NOTICE OF MEETING
February 24, 2020 | 6:45 p.m.
WCAT Studios, 24 Hemlock Road, Wakefield

TOWN COUNCIL AGENDA

ITEM 1 | Call to Order

ITEM 2 | Executive Session

There is anticipate need for Executive Session to discuss contract negotiations because an open meeting may have detrimental effects on the bargaining position of the Town, with the intent of returning to open session immediately after, ***expected to resume at 7:00 p.m.*** Motion and roll call vote anticipated.

ITEM 3 | Pledge of Allegiance

ITEM 4 | Attendance

ITEM 5 | Approval of Minutes

Approval of February 10, 2020 Regular Town Council Meeting Minutes. Vote anticipated.

ITEM 6 | Public Engagement

Any member of the public who wishes to address the Town Council is asked to arrive by **6:40 p.m.** and sign in with the Clerk. Each person who is signed in will be allotted three (3) minutes to address the Council. The Chair reserves the right to extend that time. Members of the Town Council may ask any clarifying questions or make statements related to the matters presented. In the event further deliberation or action is warranted, any issues raised may be included as an item on a future Town Council Agenda.

ITEM 7 | White Ribbon Campaign

Representative from Wakefield Alliance Against Violence (WAAV) to present information on the White Ribbon Campaign, an annual awareness program each March to address the issue of male violence.

Leaders and members of our community to take the "pledge to end gender-based violence."

ITEM 8 | PSA & Poster Project "RESPECTfully"

Student winners of the "RESPECTfully" Poster Project Contest to be recognized and all entries to be displayed.

TOWN COUNCIL AGENDA

ITEM 9 | Presentation of Fiscal Year 2021 Budgets

Finance Committee Town Hall Subcommittee Chairwoman to submit comments and recommendations for the proposed Fiscal Year 2021 Budgets along with budget overview with Town Accountant as outlined below. Vote anticipated.

A. Budget #20– Inspectional Services

B. Budget #3 – I.T. Department

C. Budget #45 – Retirement

D. Budget #34 – Library

E. Budget #1 – Town Council

F. Budget #2 – Accounting

ITEM 10 | Strategic Road Repair & Maintenance Plan

Presentation of strategic plan for comprehensive town-wide road repair and maintenance plan by Town Engineer/Department of Public Works. Vote anticipated.

ITEM 11 | Presentations, Proposals, & Updates

A. WCNA Playground Entrance Proposal. Vote anticipated.
Representative of the Wakefield Community Neighborhood Association to present detailed proposal for improvement project for entryway to playground

B. Wakefield Youth Council Proposal. Vote anticipated.
Presentation of proposal for the creation of a new Wakefield Youth Council, to be appointed annually by the Town Council.

C. Hazard Mitigation Plan Update. Vote anticipated.
Department of Public Works Stormwater Manager to present overview of updates to Hazard Mitigation Plan since July 2019.

D. Municipal Vulnerability Program. Vote anticipated.
Presentation of the Community Resilience Building Workshop Summary of Findings Report.

E. Community Garden Proposal. Vote anticipated.
Presentation of proposal for creation of a Community Garden abutting JJ Round Park.

F. Solar-Powered Initiative.
Representative of the Wakefield Municipal Gas & Light Department to provide informational presentation on solar powered project initiative.

TOWN COUNCIL AGENDA

ITEM 12 | Constituent Issues

Councilors have opportunity to briefly report any issues raised by constituents that are not included on current Agenda. No votes will be taken at this time, but items may be included on a future Town Council Agenda.

ITEM 13 | Town Owned Land

Proposed deed conveying 54 square feet of land abandoned by the Town of Wakefield for property located at 1 Hillside Avenue. Vote anticipated.

ITEM 14 | License

Applicant seeks approval for a One Day Liquor License for a fundraising event at the Americal Civic Center on March 28, 2020 from 6:00 p.m. until 12:00 a.m. Vote anticipated.

ITEM 15 | Banner Request

Applicant seeks approval to display a banner across Main Street just outside of Americal Civic Center from September 1, 2020 through September 12, 2020. Vote anticipated.

ITEM 16 | Chairman's Comments

Chairman Dombroski to offer brief comments on:

A. Latest updates from Envision Wakefield Downtown Revitalization recently held public forum; and

B. Update on Public Safety Building Reassessment Committee upcoming community information initiatives.

ITEM 17 | Matters Not Anticipated for Agenda

Any matters not anticipated prior to the 48-hour public notice requirement but necessitating immediate action by the Council.

ITEM 18 | Announcements & Acknowledgements

Town Councilors, Town Administrator, Town Counsel, and Clerk may offer recognitions and notices to the public.

ITEM 19 | Adjournment

Vote anticipated.

Next Regular Town Council Meeting: March 09, 2020 @ 7:00 p.m., WCAT Studios, 24 Hemlock Road, Wakefield

TOWN OF WAKEFIELD

1 Lafayette Street Wakefield, MA 01880 . www.wakefield.ma.us . 781.246.6390

WAKEFIELD TOWN COUNCIL

Monday, February 10, 2020
7:00 P.M.
WCAT Studios, 24 Hemlock Road, Wakefield, MA. 01880

COUNCIL MEMBERS PRESENT:	Councilor Edward F. Dombroski, Jr., Chair Councilor Ann McGonigle Santos, Vice-Chair Councilor Mehreen N. Butt Councilor Jonathan P. Chines Councilor Paul R. DiNocco Councilor Julie Smith-Galvin	**ADMINISTRATION PRESENT:** Town Council Clerk Sherri A. Dalton Town Administrator Stephen P. Maio Town Counsel Thomas A. Mullen
COUNCIL MEMBERS ABSENT:	Peter J. May	

----- TOPICS OF DISCUSSION -----

Call to Order	Councilor Dombroski called the meeting to order at 7:00 p.m.
Pledge of Allegiance	Leading the body in the Pledge of Allegiance were Brad Simpson, Wakefield High School Boys' Basketball Coach along with the three (3) captains Ryan Marcus, Pat Collins and Quinn Barys. Councilor Dombroski went on to say that Brad Simpson has been a Wakefield resident for the past 67 years, a graduate of Wakefield Memorial High School class of 1964 and has coached over 500 games and this year's basketball team just qualified for the State Tournament. Councilor Dombroski wished them luck in that endeavor on behalf of the entire Town Council and thanked coach Simpson for his many contributions and tireless dedication to Wakefield athletics and academics over the last 50 years.
Attendance	Councilor Dombroski noted that all six (6) of the Councilors were present as well as Madam Clerk Dalton, Town Administrator Maio and Town Counsel Mullen. Councilor May was absent.
Approval of Minutes – January 27, 2020	Councilor DiNocco motioned to approve the January 27, 2020 Executive Session Town Council Meeting Minutes as presented. Councilor Santos seconded. Motion passed 6-0-0. Councilor DiNocco motioned to approve the January 27, 2020 Regular Town Council Meeting Minutes as presented. Councilor Santos seconded. Motion passed 6-0-0.
Public Engagement	There was no Public Engagement.

Public Hearing – Wakefield Municipal Gas & Light Department	At 7:12 p.m. Councilor Santos motioned to open the Public Hearing regarding the Petition For Pole Locations filed by the Wakefield Municipal Gas & Light Department. Councilor DiNocco seconded. Motion passed 6-0-0. Councilor Dombroski stated the MGLD has requested for this hearing to be continued until March 9, 2020 at 7:05 p.m. Councilor Dombroski called for any public comment. Seeing there was no public input, Councilor DiNocco motioned to continue the Public Hearing to the Town Council meeting of March 9, 2020 at 7:05 p.m. Councilor Chines seconded. Motion passed 6-0-0. Councilor Chines motioned to close the Public Hearing at 7:13 p.m. Councilor Santos seconded. Motion passed 6-0-0.
Presentation of Fiscal Year 2021 Budgets	Budget #16 Police Department: Town Accountant Kevin Gill stated the total Fiscal Year 2021 request is $5,960,655.00. Chief Skory commented on the request for additional $35,000.00 for the Mental Health Clinician and how important that position is to the Police Department. Finance Committee Police Subcommittee Chairman Joseph Tringale stated that he supports the budget. Councilor DiNocco motioned to approve Budget 16 Police Department in the amount of $5,960,655.00 as presented. Councilor Santos seconded. Motion passed 6-0-0. Budget #17 Fire Department: Town Accountant Kevin Gill stated the total Fiscal Year 2021 request is $5,706,306.00. Chief Sullivan stated the budget is fair and honest. Finance Committee Fire Subcommittee Chairman Doug Butler stated that gradually the overtime issue of being consistently underfunded is now at a level where consideration needs to be given to more accurately budgeting. Councilor Santos motioned to approve Budget #17 Fire Department in the amount of $5,706,306.00 as presented. Councilor Chines seconded. Motion passed 6-0-0. Budget #19 Emergency Management: Town Accountant Kevin Gill stated the total Fiscal Year 2021 request is $74,200.00. Director Tom Walsh commented that he works with police and fire closely and has worked to secure over $400,000.00 in grants for the Town. Councilor Santos motioned to approve Budget #19 Emergency Management in the amount of $74,200.00 as presented. Councilor DiNocco seconded. Motion passed 6-0-0.
Carnival Request	Wakefield Independence Day Committee representatives appeared before the Town Council requesting permission to use the Galvin Middle School parking lot to hold their annual carnival fundraiser during the week of April 20, 2020 through April 26, 2020. They stated the proceeds from the carnival fundraiser benefits the Wakefield 4th of July Parade. Councilor Santos motioned to approve the request. Councilor DiNocco seconded. Motion passed 6-0-0.
Donation	Councilor DiNocco motioned to approve the request of the Library to accept and expend a gift or gifts to the Library in the amount of $1,010.00 from various donors with thanks. Councilor Santos seconded. Motion passed 6-0-0.

Licenses	Councilor DiNocco motioned to approve the 2020 Class I License Application for EMS Direct, LLC located at 16-18 DelCarmine Street. Councilor Santos seconded. Motion passed 6-0-0. Councilor DiNocco motioned to approve the 2020 Class II License Application for EMS Direct, LLC located at 16-18 DelCarmine Street. Councilor Santos seconded. Motion passed 6-0-0. Councilor Santos motioned to approve the Class II License Application for Albrecht Buick GMC of Wakefield, Inc. located at 614 North Avenue. Councilor DiNocco seconded. Motion passed 6-0-0. Councilor Santos motioned to approve the One Day Liquor License for a private event at the Americal Civic Center on February 15, 2020 from 5:00 p.m. until 8:00 p.m. Councilor Chines seconded. Motion passed 6-0-0. Councilor DiNocco motioned to approve the One Day Liquor License for a fundraising event at the Americal Civic Center on February 15, 2020 from 2:00 p.m. until 7:00 p.m. Councilor Santos seconded. Motion passed 6-0-0
Referral to Planning Board	Councilor Santos motioned to refer the applicant's request for zoning bylaw change amending the Wakefield Zoning Map dated May 2, 2016 as shown on Wakefield Assessors Maps for properties on North Avenue as Parcel 47B on Map 2A, Parcel 2+ on Map 2A and Parcel 47L on Map 2A within the Single Residence District to the General Residence. Councilor Chines seconded. Motion passed 6-0-0.
Constituent Issues	Councilor Dombroski mentioned one issue that had come up on Armory Street at North Avenue, as there is not a stop sign. The Traffic Advisory will be discussing this at their February 14, 2020 meeting. Councilor Dombroski went on to encourage that Mr. Maio should be the point of contact with many such issues, in an effort to move them along to resolution faster.
Chairman's Comments	"Celebrating Wakefield" Volunteer Appreciation Event on Monday March 9, 2020 at 6:00 p.m. at the High School. This is an opportunity to recognize all the volunteers that the Town Council appoints to the various boards, commissions, and committees. More information to follow on social media and an email invitation to anyone that is on a volunteering on a board/committee/commission. The latest updates in terms of where the Envision Wakefield Downtown Revitalization project stands and what we are looking at in terms of next steps going forward will be presented tomorrow evening at the Americal Civic Center at 7:00 p.m.

