Park, this 800-acre area with five miles of frontage along the Westfield River has the potential to burn, especially during a drought season. Brush fires within the park are common. There is no history of wildfires occurring in this area.

Wooded, mountainous sections of eastern Wilbraham could burn locally. High-end houses are being constructed in this part of Wilbraham, so this increases the risk of damage to these homes. Also, because of the terrain, water supplies and fire fighting capacity are limited.

A large wildfire could damage 49 percent of the town's land mass in a short period of time. This means that the location of occurrence for this hazard is "medium," or 10 to 50 percent of the Town affected.

### **Extent**

Wildfires can cause widespread damage to the areas that they affect. They can spread very rapidly, depending on local wind speeds and be very difficult to get under control. Fires can last for several hours up to several days.

Much of Wilbraham's acreage is forested. In Wilbraham approximately 49 percent of the City's total land area is in forest, or about 7,938 acres, and is therefore at risk of fire.

However, Massachusetts receives more than 40 inches of rain per year and much of the landscape is fragmented, and together these two traits make wildfires uncommon in Massachusetts. Nevertheless, in drought conditions, a brushfire or wildfire would be a matter of concern. There are many acres of privately owned land that are believed to be a fire hazard.

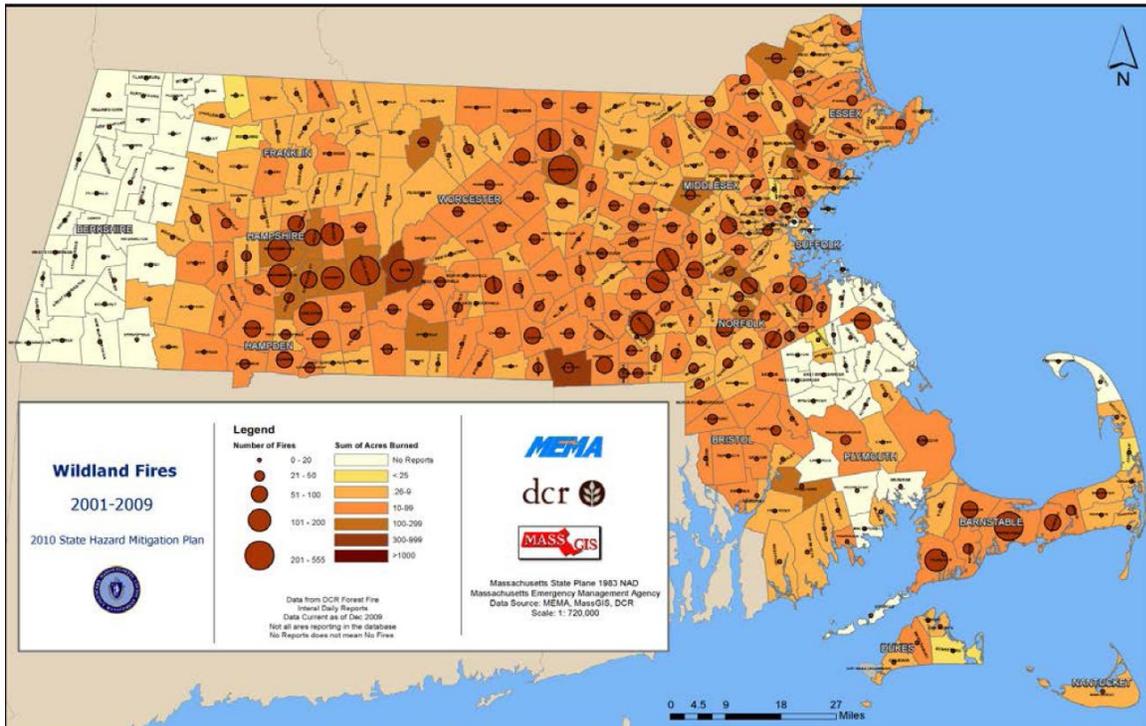
### **Previous Occurrences**

There are no records of wildfires or burned acreage available for Wilbraham. However, according to the Wilbraham Fire Department, there are no unauthorized burns or brushfires in town on an annual basis. As a point of comparison, 822 burn permits were issued in 2012.

During the past 100 years, there have not been many wildfires occurring in the Pioneer Valley. However, several have occurred during the past 20 years, as shown in the list below:

- 1995 – Russell, 500 acres burned on Mt. Tekoa
- 2000 – South Hadley, 310 acres burned over 14 days in the Litchia Springs Watershed
- 2001 – Ware, 400 acres burned
- 2010 – Russell, 320 acres burned on Mt. Tekoa
- 2012 – Eastern Hampden County, dry conditions and wind gusts created a brush fire in Brimfield, and burned 50 acres

## Wildland Fires in Massachusetts, 2001-2009



Source: Massachusetts Hazard Mitigation Plan

### Probability of Future Events

In accordance with the Massachusetts Hazard Mitigation Plan, the Town Hazard Mitigation Workgroup found it is difficult to predict the likelihood of wildfires in a probabilistic manner because the number of variables involved. However, given the proximity of previous wildfires, and their proximity to the Town, the Hazard Mitigation Workgroup identified the likelihood of a future wildfire to be “low,” or between 1 to 10 percent in any given year.

Climate scenarios project summer temperature increases between 2°C and 5°C and precipitation decreases of up to 15 percent. Such conditions would exacerbate summer drought and further promote high-elevation wildfires, releasing stores of carbon and further contributing to the buildup of greenhouse gases. Forest response to increased atmospheric carbon dioxide—the so-called “fertilization effect”—could also contribute to more tree growth and thus more fuel for fires, but the effects of carbon dioxide on mature forests are still largely unknown.

### Impact

The estimated impact from wildfire was determined to be “minor,” with minor property damage and minimal disruption to quality of life for Town residents. Using a total value of \$1,578,098,000 of all structures in Wilbraham, and an estimated 1 percent of structures damaged each by 50 percent, an estimated damage due to wildfire is \$7,890,490. This estimate does not include building contents, land values or damages to utilities.

## **Vulnerability**

As timber harvesting is reduced, debris builds up on the ground, and potential for wildfire increases town-wide. Wilbraham's forests are not actively managed. The entire town is at-risk from a wildfire, albeit a low risk. Moreover, minimal forest fire protection (dependent on on-call firefighters and problems with accessibility) is available.

The Town has cleaned up 130 acres of forested land that was affected by the October 2011 snow storm and the 2011 tornado. However, there remains significant private land that has yet to be improved. This land has significant fallen debris in the form of dry wood, and thus presents potential fuel for a wildfire.

Based on the above assessment, Wilbraham faces a vulnerability of "3 – Medium Risk" from wildfires.

## Earthquakes

---

### Hazard Description

An earthquake is a sudden, rapid shaking of the ground that is caused by the breaking and shifting of rock beneath the Earth's surface. Earthquakes can occur suddenly, without warning, at any time of the year. New England experiences an average of 30 to 40 earthquakes each year although most are not noticed by people.<sup>1</sup> Ground shaking from earthquakes can rupture gas mains and disrupt other utility service, damage buildings, bridges and roads, and trigger other hazardous events such as avalanches, flash floods (dam failure) and fires. Un-reinforced masonry buildings, buildings with foundations that rest on filled land or unconsolidated, unstable soil, and mobile homes not tied to their foundations are at risk during an earthquake.<sup>2</sup>

### Location

Because of the regional nature of the hazard, the entire town is susceptible to earthquakes. This means that the location of occurrence of this hazard is "large," with more than 50 percent of the Town affected.

### Extent

The magnitude of an earthquake is measured using the Richter Scale, which measures the energy of an earthquake by determining the size of the greatest vibrations recorded on the seismogram. On this scale, one step up in magnitude (from 5.0 to 6.0, for example) increases the energy more than 30 times. The intensity of an earthquake is measured using the Modified Mercalli Scale. This scale quantifies the effects of an earthquake on the Earth's surface, humans, objects of nature, and man-made structures on a scale of I through XII, with I denoting a weak earthquake and XII denoting a earthquake that causes almost complete destruction.

---

<sup>1</sup> Northeast States Emergency Consortium Web site: [www.nesec.org/hazards/earthquakes.cfm](http://www.nesec.org/hazards/earthquakes.cfm).

<sup>2</sup> Federal Emergency Management Agency Web site: [www.fema.gov/hazards/earthquakes/quake.shtm](http://www.fema.gov/hazards/earthquakes/quake.shtm).

Richter Scale Magnitudes and Effects	
Magnitude	Effects
< 3.5	Generally not felt, but recorded.
3.5 - 5.4	Often felt, but rarely causes damage.
5.4 - 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 - 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 - 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or >	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Modified Mercalli Intensity Scale for and Effects			
Scale	Intensity	Description Of Effects	Corresponding Richter Scale Magnitude
I	Instrumental	Detected only on seismographs.	
II	Feeble	Some people feel it.	< 4.2
III	Slight	Felt by people resting; like a truck rumbling by.	
IV	Moderate	Felt by people walking.	
V	Slightly Strong	Sleepers awake; church bells ring.	< 4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves.	< 5.4
VII	Very Strong	Mild alarm; walls crack; plaster falls.	< 6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open.	< 6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread.	< 7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards.	< 8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves.	> 8.1

Source: US Federal Emergency Management Agency

## Previous Occurrences

Earthquakes have affected the Town in the past, with the most recent earthquakes to affect Wilbraham shown in the table below. A documented fault line runs through the center of Wilbraham (Northeast States Emergency Consortium, 2003).

Largest Earthquakes to Affect Wilbraham Since 1924		
Location	Date	Magnitude
Ossipee, NH	December 20, 1940	5.5
Ossipee, NH	December 24, 1940	5.5
Dover-Foxcroft, ME	December 28, 1947	4.5
Kingston, RI	June 10, 1951	4.6
Portland, ME	April 26, 1957	4.7
Middlebury, VT	April 10, 1962	4.2
Near NH Quebec Border, NH	June 15, 1973	4.8
West of Laconia, NH	Jan. 19, 1982	4.5
Plattsburg, NY	April 20, 2002	5.1
Bar Harbor, NH	October 3, 2006	4.2
Hollis Center, ME	October 16, 2012	4.6

Source: Northeast States Emergency Consortium website, [www.nesec.org/hazards/earthquakes.cfm](http://www.nesec.org/hazards/earthquakes.cfm)

New England States Record of Historic Earthquakes		
State	Years of Record	Number Of Earthquakes
Connecticut	1668 - 2007	137
Maine	1766 - 2007	544
Massachusetts	1668 - 2007	355
New Hampshire	1638 - 2007	360
Rhode Island	1776 - 2007	38
Vermont	1843 - 2007	73
New York	1840 - 2007	755
<i>Total Number of Earthquakes within the New England states between 1638 and 1989 is 2262.</i>		

Source: Northeast States Emergency Consortium website, [www.nesec.org/hazards/earthquakes.cfm](http://www.nesec.org/hazards/earthquakes.cfm)

## Probability of Future Events

One measure of earthquake activity is the Earthquake index value. It is calculated based on historical earthquake events data using USA.com algorithms. It is an indicator of the earthquake activity level in a region. A higher earthquake index value means a higher chance of earthquake events. Data was used for Hampden County to determine the Earthquake Index Value for Wilbraham, as shown in the table below.

Earthquake Index for Hampden County and Wilbraham	
Hampden County	0.24
Massachusetts	0.70
United States	1.81

Based upon existing records, the probability of future earthquakes is “low,” or 1 to 10 percent probability in any given year.

## Impact

Massachusetts introduced earthquake design requirements into their building code in 1975 and improved building code for seismic reasons in the 1980s. However, these specifications apply only to new buildings or to extensively-modified existing buildings. Buildings, bridges, water supply lines, electrical power lines and facilities built before the 1980s may not have been designed to withstand the forces of an earthquake. The seismic standards have also been upgraded with the 1997 revision of the State Building Code.

Gas lines traveling through Wilbraham could potentially be damaged by a significant earthquake.

The impact to the Town from an earthquake is considered “Limited,” with more than 10 percent of property in affected areas damaged or destroyed.

Structures are mostly of wood frame construction in Wilbraham. Assuming a total value of all structures in town of \$1,578,098,000, an estimated loss of 20 percent of structures in town, and a 100 percent loss of those structures, an earthquake would result in \$315,619,600 worth of damage. The costs of repairing or replacing roads, bridges, power lines, telephone lines, or the contents of the structures are not included in this estimate.

## Vulnerability

Based on the above analysis, Wilbraham’s vulnerability from an earthquake is “4 – Low Risk.”

## Dam Failure

---

### Hazard Description

Dams and their associated impoundments provide many benefits to a community, such as water supply, recreation, hydroelectric power generation, and flood control. However, they also pose a potential risk to lives and property. Dam failure is not a common occurrence, but dams do represent a potentially disastrous hazard. When a dam fails, the potential energy of the stored water behind the dam is released rapidly. Most dam failures occur when floodwaters above overtop and erode the material components of the dam. Often dam breaches lead to catastrophic consequences as the water rushes in a torrent downstream flooding an area engineers refer to as an “inundation area.” The number of casualties and the amount of property damage will depend upon the timing of the warning provided to downstream residents, the number of people living or working in the inundation area, and the number of structures in the inundation area.

