THE TOWN OF WILBRAHAM
LOCAL NATURAL HAZARDS MITIGATION PLAN

Adopted by the Wilbraham Board of Selectmen on _____

Prepared by:
The Wilbraham Natural Hazards Mitigation Planning Committee

and

The Pioneer Valley Planning Commission
26 Central Street, Suite 34
West Springfield, MA 01089
(413) 781-6045
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

1 - INTRODUCTION 1
Hazard Mitigation 1
Planning Process 1

2 – LOCAL PROFILE 6
Community Setting 6
Infrastructure 8
Natural Resources 25

3 – HAZARD IDENTIFICATION & ANALYSIS 31
Natural Hazard Identification 31
Natural Hazard Analysis Methodology 39
Detailed Natural Hazards Profile for Wilbraham 43
Vulnerability Assessment 51
Past and Potential Hazards 51

4 – CRITICAL FACILITIES 59
Critical Facilities within Hazard Areas 59
Category 1 – Emergency Response Services 59
Category 2 – Non Emergency Response Facilities 61
Category 3 – Facilities/Populations to Protect 62

5 – CURRENT MITIGATION STRATEGIES 65
Flooding 65
Severe Snowstorms/Ice Storms 90
Hurricanes 96
Tornadoes 100
Wildfires/Brushfires 104
Earthquakes 108
Dam Failures 114
Drought 120
Man-Made Hazards/Hazardous Materials 123

6 – FUTURE MITIGATION STRATEGIES 126
Goal Statements and Action Items 126
General Mitigation Action Items 126
Flooding 127
Severe Snow Storms/Ice Storms 129
Hurricanes and Tornadoes 130
Wildfires/Brushfires 130
Earthquakes 130
Dam Failure 131
Drought 131
Man-Made Hazards/Hazardous Materials 132
Prioritized Implementation Schedule 133

7 – INCORPORATION WITH DOCUMENTS.....136

8 – PLAN ADOPTION & IMPLEMENTATION.....137
Plan Adoption.....137
Plan Implementation.....137
Appendix A.....141
Appendix B.....144
Appendix C.....149
Appendix D: Past and Potential Hazards/Critical Facilities Map.....150
Appendix E.....151

Acknowledgements

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

Tonya Basch, Assistant Town Engineer
Dena Grochmal, Town Engineering Assistant
Francis Nothe, Emergency Management Director
Wendy Foxmyn
Frank Shea, Highway Superintendent
Lance Trevallion, Building Inspector

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 Miller, Principal Planner/Co-Project Manager
Eric Twarog, Senior Planner/Co-Project Manager
Andrew Smith, Land Use Specialist
Shaun Hayes, Principal Planner/GIS-Graphics Section Head
Todd Zukowski, Senior Planner/GIS Specialist
Jim Scace, GIS Specialist

1 - INTRODUCTION

Hazard Mitigation

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 Local Natural Hazards Mitigation Plan before a disaster occurs can save the community money and will 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 (PDM) Program are programs with this requirement.

Planning Process

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

- Identifying the natural hazards that may impact the community.

- Conducting a Vulnerability/Risk Assessment to identify the infrastructure (i.e., critical facilities, public buildings, roads, homes, businesses, etc.) 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. Examples of such strategies include:

    - Preventing or limiting development in natural hazard areas like floodplains;
    - Incorporating recommendations in existing planning documents including Stormwater Management Plans, Master Plans, Open Space and Recreation Plans, and Emergency/Evacuation Plans that address the impacts of natural hazards; and
    - Requiring or encouraging the use of specific structural requirements for new buildings such as buried utilities, flood-proofed structures, and lightening grounding systems.

- Identifying deficiencies in the current strategies and establish goals for updating, revising or adopting new strategies.

- Adopting and implementing the final Local Natural Hazards Mitigation Plan.

During the planning process, the Town's Local Natural Hazard Planning Committee identified Action Plan items and specific time frames. The actions were selected from a list of local strategies which were compiled by the Pioneer Valley Planning Commission using current best practices and others identified by the Town during their review of existing programs, policies, and regulations. From this list, specific Action Items were prioritized by the Town's Local Natural Hazards Planning Committee based on the following criteria:

- Select Action Items which have the ability to significantly mitigate the negative impact of natural hazards on people and property;
- Select Action items which the Town has the ability to implement given the financial and staff resources available;
- Select Action Items which will have the greatest influence on achieving Local Goals & Objectives;
- Select a diverse set of Action Items which will address different Natural Hazards that present a high or moderate risk to the region; and
- Select Action items which will address those mitigation measures identified as deficient or in need of attention to ensure that the Town is in the best

- FEMA's STAPLE+E evaluation process.

For example, updating or adopting a local floodplain bylaw would be a relatively low cost action item, which could have a significant impact on mitigating hazards caused by flooding. If adopted by the Town, this bylaw would discourage development in floodplain areas and prevent harm to people and damage to property. Another action item was to review and maintain shelters for victims of natural hazards within the Town and to conduct outreach to residents so that they are aware of the availability of those shelters.

First, however, the Town must identify what services are available at the different shelters (e.g. food preparation, potable water, back-up electrical power, heat, showers, etc.) and whether the location of different shelters will be impacted by different hazards (i.e. whether flooding will make the shelter inaccessible to some residents). This action item, review and maintain shelters, also addressed a number of different natural hazards and would help ensure that suitable shelters are available for different types of natural hazards. The action items selected were all considered to have a low to moderate cost to implement. In some cases grant funding would be sought for implementation given the limited resources available in the Town.

The local action items represent a multi-faceted approach to addressing natural hazards in the Town and will be undertaken as resources become available and will be integrated into ongoing planning activities. As part of the review and adoption process, the Committee approved the action items that were in keeping with the goals and criteria established by the Town and assigned appropriate bodies within the Town to implement them within a five-year framework.

Public Committee Meetings
(Please refer to Appendix B for agendas)

1) February 27, 2007 10:30 am – 12:00 pm, Wilbraham Town Hall
2) March 15, 2007 – 10:30 am – 12:00 pm, Wilbraham Town Hall
3) May 3, 2007 – 10:00 am – 12:00 pm, Wilbraham Town Hall
4) October 24, 2007 – 10:00 am – 12:00 pm Wilbraham Town Hall

Public Meetings with the Board of Selectmen

TBD: The Board of Selectmen agreed to begin the process of developing a Local Hazard Mitigation Plan. Meeting held at Wilbraham Town Offices.

TBD: The Board of Selectmen adopted the Local Hazard Mitigation Plan. Hearing held at Wilbraham Town Offices.

A mailing was made to each committee member, prior to each meeting that contained information from the previous meeting, an agenda sheet, and information to be covered.

Public Involvement in the Planning Process

On September 13, 2007 the Pioneer Valley Planning Commission sent a press release to all area media outlets to inform the general public that drafts of the region's Hazard Mitigation plans were complete and available for public comment and review on the Commission's website (www.pvpc.org). This press release (appendix F) resulted in a series of news articles (Appendix F) that further enhanced awareness of the Hazard Mitigation Planning Process. This action was undertaken to ensure that residents of Wilbraham and neighboring jurisdictions had an opportunity to participate in the plan development process.

Involving neighboring Jurisdictions

In the initial stages of the planning process for this mitigation plan, the Pioneer Valley Planning Commission conducted a series of outreach efforts to make the public aware of the regional mitigation process. In October of 2005, the Planning Commission notified all Select Boards and Chief Elected Officials that their community could participate in the region's mitigation planning process. Again, on April 4, 2006, the Planning Commission mailed a notice of planning activities to all Chief Elected Officials and Select Board in the Pioneer Valley. Both mailings explained the purpose of mitigation planning and invited communities to participate in either Round I or Round II of the region's mitigation planning process.

On November 20th, 2007 the Pioneer Valley Planning Commission Presented the planning process that led to the creation of the *Wilbraham Local Natural Hazards Mitigation Plan*. The Western Regional Homeland Security Advisory Council is the planning entity responsible for planning and implementing the homeland security planning activities of Berkshire, Franklin, Hampden and Hampshire Counties. Collectively, this body is responsible for 101 communities.

Additionally, the Hampshire Regional Emergency Planning Committee was presented with the findings of this plan during its November15, 2007 meeting. Prior to this briefing, the HREPC was provided with updates of the Hazard Mitigation Planning Process on April 20, 2007 and again on December 21, 2006. While Wilbraham is not in Hampden County, it is useful to keep neighboring

jurisdictions appraised of the town's planning activities. Currently, there is not a regional emergency planning body for Hampden County.

Managing and Updating the Plan

The Wilbraham Local Emergency Planning Committee will manage this plan, update the plan's action steps, update the plan every five years and support funding applications for implementing the plan's action steps.

2 – LOCAL PROFILE[1]

Community Setting

Wilbraham is situated on 22.28 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 lies 87 miles southwest of Boston, thirty miles north of Hartford, and 144 miles from New York City.

Wilbraham is conveniently located near the regional transportation network. The Massachusetts Turnpike traverses the town in the northeast section. Although there is no local interchange, exits in nearby Ludlow and Palmer connect the town to Routes 91 and 291. Proximity to the regional highway system enables residents to live in a rural setting while enjoying the advantages—such as medical services, shopping and higher education—of larger communities. The Five-College Consortium (including UMASS at Amherst) is less than 25 miles away via the backroads of Ludlow and Granby. Both Worcester and Hartford are less than an hour's drive away for most Wilbraham residents. Its proximity to large institutions and major employment centers makes Wilbraham an attractive town for commuters and—more recently—telecommuters.

The town lies within two physiographic provinces that bisect Massachusetts north to south. The Wilbraham Mountains are part of the Central Upland of Massachusetts, while the portion of town west of the mountain lies within the Connecticut Valley Lowland. The most notable natural features are the Chicopee River and the escarpment that marks the eastern ridge of the valley. Known as the Wilbraham Mountains, the escarpment provides a spectacular western view.

The Town 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.

[1] The majority of the information for this section was obtained from various websites including:

Resources

Wilbraham shares several other 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. (Wilbraham sections of the trail are currently under renovation by local Cub Scouts.) Contiguous utility corridors may provide other greenway linking opportunities for the town.

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. And a variety of appointed volunteer committees are responsible for budget preparation, policy development, town bylaws, and state codes and regulations, and advisor responsibilities. All committee meetings are open to the public.

Population Characteristics

There are currently 14,449 Wilbraham residents in approximately 4900 households (2004 town census.) In the 2000 federal census, only 21% of Wilbraham households were classified as "non-family." Married couple families accounted for 67% of households, suggesting a need for family oriented leisure activities. Wilbraham has a median family income of $73,825 according to the 2000 census.

Patterns and Trends

Although it declined somewhat around the turn of the 20th century, agriculture was the mainstay of the Wilbraham economy until the end of WWII. Sheep, cattle, fruit and grain were the principal products until poultry assumed importance around 1930. Favorable railroad facilities and readily available

waterpower were two significant influences on the growth and development of North Wilbraham in the late 1800s.

The residential trend began early in this century when bungalows and cottages were laid out around Nine-Mile Pond. More residential development followed in the 1920s. This trend to residential prominence led to the establishment of a fire department around 1920; a water system in 1926; a zoning by-law and planning board beginning in 1928; and a police department in 1954. Since the end of WWII, agriculture has rapidly disappeared and housing developments have taken its place. Now the town is essentially residential, with farming limited to a handful of specialized farms. Business and industry are mainly confined to the Boston Road area in the north end of town.

It was the explosion of residential growth after WWII that converted Wilbraham from an agricultural community to a so-called "bedroom" community with a predominately residential tax base. In 1963, the town arranged for its first professional assessment of properties. Newly based on full and fair market value, the assessment significantly raised the value of what was then called "idle and waste land." Many owners of open space were prompted to sell to the highest bidder rather than pay the new and substantially higher property taxes.
.....this new value was so high that the cost of owning such land was considered by some property owners as close to confiscatory, while others began to sell their land to any buyer at all—usually a developer and builder of residences. Whether the new conservation commission will enter into this serious problem remains to be seen." (History of Wilbraham, 1964)

Economy

The majority of Wilbraham's workforce depends on the regional economy for employment, traveling an average of 22.6 minutes to work each day. Total employment in the Town of Wilbraham numbers approximately 4,000 persons with an average annual wage of $32,622 and representing a total annual payroll of almost 130 million dollars. Current economic development on Boston Road will provide additional professional office and retail space. 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.

Infrastructure

Town-supplied water has consistently earned high marks in the Commonwealth's Public Water System Award Program. The water department's corrosion control program (CCP) was fully operational as of July 28, 1997. As mandated by state and federal guidelines, the system eliminates

excessive amounts of lead and copper in the water by controlling its corrosiveness.

Total public water supply usage in 2004 was approximately 440 million gallons. In order to reduce the Town's reliance on MWRA supplied water, the Water Commissioners continue to explore a possible groundwater source on Boy Scouts property near the intersection of Soule Road and Stony Hill Road.

Sewage Treatment

Private soil absorption (septic) systems serve about 70% of the town. 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. The limitations of typical Wilbraham soils are considered in more detail in Section 4.
In order 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."

Zoning and Planning

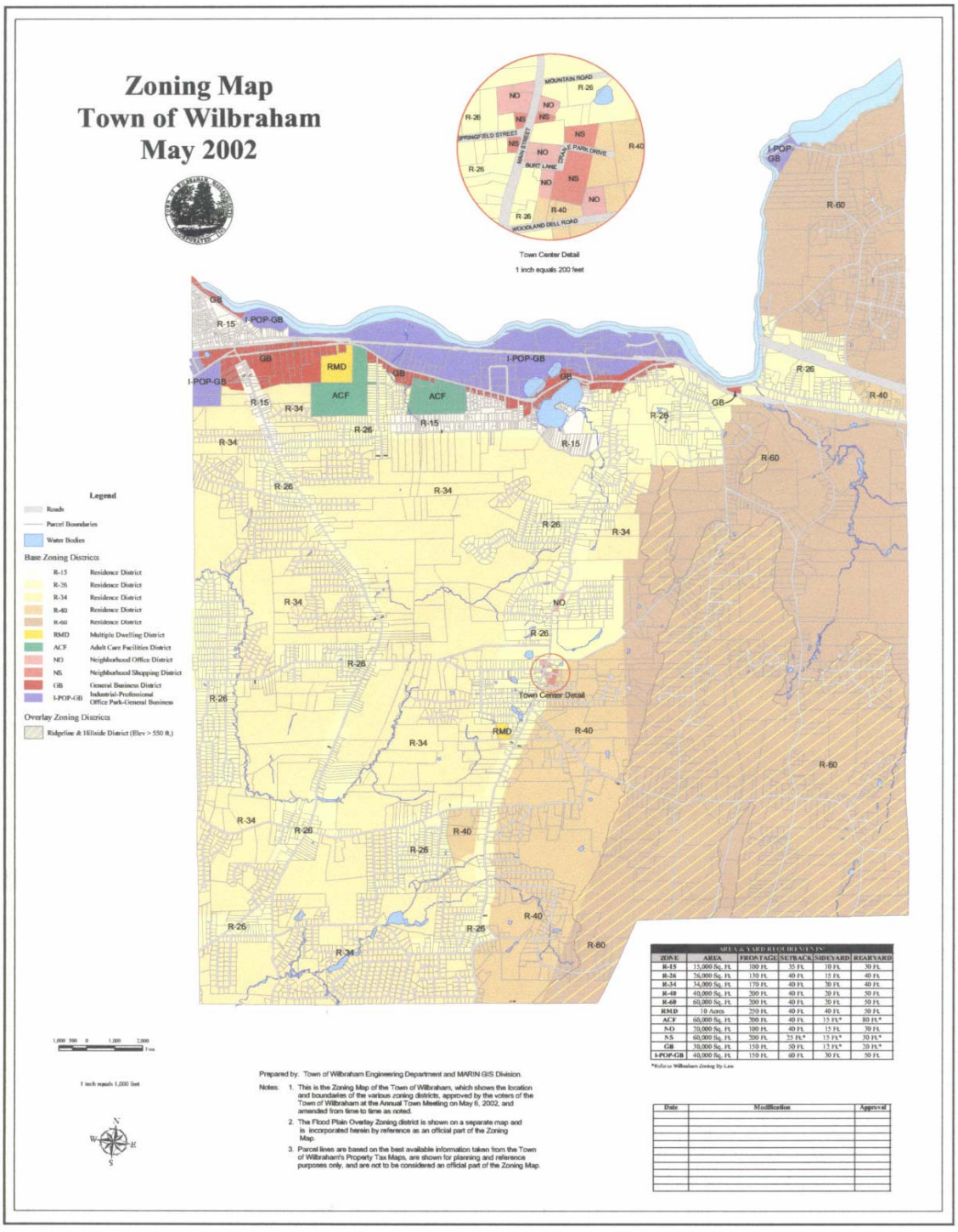
Wilbraham has evolved from an agricultural town to a desirable residential suburb. Through early zoning efforts and long-standing community interest in sound land use planning, Wilbraham has managed to maintain a semi-rural character that has contributed to its desirability as a suburban town. Approximately 90% of the town is zoned for residential use (Figure 6, Zoning Map). Residents are attracted to the town's convenient location, excellent schools and small-town character. Given the relatively small amount of local commerce and industry, most working residents are dependent on the regional economy for employment opportunities.

The Town of Wilbraham has experienced rapid growth during the last five decades. As evidenced by the large houses in many subdivisions, Wilbraham is typically 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. Eighty-eight percent of homes in town 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 two farm stores operate year round on southern Main Street. Major commercial growth, however, has occurred in the Boston Road commercial corridor. In 1988 Home Depot opened a Wilbraham store on Boston Road that has served as an economic magnet attracting additional business development.

Figure 1: Zoning Map



There are mixed reactions to commercial growth in Wilbraham. Many residents seem satisfied that such growth has been confined to Boston Road; however, there are some who would prefer no further economic development at all. While it seems that some degree of commercial development is financially beneficial, there may be hidden costs to the town that will become apparent in the future. Town officials are proceeding with caution to ensure that community character is not compromised by economic development in the commercial zones. Mindful of the uncontrolled sprawl found in other communities, local boards have attempted to balance the long-term needs of the town with the rights of commercial property owners.

In 2001, the Massachusetts Department of Housing and Community Development (DHCD) prepared a build-out analysis for the town of Wilbraham which attempted to estimate the amount of future development that would be possible based on current zoning regulations and existing environmental restraints. The state buildout analysis estimated that there are 6,962 acres of additional developable land that, if developed, would result in 4,453 additional residential units and 848,918 additional square feet of commercial building floor area.

Climate

Wilbraham is located in central Hampden County. Annual precipitation averages 44 inches, is well distributed throughout the year, and is usually adequate for all crops in the area; however, brief droughts occasionally occur in sandy soils with lower water capacity. Average seasonal snowfall is 40 inches. Prevailing winds from the south (and from the north/northwest to a lesser extent) reach their highest average speed during the month of April.

Land Use Summary

According to the 1999 MacConnell Land use data, the total land area of Wilbraham is approximately 14,244 acres with roughly 39 percent of those acres as developed land. The remaining land is classified as undeveloped with forest as the largest category (56% of all land in town) with 7,938 acres. Crop land is the second largest category of undeveloped land with 446 acres compared to pastureland which represents the third largest amount of undeveloped land in the town with 239.