Matters Not Anticipated for Agenda	There were no unanticipated matters.
Announcements & Acknowledgements	Councilor Santos recognized the Town Clerks office for running a great election and thank you to everyone that came out to vote. Councilor Smith-Galvin stated the deadline to register to vote is February 12, 2020; there is a community group that is putting together The Big Purge which will be a town-wide recycling day on April 25, 2020 from 9:00 a.m. to 1:00 p.m. More information to follow on their website which is being put together. Councilor Chines highlighted some of the work that has progressed on the Vision and Values Statement since the last meeting including a discussion with the Metropolitan Area Planning Council. They have many tools to help organize and engage with the community. Looking to also apply for a Technical Assistance Grant that would allow us to bring them on as a facilitator for the process; reaching out to different chairs of the boards and commissions where we have sought representation; Wakefield Public Schools has put out a budget priority survey to help identify areas where members of the community would look for different investments in different opportunities to allocate their resources; he has office hours this Thursday from 5:30 p.m. to 7:30 p.m. in the Trustees Room at the Library. Councilor Butt shared that Melrose Wakefield Health Care has their annual meeting last week and it is their third year anniversary at 888 Main Street and they are a great addition to the town. She received their new water bottle and will be giving all the Town Councilors one and suggested inviting them to a future Town Council meeting as they have a great community benefits program; the Wakefield Education Foundation has their annual spelling bee on February 28, 2020 and at the next Town Council meeting on February 28, 2020 there will be an update on the community garden and thanked everyone for attending the past meeting; asked the Town Administrator to give an update on the Department of Transportation response to the survey. Mr. Maio stated that a letter was sent to the MBTA. They responded that they do not have the finances to do any of the suggestions. They are ordering 60 new buses and the town will keep working with the MBTA to increase public transportation whether it is the commuter rail or in the bus service. Another area that was mentioned was the accessibility issues at the Wakefield stops which may need help from the State Delegation. Councilor DiNocco recognized the Wakefield wrestling team on being undefeated in the Middlesex League. Councilor Dombroski thanked Vice-Chair Santos for running for State Representative as she was fighting very hard to make sure Wakefield would be represented; White Ribbon Campaign is coming again this March and reminded

	everyone where men take the pledge against violence. More to follow at the next Town Council meeting; recognized Mr. Maio in the MMA Beacon publication.
Adjournment	At 8:24 p.m. Councilor DiNocco motioned to adjourn. Councilor Santos seconded. Motion passed 6-0-0.
Next Council Meeting	The next regular Town Council meeting is February 24, 2020 at 7:00 p.m. at WCAT Studios, 24 Hemlock Road, Wakefield.

Respectfully submitted,

Sherri A. Dalton
Town Council Clerk

Budget No. 20		Page 1									
Dept. No. 240											
TOWN OF WAKEFIELD											
Summary of Expenditures of Prior Periods With Estimates For the fiscal Period of 2021											
Building Department											
=====	==========	==========	==========	==========	==========	==========	==========	==========	==========		
		Actual	Actual			Act. Expend.	Departmental	Town Admin.			
		Expend.	Expend.	Approp.	Approp.	Thru Wk. 26	Request For	Request For	Recommended		
EOC	Dept/Appropriation	FY 2018	FY 2019	FY 2019	FY 2020	12/24/19	FY 2021	FY 2021	FY 2021	+/- $	+/- %
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SHEET A											
1	Personal Services	253,877.00	283,735.00	283,735.00	291,408.00	145,994.00	343,018.00	343,018.00	0.00	51,610.00	17.71%
2	Contractual Services	8,358.00	9,786.00	13,050.00	13,050.00	4,459.00	13,050.00	13,050.00	0.00	0.00	0.00%
4	Materials & Supplies	5,702.00	6,773.00	7,050.00	7,650.00	3,882.00	7,650.00	7,650.00	0.00	0.00	0.00%
7	Sundry Charges	442.00	395.00	500.00	500.00	75.00	500.00	500.00	0.00	0.00	0.00%
	TOTAL	268,379.00	300,689.00	304,335.00	312,608.00	154,410.00	364,218.00	364,218.00	0.00	51,610.00	16.51%

Budget No. 20

Dept. No. 240

TOWN OF WAKEFIELD

Summary of Expenditures of Prior Periods With Estimates For the fiscal Period of 2021

Building Department

EOC	Dept/Appropriation	Actual Expend. FY 2018	Actual Expend. FY 2019	Approp. FY 2019	Approp. FY 2020	Act. Expend. Thru Wk. 26 12/24/19	Departmental Request For FY 2021	Town Admin. Request For FY 2021	Recommended FY 2021
SHEET B - 2 CONTRACTUAL SERVICES									
5243	Repair/Maint Motor Vehicle	0.00	347.00	500.00	500.00	0.00	500.00	500.00	0.00
5244	Repair/Maint Office	0.00	0.00	100.00	100.00	131.00	100.00	100.00	0.00
5273	Vehicle Allowance	2,583.00	3,216.00	4,500.00	4,500.00	1,634.00	4,500.00	4,500.00	0.00
5306	Printing & Binding	716.00	1,209.00	1,500.00	1,500.00	36.00	1,500.00	1,500.00	0.00
5340	Postage	243.00	217.00	300.00	300.00	60.00	300.00	300.00	0.00
5341	Telephone	3,996.00	4,103.00	5,000.00	5,000.00	2,253.00	5,000.00	5,000.00	0.00
5351	Travel Inside Commonwealth	820.00	694.00	1,150.00	1,150.00	345.00	1,150.00	1,150.00	0.00
	TOTAL 2	8,358.00	9,786.00	13,050.00	13,050.00	4,459.00	13,050.00	13,050.00	0.00

Budget No. 20

Dept. No. 240

TOWN OF WAKEFIELD

Summary of Expenditures of Prior Periods With Estimates For the fiscal Period of 2021

Building Department

EOC	Dept/Appropriation	Actual Expend. FY 2018	Actual Expend. FY 2019	Approp. FY 2019	Approp. FY 2020	Act. Expend. Thru Wk. 26 12/24/19	Departmental Request For FY 2021	Town Admin. Request For FY 2021	Recommended FY 2021
SHEET B - 4 MATERIALS/SUPPLIES									
5422	Office Supplies	1,589.00	1,792.00	1,800.00	1,800.00	950.00	1,800.00	1,800.00	0.00
5423	Reproducing and Computer	136.00	580.00	750.00	750.00	0.00	750.00	750.00	0.00
5481	Motor Vehicle Parts	103.00	200.00	200.00	200.00	0.00	200.00	200.00	0.00
5482	Oil and Additives	1,282.00	1,541.00	1,500.00	1,500.00	444.00	1,500.00	1,500.00	0.00
5511	Books & Periodicals	792.00	860.00	1,000.00	1,000.00	88.00	1,000.00	1,000.00	0.00
5593	Uniforms	1,800.00	1,800.00	1,800.00	2,400.00	2,400.00	2,400.00	2,400.00	0.00
	TOTAL 4	5,702.00	6,773.00	7,050.00	7,650.00	3,882.00	7,650.00	7,650.00	0.00

Budget No. 20

Dept. No. 240

TOWN OF WAKEFIELD

Summary of Expenditures of Prior Periods With Estimates For the fiscal Period of 2021

Building Department

EOC	Dept/Appropriation	Actual Expend. FY 2018	Actual Expend. FY 2019	Approp. FY 2019	Approp. FY 2020	Act. Expend. Thru Wk. 26 12/24/19	Departmental Request For FY 2021	Town Admin. Request For FY 2021	Recommended FY 2021
SHEET B - 7 SUNDRY CHARGES									
5731	Dues & Memberships	442.00	395.00	500.00	500.00	75.00	500.00	500.00	0.00
	TOTAL 7	442.00	395.00	500.00	500.00	75.00	500.00	500.00	0.00

Budget No. 3									Page 1	
Dept. No. 155										
TOWN OF WAKEFIELD										
Summary Of Expenditures Of Prior Periods With Estimates For The Fiscal Period Of 2021										
Information Technology Department										
====	==========	==========	==========	==========	==========	==========	==========	==========	==========	
		Actual	Actual			Act. Expend.	Departmental	Town Admin.		
		Expend.	Expend.	Approp.	Approp.	Thru Wk. 26	Request For	Request For	Recommended	
EOC	Dept/Appropriation	FY 2018	FY 2019	FY 2019	FY 2020	12/24/19	FY 2021	FY 2021	FY 2021	+/- $
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SHEET A										
1	Personal Services	152,478.00	194,720.00	196,852.00	196,791.00	97,197.00	198,763.00	198,763.00	0.00	1,972.00
2	Contractual Services	110,703.00	127,332.00	146,679.00	144,963.00	96,720.00	163,229.00	163,229.00	0.00	18,266.00
4	Materials/Supplies	4,586.00	2,876.00	5,500.00	5,500.00	901.00	5,650.00	5,650.00	0.00	150.00
7	Sundry Charges	3,990.00	3,290.00	3,990.00	3,990.00	860.00	4,250.00	4,250.00	0.00	260.00
	TOTAL SHEET A	271,757.00	328,218.00	353,021.00	351,244.00	195,678.00	371,892.00	371,892.00	0.00	20,648.00

Budget No. 3									Page 2	
Dept. No. 155										
T O W N O F W A K E F I E L D										
Summary Of Expenditures Of Prior Periods With Estimates For The Fiscal Period Of 2021										
Information Technology Department										
====	==========	==========	==========	==========	==========	==========	==========	==========	==========	
		Actual	Actual			Act. Expend.	Departmental	Town Admin.		
		Expend.	Expend.	Approp.	Approp.	Thru Wk. 26	Request For	Request For	Recommended	
EOC	Dept/Appropriation	FY 2018	FY 2019	FY 2019	FY 2020	12/24/19	FY 2021	FY 2021	FY 2021	
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SHEET B - 2 CONTRACTUAL SERVICES										
5247	Computer Maint.	5,182.61	3,965.00	4,215.00	4,215.00	1,181.00	4,265.00	4,265.00	0.00	
5249	Software Maint.	91,910.85	112,899.00	117,564.00	118,848.00	92,324.00	145,864.00	145,864.00	0.00	
5275	Training	5,481.86	1,058.00	12,200.00	10,200.00	20.00	2,400.00	2,400.00	0.00	
5306	Printing/Stationery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5310	Professional Services	1,425.00	1,625.00	5,000.00	3,000.00	0.00	1,500.00	1,500.00	0.00	
5341	Telephone Other Comm.	6,702.59	7,260.00	6,200.00	6,200.00	3,015.00	6,200.00	6,200.00	0.00	
5351	Travel Inside Commonwealth	0.00	525.00	1,500.00	2,500.00	180.00	3,000.00	3,000.00	0.00	
	TOTAL 2	110,702.91	127,332.00	146,679.00	144,963.00	96,720.00	163,229.00	163,229.00	0.00	

Budget No. 3									Page 3	
Dept. No. 155										
				T O W N O F W A K E F I E L D						
				Summary Of Expenditures Of Prior Periods With Estimates For The Fiscal Period Of 2021						
				Information Technology Department						
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		Actual	Actual			Act. Expend.	Departmental	Town Admin.		
		Expend.	Expend.	Approp.	Approp.	Thru Wk. 26	Request For	Request For	Recommended	
EOC	Dept/Appropriation	FY 2018	FY 2019	FY 2019	FY 2020	12/24/19	FY 2021	FY 2021	FY 2021	
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SHEET B - 4 MATERIALS/SUPPLIES										
5422	Office Supplies	1,827.63	859.00	1,500.00	1,500.00	195.00	1,650.00	1,650.00	0.00	
5423	Reprod. & Computer Sup.	1,280.54	533.00	2,500.00	2,500.00	469.00	2,500.00	2,500.00	0.00	
5593	Clothing/Safety Equip	1,478.20	1,484.00	1,500.00	1,500.00	237.00	1,500.00	1,500.00	0.00	
	TOTAL 4	4,586.37	2,876.00	5,500.00	5,500.00	901.00	5,650.00	5,650.00	0.00	

