TOWN OF DOUGLAS

MUNICIPAL VULNERABILITY PREPAREDNESS SUMMARY OF FINDINGS

MAY 2020

LAST REVISED 5/26/2020

With Assistance from

CMRPC
Central Massachusetts Regional Planning Commission

Executive Office of Energy and Environmental Affairs

CONTENTS

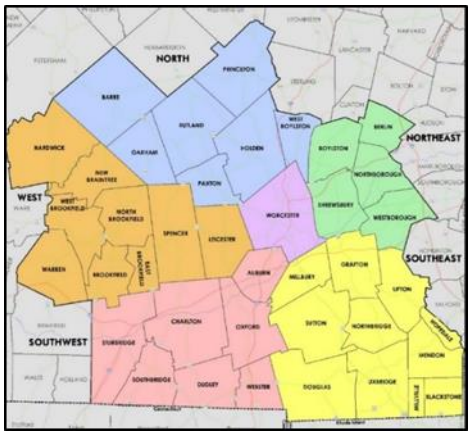
CMRPC Mission

The Central Massachusetts Regional Planning Commission is a regional partnership serving the planning and development interests of 40 member communities in southern Worcester County in Massachusetts. Our primary mission is to improve the quality of life for those who live and work in our region.

We do this by (1) addressing growth and development issues that extend beyond community boundaries; (2) maintaining the region's certification for federal transportation improvement funds; (3) providing technical knowledge an resources to assist local government in addressing specific land use, economic or environmental problems resulting from growth or decline, and (4) building strong working relationships with member communities, state and federal officials, as well as the range of area stakeholders.

Our History and Progress

Founded by the Massachusetts Legislature in 1963, the Central Massachusetts Regional Planning Commission (CMRPC) provides a variety of services to its constituencies and brings a regional perspective to planning and development. One of 13 regional planning agencies in Massachusetts, CMRPC serves the city of Worcester and 39 surrounding communities in the southern two-thirds of Worcester County. CMPRC's programs include Transportation, Regional Services, Geographic Information Systems (GIS), and Community Development and Planning.



Federal Title VI/Nondiscrimination Protections

The Central Massachusetts Metropolitan Planning Organization (CMMPO) hereby states its policy to operate its programs, services and activities in full compliance with federal nondiscrimination laws including Title VI of the Civil Rights Act of 1964 (Title VI), the Civil Rights Restoration Act of 1987, and related federal and state statutes and regulations. Title VI prohibits discrimination in federally assisted programs and requires that no person in the United States of America shall, on the grounds of race, color, or national origin, including limited English proficiency, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving Federal assistance. Related federal nondiscrimination laws administered by the Federal Highway Administration, the Federal Transit Administration, or both prohibit discrimination on the basis of age, sex, and disability. These protected categories are contemplated within the CMMPO's Title VI Programs consistent with federal and state interpretation and administration. Additionally, the CMMPO provides meaningful access to its programs, services, and activities to individuals with limited English proficiency, in compliance with US Department of Transportation policy and guidance on federal Executive Order 13166.

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The CMMPO also complies with the Massachusetts Public Accommodation Law, M.G.L. c272§§ 92a, 98, 98a, prohibiting making any distinction, discrimination, or restriction in admission to or treatment in a place of public accommodation based on race, color, religious creed, national origin, sex, sexual orientation, disability or ancestry. Likewise, CMMPO complies with the Governor's Executive Order 526, section 4, requiring all programs, activities and services provided, performed, licensed, chartered, funded, regulated, or contracted for by the state shall be conducted without unlawful discrimination based on race, color, age, gender, ethnicity, sexual orientation, gender identity or expression, religion, creed, ancestry, national origin, disability, veteran's status (including Vietnam-era veterans), or background.

ACKNOWLEDGEMENTS

This Community Resiliency Workshop has been prepared for the community of Douglas by the Central Massachusetts Regional Planning Commission with funding from the Massachusetts Municipal Vulnerability Program. The MVP encourages cities and towns to begin the process of planning for climate change and for implementing priority projects to safeguard against identifiable hazards. Communities that complete the MVP program and develop action-oriented resiliency plans become certified and are eligible for additional MVP Action Grant funding and other opportunities.

The Core Team

The CMRPC would like to acknowledge the Town of Douglas and its residents for their time and hard work in participating in this project. These include, but are not limited to:

Bill Cundiff, Town Engineer, Project lead

John Furno, Town Highways Superintendent

Kent Vinson, Fire Chief

Matt Wojcik, Town Administrator

Nick Miglionico, Police Chief

Robert Sullivan, Town Water & Sewer Systems Manager

The following individuals were directly and personally involved in planning and conducting the Douglas Community Resilience Building Workshop:

Peter Peloquin, Associate Planner, CMRPC

Ian McElwee, Associate Planner, CMRPC

Andrew Loew, Principal Planner, CMRPC

Danielle Marini, Associate Planner, CMRPC

Sarah Adams, Principal Planner, CMRPC

Hillary King, Regional Coordinator, EOEEA

Executive Order 569 and the Massachusetts Municipal Vulnerability Preparedness program

In September 2016, Massachusetts Governor Baker signed Executive Order 569, directing multiple state agencies to develop and implement a statewide comprehensive climate adaptation plan with the best climate-change data available. Recognizing that many adaptation solutions are local in nature, a key commitment of Executive Order 569 is to assist local governments in completing their own assessments and resiliency plans. The MVP Grant and Designation Program represent the first step in fulfilling this commitment.

The MVP program provides planning grants to municipalities to complete vulnerability assessments and develop action-oriented resiliency plans. Funding is used by cities and towns to hire a MVP-certified consultant who is trained to provide technical assistance and complete a community's vulnerability assessment and resiliency plan using the Community Resilience Building (CRB) Framework. Towns and cities are free to choose the consultant of their choice from a list of certified MVP providers. The Town of Douglas invited the Central Massachusetts Regional Planning Commission to lead them in this planning effort.

Communities that complete the MVP planning process become certified "MVP Communities" and are eligible for Action Grant funding and other opportunities through the Commonwealth.

Governor Baker signing legislation to authorize capital allocations for investments in climate change adaptation, environmental protection, and community investments. Retrieved from https://www.mass.gov/news/governor-baker-signs-legislation-directing-24-billion-to-climate-change-adaptation

DOUGLAS: A PROFILE

Located in the southern portion of Worcester County, MA, and bordering the states of Rhode Island and Connecticut, Douglas was first settled in 1715 and officially incorporated in 1746. According to the United States Census Bureau, the town has a total area of 37.7 square miles of which 36.4 square miles is land and 1.3 square miles is water.

The Town of Douglas is dominated by forested land, with the Department of Conservation and Recreation owned Douglas State Forest occupying one quarter of the area of the town. A tributary of the Blackstone River, the Mumford River flows through the town, linking the Whitin Reservoir, Mumford River Reservoir, and Gilboa Pond, all within the town, then flowing eastward into the neighboring town of Uxbridge.