Geology and Topography

Geologists believe that the Connecticut River Valley formed some 200 million years ago during the Paleozoic Era. During that time the land situated along the east side of Main Street was uplifted abruptly, forming the ridge that we see today. This uplift was the result of movement along a major fault know 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 height. 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 lithified and turned from sediment to rock.

These sedimentary rocks are considerably younger than the bedrock underlying the Wilbraham Mountains immediately to the east. Known today as the Portland Formation, they were deposited during the Triassic and Jurassic Periods of the Mesozoic Era. This was a time when dinosaurs roamed the valley, as evidenced by fossil dinosaur footprints left behind in the soft mud of the valley floor. The mud later lithified to become brown and reddish-brown sandstones, shales and arkose. Only a small number of these bedrock exposures can be found in the valley portion of town. Outcrops can be observed in an area north of Springfield Street and west of the Stony Hill School. A second location exists northeast of the intersection of Tinkham Road and Main Street. The lack of exposed valley sandstone and shale is primarily the result of more recent glacial deposits of unconsolidated sand and gravel that cover and conceal the underlying bedrock.

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.

It is important to note the vital disaster mitigation benefits provided by these wetland areas, which act as a kind of sponge to slow, absorb, and filter storm waters. Wetland areas also recharge aquifers and provide important wildlife habitat.

Soils

Wilbraham 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 poorly developed. 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 soils developed. The parent material consists of unconsolidated glacial till; or sand and gravel kame, delta and outwash deposit.

Glacial Till Derived Soils of Wilbraham

Development of soils across much of the Wilbraham Mountains and low valley hills occurred in areas underlain by glacial till deposits. These soils are very stony and bouldery, and have high erosion potential owing to the large amount of fines in the soil. With the exception of the Charlton soils, glacial till-derived soils have a perched water table, which sits on top of a hard pan layer from November through April.

Kame, Deltaic and Outwash Derived Soils of Wilbraham

One third of Wilbraham is underlain by sands and gravel kame, outwash and deltaic deposits, with soils that are excessively drained to moderately well drained in the upland areas. Where the water table is at—or close to—the ground for a substantial portion of the year, soils in the lowland areas are somewhat poorly drained to very poorly drained. The coarse and highly permeable nature of these soils often poses limitations for septic systems because percolation rates can exceed 2 minutes/inch. At this rapid percolation rate, the soil provides inadequate renovation of contaminants.

Glacial Lake Derived Soils of Wilbraham

Other types comprise a relatively minor percentage of soils in Wilbraham. They have developed on small areas of glacial lake deposits. These are restricted to isolated areas where lake environments existed during the ice melt. Underlain by the largest contiguous area of glacial lake derived soils in town, one such area is located on the east and west sides of Glendale Road at the Cadwell Brook crossing. Other small, localized areas of lake derived soils exist along the east side of Main Street at Wilbraham & Monson Academy, and further south near McIntosh Drive.

Drainage Class

Soil scientists use the term drainage class to describe the drainage characteristics of a given soil. Depending on its landscape position and permeability, a soil may have a seasonal water table or remain dry throughout the year. A coarse sandy soil in an upland position, such as found in sandy outwash, will be droughty for the simple reason that the soil cannot hold on to the water. The drainage class for this soil would be excessively drained. Conversely, soils developed in the sediment of old glacial lakes tend to have many fines and are typically located in broad, flat plains on valley bottoms. Many of these soils have water within 1 foot of the soil surface. Such a soil is considered poorly drained or even very poorly drained. Ponding or flooding of these soils occurs for significant periods of the growing season where wetland areas also exist.

Topography

Major Characteristic or Unusual Geologic Features

Clearly, the rural beauty of Wilbraham results from the meeting of the town's lowlands and the prominent ridge of the Wilbraham Mountains. (The abrupt contrast between the valley and ridge in Wilbraham is a result of the Great Border Fault.) 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.

Environmental Problems

Landfills

The town landfill was closed and capped in 1995. The transfer station and recycling center continue to operate, with residents paying "by-the-bag" for trash disposal. Wilbraham residents consistently earn high marks for recycling efforts. The town participates in a grant program that provides low-cost backyard composting units to town residents.

Neighborhood Characteristics

The contrast between the mountain and lowland landscapes has provided an interesting backdrop to the development of Wilbraham. Main Street runs north/south at the base of the mountain and Stony Hill Road has a similar orientation on the other side of a long, wide strip of open space bisected by only four east/west trending roadways. Most of the major roads in Wilbraham are distinctly north/south or east/west in orientation and are designated scenic highways. Major alterations to the landscape character of any of these roads would be detrimental to the overall "feel" of the town. Haphazard subdivision would severely impact the rural feeling associated with the mountain area. In the more densely populated flatlands, development of any remaining open space—or loss of farms and town landmarks—might endanger the small-town character enjoyed by Wilbraham residents. This resulted in a town that is parceled out into distinct neighborhoods.

The historic "village center" is typically considered the town center which is representative of the character of Wilbraham. However, there are other distinctly recognizable areas of town which offer Wilbraham residents a variety of neighborhood flavors.

The Village Center/Academy Historic District

The center historic district is the home of Wilbraham & Monson Academy. The anchor of this area, the school owns numerous historic buildings and a significant amount of tax-exempt open space. The center is a mix of residences and small businesses (banks, professional offices, barber and beauty shops, a drug store and the enduring Village Store.) In close proximity are two churches, the historic Grange Hall, 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 view of Crane Park from Main Street includes the old post office building and the town library. (Many residents were dismayed by the closing of their beloved small post office, which relocated to a large new building on Boston Road in late 1990. The old building has been converted to business use.) A Civil

War memorial stands in Crane Park, and the private Woodland Dell Cemetery is located behind the library. The center is served by town water, but is not connected to the sewer system. Recreation resources within walking distance include Bruuer Pond, Crane Park, Gazebo Park, the Wilbraham Public Library and Wilbraham & Monson Academy. The village center was frequently cited in responses to the survey question about the places that are representative community character.

The Pines

One of the early growth centers, the northwest section of Wilbraham borders neighborhoods in nearby Ludlow and 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 here, where some of the old mill housing has been nicely updated.

The Pines is home to the Polish American Veteran's Club, the descendent of a Polish/American organization that provided recreation opportunities and language assistance to Polish immigrants. The future of this building is in some doubt since the Club attempted to sell it (unsuccessfully) in 2004. Wilbraham's first major expenditure for a modern school building was made here when the Pines School was erected in 1924. The building has been converted and expanded for its current use as a senior center, preschool and elderly housing. Two neighborhood markets are within walking distance of the Pines building, which also serves as a small community center. The Pines area has some of the town's best access to the Chicopee River by way of River Road. Other recreation resources include the small playground and athletic field behind the Pines building, and the all-purpose room/gym at the Wilbraham Community Center. (The nearby Indian Orchard business district, also within walking distance, has recently become the home of numerous antique shops.)

The "Patch"

This quaint area is a collection 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 attractive small to medium sized houses on tree-lined streets. Residents here will soon benefit from the sidewalks planned for nearby Springfield Street. 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 midget 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 Rice and 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.

This section of Wilbraham provides a striking example of the problems associated with the mixing of farms and residential subdivisions. The Merrick farm, adjacent to Mile Tree School and Minnechaug Regional High School, is fertilized with locally produced, "natural" fertilizer from the nearby Bennett Turkey Farm. Olfactory evidence of the Merrick fertilization schedule is unavoidable—when the wind is right, the distinctive odor can be detected up to a half-mile away. (Notwithstanding, the resident survey indicates a strong desire to preserve the few remaining farms in Wilbraham). 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 northeast section of Wilbraham lies to the north of Boston Road, beyond the "elbow" where the Chicopee River turns to the west. 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.

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) under the jurisdiction of the Massachusetts Turnpike Authority, 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. We are pleased to report that 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.

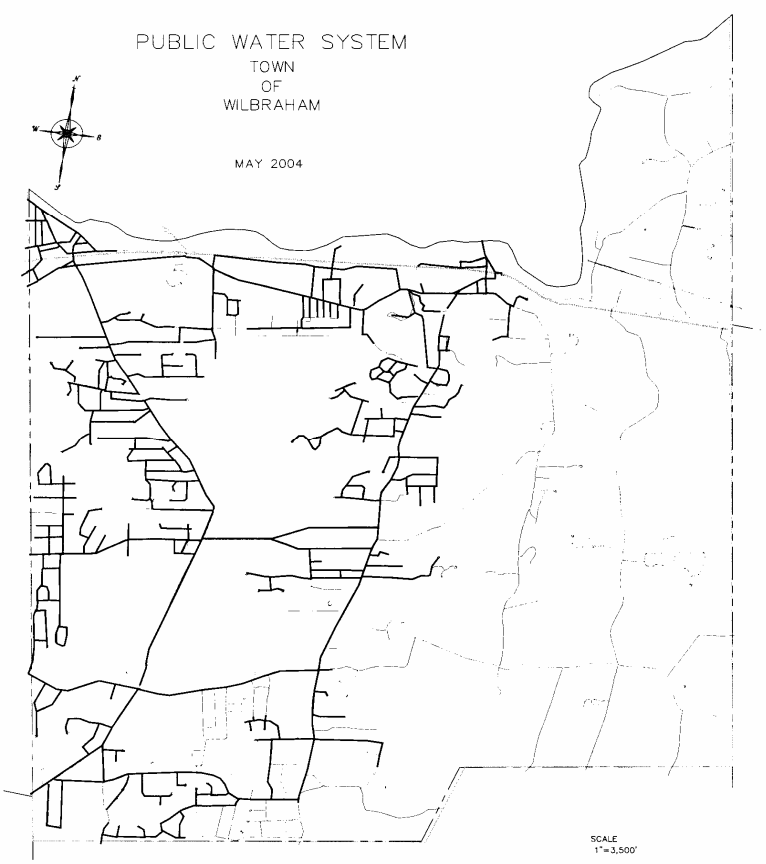
Public Transportation

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 (Figure 3). 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.

Public Drinking Water Supply

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.

Figure 2: Wilbraham Water System

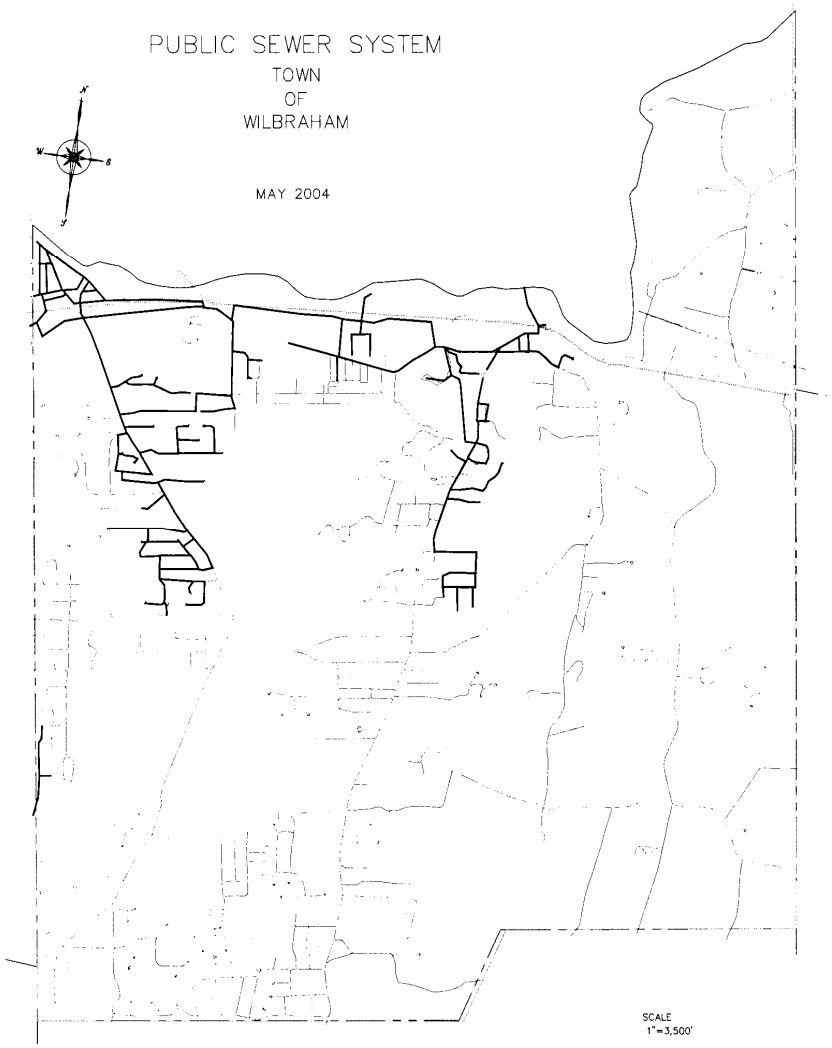


Sewer Service

The Wastewater Division maintains eight pumping stations and twenty-four 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. Wilbraham's wastewater is pumped to Springfield for treatment and discharge.

The Wilbraham Wastewater Department is operated as an enterprise fund servicing approximately 33% of the Town. The area of the community served by the public wastewater treatment system is shown on Figure 3.

Figure 3: Wilbraham Public 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. The Town of Wilbraham is negotiating with the City of Springfield to increase capacity for sewage disposal beyond current contractual limits. The Town is requesting an immediate increase in average daily flow to 480,000 gallons and peak flow to 770,000. Further increases will

need to be negotiated to implement planned system expansions and to accommodate future development on Boston Road.

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. Plans are also under discussion to expand the existing sewer system 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. Sewer expansion, while often necessary for legitimate environmental reasons, can sometimes be incompatible with goals to preserve open space and community character. This holds true to the extent that sewer improvements—especially in undeveloped areas—lead to an undesirable amount of residential development on previously undevelopable soils.

Schools

Public schools serving Wilbraham include the Memorial Elementary School, 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.

Natural Resources

The following in the Natural Resources section include excerpts from the draft Wilbraham Open Space and Recreation Plan (2005).

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.

Vegetation

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.

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, vibernum, 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

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.

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 National Flood Insurance Program has produced maps that identify floodways across America. 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;

Forests

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 fifty-six 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.

3 – HAZARD IDENTIFICATION & ANALYSIS

Natural Hazard Identification

Historical research, conversations with local officials and emergency management personnel, available hazard mapping and other weather-related databases were used to identify the natural hazards which are most likely to have an impact on the Town of Wilbraham.

Floods

The average annual precipitation for Wilbraham and surrounding areas in northwestern Massachusetts is 47.41 inches. There are three major types of storms that bring precipitation to Wilbraham. Continental storms that originate from the west continually move across the region. These storms are typically low-pressure systems that may be slow-moving frontal systems or more intense, fast-moving storms. Precipitation from coastal storms, also known as nor'easters, that travel into New England from the south constitute the second major storm type. In the late summer or early fall, the most severe type of these coastal storms, hurricanes, may reach Massachusetts and result in significant amounts of rainfall. The third type of storm is the result of local convective action. Thunderstorms that form on warm, humid summer days can cause locally significant rainfall.

Floods can be classified as either *flash floods*, which are the product of heavy, localized precipitation in a short time period over a given location or *general floods*, which are caused by precipitation over a longer time period in a particular river basin. There are several local factors that determine the severity of a flooding event, including: stream and river basin topography, precipitation and weather patterns, recent soil moisture conditions, amount of impervious surface area, and the degree of vegetative clearing. Floods occur more frequently and are one of the most costly natural hazards in the United States.

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).

In contrast, *general flooding* events may last for several days. 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).

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.

Severe Snowstorms/Ice Storms

Severe winter storms can pose a significant risk to property and human life because the rain, freezing rain, ice, snow, cold temperatures and wind associated with these storms can disrupt utility service, phone service and make roadways extremely hazardous. Severe winter storms can be deceptive killers. The types of deaths that can occur as a result of a severe winter storm include: traffic accidents on icy or snow-covered roads, heart attacks while shoveling snow, and hypothermia from prolonged exposure to cold temperatures. Infrastructure and other property are also at risk from severe winter storms and the associated flooding that can occur following heavy snow melt. Power and telephone lines, trees, and telecommunications structures can be damaged by ice, wind, snow, and falling trees and tree limbs. Icy road conditions or roads blocked by fallen trees may make it difficult to respond promptly to medical emergencies or fires. Prolonged, extremely cold temperatures can also cause inadequately insulated potable water lines and fire sprinkler pipes to rupture and disrupt the delivery of drinking water and cause extensive property damage.

Hurricanes

Hurricanes are violent rainstorms with strong winds that can reach speeds of up to 200 miles per hour. Hurricanes generally occur between June and November and can result in flooding and wind damage to structures and above-ground

utilities. In Massachusetts, major hurricanes occurred in 1904, 1938, 1954, 1955, 1960 and 1976.

Tornadoes

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. There have been two tornadoes that have touched down in Wilbraham since the 1950's. Both were ranked F2 on the Fujita Scale of Tornado Intensity. 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.). Since the 1950s, there have been close to 9 tornadoes in Hampshire County.

Of additional concern are microbursts, which often do tornado-like damage and can be mistaken for tornadoes. In contrast to the upward rush of air in a tornado, air blasts rapidly downward from thunderstorms to create microbursts.[2]

Wildland Fires/Brushfires

According to FEMA, there are three different classes of wildland fires: *surface fires*, *ground fires* and *crown fires*.[3] The most common type of wildland fire is a surface fire that burns slowly along the floor of a forest, killing or damaging trees. A ground fire burns on or below the forest floor and is usually started by lightening. Crown fires move quickly by jumping along the tops of trees. A crown fire may spread rapidly, especially under windy conditions. While wildland fires have not been a significant problem in Wilbraham, there is always a possibility that changing land use patterns and weather conditions will increase a community's vulnerability. For example, drought conditions can make forests and other open, vegetated areas more vulnerable to ignition. Once the fire starts, it will burn hotter and be harder to extinguish. Soils and root systems starved for moisture are also vulnerable to fire. Residential growth in rural, forested areas increases the total area that is vulnerable to fire and places homes and neighborhoods closer to areas where wildfires are more likely to occur.

[2] *http://www.fema.gov/regions/vii/2003/03r7n06a.shtm*
[3] FEMA, "Fact Sheet: Wildland Fires," September 1993.

There were 39 brushfires reported in Wilbraham in 2004[4]. As a point of comparison, there were 70 fires in the Wilbraham during the same year [Note: the 2004 Fire Incident Reporting System is the State's most current draft].

Earthquakes

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.[5] 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.[6]

Table 3-1
New England Earthquakes with a Magnitude of 4.2 or more 1924 - 2002

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

Source: Northeast States Emergency Consortium Web site: *www.nesec.org/hazards/earthquakes.cfm*

[4] Annual Report of the Massachusetts Fire Incident Reporting System, 2004
[5] Northeast States Emergency Consortium Web site: *www.nesec.org/hazards/earthquakes.cfm.*
[6] Federal Emergency Management Agency Web site: *www.fema.gov/hazards/earthquakes/quake.shtm.*

Table 3-2
New England States Record of Historic Earthquakes

State	Years of Record	Number Of Earthquakes
Connecticut	1568 - 1989	137
Maine	1766 - 1989	391
Massachusetts	1627 - 1989	316
New Hampshire	1728 - 1989	270
Rhode Island	1766 - 1989	32
Vermont	1843 - 1989	69
New York	1737 - 1985	24
Total Number of Earthquakes within the New England states between 1568 and 1989 = 1,239.		