Budget No. 3									Page 4	
Dept. No. 155										
T O W N O F W A K E F I E L D										
Summary Of Expenditures Of Prior Periods With Estimates For The Fiscal Period Of 2021										
Information Technology Department										
====	==========	==========	==========	==========	==========	==========	==========	==========	==========	
		Actual	Actual			Act. Expend.	Departmental	Town Admin.		
		Expend.	Expend.	Approp.	Approp.	Thru Wk. 26	Request For	Request For	Recommended	
EOC	Dept/Appropriation	FY 2018	FY 2019	FY 2019	FY 2020	12/24/19	FY 2021	FY 2021	FY 2021	
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SHEET B - 7 SUNDRY CHARGES										
5731	Dues & Memberships	3,990.00	3,290.00	3,990.00	3,990.00	860.00	4,250.00	4,250.00	0.00	
	TOTAL 4	3,990.00	3,290.00	3,990.00	3,990.00	860.00	4,250.00	4,250.00	0.00	

Budget No. 45 — Page 1

Retirement Board

TOWN OF WAKEFIELD FINANCE COMMITTEE

Summary of Expenditures Of Prior Periods With Estimates For The Fiscal Period of 2021

Contributory Retirement

Dept/Appropriation	Actual Expend. FY 2018	Actual Expend. FY 2019	Approp. FY 2019	Approp. FY 2020	Actual Expend. Thru Wk. 26 12/31/19	Requested For FY 2021	+/- $	+/- %
Pension Accumulation Fd.	4,308,541.00	4,606,659.00	4,606,659.00	4,951,783.00	4,951,783.00	5,355,055.00	403,272.00	8.14%
Non-Contributory Pension	40,091.40	40,511.40	40,512.00	40,932.00	20,465.70	41,352.00	420.00	1.03%
Assessments 59A	38.99	0.00	267.00	0.00	0.00	0.00	0.00	
TOTAL TAX LEVY	4,348,671.39	4,647,170.40	4,647,438.00	4,992,715.00	4,972,248.70	5,396,407.00	403,692.00	8.09%
TRANSFERS:								
Light Dept. - Contributory	787,400.00	852,773.00	852,773.00	914,962.00	914,962.00	907,696.00	(7,266.00)	-0.79%
Light Dept. - Non-Contributory	21,950.04	22,370.04	22,370.00	22,790.00	11,395.02	23,210.00	420.00	1.84%
Water Dept. - Contributory	174,452.00	183,071.00	183,071.00	192,139.00	192,139.00	196,010.00	3,871.00	2.01%
Sewer Dept. - Contributory	113,394.00	134,525.00	134,525.00	152,581.00	152,581.00	155,175.00	2,594.00	1.70%
TOTAL - INCLUDING TRANS.	5,445,867.43	5,839,909.44	5,840,177.00	6,275,187.00	6,243,325.72	6,678,498.00	403,311.00	6.43%
Housing Authority	148,900.00	160,638.00	160,638.00	151,664.00	151,664.00	176,567.00	24,903.00	16.42%
GRAND TOTAL	5,594,767.43	6,000,547.44	6,000,815.00	6,426,851.00	6,394,989.72	6,855,065.00	428,214.00	6.66%

FIVE YEAR SUMMARY OF PENSION ACCUMULATION FUND

	APPROPRIATION FISCAL YEAR 2021 Funding Schedule	APPROPRIATION FISCAL YEAR 2020 Funding Schedule	APPROPRIATION FISCAL YEAR 2019 Funding Schedule	APPROPRIATION FISCAL YEAR 2018 Funding Schedule	APPROPRIATION FISCAL YEAR 2017 Funding Schedule
Town	$5,376,673.00	$4,951,783.00	$4,598,953.00	$4,308,541.00	$3,960,937.00
Housing Authority	$176,567.00	$151,664.00	$160,638.00	$148,900.00	$139,576.00
Light Dept (Including ERI)	$907,696.00	$907,688.00	$852,773.00	$787,400.00	$811,575.00
Water Department	$196,010.00	$192,139.00	$183,071.00	$174,452.00	$147,843.00
Sewer Department	$155,175.00	$152,581.00	$134,525.00	$113,394.00	$102,118.00
Total Necessary to Fund - Pension Fund	$6,812,121.00	$6,355,855.00	$5,929,960.00	$5,532,687.00	$5,162,049.00
Military Service Credit	$8,005.00	$0.00	$7,706.00	$0.00	$0.00
Workers Comp Credit	$0.00	$0.00	$0.00	$0.00	$0.00
Water					
Sewer					
Light Dept. F-19 ERI	$0.00	$7,274.00	$0.00	$0.00	$0.00
Transfer from Lynnfield	($29,623.00)	$0.00	$0.00	$0.00	$0.00
Grand Total	$6,790,503.00	$6,363,129.00	$5,937,666.00	$5,532,687.00	$5,162,049.00

PERAC

MEMORANDUM

TO: Wakefield Retirement Board

FROM: John W. Parsons, Esq., Executive Director

RE: Appropriation for Fiscal Year 2021

DATE: December 10, 2019

Required Fiscal Year 2021 Appropriation: **$6,813,188**

This Commission is hereby furnishing you with the amount to be appropriated for your retirement system for Fiscal Year 2021 which commences July 1, 2020.

Attached please find summary information based on the present funding schedule for your system and the portion of the Fiscal Year 2021 appropriation to be paid by each of the governmental units within your system.

The amounts shown in this letter reflect an assumed payment date of August 1. The Housing Authority makes its payment on July 1. The payment for the Housing Authority as of July 1 is $176,567.

If your System has a valuation currently in progress, you may submit a revised funding schedule to PERAC upon its completion. The current schedule is due to be updated by Fiscal Year 2021.

If you have any questions, please contact PERAC's Actuary, John Boorack, at (617) 666-4446 Extension 935.

JWP/jfb
Attachments

cc: Board of Selectmen
Town Meeting
c/o Town Clerk

Wakefield Retirement Board

Projected Appropriations

Fiscal Year 2021 - July 1, 2020 to June 30, 2021

Aggregate amount of appropriation: **$6,813,188**

Fiscal Year	Estimated Cost of Benefits	Funding Schedule (Excluding ERI)	ERI	Total Appropriation	Pension Fund Allocation	Pension Reserve Fund Allocation	Transfer From PRF to PF
FY 2021	$9,033,879	$6,805,914	$7,274	$6,813,188	$6,813,188	$0	$2,220,691
FY 2022	$9,243,280	$7,295,101	$7,274	$7,302,375	$7,302,375	$0	$1,940,905
FY 2023	$9,457,542	$7,819,411	$7,274	$7,826,685	$7,826,685	$0	$1,630,857
FY 2024	$9,676,778	$8,388,642	$0	$8,388,642	$8,388,642	$0	$1,288,136
FY 2025	$9,901,103	$8,990,946	$0	$8,990,946	$8,990,946	$0	$910,157

The Total Appropriation column shown above is in accordance with your current funding schedule and the scheduled payment date(s) in that schedule. Whenever payments are made after the scheduled date(s), the total appropriation should be revised to reflect interest at the rate assumed in the most recent actuarial valuation. Payments should be made before the end of the fiscal year.

For illustration, we have shown the amount to be transferred from the Pension Reserve Fund to the Pension Fund to meet the estimated Cost of Benefits for each year. If there are sufficient assets in the Pension Fund to meet the Cost of Benefits, this transfer is optional.

Wakefield Retirement Board
Appropriation by Governmental Unit

Fiscal Year 2021 - July 1, 2020 to June 30, 2021

Aggregate amount of appropriation: **$6,813,188**

UNIT	Percent of Aggregate Amount	Funding Schedule (excluding ERI)	ERI	Total Appropriation
Town of Wakefield	97.39%	$6,628,280	$7,274	$6,635,554
Wakefield Housing Authority	2.61%	$177,634	$0	$177,634
UNIT TOTAL	**100%**	**$6,805,914**	**$7,274**	**$6,813,188**

The Total Appropriation column shown above is in accordance with your current funding schedule and the scheduled payment date(s) in that schedule. Whenever payments are made after the scheduled date(s), the total appropriation should be revised to reflect interest at the rate assumed in the most recent actuarial valuation. Payments should be made before the end of the fiscal year.

DETAIL OF NON-CONTRIBUTORY PENSION FUND

DEPARTMENT	# EMPLOYEES	APPROPRIATION FISCAL YEAR 2021	
Veterans	0.5	$4,602.00	
Accounting/Selectmen	1	$36,750.00	
NON-CONTRIBUTORY TOTAL FOR ALL NON-REVENUE PRODUCING DEPTS.			$41,352.00
TRANSFERS:			
Light	0.5	$23,210.00	
ASSESSMENTS:			

DETAIL OF NUMBER OF EMPLOYEES COVERED BY THE WAKEFIELD RETIREMENT SYSTEM

	December 2019	December 2018	December 2017	December 2016	December 2015
Active Employees	457	463	449	444	460
Non-Contributory Retirees	2	2	2	2	2
Contributory Retirees	365	364	365	362	361
CONTRIBUTORY BREAKDOWN:					
Superannuations	271	269	271	268	263
Survivor Benefits	50	49	46	45	47
Accidental Disabilities	30	32	35	35	37
Ordinary Disabilities	6	6	5	6	6
Accidental Death Benefits	8	8	8	8	8
ACCIDENTAL DISABILITIES BY DEPT:					
School	6	6	7	7	7
Light	2	2	3	3	3
Public Works	7	6	8	8	9
Fire	6	6	6	6	7
Police	9	10	11	11	11
Housing Authority	0	2	0	0	0

	Number of Retirees and Pensions Paid Calendar 2019		Number of Retirees and Pensions Paid Calendar 2018		Number of Retirees and Pensions Paid Calendar 2017		Number of Retirees and Pensions Paid Calendar 2016		Number of Retirees and Pensions Paid Calendar 2015	
CONTRIBUTING DEPARTMENTS:										
Light	56	$1,858,146.19	54	$1,681,950.21	51	$1,602,855.33	53	$1,563,296.59	51	$1,455,720.27
Water	5.88	$123,266.09	5.630	$109,058.58	5.130	$95,758.02	3.950	$80,840.77	3.950	$79,583.43
Sewer	3.88	$71,639.39	3.630	$58,449.78	3.130	$46,084.14	2.950	$42,962.92	2.950	$42,156.39
Housing Authority	11	$157,218.40	11	$155,388.49	12	$149,272.47	11	$144,837.34	12	$152,533.38
NON-CONTRIBUTING DEPARTMENTS:										
Public Works	44.24	$859,888.17	42.74	$788,749.10	42.74	$758,969.89	46.10	$760,211.85	42.10	$713,333.14
Fire	56	$1,981,266.87	57	$1,999,925.13	58	$1,977,053.85	57	$1,945,723.19	55	$1,801,202.26
Library	9	$217,073.17	9	$201,719.07	9	$162,889.59	8	$126,856.68	8	$124,272.36
School	118	$1,249,870.22	117	$1,263,801.74	111	$1,204,127.77	114	$1,165,861.58	113	$1,131,626.04
Police	64	$2,177,718.70	60	$2,130,494.85	59	$2,110,433.35	61	$2,071,229.00	62	$2,014,476.58
Various Town Hall Departments	27	$535,148.51	28	$541,326.06	28	$501,130.74	30	$518,262.49	33	$484,056.45
Master Mechanic	0	$0.00	0	$0.00	0	$0.00	0	$0.00	1	$28,313.21
		$9,231,235.71		$8,930,863.01		$8,608,575.15		$8,420,082.41		$8,027,273.51