Many dams in Massachusetts were built during the 19<sup>th</sup> Century without the benefit of modern engineering design and construction oversight. Dams of this age can fail because of structural problems due to age and/or lack of proper maintenance, as well as from structural damage caused by an earthquake or flooding.

The Massachusetts Department of Conservation and Recreation Office of Dam Safety is the agency responsible for regulating dams in the state (M.G.L. Chapter 253, Section 44 and the implementing regulations 302 CMR 10.00). To be regulated, these dams are in excess of 6 feet in height (regardless of storage capacity) and have more than 15 acre feet of storage capacity (regardless of height). Dam safety regulations enacted in 2005 transferred significant responsibilities for dams from the State of Massachusetts to dam owners, including the responsibility to conduct dam inspections.

### Location

The Massachusetts Emergency Management Agency (MEMA) identifies 6 dams in Wilbraham.

Dams in Wilbraham	
Dam	Hazard Level
Cottage Avenue Dam	Low
Red Bridge Dam	Significant
Rice Pond Dam(NJ)	Low
Fruit Farm Pond Dam	Low
Bennett Pond Dam	Significant
Guidette Pond Dam(NJ)	High

The location of occurrence of this hazard is determined to be “medium,” with 10 to 50 percent of the Town affected.

## Extent

Often dam breaches lead to catastrophic consequences as the water ultimately rushes in a torrent downstream flooding an area engineers refer to as an “inundation area.” The number of casualties and the amount of property damage will depend upon the timing of the warning provided to downstream residents, the number of people living or working in the inundation area, and the number of structures in the inundation area.

Dams in Massachusetts are assessed according to their risk to life and property. The state has three hazard classifications for dams:

- *High Hazard:* Dams located where failure or improper operation will likely cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways, or railroads.
- *Significant Hazard:* Dams located where failure or improper operation may cause loss of life and damage to homes, industrial or commercial facilities, secondary highways or railroads or cause interruption of use or service of relatively important facilities.
- *Low Hazard:* Dams located where failure or improper operation may cause minimal property damage to others. Loss of life is not expected.

## Previous Occurrences

To date, there have been no dam failures in Wilbraham.

## Probability of Future Events

As Wilbraham’s high hazard dams age, and if maintenance is deferred, the likelihood of a dam failure will increase, but, currently the frequency of dam failures is “very low,” with a less than 1 percent chance of a dam failing in any given year.

As described in the Massachusetts Hazard Mitigation Plan, dams are designed partly based on assumptions about a river’s flow behavior, expressed as hydrographs. Changes in weather patterns can have significant effects on the hydrograph used for the design of a dam. If the hydrograph changes, it is conceivable that the dam can lose some or all of its designed margin of safety, also known as freeboard. If freeboard is reduced, dam operators may be forced to release increased volumes earlier in a storm cycle in order to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream. Throughout the west, communities downstream of dams are already increases in stream flows from earlier releases from dams. Dams are constructed with safety features known as “spillways.” Spillways are put in place on dams as a safety measure in the event of the reservoir filling too quickly. Spillway overflow events, often referred to as “design failures,” result in increased discharges downstream and increased flooding potential. Although climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures.

## **Impact**

The impact from a dam failure is estimated to be “minor,” with only minor property damage and minimal disruption on the quality of life.

A failure of the Guidette Pond Dam, with a high hazard level, could create 100 percent damage to 20 percent of structures in town, for a total cost of \$315,619,600. A failure of Bennett Pond Dam, with a significant hazard level, could create 100 percent damage to 10 percent of structures in town, for a total cost of \$157,809,800. Red Bridge dam also has a significant hazard level and could create 100 percent damage to 10 percent of structures in town, for a total cost of \$157,809,800. Other dams in town are not considered to be a risk to property or people.

## **Vulnerability**

Based on this analysis, Wilbraham faces a vulnerability of “5— Lowest Risk” from dam failure.

# Drought

---

## Hazard Description

Drought is a normal, recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. In the most general sense, drought originates from a deficiency of precipitation over an extended period of time, resulting in a water shortage for some activity, group, or environmental sector. Reduced crop, rangeland, and forest productivity; increased fire hazard; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitat are a few examples of the direct impacts of drought. Of course, these impacts can have far-reaching effects throughout the region and even the country.

## Location

Because of this hazard’s regional nature, a drought would impact the entire town. This means that the location of occurrence is “large,” with more than 50 percent of the Town affected.

## Extent

The severity of a drought would determine the scale of the event and would vary among town residents depending on whether the residents’ water supply is derived from a private well or the public water system.

The U.S. Drought Monitor also records information on historical drought occurrence. Unfortunately, data could only be found at the state level. The U.S. Drought Monitor categorizes drought on a D0-D4 scale as shown below.

U.S. Drought Monitor		
Classification	Category	Description
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies

Source: US Drought Monitor, <http://droughtmonitor.unl.edu/classify.htm>

## Previous Occurrences

In Massachusetts, six major droughts have occurred statewide since 1930.<sup>3</sup> They range in severity and length, from three to eight years. In many of these droughts, water-supply systems were found to be inadequate. Water was piped in to urban areas, and water-supply systems were modified to permit withdrawals at lower water levels. The following table indicates previous occurrences of drought since 2000, based on the US Drought Monitor:

Annual Drought Status	
Year	Maximum Severity
2000	No drought
2001	D2 conditions in 21% of the state
2002	D2 conditions in 99% of the state
2003	No drought
2004	D0 conditions in 44% of the state
2005	D1 conditions in 7% of the state
2006	D0 conditions in 98% of the state
2007	D1 conditions in 71% of the state
2008	D0 conditions in 57% of the state
2009	D0 conditions in 44% of the state
2010	D1 conditions in 27% of the state
2011	D0 conditions in 0.01% of the state
2012	D2 conditions in 51% of the state

Source: US Drought Monitor

## Probability of Future Events

In Wilbraham, as in the rest of the state, the probability of a future event is “low,” with between a 1 and 10 percent chance of occurring in any given year.

Based on past events and current criteria outlined in the Massachusetts Drought Management Plan, it appears that western Massachusetts may be more vulnerable than eastern Massachusetts to severe drought conditions. However, many factors, such as water supply sources, population, economic factors (i.e., agriculture based economy), and infrastructure, may affect the severity and length of a drought event.

---

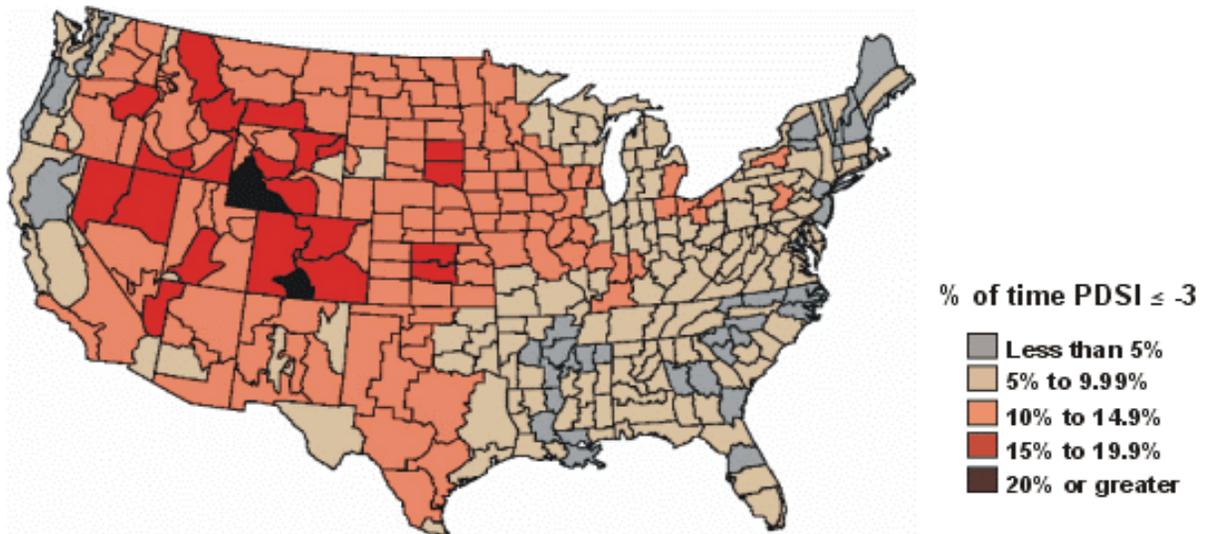
<sup>3</sup> US Geological Survey Water-Supply Paper 2375. “National Water Summary 1989 – Floods and Droughts: Massachusetts.” Prepared by S. William Wandle, Jr., US Geological Survey.

When evaluating the region’s risk for drought on a national level, utilizing a measure called the Palmer Drought Severity Index, Massachusetts is historically in the lowest percentile for severity and risk of drought.<sup>4</sup> However, global warming and climate change may have an effect on drought risk in the region. With the projected temperature increases, some scientists think that the global hydrological cycle will also intensify. This would cause, among other effects, the potential for more severe, longer-lasting droughts.

## Palmer Drought Severity Index

1895–1995

Percent of time in severe and extreme drought



### Impact

The impact of a drought is considered to be minor, with only minor property damage and minimal disruption to quality of life to Town residents. Due to the water richness of western Massachusetts, Wilbraham is unlikely to be adversely affected by anything other than a major, extended drought. While such a drought would require water saving measures to be implemented, there would be no foreseeable damage to structures or loss of life resulting from the hazard.

### Vulnerability

Based on the above assessment, Wilbraham’s vulnerability from drought is “4 – Low Risk.”

---

<sup>4</sup> National Drought Mitigation Center – <http://drought.unl.edu>

## **Other Hazards**

---

In addition to the hazards identified above, the Hazard Mitigation Workgroup reviewed the full list of hazards listed in the Massachusetts Hazard Mitigation Plan. Due to the location and context of the town, coastal erosion, landslides, and tsunamis, were determined to not be a threat.

Extreme temperatures, while a hazard identified in the state Hazard Mitigation Plan, was determined by the Wilbraham Hazard Mitigation Workgroup to not currently be a primary hazard to people, property, or critical infrastructure in Wilbraham. While extreme temperatures can result in increased risk of wildfire, this effect is addressed as part of the “Wildfire/Brushfire” hazard assessment.

Ice jams, another hazard identified in the state Hazard Mitigation Plan, was similarly determined by the Wilbraham Hazard Mitigation Workgroup to not be a primary hazard to people, property, or critical infrastructure in town. To the extent that ice jams do result in flooding, ice jams are addressed in the "Flooding" section of this chapter.

The Hazard Mitigation Workgroup will continue to assess the impact of extreme temperatures and ice jams and update the Hazard Mitigation Plan accordingly.

## 4: CRITICAL FACILITIES

### Facility Classification

---

A Critical Facility is defined as a building, structure, or location which:

- Is vital to the hazard response effort
- Maintains an existing level of protection from hazards for community residents and property
- Would create a secondary disaster if a hazard were to impact it

The Critical Facilities List for the Town of Wilbraham has been identified utilizing a Critical Facilities List provided by the State Hazard Mitigation Officer. Wilbraham' Hazard Mitigation Workgroup has broken up this list of facilities into three categories:

- Facilities needed for emergency response in the event of a hazard event.
- Facilities identified as non-essential and not required in an emergency response event, but which are considered essential for the everyday operation of the Town.
- Facilities or institutions that include special populations which would need additional attention in the event of a hazard event.

The critical facilities and evacuation routes potentially affected by hazard areas are identified following this list. The Past and Potential Hazards/Critical Facilities Map (Appendix D) also identifies these facilities.

## **Category 1 – Emergency Response Services**

---

The Town has identified the Emergency Response Facilities and Services as the highest priority in regards to protection from natural and man-made hazards.

- 1. Emergency Operations Center**  
Wilbraham Police Station – Main Street  
Wilbraham Town Hall – Springfield Street
- 2. Fire Station**  
Wilbraham Fire Department Headquarters – Boston Road  
Fire Station #2 – Woodland Dell Road
- 3. Police Station**  
Wilbraham Police Station – Main Street
- 4. Department of Public Works**  
Department of Public Works Headquarters – Boston Road  
Minnechaug Regional High School – Main Street  
Home Depot Parking Lot – Boston Road
- 5. Water**  
Department of Public Works – Town Hall
- 6. Emergency Fuel Stations**  
Fire Station – Boston Road
- 7. Emergency Electrical Power Facility**  
4 permanent generators located at Town Hall, Police and Fire Station, Department of Public Works, and Minnechaug High School.  
1 mobile generator
- 8. Emergency Shelters (not Red Cross Approved)**  
Pines School – Stony Hill Road  
Life Care Nursing Home – Boston Road  
Minnechaug Regional School – Main Street  
Memorial Elementary School – Main Street  
Soule Road Elementary – Soule Road  
Wilbraham Middle School – Stony Hill  
Wingate Nursery Home – Maple Street  
Wilbraham Monson Academy – Main Street  
St. Cecelia’s Church – Main Street

**9. Utilities**

Liquified Natural Gas Pipeline – North Wilbraham  
Electrical substation – Main Street  
Columbia Gas 20 million gallon storage tank – Ludlow  
2 million gallon water storage tank – Bartlett

**10. Primary Evacuation Routes**

Route 20  
Stony Hill Road  
Springfield Street  
Monson Road  
Ridge Road

**11. Bridges Located on Evacuation Routes**

Stony Hill Road-North Branch Mill River Bridge  
Stony Hill Road-South Mill River Bridge  
Monson Road-Big Brook  
Cottage Avenue Bridge over Chicopee River  
Red Bridge

## **Category 2 – Non Emergency Response Facilities**

---

The town has identified these facilities as non-emergency facilities; however, they are considered essential for the everyday operation of Wilbraham.