Source: Northeast States Emergency Consortium Web site: *www.nesec.org/hazards/earthquakes.cfm*

Massachusetts introduced earthquake design requirements into their building code in 1975. 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 1975 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.

Dam Failure

Although dams and their associated impoundments provide many benefits to a community, such as water supply, recreation, hydroelectric power generation, and flood control, 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. Most earthen 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 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.

Many dams in Massachusetts were built in the 19th century without the benefit of modern engineering design and construction oversight. Dams can fail because of structural problems due to age and/or lack of proper maintenance. Dam failure can also be the result of structural damage caused by an earthquake or flooding brought on by severe storm events.

The Massachusetts Department of Conservation and Recreation (MA DCR) 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). Until 2002, DCR was also responsible for conducting dam inspections but then state law was changed to place the responsibility and cost for inspections on the owners of the dams. However, the new regulations have not been issued, so the DCR is still conducting inspections, but only of dams classified as high hazard.

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.

The inspection schedule for dams is as follows:

- Low Hazard dams – 10 years
- Significant Hazard dams – 5 years
- High Hazard dams – 2 years

The time intervals represent the maximum time between inspections. More frequent inspections may be performed at the discretion of the state. Dams and reservoirs licensed and subject to inspection by the Federal Energy Regulatory Commission (FERC) are excluded from the provisions of the state regulations provided that all FERC-approved periodic inspection reports are provided to the DCR. All other dams are subject to the regulations unless exempted in writing by DCR.

The Massachusetts Emergency Management Agency (MEMA) identifies four dams, two of which are identified as having a *Low Hazard*: Rice Pond Dam and Fruit Pond Dam.

MEMA identifies one *Significant Hazard* dam: Bennett Pond Dam.

MEMA identifies one *High Hazard Dam*: Guidette Pond Dam

The 100-year floodplain covers about 5.4 percent, or approximately 770 acres of the town, including an estimated 60 acres of developed residential land.

Table 3-3: Dams in Wilbraham

Rice Pond Dam(NJ)	Low
Fruit Farm Pond Dam	Low
Bennett Pond Dam	Significant
Guidette Pond Dam(NJ)	High

Drought

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.[8]

In Massachusetts, six major droughts have occurred statewide since 1930[7]. 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 1987-89 drought cost $39 billion in estimated damages to agricultural crops, wildlife, livestock, land values, water quality and the economy in the Central and Eastern States.

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.

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

[7] US Geological Survey Water-Supply Paper 2375. "National Water Summary 1989 – Floods and Droughts: Massachusetts." Prepared by S. William Wandle, Jr., US Geological Survey.

the lowest percentile for severity and risk of drought.[8] 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.

Man-Made Hazards – Hazardous Materials

Hazardous materials are chemical substances, which if released or misused can pose a threat to the environment or health. These chemicals come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. Hazardous materials in various forms can cause death, serious injury, long-lasting health effects, and damage to buildings, homes, and other property. Many products containing hazardous chemicals are used and stored in homes and businesses routinely. These products are also shipped daily on the nation's highways, railroads, waterways, and pipelines.

The Toxics Release Inventory (TRI), a publicly available EPA database that contains information on specific toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities.[9] According to TRI, there are no industries currently releasing hazardous materials within Wilbraham's Town limits.

However, varying quantities of hazardous materials are manufactured, used, or stored at an estimated 4.5 million facilities in the United States--from major industrial plants to local dry cleaning establishments or gardening supply stores. These hazardous materials are transported regularly over our highways and by rail and if released can spread quickly to any community. Incidents can occur at any time without warning. Human error is the probable cause of most transportation incidents and associated consequences involving the release of hazardous materials.

There are seven registered EPA Tier II facilities in Wilbraham. The Town's fire department is responsible for having the resources and training to manage a crisis involving the chemicals stored at these facilities. These locations are:

[8] National Drought Mitigation Center – http://drought.unl.edu
[9] 2004 Toxic Releases Inventory (TRI) Data Files for Massachusetts. www.epa.gov/tri/

Table 3-5: Tier II Locations in Wilbraham

1. Construction Service	Boston Road
2. Friendly Ice Cream Corporation	Boston Road
3. Wilbraham #507	Main Street
4. Utility Mfg. Co.	Boston Rd.
5. Verizon Wilbraham Co	Main St
5. Verizon Wilbraham Co	Main St
7. USPS-Wilbraham, MA Main Post Office	Post Office Park

Natural Hazard Analysis Methodology

In order to review the likelihood of a specific hazard occurring, to identify the location of occurrence, and to assess the impacts of the hazard event, a *Hazard Identification and Analysis Matrix* was prepared to organize the information that was gathered for this project. The matrix is organized into the following sections: Type of Hazard, Frequency of Occurrence, Severity of Impacts and Hazard Index. The Hazard Index was completed to rank the hazards according to the frequency of occurrence and the amount of potential damage likely to occur. The Hazard Index forms the basis for concentrating the future mitigation efforts outlined in this plan. A description of each of the matrix categories is provided below. The completed Matrix is shown on Table 3-6.

Type of Hazard

The natural hazards identified for Wilbraham include floods, severe snowstorms/ice storms, hurricanes, tornadoes, wildfires/brushfires, dam failure and earthquakes. Many of these hazards result in similar impacts to a community. For example, hurricanes, tornadoes and severe snowstorms may cause wind-related damage. A more detailed description of each type of hazard is included in the earlier section of this chapter.

Frequency of Occurrence

The frequency or likelihood of occurrence for each natural hazard was classified according to the following scale:

Table 3-6
Frequency of Occurrence and Annual Probability of Given Natural Hazard

Frequency of Occurrence	Annual Probability
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

Source: information adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002.

Location of Occurrence

The classifications are based on the area of the Town of Wilbraham that would potentially be affected by the hazard. The following scale was used:

Table 3-7
Location of Occurrence and Percentage of Town Impacted of 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

Source: information adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002.

Severity of Impacts

The severity of direct impacts an affected area could potentially suffer were classified according to the following scale:

Table 3-8
Severity of Impacts and Magnitude of Multiple Impacts of Given Natural Hazard

Severity 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.

Source: information adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002.

Hazard Index

The hazard index ratings were determined after assessing the frequency, location and impact classifications for each hazard. The hazard index ratings are based on a scale of 1 (highest risk) through 5 (lowest risk). The ranking is qualitative and is based on local knowledge of past experiences with each type of hazard. The committee considered historical events and damage in Wilbraham and estimated what the scale and intensity of future events based on their knowledge of the town.

Table 3-9
Hazard Identification and Analysis Worksheet for Wilbraham

TYPE OF HAZARD	FREQUENCY OF OCCURRENCE	LOCATION OF OCCURRENCE	IMPACT	HAZARD RISK INDEX RATING
Flooding	**High**	**Large**	**Limited/Critical**	**1**
Severe Snowstorms/Ice Storms	**High**	**Large**	**Minor**	**2**
Severe Thunderstorms (microbursts) which cause wind damage	**High**	**Small**	**Limited/Minor**	**3**
Hurricanes	**Low**	**Large**	**Limited/Critical**	**4**
Tornadoes	**Low**	**Small**	**Critical**	**2**
Wildfire/Brushfire	**Low**	**Medium**	**Minor**	**2**
Earthquakes	**Low**	**Large**	**Limited/Critical**	**4**
Dam Failures	**Low**	**Medium**	**Minor/Critical**	**3**
Man-made Hazards: Hazardous Materials	**Moderate**	**Medium**	**Limited**	**2**

Source: information adapted from Town of Holden Beach North Carolina Community-Based Hazard Mitigation Plan, July 15, 2003 and the Massachusetts Emergency Management Agency (MEMA).

Detailed Natural Hazards Profile for Wilbraham

Flooding

Location

Wilbraham has four 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.

Extent

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. A total of 32 structures are located within the Special Flood Hazard Area in Wilbraham, totaling approximately $9,276,800 of damage, and 85 people impacted. 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.

Previous Occurrences

According to the National Flood Insurance Program (NFIP) statistics, there have been five (5) flooding incidents in the town of Wilbraham for a total damage amount of $228,765 since 1978. The Pre-Disaster Mitigation Committee also identified a flooding event that occurred in 1955 when Twelve Mile Brook flooded.

Probability of Future Events

Based upon previous data, it seems likely that there is a twelve percent chance of minor or severe flooding occurring every year in Wilbraham. 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. The area within the 100-year flood plain still has a one (1) percent chance of a severe flood in any given year.

Snowstorms and Severe Winter Weather

Location: The entire Town of Wilbraham is susceptible to severe winter weather.

Extent

Previous Occurrences

Available records, dating back to 1950, indicate that 76 severe winter storms have occurred in Hampden County. There were no specific records for Wilbraham, but the committee has agreed to keep records on future severe winter storm events.[10]

The Town has had ice problems with the following roadways (see map for complete locations):

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

Probability of Future Events

Based upon the availability of records for Hampden County, the likelihood that a severe snow storm will hit Wilbraham in any given year is greater than ten percent.

Hurricanes

Location: Massachusetts is susceptible to hurricanes and tropical storms. Between 1851 and 2004, approximately 32 tropical storms; five Category 1 hurricanes, two Category 2 hurricanes and three Category 3 hurricanes have made landfall. To date, the Commonwealth has not experienced a Category 4 or 5 hurricane. Aside from direct hits from hurricanes and tropical storms, the Commonwealth is often affected by their extra tropical remnants as these storms move up the coast and out into the Atlantic Ocean. Since the destructive hurricane of 1938, four other major hurricanes have struck the Massachusetts coast in 1954, 1955, 1960, 1985, and 1991. The last hurricane to make landfall in New England was Hurricane Bob, a weak category 2 hurricane, in August 1991. Therefore, it is forecasted that, Massachusetts, and the rest of New England, is long overdue for a major hurricane to make landfall. Based on

[10] **National Environmental Satellite, Data, and Information Service (NESDIS)**

past hurricane and tropical storm landfalls, the frequency of tropical systems to hit the Massachusetts coastline is an average of once out of every six years.

Wind damage from a hurricane is less likely than flood damage. Wilbraham's inland location makes it less susceptible to wind damage than flood damage resulting from a strong storm surge on the Mill River.

Extent

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.

Previous Occurrences

According to the Northeast States Emergency Consortium (NESEC), Wilbraham has been hit by a tropical storm since records have been kept (roughly 150 years). This means that Wilbraham has experienced severe tropical weather in the past and is likely to again as time passes.

Probability of Future Events

Based upon the past reporting of one tropical storm within Wilbraham over a period of 150+ years, it is reasonable to say that there is a low frequency of hurricane and tropical storm occurrence in Wilbraham (once every fifty years is less than a one percent chance of any such storm occurring in a given year).

Tornados/Microbursts

Location:

The hazard area for tornadoes in Wilbraham varies according to the intensity and size of the tornado. There have not been enough tornadoes in Wilbraham to accurately predict sections of town that are more likely to experience a tornado. However, the Massachusetts State Hazard Mitigation Plan (2004) identifies eastern Wilbraham and the surrounding communities as having a high frequency of tornados occurrence within Massachusetts.

Extent

The potential for locally catastrophic damage is a factor in any tornado 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, and 77.5% of the city's housing was constructed prior to this date.

Previous Occurrences

Between 1950 and 2004, two tornadoes have touched down in Wilbraham; both were category F2 tornados. No records contained information about damage, but the Tornado was documented in central Wilbraham.

Probability of Future Events

Based upon the available historical record, as well as Wilbraham's location in a high-density cluster of state-wide tornado activity, it is reasonable to estimate that there is a medium-high frequency of tornado occurrence in Wilbraham (a 5% - 10% chance in any given year).

Wildfires/Brush Fires

Location: 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.

Extent

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. A large wildfire could damage 49 percent of the town's land mass in a short period of time. 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.

Previous Occurrences

There are no records of wildfires or burned acreage available for Wilbraham, but the 2005 Massachusetts *Fire Incident Reporting System* recorded 16 "other" fires, a category that includes any fire that does not occur in a building. The fire department is committed to collecting data on and acreage statistics on wildfires in Wilbraham.

Probability of Future Events

Based upon the availability of data, there is a low frequency of wildfires in Wilbraham.

Earthquakes

Location

The last major earthquake to strike Massachusetts did so more than 200 years ago in 1755 when an estimated 5.75 strength earthquake struck off of Cape Anne, which is North of Boston. Damage from this event stretched from Northern Massachusetts to Boston, and is thought to have occurred because of compression and buckling along the North American Plate, which stretches from California to the middle of the Atlantic Ocean. Unlike California, where earthquakes occur along fault lines, there is no predictable pattern for where an earthquake will emerge in New England. However, the forces that initiate buckling in New England are the downward weight of mountains and the upward stress relief that resulted from the retreat of the glaciers. These factors, when combined with the geography of New England and the historical record, indicate that Cape Ann and Eastern Massachusetts are the sections of the Commonwealth that are most likely to experience an earthquake. However, seismologists have concluded that earthquakes in New England can occur anywhere in the region and that there is no way to specify where the greatest risk lies.

Extent

In the event of an earthquake, all of Wilbraham would be affected with some portions more impacted than others, depending on the magnitude of the earthquake and the underlying population density.

Previous Occurrences

There have been no documented earthquakes in Wilbraham, but a documented fault line runs through the center of Wilbraham (Northeast States Emergency Consortium, 2003).

Probability of Future Events

Based upon existing records, there is a low frequency of earthquakes in Wilbraham with between a 1% and 2% chance of an earthquake occurring in any given year.

Dam Failures

Location: The Town of Wilbraham has four dams on public and private land. Refer to the Hazard Mitigation Map (Appendix D) for their locations.

Extent

Dams in Massachusetts are assessed according to their risk to life and property. Dams with a *Low Hazard* rating may cause minimal property with no expected loss of life; *Significant Hazard* dams 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; *High Hazard* dams will most probably cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways, or railroads. The following dams have the following ratings:

Dam	**Hazard Level**
Rice Pond Dam(NJ)	Low
Fruit Farm Pond Dam	Low
Bennett Pond Dam	Significant
Guidette Pond Dam(NJ)	High

Previous Occurrences

To date, there have been no records of 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 one percent chance of a dam failing in any given year.

Drought

Location: A drought would impact all of Wilbraham. Water-intensive uses such as agriculture and industries would be more impacted than other sectors of the city.

Extent

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 Quabbin Reservoir also supplies drinking water to the greater Metropolitan Boston Area, so a drought that affected Wilbraham's drinking water supply would have statewide implications. Water managers and regulators would act accordingly to limit intake on the residential side; groundwater derived sources from private wells would be more difficult to regulate, perhaps resulting in a drawdown of the water table and depleting regional water resources.

Previous Occurrences

In Massachusetts, six major droughts have occurred statewide since 1930. 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.

Probability of Future Events

In Wilbraham, as in the rest of the state, drought occurs at a medium frequency, with a range of a 1% or a 10% chance of drought occurring in a single given year.

Man-Made Hazards

Location

Wilbraham has several facilities in town that could produce damage from man-made chemical explosions, leaks or spills. Please refer to the Wilbraham Natural Hazard map to see where these uses are distributed.

There are seven registered EPA Tier II facilities in Wilbraham. The Town's fire department is responsible for having the resources and training to manage a crisis involving the chemicals stored at these facilities. These locations are:

1. Construction Service	Boston Road
2. Friendly Ice Cream Corporation	Boston Road
3. Wilbraham #507	Main Street
4. Utility Mfg. Co.	Boston Rd.
5. Verizon Wilbraham Co	Main St
5. Verizon Wilbraham Co	Main St
7. USPS-Wilbraham, MA Main Post Office	Post Office Park

Extent

There is no reliable indicator of the extent of a man-made event in Wilbraham.

Previous Occurrences

There have been no previous occurrences in Wilbraham.

Probability of Future Events

Unknown

Vulnerability Assessment

The following is a list of natural and manmade disasters, and the areas affected by them, that have or could affect the Town of Wilbraham. The Past and Potential Hazards Map at the end of this Plan reflects the contents of this list.

In order to determine estimated losses due to natural and man made hazards in Wilbraham, each hazard area was analyzed with results shown below. Human losses are not calculated during this exercise, but could be expected to occur depending on the type and severity of the hazard. Most of these figures exclude both the land value and contents of the structure. The value of all structures in the Town of Wilbraham, including exempt structures such as schools and churches, is $763,165,138 as of 2006. The median value of a home in Wilbraham is $289,900 according to The Warren Group.

Past and Potential Hazards

Flooding (100-year base flood): High Risk

In this section, a vulnerability assessment was prepared to evaluate the potential impact that flooding could have on the portions of Wilbraham located within the 100-year floodplain. Flooding can be caused by severe storms, such as hurricanes, nor'easters, and microbursts, as well as ice dams and snow melt.

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. According to the Community Information System (CIS) of FEMA, there were 32 1-4 family structures and 0 "other" structures located within the Special Flood Hazard Area (SFHA) in Wilbraham as of July 14, 2005, the most current records in the CIS for the Town of Wilbraham. Utilizing the Town's median home value of $289,000, a preliminary damage assessment was generated. For the estimated number of people living in the floodplain, an average household size of 2.66[11] people was used.

A total of 32 structures are located within the SFHA in Wilbraham, totaling approximately $9,276,800 of damage, and 85 people impacted. 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.

[11] Figure courtesy of 2000 U.S. Census.

Flooding: High Risk

Stormwater in Wilbraham falls on the slopes of the hilly terrain in Wilbraham's eastern section, where it drops from an elevation of 940 to 140 feet in less than a mile. This directs water through a forested stand and down to Upper Monson Road and Ridge Road, where two thirty inch culverts handle all of the this stormwater. These two culverts cause the water to accelerate down through recently developed sections of town, causing flooding in the broad, flat sections of down town Wilbraham. For this reason, flooding occurs on a regular basis.

Main Street at Woodland Dell

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. There are eight homes in this vicinity that are subject to flooding, which could result in a maximum damage of $2,156,000

- Culverts are not adequately sized to handle the amount of water directed at this section of town.
- Portions of Main Street are in the 100-year floodplain
- Properties are flooded regularly, and septic systems fail, causing a health hazard
- Debris accumulates, causing a hazard for the community

Soule Road / Sawmill Pond-Mill River

This section of town has a culvert that blocks frequently. The road is flooded out regularly and 2 structures are at risk. One hundred percent damage to 100% of the structures would result in $579,800 of estimated repair costs. Cost for repairing or replacing any dams or bridges, power lines, telephone lines, and contents of structures are not included.

- Damage to Soule Road occurs when floodwaters are high
- Adjacent properties are damaged

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.

Mountain Road / north of Sunset Rock

This is an Agricultural – 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.

- Damage to town roads
- Reduced access and impaired response time for emergency services

Macintosh 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 gulley 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.

Brewer Road / Brewer 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 19th 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.

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.

Severe Snowstorms/Ice Storms: Medium-High Risk

Three types of winter events are heavy snow, ice storms and extreme cold which cause concern. Occasionally heavy snow years will collapse buildings. Ice storms have disrupted power and communication services. Timberland has been severely damaged. Extreme cold affects the elderly. Wilbraham's recent history has not recorded any loss of life due to the extreme winter weather. These random events are difficult to set a cost to repair or replace any of the structures or utilities affected.