ACCT #	ACCOUNT NAME	ASSETS DECEMBER 2019	ASSETS DECEMBER 2018	ASSETS DECEMBER 2017	ASSETS DECEMBER 2016	ASSETS DECEMBER 2015
1041	Cash - Checking Account	$479,456.31	$588,470.29	$635,656.14	$1,026,420.99	$804,232.50
1042	Cash - Payroll Account	$3,914.32	$0.00	$0.00	$0.00	$0.00
1198	PRIT Cash Fund	$60,483.36	$60,626.99	$60,416.33	$60,220.31	$60,072.84
1199	PRIT Capital Fund	$133,613,617.64	$117,672,087.58	$122,652,910.22	$106,886,055.14	$101,978,426.64
1398	Accounts Receivable	$15,343.56	$40,337.25	$76,117.52	$17,831.55	$95,288.01
2020	Accounts Payable	($772.96)	($467.65)	($11,693.09)	($402.91)	($832.77)
	Total Assets	$134,172,042.23	$118,361,054.46	$123,413,407.12	$107,990,125.08	$102,937,187.22

PRIT FUND RETURNS

Calendar Year	Net Rate of Return Wakefield PRIT Fund	Annualized Rate of Return Since Inception 7/1/85
1986	21.67%	
1987	4.48%	
1988	13.70%	
1989	16.79%	
1990	-2.57%	
1991	13.59%	
1992	4.16%	
1993	15.34%	
1994	00.09%	9.79%
1995	23.54%	11.03%
1996	16.10%	11.46%
1997	18.53%	12.64%
1998	14.59%	12.19%
1999	22.89%	12.90%
2000	-1.68%	11.90%
2001	-5.64%	10.75%
2002	-9.40%	9.48%
2003	25.95%	10.31%
2004	14.02%	10.49%
2005	12.19%	10.57%
2006	16.21%	10.82%
2007	11.48%	10.88%
2008	-29.84%	8.71%
2009	17.05%	9.04%
2010	13.22%	9.20%
2011	-0.19%	8.83%
2012	13.33%	8.99%
2013	14.81%	9.19%
2014	7.62%	9.14%
2015	0.78%	8.85%
2016	7.56%	8.81%
2017	17.20%	9.06%
2018	-2.33%	8.70%
2019	16.19%	8.91%

TOWN OF WAKEFIELD
FY21 BUDGET
LIBRARY DEPARTMENT

	Account Title	Actual Expenditure FY18	Actual Expenditure FY19	Appropriated FY19	Appropriated FY20	W#26 Actual Expenditure FY20	Requested FY21	$ Change	% Change	*notes*
1	Personal Services	1,162,753	1,188,175	1,192,998	$ 1,268,026	$ 541,561	$ 1,312,428	$ 44,402	3.50%	*contractual. No added hrs or positions*
2	Contractual Services	229,029	236,204	240,565	241,446	100,234	244,628	$ 3,182	1.32%	
4	Materials & Supplies	210,100	218,418	218,909	220,319	82,867	222,000	$ 1,681	0.76%	
TOTAL OPERATING BUDGET		**1,601,882**	**1,642,797**	**1,652,472**	**1,729,791**	**724,663**	**1,779,056**	**$ 49,265**	2.85%	
13% State Minimum Materials Expenditure Requirement estimate				*214,821*	*224,873*		*231,277*			
trust fund income					41,956		45,607			
tax levy					1,687,835		1,733,449		2.70%	

	Account Title	Actual Expenditure FY18	Actual Expenditure FY19	Appropriated FY19	Appropriated FY20	W#26 Actual Expenditure FY20	Requested FY21	$ Change	% Change	*notes*
CONTRACTUAL SERVICES										
5211	Electricity	58,557	57,258	61,500	62,370	23,671	62,370	$ -	0.00%	
5212	Gas	16,816	18,837	19,500	19,500	1,981	19,500	$ -	0.00%	
5231	Water & Sewer Charges	5,253	4,756	5,250	5,700	1,633	5,800	$ 100	1.75%	
5240	HVAC Maintenance	5,785	5,876	9,830	9,742	1,200	9,793	$ 51	0.52%	*contract increase*
5241	Building Maint. & Improvement	42,564	41,689	37,150	36,150	7,841	38,250	$ 2,100	5.81%	5241 increase in snow removal and building maintenance for building now 20 years past renovation.
5244	Equipment Maintenance	6,303	5,231	9,143	6,783	3,812	6,786	$ 3	0.04%	
5273	Vehicle Allowance	634	549	1,000	1,000	208	1,000	$ -	0.00%	
5302	Tuitions	6,933	4,696	5,000	5,000	979	5,000	$ -	0.00%	
5316	Professional Services	12,619	20,921	15,021	16,867	8,184	17,900	$ 1,033	6.12%	5316 increase in public printers maintenance contract & RFID software licenses
5323	Automated Network Services	71,176	74,179	74,071	75,584	49,547	75,479	$ (105)	-0.14%	
5340	Postage	1,290	1,112	2,000	1,650	81	1,650	$ -	0.00%	
5341	Telephone	1,100	1,100	1,100	1,100	1,100	1,100	$ -	0.00%	
TOTAL CONTRACTUAL SERVICES		**229,029**	**236,204**	**240,565**	**241,446**	**100,234**	**244,628**	$ 3,182	1.32%	
MATERIALS & SUPPLIES										
5422	Office Supplies	13,313	11,581	11,809	11,169	4,769	10,800	$ (369)	-3.30%	move to RFID security & tracking results in license & maintenance support increases (5316), processing supply costs decreases (5422)
5431	Building Maintenance Supplies	11,214	11,406	12,100	11,150	6,305	12,200	$ 1,050	9.42%	5431 increased use of rest room supplies
5511	Books & Publications	185,573	195,431	195,000	198,000	71,793	199,000	$ 1,000	0.51%	5323 decrease in materials provided by NOBLE is offset by increase in 5511 to level fund materials. This budget meets MBLC certification requirements.
TOTAL MATERIALS & SUPPLIES		**210,100**	**218,418**	**218,909**	**220,319**	**82,867**	**222,000**	$ 1,681	0.76%	

Budget No. 1		Page 1								
Dept. No. 122										
TOWN OF WAKEFIELD										
Summary of Expenditures of Prior Periods With Estimates For the Fiscal Period of 2021										
Town Council										
====	==========	==========	==========	==========	==========	==========	==========	==========		
		Actual	Actual			Act. Expend.	Requested	Recommended		
		Expend.	Expend.	Approp.	Approp.	Thru Wk. 26	For	For		
EOC	Dept/Appropriation	FY 2018	FY 2019	FY 2019	FY 2020	12/24/19	FY 2021	FY 2021	+/- $	+/- %
====	==========	==========	==========	==========	==========	==========	==========	==========		
SHEET A										
1	Personal Services	382,109.00	388,907.00	391,338.00	404,148.00	201,124.00	412,155.00	0.00	8,007.00	1.98%
2	Contractual Services	91,707.00	61,227.00	70,731.00	70,731.00	21,656.00	70,731.00	0.00	0.00	0.00%
4	Materials/Supplies	655.00	778.00	1,150.00	2,150.00	1,227.00	3,150.00	0.00	1,000.00	46.51%
7	Sundry Charges	3,215.00	3,298.00	3,500.00	3,500.00	3,057.00	3,500.00	0.00	0.00	0.00%
	TOTAL TAX LEVY	477,686.00	454,210.00	466,719.00	480,529.00	227,064.00	489,536.00	0.00	9,007.00	1.87%
	TRANSFERS:									
	Water, Sewer, & Ins	35,569.00	38,837.00	38,837.00	49,937.00	24,969.00	73,193.00	0.00	23,256.00	
	TOTAL WITH TRANSFERS	513,255.00	493,047.00	505,556.00	530,466.00	252,033.00	562,729.00	0.00	32,263.00	
	RFT	24,333.00	14,925.00	14,925.00						

Budget No. 1

Dept. No. 122

TOWN OF WAKEFIELD

Summary of Expenditures of Prior Periods With Estimates For the Fiscal Period of 2021

Town Council

EOC	Dept/Appropriation	Actual Expend. FY 2018	Actual Expend. FY 2019	Approp. FY 2019	Approp. FY 2020	Act. Expend. Thru Wk. 26 12/24/19	Requested For FY 2021	Recommended For FY 2021
SHEET B - 2 CONTRACTUAL SERVICES								
5203	Town Reports	2,134.00	1,202.00	3,000.00	3,000.00	0.00	3,000.00	0.00
5244	Equipment Maint. - Office	0.00	0.00	100.00	100.00	0.00	100.00	0.00
5301	Advertising	11,515.00	11,367.00	15,000.00	15,000.00	3,174.00	15,000.00	0.00
5306	Printing/Stationery	0.00	0.00	1,500.00	1,500.00	184.00	1,500.00	0.00
5316	Prof Serv - Other	17,006.00	34,433.00	26,000.00	26,000.00	7,821.00	26,000.00	0.00
5340	Postage	442.00	61.00	750.00	750.00	9.00	750.00	0.00
5341	Telephone	576.00	576.00	576.00	576.00	576.00	576.00	0.00
5351	Travel Inside Comm.	2,140.00	231.00	2,000.00	2,000.00	330.00	2,000.00	0.00
5399	Not Classified	57,894.00	13,357.00	21,805.00	21,805.00	9,562.00	21,805.00	0.00
	TOTAL 2	91,707.00	61,227.00	70,731.00	70,731.00	21,656.00	70,731.00	0.00

Budget No. 1

Dept. No. 122

TOWN OF WAKEFIELD

Summary of Expenditures of Prior Periods With Estimates For the Fiscal Period of 2021

Town Council

EOC	Dept/Appropriation	Actual Expend. FY 2018	Actual Expend. FY 2019	Approp. FY 2019	Approp. FY 2020	Act. Expend. Thru Wk. 26 12/24/19	Requested For FY 2021	Recommended For FY 2021
SHEET B - 4 MATERIALS/SUPPLIES								
5421	Office Equipment	0.00	0.00	100.00	100.00	0.00	100.00	0.00
5422	Office Supplies	655.00	778.00	1,050.00	1,050.00	977.00	1,050.00	0.00
5424	Human Rights Commission	0.00	0.00	0.00	1,000.00	250.00	1,000.00	0.00
5426	Environmental Sustainability	0.00	0.00	0.00	0.00	0.00	1,000.00	0.00
	TOTAL 4	655.00	778.00	1,150.00	2,150.00	1,227.00	3,150.00	0.00

Budget No. 1

Dept. No. 122

TOWN OF WAKEFIELD

Summary of Expenditures of Prior Periods With Estimates For the Fiscal Period of 2021

Town Council

EOC	Dept/Appropriation	Actual Expend. FY 2018	Actual Expend. FY 2019	Approp. FY 2019	Approp. FY 2020	Act. Expend. Thru Wk. 26 12/24/19	Departmental Request For FY 2021	Recommended FY 2021
SHEET B - 7 SUNDRY CHARGES								
5731	Dues & Subscriptions	3,215.00	3,298.00	3,500.00	3,500.00	3,057.00	3,500.00	0.00
	TOTAL 7	3,215.00	3,298.00	3,500.00	3,500.00	3,057.00	3,500.00	0.00

Budget No. 2 | Page 1

Acct. No. 135

TOWN OF WAKEFIELD

Summary of Expenditures of Prior Periods With Estimates For the Fiscal Period of 2021

Accounting Department

EOC	Dept/Appropriation	Actual Expend. FY 2018	Actual Expend. FY 2019	Approp. FY 2019	Approp. FY 2020	Act. Expend. Thru Wk. 26 12/24/19	Departmental Request For FY 2021	Town Admin. Request For FY 2021	Recommended FY 2021	+/- $	+/- %
SHEET A											
1	Personal Services	274,064.00	266,166.00	287,845.00	296,694.00	133,401.00	305,736.00	305,736.00	0.00	9,042.00	3.05%
2	Contractual Services	92,722.00	92,184.00	94,901.00	97,401.00	30,497.00	98,101.00	98,101.00	0.00	700.00	0.72%
4	Materials/Supplies	2,435.00	3,381.00	3,550.00	3,050.00	716.00	3,050.00	3,050.00	0.00	0.00	0.00%
7	Sundry Charges	115.00	115.00	210.00	210.00	115.00	210.00	210.00	0.00	0.00	0.00%
	TOTAL TAX LEVY	369,336.00	361,846.00	386,506.00	397,355.00	164,729.00	407,097.00	407,097.00	0.00	9,742.00	2.45%
	TRANSFERS:										
	DPW Water & Sewer Div.	17,750.00	18,164.00	18,164.00	18,972.00	9,486.00	19,515.00	19,515.00	0.00	543.00	2.86%
	TOTAL WITH TRANSFERS	387,086.00	380,010.00	404,670.00	416,327.00	174,215.00	426,612.00	426,612.00	0.00	10,285.00	2.47%