As of the 2010 census, there were 8,471 people residing in the town. The population density was 240 people per square mile. Approximately 97 percent of its residents were Caucasian. The median age of residents was 42 with 27 percent of residents under the age of 18. According to the 2017 American Community Survey, the median income for the town was $94,675 with four percent of the population living below the poverty line.

The northeastern portion of the town known as East Douglas is the most densely settled area of the town and has the oldest infrastructure in the town, including the North St. Bridge over the Mumford River. The eastern portion of the town is served by municipal wells and town sewer, while the remainder relies on septic systems and private wells. Emergency services in Douglas are a hybrid of professional and volunteer; professional police force and two professional fire staff on duty at all times with volunteers able to be called in for major events. Douglas has several town facilities, including a Town Hall, Fire and Police stations, a wastewater treatment plant, drinking water wells, one high school, one middle school, and two elementary schools.

The Douglas Municipal Center, Photo by Peter Peloquin.

WORKSHOP SUMMARY

November 20, 2019, 8:00am – 4:30pm, Douglas Municipal Center:
CMRPC Presenters: Peter Peloquin, Ian McElwee, Andrew Loew
EOEEA Presenter: Hillary King
Total Attendees: 20

The Town of Douglas' Municipal Vulnerability Preparedness (MVP) workshop was held on November 20, 2019 at the Douglas Municipal Center. Douglas contracted with the Central Massachusetts Regional Planning Commission (CMRPC) to serve as the MVP provider, including the Community Resilience Building (CRB) Workshop. A small group of Town officials and board members convened on August 10, 2019 to form the 'Core Team' which, together with CMRPC staff, organized and planned the day.

Core Team and Project Team

Name	Affiliation	Role
Bill Cundiff	Town of Douglas	Engineer, Project Lead
Robert Sullivan	Town of Douglas	Water & Sewer Systems Manager
John Furno	Town of Douglas	Highways Superintendent
Kent Vinson	Town of Douglas	Fire Chief
Matt Wojcik	Town of Douglas	Administrator
Nick Miglionico	Town of Douglas	Police Chief
Peter Peloquin	CMRPC	Associate Planner, Staff Lead
Ian McElwee	CMRPC	Associate Planner

The Workshop's goal was to identify top hazards and develop strategies to enhance the town's resiliency related to climate change. Following the CRB work plan process, CMRPC facilitators and planners gave three presentations:

- Information about the CRB process and the MVP program.
- A summary of climate change projections and a detailed profile of natural hazards in the Town of Douglas, including the top four hazards perceived by the core team.
- Description of climate mitigation strategies.

CMRPC facilitators then guided stakeholders in small groups to Identify the resources of the Town and:

- Identify the Town's most serious concerns regarding natural and climate-related hazards that threaten their community.
- Categorize existing and potential strengths and vulnerabilities.

Next, Hillary King of the Executive Office of Energy and Environmental Affairs presented examples of projects from other municipalities in the state that were funded by MVP Action Grants, providing inspiration for participants to:

- Develop and prioritize actions to prevent or allay threats.
- Identify opportunities for collaboration aimed at increasing the Town's resilience.

Douglas Residents and Invitees

Twenty people attended the MVP Workshop, including representatives from the town government, emergency services, the MVP Core team and the Department of Conservation and Recreation which has significant land holdings in town. One person from the Senior Center along with local three students from Douglas High School acted as scribes, and contributed their perspective as well.

Participants were divided among four tables where they discussed issues raised during the presentations, completed the Community Resilience Building matrices, and annotated maps with the locations of opportunities or vulnerable areas in Douglas. CMRPC staff helped to facilitate discussions at each table. A public listening session to discuss MVP results and recommendations for future actions was held on February 4, 2020. Between the two meetings, a total of 35 people participated in the process.

MVP workshop participants identifying locations of opportunities or vulnerable areas in Douglas, Photo by Peter Peloquin.

Workshop Invitees and Participants

Name	Affiliation	Attended	Table #
Carol Gogolinski	Local Developer / Various Boards	Y	1
Kent Vinson	Fire Chief	Y	1
Matthew Wojcik	Town Administrator	Y	1
Michael Fitzpatrick	Local Developer / Various Boards	N	1
Patrice Rousseau	Adult Center	Y	1
Nick Daley	Emergency Mgmt Asst. Dir	Y	2
Adam Furno	Facilities Maintenance	Y	2
Cary Vandenakker	DCR	Y	2
Chuck Stone	DCR	Y	2
Robert Minarik	Economic Development Committee	Y	2
William Cundiff	Town Engineer	Y	2
Colin Haire	Local Developer / Various Boards	Y	3
Daniel Heney	Local Developer / Various Boards	N	3
John Furno	Highway Supt. / Deputy Fire Chief	N	3
Kevin Morse	Board of Selectmen	N	3
Matthew Keith	Fire Department Intern	Y	3
Robert Larson	DCR - Fire District #7	N	3
Timothy Bonin	Board of Selectmen	N	4
Andy Leonard	Pyne Sand and Stone	N	4
Ernest Marks	Planning Board Chair	N	4
Linda Brown	Conservation / Various Boards	Y	4
John C Coyne	Fire Department	Y	4
Nick Miglionico	Police Chief	Y	4
Robert Sullivan	Water/Sewer Supt.	Y	4
Shirley Mosczynski	Fmr. Selectman, Various Boards	N	4
Christin Waller	Douglas High School	Y	1
Lauren D'Amico	Douglas High School	Y	2
Angelina Carneiro	Douglas High School	Y	4
Janis Duchan	Adult Center	Y	3

Top Hazards

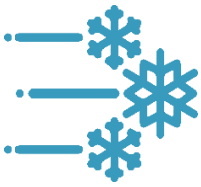
The hazards identified by the Core Team and workshop participants are **flood**, **drought**, **winter storms**, and **wind events**. In 2016, Douglas experienced extreme drought along with the majority of the state of Massachusetts. In the late 1990s a wildfire burned a 200-acre area east of Whitin Reservoir. And in 2001, a larger wildfire burned 600 acres in the northwest portion of Town. Severe storms, including high wind and intense rainfall, have been increasing in frequency. All of these have caused disruption to the town, including localized flooding, power outages, and calling upon mutual aid agreements. With climate change, all of these types of events are expected to increase in severity and frequency.

DROUGHTS & WILDFIRES

Projecting an increase of consecutive dry days, with the driest periods in the summer and fall. This leads to increased wildfire risk and stress on drinking water systems.

FLOODING

Expected increase in precipitation across all seasons. Heavy rainfall will become more frequent, increasing the risk for flash floods. Also increases non-point source pollution.



WINTER STORMS

Annual days below freezing will decrease resulting in winter precipitation falling as rain or freezing rain. This increases risk for ice storms and flash flooding when rain falls on frozen ground.

HIGH WIND

Intensity of storm events is expected to increase due to the warmer atmosphere. This will lead to increased severe thunderstorm and hurricane activity with higher wind speeds.