- Area has been subject to extremely heavy snow falls, records of early 1900s and into the 1950s and 1960s indicate this.
- High risk town wide due to snow, ice and extreme cold.
- 1996 heavy snow event—sections of Town without power for 12 days
- 1988 temperature below 0 degrees for a month (Nov.-Dec.).
- Elderly are affected by extreme weather.

Poor Access

The following areas in the Town of Wilbraham have been identified as areas where snow prevents access during winter storm events:

- "The Hill"—an area east of Main Street, South of Boston Road and North of Tinkham Road
- In 1996, portions of The Hill were isolated for a week and a half

Mutual Aid Limitations

In period of high demand, salt quantities can be limited in Wilbraham and surrounding communities. This results in roads that are not maintained as well as they can be during periods of peak demand.

Town-wide events

In 1996, the entire town of Wilbraham suffered from the effects of a heavy snow event. This resulted in temporary road closures, poor access in certain portions of town and power outages. In this type of event, the elderly and the sick are particularly at-risk because there is a chance they might not have adequate care.

Hurricanes/Severe Thunderstorms: Medium Risk

Wilbraham's location in Western Massachusetts reduces the risk of extremely high winds that are associated with hurricanes. The Town has experienced small blocks of downed timber and uprooting of trees onto structures. Hurricanes can and do create flooding. Estimated wind damage 5% of the structures with 10% damage $8,315,388. Estimated flood damage 10% of the structures with 20% damage $33,261,552. Cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included.

- Main Street is at risk.
- 1955 – Hurricane Diane was a major event

- Power and phone lines - disruptions of services.
- Flooding/washing of evacuation routes.

Tornadoes/Microbursts: Medium Risk

For Massachusetts, risk of tornadoes is considered to be high in Hampden County. Tornadoes rarely occur in this part of the country; therefore, assessing damages is difficult. 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. According to the 2000 U.S. Census, approximately 77.5% of the housing in Wilbraham was built before 1970. Estimated damages to 10% of structures with 20% damages $33,261,552. Estimated cost does not include building contents, land values or damages to utilities.

- In the last fifty years, two known tornadoes have touched down in Wilbraham
- River corridors and hill tops susceptible.
- 15 incidents of tornado activity occurred in Hampden County from 1954 to 2006.
- A microburst occurred along Manshonas Road in 1999
- A microburst also occurred along Oakland Street in 2002

Wildfires/Brush Fires: Low Risk

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 following areas have been identified as potential wildfire areas in Wilbraham:

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.

Earthquakes: Low Risk

Moderate potential for serious damage in village portions of town and along Connecticut River shoreline. Structures are mostly of wood frame construction estimated loss 20% of town assessed structural valuation $332,615,520. Costs of repairing or replacing roads, bridges, power lines, telephone lines, or the contents of the structures are not included.

- Low risk to town.
- The Town's water supply runs under the Cottage Street Bridge. Should a rupture occur in this location, which recently has been upgraded to withstand earthquakes, the Town would lose its water supply.

Dam Failure: Low Risk

The Massachusetts Emergency Management Agency (MEMA) identifies four (4) dams in Wilbraham. Table 3-3 identifies the dams within the town as well as whether they are classified as low, significant, or high hazard. Town officials also identified four additional dams. Of the four dams in Wilbraham two are classified as *Low Hazard*: Dams located where failure or improper operation may cause minimal property damage to others. Loss of life is not expected. Tri-Mill River is classified as *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. There is one *High Hazard Dam*. Several of the dams in town are more than 150 years old and constructed of wood. This could be a problem as the wood become increasingly un-stable.

Drought: Low Risk

In Massachusetts, six major droughts have occurred statewide since 1930[12]. 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.

Man-Made Hazards - Hazardous Materials: Low-Medium Risk

Wilbraham relies on the support of the Fire Department for responding to incidents involving hazardous materials. Public transportation of chemicals and bio-hazardous materials by vehicle transport on Route 20 and the rail road area a concern. There are seven sites in the Town of Wilbraham identified by the U.S. EPA as Tier II Hazardous Material sites. These sites are:

[12] US Geological Survey Water-Supply Paper 2375. "National Water Summary 1989 – Floods and Droughts: Massachusetts." Prepared by S. William Wandle, Jr., US Geological Survey.

Table 3-5: Tier II Locations in Wilbraham

1. Construction Service	Boston Road
2. Friendly Ice Cream Corporation	Boston Road
3. Wilbraham #507	Main Street
4. Utility Mfg. Co.	Boston Rd.
5. Verizon Wilbraham Co	Main St
5. Verizon Wilbraham Co	Main St
7. USPS-Wilbraham, MA Main Post Office	Post Office Park

The Town also identified several hazards on its own. These were:

1) The Tennessee Gas Pipeline—this runs through Town along Route 20
2) Several thousand pounds of Ammonia in storage at the Friendly's Ice Cream manufacturing plant.
3) The Rail Road Line
4) Waste Management, a local construction demolition firm, has had several on-site explosions
5) High Pressure Gas Line—Cottage Avenue
6) High Pressure Gas Line—Stony Hill
7) One Million Gallons of Liquified Natural Gas in storage in Ludlow
8) Mobile Gas Line—Runs from Rhode Island and Connecticut, converges near West Street to serve Westover,
9) Water Storage Tank—Bartlett Court, several thousand gallons for water.

(Past and Potential Hazards Map Located In Back of Plan)

4 – CRITICAL FACILITIES

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 the community.
- Would create a secondary disaster if a hazard were to impact it.

Critical Facilities within Hazard Areas

Hazards identified in this plan are regional risks and, as such, all critical facilities fall into the hazard area. The exception to this is flooding. There are several critical facilities that fall within the 100-year floodplain as shown in the table at the end of this section.

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's Hazard Mitigation Committee has broken up this list of facilities into four categories. The first category contains facilities needed for Emergency Response in the event of a disaster. The second category contains Non-Emergency Response Facilities that have been identified by the Committee as non-essential. These are not required in an emergency response event, but are considered essential for the everyday operation of Wilbraham. The third category contains Facilities/Populations that the Committee wishes to protect in the event of a disaster. The fourth category contains Potential Resources, which can provide services or supplies in the event of a disaster. The Critical Facilities Map at the end of this Plan 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

Town Municipal Garage – South Main Street

7. Emergency Electrical Power Facility

Four (4) 25+ KW generators at Wilbraham FD Head Quarters – Boston Road
Three (3) 25+ KW generators at Police Headquarters – Main Street

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

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

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.[13]

2. Problem Culverts

A list of potential problem culverts compiled by the Road Agent is included in the 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.

[13] Wilbraham Annual Statistics Report 1999-2005

Category 3 – Facilities/Populations to Protect

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
State Game Farm – Tinkham Road
Adam Cemetery – 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

Critical Facilities and Evacuation Routes Potentially Affected by Hazard Areas

Hazard Type	Hazard Area	Critical Facilities Affected	Evacuation Routes Affected
Flooding (100-year Flood)	Main Street / River Road / Boston Road / Sawmill Road / Soule Road	Main Street / Fire Department Station #2	Boston Road and Main Street
Flooding	Underpass at Stony Hill Road is regularly inundated	Flow of persons and goods	Northbound exit from Wilbraham
Severe Thunderstorms / Microbursts	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
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
Man-Made: Hazardous Materials	Refrigeration at Friendly's Plant / Liquified Natural Gas Plant in Ludlow / CSX Rail transit – freight trains every day	Springfield / Wilbraham / Ludlow	Route 20 / MassPike (I-90)

(Critical Facilities Map Located In Back of Plan)

5 – CURRENT MITIGATION STRATEGIES

Flooding

The Critical Facilities, Infrastructure, 1999 Land Use & Natural Hazards Map for the Town of Wilbraham shows the 100-year flood zone identified by FEMA flood maps. The 100-year flood zone is the area that will be covered by water as a result of a flood that has a one percent chance of occurring in any given year. The 100-year flood zone covers mostly narrow bands of level floodplain land along the Twelve Mile Brook, Chicopee River, Cedar Swamp, North and South Branches of the Mill River, and Sawmill Brook. In several areas, the flood zone widens out to encompass farmland, some residential land, industrial lands.

The major floods recorded in Wilbraham during the 20th century have been the result of rainfall alone or rainfall combined with snowmelt. One of the goals of this Natural Hazards Mitigation Plan is to evaluate all of the town's existing policies and practices related to natural hazards and identify potential gaps in protection.

Management Plans

The Comprehensive Emergency Management (CEM) Plan for Wilbraham lists the following generic mitigation and response measures for flood planning:

A. Mitigation

1. Identify areas in the community that are flood prone and define methods to minimize the risk. Review National Flood Insurance Maps.
2. Disseminate emergency public information and instructions concerning flood preparedness and safety.
3. Community leaders should ensure that their community is enrolled in the National Flood Insurance Program.
4. Strict adherence should be paid to land use and building codes (e.g. Wetlands Protection Act) and new construction should not be built in flood-prone areas.
5. Ensure that flood control works are in good operating condition at all times.
6. Natural water storage areas should be preserved.
7. Maintain plans for managing all flood emergency response activities including addressing potentially hazardous dams.

B. Preparedness

1. Place EOC personnel on standby during stage of flood 'watch' and monitor NWS/New England River Forecast Center reports.
2. Ensure that public warning systems are working properly and broadcast any information that is needed at this time.
3. Review mutual aid agreements.
4. Monitor levels of local bodies of water.
5. Arrange for all evacuation and sheltering procedures to be ready for activation when needed.
6. Carry out, or assist in carrying out, needed flood-proofing measures such as sand bag placement, etc.
7. Regulate operation of flood control works such as flood gates.
8. Notify all Emergency Management related groups that will assist with flood response activities to be ready in case of flood 'warning'.

Evacuation Options

The majority of land subject to the 100-year floodplain in town, which is located along the Chicopee River, North and South Branches of the Mill River and Nine Mile Pond, is forest, abandoned cropland, and residential. According to the Wilbraham CEM Plan, local officials have stated that there are local shelters available for flooding victims, including people with Special, non-institutional needs. Approximately eighty-five people would be expected to be impacted by a 100-yr.flood, of which some may need transportation. Emergency management personnel should assess existing floodplain and dam failure data to determine an appropriate evacuation plan.

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.

Flood Control Structures

FEMA has identified no flood control structures within the Town of Wilbraham

Land Use Regulations that Mitigate Impacts from Flooding[14]

The Town of Wilbraham has adopted several land use regulations that serve to limit or regulate development in floodplains, to manage stormwater runoff, and to protect groundwater and wetland resources, the latter of which often provide important flood storage capacity. These regulations are summarized below and their effectiveness evaluated in Table 4-1.

Subdivision Rules and Regulations

Wilbraham's Subdivision Rules and Regulations which govern the subdivision of land were adopted for the purpose of "protecting the safety, convenience, and welfare of the inhabitants of the Town of Wilbraham, by regulating the laying out and construction of ways in subdivisions providing access to the several lots therein, but which have not become public ways, and ensuring sanitary conditions in subdivisions and, in proper cases, parks and open areas." The Subdivision Rules and Regulations contain several provisions that mitigate the potential for, and impact of, flooding, including:

- Section 4.2 Definitive plan Requirements applicants must identify, in pertinent part, the following details:
    - 4.2.0.2 Storm water drainage information. See section (5.10)
    - 4.2.3.10 Permanent open space, where appropriate
    - 4.2.3.11 Flood plain zones
    - 4.2.4.7 Construction details, including all pertinent dimensions, grades and elevations for the Town water supply, storm and water drainage, telephone, electric and gas services...

      Profile shall show all structures, drainage and sewer lines between structures and elevations of inverts and tops of frames and grates. Drainage and sewer lines shall be identified by size, type, and percent of grade. All structures shall be numbered.
    - 4.2.5 Individual Sanitary Sewage Disposal Report. Where individual sanitary sewer disposal systems are proposed, the definitive plan shall be accompanied by a Sanitary Report prepared by an Engineer. This report will demonstrate the feasibility of the proposed individual systems. Three (3) copies of the report must be submitted with the engineer's seal of

[14] All bulleted items and direct quotes in the Wilbraham Comprehensive Emergency Management Plan are taken from the Town of Wilbraham's zoning bylaw and subdivision regulations. Other references to those documents contained herein are paraphrases of the same.

certification. The report should deal with the area as a whole, discussing the following points:
f. Flood heights of nearby streams, brooks, or rivers.

- Section 5.1 Streets The layout of the proposed subdivision is to be described according to the following criteria…:

  5.1.3 Grade

  5.1.3.1 Street grade shall be not less than one-half of one percent (0.5%). Grade shall not be more than six percent (6%) for a principal street nor more than eight percent (8%) for a secondary street.

  5.1.3.2 Where the grade of a street at the approach to an intersection exceeds six percent (6%), a leveling area of not greater than three percent (3%) grade shall be provided for at least thirty-five (35) feet, measured from the nearest edge of the paved surface of the intersecting roads.

- Section 5.2 Deeds and Easements:

- 5.2.3 Where a subdivision is traversed by a watercourse, drainage way, channel or stream, or a wetland exists, space shall be reserved of a width sufficient to carry a flow equal to a fifty (50) year storm at such levels to prevent the hazard of flooding habitable structures. The Planning Board shall require that there be provided a storm water easement or drainage right-of-way of adequate width to conform substantially to the lines of such watercourse, drainage way, channel or stream, and to provide for construction of any safety devices or structures required in the interest of public safety. Any changes in the existing streams shall be subject to the approval of the Planning Board and the Conservation Commission.

- 5.2.4 Any such land that is included in the reserved space shall not be built upon in a manner so as to restrict a fifty (50) year storm level flowage nor shall any habitable structure be built therein.

- Section 5.4. Protection of Natural Features. Natural features, including significant trees, watercourses, ledge rock, ridge tops, and scenic and historic sites shall be preserved. Any demolition, destruction, or significant modifications of such natural features will be permitted only where there is no reasonable alternative, and then only on written approval of the Planning Board. Suitable performance bonding may be required.

- Section 5.10 Storm Drainage:

- 5.10.1 Storm drainage piping, structures and facilities, capable of sustaining a fifty (50) year storm runoff, shall be installed in accordance with design standards described in "Design and Construction Standards for Storm Water Drainage for Town of Wilbraham" (see Appendix D). The Developer shall be responsible for intercepting storm and surface water runoff from the entire portion of the drainage basin that drains to or across his/her property, and shall provide connections to existing water courses or connections to existing storm drains or installation of dry wells for ground water recharge so that downstream properties will be protected from flooding and erosion due to the concentration of storm and surface water runoff.

  5.10.2 All storm and surface water runoff must be conveyed either to a natural water course, an existing adequate storm drain, or approved recharge dry wells. Where necessary the Developer shall acquire and convey to the Town of Wilbraham drainage easements across adjacent land, and shall install ditches or structures, capable of sustaining a fifty (50) year storm runoff, at his/her expense, to accomplish this

- Section 5.18 Wetlands. Strict adherence to "the Wetlands Protection Act" (M.G.L. Chapter 131, Section 40, as amended) shall be maintained at all times.

Wilbraham Zoning By-Laws

The Town of Wilbraham has established a set of bylaws designed in part to "1.2.1 To promote the health, safety, convenience and general welfare of the present and future inhabitants of the Town of Wilbraham;1.2.2 To protect the community and the town's natural resources; 1.2.3 To secure safety from fire, flood, pollution, overcrowding and other dangers by regulating the location and use of structures and the open spaces around them; 1.2.4 To lessen congestion in the streets; 1.2.5 To permit and promote planned, orderly growth; 1.2.6 To conserve the value of land and buildings; 1.2.7 To facilitate the adequate provision of public services; 1.2.8 To preserve and increase the town's amenities; 1.2.9 To reconcile the need and desire of Wilbraham's diverse and growing population for adequate housing with the preservation of natural resources and the prevention of overcrowding of land and undue concentration of population; 1.2.10 To encourage compatible development and the most appropriate use of the town's land and resources;1.2.11 To provide for the expansion of suitable, economically and environmentally sound business

and industry within the town in order to diversify the local economy and the tax base; 1.2.12 To establish a fair and reasonable set of standards for evaluating each development proposal impartially, on its own merit; 1.2.13 To develop rational land development alternatives through an equitable and prescribed negotiation process so as to establish a balanced land use pattern that is responsive to the needs of property owners while minimizing the adverse effects of development; and 1.2.14 To provide the town with the full protection authorized by Chapter 40A of the General Laws as amended.." The Zoning By-Laws include several provisions that mitigate the potential for flooding, including:

- Section 3400. Environmental Controls and Septic Regulations

10.4 EARTH REMOVAL REGULATIONS

Purpose :The purpose of this section is to preserve a cover-crop on the land to prevent erosion, and to control any excavation operations that may create a safety or health hazard to the public or the adjacent property owners, or be detrimental to the immediate neighborhood or to the Town of Wilbraham. The covering of excavations may be done with the top six (6) inches of soil removed therefrom, and furnishing new top soil or loam from off the premises will not be required. Excavations which uncover [edge or rock outcrops need not be covered or seeded.

10.4.2 Standards and Conditions

B. The plan shall provide for proper drainage of the area during the period of operation and after completion. In residence districts, every slope or bank above or below natural grade must be prepared at the end of each working day so that it does not exceed one foot of vertical distance in each two feet of horizontal distance. In other districts, on completion of the operation, no bank shall exceed a slope of one foot of vertical distance in each two feet of horizontal distance.

C. At the conclusion of the operation, or of any substantial portion thereof, the whole area where removal takes place shall be covered with not less than six (6) inches of top soil and seeded with a suitable cover crop.

E. Before a permit is granted under this section the applicant shall post a bond in an amount approved by the Zoning Board of Appeals as sufficient to guarantee conformity with the provisions of the permit issued hereunder.

H. The Town Engineer or other agent designated by the Zoning Board of Appeals shall inspect each operation at least once a month and report on his inspection to the Zoning Board of Appeals. The costs to the Town of such inspections shall be billed to and paid for by the holder of the permit.

13.3 SITE PLAN REQUIREMENTS

13.4.1 Preservation of the Landscape

13.4.1.1 The landscape shall be preserved in its natural state insofar as practicable by minimizing tree, soil, and vegetation removal; minimizing the use of wetlands, steep slopes, hilltops and floodplains;

13.4.1.2 Special care shall be taken to preserve unique or important natural, historic or scenic features.

13.4.6 Surface Water Drainage

13.4.6.1 The proposed drainage system within and adjacent to the site shall be adequate to handle the increased runoff resulting from the development.

13.4.6.2 Special attention shall be given to proper discharge of surface water drainage so that removal of surface waters will not adversely affect neighboring properties, streams, wetlands or the public storm drainage system.

13.4.5.3 Surface water in all paved areas shall be collected at intervals so that it will not obstruct the flow of vehicular or pedestrian traffic, and will not create puddles in the paved areas.

9.1 FLOOD PLAIN DISTRICT

9.1.1 Purposes

The purposes of this district (in addition to those enumerated elsewhere in this Zoning By-Law) are:

9.1.1.1 To provide that lands in the Town of Wilbraham subject to seasonal or periodic flooding as described hereinafter shall not be used for residence or other purposes in such a manner as to endanger the health, safety or welfare of the occupants thereof, or of the public generally, or so as to burden the public with costs resulting from unwise individual choices of land use.