Budget No. 2
Acct. No. 135

TOWN OF WAKEFIELD

Summary of Expenditures of Prior Periods With Estimates For the Fiscal Period of 2021

Accounting Department

EOC	Dept/Appropriation	Actual Expend. FY 2018	Actual Expend. FY 2019	Approp. FY 2019	Approp. FY 2020	Act. Expend. Thru Wk. 26 12/24/19	Departmental Request For FY 2021	Town Admin. Request For FY 2021	Recommended FY 2021
SHEET B - 2 CONTRACTUAL SERVICES									
5244	Equip. Maint. Office	415.00	575.00	600.00	600.00	0.00	600.00	600.00	0.00
5271	Equip Rental	30,725.00	27,492.00	28,000.00	28,000.00	10,271.00	28,000.00	28,000.00	0.00
5302	Tuition	0.00	0.00	500.00	500.00	1,050.00	1,000.00	1,000.00	0.00
5306	Printing & Binding	564.00	752.00	700.00	700.00	416.00	900.00	900.00	0.00
5308	Professional Services - Audit	53,000.00	54,500.00	54,500.00	57,000.00	13,500.00	57,000.00	57,000.00	0.00
5340	Postage	6,017.00	6,864.00	8,000.00	8,000.00	3,259.00	8,000.00	8,000.00	0.00
5341	Telephone	2,001.00	2,001.00	2,001.00	2,001.00	2,001.00	2,001.00	2,001.00	0.00
5351	Travel Inside Comm.	0.00	0.00	600.00	600.00	0.00	600.00	600.00	0.00
	TOTAL 2	92,722.00	92,184.00	94,901.00	97,401.00	30,497.00	98,101.00	98,101.00	0.00

Budget No. 2
Acct. No. 135

TOWN OF WAKEFIELD

Summary of Expenditures of Prior Periods With Estimates For the Fiscal Period of 2021
Accounting Department

EOC	Dept/Appropriation	Actual Expend. FY 2018	Actual Expend. FY 2019	Approp. FY 2019	Approp. FY 2020	Act. Expend. Thru Wk. 26 12/24/19	Departmental Request For FY 2021	Town Admin. Request For FY 2021	Recommended FY 2021
SHEET B - 4 MATERIALS/SUPPLIES									
5422	Office Supplies	942.00	972.00	1,100.00	1,100.00	178.00	1,100.00	1,100.00	0.00
5423	Reproducing & Computer	1,277.00	2,193.00	2,200.00	1,700.00	322.00	1,700.00	1,700.00	0.00
5511	Books/Periodicals	216.00	216.00	250.00	250.00	216.00	250.00	250.00	0.00
	TOTAL 4	2,435.00	3,381.00	3,550.00	3,050.00	716.00	3,050.00	3,050.00	0.00

Budget No. 2

Acct. No. 135

TOWN OF WAKEFIELD

Summary of Expenditures of Prior Periods With Estimates For the Fiscal Period of 2021

Accounting Department

EOC	Dept/Appropriation	Actual Expend. FY 2018	Actual Expend. FY 2019	Approp. FY 2019	Approp. FY 2020	Act. Expend. Thru Wk. 26 12/24/19	Departmental Request For FY 2021	Town Admin. Request For FY 2021	Recommended FY 2021
SHEET B - 7 SUNDRY CHARGES									
5731	Dues & Memberships	115.00	115.00	210.00	210.00	115.00	210.00	210.00	0.00
	TOTAL 7	115.00	115.00	210.00	210.00	115.00	210.00	210.00	0.00

Wakefield Public Works

Joseph Conway
Public Works Director

William Renault, Jr., P.E.
Town Engineer

Strategic Road Repair & Maintenance Plan

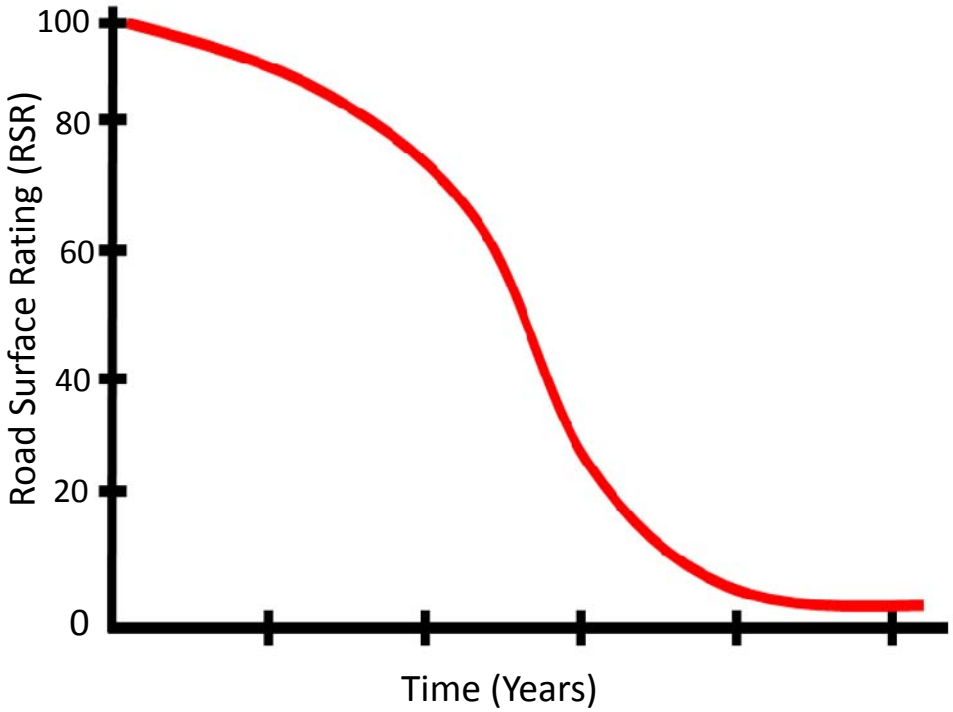
Town Council Meeting | February 24, 2020

Program Goals

- **Systematically** improve 88 mile road network to an acceptable standard.
- Request funding to allow for **consistent investments** so roadway network does not deteriorate to point that would result in more costly repairs.
- **Coordinate** roadway projects with planned utility work by:
  - WMLGD, DPW Water & Sewer, National Grid/Eversource, etc.
- **Implement improvements** when appropriate:
  - Drainage, Sidewalks, Safety, Accessibility

Roads Program Development

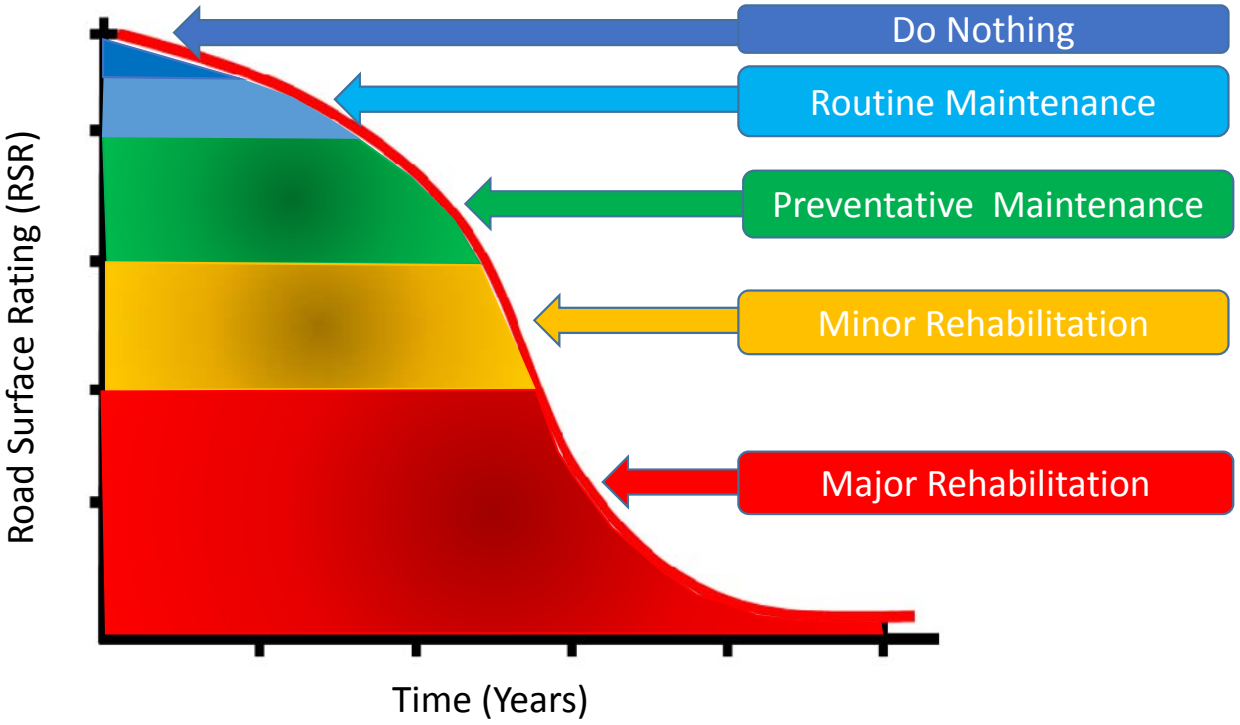
- Town-wide Pavement Condition Inventory
  - All Roadway segments in town are provided a Road Surface Rating (1-100 Score)



Roads Program Development

- Set up:

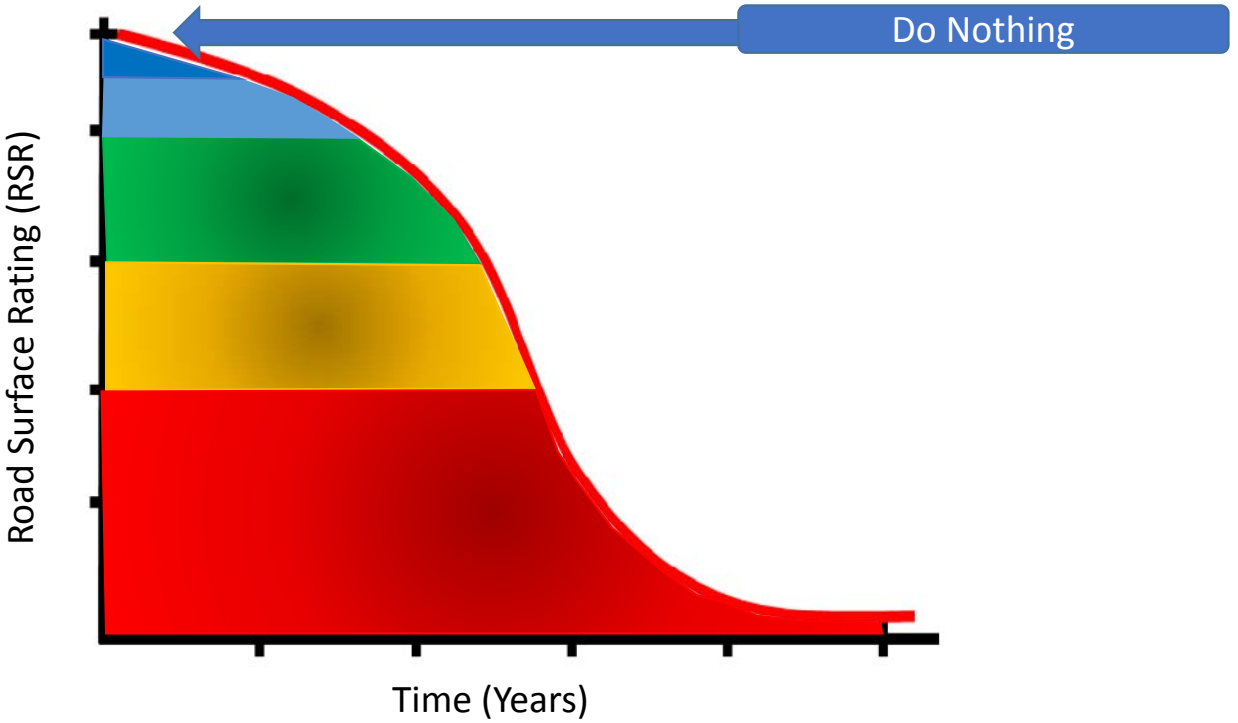
"Treatment Bands"