Flooding. Extreme weather in recent years demonstrates how various hazards impact the town. There have been numerous flooding events over the years. Specific areas with critical infrastructure have been shown to be prone to flooding, thereby creating a variety of safety concerns.

Winter Storms. Winter ice storms are a regional problem every winter, and are expected to be more intense, include more mixed participation, and will damage trees, power lines, and other infrastructure.

Droughts/Wildfires. The frequency of wildfires is expected to increase due to the impact of prolonged droughts and extreme heat. Drier forests and wooded areas will be more combustible in drought conditions. Drought will also likely lead to water shortages impacting the entire town whether or not residents and businesses are on town water or have wells.

High Wind. Heavy wind events are of primary concern as well. The town and the surrounding area have experienced an uptick in storms with hurricane-level winds. This phenomenon can be linked in part to the previously mentioned increase in average temperature and rising precipitation rates. However, the fourth hazard is focused primarily on the winds associated with these storms, leaving heavy rain events to be discussed under flooding.

The workshop participants agreed that different hazards affect the town at different times of the year. Flexibility and comprehensive response by town officials is needed to ensure the safety of the citizens in different hazard situations exacerbated by climate change.

The climate projections that these conclusions were based on include data provided by the Massachusetts Climate Clearinghouse as well as watershed-specific data from the Northeast Climate Adaptation Science Center (NECASC) at the University of Massachusetts at Amherst. For the Blackstone River Basin, projections show an expected increase in precipitation overall, with the greatest increase in the winter. The number of days with over 2" of rainfall, potentially leading to inland flooding, is also expected to increase, with the average expected to be close to 15 days by the year 2100 compared with approximately 10 days currently. Consecutive dry days and days above 90 degrees Fahrenheit are expected to increase, leading to longer periods of drought, and days above freezing are also expected to increase, leading to a greater likelihood of freezing rain in the winter and higher wind as storm severity increases with warmer temperatures.

Workshop attendees listening to the 2019 Douglas MVP presentation.

Summary of Findings

Overall, the workshop was received positively. Though some attendees questioned the accuracy of the presented climate projections, they agreed with the goal of being better prepared and more resilient as a town. Following the presentations, participants were asked if they agreed with the core team's identification of, in no particular order, flooding, drought and wildfire, winter storms, and high wind as the primary hazards facing Douglas. All of the participants felt these hazards were the most relevant for Douglas.

The Town's emergency shelters and backup generators were described as strengths, along with mutual aid agreements with neighboring towns. Budget and tax burden were considered a weakness and barrier to action identified by several attendees, along with a complex relationship between the town and the Whitin Reservoir Water District. Other vulnerabilities mentioned were issues of tree health and maintenance, water provision for firefighting, and local bridges, culverts, and dams.

Recommendations centered on emergency response, water and power resources, and road infrastructure. Each table identified specific vulnerable locations that are already in need of attention and will likely face worsening impacts due to climate change. These include the North Street Bridge, properties adjacent to water bodies, the Whitins Reservoir Causeway, and forests throughout the town.

Current Concerns and Challenges Presented by Hazards and Climate Change

At the workshop, CMRPC staff presented downscaled climate change data provided by Massachusetts's Executive Office of Energy and Environment Affairs (EOEEA) and the Northeast Climate Science Center at the University of Massachusetts, Amherst. Douglas lies mostly in the Blackstone River Basin, and should projections for the watershed hold true, by mid-century, annual average temperatures will increase in the range of 3 to 6.4 degrees from the historical baseline. Hot days over 90 degrees will increase 8 to 29 days annually by mid-century, and will increase 11 to 69 days annually by end of century. Days below freezing will fall 19 to 38 days annually; annual precipitation will increase by 1.2 to 6.3 inches. Seasonal drought conditions will become more frequent as precipitation becomes more concentrated in extreme intensity events and winter snowpack is reduced. The fall season is expected to experience an increase of 0-3 days in consecutive dry days by the end of the century. Some of the challenges of these projected changes – many of which are already being observed – were discussed in a presentation at the workshop focused on specific hazards in the Douglas area.

Challenges highlighted in the presentations and/or discussed as a group or in the breakout groups:

- In general, attendees cited concerns that climate change will exacerbate problems that are already apparent and the town lacks the resources to address comprehensively. These

problems include flooding and storm water management, vulnerable roads, ecological damage, and vulnerable populations, all within the context of a small community.

- An increase in hot and warm days and decrease in cold days will mean increased need for cooling and less need for heating, especially among vulnerable groups such as children and seniors. This concern was elevated because of the Town's electrical grids. Transmission lines are already at maximum capacity and will not be able to handle increased air conditioning loads as hot days increase.

- Increased temperatures are also expected to cause changes in the water cycle, which will lead to more intense rain events. Increased precipitation rates will lead to more frequent and severe flooding in areas outside of designated flood zones defined using historical data, particularly along Route 16 in front of the fire station.

- Increased storm intensity will likely cause more tree damage leading to power outages and road closures, higher peak river flows requiring new approaches to storm water management, and increased erosion of river and brook banks and nearby infrastructure. Severe storms will still likely damage and impact the power lines throughout the town and especially the overhead transmission lines owned and maintained by National Grid. Tree damage will occur from intense wind storms such as recent tornadoes or from heavy snow and ice storms.

- More frequent and severe droughts will challenge water supplies and increase risks from wildfire. Increased risk of wildfire can lead to a wide-range of ecological outcomes including increased damage to human property and life, removal of suitable habitat space, and changes in ecosystem services made available by forest cover.

- Invasive plant and animal species can impact public health through increasing numbers of disease carrying pests (e.g., ticks and mosquitoes) and by damaging key ecosystems such as forests and wetlands, thereby increasing wildfire and flood risks.

As the climate continues to change and natural disasters increase in frequency and strength there is a greater need to communicate with residents, businesses, and other institutions. Changing climate will dictate the need for enhanced communications systems and related infrastructure and flexible emergency response and evacuation plans. These flexible response and evacuation plans will be particularly important for the senior citizens who live alone and do not have access to a vehicle.

Vulnerable Areas

The locations in Douglas identified by workshop participants during discussion as vulnerable to the hazards discussed include areas adjacent to water bodies, forested areas, roadways that frequently flood, and neighborhoods that are dense and difficult to access in case of emergency.

VULNERABLE AREAS

- Forested Areas
- Localized Flooding
- Dams
- Safety Education

Forested areas throughout town are vulnerable to increasing pressures from heat, drought, and invasive insect species. Questions of state, town, or private ownership, the aging tree population, and the lack of fire safety awareness is of concern for the overall health of the forested areas covering approximately 73% of the Town. Roadside trees were also noted as a vulnerability due to tree cutting and maintenance, especially those areas managed by National Grid.