9.1.1.2 To assure the continuation of the natural flow pattern of the water course(s) within the Town, in order to provide adequate and safe floodwater storage capacity to protect persons and property against the hazards of flood inundation.

9.1.2 Scope of Authority

The Flood Plain District is herein established as an overlay district and shall be superimposed on other districts established by this By-Law. All regulations of the Wilbraham Zoning By-Law applicable to such underlying districts shall remain in effect, except that where the Flood Plain District imposes additional regulations, such regulations shall prevail.

All development in the Flood Plain District, including structural and non-structural activities, whether permitted by right or by special permit, must be in compliance with Chapter 131, Section 40 of the Massachusetts General Laws and the Flood Resistant Construction Regulations of the State Building Code (Section 780 CMR 3107). Any variances from the provisions and requirements of the above referenced state regulations may only be granted in accordance with the required variance procedures of these state regulations.

9.1.3 District Delineation

9.1.3.1 The Flood Plain District includes all special flood hazard areas designated as Zone A or Zone A1-30 on the Wilbraham Flood Insurance Rate Maps (FIRM) issued by the Federal Emergency Management Agency (FEMA), panel 250154-0005D dated June 15, 1988 and panel 250154-0010C dated July 10, 1981, as amended.

9.1.3.2 The regulatory floodway is designated on the Wilbraham Flood Boundary and Floodway Maps issued by the Federal Emergency Management Agency (FEMA), panel 250154-0005 dated June 15, 1988 and panel 250154-0010C dated July 10, 1981, as amended.

9.1.3.3 These maps as well as the accompanying Wilbraham Flood Insurance Study are incorporated herein by reference as part of the Zoning Map and are on file with the Town Clerk, Planning Board and Building Inspector.

9.1.3.4 Within Zone A, where the base flood elevation is not provided on the FIRM, the Building Inspector shall obtain and review existing base flood elevation data. If the data is sufficiently detailed and accurate it shall be relied upon to require compliance with this Zoning By-Law.

9.1.4 Permitted Uses

9.1.4.1 In the Flood Plain District no new buildings shall be erected or constructed, no existing buildings shall be enlarged or moved except as hereinafter provided, no dumping, filling or earth transfer or relocation shall be permitted, and no land or building shall be used for any purpose except:

A. Conservation of water, plants and wildlife;

B. Outdoor recreation, including play areas, nature study, boating, fishing and hunting where otherwise legally permitted, but excluding building and structures;

C. Wildlife management areas, foot, bicycle, and/or horse paths and bridges provided such uses do not affect the natural flow pattern of any water course;

D. Grazing and farming, including truck gardening and harvesting of crops;

E. Forestry and nurseries;

F. Temporary non-residential buildings used in connection with fishing or growing, harvesting, storage or sale of crops raised on the premises;

G. Buildings lawfully existing prior to the adoption of these provisions.

9.1.4.2 The portion of any lot within the area delineated in Section 9.1.3 above may be used to meet the area and yard requirements for the district or districts in which the remainder of the lot is situated.

9.1.5 Uses by Special Permit

9.1.6.1 A special permit shall not be issued for new habitable buildings to be erected within the Flood Plain District but a special permit may be granted for the reconstruction or addition up to a maximum of fifty (50) percent increase of the existing valuation, to buildings lawfully existing prior to adoption of these provisions so long as the Board of Appeals acting as the Special Permit Granting

9.1.5.2 The Board of Appeals acting as the Special Permit Granting Authority in accordance with Section 13.6 of this By-Law, may consider

and issue a special permit for a deviation from the regulations set forth in the Flood Plain District in this By-Law only upon finding all of the following:

A. A showing of good and sufficient cause;

B. A determination that failure to grant the special permit would result in exceptional hardship to the applicant;

C. A determination that the granting of a special permit will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public or conflict with existing local laws;

D. A determination that the special permit is the minimum necessary considering the flood hazard to afford relief.

9.1.6.3 The Board of Appeals acting as the Special Permit Granting Authority shall provide notice of any hearings hereunder to the Planning Board, Board of Health and the Conservation Commission and shall maintain a good record of all special permit actions, including justification for their issuance and report such special permits issued in the annual report submitted to the Federal Insurance Administration.

9.1.6.4 Under no circumstances shall a special permit be issued in the regulatory floodway.

- 4.6 Flexible Subdivision Regulations.

  For the purpose of promoting the more efficient use of land in harmony with its natural features, an owner of a tract of land situated within a Residence District, or other suitable applicant, may make application to the Planning Board, acting as the Special Permit Granting Authority, for a special permit exempting any or all of the lots to be created upon the subdivision of such land from the square foot, usable lot area, frontage, yard, and setback requirements of Section 4.4.

  4.6.1 Such application shall be accompanied by a Site Plan and such other information as is required by Planning Board Subdivision Rules and Regulations.

  4.6.2

  A. The number of lots on which there is to be a single dwelling unit does not exceed the number of lots upon which dwellings could be

constructed on the total land area of the tract which is Land Usable for Residential Construction;

E. At least twenty-five (25) percent of the area of the tract subject to said special permit (exclusive of land set aside for road area) shall be Open Space;

F. No lot shown on said Site Plan shall have less than 48,000 square feet in a R-60 District, 34,000 square feet in a R-40 District, or 30,000 square feet in a R-34 District, in ail other residential districts the lot size shall not be reduced.

F. Whether or not the proposed Open Space is of a size and shape to provide adequate access to benefit the Town or the creation of which is otherwise advantageous to the Town;

- 4.7 FLEXIBLE NON-SUBDIVISION (ESTATE LOT) REGULATIONS

The Planning Board, acting as the Special Permit Granting Authority may grant approval to a non-subdivision plan which includes the creation of lots having less frontage on a street as defined in Section 1.3 under sub-definitions (a) (b) and (c) than is otherwise provided for in this By-Law, for the purpose of preserving open space and of reducing visual and traffic density, provided that the following conditions are met.

4.7.2.A. The total parcel consists of at least 320,000 square feet before division into separate lots, of which no more than forty (40) percent is wetland.

B. Any lot which does not satisfy the frontage requirements has a total area which is at least equal to three hundred (300) percent of the lot size requirement for said parcel as set forth in Section 4.4. If the lot is located in two residential zoning districts, the district in which the house is to be located shall determine the size of the lot.

C. As a result of the approval of said plan, Open Space equal to at least 200,000 square feet for each lot having less than the required frontage is being created thereby on that lot or on other adjacent land. The purpose of this requirement is to avoid increasing density on tracts of land which could otherwise be developed as a formal subdivision by providing for a more limited form of development which

results in substantially less overall density than would occur if said parcel was to be developed as a subdivision under this By-Law.

4.8 Planned Unit Residential Development

The Planning Board, acting as the Special Permit Granting Authority, may authorize a Planned Unit Residential Development (PURD)...

4.8.1 Purpose

It is the purpose of this section to allow for greater variety and flexibility in the development of housing types and to facilitate the construction and maintenance of streets, utilities and public services in a more economical and efficient manner while at the same time conserving important natural site features and permanently preserving open space.

4.8.3 Application

(5) An engineering report regarding the adequacy of sewage disposal, water supply and storm water drainage including the impact of the proposed design on the existing municipal utility infrastructure of the Town.

B. Said application shall contain sufficient information so that the Planning Board can determine the applicability of said application for the following items:

(2) Preserves and protects the character of the Town and especially the immediate neighborhood, giving due consideration to such features as public safety, including traffic control and traffic impact upon surrounding roads; development of adequate recreational facilities for the use of the residents of said proposal; adequate fire protection; public health including sewerage disposal, drainage and water supply; and the compatibility of the size, location, architecture, and landscaping of said project with the adjacent neighborhood and the Town;

(3) Minimizes potential adverse environmental impacts upon the Town;

C. Said permit shall not be issued unless the Planning Board affirmatively determines that each of the above listed criteria is met by said applicant.

4.8.5 Dimensional Regulations

Property for PURD use shall comply with the following dimensional requirements:

4.8.5.1 Minimum Parcel Size. The total parcel shall have a minimum area of not less than twenty (20) acres. A minimum of ten (10) acres of the total area required for zoning compliance shall consist of usable land as defined in Section 1.3.

4.8.5.2 Minimum Parcel Frontage. The total parcel shall have a minimum frontage on a public way of at least one hundred (100) feet. There shall be no frontage requirements within the PURD.

4.8.10 Landscaping Requirements

B. Wherever possible, existing trees and vegetative cover shall be conserved and integrated into the landscape design.

4.8.11 Common Open Space Requirements

A. All land within the PURD which is not covered by buildings, roads, driveways, parking areas or other development, or which is not set aside as private yards, patios or gardens for the residents, shall be common open space. The area of the common open space shall equal at least forty percent (40%) of the total area of the PURD tract. Such land shall have a shape, dimension, character and location suitable to assure its use for park, recreation, conservation, or agricultural purposes by all the residents of the development.

B. Suitable and usable outdoor recreational area or areas shall be provided for the use of tenants. At least 2,000 square feet per dwelling unit must be usable open space for active and passive recreation. Such space shall not include wetlands as determined by the Conservation Commission. Usable open space shall be defined to include land for community gardens, hiking/jogging paths, tennis courts, swimming pools or similar facilities.

C. Further subdivision of common open land or its use for other than recreation, conservation, or agriculture, except for easements for underground utilities shall be prohibited.

Ridgeline and Hillside District

9.3.1 Purpose

The purposes of the Ridgeline and Hillside District (in addition to those enumerated elsewhere in this Zoning By-Law) are:

9.3.1.1 To preserve and protect the natural scenic beauty and related natural resources of the upland areas in the Town of Wilbraham.

9.3.1.2 To regulate new construction, the removal of natural vegetation, especially large trees, and the excavation and alteration of land, in order to minimize any danger of erosion, sedimentation, flooding, water pollution, and other adverse impacts of development within the District or any adjacent low lying area.

9.3.1.3 To insure that development within the District does not reduce property values within said District or adjacent thereto by unnecessarily detracting from the natural visual setting or obstructing significant views.

9.3.3 District Delineation

The Ridgeline and Hillside District includes all land in the Town of Wilbraham at an elevation of five hundred and fifty (550) or more feet above sea level as delineated on a map entitled "Ridgeline and Hillside Overlay District, Town of Wilbraham, MA, March 1991", as amended.

9.3.4 Development Subject to Ridgeline and Hillside District Review

Notwithstanding other provisions of this By-Law, no land development within the Ridgeline and Hillside District shall be permitted and no building permit, special permit or approval of a definitive subdivision plan under the Subdivision Control Law shall be issued until the provisions of Ridgeline and Hillside District Review have been fulfilled and site plans approved by the Ridgeline and Hillside District Review Board. Activities constituting development and subject to review within said district include the following:

A. The construction of a new dwelling or principal structure.

B. A significant addition or alteration to any dwelling or other structure, if such action affects the exterior appearance. A significant addition or alteration is defined as an alteration which increases the assessed value by fifteen (15) percent, or which adds to the height of the structure, or which substantially alters the visual profile of the property or structures thereon.

C. The removal, filling, excavation or alteration of earthen materials or the construction of an access road, if such action changes pre-existing drainage characteristics or sedimentation patterns, or alters the topographic or visual profile of the property.

D. The construction of a windmill, tower, satellite dish, antenna or other visually prominent accessory structure.

E. Any subdivision which requires approval under the Subdivision Control Law, M.G.L., Chapter 41.

F. The removal or destruction of trees, if such action results in a clear cutting or denuding of the forest cover, or an observable visual modification to the forest canopy as viewed from a public way or Public Vantage Point. Selective timber cutting shall be permitted within the area of a designated building envelope wherein principal and accessory structures have been approved. Timber cutting for the purpose of clearing land for legitimate agricultural purposes shall be permitted subject to satisfactory evidence of such intended use.

9.3.6 Application Information

9.3.6.3 Applications must be accompanied by a site plan. If the development site occupies only a small portion of a parcel of land, the Ridgeline and Hillside Review Board may specify that only a portion of the parcel of land in question be identified on any site plan so submitted, the site plan shall contain the required information listed under section 13.3 as well as the following additional information:

A. The placement, height, physical characteristics, and architectural rendering of all existing and proposed buildings and structures on the development site including building envelopes if so required.

C. Measures to be undertaken during and after construction to prevent erosion, sedimentation, flooding or water pollution.

9.3.7 Design Standards

Development in the Hillside and Ridgeline District shall be designed to blend harmoniously with the natural terrain and vegetation in order to preserve and protect the scenic character and the environmental quality of the site in accordance with the following standards:

9.3.7.1 Siting of Structures and Building Characteristics

C. Foundations shall be constructed to reflect the natural slope of the terrain.

D. Roof lines and roof surfaces should be an important part of the building design and shall reflect the natural slope of the terrain.

9.3.7.2 Landscaping

A. The removal of native vegetation, especially large trees, shall be minimized. Trees may only be removed for construction of streets, driveways or structures. Selective clearing for lawns and septic systems shall be designated on the site plan.

B. Landscaping and plantings shall be utilized to screen buildings in open or prominent areas from significant views. Landscaping and plantings shall be generally compatible with native vegetation.

9.3.7.3 Grading

Any grading or earth moving operation is to be planned and executed in such a manner that final contours appear to be consistent with the existing terrain, both on and adjacent to the site.

9.3.7.4 Utilities

Utilities shall be constructed and routed underground.

9.3.7.5 Erosion and Sediment Control

A. Post development runoff shall not exceed pre-development levels. All runoff from impervious surfaces shall be retained on site, and if necessary, shall be diverted to infiltration basins covered by natural vegetation which shall be designed to handle a minimum 25 year storm.

B. Appropriate sediment and erosion control measures shall be employed to minimize the impacts during and after construction.

13.6 Special Permits

Special permits are intended to provide detailed review of certain uses and structures which may have substantial impact upon abutters, traffic, utility systems, the character of the Town, and public services. The special permit review process is intended to ensure a harmonious relationship between proposed development and its surroundings, and ensure that proposals are consistent with the purpose and intent of this By-Law.

13.6.5 Required Findings

13.6.5.4 The proposed use will not constitute a nuisance due to air and water pollution excessive noise, dust, vibration, lights, or visually offensive structures and accessories;

13.6.6.9 The design of the project provides for adequate methods of disposal and/or storage of sewage, refuse and other wastes generated by the proposed uses on the site;

13.6.5.110. The design of the project provides for adequate surface water drainage and the proposed use will not create a significant adverse impact to the quality of surface water or groundwater during or after construction;

13.6.7 Conditions, Safeguards and Limitations

In granting a special permit, the special permit granting authority may impose conditions, safeguards, and limitations which shall be in writing and may include but are not limited to the following:

13.6.7.4 Measures to protect against environmental pollution.

River and Stream Protection

The Town of Wilbraham follows the standards established by the Wetlands Protection Act, which protects water bodies and wetlands through the town Conservation Commission. The Town also has instituted its 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.

Wilbraham Open Space and Recreation Plan

Recent efforts by the Town of Wilbraham Conservation Commission and others have resulted in the creation of municipal plans that are useful for flood hazard mitigation purposes. In 2005, the town completed its Open Space and Recreation Plan. The intent of the document is not to address hazard mitigation or flood control in a direct or comprehensive way; however, it inventories the natural features and environments in the town, many of which, such as wetlands, aquifer recharge areas, farms, rivers, streams, and brooks, contain floodplain, dam failure inundation or localized flooding areas.

The plan highlights the importance of balancing future development with the preservation of the community's natural and scenic resources. The preservation of open space and farmland will provide flood storage capacity, which reduces the amount of impervious surfaces in an area, as well as other benefits not directly related to natural hazard mitigation.

National Flood Insurance Program

The Town of Wilbraham participates in the National Flood Insurance Program. As of 2006, there were 20 policies in effect in Wilbraham for a total of $4,332,300 worth of insurance. The town is not a member of the Community Rating System, which entitles policyholders to a discount on flood insurance premiums. The CRS ranking is based on the steps that a town has taken to control flood losses.

The Community Rating System reduces flood insurance premiums to reflect what a community does above and beyond the National Flood Insurance Program's (NFIP) minimum standards for floodplain regulation. The objective of the CRS is to reward communities for what they are doing, as well as to provide an incentive for new flood protection activities. To participate in the CRS, a community must fill out an application and submit documentation that shows what it is doing and that its activities deserve at least 500 points. More information including instructions and applications is available at *http://training.fema.gov/EMIWeb/CRS/m3s1main.htm.*

Table 5-1
Existing Flood Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Subdivision Rules and Regulations	1. Requires a definitive plan that identifies stormwater drainage, permanent open space, flood plains, public water supply proposals, and a utilities layout. 2. Requires a report on individual on-site septic systems that discusses the flood height of nearby streams. 3. 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 (principal street); no more than eight	Entire town.	1. Somewhat effective for mitigating or preventing localized flooding of roads and other infrastructure. 2. Somewhat effective for preventing septic system failure in a flood. 3. Somewhat effective at slowing water.	**1. Consider adding Flood Prevention and Mitigation to purpose section of the Subdivision Rules and Regulations.** **2. Revise regulations to require comment on 100-year storm height.** **3. None**

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
	percent (secondary street). 4. Requires watercourses be preserved in perpetuity with an easement to a width sufficient to carry a flow equal to a fifty year storm. 5. Requires stormwater drainage systems in a development that are capable of piping a fifty year storm. 6. Re-emphasizes the primacy of Massachusetts Wetlands Protection Act. 7. Requires the protection of natural features such as significant trees, historic sites, ledges, waterways.		Somewhat effective at preventing flood damage	4. Increase buffer to 100-year storm. 5. None 6. None 7. None

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Zoning Bylaws: **1. Earth Removal Regulations**	1. Requires a cover crop of vegetation, and mandates that six inches of topsoil must be returned to the entire site to promote growth.	1. Entire town.	1. Addresses long-term problem of erosion by requiring actions to restore the landscape.	**1. None.**
2. Site Plan Review	2. 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.	2. Entire Town	2. Somewhat effective for controlling surface runoff and erosion problems.	**2. None.** **2.1 Revise language in ordinance to reflect NPDES-Phase II regulations.**

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
3. Flood Plain District	3. Purpose includes preserving natural flood control characteristics and flooding storage capacity of the flood plain.	3. Areas delineated by the Wilbraham Flood Insurance Rate Map	3. Somewhat effective for minimizing impacts of development on flood levels within flood plain.	**3. None.**
4. Flexible Subdivision Regulations	4. 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.	4. Residential Districts.	4. Somewhat effective at promoting development styles that conserve remaining open space.	**4. Consider allowing this use by right.**
5. Flexible Non-Subdivision (Estate Lot)	5. Allows the creation of lots that have less frontage on a way than the town's	5. All Districts	5. Somewhat effective at	**5. Adopt a cluster bylaw and allow it by right to reduce demand for conventional**

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Regulations	regulations allow on parcels of 320,000 square feet, provided 200,000 square feet will be reserved as open space.		preserving flood storage land.	**subdivisions.**
6. Planned Unit Residential Development (PURD)	6. Allows flexibility in the development in housing while preserving open space.	6. All Districts	6. Somewhat effective tool for preserving flood storage capacity.	**6. Adopt a cluster bylaw and allow it by right to reduce demand for conventional subdivisions.**
7. Ridgeline and Hillside District	7. Guide development in Wilbraham's while preserving scenic and natural amenities.	7. Uplands	7. Somewhat effective for ensuring that permitted projects do not increase flooding potential, as this limits	**7. Consider development ratios that maximize preserved open space.**

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
			development on steep slopes.	
Town of Wilbraham Open Space and Recreation Plan	Inventories natural features and promotes natural resource preservation in the town, including areas in the floodplain; such as wetlands, aquifer recharge areas, farms and open space, rivers, streams and brooks.	Entire town.	Effective in identifying sensitive resource areas, including floodplains.	**Consider implementing the Five-Year Action Plan strategies, particularly those dealing with protection of forests, farmland and floodplain forests.**
Participation in the National Flood Insurance Program	As of 2005, there were 20 homeowners with flood insurance policies.	Areas identified by the FEMA maps.	Somewhat effective, provided that the town remains enrolled in the National Flood Insurance Program.	**The town should evaluate whether to become a part of FEMA's Community Rating System.**

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Beaver Management Strategy	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.	Areas within the 100-Year Floodplain.	Would be effective in controlling the negative impacts of flooding caused by beaver activity.	**Develop a Beaver Management Strategy in cooperation with the Wilbraham Board of Health.**

Severe Snowstorms/Ice Storms

Winter storms can be especially challenging for emergency management personnel even though the storm has usually been forecast. 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.[15]

Management Plans

The CEM Plan for Wilbraham lists the following generic mitigation and preparedness measures for severe winter storms:

A. Mitigation

1. Develop and disseminate emergency public information concerning winter storms, especially material which instructs individuals and families how to stock their homes, prepare their vehicles, and take care of themselves during a severe winter storm.
2. Local governments should assume that winter will occur annually and budget fiscal resources with snow management in mind.
3. Maintain plans for managing all winter storm emergency response activities.

