City of Pittsfield

Community Resilience Building Workshop
Summary of Findings

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FUSS & O'NEILL

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Overview

Extreme weather and natural and climate-related hazards are an increasing concern for the communities of Massachusetts, and there is a clear need to involve municipalities, corporations, organizations, and the State in increasing resilience at all levels. Recent storm events affecting the region have highlighted many of the vulnerabilities that towns and cities face. Hurricane Irene and Superstorm Sandy brought intense flooding to many municipalities and threatened (or destroyed) infrastructure across the state. Extreme temperatures at both ends of the spectrum have pushed the limits of communities' preparedness to protect both infrastructure and people. In coastal communities, the impacts of sea level rise are felt daily and further exacerbate the impacts of other extreme events. Current climate modeling indicates that all of these hazards are expected to increase in frequency and scale over the coming decades. The Municipal Vulnerability Preparedness (MVP) program provides support and a prescribed process for cities and towns in Massachusetts to plan proactively for resiliency and implement key climate change adaptation actions.

In 2018, the City of Pittsfield was awarded a $40,500 MVP grant to fund the planning stage of this process and simultaneously complete Hazard Mitigation Planning for the City. The City partnered with Fuss & O'Neill, a state certified MVP Provider, to complete a comprehensive, baseline climate change and natural hazard vulnerability assessment and develop a list of priority actions for the City. This process involved the development of an MVP Core Team, which met on November 1, 2018 to determine initial concerns and worked to identify stakeholders within the municipality and set goals for the process. Those stakeholders were then invited to participate in a Community Resilience Building (CRB) workshop on December 6, 2018, engaging in a day-long, tried and tested process developed by The Nature Conservancy. The CRB methodology is an "anywhere at any scale" format that draws on stakeholders' wealth of information and experience to foster dialogue about the strengths and vulnerabilities within the City. Workshop participants interacted at both large and small group levels, using an iterative process to gather input, synthesize ideas across groups, and ultimately develop a set of priority resilience and adaptation actions.

The CRB workshop's central objectives were to:

- Define top local natural and climate-related hazards of concern;
- Identify existing and future strengths and vulnerabilities;
- Develop prioritized actions for Pittsfield;
- Identify immediate opportunities to collaboratively advance actions to increase resilience.

Top Hazards and Vulnerable Areas

During the Community Resilience Building workshop, participants were asked to identify the top four natural hazards of concern for the City of Pittsfield. Discussion of the top hazards built on earlier conversations that took place at the MVP Core Team Meeting, as well as simultaneous, ongoing City conversations that are forming the basis of the City's Hazard Mitigation Planning. Flooding was identified as a top hazard. Extreme temperatures, both cold and heat, especially the increase in days over 90 degrees Fahrenheit, was a second hazard. Severe storms bringing intense wind and rain were considered a third hazard. The collective impacts of ice and snow were seen as a fourth major hazard. These four hazards have already had demonstrated impacts on the City, and as climate change progresses, these hazards are expected to have ever greater consequences for infrastructure and environment, as well as for various societal elements. Specific areas of concern are identified below.

Top Hazards

- Flooding
- Extreme Temperatures
- Severe Storms
- Ice and Snow

Areas of Concern

While many impacts are expected to be felt City-wide, certain elements, locations, or community groups present particular concerns.

Neighborhoods/Communities

Lakewood Neighborhood, Morningside, Grant Street, Brattle Street, Providence Court, West Street, East Street, low-income housing and low-income neighborhoods, housing authority properties

Facilities

Hill 78 & Allendale School, Berkshire Medical Center, Berkshire Community College, Joseph Scelsi Intermodal Transportation Center, U-Haul, Big Y Shopping Center, Bowling Alley, Reid Middle School

Ecosystems

Housatonic River, Southwest Branch Housatonic River, West Branch Housatonic River, East Branch Housatonic River, Brattle Brook, Unkamet Brook, Wetlands around the King St Dump, Cleveland and Ashley Reservoirs

Dams

Farnham Dam, Tel-Electric Dam, Bel Air Dam, Wild Acres Pond Dams

Infrastructure

Dan Casey Memorial Drive/Causeway, power grid, WWTP interceptor line, pump stations, RR crossings at Morewood Lake and Shaker Brook, South Mountain Road, Coltsville and East New Lenox flow control stations, Berkshire Gas lines

Parks

Wahconah Park Baseball Stadium, Marchisio Park, Kirvin Park

Current Concerns and Challenges Presented by Hazards

Major storm events have been a recurring threat to Pittsfield throughout its history, from hurricanes bringing wind, intense precipitation, and localized flooding, to winter storms delivering ice and snow. Notable historic events include impacts from the Great Hurricane of 1938, the flood stage of which is memorialized with a sign on the Pomeroy Bridge. More recently, the City has been experiencing an increasing regularity of storms, with the so-called 100 year storm now happening several times a year. One resident has used the Pomeroy Bridge sign as a reference point for comparing recent flooding events, and indicated that recent storms have come close in severity to the historic flood levels marked on the bridge.

More intense storms delivering higher volumes of precipitation in a single event are expected to put significant pressure on dams, culverts, and other drainage infrastructure that were designed to handle smaller storms with more consistent distributions of precipitation. This problem manifests at points across the City and is acute where the local drainage systems concentrate and discharge, especially near Wahconah Park.

The City is also noticing a shift in the type and timing of storms. Many storm events now encompass a mixture of rain, ice, and snow, making it more difficult to maintain safe, accessible roadways. The major snow storm that hit in October 2011 is also still fresh in residents' memories. Due to the unusual timing of wet, heavy snow when leaves were still on the trees, that storm caused extensive damage to electrical infrastructure, leading to extended power outages. That same year, Hurricane Irene and Tropical Storm Lee had substantial impacts on Pittsfield, including washouts on the streambank of the Housatonic River by the airport. Trees and ground vegetation had been removed in the flight path northwest of the airport as part of an expansion project, leaving the landscape vulnerable to storm impacts, which led to catastrophic erosion and sedimentation in the river.

In 2016, the schools were impacted by severe winter weather and cold which used up all of the district's snow days and forced students to attend school later into the summer months. As this trend continues, they see decreased student attendance on days with extreme temperatures, which exacerbates the pressure to close school on both cold and hot days. Pittsfield was on the verge of calling off school for excessive heat days in 2018.

Extreme temperatures are also leading the City to make greater use of cooling shelters. The Senior Center and Athenaeum were both used as designated cooling shelters into August during 2018. Municipal leaders are eager to get the word out and increase transportation options so that more people, especially the elderly, are able to access these vital resources more often.

Although excessive heat is a concern, Pittsfield generally has not experienced the impacts of drought. While many cities and towns across the Commonwealth were under severe drought warnings during the extended drought of 2016, Pittsfield was under advisement only, and its water supplies were sustained.

Specific Categories of Concerns and Challenges

Infrastructural

Culverts and Bridges

Culverts and bridges are a concern City-wide, particularly as Pittsfield's developed areas are in such close proximity to the Housatonic River and several brooks and wetlands. Flooding at the causeway on Dan Casey Memorial Drive was one area of particular concern. Existing culverts and bridges were designed to accommodate historic patterns of precipitation and runoff, but are rapidly becoming inadequate as a result of climate change. While design standards have changed, the City's infrastructure largely predates such changes, and thus has not kept up with new standards. As precipitation events become more intense and less predictable, undersized culverts are expected to pose a greater threat of failure and flooding. The Housatonic Valley Association (HVA) has completed road-stream crossing assessments throughout the City as part of a larger regional assessment effort, and the City has detailed information on structures that have been prioritized for replacements or upgrades to improve aquatic connectivity and address areas where undersized culverts or washouts contribute to road overtopping during heavy precipitation events. One high-priority culvert replacement has already been completed on Churchill road, and several other structures have been identified as ready for design and permitting based on the HVA study. The City has also used consultants to conduct condition assessments of several of the City's bridges.

Stormwater Basins and Conveyances

Detention basins and other stormwater infrastructure are recognized as a potential concern City-wide. Similarly to culverts conveying natural streams, there is a general recognition that much of the stormwater drainage system was designed to accommodate historic patterns of precipitation and runoff, and may be undersized as climate and weather patterns continue to shift. The City's aging stormwater infrastructure and lack of maintenance funds exacerbates flooding potential during heavy rains. Further, illicit discharges (i.e., non-stormwater discharges) are known to occur along the Housatonic West Branch when sanitary sewers overflow during heavy precipitation events. Stormwater detention basins were also noted as a concern, particularly in the areas around the former General Electric (GE) site and East Street. If proper maintenance is not conducted at detention basins it ultimately detracts from their functionality. Finally, residents described a problem with litter getting into storm drains and outfalls to wetlands, which is detrimental to the environment and public health as well as the drainage system.

Roads

Roads in Pittsfield are vulnerable to flooding, as well as the impacts of snow and ice. In general, shifting weather patterns due to climate change are increasing the difficulty of maintaining those roadways. Potholes and sinkholes are becoming more problematic due to new patterns of freezing and thawing that occur repeatedly throughout the winter season. Participants also voiced concern about the amount of sand and salt needed to keep streets clear during the winter, the financial burden of purchasing increasing quantities of these materials, and the impact that these materials have on wetlands and protected areas (as well as impacts on the landscapes where they are being mined or extracted). Roadway impacts due to hazard events in turn compromise the City's ability to provide emergency services. The layout of Pittsfield's street system is an interconnected urban grid, which is beneficial for being able to circumvent road closings and escape hazard areas. However, roads vulnerable to flooding were identified in multiple locations across the City and were especially of concern where they limit access to hospitals, supermarkets, gas stations, shelters and social services. Known areas where blockages may reduce access

to critical destinations include roads leading to Big Y, Berkshire Community College, and the Berkshire Medical Center on North Street (the latter has had issues with ambulance access in the past).

Public Water Supply

The City's current water supply is drawn from six City-owned reservoirs, all of which are located outside of the City. The reservoirs were built between the 1930s and 1950s, when Pittsfield's population was projected to reach 90,000 people. As the City's population has instead declined in recent decades, the quantity of Pittsfield's water supply has not been a topic of concern, and the City generally has confidence in its supply, even during periods of drought. However, workshop participants did express concern about protecting the watersheds surrounding these reservoirs to preserve water quality. Pittsfield has two City-owned water treatment plants, Cleveland and Ashley, as well as two flow control stations on the east side of the City (Coltsville and East New Lenox) and approximately 241 miles of water distribution lines. Critical infrastructure, equipment, and water mains may be susceptible to hazards, especially flooding and extreme temperatures. It was also noted that the City's five water pump stations are not all equipped with backup power, meaning that they cannot operate during outages. Upgrades to the drinking water infrastructure are necessary and on-going.

Wastewater Infrastructure

The City has been actively working for several decades to assess, prioritize and upgrade its wastewater infrastructure. Improvements such as using siphons instead of pump stations have helped make the system more resilient. Further safeguards are needed at remaining pump stations in low areas to ensure back-up power, flow control, and protection from flooding. Overall, however, the maintenance currently needed by Pittsfield's wastewater infrastructure, including at multiple collection points across the City, is typical of the maintenance needs for a system of its age. The wastewater treatment plant is in need of upgrades to address a range of long-term issues including capacity constraints, sanitary sewer overflows, external equipment vulnerable to climate-related hazards and power outages, and infiltration and inflow (I/I). Infiltration has a major impact on the interceptor pipe which flows through the main branch of the Housatonic on its way to the wastewater treatment plant. As a result, the City is inadvertently treating clean water from the river that infiltrates the line.

Underground Storage Tanks

A Mobil Gas Station located at the intersection of South Street (Route 20) and Industrial Drive was identified as an area of concern due to the potential vulnerability of its underground storage tanks to flooding. The gas station is approximately 1,000 feet from the Southwest Branch Housatonic River to the North and 1,500 feet from Wampenum Brook to the South. FEMA mapping indicates that the gas station is just outside the flood extent from a 100 year storm; as larger storms become more frequent, there is concern about flood risk relative to these tanks. Similar vulnerability issues of underground storage tanks may exist in other flood-prone locations in the City.

Electrical and Communications Infrastructure

Communications and power lines can be knocked out by snow and ice, in addition to wind events, causing extensive impacts to the City. Workshop participants described wooden utility poles, which are the norm in the City, as being vulnerable to snapping. Extreme heat also stresses the electrical system, as increasing use of air conditioning leads to a risk of brown outs and outages, particularly if heat impacts are region-wide. At various sites in the City, renewable power generation and storage projects are helping to reduce reliance on the primary power grid, however participants expressed concern over whether these projects, such as solar sites, may be vulnerable to the impacts of storms, snow and ice, flooding, or even extreme temperatures.

Buildings and Facilities

The impacts of heavy snow loads on the City's aging, flat-roofed municipal buildings were a concern. Extreme temperatures are also impacting the ability to effectively heat or cool buildings. For example, buildings with brick and masonry facades absorb excessive heat from the urban environment and retain it during extremely hot days. Cooling capacity is an issue at locations City-wide, but was noted in particular for senior housing buildings such as Providence Court, which has air conditioning in common areas, but not in individual housing units where seniors may be vulnerable to health problems amid high temperatures. More generally, the need to buffer and protect structures in flood zones and establish backup power for critical infrastructure and facilities across the City is recognized as a major concern affecting large portions of the community.

Beavers

Concerns about beavers were discussed as an environmental issue, but also, and more critically, as an infrastructure problem. Whereas the City generally has some record of and control over man-made stream crossings or impoundments, beaver activity is often known only anecdotally, if at all, and can cause unpredictable problems during heavy precipitation, when flooding occurs in unexpected locations. The City struggles with trying to keep beaver impoundments from inundating recreation areas with water; for instance, beaver-driven flooding has impacted field use at Marchisio Park and caused flooding in the northeast corner of the City when a beaver dam at the top of Oak Hill was breached approximately 15 years ago. The City's Conservation Agent feels that the current regulations get in the way of managing the problem.