Localized flooding was identified on Route 16 immediately in front of the Douglas Fire Department. This is a particular concern because it could impede emergency response. Other roadway flooding concerns include SE Main Street, Linden Street, and Shore Road. Neighborhoods that are low-lying and near water are at risk for flooding, especially those near Wallum Lake, Whitin Reservoir, the Mumford River, and senior housing along Centerville Brook. Crossings over streams and the Mumford River are vulnerable as increased precipitation and intensity of storms raise water levels. In particular, the North Street Bridge has been identified as a bottleneck for evacuation and vulnerable to high water and debris flow in case of flooding.

Dams were considered vulnerable to all groups during the breakout session. There are 20 regulated dams in town, 1 of which is designated as High Hazard, and 3 that are identified as Significant Hazard dams. The Whitin Reservoir Dam was designated as High Hazard, and the Dudley Pond Dam, the Douglas Mill Pond Dam, and the Hunts Pond Dam were all designated as Significant Hazards. The Gilboa Pond Dam, Potter Road Dam, Wallis Pond Dam, Morse Pond Dam, and Riddle Road Pond Dam were all designated as Low Hazard. The Wallis Pond Dam and the Whitin Reservoir Dam were thought of to be upgraded or replaced. In addition to town-wide dams, many participants discussed beaver dams and beaver activities as points of concerns. Dams outside of town, such as the High Hazard designated dams in Sutton, could also have negative impacts to Douglas.

Public safety education and training was also a worry to all groups. A lack of education on fire hazards and fire safety was concerning due to the due to the projected increases in temperature and drought. Attendees identified several other areas in need of better emergency planning and training, such as runoff pollution prevention, evacuation planning, and information on insect-borne disease, specifically Eastern Equine Encephalitis (EEE) and Lyme Disease.

Specific Categories of Concerns and Challenges

Identification of current concerns and challenges was part of the first step in completing the Community Resilience Building (CRB) Matrix at each table. These topics are compiled from the matrices from all four tables at the Douglas MVP Workshop.

Infrastructure Concerns:

INFRASTRUCTURE

- Water Services
- Dams, Culverts, Bridges
- Tree Management
- Municipal Facilities
- Flood/Stormwater Management

Water Service

The Town of Douglas is impacted by two subcategories of water service: limited geographic coverage, and poor system infrastructure. The limited geographic coverage of a public water system will have negative impacts on both firefighting efforts and drinking water. During workshop discussions, it was noted that the western side of town lacks public water service. Within the Blackstone River Basin, an increase in consecutive dry days is projected. The fall and summer seasons are expected to continue to experience the highest number of consecutive dry days. As these occurrences of drought increase, the fuel load in forests and fire risks will also increase. Those areas outside of the town's water district, particularly the northeast corner, will require water to be brought in via tanker or pumped from nearby surface water bodies for firefighting. If fires are not an issue, access to drinking water will be. With more dry days, well pump outage could increase and will lead to emergency water needs.

Poor water system infrastructure was also discussed as an area of concern. The town has experienced a number of water main breaks. Route 16 was noted as having frequent water main breaks leading to constant flooding. The East Douglas neighborhood, especially upper North Street, also experiences water main breaks frequently. Not only will water main breaks lead to increased flooding and cause concern during fires and droughts, they can also increase risk of contaminants. Efforts should be made to study the existing public water systems to see where services could be expanded or updated with better source protections and infrastructure.

Dams, Culverts, and Bridges

There are a number of dams, culverts, and bridges located throughout town. Each of these features contribute to the ongoing flooding issues in town and should be addressed. As stated above, the Town of Douglas has 20 regulated dams. The Whitin Reservoir Dam is designated as a high hazard dam. Dams assigned as high hazard are those where failure or mis-operation may cause loss of human life. The emergency spillway at the northwest corner of the reservoir no longer functions, and water levels have not been well-managed due to issues with ownership between the Town and the Whitin Reservoir Watershed District. Another dam of concern that

was discussed is the Wallis Pond Dam. The Wallis Pond Dam is designated as a low hazard dam, meaning that failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. While it is only designated as low hazard, attendees noted that the dam is not sufficient and should either be upgraded or replaced. In addition to these two dams of concern, there are also several high hazard dams located in the Town of Sutton. Failures with any of these dams could negatively impact Douglas, which lies just south of Sutton.

Douglas has a number of culverted streams throughout town, several of which have been identified by workshop participants as currently undersized. Notable culverts were located at the Whitin Reservoir causeway, Wallis Street, and North Street. As precipitation volume and intense rain events increase with climate change, these culverts will not be able to handle the capacity of water needing to flow through them. The Wallis Street culvert is currently a 3-sided culvert. It should be replaced with a box culvert, the causeway should be elevated, and the road should be widened in order to increase capacity. The North Street Bridge over the Mumford River was identified by several participants as a concern because of its low arch over the water and narrow roadway. The low arch is a risk during flooding when debris may become trapped under the bridge, and the narrow roadway creates a bottleneck along an important evacuation route for the town. The spillway there should be replaced and a culvert should be installed. Though not as high a risk, the Mechanic Street bridge over the Mumford River is low and should also be upgraded.

Tree Management

Street trees are a critical tool in managing and mitigating the effects of climate change. They, like their forest counterparts, have the ability to sequester carbon and remove CO_2 from the atmosphere. They can also provide shading to houses, people, and infrastructure. While street trees can be helpful in mitigating climate change effects, they can also be vulnerable to them as well. The Town of Douglas has many streets trees that will be at risk as climate change impacts worsen. As winter storms and high wind events increase, dead, dying, and unhealthy trees could be at risk of falling or losing limbs. Fallen trees can cause power outages and roadway hazards. Trimming and monitoring trees on a regular basis can help trees stay healthy longer. Though the Town of Douglas has a tree trimming program, funding and ownership control has been a concern. Due to a lack of funding, tree trimming has not been sufficient town-wide, and especially along Manchaug Street, Gilboa Street, and Route 16. In addition, the town shares tree trimming responsibilities with National Grid. Those areas managed by National Grid are of great concern because they abut the utility lines in town. If a high wind event occurs and causes these trees to fall or lose limbs, utility lines could be damaged causing power outages across town.

Municipal Facilities

The town is fortunate to have a number of Municipal facilities throughout town. However, it was noted that several of these facilities need significant upgrades or redesigns. Municipal buildings throughout town will require a roof maintenance study. In particular, the Town Hall, Douglas High School, Douglas Middle School, and Douglas Elementary School all have a flat roof. Flat roofs

are at risk for pooling water, snow build up, and extreme changes in temperature. As rain events become more frequent, pooling water will become more frequent, leading to damage and potential leakage. As the climate changes snow events may not be as frequent, but the snow will be heavier and will pose more risks as it builds up on flat roofs. In addition, the schools also serve as shelters in case of emergency. While it is considered a strength to have these shelters in town, the current sites have limited access. In the event of an evacuation emergency, it could be difficult to safely access these shelters.

In addition to the buildings and shelters in town, it was also noted that there is a lack of capacity on the transmission lines throughout Douglas. These transmission lines are already functioning at maximum capacity. As the temperatures increase and as hot days become more frequent, air conditioning usage will increase. The current transmission lines will be unable to handle the increased air conditioning loads.