B. Preparedness

1. Ensure that warning/notification and communications systems are in readiness.
2. Ensure that appropriate equipment and supplies, especially snow removal equipment, are in place and in good working order.
3. Review mutual aid agreements.
4. Designate suitable shelters throughout the community and make their locations known to the public.
5. Implement public information procedures during storm 'warning' stage.
6. Prepare for possible evacuation and sheltering of some populations impacted by the storm (especially the elderly and those with special needs).

[15] Comprehensive Emergency Management Plan for the Town of Wilbraham, 2004.

Restrictions on Development

There are no restrictions on development that are directly related to severe winter storms. The Town of Wilbraham's Zoning Regulations do allow common driveways (Section 4.9), and restrictions on utility placement (Section 5, Utility Trenches), which, although not specified as weather hazard mitigation, can serve to minimize accident potential and power loss from severe winter storms:

Subdivision Regulations

Wilbraham's Subdivision Rules and Regulations establish a maximum grade for streets and ways that are constructed in a new development. The following regulations, in part, establish that:

- Section 5.1 Streets The layout of the proposed subdivision is to be described according to the following criteria…:

  5.1.3 Grade

  5.1.3.1 Street grade shall be not less than one-half of one percent (0.5%). Grade shall not be more than six percent (6%) for a principal street nor more than eight percent (8%) for a secondary street.

  5.1.3.2 Where the grade of a street at the approach to an intersection exceeds six percent (6%), a leveling area of not greater than three percent (3%) grade shall be provided for at least thirty-five (35) feet, measured from the nearest edge of the paved surface of the intersecting roads.

Furthermore, the Subdivision Rules and Regulations for Wilbraham require that all new utilities be buried underground (Section 5.6.6.1):

- 5.6.6 Utility Trenches.
  5.6.6.1 All electrical and telephone distribution wires shall be installed underground, unless in the opinion of the Planning Board such installation is not in the best interests of the Town or is impractical.
  5.6.6.2 All utility entrances and trenches in the subdivision shall be completed prior to the application of the finished course.
  5.6.6.3 A connection for each underground utility shall be installed to the edge of the street right-of-way for each house lot before the finished course of the street is installed.

Zoning Regulations

Wilbraham's Zoning Regulations allow for the sharing of constructed driveways across multiple lots. This reduces the risk of driveway obstructions for individual land owners and gives emergency service personnel the opportunity to streamline their efforts, in part, by:

4.9 Access To Lot Other Than From Street Frontage

In a residence district, vehicular access to and from the lot shall be across the front lot line subject to the following exception. The Planning Board acting as the Special Permit Granting Authority may authorize by Special Permit access to a single lot or up to three (3) adjacent lots across the side lot line or rear lot line from a single or common driveway. Such access is not intended for a lot which would otherwise be inaccessible or undevelopable and the Planning Board will not issue a Special Permit in those circumstances. Such access is intended for otherwise bonafide building lots when a common driveway will improve safety or convenience of access. It is also intended for use in new Flexible Subdivisions (Section 4.6) and new Flexible Non-Subdivisions (Estate Lots) (Section 4.7). Issuance of a Special Permit shall be subject to the following conditions:

4.9.5 Common driveways shall be constructed to meet the following minimum standards which may be made more stringent at the discretion of the Planning Board where appropriate:

A. Minimum turning radius of fifty (50) feet;

B. Minimum width of fourteen (14) feet;

C. Driveway surface able to support a minimum of sixty five thousand (65,000) pounds of gross vehicle weight; and

D. Turnoff provided for every five hundred (500) feet of driveway length.

Other Mitigation Measures

Severe snowstorms or ice storms can often result in a small or widespread loss of electrical service. The Elementary School and the Public Safety Complex are both served by a large pad-mounted generator that will provide electric power in the event of primary power failure.

State Building Code

For new or recently built structures, the primary protection against snow-related damage is construction according to the State Building Code, which addresses designing buildings to withstand snowloads. The Town of Wilbraham has a full-time, professionally trained building inspector on staff.

Table 5-2
Existing Severe Snowstorms/Ice Storms Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Subdivision Regulations – Design Standards for Roads	Standards include street grade regulations (three to eight percent maximum).	Entire town.	Effective.	**None.**
Subdivision Regulations – Utilities (electric and telephone)	The town requires all utilities for new subdivisions to be underground.	Entire town.	Somewhat effective for ensuring that utility service is uninterrupted by severe storms in new areas of residential development.	**Work with utility companies to underground existing utility lines in locations where repetitive outages occur.**

Common Driveways	Wilbraham allows a common driveway for up to three (3) adjacent lots.	Entire town.	Effectively establishes standards for permitting driveways that can accommodate emergency vehicles.	**None.**
State Building Code	The Town of Wilbraham has adopted the Massachusetts State Building Code.	Entire town.	Effective.	**None.**

Hurricanes

Of all the natural disasters that could potentially impact Wilbraham, hurricanes provide the most lead warning time 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).[16] The flooding associated with hurricanes can be a major source of damage to buildings, infrastructure and a potential threat to human lives. Therefore, all of the flood protection mitigation measures described in Table 4-1 can also be considered hurricane mitigation measures. High winds that oftentimes accompany hurricanes can also damage buildings and infrastructure.

Town of Wilbraham's telecommunications facilities bylaw, restrictions on development, and mobile home and State Building Code regulations, as listed below, are equally applicable to wind events such as hurricanes and tornadoes.

Management Plans

The CEM Plan for Wilbraham includes the following generic preparedness and mitigation measures for hurricane planning and response:

A. Mitigation

1. Develop and disseminate emergency public information and instructions concerning hurricane preparedness and safety.
2. Community leaders should ensure that the community is enrolled in the National Flood Insurance Program.
3. Develop and enforce local building codes to enhance structural resistance to high winds and flooding. Build new construction in areas that are not vulnerable to direct hurricane effects.
4. Make informed decisions concerning protecting natural attributes such as beaches and dunes with breakwaters and sea walls. Review National Flood Insurance Rate Maps and Hurricane Evacuation Maps for possible impact on the community. Hurricane Evacuation Maps are available for coastal communities along Buzzard's Bay and Nantucket Sound.

[16] Comprehensive Emergency Management Plan for the Town of Wilbraham, January 1999.

5. Maintain plans for managing all hurricane emergency response activities.

B. Preparedness

1. Ensure that warning/notification systems and equipment is ready for use at the 'hurricane warning' stage.
2. Review mutual aid agreements.
3. Designate suitable wind and flood resistant shelters in the community and make their locations known to the public.
4. Prepare for coordination of evacuation from potentially impacted areas, including alternate transportation systems and locations of special facilities

Evacuation Options

According to the Wilbraham CEM plan, local officials have stated that the all shelters will be used in a Hurricane.

Subdivision Rules and Regulations

All utilities in Wilbraham shall be constructed underground:

Subdivision Rules and Regulations, Section 5 Design Standards

- 5.6.6 Utility Trenches.
  5.6.6.1 All electrical and telephone distribution wires shall be installed underground, unless in the opinion of the Planning Board such installation is not in the best interests of the Town or is impractical.
  5.6.6.2 All utility entrances and trenches in the subdivision shall be completed prior to the application of the finished course.
  5.6.6.3 A connection for each underground utility shall be installed to the edge of the street right-of-way for each house lot before the finished course of the street is installed.

Zoning

8.7 Utilities

A. All utilities shall be placed underground

10.5 Wireless Communications Facilities Regulations

The purpose of this subsection of the Zoning By-Law is to establish appropriate siting criteria and standards for wireless communications facilities, to minimize the adverse impact on adjacent properties, to preserve scenic views, to limit the number and height of such facilities, to promote the shared use of existing facilities to reduce the need for new facilities, and to provide maximum wireless coverage as mandated by Section 704 of the Federal Telecommunications Act of 1996, while protecting the historic and residential character of the Town of Wilbraham, the property values of the community and the health and safety of citizens.

10.5.2 Design Guidelines

The following guidelines shall be used when preparing plans for the siting and construction of wireless communications facilities.

A. To the extent feasible, wireless communications facilities shall be located on existing structures, including but not limited to buildings, water towers, telecommunications towers, utility poles and related facilities, provided that such installation preserves the character and integrity of those structures. The applicant shall have the burden of proving that there are no feasible existing structures upon which to locate.

C. To the extent feasible, wireless communications facilities shall be designed to accommodate the maximum number of users technologically practical. The intent of this requirement is to reduce the number of towers which will be required within the community. New towers shall be considered only upon a finding by the Planning Board that existing or approved towers cannot adequately fulfill the applicant's service requirements or accommodate the wireless communications equipment planned for the proposed tower.

E. Only free standing monopoles, with associated antennae and panels are allowed in new locations. Lattice style towers or any tower requiring guy wires for support are not allowed unless pre-existing on the location.

F. No new wireless communications tower shall be located closer than two miles to any other existing tower location unless the Applicant demonstrates to the satisfaction of the Planning Board that:

1. In residential zoning districts, wireless communications facilities shall not exceed one hundred (100) feet in height as measured from ground level

at the base of the tower, unless the Applicant demonstrates to the satisfaction of the Planning Board that a taller tower will permit multiple users without significantly increasing the impact upon the viewshed and/or that the Applicant will be unable to provide service with a shorter tower. However, in no event shall the tower height exceed one hundred fifty (150) feet.

I. Further, the tower shall be located a minimum of 500 feet from any existing building that is used as a residence, school, or child care facility.

H. All wireless communications towers shall be pre-engineered to fall at a pre-determined height and "fold in half" in the event of catastrophic failure.

Restrictions on Development

The only restrictions on development that are wind-related are the provisions in the zoning bylaw related to telecommunications facilities.

Mobile Homes

According to the Town of Wilbraham's Zoning Bylaws, mobile homes are not an allowed use, unless they are used after a fire has destroyed a residential property (maximum of 12 months).

State Building Code

For new or recently built structures, the primary protection against wind-related damage is construction that adheres to the State Building Code, which, when followed, results in buildings that withstand high winds. The Town of Wilbraham has a full-time, licensed building inspector.

Tornadoes

Worcester County and areas just to its west, including portions of Hampshire County, have been dubbed the "tornado alley" of the state because the majority of significant tornadoes in Massachusetts's weather history have occurred in that region.[17] 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.[18] Like earthquakes, the location and extent of potential damaging impacts of a tornado are completely unpredictable. Most damage from tornadoes comes from high winds that can fell trees and electrical wires, generate hurtling debris and, possibly, hail.

Management Plans

The CEM Plan for Wilbraham includes the following generic preparedness and mitigation measures for tornado planning and response:

A. Mitigation

1. Develop and disseminate emergency public information and instructions concerning tornado safety, especially guidance regarding in-home protection and evacuation procedures, and locations of public shelters.
2. Strict adherence should be paid to building code regulations for all new construction.
3. Maintain plans for managing tornado response activities. Refer to the non-institutionalized, special needs and transportation resources listed in the ***Resource Manual*** (Core Functions, and Vulnerable Populations and Areas).

A. Preparedness

1. Designate appropriate shelter space in the community that could potentially withstand tornado impact.
2. Periodically test and exercise tornado response plans.
3. Put emergency management on standby at tornado 'watch' stage.

➢

Evacuation Plans

Wilbraham's officials have stated that the Town's mass care shelters are intended to serve in all emergencies.

[17] Comprehensive Emergency Management Plan for the Town of Wilbraham, 2004.
[18] *www.ibhs.org.*

(This Page Intentionally Left Blank)

Table 5-3
Existing Hurricane & Tornado Hazard Mitigation Measures
(Wind-related)

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Zoning regulations for Tele-communications Facilities	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.	Entire town.	Effective.	**Consider adding safety and prevention of wind-related damage as a stated purpose.**
Subdivision Regulations – Utilities (electric and telephone)	The town requires all utilities for new subdivisions to be underground.	Entire town.	Somewhat effective for ensuring that utility service is uninterrupted by severe storms in new areas of residential development.	**Work with utility companies to underground new utility lines in general and existing utility lines in locations where repetitive outages occur.**

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Zoning Regulations regarding new mobile homes	Mobile homes are not allowed.	Entire town.	Does not address the potential for wind-related damage to mobile homes.	**None.**
State Building Code	The Town of Wilbraham has adopted the Massachusetts State Building Code.	Entire town.	Effective.	**None.**
Debris Management Plan	A debris management plan could be developed.[19]	Entire town.	Effective.	**Consider participation in the creation of a Regional Debris Management Plan.**

[26] Natural disasters can precipitate a variety of debris, including trees, construction and demolition materials and personal property. After a natural disaster, potential threats to the health, safety and welfare of impacted citizens can be minimized through the implementation of a debris management plan. Such a plan can be critical to recovery efforts after a disaster, including facilitating the receipt of FEMA funds for debris clearance, removal and disposal. Additional information is available at *http://www.fema.gov/rrr/pa/dmgbroch.shtm.*

Wildfires/Brushfires

Hampshire and Hampden Counties have approximately 469,587 acres of forested land, which accounts for 63 percent of total land area. Forest fires are therefore a potentially significant issue. 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. In 2005, there were 41 fires reported in Wilbraham. Of this number, 20 fires occurred in buildings, 5 occurred in vehicles and 16 occurred out-of-doors.

The threat from wildfire is particularly serious where residential, and commercial development, major transportation routes, power/gas lines, and other infrastructure intersect. Thus, a fire that might in the past have been allowed to burn itself out with a minimum of fire fighting or containment must now be fought to prevent not only fire damage to surrounding homes and commercial areas, but also to prevent smoke threats to health and safety in these areas.

Despite Massachusetts' extensive state regulations governing fire prevention, control, and suppression, there are still specific areas which are especially vulnerable to fire hazards. These include rural areas where personnel and specialized equipment to handle major fires are scarce, as well as the wildland/urban interface areas.

Management Plans

Mitigation

- Promote fire safety measures such as fire-safe landscaping and construction practices to the public and business communities.

Preparedness

- Restrict outside burning etc. based on moisture levels, fuels supply conditions such as drought.
- Identify high vulnerability or problem areas.

Regulatory Measures

Burn Permits*:* Burn permits for the Town of Wilbraham are issued for the entire season; once a permit has been granted, permit holders call the fire department on the day that they wish to burn to find out if they town is allowing burning. Specific burn permit guidelines are established by the state, such as the burning season and the time when a burn may begin on a given day.

Subdivision Review: The Preliminary Plan and Definitive Plans are reviewed by the Wilbraham Fire Department to ensure that their trucks will have adequate access and that water supplies are adequate for firefighting purposes.

Industrial Uses: For the Industrial, Professional Office Park, and General Business (I-POP-GB) zones, a development must be reviewed by the Fire Department to ensure adequate water supplies (Section 7.0):

7.2.1 Where an industrial use is located beyond the service area of public water supply, adequate provision for fire protection in the judgment of the Fire Chief of Wilbraham shall be made.

7.2.2 The storage of flammable or explosive materials shall be in a manner approved by the Fire Chief of Wilbraham, who may require any precautionary measures necessary in his judgment to eliminate serious exposure hazards to life and property.

Public Education/Outreach: The Wilbraham Fire Department works with the school system and provides educational programs to the town's students.

Restrictions on Development

There are currently no restrictions on development that are based on the need to mitigate the hazards of wildfires/brushfires.

Table 5-4
Existing Wildfire/Brushfire Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Burn Permits	Residents apply for a seasonal burn permit and request permission directly from the fire department on the day they wish to burn.	Entire town.	Effective.	**Consider having a Fire Department staff member inspect burn piles on the day of burning.**
Subdivision Review: **Fire Safety**	The Fire Department is involved in the review of subdivision plans, commercial plans and industrial plans.	Entire town.	Effective.	**None.**
Public Education/Outreach	The Fire Department has an ongoing educational program in the schools.	Entire town.	Effective.	**None.**

(This Page Intentionally Left Blank)

Earthquakes

Although New England has not experienced a damaging earthquake since 1755, numerous less powerful earthquakes have been centered in Massachusetts and neighboring states. Seismologists state that a serious earthquake occurrence is possible.

There are five seismological faults in Massachusetts, but there is no discernable pattern of previous earthquakes along these fault lines. Earthquakes occur without warning and may be followed by after shocks. Most buildings and infrastructures in Massachusetts were constructed without specific earthquake resistant design features. Fill, sandy, or clay soils are more vulnerable to earthquake pressures than other soils.

Earthquakes precipitate several potentially devastating secondary effects, namely:

- The collapse of buildings, bridges, roads, dams, and other vital structures
- Rupture of utility pipelines
- Flooding caused by dam failure
- Landslides
- Major transportation accidents, (railroad, chain highway crashes, aircraft, and marine)
- Extended power outage
- Fire and/or explosion
- HAZMAT accident

Management Plans

The Wilbraham CEM Plan lists the following generic mitigation and preparedness measures for earthquakes:

Mitigation

1. Community leaders in cooperation with Emergency Management Personnel should obtain local geological information and identify and assess structures and land areas that are especially vulnerable to earthquake impact and define methods to minimize the risk.
2. Strict adherence should be paid to land use and earthquake resistant building codes for all new construction.
3. Periodic evaluation, repair, and/or improvement should be made to older public structures.

4. Emergency earthquake public information and instructions should be developed and disseminated.
5. Earthquake drills should be held in schools, businesses, special care facilities, and other public gathering places.