### **1. Water Supply**

Water is supplied to Wilbraham from DCR's Quabbin Reservoir via a 36 inch Chicopee Valley Aqueduct (CVA). MWRA owns and maintains the CVA and is responsible for selling the water to Wilbraham, Chicopee and South Hadley FD#1.<sup>5</sup>

### **2. Problem Culverts**

A list of potential problem culverts compiled by the Road Agent is provided by the list of action steps section of the plan.

### **3. Wastewater**

There are a total of eight pumping stations that direct wastewater to the main River Road Pump Station. At the River Road Pump Station the flows are monitored as well as sampled for Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS). In 2004, the system pumped a total of almost 115 million gallons of sewage with an average daily flow of approximately 315,000 gallons per day. Wastewater is pumped from the River Road Pump Station to the City of Springfield's gravity system for eventual treatment at the Springfield Regional Wastewater Treatment Facility (SRWTF) operated by the City of Springfield on Bondi's Island in Agawam.

---

<sup>5</sup> Wilbraham Annual Statistics Report 1999-2005

### **Category 3 – Facilities/ Institutions with Special Populations**

---

The third category contains people and facilities that need to be protected in event of a disaster.

#### **1. Hospitals & Health Facilities**

Boston Road Medical Association – Boston Road  
Wilbraham Fires Station Headquarters – Boston Road  
Wing Memorial Hospital – Boston Road

#### **2. Special Needs Population (s)**

Life Care Nursing Home – Boston Road  
Memorial Elementary – Main Street  
Mile Tree Elementary – Main Street  
Minnechaug Regional High School – Main Street  
Orchard Valley – Boston Road  
Soule Road Elementary – Soule Road  
Stony Hill School – Stony Hill  
Wilbraham Middle School – Stony Hill  
Wing Gate Nursing Home – Maple Street

#### **3. Recreation Areas**

Red Bridge Boat Launch – Red Bridge Road  
Fountain Park – Tinkham Road  
Old Meeting House – Main Street  
White Cedar Swamp Conservation Area – Cedar Oak Drive  
Twelve Mile Brook Conservation Area – Glendale Road  
Wilbraham Community Gardens – Bennett Road  
Sawmill Pond Conservation Area – Soule Road  
Bruuer Pond – Main Street

#### **4. Schools**

Memorial Elementary School – Main Street  
Mile Tree Elementary – Main Street  
Minnechaug Regional High School – Main Street  
Soule Road Elementary – Soule Road  
Stony Hill School – Stony Hill  
Wilbraham Middle School – Stony Hill

**5. Churches**

Church of the Epiphany – Highland Avenue  
Wilbraham United Church – Main Street  
Christ the King Lutheran Church – Main Street  
St. Cecelia’s Parish – Main Street  
Evangel Assembly of God – Stony Hill  
Grace Union Church – Chapel Street

**6. Historic Buildings/Sites**

Adams Cemetery –Tinkham Road  
East Wilbraham Cemetery – Boston Road  
Glendale Cemetery – Glendale Road  
Old Meeting House – Main Street

**7. Employment Centers**

Wilbraham & Monson Academy – Main St  
Mile Tree Schools – Church Lane  
Minnechaug Regional High School – Church Lane  
Soule Road School – Soule Road  
Memorial School – Old Orchard Road  
Stony Hill School – Stony Hill Road  
The Pines School – River Road  
Boston Road business corridor – Boston Road

Critical Facilities and Evacuation Routes Potentially Affected by Hazard Areas			
Hazard Type	Hazard Area	Critical Facilities Affected	Evacuation Routes Affected
Flooding	Underpass at Stony Hill Road is regularly inundated, also Main Street / River Road / Boston Road / Sawmill Road / Soule Road	Main Street / Fire Department Station #2, Flow of persons and goods	Boston Road and Main Street, Northbound exit from Wilbraham
Severe snowstorms / ice Storms	Entire Town	Ridge Road Telephone and Radio Relay Equipment	N/A
Hurricanes	Main Street / River Road / Boston Road / Sawmill Road / Soule Road	Main Street / Fire Department Station #2	Boston Road and Main Street
Severe thunderstorms / wind / tornadoes	N/A	N/A	N/A
Wildfires / brushfires	Hills in western Wilbraham	Residential properties	N/A
Earthquakes	N/A	N/A	N/A
Dam failures	Quabbin Reservoir / Ludlow Reservoir	Entire Town and/or River Road	N/A
Drought	N/A	N/A	N/A

(Critical Facilities Map Located In Back of Plan in Appendix D)

## 5: MITIGATION STRATEGIES

One of the steps of this Hazard Mitigation Plan is to evaluate all of the Town's existing policies and practices related to natural hazards and identify potential gaps in protection. After reviewing these policies and the hazard identification and assessment, the Town Hazard Mitigation Workgroup developed a set of hazard mitigation strategies it would like to implement.

The Town of Wilbraham has developed the following goal to serve as a framework for mitigation of the hazards identified in this plan.

### **Goal Statement**

To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to the following hazards: flooding, severe snowstorms/ice storms, severe thunderstorms, hurricanes, tornadoes, wildfires/brushfires, earthquakes, dam failures, and drought.

For the extent of this analysis, the Workgroup reviewed the following Town documents:

- Zoning Bylaws
- Subdivision Rules and Regulations
- Comprehensive Emergency Management Plan
- Town Open Space and Recreation Plan

## **Overview of Mitigation Strategies by Hazard**

---

An overview of the general concepts underlying mitigation strategies for each of the hazards identified in this plan is as follows:

### **Flooding**

The key factors in flooding are the water capacity of water bodies and waterways, the regulation of waterways by flood control structures, and the preservation of flood storage areas and wetlands. As more land is developed, more flood storage is demanded of the town's water bodies and waterways. The Town currently addresses this problem with a variety of mitigation tools and strategies. Flood-related regulations and strategies are included in the Town's general bylaws, zoning by-law, and subdivision regulations. Infrastructure like dams and culverts are in place to manage the flow of water.

### **Severe Snowstorms / Ice Storms**

Winter storms can be especially challenging for emergency management personnel. The Massachusetts Emergency Management Agency (MEMA) serves as the primary coordinating entity in the statewide management of all types of winter storms and monitors the National Weather Service (NWS) alerting systems during periods when winter storms are expected. Even though the storm has usually been forecast, there is no certain way for predicting its length, size or severity. Therefore, mitigation strategies must focus on preparedness prior to a severe snow/ice storm.

The Town's current mitigation tools and strategies focus on preparedness, with many regulations and standards established based on safety during storm events. To the extent that some of the damages from a winter storm can be caused by flooding, flood protection mitigation measures also assist with severe snowstorms and ice storms.

### **Hurricanes**

Hurricanes provide the most lead warning time of all identified hazards, because of the relative ease in predicting the storm's track and potential landfall. MEMA assumes "standby status" when a hurricane's location is 35 degrees North Latitude (Cape Hatteras) and "alert status" when the storm reaches 40 degrees North Latitude (Long Island). Even with significant warning, hurricanes can do significant damage – both due to flooding and severe wind.

The flooding associated with hurricanes can be a major source of damage to buildings, infrastructure and a potential threat to human lives. Flood protection measures can thus also be considered hurricane mitigation measures. The high winds that often accompany hurricanes can also damage buildings and infrastructure, similar to tornadoes and other strong wind events.

## **Severe Thunderstorms / Winds / Tornadoes**

Most damage from tornadoes and severe thunderstorms come from high winds that can fell trees and electrical wires, generate hurtling debris and, possibly, hail. According to the Institute for Business and Home Safety, the wind speeds in most tornadoes are at or below design speeds that are used in current building codes, making strict adherence to building codes a primary mitigation strategy. In addition, current land development regulations, such as restrictions on the height of telecommunications towers, can also help prevent wind damages.

## **Wildfires / Brushfires**

Wildfire and brushfire mitigation strategies involve educating people about how to prevent fires from starting, as well as controlling burns within the town.

## **Earthquakes**

Although there are five mapped seismological faults in Massachusetts, there is no discernible pattern of previous earthquakes along these faults nor is there a reliable way to predict future earthquakes along these faults or in any other areas of the state. Consequently, earthquakes are arguably the most difficult natural hazard for which to plan.

Most buildings and structures in the state were constructed without specific earthquake resistant design features. In addition, earthquakes precipitate several potential devastating secondary effects such as building collapse, utility pipeline rupture, water contamination, and extended power outages. Therefore, many of the mitigation efforts for other natural hazards identified in this plan may be applicable during the Town's recovery from an earthquake.

## **Dam Failure**

Dam failure is a highly infrequent occurrence, but a severe incident could prove catastrophic. In addition, dam failure most often coincides with flooding, so its impacts can be multiplied, as the additional water has no where to flow. The only mitigation measures currently in place are the state regulations governing the construction, inspection, and maintenance of dams. This is managed through the Office of Dam Safety at the Department of Conservation and Recreation.

## **Drought**

Although Massachusetts does not face extreme droughts like many other places in the country, it is susceptible to dry spells and drought. Drought can most likely be effectively mitigated in regions like the Pioneer Valley if measures are put into place, such as ensuring that groundwater is recharged.

## Existing Mitigation Strategies

The Town of Wilbraham has a list of existing mitigation strategies that were in place prior to the development of the first Hazard Mitigation Plan in 2007, as well as a set of prioritized mitigation strategies to be pursued in the future. Strategies that were previously completed prior to 2007, or completed between 2007 and 2013, are listed below and noted under the “effectiveness” column. Strategies that were completed since the last version of the plan are listed in bold.

As part of the development of this plan update in 2013, the Hazard Mitigation Workgroup evaluated each mitigation strategy to determine its effectiveness and whether any improvements could be made.

Existing Mitigation Strategies				
Capability	Action Type	Description	Hazards Mitigated	Effectiveness / Potential Improvements
Stormwater drainage requirements for subdivision developments	Subdivision regulations	Requires a definitive plan that identifies stormwater drainage, permanent open space, flood plains, public water supply proposals, and a utilities layout.	Flooding	Effective. No potential changes.
Septic systems designed for flood heights in subdivision developments	Subdivision regulations	Requires report on individual on-site septic systems that discusses flood height of nearby streams	Flooding	Effective. Potential improvements: Ensure 500-year flood level is incorporated into report.
Street grading requirements	Subdivision regulations	Requires the layout of proposed subdivision streets to show ways that are not less than one-half of one percent (street grade), no more than six percent on principal streets, and no more than eight percent on secondary streets.	Flooding	Effective. No potential changes.

Existing Mitigation Strategies				
Capability	Action Type	Description	Hazards Mitigated	Effectiveness / Potential Improvements
Accommodation of 50-year storm by waterways	Subdivision regulations	Requires watercourses to be preserved with an easement to a width sufficient to carry a flow equal to a fifty-year storm.	Flooding	Effective. Potential improvements: Revise regulations to require 100-year storm accommodation.
Accommodation of 50-year storm by drainage systems	Subdivision regulations	Requires stormwater drainage systems in a development that are capable of piping a fifty year storm	Flooding	Effective. Potential improvements: Revise regulations to require 100-year storm accommodation.
Protection of natural flood-related features	Subdivision regulations	Requires the protection of natural features such as significant trees, historic sites, ledges, waterways.	Flooding	Effective. No potential changes.
Earth removal regulations	Zoning bylaws	Requires a cover crop of vegetation, and mandates that six inches of topsoil must be returned to the entire site to promote growth.	Flooding	Effective. No potential changes.
Site plan review	Zoning bylaws	Requires that plans show storm drainage. Requires that the natural setting of a parcel will be preserved in a natural state insofar as is practicable; contains standards for surface water drainage that require measures to handle and manage increased runoff, while maintaining vehicular access.	Flooding	Effective. No potential changes.
Flood Plain Overlay District	Zoning bylaws	Purpose includes preserving natural flood control characteristics and flooding storage capacity of the flood plain.	Flooding	Effective. Potential improvements: Expand overlay district from 100-year to 500-year flood plain areas.