Flood/Stormwater Management

As rain events become more frequent, and precipitation volumes increase, flooding hazards will increase. Flooding risks are already a major concern in town, so this risk will only worsen with climate change. Southeast Main Street, Linden Street, and Perry Street were identified as areas where groundwater is heaving the road from below. This flooding could impede travel and is causing roadway destruction. Route 16 was another area of concern as it was identified as flooding frequently, especially in front of the fire station. Flooding here could impede emergency response. There was also concern for storm drains and catch basins throughout town, such as at the Police Station.

Societal Concerns:

SOCIETAL

- Senior Residents
- Flood-Prone Neighborhoods
- Community Preparedness
- Recreational Programming

Senior Residents

The Riddlebrook Apartments is a senior housing community in Douglas. It is located on West Street, south of the Mumford River and east of the Centerville Brook. Though the senior community within Douglas is considered a strength, these residents will need greater assistance in times of emergency. Senior citizens will feel the effects of climate change more than other citizens in town. Due to their age, they will be more vulnerable to both extreme temperatures and the limited drinking water supply that will accompany drought and hot days. In addition, older residents are more susceptible to disease, particularly EEE and other insect-borne diseases which will only increase with the changing climate. Older residents will be more vulnerable in times of emergency when evacuation is necessary due to their reduced ability to mobilize quickly. Due to the location of the Riddlebrook Apartments in relation to the Mumford River and

Centerville Brook, residents there will be even more vulnerable to increased flooding risks. Physical health status, psychological well-being, and social characteristics will make it more challenging for senior residents to move, recover, or evacuate quickly in the time of crisis.

Flood-Prone Neighborhoods

Three other neighborhoods of concern were discussed by attendees. These neighborhoods included Hayward Landing, Cottage Colony, and Wallum Lake Terrace. The Hayward Landing Apartments are located along North Street and is bordered on the north and west by the Mumford River, and on the south by the Mumford River Reservoir. The Cottage Colony community is located in the northwestern section of Douglas, and is bordered on the south by the Whitin Reservoir. And Wallum Lake Terrace is located in south Douglas bordered on the west by Wallum Lake. Due to their proximity to lakes, all three of these neighborhoods are at increased risk from flooding. Attendees felt that residents living in flood-prone areas are at greater vulnerability to septic systems being impacted by rising water tables. In particular, Wallum Lake Terrace and Cottage Colony both have older septic systems that could leach into nearby groundwater. This could cause property damage or possibly contaminate drinking water. Additionally, flooding in these low-lying neighborhoods could impede travel. These communities will likely need help evacuating in the event of severe climate.

Community Preparedness

Public safety education, emergency notification, and training were of high concern for attendees. The residents of Douglas are not well informed to handle emergencies, especially those in vulnerable populations. Douglas's vulnerable populations include flood-prone neighborhoods, senior residents, low-income residents, and those with limited English language proficiency. Each of these vulnerable populations will likely need assistance during severe climate emergencies, yet evacuation procedures are not well known or developed among them. There is also concern that, in general, climate change risks are not well known throughout the town. Despite Douglas being a highly forested town, there is not much understanding of fire hazards or prevention techniques. Safety and prevention information regarding insect-borne illness as well as runoff pollution and contamination are also know well understood throughout Douglas. Notable communities that would benefit from education and outreach are the East Douglas neighborhood, the Riddle Brook Apartments, Wallum Lake Terrace, and Cottage Colony.

Douglas currently has a Code Red system in place. This was seen as a strength for the community, but there was discussion that this system should continue to be updated and maintained.
The Lake Manchaug Campground was another area of concern where emergency notification and response are not well developed. This area is at higher risk for flooding, forest fires, and insect-borne disease breakouts, so notification in times of emergency will be critical. Public safety training for first responders, especially volunteers was also noted as a concern.

Recreational Programming

Environmental risks will be touched upon in the following section, but it was also discussed how insect-borne diseases can have affects on the community as well. Outdoor programming has suffered disturbance due to the heightened risk of Eastern Equine Encephalitis (EEE) and state mandated insecticide spraying. Both of these factors have led to the postponement or cancellation of outdoor activities in order to keep residents safe. With a lack of indoor facilities or alternative recreational opportunities, there was a concern that climate change will severely limit recreational programming in town.

Environmental Concerns:

ENVIRONMENTAL

- Insect-Borne Disease
- Forest Management
- Runoff Pollution
- Nuisance Species

Insect-Borne Disease

Risk of insect-borne diseases, especially EEE and Lyme disease, will worsen as the climate warms and periods of flood and drought increase. Mosquitos carry EEE and West Nile Virus (NV). They tend to lay their eggs in and around standing water, so populations of mosquitos will likely increase in times of flooding. Mosquitos are also more aggressive on hot, dry days, and will feed more frequently during those periods, causing greater instances of contracting those diseases. In Massachusetts, deer ticks (*Ixodes scapularis*) can carry Lyme disease. Typically, deer ticks will die out during the cold winter months, controlling the deer tick population and managing the spread of Lyme disease. However, climate change will result in milder and warmer winters, causing fewer disease-carrying ticks to die out during those winter months. With fewer ticks dying, the overall tick population will increase, creating a greater chance of contracting Lyme-disease. Children and senior citizens are more susceptible to the effects of insect-borne diseases, and those living near open water or flood-prone areas could be more exposed to insect-borne diseases. Education and prevention measures of insect-borne disease should be taught town-wide.

Forest Maintenance

Forested areas in Douglas, including Douglas State Forest managed by the Department of Conservation and Recreation (DCR), are at risk from drought and invasive species. Both of these hazards lead to increased fire load and risk of wildfires, and many of these areas have limited access to water for firefighting. The Town of Douglas has already experienced 107 wildfire incidents between 2005-2017, totaling 115 acres burned. With an increase in temperatures and numbers of consecutive hot days, drought, and consequently more wildfires, will be an ongoing hazard. Along with drought, climate change will bring a shift in flora and fauna of the region. Plants and animals that have adapted to warmer and drier climates will increase in Massachusetts, and native species that are better adapted to cooler weather will decrease. When a non-native species invades an area, it can often outcompete the native species. And without a

predator to manage population numbers, invasive species can dominate an ecosystem very quickly. This is especially detrimental to forest ecosystems. Attendees noted the gypsy moth and emerald ash borer as invasive insect concerns. While these insects typically do not have direct harmful effects to humans, they do have disastrous effects on native tree species in Massachusetts. The gypsy moth prefers to feed on oak and birch trees among other species, while the emerald ash borer feeds on ash trees. Trees that are impacted by invasive insects are much more vulnerable to damage during intense storm events as well as drought. Issues regarding ownership of forested lands has hindered monitoring of these lands historically. Relations between the town, the state (DCR), and private landowners should be improved so that these fire hazards can be properly managed or prevented.