Preparedness

1. Earthquake response plans should be maintained and ready for immediate use.
2. All equipment, supplies and facilities that would be needed for management of an earthquake occurrence should be maintained for readiness.
3. Emergency Management personnel should receive periodic training in earthquake response.
4. If the designated EOC is in a building that would probably not withstand earthquake impact, another building should be chosen for an earthquake EOC.
5. Mass Care shelters for earthquake victims should be pre-designated in structures that would be most likely to withstand earthquake impact. See the ***Resource Manual*** (Core Functions) for Mass Care Shelters.
6. It is assumed that all special needs facilities could be affected to some extent by earthquake effects therefore preparedness measures should be in place to address the needs of all facilities listed in the ***Resource Manual*** (Vulnerable Populations and Areas).
7. Most likely the entire population of the community will be affected by a seismic event. Estimate the maximum peak population affected, considering peak tourism, special event populations, and work hours.

Evacuation Options

The Wilbraham CEM identifies all shelters as potential earthquake mass care shelters.

The maximum peak population affected by an earthquake is estimated at 14,000 people.

State Building Code

State and local building inspectors are guided by regulations put forth in the Massachusetts State Building Code. The first edition of the Massachusetts State Building Code went into effect on January 1, 1975 and included specific earthquake resistant design standards. These seismic requirements for new construction have been revised and updated over the years and are part of the current, 6th Edition of the Massachusetts State Building Code. Given that most structures in Massachusetts were built before 1975, of many buildings and structures do not have specific earthquake resistant design features. According to the 2000 U.S. Census, 91 percent of the housing in Wilbraham was built before 1970. In addition, built areas underlain by artificial fill, sandy or clay soils are particularly vulnerable to damage during an earthquake.

Restrictions on Development

There are no seismic-related restrictions on development.

Table 5-5
Existing Earthquake Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
State Building Code	The Town of Wilbraham has adopted the 6th Edition of the State Building Code.	Entire town but applies to new construction only.	Effective for new buildings only.	**Evaluate older structures to be used as shelters and the Elementary School to determine if they are earthquake resistant.**
Debris Management Plan	A debris management plan could be developed.	Entire town.	Effective.	**Consider participation in the creation of a Regional Debris Management Plan.**
Shelters	Shelters have been identified for victims of natural disasters in Wilbraham.	Entire town.	Effective.	**Consider identifying specific shelters for all natural disasters in Wilbraham**

(This Page Intentionally Left Blank)

Dam Failures

Dam failure is a highly infrequent occurrence, but a severe incident could prove deadly. Since 1984, three dams have failed in or very near Massachusetts, and two have come very close to failing. One of these dam failures resulted in death.

There are over 2,500 dams in Massachusetts. The Army Corps of Engineers in conjunction with the Department of Environmental Management has classified over 50 of these dams as "structurally unsafe". Three hundred dams, (including over 40 of the "unsafe" dams) are designated as 'high hazard' dams. High hazard dams are those located upstream of an area which would probably suffer fatalities and property destruction if the dam were to fail. Many of the dams in the state were built in the 19th Century during the early Industrial Revolution; some are even older and date back to the late 18th Century, These structures are definite hazards that must be considered when planning for the safety of local residents. Even dams which theoretically would pose little threat under normal circumstances can overspill or fail under the stress of a cataclysmic event such as an earthquake or sabotage.

A list of dams that may affect the community is located in the Maps and Tables Annex.

Weather-related or human caused conditions which may compromise a dam's integrity should be monitored by local emergency management services. Assistance under these conditions is available from MEMA.

Dam failure or overspill with subsequent flooding to downstream areas is classified as one of three types, and action is taken according to hazard rating:

Type 1: Slowly developing condition
Type 2: Rapidly developing condition
Type 3: Imminent or Instantaneous failure

The following basic measures are to be taken for each of these three types of dam failures:

Type 1: Slowly developing condition

1. Activate EOC.
2. Activate all communications networks and establish 24-hour communications with Command Post.

3. Release public information.
4. Notify the following:
   a. MEMA Region Headquarters
   b. American Red Cross
   c. Downstream communities

5. Review plans for evacuation and sheltering
   a. Evacuation
      (1) Routes
      (2) Notification
   b. Sheltering
      (1) Availability and capacity
      (2) Food, supplies and equipment
      (3) Shelter owners and managers
      (4) Other communities (if out of town sheltering is required)
6. Require "Stand By" status of designated emergency response forces.

Type 2: Rapidly developing condition

1. Establish a 24-hour communications from dam site to EOC.
2. Assemble, brief and assign specific responsibilities to emergency response forces.
3. Release public information.
4. Obtain and prepare required vehicles/equipment for movement.
5. Prepare to issue warning.

Type 3: Practically instantaneous failure

1. Issue warning
2. Commence immediate evacuation.
3. Commit required resources to support evacuation.
4. Activate shelters or coordinate activation of shelters located outside the community.
5. Notify:
   a. MEMA Region Headquarters
   b. Red Cross
6. Initiate other measures as required to protect lives and property.

The Wilbraham CEM Plan contains the following generic mitigation measures for dam failure:

A. Mitigation

1. Develop and conduct public education programs concerning dam hazards.
2. Maintain up-to-date plans to deal with threat and actual occurrence of dam over-spill or failure.
3. Emergency Management and other local government agencies should familiarize themselves with technical data and other information pertinent to the dams which impact their jurisdiction. This should include determining the probable extent and seriousness of the effect to downstream areas.
4. Dams should be inspected periodically and monitored regularly.
5. Repairs should be attended to promptly.
6. As much as is possible burdens on faulty dams should be lessened through stream re-channeling.
7. Identify dam owners.
8. Determine minimum notification time for down stream areas.

B. Preparedness

1. Pre-place adequate warning/notification systems in areas potentially vulnerable to dam failure effects.
2. Develop procedures for monitoring dam site conditions at first sign of any irregularity that could precipitate dam failure.
3. Identify special needs populations, evacuations routes, and shelters for dam failure response.

Evacuation Options

The Wilbraham CEM Plan does not note any potential for dam hazards emanating from dams upstream of the town. In the event of the catastrophic failure of an upstream dam such as the Windsor Dam and Goodnough Dike, there is potential for damage to some low-lying portions of town.

Permits Required for New Dam Construction

Massachusetts State Law (M.G.L. Chapter 253 Section 45) regulates the construction of new dams. A permit must be obtained from the Department of Conservation and Recreation (DCR) before construction can begin. One of the permit requirements is that all local approvals or permits must be obtained.

Dam Inspections

The DCR requires that dams rated as Low Hazards are inspected every ten (10) years and dams that are rated as Medium/Significant Hazards are inspected every five (5) years. High Hazard Dams are required to be inspected every two (2) years. In 2005, DCR changed its enforcement program, and it is now the responsibility of the dam owner to respect her dam according to DCR's regulations and schedule.

Zoning

There is no mention made regarding the construction of new dams in the Town of Wilbraham's zoning or subdivision regulations.

Restrictions on Development

There are no town restrictions on dam locations. The DCR issues permits for new dams and does have the authority to deny a permit if it is determined that the design and/or location of the dam is not acceptable.

Table 5-6
Existing Dam Failure Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Permits required for new dam construction	State law requires a permit for the construction of any dam.	Entire town.	Effective. Ensures dams are adequately designed.	**None.**
Dam Inspections	DCR has an inspection schedule that is based on the hazard rating of the dam (low, medium, high hazard).	Entire town.	Low. The DCR Changed its regulatory policies in 2005 to require dam owners to inspect their dams with their own resources.	**The town should work to ensure that dam owners are meeting their obligations under DCR's new regulations.**
Evacuation Plans	Comprehensive evacuation plans would ensure the safety of the citizens in the event of dam failure.	Inundation areas in town.	None.	**None.**

(This Page Intentionally Left Blank)

Drought

Although Massachusetts does not face extreme droughts like many other places in the country, it is susceptible to dry spells and drought. And unlike other places, drought can most likely be effectively mitigated in regions like the Pioneer Valley if measures are put into place. Wilbraham has several water protection regulations in place, as evidenced in the section on flooding. Wilbraham also has an outdoor watering ban on record in its general bylaws. Additional regulations and mitigation options, specific to drought mitigation, are included here.

9.2 Ground Water Protection District

A. The underground storage of liquid chemicals and fuels shall only be permitted in tanks constructed of fiberglass or other approved corrosion proof materials as prescribed by the Fire Chief of the Town of Wilbraham.

B. The minimum size tank for underground storage shall be five-hundred fifty (550) gallons.

C. All storage tank installations shall meet or exceed the existing and updated governmental regulations as administered by the Fire Chief of the Town of Wilbraham.

9.2.4.2 Industrial and Commercial Uses.

Industrial and commercial uses shall be subject to the issuance of a special permit. In addition to site plans and other information currently submitted to Town agencies, commissions and boards, an applicant shall submit to the Board of Selectmen information including but not limited to:

A. The approximate amount and composition of leachable wastes used, produced or handled and proposed methods of disposal of such wastes;

B. The amount and composition of any hazardous materials that are used, produced, handled or transported on site;

C. Copies of appropriate reports required by State and Federal regulatory agencies controlling water quality and handling of hazardous waste or hazardous materials.

9.2.5 Prohibited Uses

9.2.6.1 Hazardous Waste.

The storage of over ninety (90) days or disposal of hazardous wastes is prohibited except that a hazardous waste facility may be sited in the Industrial District where such activity may be permitted pursuant to the provisions of M.G.L. Chapter 40A, Sec. 11.

9.2.5.2 Solid Waste Landfill.

Expanding the area of the existing or siting of additional solid waste landfill operations is prohibited. The existing solid waste landfill operation shall be operated in accordance with the best available practices and shall be terminated as soon as feasible. If alternative means for solid waste disposal are not available, the Board of Selectmen shall request an amendment to this By-Law to authorize locating a new landfill area. The location shall be determined by the Town in conjunction with the Mass. Department of Environmental Quality Engineering and/or other technical experts and shall be in conformity with the intent and purposes of this By-Law.

9.2.5.3 Leachable Wastes.

Dumping in or upon the land of leachable wastes, oils, fuels, septage or other non-agricultural materials which may cause deterioration of ground water quality is prohibited.

9.2.5.4 Road Salt Storage.

Siting of additional road salt (sodium chloride) storage or loading facilities is prohibited. The existing road salt open storage shall be replaced with a suitable closed structure as soon as feasible. The use of road salt shall be minimized, consistent with public highway safety requirements.

Table 5-7
Existing Drought Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Ground Water Protection District	Minimizes uses that rely on toxic chemicals within the GWPD.	Ground Water Protection District	Somewhat effective at maintaining a clean drinking water supply	**Revise dimensional regulations to minimize impervious surfaces.**
Outdoor Watering Ban	Establishes measures in the general bylaws for restricting water use in extreme events	Entire Town	Effective at reducing use after a drought has been declared	**Encourage conservation before a drought**

Man-Made Hazards/Hazardous Materials

Hazardous materials are in existence throughout Town, and are constantly being moved on Wilbraham's roads and highways. However, there is no way to anticipate where and when a hazardous materials spill or explosion could take place. Therefore, it makes it somewhat difficult to determine mitigation strategies, but Wilbraham has some regulations currently in place to mitigate the impacts of a hazardous materials disaster.

Wilbraham Zoning Bylaw, Section 10.3 Gas And Oil Pipe Lines

No building used for human habitation or human occupancy shall be located less than 40 feet from the right-of-way of any high pressure liquid petroleum transmission pipe line. Any pressure of one hundred (100) Pounds Per Square Inch F.S.I.) or greater shall be considered to be high pressure.

Table 5-7
Existing Man Made Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Special Restrictions for Projects abutting Oil and Gas Pipelines	Establishes a 40 foot setback	Northern Wilbraham	Effective at minimizing the encroachment upon this sensitive infrastructure component	**None.**
Mutual Aid Agreement	Adopt the Western Regional Homeland Security Advisory Council's Revised Mutual Aid Agreement	Entire town.	Effective tool for providing an multi-front response to man made disasters	**None**
Evacuation Plans	Comprehensive evacuation plans would ensure the safety of the citizens in the event of a man made disaster	Plume and impact areas	Effective for managing the movement of citizens out of a hazard zone	**None.**

(This Page Intentionally Left Blank)

6 – FUTURE MITIGATION STRATEGIES

Goal Statements and Action Items

As part of the natural hazards mitigation planning process that will be undertaken by the Wilbraham Natural Hazards Planning Committee, existing gaps in protection and possible deficiencies will be identified and discussed. The committee will then develop general Goal Statements and Action Items that, when implemented, will help to reduce risks and future damages from natural hazards. The Goal Statements, Action Items, town department(s) responsible for implementation, and the proposed timeframe for implementation for each category of natural hazard are described below.

Several of the Action Items have multiple benefits because, if implemented, these Action Items will mitigate or prevent damages from more than one type of natural hazards. For example, updating the Subdivision Regulations to require new utility lines be placed underground will prevent property damage and loss of service in the event of high winds (tornado or hurricane) or severe snow and ice storms.

The Wilbraham Annual Town Meeting is the forum Wilbraham uses to authorize spending. For this reason, Wilbraham's residents will have ultimate and final oversight of all mitigation-related activities

General Mitigation Action Items

Goal Statement: To provide adequate shelter, water, food and basic first aid to displaced residents in the event of a natural disaster and to provide adequate notification and information regarding evacuation procedures, etc., to residents in the event of a natural disaster.

Action Item: Update Wilbraham's Hazard Mitigation Plan every five years.
Responsible Department/Board: Local Emergency Planning Committee, Police Chief, Fire Chief, DPW
Proposed Completion Date: on-going

Action Item: Examine current notification system including feasibility of Reverse 911.[20] Develop a preliminary project proposal and cost estimate.
Responsible Department/Board: Board of Selectmen
Proposed Completion Date: 2007

Action Item: Public education on the need to prevent yard waste, debris, trash, and household items out of storm culverts. When accomplished, this will mitigate local flooding from storm events by preventing culvert blockages from occurring.
Responsible Department/Board: Emergency Management Director, DPW, Cable Programming Manager
Proposed Completion Date: on-going

Flooding

Overall, the Town of Wilbraham's existing land use regulations regulate development, reduce or eliminate localized flooding events and control the quantity and quality of stormwater runoff. Long-range planning documents such as the town's Open Space and Recreation Plan and Community Development Plan also address flood prevention and mitigation either directly or indirectly in the goals and objectives listed in these documents.

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to flooding.

Action Item: Make improvements and upgrades to Upper Monson Road's two 32' culverts to minimize localized flooding.
Responsible Department/Board: DPW, EMD
Proposed Completion Date: 2012

Action Item: All development in Wilbraham must comply with stormwater regulations and eliminate existing drainage issues and minimize the flooding impacts of a proposed development.

[20] In essence, Reverse 911 is a Windows compatible software program, which uses GIS and database technology to create call lists of phone numbers within a specified geographical area and provide prerecorded messages to the residents at those numbers. Call lists can be created ahead of time or as emergency or other situations arise. The system is voluntary and it is a simple matter to remove those residents who do not wish to participate. Cost of the system varies depending on a number of factors. The Town of Green Tree, Pennsylvania was able to subsidize their purchase of a Reverse 911 system through a $10,000 Community Development Block Grant.

***Responsible Department/Board**:* Planning Board
Proposed Completion Date: 2007

Action Item: In regards to the Wilbraham Open Space and Recreation Plan, implement the Five-Year Action Plan strategies, particularly those that are subject to flooding.
Responsible Department/Board: Conservation Commission and the Board of Selectmen
Proposed Completion Date: Ongoing

Action Item: The town should evaluate whether to become a part of FEMA's Community Rating System.
Responsible Department/Board: Board of Selectmen, Emergency Management Director
Proposed Completion Date: 2009

Action Item: Apply to the Hazard Mitigation Grant Program to fund the replacement of Woodland Dell culvert system, which would require the widening of two 40" culverts under Main Street.
Responsible Department/Board: Board of Selectmen, Emergency Management Director, Highway Department
Proposed Completion Date: 2008

Action Item: Apply to the Hazard Mitigation Grant Program to fund the replacement of McIntosh/Mill Brook culvert system, which has overflowed four times in the past ten years and would require:
(1) Improving a 1.5 mile stretch of drainage on Main Street
(2) Replacing Box Culvert underneath Main Street that must be widened
(3) Replacing twin 50" culvert under Soule Road that drain from Sawmill Pond because they are corroded
(4) Installing trash racks over existing culverts to prevent blockages

Responsible Department/Board: Board of Selectmen, Emergency Management Director, Highway Department
Proposed Completion Date: 2008

Action Item: Apply to the Hazard Mitigation Grant Program to fund the replacement of Mountain Road Culvert System, which runs under Boston Road and empties into the Chicopee River and would require the widening six different sets of culverts, specifically:

(1) Twelve Mile Brook – Inadequate culvert under Boston Road
(2) Repairing and replacing restrictions at the Crane Hill Road Bridge
(3) Enlarging two culverts on Silver Street

Responsible Department/Board: Board of Selectmen, Emergency Management Director, Highway Department
Proposed Completion Date: 2008

Action Item: Apply to the Hazard Mitigation Grant Program to improve drainage on Stony Hill Road and River Road:

Responsible Department/Board: Board of Selectmen, Emergency Management Director, Highway Department
Proposed Completion Date: 2008

Severe Snow Storms/Ice Storms

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to severe snow and ice storms.

Action Item: Tree removal of at-risk trees that would fall and create damage to critical infrastructure in an ice storm.
Responsible Department/Board: Tree Warden, Highway Department
Proposed Completion Date: 2008

Action Item: Road improvements to those roadways that were identified as being subject to icing throughout the winter, specifically the installation of drainage basins to improve the movement of water.
Responsible Department/Board: Board of Selectmen, Planning Board, and Emergency Management Director
Proposed Completion Date: 2012

Hurricanes and Tornadoes

The Action Items listed above, under flooding, address the flooding that can result from a hurricane.

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to high winds associated with hurricanes and tornadoes.

Action Item: Tree removal of at-risk trees that would fall and create damage to critical infrastructure during a high-wind event.
Responsible Department/Board: Tree Warden, Highway Department
Proposed Completion Date: 2009

Wildfires/Brushfires

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to wildfires/brushfires.

Action Items: Extend water service to South Wilbraham to improve delivery to residences that are on private well and distant from existing Town Fire Stations.
Responsible Department/Board: Fire Department, DPW
Proposed Completion Date: Ongoing

Action Items: Participate in US Fire Administration's training program for homeowners on how to manage the rural/urban interface. Extend trainings to local community access to further educate homeowners.
Responsible Department/Board: Fire Department and Conservation Commission
Proposed Completion Date: 2008

Earthquakes

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to earthquakes.

Action Item: Make seismic improvements to municipal water tower (currently a 2 million gallon storage facility) that is located above heavily populated areas to mitigate the future potential for a collapse.
Responsible Department/Board: Building Inspector, Department of Public Works
Proposed Completion Date: 2012

Dam Failure

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to dam failures.

Action Item: Fund impact studies for high hazard dams to mitigate the impact of dam breaches in Wilbraham.
Responsible Department/Board: Emergency Management Director
Proposed Completion Date: 2012

Drought

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to drought.

Action Item: Public education on leaky faucets, cost to society of over watering.
Responsible Department/Board: Emergency Management Director, Board of Selectmen, Conservation Commission
Proposed Completion Date: Ongoing

Man-Made Hazards/Hazardous Materials

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to dam failures.