Existing Mitigation Strategies				
Capability	Action Type	Description	Hazards Mitigated	Effectiveness / Potential Improvements
Flexible Subdivision Regulations	Zoning bylaws	Allows landowners of parcels located within a Residence District to apply for a special permit exempting any or all lots created on the parcel from square foot, lot area, frontage, yard and setback requirements.	Flooding	Effective. No potential changes.
Flexible non-subdivision (estate lot) regulations	Zoning bylaws	Allows the creation of lots that have less frontage on a way than the town's regulations allow on parcels of 320,000 square feet, provided 200,000 square feet will be reserved as open space.	Flooding	Effective. No potential changes.
Stormwater Bylaw	General regulations	Stormwater bylaw reduces the rate of stormwater off of new development, reduces adverse impacts from stormwater, provides for recharge of groundwater supply, and minimizes damage to public and private property from flooding	Flooding	Effective. No potential changes.
Planned Unit Residential Development (PURD)	Zoning bylaws	Allows flexibility in the development in housing while preserving open space.	Flooding	Effective. No potential changes.
Ridgeline and Hillside District	Zoning bylaws	Guide development in Wilbraham's while preserving scenic and natural amenities.	Flooding, severe thunderstorms, winds, hurricanes	Effective. No potential changes.
Stream and Lake Protection District	Zoning bylaws	Stream and Lake Protection District, an overlay district that provides restrictions on the location of septic tanks and leach fields, as well as on the impacting of the flood storage capacity of the land.	Flooding	Effective. No potential changes.
Underground utilities (electric and telephone) for new subdivisions	Subdivision regulations	The town requires all utilities for new subdivisions to be underground.	Severe Snowstorms / Ice storms Tornadoes Hurricanes	Effective. Potential improvements: Work with utility companies to underground existing utility lines in locations where repetitive outages occur.

Existing Mitigation Strategies				
Capability	Action Type	Description	Hazards Mitigated	Effectiveness / Potential Improvements
State Building Code	State regulation	The Town of Wilbraham has adopted the Massachusetts State Building Code, which promotes construction of buildings that can withstand hazards to a certain degree.	Floods Severe Snowstorms / Ice storms Severe Thunderstorm Hurricanes Tornadoes Wildfire / Brushfire Earthquakes Dam Failure Drought	Effective. Potential improvements: Evaluate older structures to be used as shelters and the Elementary School to determine if they are earthquake resistant.
Zoning regulations for tele-communications facilities	Zoning Bylaws	No facility shall exceed 150 feet in height as measured from the mean finished grade at facility base. Towers must be 500 feet away from adjacent residential and commercial uses.	Severe Snowstorms / Ice storms Tornadoes Hurricanes	Effective. Potential improvements: Consider adding safety and prevention of wind-related damage as a stated purpose in bylaws.
Zoning regulations regarding new mobile homes	Zoning Bylaws	Mobile homes are not allowed.	Hurricanes Tornadoes	Effective. No potential changes.
Groundwater Protection District	Zoning Bylaws	Minimizes uses that rely on toxic chemicals	Drought	Effective. Potential improvements: Revise dimensional regulations to minimize impervious surfaces.

<b>Existing Mitigation Strategies</b>				
<b>Capability</b>	<b>Action Type</b>	<b>Description</b>	<b>Hazards Mitigated</b>	<b>Effectiveness / Potential Improvements</b>
Mitigation of flooding impacts from proposed developments	Zoning Bylaws	Stormwater bylaw is in effect and monitors development in flooding areas	Flooding	Effective, completed during last 5 years. No potential changes.
Public education on ways to care for drainage system	Public outreach	Stormwater bylaw provides restrictions and guidance on drainage system care	Flooding	Effective, completed during last 5 years. No potential changes.
Water loss public education	Public outreach	Public education materials discussing the social costs of water loss are currently available from the town	Drought	Effective, completed during last 5 years. No potential changes.
Reverse 911	Operational strategy	Blackboard Connect system allows for contacting of residents to alert them about hazards	Floods Severe snow storms / ice storms / severe thunderstorm Hurricanes Tornadoes Wildlife / Brushfire Earthquakes Dam Failure Drought	Effective, completed during last 5 years. No potential changes.
Conformance with Wetlands Protection Act	Subdivision regulations	Require all new development to conform to regulations set forth in Wetlands Protection Act.	Flooding	Effective. No potential changes.

Existing Mitigation Strategies				
Capability	Action Type	Description	Hazards Mitigated	Effectiveness / Potential Improvements
Compliance with and participation in the National Flood Insurance Program	Regulation	There are currently 46 NFIP policies in force in Wilbraham, for a total of \$11.4 million in coverage	Flooding	Effective. Potential improvements: Join Community Rating System to expand flood mitigation efforts and provide reduced premiums to flood insurance holders.
Public education on culvert care	Operational strategy	Conduct public education on the need to prevent yard waste, debris, and trash from entering and blocking culverts.	Flooding	<b>Effective, completed during last 5 years. No potential changes.</b>
Removal of at-risk trees	Operational strategy	Removed at-risk trees from 135 acres of land. Trees were removed that would create damage to infrastructure if they were to fall during a severe snow storm or ice storm.	Snow storm / ice storm Tornadoes Hurricanes	Effective. No potential changes.
Flood prevention and mitigation as purpose in subdivision regulations	Subdivision regulations	The intent of this strategy is addressed by the Town's stormwater bylaw	Flooding	Effective. No potential changes.
Burn permits	Operational strategy	Fire Department continues to require residents to apply for burn permits and will do so in the future. Residents required to annually apply for a seasonal burn permit and request permission directly from the fire department on the day they wish to burn	Wildfire / Brushfire	Effective. Potential improvements: Have a Fire Department staff member inspect burn piles on the day of burning.

## **Existing Resources**

---

In addition to the existing mitigation strategies listed above, the Town currently has the following resources available for hazard mitigation, in the form of staffing and funding capabilities:

- The Town has a Capital Improvement Plan, which provides the overall budget for capital expenditures of general Town funds. The CIP is reviewed annually by the Town's Capital Planning Workgroup. The review involves evaluating proposals for the construction of municipal buildings, including schools, and the acquisition of land or personal property. The review also includes feedback from the Town's Fire Chief, Police Chief, Emergency Management Director, and DPW Director to assess what, if any, capital improvements should be conducted to reduce the Town's vulnerability from hazards.
- The Town has an annual budget allocated of \$20,000 for geographical information systems mapping, to allow the mapping of the location of infrastructure repairs. A review of public complaints and maintenance operations for the stormwater and drinking water systems allows the Town to identify areas of Wilbraham - especially critical infrastructure, such as culverts - that are most susceptible to specific hazards, such as flooding.
- Staff from the Town's various departments - including Fire, Police, DPW, Board of Health, Planning, etc. - regularly collaborate and share information. For example, the Police Department alerts the Department of Public Works to any issues with flooding or road conditions they find during regular patrolling.
- The Town receives Massachusetts Chapter 90 funding, which provides financing to implement drainage improvements for any identified drainage issues on roads. The funds are provided by the State Transportation Bond authorizes funding for capital improvement projects such as highway construction, and preservation and improvement projects that extend the life of existing capital facilities.
- The Town's Firemen and Police are available for conducting outreach and education on fire prevention and safety to local schools, to reduce the risk of fire in Wilbraham.

## **Potential Improvements to Existing Capabilities and Resources**

---

The following list of potential improvements to existing capabilities and resources have been developed by the Wilbraham Hazard Mitigation Workgroup:

- Ensure the 500-year floodplain is incorporated into the report that is required by subdivisions indicating on-site septic systems that show flood height of nearby streams.
- Increase the preservation of watercourses in subdivision regulations to allow sufficient width to carry flow from a 100-year storm instead of the current 50-year storm.

- Expand the current Flood Plain Overlay District to match the designated 500-year flood plain, instead of the current 100-year flood plain.
- Work with utility companies to underground existing utility lines in locations where repetitive outages occur, in addition to current standards that utility lines be underground for all new subdivisions.
- Expand upon existing State Building Code requirements for earthquake-resistant buildings by evaluating older structures in town that could potentially be used as emergency shelters, including the Elementary School, to determine if they are earthquake resistant.
- Consider adding safety and prevention of wind-related damage as a stated purpose in the Town's existing telecommunications zoning bylaw.
- Revise dimensional regulations in the Groundwater Protection District to minimize impervious surfaces.
- Expand upon current NFIP flood mitigation efforts by joining the Community Rating System.
- Assign a Fire Department representative to inspect burn piles on day of burning, prior to burning occurring.

These potential improvements were evaluated and considered for inclusion in the list of Proposed Future Mitigation Strategies found later in this section.

## Deleted Mitigation Strategies

Several mitigation strategies listed in the 2007 version of the Wilbraham Hazard Mitigation Plan have been removed in this 5-year update. Strategies were deleted for one of two reasons: 1) they have been determined as no longer useful for mitigating a hazard. 2) They have been determined to be over generalized and in need of being replaced by a more specific mitigation strategy.

Deleted Mitigation Strategies					
Action Name	Action Type	Description	Hazards Mitigated	Responsible Agency	Reason for Deletion
Educate homeowners about rural / urban interface	Operational strategy	Provide residents with education about need for fire safety in urban and rural contexts	Wildfire / Brushfire	Fire Department	Too general of a mitigation strategy and is addressed by another mitigation strategy: "public education / outreach about fire safety"
Road improvements that are subject to icing	Capital construction	Road improvements to roadways that are subject to icing throughout the winter, specifically installing drainage basins to improve the movement of water	Severe Snowstorms / Ice storms	Board of Selectmen, Planning Board, EMD	Too general of a mitigation strategy and is addressed by other mitigation strategies that are focused on addressing flooding in specific areas of town
Water service to South Wilbraham	Capital construction	Extend water service to portions of South Wilbraham that lack access to public water to prevent fire damage	Wildfire / Brushfire	Fire Department, DPW	Determined not to provide enough benefit to justify the cost of construction

## **Previously Identified and New Strategies**

---

Several of the action items previously identified in the 2007 Hazard Mitigation Plan are currently continuing, either because they require more time to secure funding or their construction process is ongoing. In addition, the Hazard Mitigation Workgroup identified several new strategies that are also being pursued. These new strategies are based on experience with currently implemented strategies, as well as the hazard identification and risk assessment in this plan.

## **Prioritization Methodology**

---

The Wilbraham Hazard Mitigation Planning Workgroup reviewed and prioritized a list of previously identified and new mitigation strategies using the following criteria:

**Application to multiple hazards** – Strategies are given a higher priority if they assist in the mitigation of several natural hazards.

**Time required for completion** – Projects that are faster to implement, either due to the nature of the permitting process or other regulatory procedures, or because of the time it takes to secure funding, are given higher priority.

**Estimated benefit** – Strategies which would provide the highest degree of reduction in loss of property and life are given a higher priority. This estimate is based on the Hazard Identification and Analysis Chapter, particularly with regard to how much of each hazard’s impact would be mitigated.

**Cost effectiveness** – in order to maximize the effect of mitigation efforts using limited funds, priority is given to low-cost strategies. For example, regular tree maintenance is a relatively low-cost operational strategy that can significantly reduce the length of time of power outages during a winter storm. Strategies that have identified potential funding streams, such as the Hazard Mitigation Grant Program, are also given higher priority.

**Eligibility Under Hazard Mitigation Grant Program** – The Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. Funding is made available through FEMA by the Massachusetts Emergency Management Agency. Municipalities apply for grants to fund specific mitigation projects under MEMA requirements

The following categories are used to define the priority of each mitigation strategy:

**Low** – Strategies that would not have a significant benefit to property or people, address only one or two hazards, or would require funding and time resources that are impractical

**Medium** – Strategies that would have some benefit to people and property and are somewhat cost effective at reducing damage to property and people

**High** – Strategies that provide mitigation of several hazards and have a large benefit that warrants their cost and time to complete

**Very High** – extremely beneficial projects that will greatly contribute to mitigation of multiple hazards and the protection of people and property. These projects are also given a numeric ranking within the category.

## Cost Estimates

---

Each of the following implementation strategies is provided with a cost estimate. Projects that already have secured funding are noted as such. Where precise financial estimates are not currently available, categories were used with the following assigned dollar ranges:

- **Low** – cost less than \$50,000
- **Medium** – cost between \$50,000 – \$100,000
- **High** – cost over \$100,000

Cost estimates take into account the following resources:

- Town staff time for grant application and administration (at a rate of \$25 per hour)
- Consultant design and construction cost (based on estimates for projects obtained from town and general knowledge of previous work in town)
- Town staff time for construction, maintenance, and operation activities (at a rate of \$25 per hour)

## Project Timeline

---

Each strategy is provided with an estimated length of time it will take for implementation. Where funding has been secured for the project, a specific future date is provided for when completion will occur. However, some projects do not currently have funding and thus it is difficult to know exactly when they will be completed. For these projects, an estimate is provided for the amount of time it will take to complete the project once funding becomes available.