Dams

Dams in Pittsfield were identified as a high-priority for resiliency improvements. The City owns six dams outside the City that support Pittsfield's drinking water reservoirs. Five of these are considered high hazard dams, however they are not currently a major concern because inspection of the impoundments is up-to-date and three of the six have been renovated in the past ten years. Within City limits, most City-owned dams are regulated under State dam safety regulations, and the condition of these dams is typically known. As one City staff person noted, "I doubt there's an unknown [regarding Pittsfield's dams], we have a pretty good handle on the terrible condition of our dams." Maintenance and monitoring of dams, and of Farnham Dam in particular, is complicated by the fact that road access to the City's dams is limited by deteriorating road conditions, as well as snow and ice during the winter months, and the City does not have equipment for remote monitoring. Less oversight, and in some cases, less information, exists for some of the private dams in the City, and there was discussion about how the City can encourage or enforce maintenance on private property. One example is Bel Air Dam, which holds water from Pontoosuc Lake and is a high hazard dam upstream of several low-income neighborhoods as well as Berkshire Medical Center. Bel Air Dam is known to have water leaking through a broken spillway, but because it is privately-owned and funds are not available for repairs, there is little the City can do to manage this hazard. Water backups and flooding have been problematic at the Telelectric Dam, but progress is being made toward removing this dam. Similarly, the City has pursued dam removal feasibility studies for the City-owned Upper Wild Acres Dam, but funds have not been available to carry out that assessment. Other dams in the City, including Cleveland and Ashley Dams, are also upstream of major medical, commercial, and municipal sites for which flooding would be catastrophic. Understanding the City's overall vulnerability to dam failure, where dam removal is possible, and where improvements can be made to public and privately-owned dams, especially high-hazard dams, was a major infrastructure concern.

Berkshire Gas

Safety and reliability of gas service is important to Pittsfield's resiliency. Dave Grande, representing Berkshire Gas, described two key vulnerability points for the natural gas lines serving Pittsfield: lines are

vulnerable at bridge crossings where pipes could be submerged in storm flows or disconnected in the event of a bridge failure, and old, bare metal pipes are susceptible to inflow. Berkshire Gas is proactively working to improve the resiliency of its infrastructure and prevent a disruption that could impact gas service to major portions of the City. The company has started moving underground infrastructure above-ground for better access, and also has an emergency management plan and mutual aid agreements in place.

Microgrid

A City-initiated, microgrid feasibility study is underway to explore priority usage areas where access to an independent power grid would be most beneficial. A microgrid would allow buildings to continue receiving electricity even if the main power grid experienced an outage.

Environmental

PCBs

Pittsfield's industrial history has left behind a legacy of environmental contaminants, notably polychlorinated biphenyls, or PCBs. PCBs are a known problem in the Housatonic River in Pittsfield, and at a portion of the former General Electric (GE) site known as the Hill 78 Area, which contains a pile of PCBs behind the City's Allendale Elementary School. State Health Official's reports for this area indicate that there is currently no risk to students or the general public from these contaminants, and substantial heat would be required to mobilize these pollutants in a way that would be detrimental to human health. However, a representative from the City did note that new PCB readings in some areas of the GE site are closer to actionable levels than they have been in the past, and monitoring is ongoing. Regardless of the fact that readings have stayed under actionable levels, there is concern and public anxiety about the potential for flooding to mobilize contaminated soils. There was also question about whether PCB contamination could exist in an underground aquifer or individual wells, although this is not anticipated to affect the City's drinking water since Pittsfield is served by surface reservoirs.

Wildlife Habitat

The City's concern for the vitality and resilience of its rivers, brooks, and wetlands is for both human safety and enjoyment, as well as for the well-being of wildlife. Ongoing improvements to storm water infrastructure and road/stream crossings are expected to increase habitat quality and resiliency, reducing decades of negative impacts to riparian and wetland habitats, which was expressed as constituting a "win-win" for the City and for wildlife. Workshop participants representing several environmental advocacy groups that work within the City and the greater watershed gave voice to the importance of protecting existing habitat and creating new habitat that would support safe passage for wildlife year-round, as well as provide wildlife with evacuation routes and areas for sheltering during natural disasters or hazards affecting the City and surrounding region. Managing beaver issues, which are a significant wildlife concern in Pittsfield due to their role in flood risk, is part of the larger project of stewarding wildlife habitat, as they are inextricably linked to the major and minor waterways that weave through the City, as well as the wetlands.

Trees and Forests

Forests provide critical ecosystem services that help buffer the effects of climate change, from sequestering carbon, to increasing groundwater recharge, to modulating local temperature. Street trees are likewise critical for infiltration of rainwater and provision of shade. However, trees and forests are also threatened by climate change. Participants noted that oak, hemlock, maple, ash, and pine are all in decline either due to pests or changing climate. Wind and storms cause blowdowns, drought can contribute to die-off, new invasive pests (e.g., Emerald Ash Borer, Hemlock Wooly Adelgid, and Asian Longhorned Beetle) are eliminating certain tree species, and others are in decline due to shifting

temperature and precipitation regimes that favor more southerly species. The City's emergency services also recognize that hazard events can convert trees from assets to threats. Pittsfield is part of the Massachusetts Greening the Gateway Cities Program, which is planting trees in targeted neighborhoods with the aim of reducing household heating and cooling costs by increasing canopy cover in those areas.

Invasive Species

Invasive plants and animals are already a source of concern in Pittsfield, as they are throughout the Commonwealth. Forest and upland ecosystems are threatened by a variety of invasive plants, including plants such as oriental bittersweet, multiflora rose, two types of swallowwort, and several non-native honeysuckles. Riparian and aquatic habitats are severely threatened by common reed, Japanese knotweed, invasive water chestnut, hydrilla, purple loosestrife, Eurasian milfoil, and zebra mussels. In addition to their habitat impacts, the latter can potentially cause flooding by clogging drain pipes. Critical invasive insect pests already in the area include the Asian Longhorned Beetle, Hemlock Wooly Adelgid, and Emerald Ash Borer, all of which have the potential to do serious damage (both environmental and economic) to Massachusetts' forests and trees. These and other species already pose a significant challenge and have serious consequences for ecosystem health and resilience, and these impacts are likely to increase in response to climate change. Warming temperatures will also bring new invasives to the area, and these will have an easier time gaining a foothold if the City's natural ecosystems are simultaneously weakened due to changes in climatic conditions.

Water Quality

Pittsfield has a history of industrial activity which has impacted water quality and left a legacy of contamination. One participant at the workshop recalled watching the Housatonic river burn as a child, and historically, the river had been known to change color due to the impacts of oils, paints, and dyes used in nearby factories. The river is in much better condition today; in more recent decades, General Electric (GE), a major contributor to legacy contamination, has made efforts to remove and stabilize some of the contamination left behind by its operations in the area. However, significant pollution will remain into the future and is likely to be accompanied by constant concern about potential negative impacts the City's water quality could have on human communities, ecosystems, and wildlife, especially as climate change threatens to mobilize latent contamination through increased heat and flooding risks. Pittsfield also experiences ongoing sanitary sewer overflows (SSOs) during periods of heavy precipitation. Workshop participants described that seeing toilet paper in the streets after heavy rain events is not uncommon. In addition to the problems posed by heavy rainfall, rising average water temperatures resulting from climate change and decreased water levels due to drought both contribute to conditions that are increasingly favorable for the presence of harmful algal blooms and bacteria. These negative impacts, as well as nutrient pollution, which is driven in part by changes in land use, can result in fish kills, and impacts to recreation and public health. Continued monitoring of water quality in the City will involve major partners at local, state and federal levels, including the EPA. A number of beneficial watershed projects are already underway, which, in combination with efforts to improve stormwater management, should help to improve water quality over time.

Local Agriculture

Unpredictable climate and weather conditions are taking a toll on agriculture locally and across the region. Workshop participants have noticed that the crucial hardening-off period for apples no longer occurs reliably and can harm crops. Climate change is expected to result in a longer growing season for New England, which can be beneficial for some crops but may lead to issues with others, for instance, by allowing additional time for blight or other crop diseases to develop. Early melt of snow pack, drought, excessive rain, and changing temperatures may all affect agriculture and livestock at varying scales.

Flood Mapping

Pittsfield's flood mapping is approximately 50 years old and does not reflect contemporary data or modeling that accounts for climate change. FEMA does have plans to update the City's flood maps, however these plans do not include conducting any new studies or determining new flood elevations. The updates will instead only include incorporation of new LIDAR data and updated digital photos into the existing models.

Debris Management

Flood debris is a concern, especially as accumulating debris in waterways and floodplains leftover from one event can create blockages that further exacerbate the impacts of future storms. After a flood event in 1987, the City endured weeks of haze and smoke as large amounts of debris produced by the storm were piled and burned at a designated site on the City perimeter.

Societal

Water-Based Recreation

Pittsfield's Onota Lake is recognized as one of the best free recreation and cooling-off locations in the City. Workshop participants recognized that the Lake is a key resource for vulnerable populations and families, and that if swimming were shut down due to a hazardous condition such as a harmful algal bloom, it would pose a major problem for the City's resiliency to heat. Climate hazards also threaten the use of the City's rivers for recreation. Use of the rivers may already be somewhat impacted by perceptions of contamination, limiting their value as a means for residents to keep cool during periods of extreme heat. More immediately though, emergency personnel noted that for those who do use the rivers, excessive precipitation and severe storms can create dangerous conditions where water rises quickly and is moving faster than boaters are prepared to handle. Emergency responders have already had incidents where they have been required to rescue kayakers or canoers who were out on the Housatonic River in high water conditions.

Vulnerable Neighborhoods

Certain neighborhoods within Pittsfield are especially prone to flooding and have been experiencing problematic events for decades. These include the Lakewood section of the City, Dan Casey Memorial Drive (the Causeway), neighborhoods along the East Branch of the Housatonic, and the neighborhood around Goodrich Pond, which floods in even a light rain event. As Jim Clark, the Director of the Council on Aging put it at the Core Team meeting, "it sounds weird, but this has been this way for years, and people know that." Police Captain, Michael Grady, confirmed that local residents are accustomed to these repeat impacts, saying that as someone who lives in the Lakewood Section, "If we know it's going to rain, we know what to do." While drainage-driven flooding from heavy rain is one concern, the City is also concerned about neighborhoods downstream of its many dams, including Bel Air Dam, which is upstream of Berkshire Medical Center, and a low-income residential neighborhood in the vicinity of Wahconah Park. A question raised many times was whether flooding was disproportionately impacting neighborhoods with low socio-economic status, presenting the potential to overwhelm support services if disaster struck. Repetitive loss was also a concern, and participants noted that many residents of these most vulnerable areas are renters and therefore may not have flood insurance, or, in some cases, may not even be aware that they reside in a flood zone.

Vulnerable Populations

Workshop participants acknowledged the challenges of identifying and reaching vulnerable individuals, especially those without internet access for viewing the City's Facebook page, which serves as a primary outlet for emergency information, those who may no longer have a land-line telephone, homeless individuals without an address, or those who may not self-identify as vulnerable. Certain populations,

especially seniors, homeless citizens, citizens struggling with addiction, and environmental justice communities within the City, are known to be at higher risk during hazard events and may require support beyond emergency notifications. Approximately 25% of Pittsfield's population is over 60, but only about 10% of that group is known to be actively engaged in activities through the Senior Center. Currently, the Berkshire Athenaeum (Pittsfield's Public Library) and the Intermodal Transportation Center are informally providing respite for homeless citizens during the day, including as warming and cooling centers during extreme temperatures. The need for a more formal plan has prompted the City to reinstate its Homeless Prevention Committee. Pittsfield is also aware that the City has high rates of disease and individuals with chronic health conditions, both factors which can worsen health outcomes associated with hazard events, especially extreme heat. Workshop participants expressed concerns about vulnerable citizens' ability to obtain food and medical supplies during hazard events, and to access heating and cooling centers on their own due to lack of transportation. The Council on Aging, which provides a variety of activities and services to senior residents in the City, is concerned about the limitations of its vehicle fleet in light of the increasing need for transportation services. The Salvation Army is also working to support residents through community activities and transportation options. However, both the Council on Aging and Salvation Army vehicles have limited capabilities.

Communications Systems

Many channels of communication are coordinated out of the Mayor's office. The City's Facebook page currently serves as a repository for official information and allows emergency management teams to share live information during hazards. In addition, the City deploys a CODE RED alert system to send mass messages to all registered users during emergency situations. In Pittsfield, this includes any land line number that was active at the time the system was instituted, as well as anyone who has chosen to enroll their phone number (land line or cell phone) since that time. Pittsfield also has its own local 911 call center, which improves response times during emergencies. Local communications assets, such as Pittsfield Community Television (PCTV), also play a role in ensuring that emergency information reaches everyone consistently and reliably. Police Chief Wynn described plans that are in progress to provide emergency departments with off-hours access to the local broadcasting station so that important information can be sent out over live TV or radio transmissions. The Chief also noted the importance of making sure that residents still own battery powered radio receivers, which is increasingly uncommon in the age of cell phones and internet-based communications.

Shelters

Many social organizations and charitable institutions in Pittsfield are equipped to help with the task of providing shelter services in times of need. However, there is a lack of trained personnel to open the City's shelters, and many locations have limitations. For instance, Reid Middle School has a back-up generator and can serve as an overnight shelter, but it is susceptible to road access issues. Barton's Crossing and Soldier On provide shelter for homeless individuals year-round, but have a limited number of beds that fill up quickly on cold nights and may be closed during the day. Many emergency shelters throughout the City are open only on a short-term basis due to lacking backup power, food supplies, or the ability to offer medical services. There was also concern among workshop participants about the lack of appropriate sheltering options for vulnerable populations, including opioid-addicted residents, others with health conditions requiring electricity for medical devices, and individuals with mental illness who may need specialized support for coping with the stress of emergency situations. The particular challenges of sheltering seniors were discussed, including getting them to leave their homes, providing appropriate transportation to shelters, integrating the medical services they need at shelters, and providing overnight and long-term sheltering options. Understanding the different needs of the City's residents and the strengths and limitations of its sheltering resources was a major concern for Pittsfield's emergency preparedness in the face of a hazard event.

Schools

Pittsfield's schools and student population are affected by a variety of hazard types. Schools are increasingly forced to cancel classes due to snow and ice events or extreme cold that make it impossible to safely get students to school. Participants described a "ripple effect" of unintended consequences when schools close, in which parents have to miss work, which results in lost wages. Closures, in turn, have the potential to extend the school year further into the summer, which exacerbates the risks that school will be in session during extreme heat events. For instance, in 2016, the schools had no snow days left and students had to attend school late into June. As days above 90 degrees increase, heat stroke is a concern for the student population in general, as the schools are not air conditioned, and for student athletes in particular. Pittsfield's School Superintendent also reported that on extremely cold days (below 10°F) or extremely hot days (around 90°F), they see a "pretty massive drop in daily attendance." This impact is particularly prominent for the 1500 to 1800 students who walk to school each day. The high school also suffers from dramatic temperature differentials in different parts of the school building; the Superintendent reported that it can be 40°F in one room, while close to 90°F in another because of inadequate or outdated heating systems. Pittsfield does have one brand new school, Taconic High School, which has air conditioning and is equipped with generators. Finally, school lunches are critical for many of Pittsfield's students, and school closures, particularly those lasting longer than a single day, can mean that students are hungry and/or cold.