Action Item: Update a third-party verified action plan that addresses toxic releases at EPA Tier II locations
Responsible Department/Board: Emergency Management Director, Fire Department, Police Department
Proposed Completion Date: Ongoing

Prioritized Implementation Schedule

Summary of Critical Evaluation

The Wilbraham Hazard Mitigation Planning Committee reviewed each of the actions identified above, as well as existing mitigation strategies using the following factors to prioritize mitigation projects:

- Ability to reduce disaster damage
- Social acceptability
- Ability to complete or be combined w/other actions
- Technical feasibility / potential success
- Impact on the environment
- Administrative workability
- Ability to meet regulations
- Political acceptability
- Ability to save or protect historic structures
- Legal implementation
- Ability to meet other community objectives
- Economic impact
- The duration of its implementation period
- Environmental compatibility

Project Prioritization

The Wilbraham Hazard Mitigation Planning Committee created the following prioritized schedule for implementation of prioritized items. The table lists items in order of priority.

Note: As additional information becomes available regarding project leadership, timeline, funding sources, and/or cost estimates, the Plan will be reviewed and amended accordingly.

PRIORITIZED IMPLEMENTATION SCHEDULE
(ACTION PLAN)

IMPLEMENTATION STRATEGY FOR PRIORITY MITIGATION ACTIONS

The Wilbraham Hazard Mitigation Planning Committee created the following prioritized schedule for implementation:

MITIGATION ACTION	RESPONSIBLE DEPARTMENT/BOARD	PROPOSED COMPLETION DATE	POTENTIAL FUNDING SOURCE(S)	ESTIMATED COST	PRIORITY
Contract with reverse 911 provider for Wilbraham	Board of Selectmen	2007	Town Treasury, CDBG	$20,000	Very High
Mandate that proposed developments remedy existing problems with flooding and eliminate impacts of proposed development	Planning Board	2007	Town Staff/Volunteers	N/A	High
Apply to the HMGP to fund the replacement of Woodland Dell culvert system and widen two 40" culverts under Main Street	Board of Selectmen, EMD, Highway Department	2008	Town Staff/HMGP	$50,000	Very High
Educate homeowners about rural/urban interface	Fire Department and Conservation Commission	2008	Town Staff/Volunteers	To be Determined	Medium
Apply to Hazard Mitigation Grant Program (HMGP) to fund replacement of McIntosh Drive/Mill Brook Culvert System	Board of Selectmen, Highway Department, EMD	2008	HMGP	$75,000	Very High
Apply to Hazard Mitigation Grant Program (HMGP) to fund replacement of Mountain Road Culvert System	Board of Selectmen, Highway Department, EMD	2008	HMGP	$75,000	Very high
Apply to Hazard Mitigation Grant Program (HMGP) to fund improvement of drainage on Stony Hill Road and River Road.	Board of Selectmen, Highway Department, EMD	2008	HMGP	$50,000	Very High
Removal of at-risk trees that would fall and create damage to infrastructure in an ice storm	Tree Warden, Highway Department	2008	Town Staff / Volunteers	N/A	Low
Removal of at-risk trees that would fall and create damage to infrastructure in a high-wind event	Tree Warden, Highway Department	2009	Town Staff / Volunteers	N/A	Low

Evaluating whether or not to enroll in CRS	Board of Selectmen, Emergency Management Director	2009	Town Staff/Volunteers	N/A	Medium
Make seismic improvements to 2-million-gallon water tower to prevent tower rupture from damaging critical infrastructure	DPW, Building Inspector	2010	Town Staff/HMGP	TBD	Low
Road improvements to roadways that are subject to icing throughout the winter, specifically installing drainage basins to improve the movement of water	Board of Selectmen, Planning Board, and Emergency Management Director	2012	Town Staff/Regional Transportation Plan/HMGP	Cost per linear foot of roadwork.	High
Fund impact studies for high-hazard dams to mitigate the impact of dam breaches in Wilbraham	EMD	2012	HMGP	TBD	High
Make improvements to Upper Monson Road's Culverts	EMD, DPW	2012	HMGP, Capital Budget	$75,000 $100,000	Medium
Extend water service to portions of South Wilbraham that lack access to public water to prevent fire damage	Fire Department, DPW	On-going	Town Staff	Cost per linear foot of water main	Low
Update Wilbraham's Hazard Mitigation Plan every 5 years	LEPC, Police Chief, Fire Chief, DPW	On-going	Town Staff/HMGP	N/A	Medium
Public Education on the need to prevent yard waste, debris, and trash from entering and blocking culverts.	EMD, Cable Programming Manager	On-going	Town Staff/Volunteers	N/A	Medium
Aggressively pursue conservation of parcels that are subject to flooding	Conservation Commission, Board of Selectmen	On-going	Town Staff/Rural Self-Help Grants, HMGP	Cost per acre of land	High
Public education on the social impacts of water leaks and over-watering	EMD, Board of Selectmen, Conservation Commissioner	On-going	Town Staff	N/A	Medium
Public education on social costs of water loss	EMD, Board of Selectmen, Conservation Commission	On-going	Town Staff	N/A	Medium
Update action plan for EPA Tier II toxic releases	EMD, Fire Department, Police Department	On-going	Town Staff/Volunteers	N/A	High

7 – INCORPORATION WITH DOCUMENTS

Existing plans, studies, reports and technical information were incorporated throughout the planning process. 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* – 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.

- *Draft State of Massachusetts' Multi-Hazard Mitigation Plan* - This plan was used to insure that the Town's PDM was consistent with the State's Plan.

8 – PLAN ADOPTION & IMPLEMENTATION

Plan Adoption

Upon completion, copies of the Draft Local Hazards Mitigation Plan for the Town of Wilbraham were distributed to the town boards for their review and comment. A public meeting was held by the Wilbraham Board of Selectmen to present the draft copy of the Wilbraham Local Natural Hazards Mitigation Plan to town officials and residents and to request comments from this committee and the general public. The Natural Hazards Mitigation Plan was formally approved by the Board of Selectmen and forwarded to the Massachusetts Emergency Management Agency (MEMA) and the Federal Emergency Management Agency (FEMA) for their approval.

Plan Implementation

The implementation of the Wilbraham Local Natural Hazards Mitigation Plan will begin following its formal adoption by the Wilbraham Board of Selectmen and approval by MEMA and FEMA. Specific town departments and boards will be responsible for ensuring the development of policies, bylaw revisions, and programs as described in Sections 5 and 6 of this plan. The Wilbraham Natural Hazards Planning Committee will oversee the implementation of the plan.

Plan Monitoring and Evaluation

The measure of success of the Wilbraham Local Natural Hazards Mitigation Plan will be the number of identified mitigation strategies implemented. In order for the town to become more disaster resilient and better equipped to respond to natural disasters, there must be a coordinated effort between elected officials, appointed bodies, town employees, regional and state agencies involved in disaster mitigation, and the general public.

The Wilbraham Natural Hazards Planning Committee will meet on an annual basis or as needed (i.e., following a natural disaster) to monitor the progress of implementation, evaluate the success or failure of implemented recommendations, and brainstorm for strategies to remove obstacles to implementation. Following these discussions, it is anticipated that the committee 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. At a minimum, the committee will review and update the plan every five years, beginning in the fall of 2009. The meetings of the committee will be organized and facilitated by the Emergency Management Director or the Wilbraham Board of Selectmen.

CERTIFICATE OF ADOPTION

TOWN OF Wilbraham, MAASSACHUSETTS

BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE Wilbraham

HAZARD MITIGATION PLAN

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

WHEREAS, several public planning meetings were held between January 2007 and April 2007 regarding the development and review of the Wilbraham Hazard Mitigation Plan; and

WHEREAS, the Wilbraham Hazard Mitigation Plan contains several potential future projects to mitigate hazard damage in the Town of Wilbraham; and

WHEREAS, a duly-noticed public hearing was held by the Wilbraham Board of Selectmen on _____, 2007 to formally approve and adopt the Wilbraham Hazard Mitigation Plan.

NOW, THEREFORE BE IT RESOLVED that the Wilbraham Board of Selectmen adopts the Wilbraham Hazard Mitigation Plan.

ADOPTED AND SIGNED _____, 2007. David Barry, Chair

Wilbraham Board of Selectmen

James E. Thompson
Wilbraham Board of Selectmen

Patrick J. Brady
Wilbraham Board of Selectmen

ATTEST

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 (SRPEDD)……..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
Massachusetts Association of Regional Planning Agencies (MARPA)……...413/781-6045
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
US Department of Commerce: National Oceanic and Atmospheric Administration: National Weather Service; Tauton, Massachusetts 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) .....Massachusetts Emergency Management Agency
406 Public Assistance and Hazard Mitigation .....Massachusetts 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) .....Massachusetts Emergency Management Agency

Emergency Generators Program by NESEC[‡] ....Massachusetts Emergency Management Agency
Emergency Watershed Protection (EWP) Program.....USDA, Natural Resources Conservation Service
Flood Mitigation Assistance Program (FMAP) ..... Massachusetts Emergency Management Agency
Flood Plain Management Services (FPMS).....US Army Corps of Engineers
Mitigation Assistance Planning (MAP)..... Massachusetts Emergency Management Agency
Mutual Aid for Public Works.....Western Massachusetts Regional Homeland Security Advisory Council
National Flood Insurance Program (NFIP)[†] ..... Massachusetts Emergency Management Agency
Power of Prevention Grant by NESEC[‡] .....Massachusetts 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) Websites

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	http://www.colorado.edu/litbase/ha zards/	Searchable database of references and links to many disaster-related websites.
Atlantic Hurricane Tracking Data by Year	http://wxp.eas.purdue.edu/hurricane	Hurricane track maps for each year, 1886 – 1996
National Emergency Management Association	http://nemaweb.org	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center "Disaster Finder:	http://www.gsfc.nasa.gov/ndrd/dis aster/	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	http://ltpwww.gsfc.nasa.gov/ndrd/main/html	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	http://www.statelocal.gov/	General information through the federal-state partnership.
National Weather Service	http://nws.noaa.gov/	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	http://h20.usgs.gov/public/realtime.html	Provisional hydrological data
Dartmouth Flood Observatory	http://www.dartmouth.edu/artsci/g eog/floods/	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	http://www.fema.gov/fema/csb.html	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	http://www.met.fsu.edu/explores/tropical.html	Tracking and NWS warnings for Atlantic Hurricanes and other links
National Lightning Safety Institute	http://lightningsafety.com/	Information and listing of appropriate publications regarding lightning safety.
NASA Optical Transient Detector	http://www.ghcc.msfc.nasa.gov/ot d.html	Space-based sensor of lightning strikes
LLNL Geologic & Atmospheric Hazards	http://wwwep.es.llnl.gov/wwwep/g hp.html	General hazard information developed for the Dept. of Energy.
The Tornado Project Online	http://www.tornadoroject.com/	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	http://www.nssl.uoknor.edu/	Information about and tracking of severe storms.
Independent Insurance Agents of America IIAA Natural Disaster Risk Map	http://www.iiaa.iix.com/ndcmap.html	A multi-disaster risk map.
Earth Satellite Corporation	http://www.earthsat.com/	Flood risk maps searchable by state.
USDA Forest Service Web	http://www.fs.fed.us/land	Information on forest fires and land management.

Appendix B

Documentation of the Planning Process

Wilbraham Hazard Mitigation Planning Committee

Meeting #1

AGENDA

February 27, 2007
10:30 p.m.

1) Introduction

2) Purpose of Committee

- Why selected to serve on Committee
- What we are doing and why

3) What is Hazard Mitigation Planning?

- PowerPoint Presentation on Hazard Mitigation

4) Step 1: Organize Hazard Mitigation Team

- Establish a chairperson/point of contact

5) Identify Hazards (past and potential) on Base Map

- What are the hazards?
- What is at risk from those hazards?

6) Develop Base Map with Critical Facilities

- Identify Critical Facilities on Base Map. The following list contains items that should be clearly identified on the map, as they apply to your community:

- Emergency Operations Center
- Emergency Fuel Facilities
- Town/City Hall
- Police Station
- Fire Station
- Public Works Garages
- Water Treatment Facilities
- Sewage Treatment Plants
- Water Tower/Supply Pumps
- Power Plants
- Electrical Power Substations
- Schools
- Major Highways and Roadways
- Bridges
- Dams
- Nursing Homes
- Elderly Housing
- Day-Care Facilities
- Correctional Facilities
- Other Congregate Care Facilities
- Shelters
- Special Needs Populations
- Hazardous Materials Facilities
- Access Roads to Critical Facilities
- Evacuation Routes
- Unique or Historic Resources
- Commercial Economic Impact Areas
- Socio-Economic Impact Areas
- Areas with Second Language Needs
- Hospitals

7) Question and Answer Period

8) Set Goals for Next Meeting

Hadley Hazard Mitigation Planning Committee

Meeting #2

AGENDA

November 14, 2006
2:00 p.m.
Location: Hadley Public Safety Complex

1) Review Identification of Hazards

- Past and Potential
- Critical Facilities

2) Analyze Development Trends

- Looking at Community Change
- Map out Development Patterns

3) Existing Protection Measures

- Review of Draft Existing Protection Measures

4) Question and Answer Period

5) Set Goals for Next Meeting

Hadley Hazard Mitigation Planning Committee

Meeting #3

AGENDA

December 12, 2006
2:00 p.m.
Hadley Public Safety Complex

1) Identify What's in Place & Identify gaps in the current protection

- Review Draft Existing Protection Measures
- Identify gaps in existing protection

2) Review of Draft Goal Statements

3) Brainstorm Mitigation Actions

- What actions can be taken?
- Evaluating Action Feasibility

4) Prioritize Final List of Actions

- Select Actions which Best Suit Community's Needs
- Include actions that can be implemented quickly

5) Develop Process for Adoption and Monitoring of the Plan

6) Identify What's in Place & Identify gaps in the current protection

- Review Draft Existing Protection Measures
- Identify gaps in existing protection

7) Identify What's in Place & Identify gaps in the current protection

- Review Draft Existing Protection Measures
- Identify gaps in existing protection

8) Brainstorm Mitigation Actions

- What actions can be taken?
- Evaluating Action Feasibility

9) Prioritize Final List of Actions

- Select Actions which Best Suit Community's Needs
- Include actions that can be implemented quickly

10) Adoption Phase

- Identify strategy for plan adoption

Wilbraham

Agenda #4

October 24, 2007

Pre-Disaster Mitigation Plan Review

10:00 a.m.

Wilbraham Town Hall

---

1) Committee Sign-in

2) Pre-Disaster Mitigation Planning Process Update

3) Remaining Tasks for PVPC to Complete

    a. Detailed profiling of hazards ☑
    b. Incorporation of PDM Plan with other documents ☑

4) Remaining Tasks for PDM Committee to complete with PVPC
    a. Public notices for public comment session ☑
    b. Public comment session ☒
    c. Section on identifying future parties to involve ☒
    d. Discussion of development and risks posed from ALL hazards, not just floods ☒
    e. Specific goal statements for each hazard
    f. Elimination of actions that are not mitigation actions, (i.e. disaster kits, which are response oriented) ☒
    g. Actions that are mitigation actions and not response ☒
    h. Section on "Plan Monitoring" with clearly designated responsibilities among town officials for tracking success with action steps ☒

5) Incorporate public comment period, and develop action steps at that meeting

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

Appendix E

Public Notice

PRESS RELEASE

CONTACT: Andrew Smith, Pioneer Valley Planning Commission, (413) 781-6045

FOR IMMEDIATE RELEASE
September 12, 2007

Public Input Sought on Pre-Disaster Mitigation Plans

The Pioneer Valley Planning Commission has completed final working drafts of pre-disaster mitigation plans for thirteen communities in the region: Agawam, Chester, Chesterfield, Easthampton, Hadley, Hampden, Hatfield, Holland, Holyoke, Ludlow, Monson, Northampton, and South Hadley.

This planning effort is being undertaken to help communities assess the risks they face 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 draft plans are posted for public review and comment on PVPC's website at www.pvpc.org. Please submit comments to PVPC's Andrew Smith at (413) 781-6045 or asmith@pvpc.org no later than November 30, 2007. Communities with approved plans will be eligible for Hazard Mitigation Grant Program funding from the Massachusetts Emergency Management Agency.

These pre-disaster mitigation plans are being developed with assistance from the Pioneer Valley Planning Commission with funding provided by the Massachusetts Emergency Management Agency.

—30—

The Republican.

'Predisaster plans' readied for grants

Sunday, September 23, 2007

By NANCY H. GONTER
ngonter@repub.com

It's the public's turn to weigh in on plans prepared by local communities to keep the damage from natural disasters to a minimum.
Sixteen "predisaster mitigation plans," developed by the Pioneer Valley Planning Commission working with local officials from each community, are part of an effort to secure grant money from the Massachusetts Emergency Management Agency, said Catherine M. Miller, principal planner with the commission.

"This comes from an effort by the Federal Emergency Management Agency that while we are aware you can't prevent natural disasters from happening, you can prevent the long term consequences," Miller said.

The plans, which average more than 100 pages each, can be viewed on the agency's Web site at www.pvpc.org Plans for Agawam, Chester, Chesterfield, Easthampton, Hadley, Hampden, Hatfield, Holland, Holyoke, Ludlow, Monson, Northampton, South Hadley, Southwick, Ware and Wilbraham are available, she said.

"This is largely an education exercise so people know local government is looking into these things and thinking about what the consequences of natural disasters would be. It's reassuring to know local governments are looking at this kind of thing especially after all the awareness following (hurricane) Katrina," Miller said.

Comments may be made by calling Andrew Smith at the Commission at (413) 781-6045 or by e-mailing him at asmith@pvpc.org by Nov. 30.

The plans were developed with a state grant of $224,962 which was supplemented by local communities for total cost of just under $300,000, she said.

Each plan looks at the risks communities may face from natural disasters such as flooding, tornadoes, drought and earthquakes, and what can be done to prevent damage to property and loss of life. They also prioritize projects for funding for mitigation efforts, Miller said.
An example of a mitigation project is Greenfield's purchase of the Wedgewood Gardens mobile home park which was badly flooded by the Green River in 2005 and had previously been flooded, although that was not part of this program, Miller said.

The commission is working with 32 communities in this area and a second round of 16 more communities will soon be started. They are Amherst, Belchertown, Brimfield, Chicopee, Cummington, Goshen, Granby, Huntington, Palmer, Southampton, Springfield, Westfield, West Springfield, Westhampton, Williamsburg and Worthington.

After that, a plan for the entire region will be prepared, Miller said.

Northampton Deputy Fire Chief Dana Cheverette, a member of the local committee that worked with the commission on the city's plan, said going through the process of preparing the plan was helpful.

"You identify the flood plans and you identify the area where you need to put your resources. In 1988 when the Oxbow area flooded, a lot of people got isolated. Now we know where the people could get isolated," Cheverette said.

Sunday's news briefs

Posted by The Republican Newsroom September 30, 2007 12:04PM

Predisaster plan drafts
The Pioneer Valley Planning Commission has completed final working drafts of predisaster mitigation plans for 13 communities in the region. The draft plans are posted for public review and comment on the commission's Web site at www.pvpc.org. The deadline for comments is Nov. 30.

This planning effort is being undertaken to help communities assess the risks they face 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. Communities with approved plans will be eligible for Hazard Mitigation Grant Program funding from the Massachusetts Emergency Management Agency.

Affected are Agawam, Chester, Chesterfield, Easthampton, Hadley, Hampden, Hatfield, Holland, Holyoke, Ludlow, Monson, Northampton and South Hadley.