## Previously Identified and New Strategies Prioritized by Wilbraham

Status	Action Name	Action Type	Description	Hazards Mitigated	Responsible Agency	Priority	Cost	Funding Source	Timeframe
New strategy	Emergency backup generator	Operational strategy	Install emergency backup generator at Department of Public Works facility	Floods Severe Snowstorms / Ice storms Severe Thunderstorm Hurricanes Tornadoes Wildfire / Brushfire Earthquakes Dam Failure Drought	Board of Selectmen, Department of Public Works, EMD	Very High - 1	\$123,500	HMGP (secured)	1 year from funding date
New strategy	Drainage improvement - Hunting Lane	Capital construction	Improve a 1.5 mile stretch of drainage on Hunting Lane and Main Street. (Waiting for contract from FEMA)	Flooding	Board of Selectmen, Highway Department, EMD	Very High - 2	\$938,000	HMGP (applied)	2 years from funding date
Identified in previous plan. Town has applied for and received HMPG funding and is awaiting dispensing of funds.	Improvement of culverts - Woodland Dell	Capital construction	Construct improvement of Woodland Dell culvert system, installing trash racks, walls and bank stabilization.	Flooding	Board of Selectmen, EMD, Highway Department	Very High - 3	\$386,000	HMGP (secured)	2 years from funding date
New strategy	Improvement of culverts - Brookmont	Capital construction	Improve drainage and stabilize flood control bank at Brookmont and Hilltop	Flooding	Board of Selectmen, Highway Department, EMD	Very High - 4	High	HMGP	2 years from funding date

## Previously Identified and New Strategies Prioritized by Wilbraham

Status	Action Name	Action Type	Description	Hazards Mitigated	Responsible Agency	Priority	Cost	Funding Source	Timeframe
Identified in previous plan. Town has investigated feasibility of construction and will be applying for HMGP funds.	Culverts at Soule Road	Capital construction	Construct twin 50" culverts under Soule Road that drain from Sawmill Pond	Flooding	Board of Selectmen, Highway Department, EMD	Very High - 5	High	HMGP	2 years from funding date
Identified in previous plan. Town has investigated feasibility of construction and will be applying for HMGP funds.	Improvements to Mountain Road culverts	Capital construction	Culvert improvements of the Mountain Road / Sunset Rock drainage system	Flooding	Board of Selectmen, Highway Department, EMD	Very High - 6	High	HMGP	2 years from funding date
New strategy	Culvert improvements - Upper Monson Road	Capital construction	Construct culvert improvements and drainage improvements at Upper Monson Road / Glendale	Flooding	Board of Selectmen, Highway Department, EMD	Very High - 7	High	HMGP	2 years from funding date
New strategy	Drainage improvement - Upper Tinkham Road	Capital construction	Install detention basin at Upper Tinkham Road or drainage to Main Street	Flooding	Board of Selectmen, Highway Department, EMD	Very High - 8	High	HMGP	2 years from funding date
New strategy	Dredging at Bruuer Pond	Capital construction	Dredge Bruuer Pond	Flooding	Board of Selectmen, Highway Department, EMD	Very High - 9	\$115,000	CPA (secured)	1 year from funding date

## Previously Identified and New Strategies Prioritized by Wilbraham

Status	Action Name	Action Type	Description	Hazards Mitigated	Responsible Agency	Priority	Cost	Funding Source	Timeframe
New strategy	Wastewater treatment plant alarm system	Operational strategy	Install new SCADA alarm system at pump stations	Flooding	Board of Selectmen, Highway Department, EMD	Very High - 10	\$100,000 High	Grant MIIA (secured)	1 year from funding date
New strategy	Stabilizing of Rice Drive Brook	Capital construction	Stabilize Rice Drive Brook	Flooding	Board of Selectmen, Highway Department, EMD	Very High - 11	High	HMGP	2 years from funding date
New strategy	Clear waterway on Ruth Drive	Capital construction	Clear debris out of waterway from storm, Brentwood & Jeffrey Lane area	Severe Snowstorms / Ice storms Tornadoes Hurricanes	Board of Selectmen, Highway Department, EMD	Very High - 12	Medium	DPW	2 years from funding date, and once permission/permitting completed
New strategy	Detention basin improvement - Pigeon Drive	Capital construction	Improve detention basin at Pigeon Drive and Gary Drive	Flooding	Board of Selectmen, Highway Department, EMD	Very High - 13	High	HMGP	2 years from funding date
New strategy	Tree clearing - Brookside Circle	Capital construction	Assist and encourage residents in applying for funding through NRCS for tree clearing at Brookside Circle	Severe Snowstorms / Ice storms Tornadoes Hurricanes	Board of Selectmen, Highway Department, EMD	Very High - 14	Medium	NRCS	Privately funded based on resident cooperation, estimated completion of 5 years from funding date

**Previously Identified and New Strategies Prioritized by Wilbraham**

<b>Status</b>	<b>Action Name</b>	<b>Action Type</b>	<b>Description</b>	<b>Hazards Mitigated</b>	<b>Responsible Agency</b>	<b>Priority</b>	<b>Cost</b>	<b>Funding Source</b>	<b>Timeframe</b>
Identified in previous plan. Plan was updated and completed in 2013-2014. Town staff will work with the Pioneer Valley Planning Commission to apply for HMGP funding to update the plan in the next five years.	Hazard Mitigation Plan updates	Planning document	Update Wilbraham's Hazard Mitigation Plan every 5 years, using procedure identified in plan	Floods Severe Snowstorms / Ice storms Severe Thunderstorm Hurricanes Tornadoes Wildfire / Brushfire Earthquakes Dam Failure Drought	LEPC, Police Chief, Fire Chief, DPW	Very High - 15	Low	DPW / HMGP	5 years
Identified in previous plan. Town is working to determine most effective locations for trash racks and will install racks as resources are available.	Trash racks on culverts	Operational strategy	Install trash racks over various existing culverts to prevent blockages	Flooding	Board of Selectmen, Highway Department, EMD	High	Low	DPW	1 year from funding date

## Previously Identified and New Strategies Prioritized by Wilbraham

Status	Action Name	Action Type	Description	Hazards Mitigated	Responsible Agency	Priority	Cost	Funding Source	Timeframe
Identified in previous plan. Impact study has not been completed. Town is planning to apply for HMGP funds to fund study.	Impact studies for high-hazard dams	Planning document	Conduct impact studies for high-hazard dams to mitigate the impact of dam breaches in Wilbraham	Dam Failure	EMD	High	Low	HMGP	2 years
Identified in previous plan. Town has not completed strategy but will investigate feasibility of applying based on available funds.	NFIP Community Rating System	Operational strategy	Determine whether feasible to enroll in NFIP's Community Rating System	Flooding	Board of Selectmen, Emergency Management Director	Medium	Low	DPW / PVPC Local Technical Assistance	1 year from time determined to be feasible

**Previously Identified and New Strategies Prioritized by Wilbraham**

Status	Action Name	Action Type	Description	Hazards Mitigated	Responsible Agency	Priority	Cost	Funding Source	Timeframe
Identified in previous plan. Plan has been updated as required by state with appropriate updates to content and planning process.	Wilbraham Comprehensive Emergency Management (CEM) Plan	Planning document	Regularly update plan and continue implementation of plan's strategies, including: 1. Identification of areas in the community that are flood prone and define methods to minimize the risk. 2. Review of National Flood Insurance Maps. 3. Dissemination of emergency public information and instructions concerning flood preparedness and safety. 4. Following of land use and building codes (e.g. Wetlands Protection Act) 5. Regularly testing flood control works to ensure good operating condition at all times 6. Preserving natural water storage areas as per OSRP 7. Maintaining plans for managing all flood emergency response activities including addressing potentially hazardous dams.	Floods Severe Snowstorms / Ice storms Severe Thunderstorm Hurricanes Tornadoes Wildfire / Brushfire Earthquakes Dam Failure Drought	Board of Selectmen, EMD	Medium	Low	Fire Dept. Police Dept.	Every 5 years, using the process indicated in the CEM Plan

**Previously Identified and New Strategies Prioritized by Wilbraham**

<b>Status</b>	<b>Action Name</b>	<b>Action Type</b>	<b>Description</b>	<b>Hazards Mitigated</b>	<b>Responsible Agency</b>	<b>Priority</b>	<b>Cost</b>	<b>Funding Source</b>	<b>Timeframe</b>
Identified in previous plan. Select Board and town staff is currently in discussion about logistics of development of plan.	Debris Management Plan	Planning document	Create a local debris management plan to address debris after hazards and reduce potential of debris causing wildfire or other hazard	Hurricanes Tornadoes Earthquakes	EMD, Police Department, Fire Department, Board of Selectmen	Low	Low	Fire Dept. Police Dept.	Discussion currently ongoing between town staff and Select Board, estimated completion in 5 years
Identified in previous plan. Fire Department has reviewed all development plans and will continue to do so in the future.	Subdivision review for fire safety	Subdivision regulations	Continue Fire Department review of subdivision plans, commercial plans, and industrial plans	Drought Wildfire / Brushfire	Fire Department, Planning Board	Low	Low	DPW Mass DEP	As required by Mass DEP

**Previously Identified and New Strategies Prioritized by Wilbraham**

<b>Status</b>	<b>Action Name</b>	<b>Action Type</b>	<b>Description</b>	<b>Hazards Mitigated</b>	<b>Responsible Agency</b>	<b>Priority</b>	<b>Cost</b>	<b>Funding Source</b>	<b>Timeframe</b>
Identified in previous plan. Fire Department regularly does outreach to community schools to educate students about need to prevent fires. Programs will continue into the future.	Public education / outreach about fire safety	Operational strategy	Continue Fire Department educational program in schools	Drought Wildfire / Brushfire	Fire Department	Low	Low	Fire Dept.	Annually
Identified in previous plan. Strategy is implemented as weather conditions dictate.	Outdoor watering ban	Regulation	Watering ban establishes measures in the general bylaws for restricting water use in extreme events. Institute watering ban as necessary	Drought	Fire Department, DPW	Low	Low	Fire Dept.	As required by drought conditions
Identified in previous plan. Town has not made progress on this strategy because of cost considerations.	Water tower seismic improvements	Capital construction	Make seismic improvements to 2-million-gallon water tower to prevent tower rupture from damaging critical infrastructure	Flooding	DPW, Building Inspector	Low	High	HMGP	5 years

**Previously Identified and New Strategies Prioritized by Wilbraham**

Status	Action Name	Action Type	Description	Hazards Mitigated	Responsible Agency	Priority	Cost	Funding Source	Timeframe
Identified in previous plan. Town has been utilizing services of local company to remove beaver dams when they are constructed and will continue to do so moving forward.	Beaver Management Strategy	Operational strategy	Develop a Beaver Management Strategy in cooperation with the Wilbraham Board of Health. There is a need for controlling the beaver population in critical locations whereby dam flooding can cause significant damage to public and private property as well as produce public safety hazards.	Flooding	Board of Health, DPW, Board of Selectmen	Low	Low	Planning Dept.	Licensed beaver and wildlife removal control service on contract with town as needed

## 6: PLAN REVIEW, EVALUATION, IMPLEMENTATION, AND ADOPTION

### Plan Adoption

Upon completion of the draft Hazard Mitigation Plan, a public meeting was held on March 27<sup>th</sup> to request comments. The Hazard Mitigation Plan was then submitted to the Massachusetts Emergency Management Agency (MEMA) and the Federal Emergency Management Agency for their review. Upon receiving conditional approval of the plan by FEMA, the plan was presented to the Town's Select Board and adopted.

### Plan Implementation

The implementation of this plan began upon its formal adoption by the Town Select Board and approval by MEMA and FEMA. Those town departments and boards responsible for ensuring the development of policies, bylaw revisions, and programs as described in Sections 5 and 6 of this plan will be notified of their responsibilities immediately following approval. The Town's Hazard Mitigation Workgroup will oversee the implementation of the plan.

### Incorporation with Other Planning Documents

Existing plans, studies, reports and technical information were incorporated throughout the planning process into this plan, as well as the previous version of this plan that was developed in 2008. This included a review and incorporation of significant information from the following key documents:

- *Wilbraham Comprehensive Emergency Management Plan* (particularly the Critical Infrastructure Section) – the Critical Infrastructure section was used to identify those infrastructure components in Wilbraham that have been identified as crucial to the function of the Town; also, this resource was used to identify special needs populations as well as potential emergency shortcomings.
- *Wilbraham Open Space and Recreation Plan 2011-2018* – this Plan was used to identify the natural context within which the Wilbraham mitigation planning would take place. This proved useful insofar as it identified water bodies, rivers, streams, infrastructure components (i.e. water and sewer, or the lack thereof), as well as population trends. This was incorporated to ensure that the Town's mitigation efforts would be sensitive to the surrounding environment. During the OSRP update, the Town can use the work of the PDM Plan to incorporate identified hazard areas into open space and recreation planning. This could either take the form of acquiring parcels of land that are currently un-developed, but situated within an identified hazard area, as permanent open space, thereby minimizing the likelihood that critical infrastructure components will be constructed in an area prone to damage from natural hazards.
- *Wilbraham Community Development Plan*—this Plan was used to identify any action items that might prove successful, based on previous planning efforts.

- *Wilbraham Zoning Bylaw* - The Town's Zoning Bylaw was used to gather identify those actions that the Town is already taking that are reducing the potential impacts of a natural hazard (i.e. floodplain regulations) to avoid duplicating existing successful efforts.
- *State of Massachusetts Hazard Mitigation Plan* - This plan was used to insure that the Town's PDM was consistent with the State's Plan.

As the Town of Wilbraham creates new and updates existing planning documents, this plan and its implementation strategies will be incorporated as applicable. This process will be ongoing and part of the standard practice of reviewing other plans to ensure consistency between plans.