Runoff Pollution

As noted above, climate change impacts will increase rain frequency and volume. Aside from concerns over roadway flooding or infrastructure damage, attendees also discussed worries of runoff pollution from neighborhoods, solar farms, and brownfields in town. Douglas has a number of water resources and, as such, has a number of neighborhoods located around or near various streams, lakes, and ponds. Wallum Lake Terrace was noted above as a neighborhood that is vulnerable to flooding due to its proximity to Wallum Lake. Cottage Colony, which lies near the Whitin Reservoir, also has similar flooding risks. The location of these dense neighborhoods increases the risk of pollution and contamination to the town's natural resources from use of fertilizers, septic systems, and even from exposed cracks in surface lots and driveways. Risk of chemical pollution from ice melt will also increase in these areas due to more frequent icing.

In addition to household runoff, attendees identified a solar farm and landfill as other points of contamination. A solar farm was identified along West Street, just north of a stream that flows into the Whitin Reservoir. While there are current requirements for managing runoff in place, attendees were concerned that these will need to be updated as intensity and frequency of rain events increase. In addition, the Douglas Transfer Station, located on Riedell Road, has an uncapped landfill. Riddle Brook runs north and west of the transfer station, and the town wells are located downstream of it. The proximity of the transfer station to Riddle Brook increases flooding risks at this location. It also increases the likelihood that contaminants from the landfill could either flow into Riddle Brook or could run downstream to the town wells.

Nuisance Species: Beavers/Deer

The Town of Douglas has many woodlands and water resources. As a result, there is also a large population of beavers and dams. While not invasive species, due to both the abundance of resources and lack of natural predators, beaver and deer populations have grown in recent years. Attendees noted that overpopulated deer have been a concern. An even larger concern regarded the presence of beavers and beaver-made dams. Current Massachusetts regulations mostly protect beavers and beaver dams from human interference. As such, it can be difficult to trap beavers or breach dams outside of the trapping season. Beaver dams can often cause a backup of stream water that may impact to communities downstream. Especially since climate change

should bring more powerful and more frequent storms, risks of increased flooding should these dams break was of even greater concern to attendees.

Current Strengths and Assets

Identification of current strengths in Douglas was part of the first step in completing the CRB Matrix at each table. These topics were compiled from the matrices from all four tables at the Douglas MVP Workshop. The completed matrix for each table can be found in the Appendix of this document. Douglas' emergency preparedness is the source of infrastructure strengths identified by workshop attendees. Good working relationships between emergency services in Douglas and neighboring towns is a major societal strength that will protect the town in the event of a disaster.

Infrastructure Strengths:

INFRASTRUCTURE

- Municipal Facilities
- Public Safety
- Public Water System

Municipal Facilities

While some municipal buildings are in need of updates or flat roof engineering, Douglas has been able to provide a number of services to the community through these facilities. The Douglas Municipal Center houses the Town Hall and the Police Department. Douglas offers a variety of different schools in town. The High School, Middle School, and Elementary School are all located along Davis Street, and collectively serve students in grades 2 - 12. The Douglas Primary School is located at 17 Gleason Court and offers full day pre-kindergarten, kindergarten, and first grade. The Adult Social Center (Senior Center), Douglas Simon Fairfield Public Library, Fire Station, and Highway Department can all be found on Main Street and offer a variety of services from social activities to safety and maintenance.

Public Safety

Despite a lack of public awareness, Douglas has taken steps to be prepared in times of emergency. There are back-up generators at a number of municipal facilities throughout town that will enable services to be provided in the event of a power outage. In addition, the High School and Middle School act as the town's emergency shelters. The town is also fortunate to have fully staffed and operational Police and Fire Departments, and a Highway Department that is highly regarded for their street maintenance and snow clearing. The Southern New England Trunkline Trail runs through town and while not utilized yet, could be used to improve fire and emergency access.

Public Water System

Though limited in coverage area, the Town of Douglas does have a municipal water system. The town sources water from underground aquifers in two wellfields. Water is then distributed

through several miles of mains and two storage tanks. The town is discussing creating cistern regulations for subdivisions to provide access to water in times of need. Douglas is also diligent in trying to conserve water every year. They have a standard water use restriction policy to preserve water supplies as a preventative measure which runs from May 1st to September 30th yearly. During dry years, Douglas has implemented more severe restrictions.

Societal Strengths:

SOCIETAL

- Community
- Adult Social Center
- E.N. Jenckes Store
- Public Safety

Community

While there is a desire to unify the town more, there are a number of communities in Douglas that can serve as a great starting point. The dense East Douglas neighborhood provides a town center, links to the history of town, and helps create a sense of community. Hayward Landing offers housing and services for low-income individuals. The Riddlebrook Senior Living Community provides affordable housing for senior citizens. And the high school, middle school, elementary school, and primary schools provide education and programs to engage the youth in town. Continued residential and commercial development provides the opportunity to build up and connect other neighborhoods in town.

Adult Social Center (Senior Center)

The Adult Social Center, or more commonly referred to as the Senior Center, is a highly regarded asset in town. Located in East Douglas and managed by the Council on Aging, the Senior Center provides a number of services and programs to the senior citizen community in Douglas. In addition, the center also provides emergency preparedness sheets, mailings, and public service announcements to the senior community.

E.N. Jenckes Store

The E.N. Jenckes Store is located on Main Street and was built in 1833. It has become a museum that is now operated by the Douglas Historical Society. In 1988, the building was listed on the National Register of Historic Places.

Public Safety

In addition to being an infrastructural strength, public safety is also regarded as a societal strength in town. The Town of Douglas, along with many other towns in Worcester County, voted to approve a Central Mass Law Enforcement Mutual Aid Agreement. This agreement, along with other approved mutual aid agreements, can provide assistance in case of major events and help Douglas provide services despite the town's limited budget. The town also runs a Code Red program that can alert residents in times of crises.

Environmental Strengths:

ENVIRONMENTAL

- Forests
- Water Resources
- Open Space and Recreation

Forests

The tree canopy and large areas of forest were identified by participants as beneficial for the overall feel of the town and a buffer to increasing heat. While relations with DCR should be improved, Douglas State Forest was regarded as an important feature in town. With 5,907 acres, the state forest provides a point of tourism, passive recreation, and wildlife viewing in town.

Water Resources

Douglas has a number of lakes, ponds, and streams in town. Wallum Lake, Manchaug Pond, Whitin Reservoir, Wallis Pond, and Badluck Pond are a few notable surface water bodies. Coopertown Brook and the Mumford River are notable rivers that provide flowing water through the town. Each of the mentioned bodies of water provide cooling off points on hot days, as well as tourism opportunities. Wetlands in town were also noted as an asset for their flood storage capabilities.

Open Space and Recreation

As mentioned above, the Town of Douglas is full of various forested areas and water resources. Each of those areas provide the town with a number of different recreational opportunities. Residents can enjoy swimming, boating, hiking, camping, and much more. The Southern New England Trunkline Trail also runs through Douglas and provides hiking opportunities.