Childcare Centers

When schools close due to inclement or extreme weather, some of Pittsfield's childcare centers remain open or offer additional hours for school-aged children to provide services for students who would otherwise be at school. Many facilities, however, have a policy of closing whenever the public schools close. This has economic repercussions for parents who may be forced to miss work in order to stay home with their children.

Berkshire Community College

The College has an agreement with the City to make its facilities available to provide meals and shelter to Pittsfield residents during emergencies. Primary access to the College is from West Street, which is susceptible to flooding in two places: near the west exit parking lot and where the street crosses Smith Brook. In both locations, the flooding is thought to be due to undersized culverts. Flooding of West Street renders the college inaccessible as alternative road access is limited. The College also lacks backup power for operating its facilities during long term outages, and has concerns about funding and equipment for snow removal to keep the college functioning safely.

Pests and Disease Control

Climate change is affecting pests and disease vectors both through changing precipitation conditions and changing temperature conditions. Warmer, wetter conditions lead to increased mosquito populations, while the absence of sufficient periods of cold means that pest populations that would historically have been killed off or reduced are able to survive the winter and emerge in greater numbers the following season. Workshop participants also noted that rodent infestations increase after flooding events; rats had been a problem during the summer of 2018. Further, as the Massachusetts climate begins to look more like the climate of the mid-Atlantic and southern states, we are seeing new types of diseases show up in existing pests (e.g. mosquitoes carrying West Nile Virus, Eastern Equine Encephalitis, or Zika and ticks carrying Rocky Mountain Spotted Fever). 2018 marked the Commonwealth's highest ever incidence of West Nile Virus diagnosis. Pittsfield's Public Health Nurse noted that the City saw Rocky Mountain Spotted Fever for the first time in 2018, mosquitoes are becoming increasingly problematic, even during the day, and that other diseases, especially tick-borne diseases, have been undergoing an "exponential increase and almost doubling every year." These changes present a major public and animal health challenge in terms of education, prevention, and treatment. Workshop participants noted that unmaintained

stormwater detention basins collect standing water, which supports increased mosquito populations. Pittsfield is currently part of a mosquito control district and participates in spraying programs, but this is controversial among residents.

Provisions, Medicine, and Fuel

Maintaining access to essential supplies like groceries, medicines, and fuel (for vehicles, heating, and generators), as well as critical medical care and drug treatment during emergencies, was a concern for workshop participants. It was acknowledged that power outages or road closures which affect access to these services could have extensive impacts on residents throughout the City. These issues are exacerbated for vulnerable populations, and for particular neighborhoods where there is limited access to grocery stores. Workshop participants expressed concern about the Morningside area in particular, as many residents rely on public transportation and there are no grocery stores in walking distance. Berkshire Medical Center is always open with heat, food, and a pharmacy, but more options for accessing refrigerated medicines during a hazard event are needed. Access to fuel assistance is also a concern, as extreme temperatures and severe storms can place an extra burden on residents' heating budgets, and funding for fuel assistance in Berkshire County was recently cut.

Economic Revitalization

In addition to the fact that Pittsfield has a large number of low-income residents and homeless, the City as a whole has suffered from an economic downturn that has left many buildings empty and limits the availability of jobs, retail opportunities, and services within the City. A revitalized downtown core could potentially increase the City's resiliency, both from an economic perspective, and in terms of the ability to access resources during a hazard event.

Stress on Emergency Services

Pittsfield's Fire, Police, and Public Works departments bear much of the burden of responding to the increased human threats that result from climate-induced hazards. An ever larger percentage of the departments' time and resources are being devoted to handling things like traffic accidents and injuries that result from ice or other dangerous conditions and activities to protect property and maintain traffic flows during storm events, and Public Works is relied upon to clear roads and maintain access throughout the City. Pittsfield has a formal mutual aid agreement within Berkshire County for police and fire services and support from the Law Enforcement Council for services between counties, but many climate hazards are expected to have regional effects, in which case resources from neighboring communities may not be available. Some additional support has come from the federal government under the auspices of Homeland Security and the National Guard to help with emergency preparedness.

Transportation

The City has a valuable transportation partnership with the Berkshire Regional Transit Authority (BRTA). Public transportation is vital to many of the City's residents, and BRTA is committed to their role in serving the community and has an existing MOU with the City. In addition to transportation services, BRTA also provides de facto shelter for many transient or homeless individuals. There is therefore concern about the impacts of a service disruption associated with a hazard event, as well as more general concerns about how to transport citizens, including transporting seniors to heating and cooling centers and evacuating schools and daycare facilities. Both the BRTA Administrator and the School Superintendent expressed willingness and ability to provide such services. The schools own their own bus fleet, which gives them flexibility in providing services, however, there are questions related to licensure, liability and insurance coverage if adults are transported on City school busses. Both the schools and BRTA also operate with union staff, which places some restriction on the availability of drivers, but both administrators expressed optimism about the ability to utilize non-union staff and make necessary arrangements that would allow their vehicles to support emergency transportation needs.

Local and State Regulations

There was recognition among workshop participants that City and state regulations are outdated and therefore insufficient to address climate change risks. In particular, the City's stormwater ordinance, building code, and zoning ordinances are in need of updating to make sure that new buildings and development achieve higher standards for resilience with respect to the City's four hazard areas. Discouraging any development within the City's flood zones and protecting wetland areas were also priorities for revised City regulations.

Parks and Open Space

Open space provides ecosystem services that help buffer the effects of climate change, from sequestering carbon, to increasing groundwater recharge, to modulating local temperature. Open space is also critical in floodplains for providing a buffer and increased flood storage, near public water supplies to maintain high water quality and promote recharge, and to maintain overall habitat connectivity that will be vital to allowing ecosystems and individual species to adapt to a changing climate. From a social perspective, open space and parks also provide opportunities for recreation and stress-relief. Several of Pittsfield's parks are subject to flooding. Kirvin Park, which includes soccer facilities, experiences flooding during heavy precipitation which affects both fields and access in and out of the park. Wahconah Park also suffers from regular flooding, which is particularly problematic as the park serves as the main helicopter landing site for Berkshire Medical Center. Plans are currently being developed for a new park known as the West Side Riverway which would provide access to the Housatonic River in the area near Dewey Avenue and John Street, downstream of Wahconah Park. The West Side Riverway project would increase flood storage, and could potentially form the basis for a larger floodplain restoration in the urban center.

Current Strengths and Assets

While the City recognized a number of vulnerabilities, workshop participants identified key strengths as well. Pittsfield has a number of systems in place to facilitate emergency communications and information transfer, and the City has obtained specialized equipment to help ensure that emergency services can be provided in a wide range of conditions. The City has also established memorandums of understanding and mutual aid agreements that will support resiliency during hazards. Numerous social and charitable organizations are already providing valuable, year-round care to citizens, including vulnerable populations.

- Pittsfield's Schools have emergency response and evacuation plans in place.
- The City's Taconic High School is brand new and equipped with air conditioning and generators.
- Pittsfield recently reconvened the Homeless Prevention Committee to serve homeless residents.
- Pittsfield has an existing City Facebook page that serves as an information hub for residents.
- Police will have access to local broadcasting equipment for live TV and radio transmissions.

- Pittsfield has its own 911 call center.
- The City focuses on Low Impact Development for stormwater management, rather than traditional conveyance structures.
- Pittsfield is working toward removal of impervious surfaces.
- The City operates a CODE RED Emergency Alert system that can be used to share information relevant to short-term hazards or expected long-term hazards.
- Pittsfield's Emergency Operations Center can operate out of multiple redundant locations, including the training room at Berkshire Corrections facility for larger-scale emergencies.
- Pittsfield has two vans to provide transportation to shelters.
- The City owns its own school busses, making them available for use in emergencies.
- Pittsfield's Council on Aging has two handicap-accessible vehicles for providing shopping and care services for seniors.
- The Salvation Army has a small disaster vehicle available for public use during emergencies.
- A microgrid feasibility study is underway in the City.
- The City has an existing survey of road/stream crossings conducted by HVA.
- The City has many existing infrastructure studies that provide baseline information on water and wastewater systems.
- Pittsfield has invested in new equipment, vehicles and training to help with emergency response and resiliency.
- Facilities and plans are in place for emergency pet sheltering.
- Berkshire Medical Center has back-up power and its own pharmacy.
- The City has mutual aid agreements for police and fire services.
- The City has a comprehensive emergency management plan already in place.
- The City is working to update its Hazard Mitigation Plan.
- Berkshire Gas has an Emergency Management Plan and Mutual Aid Agreements in place and is in the process of implementing ongoing line replacements and upgrades.
- The DPW Garage has its own fuel pumps and emergency communications system, though these are currently covered only by portable back-up power systems in the case of an outage.
- The City benefits from the efforts of Eversource, which invests time and money into clearing hazard trees and improving the robustness of the electrical system through grid modernization.

- The City has many organizations that serve vulnerable populations including ServiceNet, Soldier On, and The Salvation Army, and religious groups, including the Christian Center.
- The Athenaeum serves as an informal shelter, heating, and cooling center, and plays a conscious role in caring for the City's homeless and vulnerable residents.
- The City has a Community Sheltering Plan.
- There are several shelters in place and additional options available at local institutions.
- Berkshire Community College has sheltering and commercial kitchen facilities available to the community during emergencies.
- There is a wide array of organizational support for senior residents in Pittsfield, including from the Council on Aging, YMCA, Silver Sneakers, and the Senior Center.
- The City has short-term heating and cooling centers.
- The City is part of the Massachusetts Greening the Gateway Program which encourages tree planting to improve the City's streetscape for resilience and aesthetics.
- The City is part of a regional mosquito control district.
- The West Side Riverway Project is creating new public park space and additional flood storage along the Housatonic River.

Top Recommendations to Improve Resilience in Pittsfield

Participants at the CRB workshop identified a number of recommendations to address vulnerabilities and increase resiliency in three main topic areas: infrastructure, environment, and society. Management of water, primarily dealing with excesses of water due to flooding, was a primary concern that emerged in both the small and large group discussions, encompassing a wide variety of infrastructural concerns. Providing sufficient protections and planning for vulnerable populations in the City was a second major theme.

Highest Priority

- Implement priority projects from the City's existing field inventory of culverts, and bridges for increased flooding resiliency and storm-hardening, including design of priority re-sizing or replacement projects. Green infrastructure, Low-Impact Design, and other nature-based solutions should be integrated with hard-infrastructure improvements to establish approaches that will be robust in the face of natural hazards and climate-change scenarios and that will meet the Massachusetts stream crossing standards.

- Conduct dam assessments and study feasibility of dam removals, specifically at Bel Air Dam and Wild Acres Dam, and where other aging, public or privately-owned dams may pose a threat of failure and flooding, or where removal may have significant positive impacts on stream habitat and aquatic organism passage or for increasing flood storage and flood control possibilities.

- Assess cost-effective green infrastructure opportunities for stormwater management to develop a list of specific priority projects where reduction of stormwater runoff could mitigate flooding risk without the need to conduct expensive culvert replacement and resizing projects. Assess feasibility and cost, rank priority projects in terms of climate resilience potential, and develop concept designs for key projects. Review City regulations and update as necessary to support green infrastructure and low-impact development approaches.

- Develop a comprehensive plan to address flooding at Wahconah Park and surrounding neighborhoods. Assess the viability of using nature-based solutions such as restoration of wetlands and river channels or implementation of green infrastructure to develop a list of specific priority projects where reduction of stormwater runoff and increased flood storage capacity could mitigate flooding risk. Determine the best leverage points in the system to effectively address flooding, whether at the park, or further upstream.

- Update and improve City regulations and building code to reduce vulnerability of existing developed areas and promote resiliency of new development to flooding, severe weather, and extreme temperatures. Improve construction standards and requirements to prevent issues with snow and ice hazards on new buildings. Increase enforcement of regulations related to maintenance of detention ponds. Ensure that the zoning enforcement officer has a list of all privately and publically owned structures.

- Develop education and outreach to residents living in flood-prone areas to ensure that all individuals and families residing in these areas are aware of the potential risks, as well as

mechanisms, such as flood insurance, to reduce their risk exposure. Ensure that outreach targets renters as well as property owners.

- Continue assessing water and wastewater systems and implementing upgrades, particularly at pump stations, collection points, and treatment plants. Establish priority actions for reducing potential flooding impacts, addressing infiltration and inflow, and incorporating nature-based solutions or green infrastructure approaches. Establish plans to implement emergency back-up power for the pump stations. Explore storm hardening and protective strategies for structures and equipment, including elevating or adding barriers to flow control stations in floodplains.

- Conduct robust education and outreach to build awareness of City resources and make City residents aware of the many planning efforts, sources of emergency information, mutual aid agreements, shelters, evacuation routes, etc. which are focused on making the City more resilient to climate change impacts. Ensure that all residents have transportation options and know how to access these resources when they are needed.

- Evaluate opportunities to provide improvements at critical facilities, especially emergency backup power, including feasibility of green power and battery storage. City-wide, there are a number of buildings and facilities (including pump stations, schools, senior housing properties, medical facilities, etc.) in need of backup power systems to protect public buildings and infrastructure from freezing and improve services for residents who may lose power during emergencies or hazard events. Consider supplying backup power to the BCC fieldhouse to enable it to serve as a shelter during hazard events.

- Evaluate and implement green power and resilient power systems, including implementing the recommendations of the ongoing microgrid feasibility study and addressing storm-hardening needs at solar sites around the City.

- Develop a City-wide Business Improvement and Economic Development Plan to support local businesses and make the business community more resilient. Identify business development areas where impacts from climate hazards can be easily avoided or mitigated (e.g., by avoiding floodplains or areas of known drainage-related flooding) and targeted improvements, such as a microgrid, could be employed to provide extra resilience to community businesses. Encourage reuse of brownfields and existing buildings, where appropriate. Simultaneously identify areas from which businesses would be encouraged to divest in order to avoid hazards and minimize the potential for economic losses or additional stress on emergency services. The plan's goals should also include a focused plan for attracting climate-friendly businesses to the City that will invigorate the City's economy, improve the tax base and reduce the tax burden to all residents, business owners, and land owners while simultaneously generating funds that will enable the City to continue building toward a resilient future.