The Town has also incorporated its Hazard Mitigation Plan into existing planning mechanisms in the time since the previously version of this plan was approved in 2008. This process included the following:

- Review of the strategies identified in the Hazard Mitigation Plan into the Wilbraham OSRP 2011-2018, particularly those pertaining to water supply protection, sewer improvements, and the preservation of open space and restrictions on development.
- Review and incorporation of the hazard identification and risk assessment completed as part of this plan into the Town's Comprehensive Emergency Management (CEM) Plan, in order to ensure the CEM Plan includes the best information possible for preparing and responding to hazards that could affect Wilbraham.
- Review of the Hazard Mitigation Plan when considering any changes to the Town's zoning bylaws that pertain to the hazard mitigation strategies identified in this plan, including the language pertaining to telecommunications facilities, the Flood Plain Overlay District, and the Groundwater Protection District.
- Review of the Hazard Mitigation Plan when considering emergency preparedness items to be funded through the Town's Capital Improvement Plan.

### **Plan Monitoring and Evaluation**

The Town's Emergency Management Director or his designee will call meetings of all responsible parties to review plan progress on an annual basis in each of the following years: 2014, 2015, 2016, 2017, 2018 and as needed (*i.e.*, following a natural disaster). The public will be notified of these meetings in advance through a posting of the agenda at Town Hall. Responsible parties identified for specific mitigation actions will be asked to submit their reports in advance of the meeting.

Meetings will involve evaluation and assessment of the plan, regarding its effectiveness at achieving the plan's goals and stated purpose. The following questions will serve as the criteria that is used to evaluate the plan:

### *Plan Mission and Goal*

- Is the Plan's stated goal and mission still accurate and up to date, reflecting any changes to local hazard mitigation activities?
- Are there any changes or improvements that can be made to the goal and mission?

### *Hazard Identification and Risk Assessment*

- Have there been any new occurrences of hazard events since the plan was last reviewed? If so, these hazards should be incorporated into the Hazard Identification and Risk Assessment.
- Have any new occurrences of hazards varied from previous occurrences in terms of their extent or impact? If so, the stated impact, extent, probability of future occurrence, or overall assessment of risk and vulnerability should be edited to reflect these changes.
- Is there any new data available from local, state, or Federal sources about the impact of previous hazard events, or any new data for the probability of future occurrences? If so, this information should be incorporated into the plan.

### *Existing Mitigation Strategies*

- Are the current strategies effectively mitigating the effect of any recent hazard events?
- Has there been any damage to property since the plan was last reviewed?
- How could the existing mitigation strategies be improved upon to reduce the impact from recent occurrences of hazards? If there are improvements, these should be incorporated into the plan.

### *Proposed Mitigation Strategies*

- What progress has been accomplished for each of the previously identified proposed mitigation strategies?
- How have any recently completed mitigation strategies affected the Town's vulnerability and impact from hazards that have occurred since the strategy was completed?
- Should the criteria for prioritizing the proposed mitigation strategies be altered in any way?
- Should the priority given to individual mitigation strategies be changed, based on any recent changes to financial and staffing resources, or recent hazard events?

*Review of the Plan and Integration with Other Planning Documents*

- Is the current process for reviewing the Hazard Mitigation Plan effective? Could it be improved?
- Are there any Town plans in the process of being updated that should have the content of this Hazard Mitigation Plan incorporated into them?
- How can the current Hazard Mitigation Plan be better integrated with other Town planning tools and operational procedures, including the zoning bylaw, the Comprehensive Emergency Management Plan, and the Capital Improvement Plan?

Following the discussion of these questions and criteria above, it is anticipated that the Workgroup may decide to reassign the roles and responsibilities for implementing mitigation strategies to different town departments and/or revise the goals and objectives contained in the plan. The Workgroup will review and update the Hazard Mitigation Plan every five years. The next updated plan will be submitted to MEMA and FEMA in the spring of 2018.

## 7: APPENDICES

## Appendix A – Technical Resources

---

### 1) Agencies

Massachusetts Emergency Management Agency (MEMA).....	508/820-2000
Hazard Mitigation Section .....	617/626-1356
Federal Emergency Management Agency (FEMA) .....	617/223-4175
MA Regional Planning Commissions:	
Berkshire Regional Planning Commission (BRPC).....	413/442-1521
Cape Cod Commission (CCC).....	508/362-3828
Central Massachusetts Regional Planning Commission (CMRPC).....	508/693-3453
Franklin Regional Council of Governments (FRCOG).....	413/774-3167
Martha’s Vineyard Commission (MVC).....	508/693-3453
Merrimack Valley Planning Commission (MVPC).....	978/374-0519
Metropolitan Area Planning Council (MAPC).....	617/451-2770
Montachusett Regional Planning Commission (MRPC).....	978/345-7376
Nantucket Planning and Economic Development Commission (NP&EDC).....	508/228-7236
Northern Middlesex Council of Governments (NMCOG).....	978/454-8021
Old Colony Planning Council (OCPC).....	508/583-1833
Pioneer Valley Planning Commission (PVPC).....	413/781-6045
Southeastern Regional Planning and Economic Development District (SRPED).....	508/823-1803
MA Board of Building Regulations & Standards (BBRS).....	617/227-1754
MA Coastal Zone Management (CZM).....	617/626-1200
DCR Water Supply Protection.....	617/626-1379
DCR Waterways.....	617/626-1371
DCR Office of Dam Safety.....	508/792-7716
DFW Riverways.....	617/626-1540
MA Dept. of Housing & Community Development.....	617/573-1100
Woods Hole Oceanographic Institute.....	508/457-2180
UMass-Amherst Cooperative Extension.....	413/545-4800
National Fire Protection Association (NFPA).....	617/770-3000
New England Disaster Recovery Information X-Change (NEDRIX – an association of private companies & industries involved in disaster recovery planning).....	781/485-0279
MA Board of Library Commissioners.....	617/725-1860
MA Highway Dept, District 2.....	413/582-0599
MA Division of Marine Fisheries.....	617/626-1520
MA Division of Capital & Asset Management (DCAM).....	617/727-4050
University of Massachusetts/Amherst.....	413/545-0111
Natural Resources Conservation Services (NRCS).....	413/253-4350
MA Historical Commission.....	617/727-8470
U.S. Army Corps of Engineers.....	978/318-8502
Northeast States Emergency Consortium, Inc. (NESEC).....	781/224-9876
National Oceanic and Atmospheric Administration: National Weather Service.....	508/824-5116
US Department of the Interior: US Fish and Wildlife Service .....	413/253-8200
US Geological Survey.....	508/490-5000

**2) Mitigation Funding Resources**

404 Hazard Mitigation Grant Program (HMGP) .....	MA Emergency Management Agency
406 Public Assistance and Hazard Mitigation .....	MA Emergency Management Agency
Community Development Block Grant (CDBG).....	DHCD, also refer to RPC
Dam Safety Program.....	MA Division of Conservation and Recreation
Disaster Preparedness Improvement Grant (DPIG) .....	MA Emergency Management Agency
Emergency Generators Program by NESEC‡ .....	MA Emergency Management Agency
Emergency Watershed Protection (EWP) Program.....	USDA, Natural Resources Conservation
Service Flood Mitigation Assistance Program (FMAP).....	MA Emergency Management Agency
Flood Plain Management Services (FPMS).....	US Army Corps of Engineers
Mitigation Assistance Planning (MAP).....	MA Emergency Management Agency
Mutual Aid for Public Works.....	Western Massachusetts Regional Homeland Security Advisory Council
National Flood Insurance Program (NFIP) † .....	MA Emergency Management Agency
Power of Prevention Grant by NESEC‡ .....	MA Emergency Management Agency
Roadway Repair & Maintenance Program(s).....	Massachusetts Highway Department
Section 14 Emergency Stream Bank Erosion & Shoreline Protection .....	US Army Corps of Engineers
Section 103 Beach Erosion.....	US Army Corps of Engineers
Section 205 Flood Damage Reduction.....	US Army Corps of Engineers
Section 208 Snagging and Clearing .....	US Army Corps of Engineers
Shoreline Protection Program.....	MA Department of Conservation and Recreation
Various Forest and Lands Program(s).....	MA Department of Environmental Protection
Wetlands Programs .....	MA Department of Environmental Protection

‡NESEC – Northeast States Emergency Consortium, Inc. is a 501(c)(3), not-for-profit natural disaster, multi-hazard mitigation and emergency management organization located in Wakefield, Massachusetts. Please, contact NESEC for more information.

† Note regarding National Flood Insurance Program (NFIP) and Community Rating System (CRS): The National Flood Insurance Program has developed suggested floodplain management activities for those communities who wish to more thoroughly manage or reduce the impact of flooding in their jurisdiction. Through use of a rating system (CRS rating), a community’s floodplain management efforts can be evaluated for effectiveness. The rating, which indicates an above average floodplain management effort, is then factored into the premium cost for flood insurance policies sold in the community. The higher the rating achieved in that community, the greater the reduction in flood insurance premium costs for local property owners. MEMA can provide additional information regarding participation in the NFIP-CRS Program.

### 3) Internet Resources

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	<a href="http://www.colorado.edu/litbase/hazards/">http://www.colorado.edu/litbase/hazards/</a>	Searchable database of references and links to many disaster-related websites.
Atlantic Hurricane Tracking Data by Year	<a href="http://wxp.eas.purdue.edu/hurricane">http://wxp.eas.purdue.edu/hurricane</a>	Hurricane track maps for each year, 1886 – 1996
National Emergency Management Association	<a href="http://nemaweb.org">http://nemaweb.org</a>	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center “Disaster Finder:	<a href="http://www.gsfc.nasa.gov/ndrd/disaster/">http://www.gsfc.nasa.gov/ndrd/disaster/</a>	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	<a href="http://ftpwww.gsfc.nasa.gov/ndrd/main/html">http://ftpwww.gsfc.nasa.gov/ndrd/main/html</a>	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	<a href="http://www.statelocal.gov/">http://www.statelocal.gov/</a>	General information through the federal-state partnership.
National Weather Service	<a href="http://nws.noaa.gov/">http://nws.noaa.gov/</a>	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	<a href="http://h20.usgs.gov/public/realtime.html">http://h20.usgs.gov/public/realtime.html</a>	Provisional hydrological data
Dartmouth Flood Observatory	<a href="http://www.dartmouth.edu/artsci/geog/floods/">http://www.dartmouth.edu/artsci/geog/floods/</a>	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	<a href="http://www.fema.gov/fema/csb.html">http://www.fema.gov/fema/csb.html</a>	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	<a href="http://www.met.fsu.edu/explores/tropical.html">http://www.met.fsu.edu/explores/tropical.html</a>	Tracking and NWS warnings for Atlantic Hurricanes and other links
The Tornado Project Online	<a href="http://www.tornadoject.com/">http://www.tornadoject.com/</a>	Information on tornadoes, including details of recent impacts.

Sponsor	Internet Address	Summary of Contents
National Severe Storms Laboratory	<a href="http://www.nssl.uoknor.edu/">http://www.nssl.uoknor.edu/</a>	Information about and tracking of severe storms.
Independent Insurance Agents of America IIAA Natural Disaster Risk Map	<a href="http://www.iaa.iix.com/ndcmap.html">http://www.iaa.iix.com/ndcmap.html</a>	A multi-disaster risk map.
Earth Satellite Corporation	<a href="http://www.earthsat.com/">http://www.earthsat.com/</a>	Flood risk maps searchable by state.
USDA Forest Service Web	<a href="http://www.fs.fed.us/land">http://www.fs.fed.us/land</a>	Information on forest fires and land management.

## **Appendix B – Documentation of the Planning Process**

---

**Wilbraham Hazard Mitigation Planning Committee  
Meeting #1**

**AGENDA  
July 10, 2013  
2:00 p.m.  
Wilbraham Town Hall**

- 1) Introductions
- 2) Chapter 1: Introduction
- 3) Chapter 2: Local Profile
- 4) Chapter 3: Hazard Identification and Analysis
- 5) Chapter 4: Critical Facilities and Infrastructure Map
- 6) Next Meeting Date

**Wilbraham Hazard Mitigation Planning Committee**  
**Meeting #2**

**AGENDA**

**September 16, 2013**

**1:30 p.m.**

**Wilbraham Town Hall**

- 1) Chapter 5: Current Mitigation Strategies
- 2) Chapter 6: Future Mitigation Strategies
- 3) Chapter 7: Incorporation with Documents
- 4) Chapter 8: Plan Adoption and Implementation
- 5) Review of Critical Infrastructure and Hazard Identification Map
- 6) Next Meeting Date

**Wilbraham Hazard Mitigation Planning Committee**  
**Meeting #3**

**AGENDA**  
**October 23, 2013**  
**2:00 p.m.**  
**Wilbraham Town Hall**

- 1) Revisions to Chapters 5 – 8
- 2) Additional information needed
- 3) Public meeting
- 4) Prioritized list of implementation strategies
- 5) Review of Critical Infrastructure and Hazard Identification Map
- 6) Press release
- 7) Next Meeting Date

**Town of Wilbraham  
Hazard Mitigation Planning Workgroup Meeting**

**March 19<sup>th</sup>, 2014, 2:30 – 4:00 p.m.  
Wilbraham Town Hall**

**Meeting Agenda**

1. Hazard identification and risk assessment
  - a. Methodology for determining vulnerability
  - b. Previous occurrences of flooding, dam failures, wildfires, snow storms
  - c. Determination of impact for each hazard
  - d. Evaluation of vulnerability for each hazard
2. Next steps