Roads Program Development

- Set up:

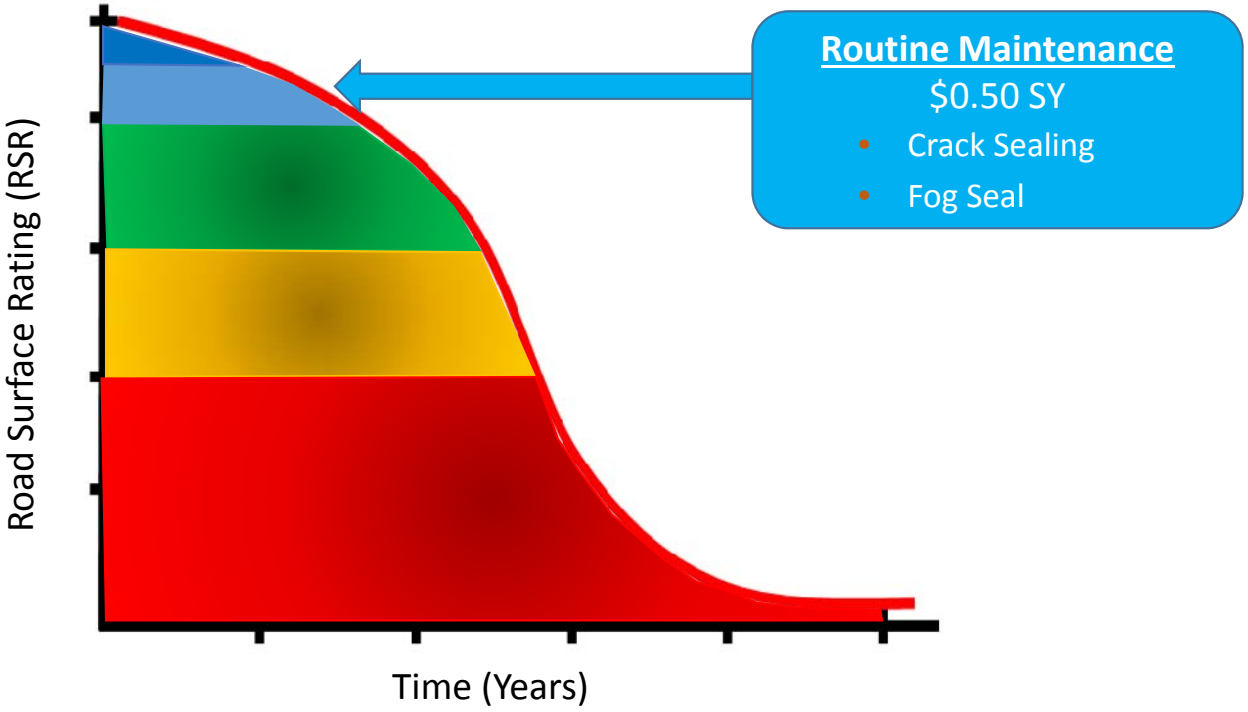
"Treatment Bands"



Roads Program Development

- Set up:

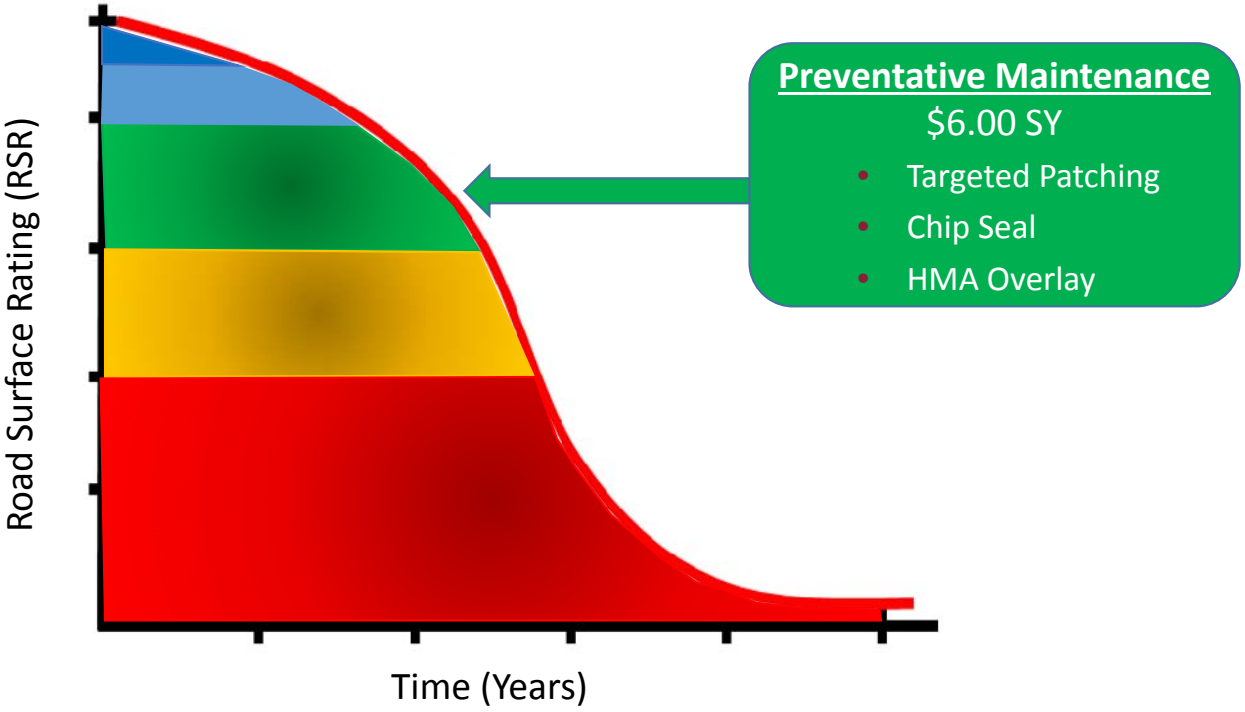
"Treatment Bands"



Roads Program Development

- Set up:

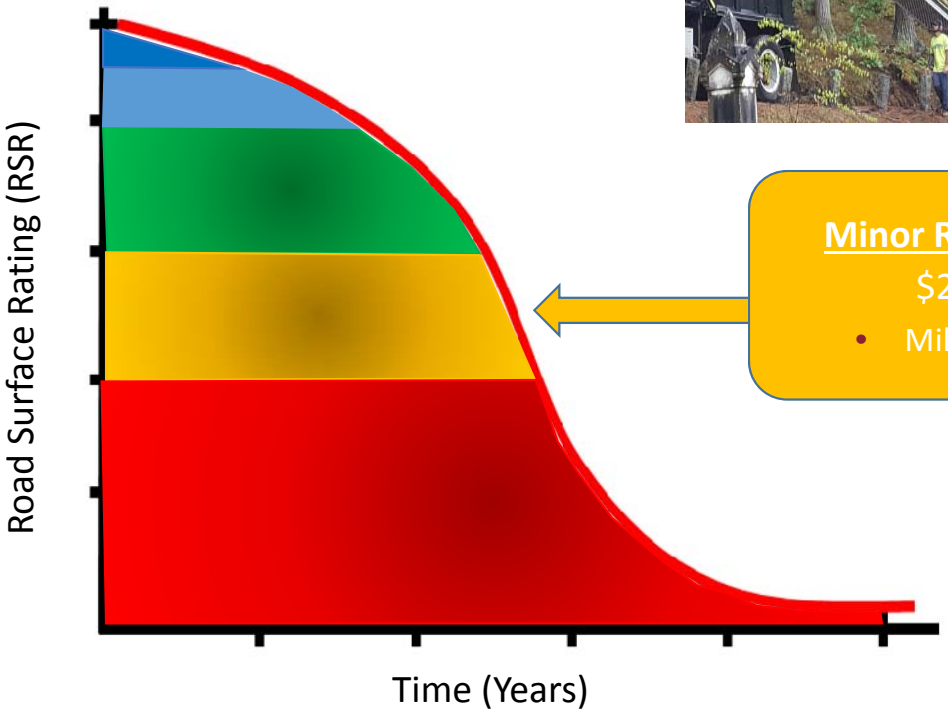
"Treatment Bands"



Roads Program Development

- Set up:

"Treatment Bands"



Minor Rehabilitation

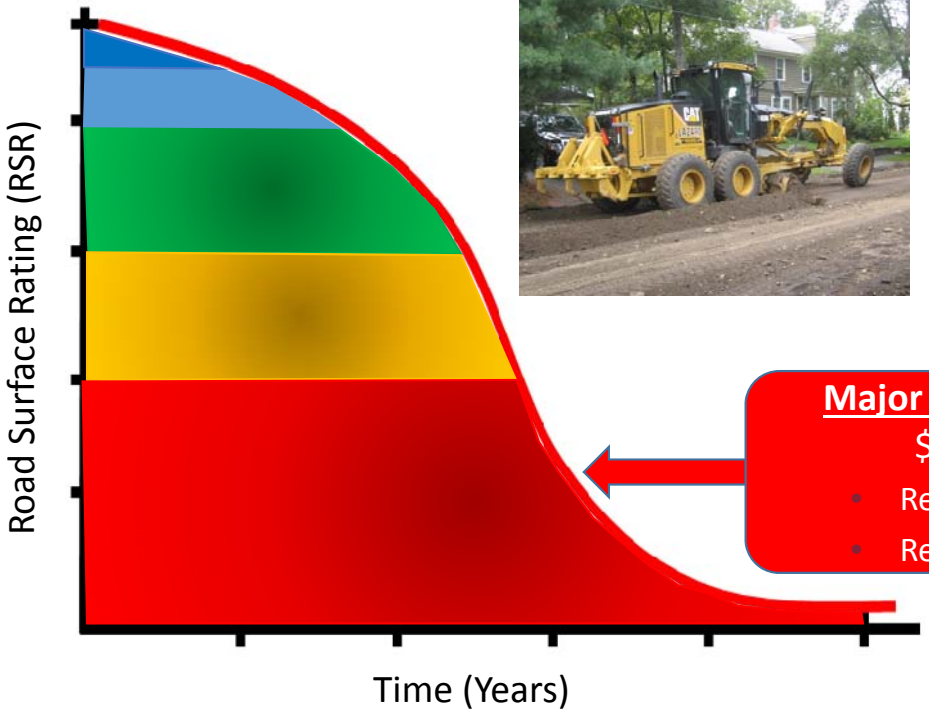
$20.00 SY

- Mill & Overlay

Roads Program Development

- Set up:

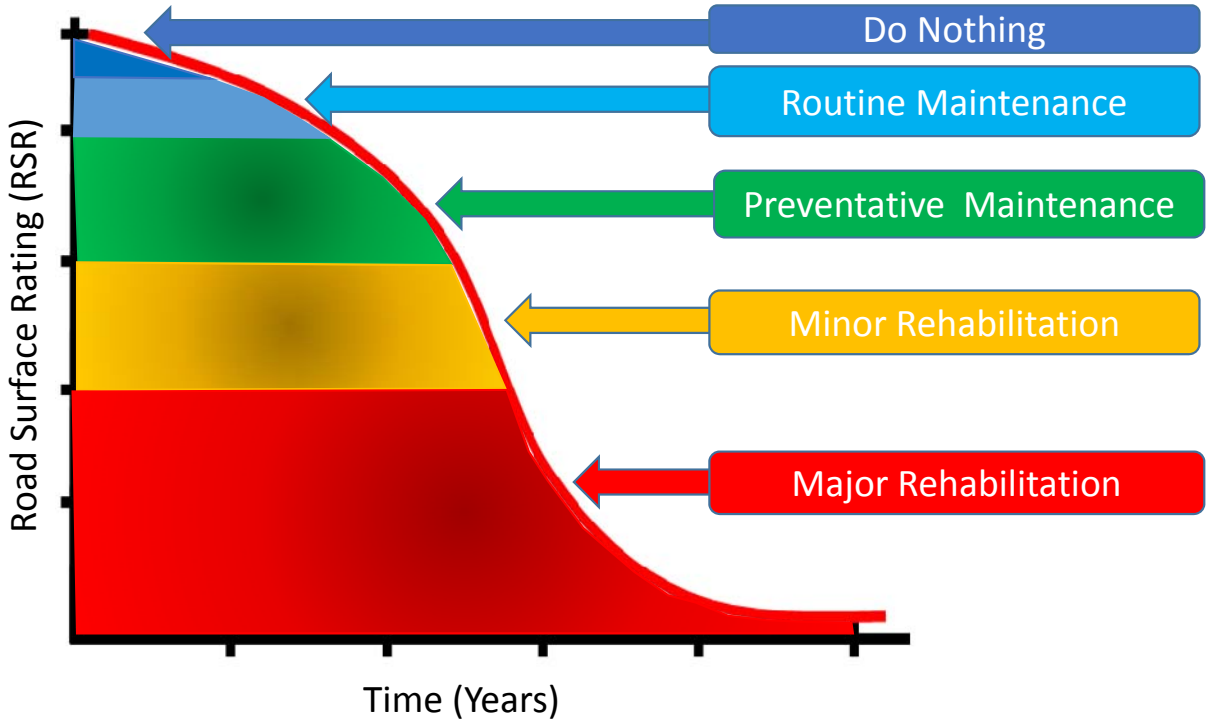
"Treatment Bands"



Roads Program Development

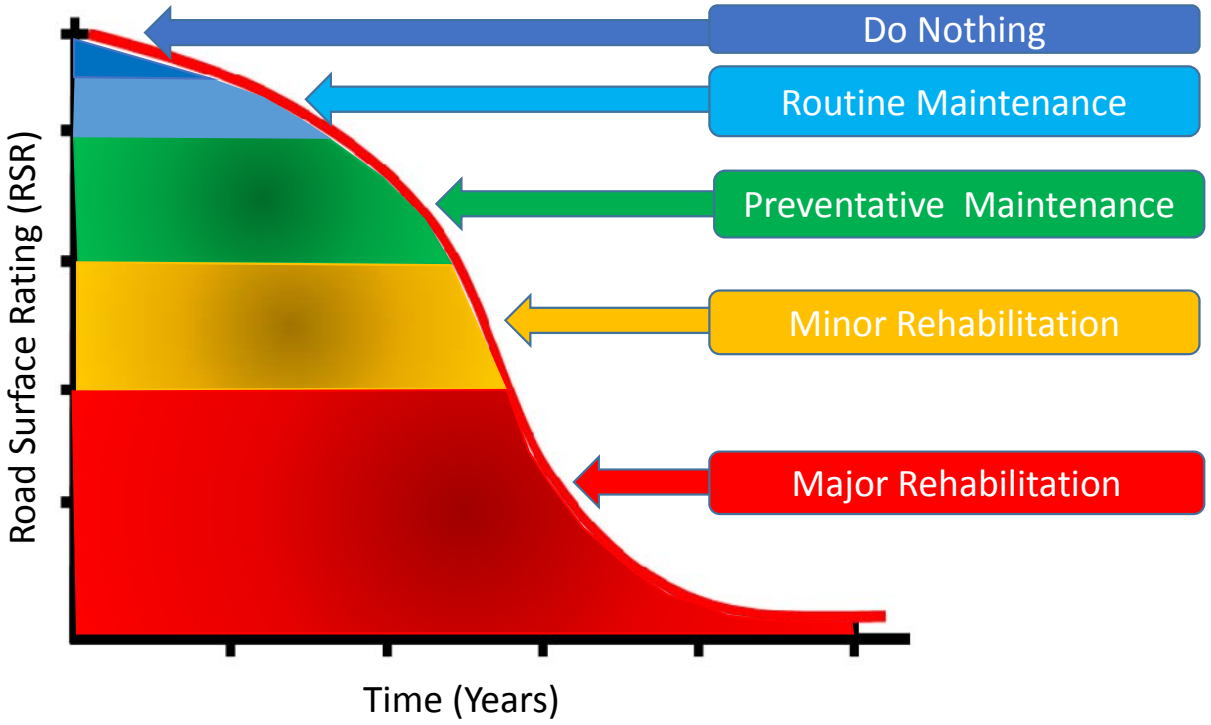
- No Maintenance Required- $0 SY
- Routine Maintenance - $0.50 SY
  - Crack Sealing
  - Fog Seal
- Preventative Maintenance - $6.00 SY
  - Targeted Patching
  - Chip Seal
  - HMA Overlay
- Minor Rehabilitation- $20.00 SY
  - Mill & Overlay
- Major Rehabilitation- $45.00 SY
  - Reconstruction
  - Reclamation

** Please note that unit prices reflect curb to curb improvements only*

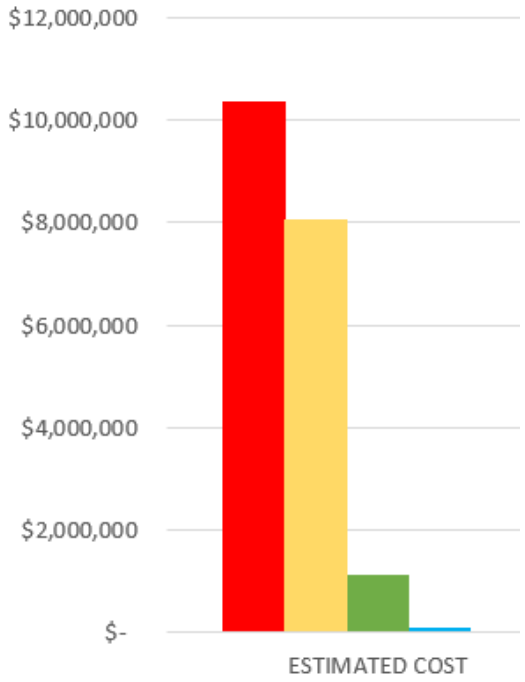


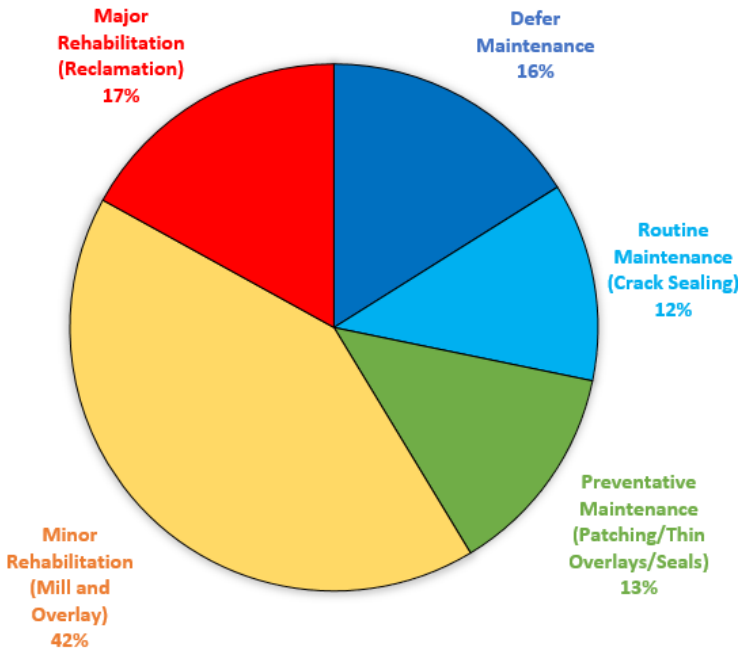
Roads Program Development

- Town-wide Pavement Condition Inventory
- Set up Treatment Bands
- Refine Repair Methods/ Unit Costs Annually
- Prioritization Paving Projects (Cost Benefit Value)
  - Traffic Count
  - Project Cost



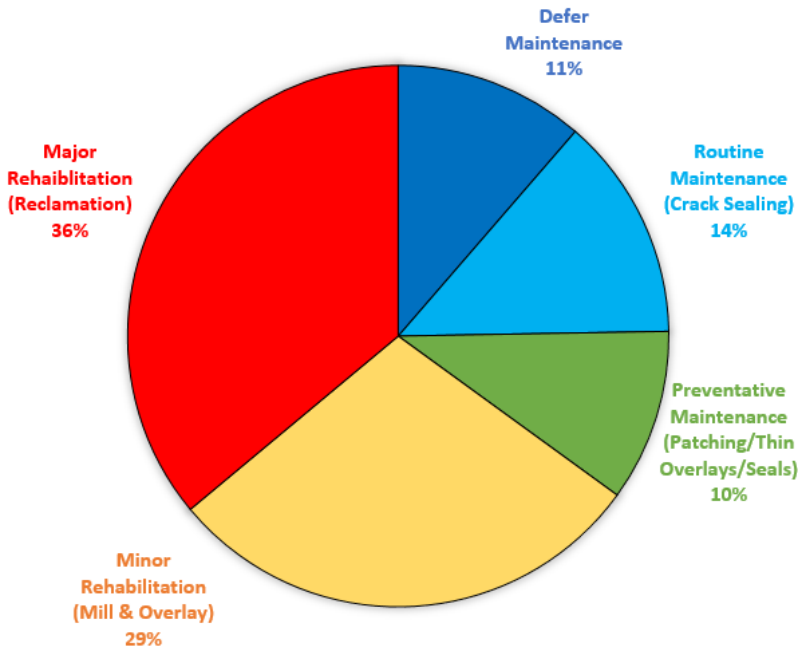
Current Backlog (2020)





REPAIR METHOD	LENGTH (Miles)	PERCENT of NETWORK	ESTIMATED COST
Defer Maintenance	14.1	16%	$ -
Routine Maintenance (Crack Sealing)	10.7	12%	$ 94,779
Preventative Maintenance (Patching/Thin Overlays/Seals)	11.5	13%	$ 1,129,065
Minor Rehabilitation (Mill and Overlay)	36.6	42%	$ 8,059,934
Major Rehabilitation (Reclamation)	14.9	17%	$ 10,370,965
		Total Cost =	**$ 19,654,743**

Projected Backlog (2025)



REPAIR METHOD	LENGTH (Miles)	PERCENT of NETWORK	ESTIMATED COST
Defer Maintenance	9.96	11%	$ -
Routine Maintenance (Crack Sealing)	11.72	14%	$ 104,398
Preventative Maintenance (Patching/Thin Overlays/Seals)	9.01	10%	$ 898,625
Minor Rehabilitation (Mill & Overlay)	25.39	29%	$ 6,086,210
Major Rehaiblitation (Reclamation)	31.62	36%	$ 22,524,331
		Totals =	**$ 29,613,564**

Funding Sources

Grants:

Complete Streets: $400,000 for Albion St.