- Expand the City's emergency communications system to establish local TV and radio access for live updates and enroll more residents in the City's CODE RED system and Facebook page for emergency updates. Engage social and charitable organizations in developing communications networks to reach vulnerable populations before, during and after hazards events. Encourage residents to include crank or battery-powered radios in emergency kits.

- Develop a robust transportation plan that addresses both emergency access to transportation and the social and economic consequences that accompany service interruptions. Planning should include supplemental funding and equipment for snow removal, a review of available

drivers, and the understanding of potential issues related to insurance and union contracts that may influence access to certain transportation resources. Access to critical resources such as childcare and provisions should be considered. Promote public transportation to help reduce cars on the road during inclement weather and reduce greenhouse gas emissions.

- Develop and implement an Illicit Discharge Detection and Elimination (IDDE) Program to meet the requirements of the City's MS4 Permit for stormwater management and address water quality problems that are exacerbated by heavy precipitation.

- Assess mosquito/tick/pest control options, including cost/benefit analysis of membership in a mosquito control district versus options for the City to manage control independently, integrated pest management approaches, determination of future risks due to increase in type and quantity of pests/disease vectors due to climate change, and development of an education and outreach program. Outreach should include programs targeted at medical providers to increase awareness of new diseases and encourage early testing. Develop local funding and resources to make it easier for residents to have ticks tested when a biting tick is found.

Moderate Priority

- Advocate for state and federal policies that improve the City's resilience to a variety of hazards, including increased access to fuel assistance and transportation funding.

- Acquire remote monitoring equipment to enable continuous monitoring of critical structures such as high hazard dams.

- Improve access roads at dams and other critical facilities and purchase appropriate vehicles or equipment to ensure access is possible under a wide range of hazard conditions.

- Implement the designs for the West Side Riverway to create additional open space and flood resiliency along the Housatonic River.

- Coordinate efforts among local partner organizations providing support for emergencies and vulnerable populations. Share information regarding available resources, such as vehicles or sheltering options, including those offered by the Council on Aging and the Salvation Army. Explore funding options for upgrades to these organizations' vehicles. Organize information on evacuation routes and emergency communications equipment so that local organizations are well-informed and can help keep residents out of hazard areas.

- Update and improve the City's flood maps to include more accurate information specific to Pittsfield, as well as new modeling that reflects up-to-date rainfall predictions that account for climate change (e.g., Atlas 14 data).

- Develop a comprehensive strategy for sheltering that evaluates strengths and vulnerabilities of existing shelters and recommends tangible steps for improvements. Include a plan for communication to residents about shelter locations, amenities, and availability. Train additional personnel to open the City's shelters and enact the Community Sheltering Plan.

- Develop partnerships with local businesses to distribute information and help facilitate outreach efforts, particularly to vulnerable populations such as senior residents.

- Continue replacement and upgrade of natural gas lines throughout the City to increase the resiliency of Berkshire Gas infrastructure, with particular attention to areas like bridge crossings.

Lower Priority

- Develop a City-wide plan to maintain open space corridors and appropriate habitat for small and large mammals (coyotes, bears, fisher cats).

- Evaluate opportunities for improved watershed protections to preserve or improve water quality in the City's reservoirs and waterways.

- Evaluate the need for a back-up water purification system at the former GE site to ensure that stormwater runoff is treated before leaving the site.

- Develop comprehensive plan for beaver management to mitigate against unpredictable flooding/impoundment impacts. Establish creative engineering solutions, identify suitable areas for beaver relocation or where beaver activity may be creating flood storage that contributes to resiliency, and consider the development of special legislation to give the Town authority to address problematic beaver dams on private property.

- Develop a comprehensive tree and forests management program that builds on the Greening the Gateway Program, to identify, remove, and replace problem trees, preserve intact forests and street tree cover, and provide guidance and resources for gradually moving toward more climate-resilient trees and forest communities (e.g. species that will tolerate warmer temperatures).

- Develop comprehensive invasive species management from inventory stage through management planning and implementation to address existing invasive populations that threaten features such as open space or forests, both of which contribute to resiliency, as well as anticipate new invasives that are likely to move into the area as climates shift.

- Conduct strategic planning to support regional agriculture in the face of climate change. All of the identified hazards (flooding, drought, extreme temperatures, storm events) have the potential to significantly impact agricultural production, with corresponding threats to livelihoods and food availability. Planning should address hazard resiliency and approaches to connect growers with local buyers to shorten supply chains.

- Evaluate alternatives to sand and salt for winter road maintenance, focusing on effectiveness, environmental impacts, and costs. Products to be considered should include newer options such as beet juice and byproducts of the brewing industry, which may be able to be obtained through partnerships with local businesses.

- Conduct outreach to residents regarding winter road maintenance to build understanding of the impacts of deicing materials, encourage safe winter driving practices, and evaluate support for various alternative winter maintenance approaches.

- Assess feasibility of using pervious paving in new road construction.

- Develop a community litter-reduction education and outreach program aimed at limiting debris in stormwater infrastructure and natural waterbodies. Increase everyday access to trash and recycling disposal and promote the use of these amenities by residents.

- Develop a debris management plan to identify appropriate disposal sites and methods for flood debris, as well as maintenance plans to ensure that debris is removed to keep waterways and floodplains clear.

- Partner with utility providers to identify vulnerabilities and assess resilience strategies, including gradual replacement of wooden poles with sturdier structures and tree management planning. Enhance communication and cooperation between the City and private utilities.

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CRB Workshop Participants

All workshop invitees are listed below; attendees are indicated with an asterisk.

Name	Position/Organization
Becky Manship*	Recreation Activities Coordinator, Community Development
Alex Reczkowski*	Director of Berkshire Athenaeum (Library)
Gerry Garner*	Building Commissioner
Mackenzie Greer*	Berkshire Natural Resource Council (BNRC)
Jane Winn*	Berkshire Environmental Action Team (BEAT)
Joe Durwin	Parks Commission
Bryan House*	Berkshire Community Action Council (BCAC)
Ellen Merritt	Christian Center
Cheryl Mirer*	Downtown Pittsfield, Inc.
Deborah Leonczyk*	Berkshire Community Action Council (BCAC)
Captain Darlene Higgins*	Salvation Army
Melissa Hancock	Eversource
Robert Malnati*	Berkshire Regional Transit Authority (BRTA)
Dennis Regan*	Housatonic Valley Association (HVA)
Jay Sacchetti	Service Net
Domenick Sacco*	Department of Conservation & Recreation (DCR)
Chris Horton*	Berkshire County Mosquito Control
Dave Grande*	Berkshire Gas
Adam Hinds	State Senator
Tricia Farley-Bouvier*	State Representative - Pittsfield
Paige Dolinski*	State Representative Paul Mark's Office - Pittsfield 1B
Melissa Olesen*	Senator Markey's Office
Neil Kulikauskas*	Consultant, Kleinfelder
Meredith Washington*	Consultant, AECOM
Steve Baker*	General Dynamics
Chief Wynn*	Pittsfield Police Department
Chief Czerwinski*	Pittsfield Fire Department
Rob VanDerKar*	Conservation Agent
CJ Hoss*	City Planner
Gina Armstrong*	Health Department Director
Jim Clark*	Council on Aging Director
Connie Scott*	Pittsfield Housing Authority Assistant Executive Director
Roberta McCulloch-Dews*	Director of Administrative Services, Mayor's Office
Nick Caccamo	City Councilor – Ward 3
Jake McCandless*	Superintendent of Pittsfield Public Schools
Eric Saydlowski*	Berkshire Medical Center
Allison Egan*	Berkshire Regional Planning Commission – Senior Planner
Ryan Grennan*	GIS Coordinator
Ricardo Morales	City Engineer
Michael King*	Director of Safety and Security, Berkshire Community College
Joy Duperault*	State Floodplain Manager
Kevin Podkowka*	Forester, DCR

* indicates attendees

Citation

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CRB Workshop Project Team

Name	Organization	Role
Becky Manship	Recreation Activities Coordinator, Community Development	Project Coordinator/ Core Team Member
Kayla Donnelly-Winters	Public Health Nurse	Core Team Member
Captain Michael Grady	Pittsfield Police Department	Core Team Member
Chief Robert Czerwinski	Pittsfield Fire Department	Core Team Member
Rob VanDerKar	Conservation Agent	Core Team Member
Jim Clark	Council on Aging Director	Core Team Member
Nate Joyner	Permit Coordinator, Community Development	Core Team Member
Connie Scott	Pittsfield Housing Authority Assistant Executive Director	Core Team Member
Roberta McCulloch-Dews	Director of Administrative Services, Mayor's Office	Core Team Member
Jake McCandless	Superintendent of Pittsfield Public Schools	Core Team Member
Eric Saydlowski	Berkshire Medical Center	Core Team Member
Allison Egan	Berkshire Regional Planning Commission - Senior Planner	Core Team Member
Ryan Grennan	GIS Coordinator	Core Team Member
Ricardo Morales	City Engineer	Core Team Member
Mary Monahan	Fuss & O'Neill	MVP Lead Facilitator
Julianne Busa	Fuss & O'Neill	MVP Facilitator/Scribe
Dan Delany	Fuss & O'Neill	Scribe
Helena Farrell	Fuss & O'Neill	Scribe
Jamie Caplan	Jamie Caplan Consulting	Scribe/HMP Process

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Appendix A

Final Risk Matrix

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

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

H-M-L priority for
V = Vulnerability

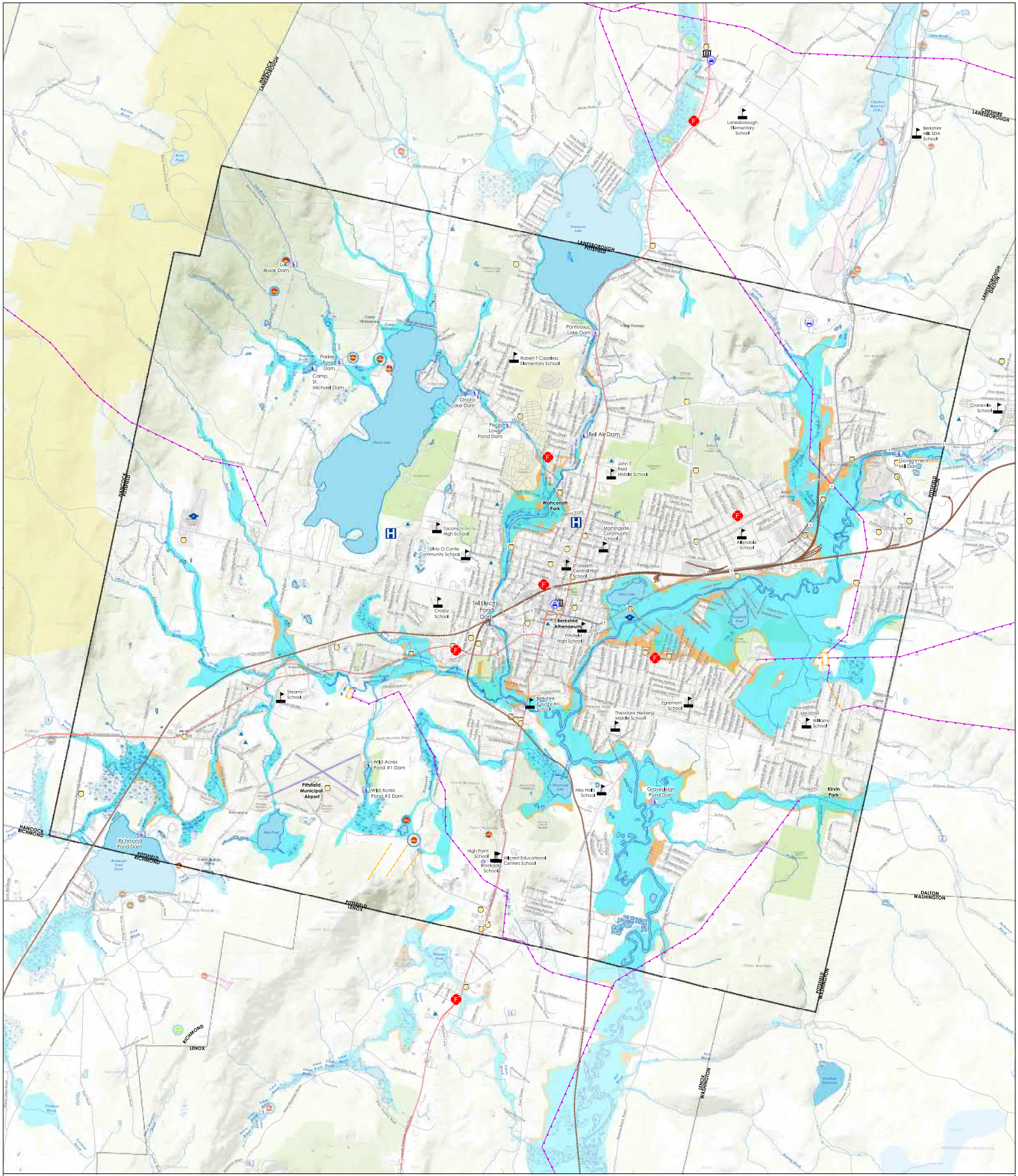
Features	Location	Ownership	V or S	Flooding	Extreme Temperatures	Severe Storms	Ice and Snow	Priority H-M-L	Time Short Long
Infrastructural									
Culverts and Bridges	City-Wide	City	S	The City has an existing survey of road/stream crossings conducted by HVA.				N/A	O
			V	Implement priority projects from the City's existing field inventory of culverts, and bridges for increased flooding resiliency and storm-hardening, including design of priority re-sizing or replacement projects. Green infrastructure, Low-Impact Design, and other nature-based solutions should be integrated with hard-infrastructure improvements.				H	O
Stormwater Basins and Conveyances	City-Wide	City	S	The City focuses on Low Impact Development for stormwater management, rather than traditional conveyance structures.				N/A	O
			S	Pittsfield is working toward removal of impervious surfaces.				N/A	O
			V	Assess cost-effective green infrastructure opportunities for stormwater management to develop a list of specific priority projects. Assess feasibility and cost, rank priority projects in terms of climate resilience potential, and develop concept designs. Review and update City regulations.				H	S
			V	Develop a community litter-reduction education and outreach program aimed at limiting debris in stormwater infrastructure and natural waterbodies. Increase everyday access to trash and recycling disposal and promote the use of these amenities by residents.				L	L
Roads	City-Wide	City/State	V				Evaluate alternatives to sand and salt for winter road maintenance, focusing on effectiveness, environmental impacts, and costs.	L	L
			V				Conduct outreach to residents regarding winter road maintenance to build understanding of the impacts of deicing materials, and encourage safe winter driving practices.	L	L
			V	Assess feasibility of using pervious paving in new road construction.				L	L
Public Water Supply	City-Wide	City	S	The City has many existing infrastructure studies that provide baseline information on water and wastewater systems.				N/A	O
Wastewater Infrastructure	City-Wide	City	S	The City has many existing infrastructure studies that provide baseline information on water and wastewater systems.					O
			V	Continue assessing water and wastewater systems and implementing upgrades, particularly at pump stations, collection points, and treatment plants. Establish priority actions for reducing potential flooding impacts, addressing infiltration and inflow, and incorporating nature-based solutions or green infrastructure approaches. Establish plans to implement emergency back-up power for the pump stations. Explore storm hardening and protective strategies for structures and equipment, including elevating or adding barriers to flow control stations in floodplains.				H	O
Underground Storage Tanks	City-Wide	City/ Private		No specific priority action identified.				N/A	N/A
Electrical and Communications Infrastructure	City-Wide	Private Utilities	S			The City benefits from the efforts of Eversource, which invests time and money into clearing hazard trees and improving the robustness of the electrical system.		N/A	O
			V		Partner with utility providers to identify vulnerabilities and assess resilience strategies. Enhance communication and cooperation between the City and private utilities.			L	O
Buildings and Facilities	City-Wide	City	S	The DPW Garage has its own fuel pumps and emergency communications system, though these are currently covered only by portable back-up power.				N/A	O
			V	Evaluate opportunities to provide improvements at critical facilities, especially emergency backup power, including feasibility of green power and battery storage.				H	S
Beavers	City-Wide	N/A	V	Develop comprehensive plan for beaver management to mitigate against unpredictable flooding/impoundment impacts.				L	L