**Town of Wilbraham  
Hazard Mitigation Planning Workgroup Meeting**

**March 20<sup>th</sup>, 2014, 10:00 – 11:30 a.m.  
Wilbraham Town Hall**

**Meeting Agenda**

1. Overview of current mitigation strategies and current status of each strategy
2. Evaluation of mitigation strategy effectiveness
3. Potential changes to current mitigation strategies
4. Next steps

**Town of Wilbraham  
Hazard Mitigation Planning Workgroup Meeting**

**March 24<sup>th</sup>, 2014, 11:00 a.m. – 12:30 p.m.  
Wilbraham Town Hall**

**Meeting Agenda**

1. Discussion of new proposed mitigation strategies for addressing hazards
  - a. Description of strategy
  - b. Hazards addressed by strategy
  - c. Estimated Cost
  - d. Responsible entity
  - e. Priority
  - f. Timeline for completion
2. Next steps

**Town of Wilbraham  
Hazard Mitigation Planning Workgroup Meeting**

**March 27<sup>th</sup>, 2014, 10:00 – 11:30 a.m.  
Wilbraham Town Hall**

**Meeting Agenda**

1. Discussion of process for adoption and maintenance of plan
2. Procedure for routine updates
3. Incorporation of plan with other municipal planning documents and operations
4. Review of overall plan
  - a. Planning Process
  - b. Local setting
  - c. Hazard identification and risk assessment
  - d. Mitigation strategies
5. Next steps

**Town of Wilbraham  
Hazard Mitigation Plan  
Public Input Meeting**

**March 20<sup>th</sup>, 2014, 9:00 – 10:00 a.m.  
Wilbraham Town Hall**

**Meeting Agenda**

1. Welcome and introductions
2. Overview of Hazard Mitigation Planning process
3. Hazard identification and risk assessment
  - a. Types of hazards affecting Wilbraham
  - b. Previous occurrences, extent, location, impact, future probability, and vulnerability of each hazard
4. Existing mitigation measures and evaluation of effectiveness for mitigation
5. Recommended new, or changes to existing, mitigation strategies
6. Discussion
7. Next steps

**Town of Wilbraham  
Hazard Mitigation Plan  
Public Input Meeting**

**March 27<sup>th</sup>, 2014, 9:00 – 10:00 a.m.  
Wilbraham Town Hall**

**Meeting Agenda**

1. Welcome and introductions
2. Overview of Hazard Mitigation Planning process
3. Review of information collected from first public meeting
  - a. Hazard identification and risk assessment
  - b. Existing mitigation measures and evaluation of effectiveness for mitigation
  - c. Recommended new, or changes to existing, mitigation strategies
4. Discussion and feedback
5. Next steps

## Public Meeting Notice for Hazard Mitigation Public Meeting on March 20<sup>th</sup>, 2014

(Posted in Wilbraham Town Hall on March 18, 2014)

# Town of Wilbraham Meeting Notice

Committee Name: Hazardous Mitigation Planning

Date of Meeting: March 20, 2014

Time of Meeting: 9:00 a.m.

Location of Meeting:

Town Hall  
240 Springfield Street  
Wilbraham, MA 01095

Posted by: D. Grochmal  
Hazardous Mitigation Planning

Date of posting: March 18, 2014

Please note that Saturday, Sunday or holidays do not count in the 48 hour requirement. MGL 30A, s18-25

## Meeting Agenda:

(Please type scheduled agenda below)

1. Welcome and introductions
2. Overview of Hazard Mitigation Planning process
3. Hazard identification and risk assessment
  - a. Types of hazards affecting Wilbraham
  - b. Previous occurrences, extent, location, impact, future probability, and vulnerability of each hazard
4. Existing mitigation measures and evaluation of effectiveness for mitigation
5. Recommended new, or changes to existing, mitigation strategies
6. Discussion
7. Next steps

## Public Meeting Notice for Hazard Mitigation Public Meeting on March 27<sup>th</sup>, 2014

(Posted in Wilbraham Town Hall on March 24, 2014)

### Town of Wilbraham Meeting Notice

Committee Name: Hazardous Mitigation Planning

Date of Meeting: March 27, 2014

Time of Meeting: 9:00 a.m.

Location of Meeting:

Town Hall  
240 Springfield Street  
Wilbraham, MA 01095

Posted by: D. Grochmal  
Hazardous Mitigation Work Group

Date of posting: March 24, 2014

Please note that Saturday, Sunday or holidays do not count in the 48 hour requirement. MGL 30A, s18-25

### Meeting Agenda:

(Please type scheduled agenda below)

#### Meeting Agenda

1. Welcome and introductions
2. Overview of Hazard Mitigation Planning process
3. Review of information collected from first public meeting
  - a. Hazard identification and risk assessment
  - b. Existing mitigation measures and evaluation of effectiveness for mitigation
  - c. Recommended new, or changes to existing, mitigation strategies
4. Discussion and feedback
5. Next steps



Catalyst for Regional Progress

**PVPC**

Timothy W. Brennan, Executive Director

## MEDIA RELEASE

CONTACT: Josiah Neiderbach, PVPC Planner, (413) 781-6045 or [jneiderbach@pvpc.org](mailto:jneiderbach@pvpc.org)  
Dena Grochmal, Engineering Assistant, Town of Wilbraham, (413) 596-2800 ext. 208 or  
[dgrochmal@wilbraham-ma.gov](mailto:dgrochmal@wilbraham-ma.gov)

FOR IMMEDIATE RELEASE

March 24, 2014

### **Town of Wilbraham Hazard Mitigation Plan Public Engagement Event Slated**

Wilbraham residents are invited to provide comments on a draft hazard mitigation plan **Thursday, March 27**, 9:00 a.m. to 10:00 a.m. in the Selectmen's Meeting Room, 240 Springfield Street. The draft plan was produced by the Town, along with Pioneer Valley Planning Commission. All members of the public are welcome to attend the event.

The meeting will include an introduction to the planning process, a summary of existing mitigation initiatives, and an outline of recommended strategies for addressing natural hazards in Wilbraham. Municipal officials and PVPC staff will be available to answer questions and listen to comments on the draft plan, which is posted at <http://pvpc.org/resources/landuse/2014/2014%20wil-hazard-mit-plan-draft.pdf>.

This planning effort is being undertaken to help the Town of Wilbraham assess the risks faced from natural hazards, identify action steps that can be taken to prevent damage to property and loss of life, and prioritize funding for mitigation efforts. A mitigation action is any action taken to reduce or eliminate the long-term risk to human life and property from hazards.

The hazard mitigation plan was developed with funding provided by the Federal Emergency Management Agency and assistance from the Massachusetts Emergency Management Agency.

For more information, please contact PVPC's Josiah Neiderbach at [jneiderbach@pvpc.org](mailto:jneiderbach@pvpc.org) or (413) 781-6045.

### Media Organizations Sent Press Releases

<b>Media Organization</b>	<b>Address</b>	<b>Town</b>	<b>State</b>	<b>Zip Code</b>
African American Point of View	688 Boston Road	Springfield	MA	01119
Agawam Advertiser News	23 Southwick Street	Feeding Hills	MA	01030
Amherst Bulletin	115 Conz Street	Northampton	MA	01060
Belchertown Sentinel	1 Main Street	Belchertown	MA	01007
Berkshire Eagle	75 South Church Street	Pittsfield	MA	01202
Brattleboro Reformer	62 Black Mountain Rd.	Brattleboro	VT	05301
CBS 3 Springfield	One Monarch Place	Springfield	MA	01144
Chicopee Register	380 Union Street	West Springfield	MA	01089
CommonWealth Magazine	18 Tremont Street	Boston	MA	02108
Country Journal	5 Main Street	Huntington	MA	01050
Daily Hampshire Gazette	115 Conz Street	Northampton	MA	01060
El Sol Latino	P.O. Box 572	Amherst	MA	01004
Going Green	PO Box 1367	Greenfield	MA	01302
Hilltown Families	P.O. Box 98	West Chesterfield	MA	01084
Holyoke Sun	138 College Street	South Hadley	MA	01075
Journal Register	24 Water Street	Palmer	MA	01069
La Voz Hispana	133 Maple Street #201	Springfield	MA	01105
Ludlow Register	24 Water Street	Palmer	MA	01069
Massachusetts Municipal Association	One Winthrop Street	Boston	MA	02110
Quaboag Current	80 Main Street	Ware	MA	01082
Recorder	14 Hope Street	Greenfield	MA	01302
Reminder	280 N. Main Street	East Longmeadow	MA	01028
Southwick Suffield News	23 Southwick Street	Feeding Hills	MA	01030
State House News Service	State House	Boston	MA	02133
Tantasqua Town Common	80 Main Street	Ware	MA	01082
The Longmeadow News	62 School Street	Westfield	MA	01085
The Republican	1860 Main Street	Springfield	MA	01102
The Westfield News	62 School Street	Westfield	MA	01085
Town Reminder	138 College Street	South Hadley	MA	01075
Urban Compass	83 Girard Avenue	Hartford	CT	06105
Valley Advocate	115 Conz Street	Northampton	MA	01061
Vocero Hispano	335 Chandler Street	Worcester	MA	01602
WAMC Northeast Public Radio	1215 Wilbraham Road	Springfield	MA	01119
Ware River News	80 Main Street	Ware	MA	01082
West Springfield Record	P.O. Box 357	West Springfield	MA	01098
WFCR-Public Radio	131 County Circle	Amherst	MA	01003

WGBY-Public TV	44 Hampden Street	Springfield	MA	01103
WGGB ABC40/FOX 6 News	1300 Liberty Street	Springfield	MA	01104
WHMP-FM	15 Hampton Avenue	Northampton	MA	01060
Wilbraham-Hampden Times	2341 Boston Road	Wilbraham	MA	01095
Worcester Telegram & Gazette	20 Franklin Street	Worcester	MA	01615
WRNX/WHYN/WPKR Radio	1331 Main Street	Springfield	MA	01103
WWLP-TV 22	PO Box 2210	Springfield	MA	01102

## **Pioneer Valley Planning Commission Regional Reporter January 2015**

Let PVPC Guide Your Community Through the Hazard Mitigation Planning Process!

Over the past 10 years, PVPC has helped 40 communities in the Pioneer Valley develop hazard mitigation plans, making them eligible for grant opportunities from the Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA).

Through the hazard mitigation planning process, communities assess their vulnerability to natural hazards, such as flooding, snowstorms, hurricanes, wildfire, and tornadoes. They also prioritize a set of mitigation strategies that will help eliminate the long-term risk to human life and property from these hazards. Common mitigation strategies that are eligible for grant funding from FEMA and MEMA include minor localized flood reduction projects, structural retrofitting of existing buildings, culvert improvements, installation of emergency backup generators, and infrastructure retrofits.

PVPC provides guidance in all aspects of the development of hazard mitigation plans, including identification and mapping of natural hazards, collaboration with municipal officials to prioritize mitigation strategies, and public outreach. PVPC can also assist communities in applying for grants to fund mitigation projects, through its Local Technical Assistance (*LTA*) program. Contact Josiah Neiderbach at [jneiderbach@pvpc.org](mailto:jneiderbach@pvpc.org) to find out more.

## **Pioneer Valley Planning Commission Regional Reporter April 2013**

The Pioneer Valley Planning Commission is currently working with 23 member municipalities to create new hazard mitigation plans and update expiring plans. These plans, approved by the Federal Emergency Management Agency (FEMA), make these municipalities eligible to apply for hazard mitigation grant funds to address identified top community priorities to mitigate the long-term consequences of natural disasters.

PVPC is currently in the process of creating or updating plans for 10 communities. This includes developing new hazard mitigation plans for Granville, Longmeadow, Montgomery, Russell, and Wales, as well as updating the current plans for Agawam, Easthampton, Hampden, Southwick, and Ware.

PVPC also recently applied for funds from FEMA to create or update plans for an additional 13 communities. This includes creating new plans for Blandford and Tolland, as well as updating existing plans for Chesterfield, Hadley, Hatfield, Holyoke, Ludlow, Monson, Northampton, South Hadley, Southampton, Westhampton, and Wilbraham.

Copies of approved hazard mitigation plans are available on PVPC's website at <http://www.pvpc.org/activities/landuse-mitplans-2011.shtml>. For more information please contact PVPC's Josiah Neiderbach at (413) 781-6045 or [jneiderbach@pvpc.org](mailto:jneiderbach@pvpc.org).

**Pioneer Valley Planning Commission Regional Reporter  
December 2012**

*PVPC working with member communities to mitigate the long term consequences of natural hazards*

PVPC is working with 10 member municipalities to update and/or develop new Hazard Mitigation plans. Granville, Longmeadow, Montgomery, Russell, and Wales are all developing their first Hazard Mitigation plans; while Agawam, Easthampton, Hampden, Southwick, and Ware are working on updates.

PVPC was also engaged by the University of Massachusetts Amherst campus to write their campus Hazard Mitigation plan, and PVPC has just submitted a grant application to MEMA to update plans for Hadley, Hatfield, Holyoke, Ludlow, Monson, Northampton, South Hadley, Southampton, Westhampton, and Wilbraham.

Having a FEMA approved Hazard Mitigation plan makes each municipality eligible to apply for Hazard Mitigation grant funds to address identified top community priorities to mitigate the long-term consequences of natural disasters.