Recommendations to Improve Resilience

After watching the presentation by Hillary King on projects already funded by MVP Action Grants and examples of best practice, Workshop participants at each table took the next step in completing the CRB Matrix by suggesting actions that would address vulnerabilities, or further bolster strengths they identified. The following actions are compiled from the matrices from all four tables at the Douglas MVP Workshop. The completed Matrix for each table can be found in the Appendix of this document.

Infrastructure Actions

Evaluating **dams and culverts** in towns for potential updates will improve current infrastructure and help Douglas prepare for expected increases in flood events. Similarly, identifying **bridges** that are at risk from flooding will help the town better prepare. A study on upgrading or replacing the North Street Bridge should be done in order to improve flooding and evacuation issues.

INFRASTRUCTURE

- Evaluate Dams and Culverts
- Update Bridges
- Assess Roadways
- Improve Water Provision

Addressing **roadway** flooding, especially along Route 16, the Causeway across Whitin Reservoir, Linden Street, Perry Street, and Southeast Main Street was recommended. This action will be important to provide regular access to homes and evacuation routes in case of emergency.

Limited **water provision** was a frequent concern, and will only become more hazardous as climate change impacts worsen. Adding drinking water wells or relocating existing ones since the current well field is downstream from the uncapped town landfill is recommended. The landfill could contaminate the wells if groundwater tables rise or if a prolonged flooding event occurs. Multiple groups discussed installing dry hydrants or cisterns to provide water in case of wildfire. Others suggested expanding the town's water supplies to reach further into forested areas. Collaboration with the DCR on these efforts is essential. Maintenance of the Southern New England Trunkline Trail and the town-owned former pipeline corridor to increase firefighting access was also recommended.

Societal Actions

Resident **outreach** on emergency preparedness, and promoting resident engagement in general was discussed as important. Regarding emergency preparedness, the historic neighborhood of East Douglas including Jenkes Store, Riddlebrook Senior Housing, Hayward Landing, Wallum Lake Terrace, and local campgrounds was identified as needing evacuation planning assistance. To address insect-borne disease hazards, **education** on prevention techniques was the primary suggestion, and developing a town policy for how to address the increasing incidence of tick and mosquito diseases. Educating residents about forest management and reducing fuel load on privately owned land is another topic for outreach. Improved engagement throughout the town was seen as important to building support for future projects, including those generated from the MVP process

SOCIETAL

- Outreach and Education
- Emergency Training
- Improve Recreation Access

Participants, especially those representing the Police and Fire Departments, felt that Douglas would benefit from **first responder training**, and strengthening their relationships with neighboring towns by organizing a regional MEMA workshop or training. They also discussed developing improved methods of contact for their volunteer firefighters.

Improving access to **recreation** facilities, especially places to cool off during hot weather (including lakes and ponds) was suggested. To make this possible, multiple tables suggested developing a better relationship with and making agreements between the town and DCR who manage Wallum Lake and the Whitin Watershed District who manage Whitin Reservoir.

Environmental Actions

Forest management and reducing the fuel load in forests was discussed at every table, with several mentioning past wildfires. There is a need for management of forested lands throughout the town, whether DCR, Town, or privately-owned. Improved pruning and maintenance and if necessary, removal or replanting, of street trees – particularly those near power lines – was highlighted by several tables and it was suggested that a survey be done of existing street trees to develop a priority list for action, and an increase in budget for such work.

ENVIRONMENTAL

- Forestry Management
- Runoff Pollution Study
- Bylaw Review
- Monitoring

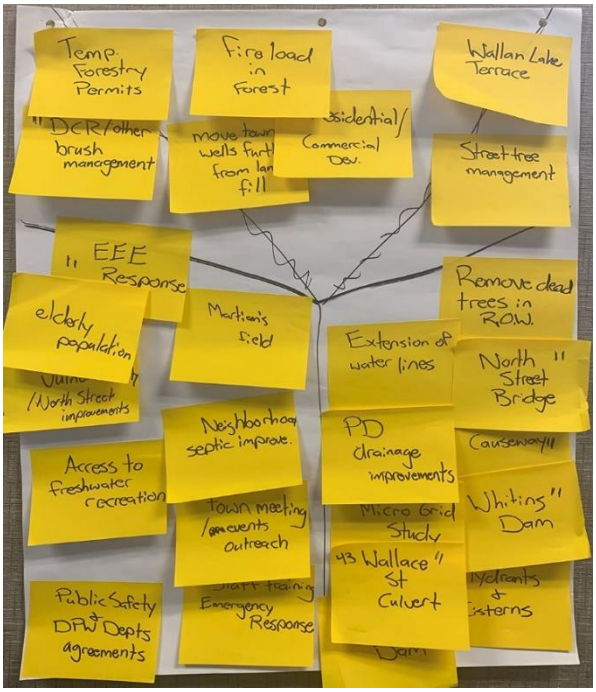
Runoff pollution and eutrophication of local water bodies is a concern. Private solar farms, dense neighborhoods near Wallum Lake and Whitin Reservoir, Main Street as it travels alongside Centerville Brook, and Gilboa Street along the Mumford River were identified as specific locations needing to be studied to determine if runoff is negatively impacting water quality in these locations. Bylaws limiting fertilizer use near water, reduced salting, and studying the feasibility of a constructed wetland at Gilboa Pond to address wastewater treatment challenges in times of low flow in the Mumford River were other actions suggested to address these concerns.

In addition, reviewing **bylaws** regarding new commercial and residential development to make sure they are reflective of environmental best practices was recommended. Participants felt the earthen berm at Riddlebrook Senior Housing and current development sites should be reviewed as well to make sure they are considering future climate changes.

Setting up a more accurate local weather station and recording temperature and seasonal data was suggested to **monitor** and understand the changing climate and provide better information for residents. Tracking wildlife populations and insect numbers was suggested by another table. Beavers and their dams are a concern, and participants would like changes in state laws regarding them, and to continue working with DCR on managing dams.

Top Recommendations

At the end of the workshop, each table was asked to report out summaries of their concerns and recommended actions. Several tables mentioned similar concerns and suggested similar ways to address them, but each table had a unique perspective on the challenges Douglas faces. These recommendations were organized on a large sheet to enable participants to see the overlap between tables and to learn about suggestions not discussed at their table.



Recommendations reported out by tables.
See Appendix for a table of these items

Three out of four tables agreed that replacing the **North Street Bridge**, addressing **EEE** risk, replacing the **culvert** on Wallis Street, evaluating **Whitin Dam**, and managing brush for forest **fire safety**, should be top priorities. Other actions mentioned during the report-out include: tree maintenance, first responder training, improving recreation opportunities, reaching out to vulnerable populations/ neighborhoods, and assessing road and dam conditions.