Dams	City-Wide	City/ Private	V	Conduct dam assessments and study feasibility of dam removals, specifically at Bel Air Dam and Wild Acres Dam.				H	S
			V	Acquire remote monitoring equipment to enable continuous monitoring of critical structures such as high hazard dams.				M	L
			V	Improve access roads at dams and other critical facilities and purchase appropriate vehicles or equipment to ensure access.				M	L
Berkshire Gas	City-Wide	Berkshire Gas	S	Berkshire Gas has an Emergency Management Plan and Mutual Aid Agreements in place and is in the process of implementing ongoing line replacements and upgrades.				N/A	O
			V	Continue replacement and upgrade of natural gas lines throughout the City to increase the resiliency of Berkshire Gas infrastructure, with particular attention to areas like bridge crossings.				M	O
Microgrid	City-Wide	N/A	S	A microgrid feasibility study is underway in the City.				N/A	O
			V		Evaluate and implement green power and resilient power systems, including implementing the recommendations of the ongoing microgrid feasibility study and addressing storm-hardening needs at solar sites around the City.			H	S
Societal									
Water-Based Recreation	City-Wide	City			No specific priority action identified.			N/A	N/A
Vulnerable Neighborhoods	City-Wide	City/ Private	V	Develop education and outreach to residents in flood-prone areas; ensure families residing in these areas are aware of potential risks, and mechanisms to reduce their risk exposure.				H	S
Vulnerable Populations	City-Wide	N/A	S	Pittsfield recently reconvened the Homeless Prevention Committee to serve homeless residents.				N/A	O
			S	The City has many organizations that serve vulnerable populations including ServiceNet, Soldier On, and The Salvation Army, and religious groups, including the Christian Center.				N/A	O
			S	There is a wide array of organizational support for senior residents in Pittsfield, including from the Council on Aging, YMCA, Silver Sneakers, and the Senior Center.				N/A	O
			V	Coordinate efforts among local partner organizations providing support for emergencies and vulnerable populations. Share information regarding available resources; explore funding options for upgrades to these organizations' vehicles; organize information on evacuation routes and emergency communications equipment.				M	S
			V	Develop partnerships with local businesses to distribute information and help facilitate outreach efforts, particularly to vulnerable populations such as senior residents.				M	S
Communications Systems	City-Wide	City/ Private	S	Police will have access to local broadcasting equipment for live TV and radio transmissions, and Pittsfield has its own 911 call center.				N/A	O
			S	The City operates a CODE RED Emergency Alert system that can be used to share information relevant to short-term hazards or expected long-term hazards, and Pittsfield has an existing City Facebook page that serves as an information hub for residents.				N/A	O
			V	Expand the City's emergency communications system to establish local TV and radio access for live updates; enroll more residents in the City's CODE RED system and Facebook page for emergency updates. Engage social and charitable organizations in developing communications networks to reach vulnerable populations. Encourage residents to have crank or battery-powered radios in emergency kits.				H	O
Shelters	City-Wide	City	S	The City has a Community Sheltering Plan and facilities and plans are in place for emergency pet sheltering; there are several shelters in place and additional options available at local institutions. The City also has short-term heating and cooling centers.				N/A	O
			S	The Athenaeum serves as an informal shelter, heating, and cooling center, and plays a conscious role in caring for the City's homeless and vulnerable residents.				N/A	O
			V	Develop a comprehensive strategy for sheltering. Include a plan for communication to residents about shelter locations, amenities, and availability. Train additional personnel to open the City's shelters.				M	L
Schools	City-Wide	City	S	Pittsfield's Schools have emergency response and evacuation plans in place.				N/A	O
			S		The City's Taconic High School is brand new and equipped with air conditioning and generators.			N/A	O
Child Care Centers	City-Wide	Private		No specific priority action identified.				N/A	N/A
Bershire Community College	1350 West Street	BCC	S	Berkshire Community College has sheltering and commercial kitchen facilities available to the community during emergencies.				N/A	O
Pests and Disease Control	City-Wide	City/ Private	S	The City is part of a regional mosquito control district.				N/A	O
			V	Assess mosquito/tick/pest control options, including cost/benefit analysis of membership in a mosquito control district versus options for the City to manage control independently, integrated pest management approaches, determination of future risks due to increase in type and quantity of pests/disease vectors due to climate change, and development of an education and outreach program. Include programs targeted at medical providers to increase awareness of new diseases and encourage early testing. Develop local funding and resources to make it easier for residents to have ticks tested.				H	L
Provisions, Medicine, and Fuel	City-Wide	Private	S	Berkshire Medical Center has back-up power and its own pharmacy.				N/A	O
			V	Advocate for state and federal policies that improve the City's resilience to a variety of hazards, including increased access to fuel assistance and transportation funding.				M	L

Economic Revitalization	City-Wide	Private	V	Develop a City-wide Business Improvement and Economic Development Plan to support local businesses and increase resiliency. Identify areas where climate hazards can be avoided/mitigated and targeted improvements, such as a microgrid, could be employed. Encourage reuse of brownfields and existing buildings, where appropriate. Simultaneously identify areas from which businesses would be encouraged to divest to avoid hazards. Include a plan for attracting climate-friendly businesses.				H	S
Stress on Emergency Services	City-Wide	City	S	Pittsfield's Emergency Operations Center can operate out of multiple redundant locations, including the training room at Berkshire Corrections facility for larger-scale emergencies. The City has invested in new equipment, vehicles, and training to help with emergency response and resiliency. The City has a comprehensive emergency managment plan in place, as well as mutual aid agreeements for police and fire services.				N/A	O
			S	The City is working to update its Hazard Mitigation Plan.				N/A	O
Transportation	City-Wide	City/ Berkshire Regional Transit Authority / State	S	Pittsfield has two vans to provide transportation to shelters; the City owns its own school busses, making them available for use in emergencies. The Council on Aging also has two handicap-accessbile vehicles for provideing shopping and care services for seniors, and the Salvation Army has a small disaster vehicle available for public use during emergencies.				N/A	O
			V	Conduct robust education and outreach to build awareness of City resources and make City residents aware of the many planning efforts, sources of emergency information, mutual aid agreements, shelters, evacuation routes, etc. which are focused on making the City more resilient. Ensure that all residents have transportation options and know how to access these resources when they are needed.				H	S
			V	Develop a robust transportation plan that addresses both emergency access to transportation and the social and economic consequences that accompany service interruptions. Planning should include supplemental funding and equipment for snow removal, a review of available drivers, and the understanding of potential issues related to insurance and union contracts. Access to critical resources such as childcare and provisions should be considered. Promote public transportation to help reduce cars on the road during inclement weather and reduce greenhouse gas emissions.				H	L
Local and State Regulations	City-Wide	City/State	V	Update and improve City regulations and building code to reduce vulnerability and promote resiliency of new development. Improve construction standards and requirements. Increase enforcement of regulations related to maintenance of detention ponds. Ensure that the zoning enforcement officer has a list of all privately and publically owned structures.				H	S
Parks and Open Space	City-Wide	City	S	The West Side Riverway Project is creating new public park space and additional flood storage along the Housatonic River.				N/A	O
			V	Develop a comprehensive plan to address flooding at Wahconah Park and surrounding neighborhoods. Consider nature-based solutions such as restoration of wetlands and river channels or implementation of green infrastructure to develop a list of specific priority projects.				H	S
			V	Implement the designs for the West Side Riverway to create additional open space and flood resiliency along the Housatonic River.				M	S
Environmental									
PCBs	City-Wide, Former GE Site	City/ Private	V	Evaluate the need for a back-up water purification system at the former GE site to ensure that stormwater runoff is treated before leaving the site.				L	S
Wildlife Habitat	City-Wide	City/ Private	V	Develop a City-wide plan to maintain open space corridors and appropriate habitat for small and large mammals (coyotes, bears, fisher cats).				L	L
Trees and Forests	City-Wide	City/ Private	S	The City is part of the Massachusetts Greening the Gateway Program which encourages tree planting to improve the City's streetscape for resilience and aesthetics.				N/A	O
			V	Develop a comprehensive tree and forests management program that builds on the Greening the Gateway Program, to identify, remove, and replace problem trees, preserve intact forests and street tree cover, and provide guidance and resources for gradually moving toward more climate-resilient trees and forest communities (e.g. species that will tolerate warmer temperatures).				L	L
Invasive Species	City-Wide	City/ Private	V	Develop comprehensive invasive species management from inventory stage through management planning and implementation to address existing invasive populations that threaten features such as open space or forests, both of which contribute to resiliency, as well as anticipate new invasives that are likely to move into the area as climates shift.				L	L
Water Quality	City-Wide	City	V	Develop and implement an Illicit Discharge Detection and Elimination (IDDE) Program to meet the requirements of the City's MS4 Permit for stormwater management and address water quality problems that are exacerbated by heavy precipitation.				H	S
			V	Evaluate opportunities for improved watershed protections to preserve or improve water quality in the City's reservoirs and waterways.				L	L
Local Agriculture	City-Wide	Private	V	Conduct strategic planning to support regional agriculture in the face of climate change. Planning should address hazard resiliency and approaches to connect growers with local buyers.				L	L
Flood Mapping	City-Wide	City	V	Update and improve the City's flood maps.				M	S
Debris Management	City-Wide	City/Private	V	Develop a debris management plan to identify appropriate disposal sites and methods for flood debris, as well as maintenance plans to ensure that debris is removed.				L	S

Appendix B

CRB Workshop Base Map



PITTSFIELD, MA

MUNICIPAL VULNERABILITY PREPAREDNESS PROGRAM

FUSS & O'NEILL

- Town Hall
- Police Station
- Fire Station
- Hospital
- School
- Colleges and Universities
- Long Term Care Residences
- Prisons
- Dams
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- Surface Water Intake
- Non-Community Groundwater Source
- Underground Storage Tanks
- Railroads - Active Service
- Powerline
- Ski Lift/Tramway
- Substation
- Landing Strip/Airport
- Perennial or Intermittent Stream
- Shoreline
- Aqueduct
- Pond, Lake, Ocean
- Reservoir
- Wetland
- Wellhead Protection Zone I
- Wellhead Protection Zone II

Flood Zone Designations

- 1% Annual Chance of Flooding
- D: Possible But Undetermined
- 0.2% Annual Chance of Flooding
- Area Not Included

N W E S

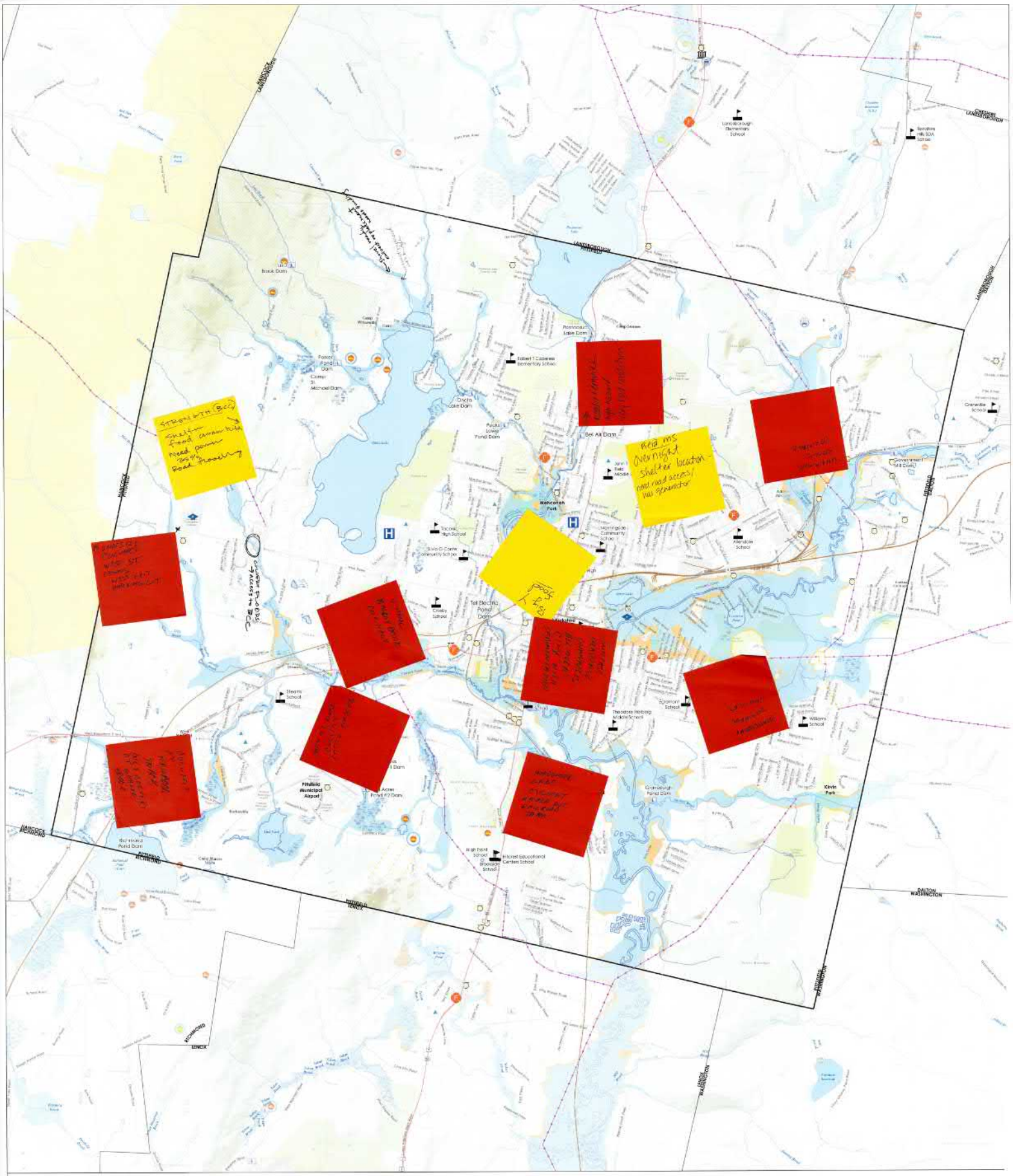
0 0.5 1

Miles

Data sources:
MassGIS - Infrastructure, Hydrology, and Administrative Data
ESRI - World Topographic Map - Base Map