For more information, please contact Catherine Ratté at [cratte@pvpc.org](mailto:cratte@pvpc.org) or 413/781-6045.

Screen shot of Pioneer Valley Planning Commission website, with press release about public meeting for Wilbraham Hazard Mitigation Plan

**Pioneer Valley Planning Commission**  
Catalyst for Regional Progress  
pvpc.org

Navigation bar compatibility issues with internet explorer?

**Projects & Plans**  
Click here for list of Projects and Plans by Sections

**Direct Local Technical Assistance (DLTA) Products**  
Click here to view or download DLTA products.

**Calendar**  
SUN MON TUE WED THU FRI SAT  
1 2 3 4 5 6 7  
8 9 10 11 12 13 14  
15 16 17 18 19 20 21  
22 23 24 25 26 27 28  
29 30 31

**Today** Thursday, April 10

**Thursday, April 10**  
5:30pm Commission Meeting

**Thursday, April 24**  
4:00pm Executive Committee Meeting

**Thursday, May 1**  
10:00am Hampden County Health Coalition

**Thursday, May 22**  
4:00pm Executive Committee Meeting

**Thursday, June 5**  
10:00am Hampden County Health Coalition

Showing events until 6/15. [Look for more](#)

Events shown in time zone: Eastern Time

**Bids & Proposals**

**Request for Qualifications: Trail and Trailhead Design Services for the Connecticut River Scenic Byway Recreational Access Project**  
Click here to view/download (pdf)

**Invitation for Bids (IFB): Consultant Services for the Scenic Byway Waypoint Interpretive Center Exhibit Design**  
Click here to view/download (pdf)

**Request for Proposals (RFP): Easement Negotiation and Acquisition Services for the Connecticut River Scenic Byway Recreational Trails project**  
Click here to view/download (pdf)

**News & Announcements**

**Hart Wool (Holyoke) Brownfields ABCA and Public Meeting, April 17, 2014 at 5:30 pm.** Click here for more information (pdf)

**Community Meeting Proposed Improvements for the Memorial and Merrick Neighborhoods, Wednesday April 9, 2014**  
Click below for more information (pdf)  
English  
Spanish  
Russian

**Draft of 5 year update to the Wilbraham Hazardous Mitigation Plan**  
Click here to view/download (pdf)

**New Pioneer Valley Data Portal Launched**  
Click here for information (pdf)

## Public Outreach Presentation

### Wilbraham Hazard Mitigation Plan

Public Outreach Event  
March 27, 2014



### Agenda

- Overview of Hazard Mitigation
- Content of Wilbraham Hazard Mitigation Plan
  - Hazard Identification and Risk Assessment
  - Critical infrastructure
  - Existing strategies for mitigating hazards
  - Proposed strategies for mitigating hazards
- Question and comment period

## What is Hazard Mitigation?

3

According to FEMA:

“any sustained action taken to reduce or eliminate long-term risk to people and property from natural hazards such as flooding, storms, high winds, hurricanes, wildfires, earthquakes, etc.”

## Benefits of Hazard Mitigation

4

- Makes community eligible to apply for Hazard Mitigation funds from FEMA
- Mitigation is less expensive than disaster clean up
- Having a plan provides an approach for using limited resources more effectively

## Overview of a Hazard Mitigation Plan

### Purpose of plan:

Lessen the long-term consequences of natural disasters

### Key plan components:

1. Hazard identification and assessment
2. Identification of critical infrastructure
3. Existing and proposed mitigation strategies
4. Proposed schedule for implementation of strategies

## Wilbraham Hazard Mitigation Workgroup

### Municipal staff provided input on the plan:

- Tonya Basch, Assistant Town Engineer
- Dena Grochmal, Town Engineering Assistant
- Francis Nothe, Emergency Management Director
- William Sperrazza, Highway Superintendent
- Lance Trevallion, Building Inspector
- Edmond Miga Jr., Department of Public Works Director

The Pioneer Valley Planning Commission assisted the Town with the development of the plan, through funding from FEMA via MEMA.

## Hazard Assessment

Type of Hazard	Location of Occurrences	Probability of Future Events	Impact	Vulnerability
Floods	Large	Moderate	Limited/Critical	1
Severe snowstorms / ice storms	Large	High	Critical	2
Hurricanes	Large	Low	Limited/Critical	4
Severe thunderstorms / wind / tornadoes	Medium	Medium	Critical	2
Wildfires / brushfires	Medium	Low	Minor	3
Earthquakes	Large	Low	Limited/Critical	4
Dam failures	Medium	Low	Minor/Critical	5
Drought	Large	Medium	Minor	4

## Critical Infrastructure Inventory

An inventory of critical infrastructure in Wilbraham was conducted, which included:

- Emergency services
- Town offices
- Water, sewer, and road infrastructure
- Communications towers
- Emergency shelters

Other structures identified include elderly housing and assisted living residences, schools and places of worship.

## Critical Infrastructure Affected by Hazards

Critical Facilities and Evacuation Routes Potentially Affected by Hazard Areas			
Hazard Type	Hazard Area	Critical Facilities Affected	Evacuation Routes Affected
Flooding	Underpass at Stone Hill Road is regularly inundated, also Main Street / River Road / Boston Road / Sawmill Road / Soule Road	Main Street / Fire Department Station #2, Flow of persons and goods	Boston Road and Main Street, Northbound exit from Wilbraham
SEVERE HURRICANES / 100 STORMS	Entire Town	Ridge Road Telephone and Radio Relay Equipment	N/A
Hurricanes	Main Street / River Road / Boston Road / Sawmill Road / Soule Road	Main Street / Fire Department Station #2	Boston Road and Main Street
Severe thunderstorms / wind / tornadoes	N/A	N/A	N/A
Wildfires / brushfires	Hills in western Wilbraham	Residential properties	N/A
Earthquakes	N/A	N/A	N/A
Dam failures	Quabbin Reservoir / Ludlow Reservoir	Entire Town and/or River Road	N/A
DROUGHT	N/A	N/A	N/A

9

## Existing and New Mitigation Strategies

10

- The Town of Wilbraham has a set of existing mitigation strategies included in its operations, zoning bylaw, subdivision regulations, and other planning documents (see handout)
- The Hazard Mitigation Workgroup evaluated each mitigation strategy to determine its effectiveness
- The Workgroup also developed and prioritized a list of new mitigation strategies (see handout)

## Next Steps in Planning Process

11

- Plan available on Monday, March 24th for public review and comment at [www.pvpc.org](http://www.pvpc.org)
- Draft plan will be submitted to MEMA and FEMA
- MEMA and FEMA provide comments, which are incorporated into plan
- Plan reviewed and voted upon by Wilbraham Select Board

## Question and Comments

12

Contact information:

Josiah Neiderbach

Planner, Pioneer Valley Planning Commission

E-mail: [jneiderbach@pvpc.org](mailto:jneiderbach@pvpc.org)

Phone: 413-781-6045

**Wilbraham Hazard Mitigation Committee Meeting  
Sign-In Sheet  
July 10<sup>th</sup>, 2013, Wilbraham Town Hall**

July 10<sup>th</sup> Hazard Mitigation Plan Mtg.  
Wilbraham

	Name	Position	<del>Contact</del>
	Tonya Basch	DPW	
Position	Ed Misa	DPW	
	Dena Grochmal	DPW	
	BILL SPERRAZZA	PUBLIC WORKS	

**Wilbraham Hazard Mitigation Planning Committee  
Meeting #2**

**September 16, 2013  
1:30 p.m.  
Wilbraham Town Hall**

**Sign In Sheet**

Name	Position
Dera Grodman	ENG ASST.
Edward J. Mize J	D.P.W. Director

**Wilbraham Hazard Mitigation Planning Committee  
Meeting #3**

**September 23, 2013  
2:00 p.m.  
Wilbraham Town Hall**

**Sign In Sheet**

<b>Name</b>	<b>Position</b>
Dena Grochmal	Engineer ASST.
Edmond Miga	DPW Director
Jared Neidhart	PUC

Note: Date on sign-in sheet was a typo. The meeting occurred on October 23, 2013, rather than September 23, 2013.

**Wilbraham Hazard Mitigation Committee Meeting  
Sign-In Sheet  
January 23rd, 10:00 a.m., Wilbraham Town Hall**

Name	Position	E-mail
BOURCIER, DAVID F.	WILB. FIRE CAPT.	DBOURCIER@WILBRAHAM-MA.GOV
Margaret Groff	MEMA	margaret.groff@memama.us
BILL SPERAZZA	WILB. DPW	wsperrazza@wilbraham-ma.gov
ED MIGN	WILB. DPW DIRECTOR	EMIGN@WILBRAHAM-MA.GOV
Dena Grochmal	Engineer Asst.	dgrochmal@wilbraham-ma.gov
Lance Trevallion	Building Commissioner	ltrevallion@wilbraham-ma.gov
Josiah Neiderbach	PVPC	jneiderbach@pvpc.org

**Wilbraham Hazard Mitigation Committee Meeting  
Sign-In Sheet  
March 19th, 2:30 p.m., Wilbraham Town Hall**

Name	Position	E-mail
Dena Grochmal	ENGINEER ASST	dgrochmal@wilbraham-mit.gov
Ed. H. King	DPW. DIRECTOR	EMIGIA@WILBRAHAM-MA.GOV
Bill SPERRAZZA	SUPT. OF OPERATIONS	wsperrazza@wilbraham-ma.gov
TONYA BASCH	ASST DIRECTOR	tbasch@ " " "

**Wilbraham Hazard Mitigation Workgroup Meeting  
Sign-In Sheet  
March 20th, 10:00 a.m., Wilbraham Town Hall**

Name	Position	E-mail
Tonya Basch	Assist. DPW Director/Engineer	tbasch@wilbraham-ma.gov
Bill Sperrazza	SUPT of Operations	wsperrazza@wilbraham-ma.gov
Ed Miga	DPW Director	EMIGA@WILBRAHAM-MA.GOV
Dena Strickland	Eng ASST	dgrahman@wilbraham-ma.gov

**Wilbraham Hazard Mitigation Workgroup Meeting**

**Sign-In Sheet**

**March 24th, 11:00 a.m., Wilbraham Town Hall**

Name	Position	E-mail
Dana Grochmal	Eng Asst	dgrochmal@wilbraham-ma.gov
Edmund Miaga	DPU Director	emiaga@wilbraham-ma.gov

**Wilbraham Hazard Mitigation Workgroup Meeting  
Sign-In Sheet  
March 27th, 10:00 a.m., Wilbraham Town Hall**

Name	Position	E-mail
Dena Grachnal	Eng Asst	dgrachnal@wilbraham-ma.gov
Tonya Basch	Asst DPW Dir	tbasch@wilbraham-ma.gov
Ed Miga	DPW Director	emiga@wilbraham-ma

## Appendix C – List of Acronyms

---

FEMA	Federal Emergency Management Agency
MEMA	Massachusetts Emergency Management Agency
PVPC	Pioneer Valley Planning Commission
EPA	Environmental Protection Agency
DEP	Massachusetts' Department of Environmental Protection
NWS	National Weather Service
HMGP	Hazard Mitigation Grant Program
FMA	Flood Mitigation Assistance Program
SFHA	Special Flood Hazard Area
CIS	Community Information System
DCR	Massachusetts Department of Conservation and Recreation
FERC	Federal Energy Regulatory Commission
TRI	Toxics Release Inventory
FIRM	Flood Insurance Rate Map
NFIP	National Flood Insurance Program
CRS	Community Rating System
BOS	Board of Selectmen
DPW	Department of Public Works
LEPC	Local Emergency Planning Committee
EMD	Emergency Management Director
Con Com	Conservation Commission
Ag Com	Agricultural Commission
EOC	Emergency Operations Center
CEM Plan	Comprehensive Emergency Management Plan
EMA	Emergency Management Agency
RACES	Radio Amateur Civil Emergency Service
WMECO	Western Massachusetts Electric Company
HAZMAT	Hazardous Materials

## **Appendix D – Past and Potential Hazards/Critical Facilities Map**

---

**CERTIFICATE OF ADOPTION**

**Town of Wilbraham, MASSACHUSETTS**

BOARD OF SELECTMEN

**A RESOLUTION ADOPTING THE TOWN OF WILBRAHAM HAZARD MITIGATION PLAN**

WHEREAS, the Town of Wilbraham established a Workgroup to prepare the Hazard Mitigation plan; and

WHEREAS, the Town of Wilbraham participated in the development of the Town of Wilbraham Hazard Mitigation Plan;

and WHEREAS, the Town of Wilbraham Hazard Mitigation Plan contains several potential future projects to mitigate potential impacts from natural hazards in the Town of Wilbraham, and

WHEREAS, a duly-noticed public meeting was held by the Board of Selectmen on \_\_\_\_\_ for the public and municipality to review prior to consideration of this resolution; and

WHEREAS, the Town of Wilbraham authorizes responsible departments and/or agencies to execute their responsibilities demonstrated in the plan, and

NOW, THEREFORE BE IT RESOLVED that the Town of Wilbraham Board of Selectmen formally approves and adopts the Town of Wilbraham Hazard Mitigation Plan, in accordance with M.G.L. c. 40.

ADOPTED AND SIGNED this \_\_\_\_\_,

ATTEST