Finally, the completed CRB matrices from each table were posted on the wall and all participants were invited to vote on the actions they felt should be priorities. Each person was given five stickers to vote for the actions they felt strongest about, whether from their own table or another. Peter Peloquin then thanked attendees for giving their time and attention, and announced several of the actions with the most votes. The following top recommendations were compiled based on those actions reported out by each table and those actions that participants voted for. Actions are organized by priority and project type, with corresponding icons. A full listing of suggested actions can be found in the completed Matrix for each table in the Appendix of this document. Icons used throughout the table are:

CATEGORY OF ACTION:

Infrastructure

Societal

Environmental

CATEGORY OF HAZARD:

Wildfire/Drought

Winter Storm

Wind

Flood

Project type	Category	Location	Issue	Recommended Action	Hazard
High Priority					
Culverts		Town-wide	Increased intensity of rain storms.	Study capacity of culverts throughout town, create priority list of those that need 'rightsizing' or switching to box culverts.	
		Causeway St		Upgrade capacity.	
		Wallace St		Replace with box culvert, increase capacity .	
		North St		Replace culvert that was removed as part of spillway removal.	
Road work		Route 16	Roadway currently flooding, frequent water main breaks.	Raise roadway at fire station. Culvert and water main need upgrades. Study how to accomplish these things concurrently.	
Bridge upgrade/ replace		North St	Bottleneck on an evacuation route and the arch is low.	Study how to upgrade or replace North St Bridge.	
Emergency Planning		Town-wide	Concern that people in town may not know evacuation procedures, are not well-informed about their risks.	Develop outreach materials for community about resources in emergencies, evacuation plans. Distribute by mailings, at senior center, schools, town hall, etc. Improve access to emergency shelter at high school.	
Emergency Services		Town-wide	First responders, especially volunteers, would benefit from training.	Create 72-hour emergency contact list for Fire Dept.	
				Public safety/ response training. Hold regional workshop with MEMA consultant.	
Water provision		West side of town	Fire risk in areas with no municipal water service.	Install dry hydrants near water bodies, review cistern bylaw for new developments. Study potential to extend municipal water for fire protection.	
Public health		Town-wide	Increasing insect populations: invasive species, mosquitoes, ticks.	Develop public education program about the risks of insect-borne diseases, especially EEE and Lyme.	
Dams		Whitin Reservoir	Emergency spillway at northwest corner of reservoir no longer functions. Water levels not well-managed.	Upgrade/ replace emergency spillway. Improve relationship with water district re: water level management.	
		Wallis Pond	Dam is not sufficient	Upgrade/ replace dam.	
Catch basins		Town-wide	Flood, Winter Storm	Increase catch basin maintenance/ cleaning.	
Runoff pollution		Wallum Lake Terrace	Dense neighborhoods next to water may be increasing nutrient loads in lakes	Study if there is pollution from runoff. Develop by-laws to restrict fertilizer usage adjacent to surface water.	
		Cottage Colony			
Brownfield		Landfill/ transfer station	Flood: Potential for contamination	Re-cap landfill site. Study moving town well field away from landfill.	
Street trees		Town-wide, especially Manchaug, Gilboa St, and Route 16	Winter Storm & Wind: Dead/ unhealthy trees	Increase town tree trimming budget. Document street tree condition throughout town and create a prioritized list for removal or pruning based on hazard level. Develop plan for storage and use of removed trees.	

Medium Priority					
Electrical Grid		Throughout town	Trees near powerlines need management, could lead to outage if limbs or an entire tree fall on power lines during wind or winter storm events.	Work with National Grid to improve tree maintenace near power lines. Study installing battery banks at town facilities. Study creating a regional Power& Light with neighboring towns. Study installing batteries instead of generators at town facilities.	
			Transmission lines are at max capacity, won't handle increased a/c loads as hot days increase.	Study creating microgrids within in the town using renewable generation and batteries to supplement available power.	
Wastewater treatment		Gilboa Pond	Low flow of water in outlet stream during summer will worsen with more dry days.	Design and install a constructed wetland to further treat effluent leaving the wastewater treatment plant so that water meets quality standards even during drought.	
Zoning		Throughout town	Development should consider climate projections, open space needs	Review and reassess development regulations	
Vulnerable neighborhoods		Riddle Brook Senior Housing	All: Population that will need help evacuating	Build relationship with owners and administration. Develop emergency communication and evacuation plans.	
		Campground			
Forest management		DCR Land	Fire risk increasing with more dry days, declining tree species because of invasive species and ecosystem change	Develop and enact forest management plans including brush and dead-wood clearing programs, including public outreach to encourage action on private lands, to reduce fuel load in forest areas. Study potential for controlled burns.	
		Privately-owned forested land			
Septic systems		Wallum Lake Terrace	Older septic systems could leach into nearby groundwater.	Communicate with residents about risks of leaking septic systems, encourage upgrades. Review codes relating to septic systems. Study potential to create shared systems, other options to manage sewage.	
		Cottage Colony			
		Birch Hill Road			
Vulnerable neighborhoods		Hayward Landing	Most at risk from flooding because of their proximity to lakes.	Build relationships with neighborhoods, help them plan for flood risk.	
		Cottage Colony			
		Wallum Lake Terrace			
		East Douglas (especially upper North St.)	Difficult for evacuation or emergency access. Water main breaks frequently.	Improve pedestrian and emergency access. Study water infrastructure upgrades in the neighborhood.	
Drinking water		Town-wide	More dry days, well pump outage, other issues could all lead to emergency water need.	Develop connection to neighboring town (Sutton or Uxbridge) for backup water supply.	
Bridge Upgrade/ Replace		Mechanic St	Bridge is low, and the approach is awkward.	Replace bridge, realign approach.	
Road work		Linden St	Groundwater is heaving road from below. This is likely to worsen as precipitation increases.	Study need for culverts, improving base course, or raising roads.	
		Perry St			
		Southeast Main St			

Low Priority					
Hydro-electric generation		Whitin Reservoir or Gilboa Pond	Interest in providing renewable power to the town, especially in case of outages.	Perform feasibility study for generating electricty at one or both of these locations.	
Ice		Town-wide	Ice is expected to increase, need better methods to deal with it.	Develop best management practices for treating roads, dealing with ice storms.	
Climate change		Town-wide	Changes are happening already but not scientifically documented.	Install local weather station to monitor temp and precip changes. Document shifts in insect, deer, plant populations.	
Open space		Town-wide	Need to document and protect assets that will help Douglas deal with climate change impacts.	Create an Open Space and Recreation Plan to help prioritize areas to be protected/ managed that will help buffer the town from climate impacts.	
Recreation		Soldier's Field Martin Rd. Park VFW Fields	All	Maintain or repair condition after events. Improve driveway and parking access, and runoff mangement.	
		Wallum Lake	Heat	Work with DCR to provide better access for visitors, especially to cool off on hot days.	

APPENDIX (Under Separate Cover)

I. Agendas and Sign-in Sheets
II. Workshop Agenda and Sign-in Sheet
III. Listening Session Agenda and Sign-In Sheet
IV. MVP Program Information
V. Hazard Mitigation Plan – Mitigation Strategies
VI. Workshop Base Maps
VII. Table 1 Materials
VIII. Table 2 Materials
IX. Table 3 Materials
X. Table 4 Materials
XI. Summary of Recommended Actions
XII. Workshop Presentation
XIII. Listening Session Presentation