Appendix C

CRB Workshop Outputs:
Participatory Mapping Exercise & Risk Matrices



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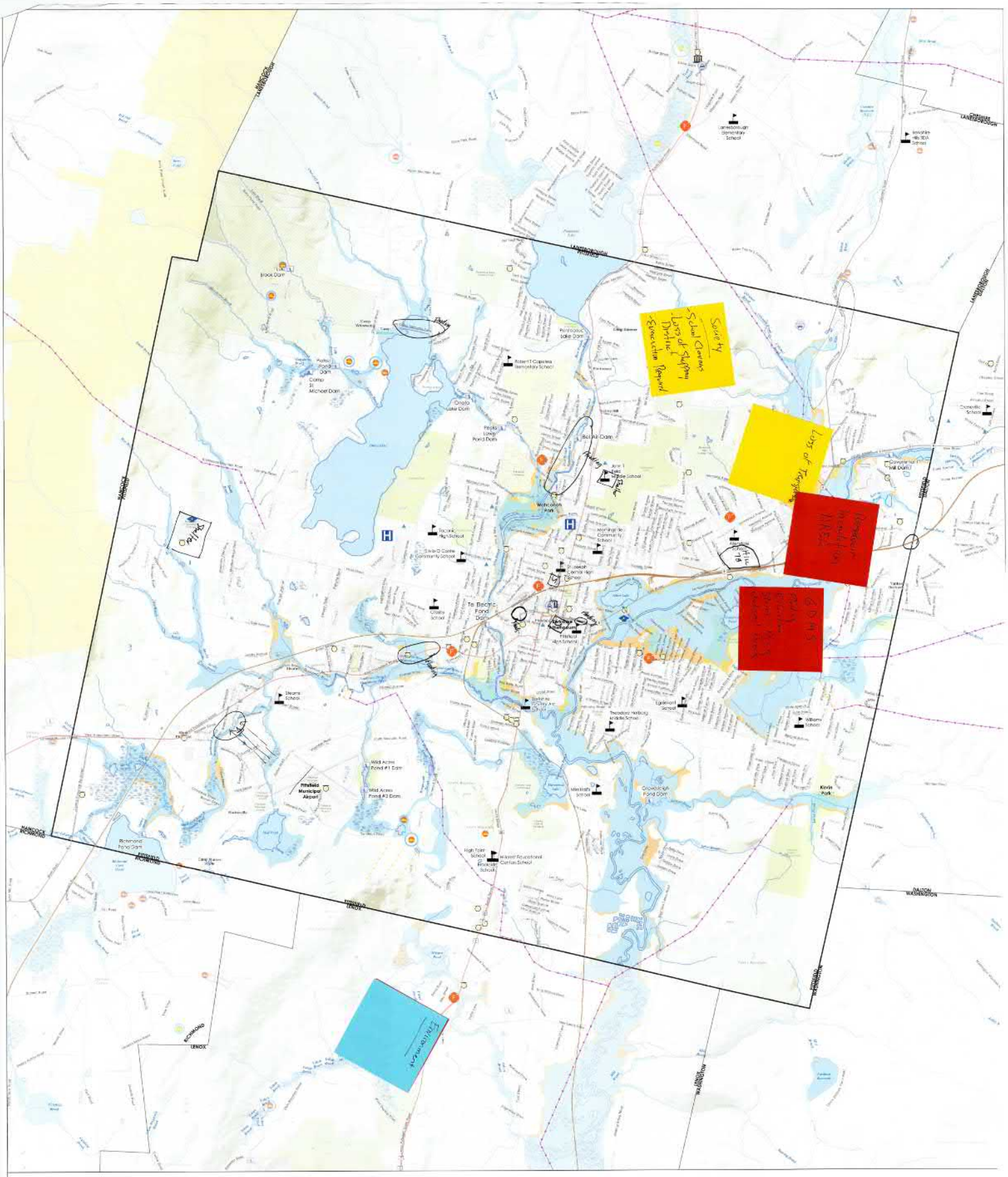

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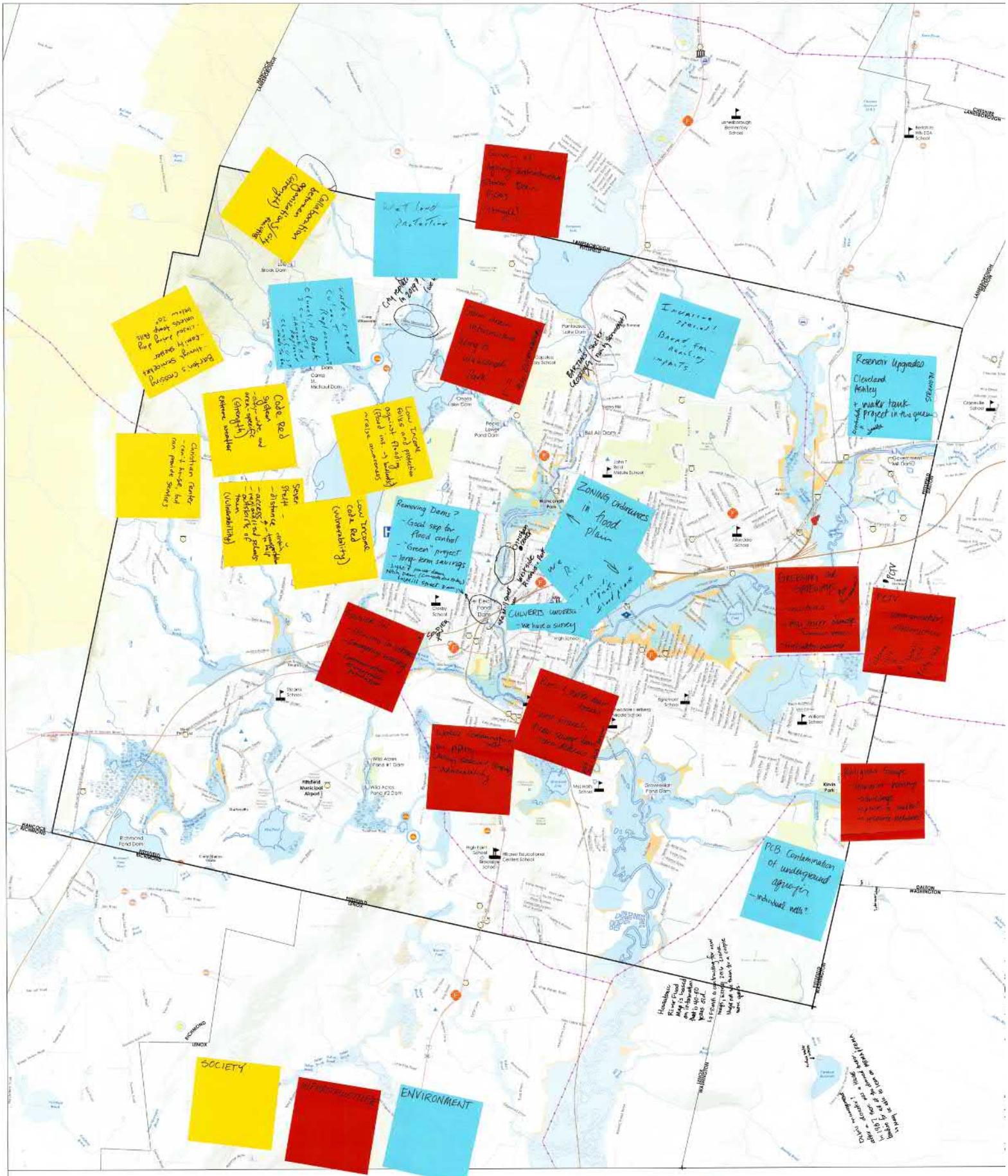

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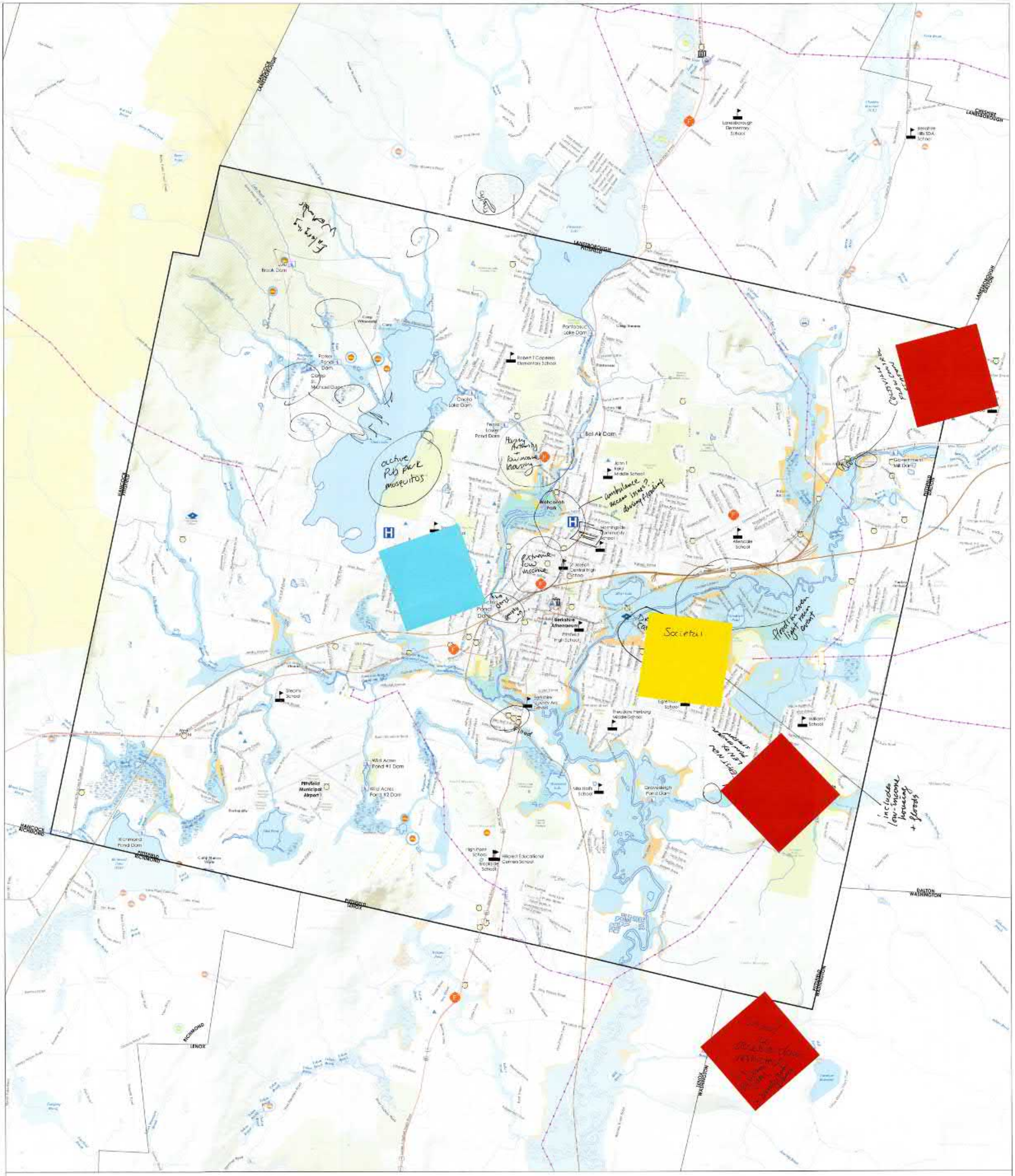

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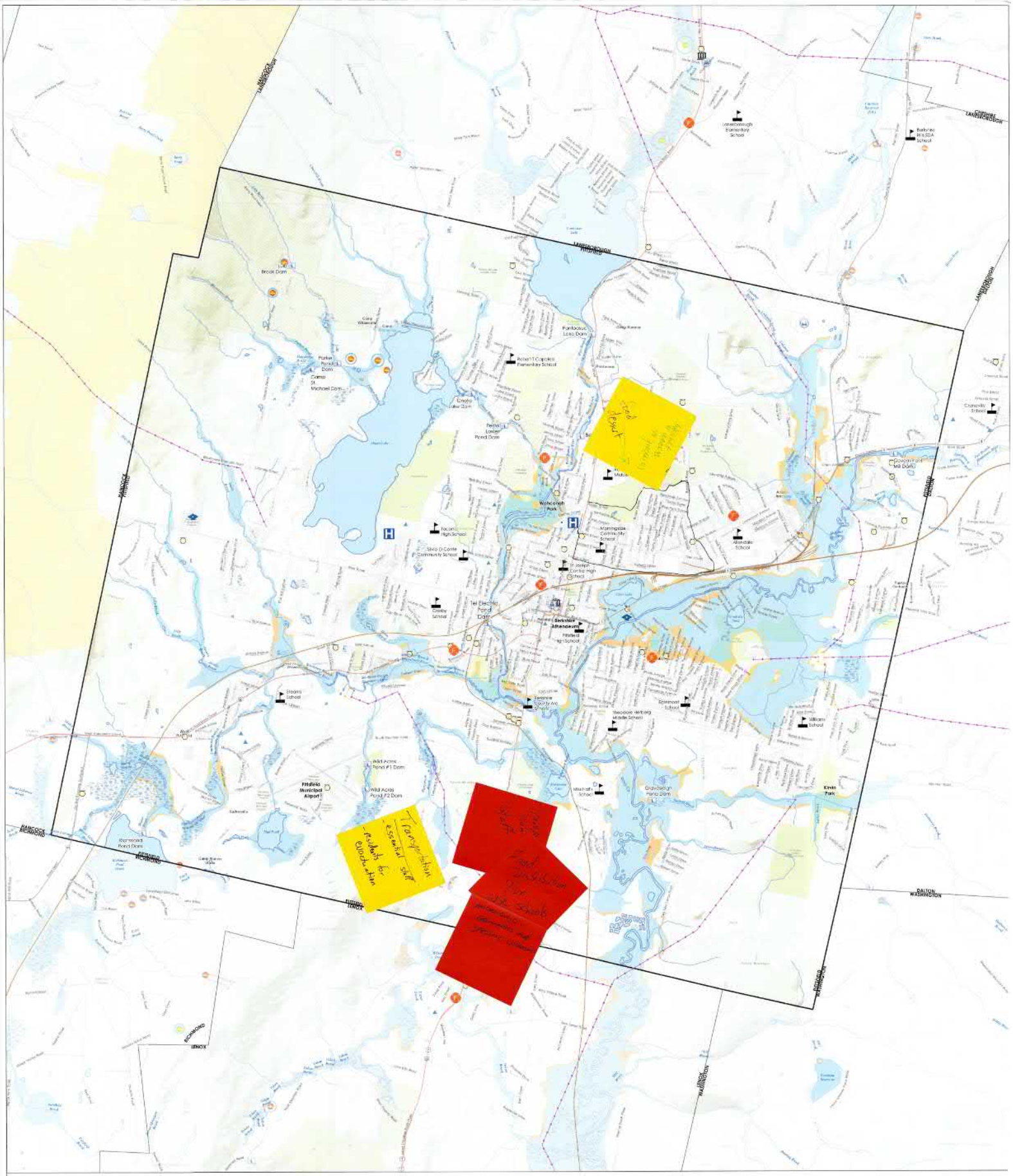

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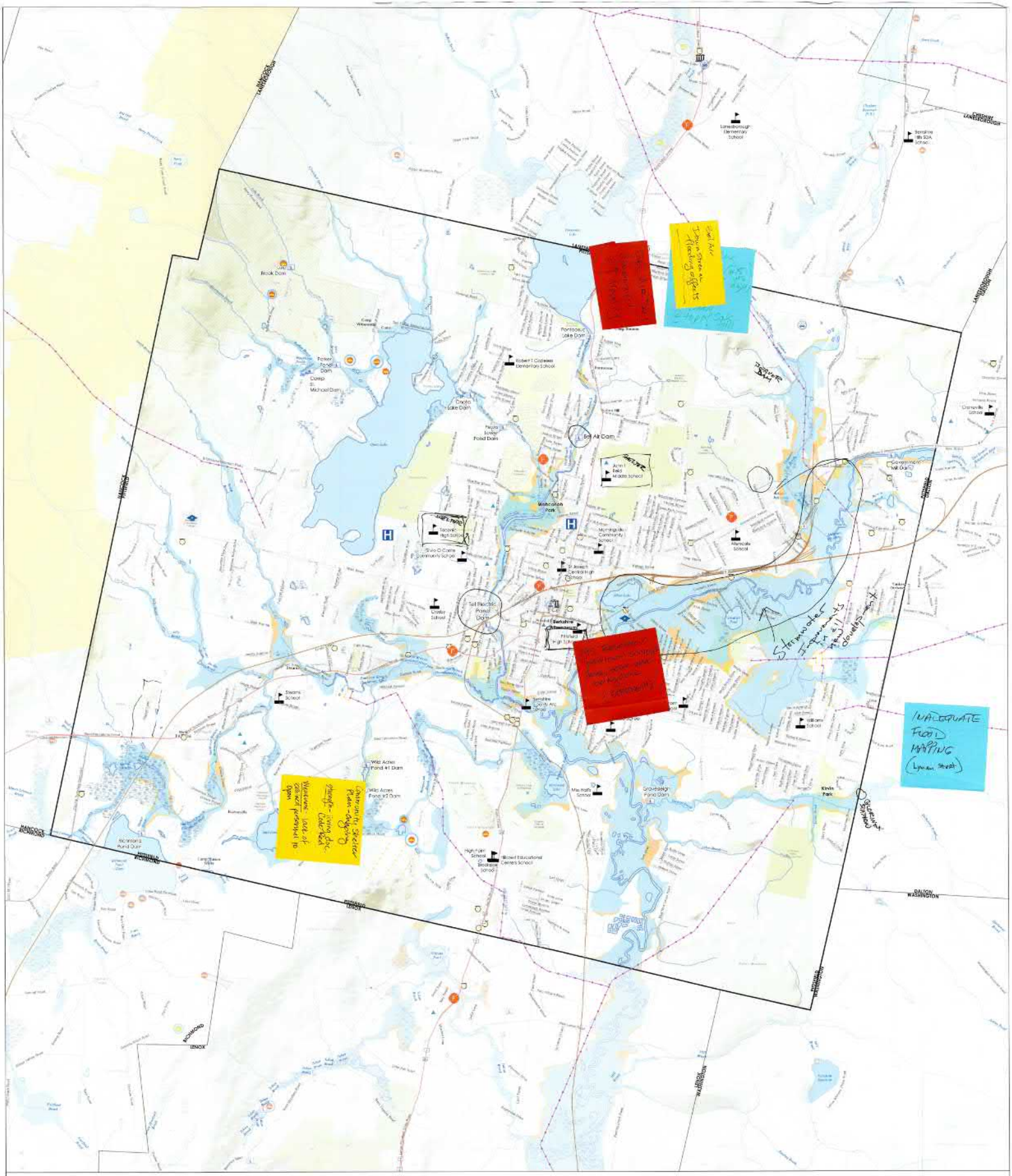

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Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.com

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

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

Features	Location	Ownership	V or S	FLOODING	EXTREME TEMPS	SEVERE STORMS	SNOW/ICE	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Dam access problems w/snow/ice	in pitts. owned watershed (DPU)/Fire	Pittsfield	V	snow/ice prevent access. need vehicles able to access + access roads/improvements + remote monitoring					
Flat roofs on industrial/city buildings		private + city zoning/building	V	construction standards + requirements to prevent issues					
Lack of power for pump stations Some flow control adjacent to flood plain		Pittsfield DPU	V	• get backup power – generator purchasing • elevate pump station, add a barrier					
Road Treatment, more sand + salt coming in, exporting demand – getting into wetlands/protected areas	Pitts	Pitts/state DPU/conservation	V	• reduce sand + salt • other melting products that are more enviro friendly • for new roads, switch to pervious paving materials	– education + advocacy each	• find out where it comes from/who else uses			
litter getting into storm drains – cig. butts – trash – lack of recycling bins	Pitts	Pitts DPU	V	• Public education + programs • treat water before it goes into wetlands • more opportunities to recycle					
Telephone/Power poles are vulnerable to snapping (outfalls to wetlands)	Pitts DPU/city/eversource	Pitts	V	• Use of concrete poles – more resistant to wind/storms					
Societal									
East branch of Housatonic/low income housing		private/city/concom	V						
Opioid epidemic - pushing people out of housing/need for treatment/community centers	Pittsfield	City Health dept. + emergency mgmt	V						
Sheltering considerations									
strength - Pittsfield homelessness initiatives	City (Pitts)	City mayor, health dept. legislators	S						
EEE/WNV mosquito borne illnesses + ticks + other communicable diseases – lack of affordable tick testing program. increase west nile virus	city + state	city + other groups? health dept.	V	enhanced arthropod • expand spraying	program testing/screening/spraying				
Salvation Army - Bolster services needed – Bigger van ★ FOOD capabilities	city	state	V/S	Build awareness of expansive programs need bigger emergency disaster vehicle					
Environmental									
Growing wetlands	city	state/city concom	V/S	will still function in landscape – possible disease vector					
Greening the gateways/Trees	city/state	DCR	V/S	city should look @ urban tree inventory. need more storm resistant trees/Diversity increase cypress for example – Tyler street streetscaping initiative					
extreme temps leading to more invasive plants + animals – not hitting extreme low temps – earlier snow melt	Feed/state/city		V						
Agriculture – economy	Feed/state/city		V/S	longer season, some crops may have issues with temps + flooding – • more cooperation btwn groups			Blight		

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Infrastructural									
WASTEWATER SYSTEM & WWTP	CITYWIDE	CITY	V/S	I/I, WWTP CAPACITY <550's	EXTERNAL EQUIPMENT PROTECT	POWER LOSS			
WATER TP'S x2	WTPS x2 CITYWIDE	CITY	V	HARDEN / PROTECT EQUIPMENT	WATER MAIN BREAKS				
LOCAL DRAINAGE (CHANNELS, CULVERTS) LID	CITY WIDE	CITY	V	- DRAINAGE STUDIES - MAINTENANCE - IMPROVEMENTS	MAINTENANCE	YES	YES		
RENEWABLE POWER & STORAGE	CITYWIDE	MIXED	S/V	HARDEN / PROTECT EQUIPMENT		→	SOLAR SITES? →		
~~LID RETROFITS~~ DAMS	CITYWIDE	CITY / PRIVATE	V	- REMOVE BEL-AIR DAM - DAM MAINTENANCE/STUDIES	—	EVACUATE DAMS? DAM MAINTENANCE + DAM STUDIES, REMOVAL?	—		
POWER (MICRO) GRID - ~~EXPANSION~~	CITYWIDE	PRIVATE				PROTECT INF. MOVE U-GROUND? ↔	MICROGRID? IMPLEMENTATION		
Societal									
BCC (SHELTER?) / SCHOOLS	WEST ST.	STATE	S	ACCESS TO EMERGENCY SHELTER	HEATING / COOLING SYSTEMS	POWER EMERGENCY GENERATORS - NO BACKUP	SNOW REMOVAL FUNDING / EQUIPMENT		
HOSPITAL	WATERCOURT			ACCESS + DRAINAGE IMPROVEMENTS	"	POWER - EXTEND BACK-UP POWER	ACCESS		
SUPERMARKETS				ACCESS	?	DRAINAGE STUDIES AND IMPROVEMENTS POWER	ACCESS		
GAS STATIONS				ACCESS	?		ACCESS		
BCAC, SHELTERS, SENIOR HSG	EAST ST	PUBLIC		ACCESS	HEATING / COOLING SYSTEMS		ACCESS		
PUBLIC TRANSIT (BUSES)				ROUTE ACCESS	—		SNOW REMOVAL FUNDING / EQUIPMENT		
Environmental									
RESERVOIRS & WTP'S				WATER QUALITY?	DROUGHT	?	?		
RECREATIONAL / USE OF RIVERS PARKS									
WILDLIFE - MOVEMENT									
MOSQUITOS - IMPOUNDMENTS				MAINTAIN SURFACE DRAINAGE ~~ENHANCEMENT~~ NEED EQUIPMENT TO MAINTAIN RIGHT	INCREASED IN XTREME HEAT	SHARED EQUIPMENT?	—		
TICKS									
LOCAL AGRICULTURE									

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Features	Location	Ownership	V or S	FLOODING	XTREME TEMPS	SEVERE STORMS	SNOW/ICE	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Dams	Bel Air Wild Acres	- Private - Public	V	- Wahconah St - Airport / residents - REMOVAL				H	~~O~~ S
Reservoirs	watershed	- City	S		continued	Maintenance		M	O
Stormwater Improvements	City-wide	Public / Private	V	Removal of improvements - where possible - Repair / replacement				H	O
General Infrastructural Improvements	City-wide	City	V/S	- Comprehensive data collection for all City Infrastructure - Develop prioritization plan w/ potential funding sources				H	
Societal									
Down stream flooding effects	~~Bel Air~~ Various	Public / private ownership	V	Improvements to City infrastructure / enhanced maint on private prop.				H	O
Community Shelter Plan - aging	various	City Prop	S	Continue	providing accomodations as necessary			H	O
Ordinance modification - i.e. stormwater		City		Increase thresholds for triggering enhanced stormwater management				H	S
Disease	Vulnerable areas	City	V	Increased vector transmission education to reduce standing water and best practices for watering ticks				H	O
Environmental									
Inadequate flood mapping	FEMA mapped locations	- Private - Public	V	update / modernize map					
Debris management	Throughout watersheds/ floodplains	Public / private	V	- maintenance		maintenance			
Wildlife management (beaver)	Throughout city	Public / private	V	- better water level controls - legislation ?					

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Infrastructural									
Stormwater drainage	Stecific			STREET FLOODING,	DRAIN ISSUES				
Berkshire Gas	M	P	V/S	Emerg. Mngmt Plan + Mutual Aid Agreements; ongoing line replace/upgrades Lines vulnerable@ bridges (flooding/bridge loss) old bare metal lines vulnerable to inflow				M	O
microgrid	S	CITY		STATUS, FUNDING, EXECUTION				H	L
ELECTRICAL	M	P	✓	SYSTEM RELIABILITY				H	O
Societal									
Child care centers	S	CITY		TRANSPORTATION	NEED STUDY			M	O
Shelters + pets	M	P		STUDY	NEED STUDY				
school (closures)	TYLER STREET MORNINGSIDE			Generation @ Sands Community TRANSPORTATION PLAN FOR STAFF	NEED STUDY			H	S
grocery access	M	P		WE					
COMMUNICATION									
TRANSPORTATION	M	P		WE HAVE TWO POTENTIAL SOURCES FOR TRANSPORTATION. AVAILABILITY of DRIVERS, CALL IN PROVISIONS.		REQUIRED INSURANCE MATTERS. NEEDS STUDY		H	O
Environmental									
STORM WATER	GE SITE TO EAST STREET			Managing Detention		Managing Detention Ponds			

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Infrastructural									
ANTIQUATED PIPES/Storm Drains	City-wide	City & Home Owners	V	IDDE/INI: Storm Drains & Sewage cross-connection; Reduce concentration at Wahconah Park		Overwhelmed System		H	
CULVERTS: Replace undersized culverts	City-Wide	City	V→S	Minimize flooding		Minimize effects		H	L
PUBLIC TRANSPORTATION	City-Wide	BRTA					Stronger system can mean fewer cars out in snow/ice		
LAKEWOOD NEIGHBORHOOD FLOODING			V	Re-occurring problem					
ZONING ORDINANCES: update ordinances & educate people on what they are	City	City	V→S	Re-examine for floodplain issues	→ Enforcement ability to hold to higher standard				
Societal									
Shelters/Resources for Homeless	City-wide -noted on map	NGO – ServiceNet Soldier ON	V & S	Access to Vulnerable populations. Transportation	Cold Temps→emergency shelter		Barrier to Transportation		
Ripple Effect when Schools Close	City-wide	Govt. Businesses Private	V	More adversely affect	workers without benefits	Regionalization – how close/far from people → Emergency Services consolidation has unintended consequences			
CODE RED Communication System			V & S	Alert/warn residents in any hazard -can isolate neighborhoods/populations -may be excluding some Vulnerable populations					
Outreach/Awareness / EDUCATION ~~OUTREACH~~				Info about flood insurance for renters/vulnerable population	It gets hot in some city buildings (PHS), buildings hold heat				
Informal Social Communication – Library, Senior Center, Religious groups			S	Share info & responsibility for taking care of each other					
WEST SIDE RIVERWAY	Housatonic River near Dewey Ave John St.		S	Gives flood some place to go.	Hot: Trees/water = cooler recreation				
Environmental									
WETLAND PROTECTION	(King St. Dump) Wahconah Park		V						O
GREENING THE GATEWAYS		Public & Private	S	Trees help → Healthy				M	O
(Zebra Muscles) (Emerald Ash) Invasive Species – Killing Trees	City-wide		V	Zebra mussels - clog drain pipes & cause flooding	Fire hazard in extreme heat	Trees falling b/c weak	ICE → trees down		
DAM REMOVAL	Nash Dam aka Mill St. aka Tel Electric	CITY	V→S	Removing dam is a good "Green" Project Long-term savings	step for flood control				
RESERVOIR PROTECTION	Washington	CITY							

Educate

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Infrastructural									
CITY-OWNED BUSSES			S						
~~Pittsfield Municipal Airport~~									
Mutual Aid	County Wide +	Police + Fire	S	✓			✓		Ongoing
Code Red	citywide	Emergency Management	S						Ongoing
Societal									
LONG TERM SHELTERING			V/S	Power outages affecting homes w/ all electric Have SHELTERING PLAN CEMP					
SHORT TERM COOLING/HEATING			S	Need expansion → transportation for vulnerable pop					
MEDICAL RESOURCES w/o back-up power	Pharmacies hospital		V	Micro-grid					
Economic Revitalization Market rate housing & retail	Berkshir Innovation (BIC) & Williams Stanley business Park → TYLER ST.		S	Adaptive Re-use of buildings & brownfields for new businesses					
HOMELESS POPULATION	CITY WIDE		V/S	LIBRARY, INTERMODAL CENTER HOMELESSNESS Prevention committee reenacted to plan for homelessness					
SENIORS			(V) (S)	25% POP +60Y.O. Robust activities for	10% pop actively engaged in senior center activities, Senior run by volunteers, YMCA silversneakers, Senior Center,			SHUT-INS concern care	
Environmental									
DAMS HOLDING RESERVIRS V/S OF SHOPPING AREAS	FARNUM CLEVELAND ASHLEY			SHOPPING AREA, BASSET BERKSHIRE MEDICAL					
Hill 78 - ALLENDALE			V	Re-exposure					
PCB - Education			V						

Appendix D

CRB Workshop Presentation Materials

FUSS & O'NEILL

Boston Firefighters, January 4, 2018 (Reuters)

Train Trestle, West Housatonic Street

Municipal Vulnerability Preparedness Program
MVP Workshop
City of Pittsfield
December 6, 2018

Community Resilience Building Workshop

Agenda

- CRB Team and participant introductions
- Introduction to Massachusetts Municipal Vulnerability Preparedness Program (MVP)
- Introduction to Climate Change and the City of Pittsfield
- Discussion by Pittsfield participants on status of current planning and risks
- Introduction to CRB Workshop process

- Large group
  - Review top four hazards

- Small work groups (Using Risk Matrix)
  - Identify Pittsfield's vulnerabilities and strengths
  - Prioritize response actions

- Lunch

- Large group
  - Report out from small groups
  - Determine overall priority actions for the City

- Discussion on next steps
- Conclusion

FUSS & O'NEILL

Fuss & O'Neill Overview

Fuss & O'Neill is a leading MVP consultant in assisting Massachusetts communities secure grant assistance, achieve designation as a Massachusetts Municipal Vulnerability Preparedness (MVP) community, and execute their MVP priority projects.

The MVP team is experienced in local government, environmental services, civil site engineering, stormwater management, and emergency management.

Fuss & O'Neill assisted new MVP communities secure more than $700,000 MVP Action Grants in the program's first funding round.

MVP Project Team

Mary Monahan

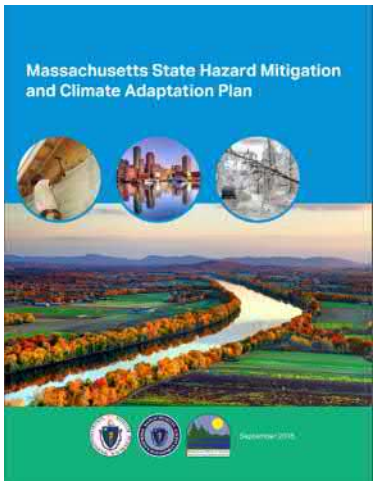
Mary is a municipal public works specialist well-versed in issues related to stormwater management; wastewater collection and treatment; drinking water supply, treatment, and distribution; solid waste management; and sustainable operations. Mary serves as a liaison between the public works project owner and the design team.

Julie Busa

Julie is an environmental scientist in the Water Environment and Natural Resources group of Fuss & O'Neill. She has over 10 years of experience in the areas of global biodiversity and forest conservation, sustainability, and ecological modelling. Julie works extensively with municipalities on MS4 compliance and the MVP program.

Jamie Caplan Consulting LLC

- MA Mitigation Plans
  - MA State Plan
  - Blandford
  - South Hadley
  - Ludlow
  - North Reading
  - UMass Amherst



JAMIE CAPLAN CONSULTING LLC
Emergency Management Services

5

Pittsfield's MVP and HMP Program - $40,500

Grant Supports Climate Change Vulnerability Assessments and Resiliency Planning and Local Hazard Mitigation Planning

- MVP Comprehensive Approach
  - Infrastructure
  - Society
  - Environment
- HMP Comprehensive Approach
  - Assessment
  - Participation
  - Prioritization

MVP Designation Leads to Enhanced Standing in Future Funding Opportunities

MVP Action Grant NEW

- Grant supports priority actions identified at Community Resilience Building Workshop
- $10,000 - $400,000 available
- Local match of 25% - can be in-kind
- Next funding round anticipated Fall 2018

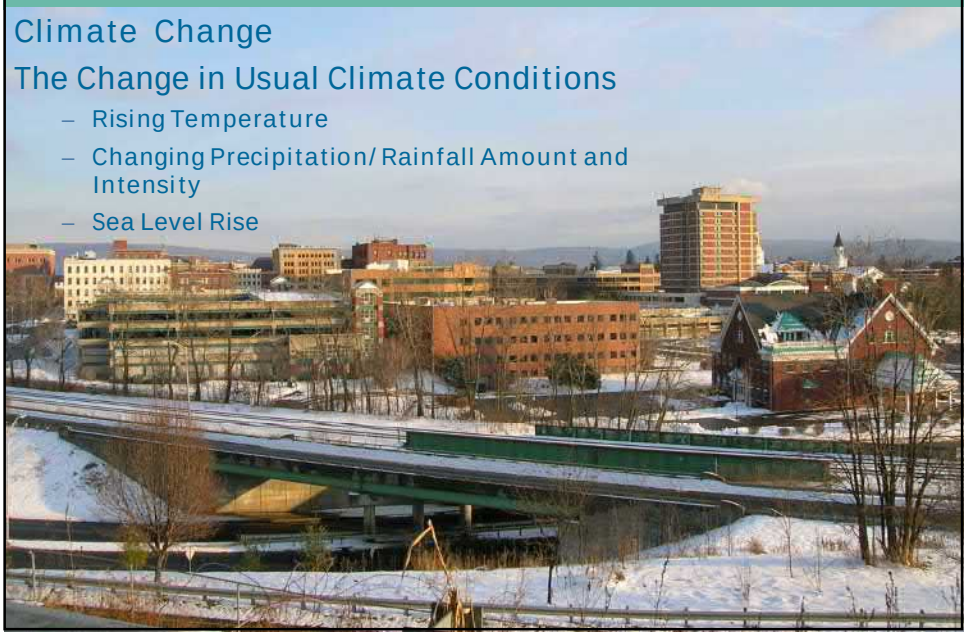
Only those communities which have completed the CRB workshop are eligible to apply

Terminology

Climate Change

The Change in Usual Climate Conditions

- Rising Temperature
- Changing Precipitation/ Rainfall Amount and Intensity
- Sea Level Rise



City of Pittsfield– Housatonic Basin

Rising Temperature

Housatonic	Observed Baseline 1971-2000	Projected Change in 2030s	Projected Change in 2050s	Projected Change in 2070s	Projected Change in 2090s
Average Annual Temperature (°F)	44.32	2.24 to 4.61	3.09 to 6.72	3.69 to 9.29	4.28 to 11.30
Annual Days with Maximum Temperature over 90°F (Days)	1.33	2.89 to 10.27	4.43 to 20.21	5.59 to 38.75	7.19 to 56.83
Annual Days with Minimum Temperature below 32°F (Days)	172.97	-10.88 to -28.16	-19.40 to -38.83	-22.42 to -53.75	-23.77 to -63.13

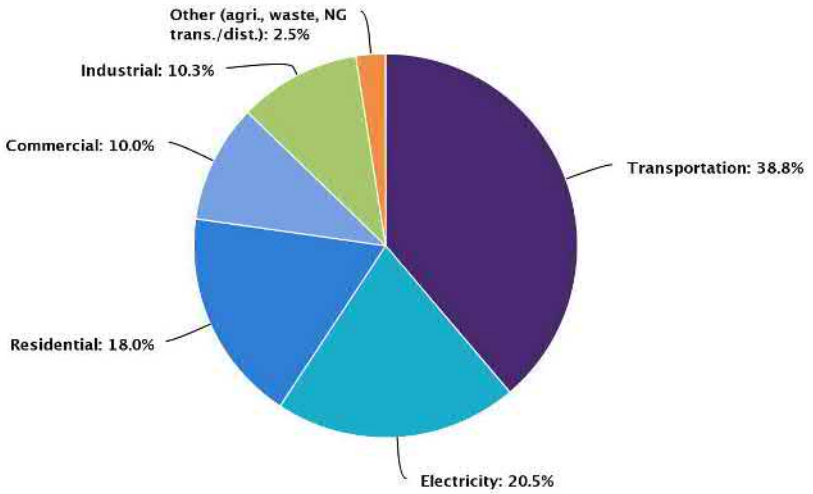
City of Pittsfield– Housatonic Basin

Changing Precipitation

Housatonic	Observed Baseline 1971-2000	Projected Change in 2030s	Projected Change in 2050s	Projected Change in 2070s	Projected Change in 2090s
Total Annual Precipitation (Inches)	47.43	0.21 to 4.41	1.09 to 6.42	1.57 to 6.85	1.56 to 7.66
Annual Consecutive Dry Days (Days)	15.98	-0.07 to 1.00	-0.06 to 1.94	-0.19 to 1.89	-0.08 to 2.26

2015 MA GHG Emissions by Sector

76.3 MMTCO2e



Climate Change Impacts - Temperature

- Economic
  - Winter Recreation
  - Snow and Ice
- Agricultural
  - Longer Growing Season
- Health
  - Increased Pests
  - Heat Stroke
- Infrastructure
  - Road Buckling
  - More Potholes
  - Power Outages
- Environment
  - Change in Habitat

Climate Change Impacts - Precipitation

- Economic
  - Dangerous Floods
  - Lost work time
- Agricultural
  - Excessively Wet Spring
  - Drought
- Health
  - Flood/High Water-related Deaths
  - Emergency Response Delays
- Infrastructure
  - Road Washout
  - Environment
  - Sewer System Overflows
  - Compromised Bridges
- Changes in Habitat

Stakeholder Updates

Risk Matrix – Determine Top Four Hazards

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

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

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

Features	Location	Ownership	V or S					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

MVP Program

- Identify Top Four Hazards
  - Review MVP Sectors
  - Maps as tool
  - List infrastructure, societal, environmental feature
  - Determine whether a vulnerability or strength
  - Identify actions to reduce vulnerability or reinforce strength
  - Prioritize actions
  - Report Out
- Finalize Prioritization Plan

Climate Change Hazards

- Flooding
- Extreme Precipitation Events
- Heat Waves
- Drought
- Snow/Ice
- Wildfire
- Tornadoes
- Hurricanes
- Nor'easters
- Other

MVP Sectors

- Infrastructure
  - Evacuation routes
  - Schools
  - Roads, bridges, dams
  - Water and wastewater
  - Septic systems
  - Hospitals
  - Commercial Buildings, churches
  - Utilities: electric, gas
  - Factories
  - Emergency management facilities

MVP Sectors

- Societal
  - Emergency shelters
  - Senior housing
  - Schools and campuses
  - Economically challenged populations
  - Evacuation plans
  - Animal shelters
  - Hospitals, pharmacies
  - Grocery stores
  - Utilities: electric, gas
  - Homeless
  - Other

MVP Sectors

- Environmental
  - Drinking water supply
  - Rivers and streams
  - Parklands
  - Agriculture
  - Title V systems
  - Stormwater management
  - Open spaces
  - Flood plains
  - Forest
  - Other

Community Resilience Building Workshop

Next Steps:

- Public Review of Priorities
- Monitor and Update
- Annual Review

Community Resilience Building Workshop

Questions?