MVP: Main Street/Lake Q Cleanup

TIP: Main Street Envison Wakefield

Chapter 90 State Aid

Approximately $673, 000 Annually

Road Revolving Fund

Approximately $75, 000 Annually

Roadway Article

FY20 $750,000

DPW Operating Budget

$30,000 Crack Sealing

$25,000 Pot Hole Filling

Funding Scenarios

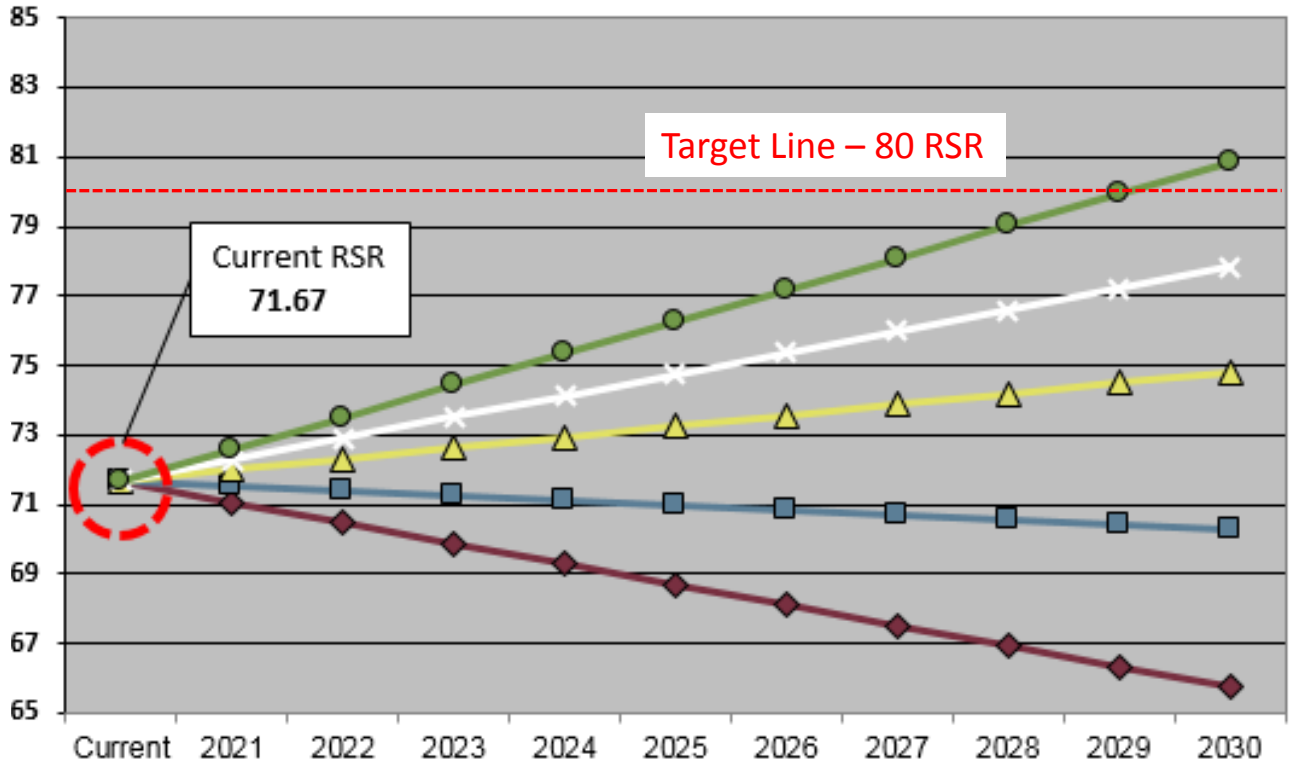
Community Profile

Road Miles = 87.76
Ch. 90 Allotment = $673,616
Population = 27,000

Funding Scenarios

	Article	Total
*Scenario 1**	$0	$673,616
Scenario 2	$750,000	$1,423,616
Scenario 3	$1,500,000	$2,173,616
Scenario 4	$2,000,000	$2,673,616
Scenario 5	$2,500,000	$3,173,616

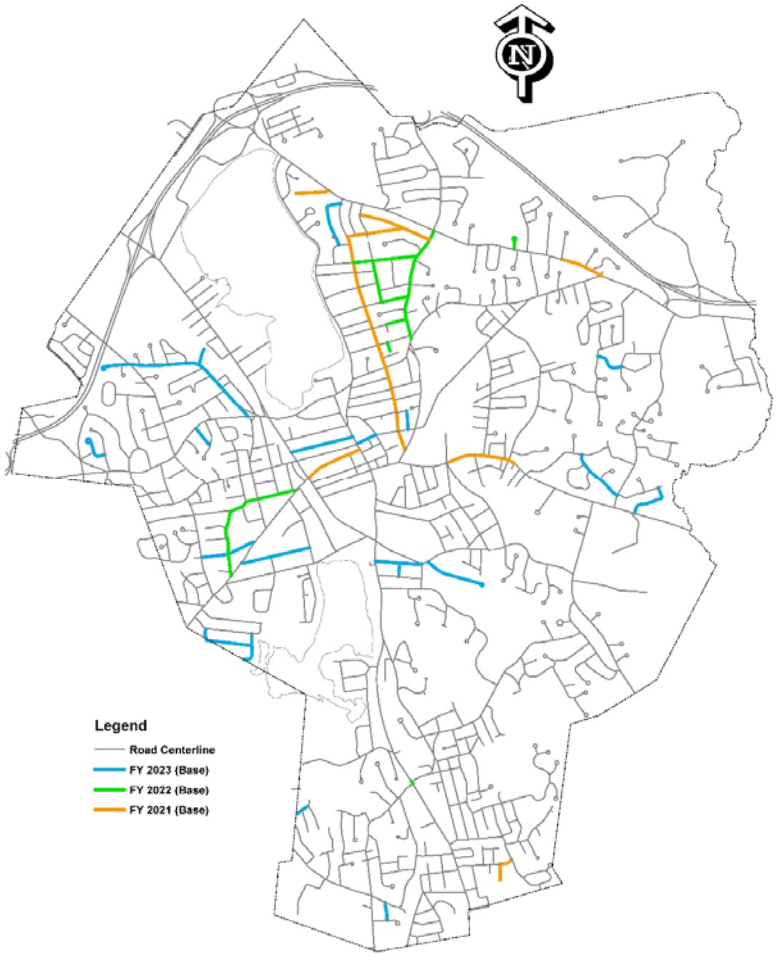
*Approximate FY2020 Ch. 90 Allotment



FY21-FY23 Preliminary Plan

Assume $1MM Annual Investment

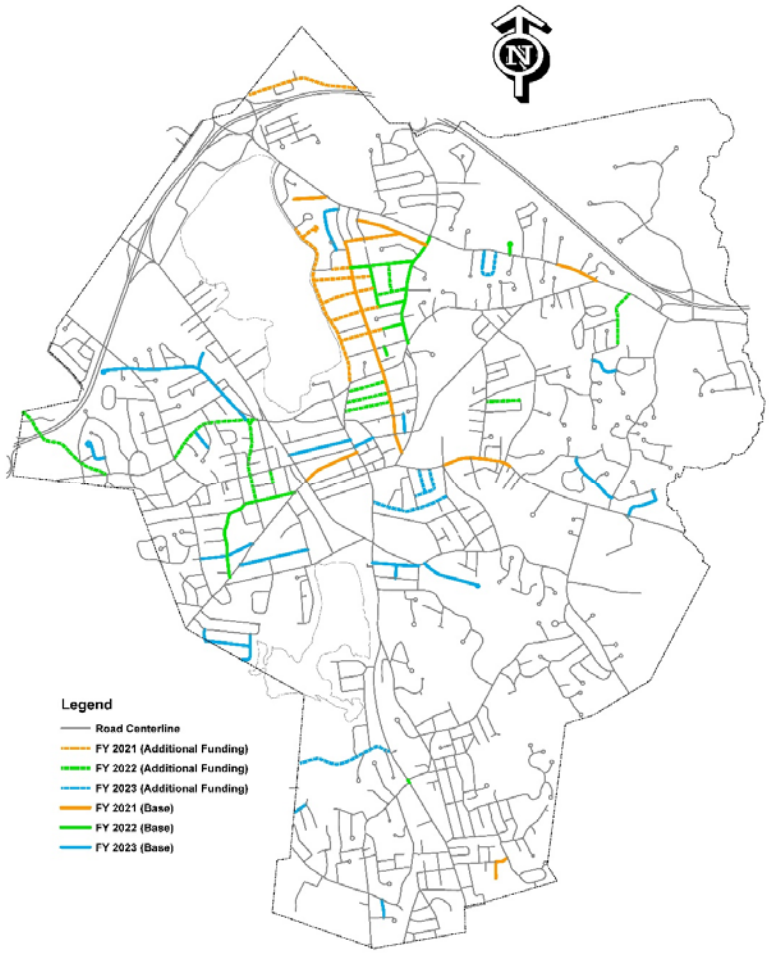
- FY21 – 2.06 miles of road rehabilitated
- FY22 – 2.65 miles of road rehabilitated
- FY23 – 1.91 miles of road rehabilitated



FY21-FY23 Preliminary Plan

Assume $2.5MM Annual Investment

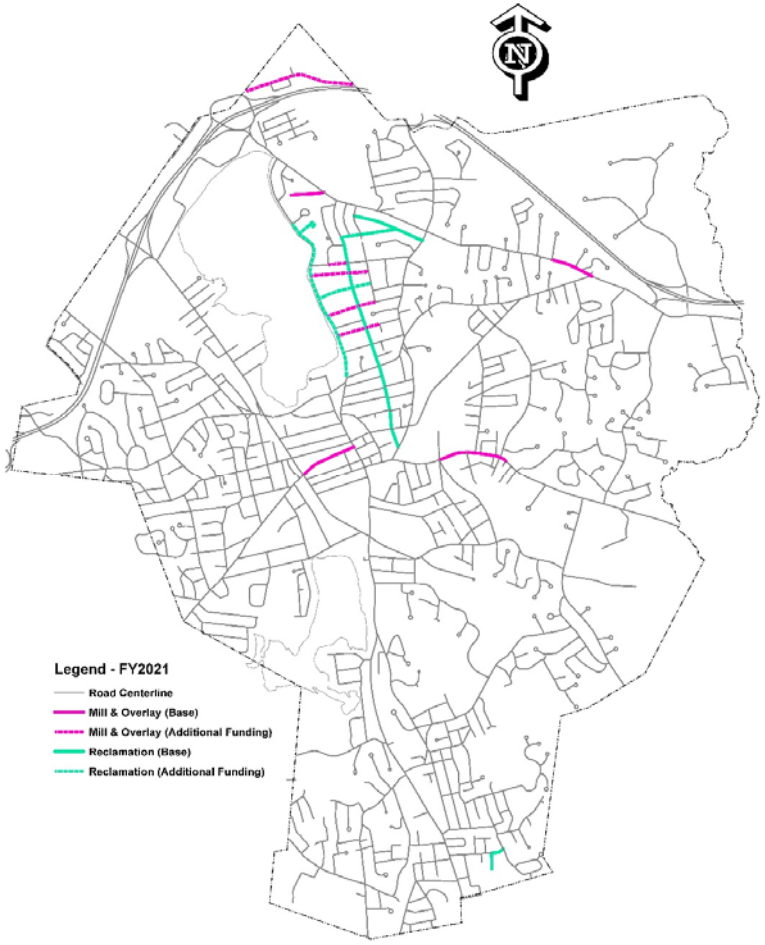
- FY21 – 4.27 miles of road rehabilitated
- FY22 – 5.55 miles of road rehabilitated
- FY23 – 4.26 miles of road rehabilitated



FY21 Preliminary Plan

Assume $2.5MM Investment

STREET	FROM	TO
PLEASANT STREET	SALEM ST	BREWSTER RD
GRAFTON STREET	MAPLE AVE	HARRISON AVE
MAPLE AVENUE	GRAFTON ST	DEAD END
ALBION STREET	MAIN ST	NORTH AVE
FORRESTER ROAD	DRURY LN	VERNON ST
BREWSTER ROAD	PLEASANT ST	FORRESTER RD
WATER STREET	MELVIN ST	BENTLEY ST
LOWELL STREET	SALEM ST	DEXTERS LN
WALTON LANE	LOWELL ST	DEAD-END
MAIN STREET	CARRIAGE LN	SALEM ST
WAVE AVENUE	MAIN ST	WAVE TER
WHITE AVENUE	MAIN ST	PLEASANT ST
ABORN AVENUE	MAIN ST	COURT ST
SWEETSER STREET	MAIN ST	COURT ST
CENTRAL STREET	MAIN ST	PLEASANT ST
CORDIS STREET	FLANDERS LN	PLEASANT ST
BAY STATE ROAD	READING TL	LYNNFIELD TL
LAKE SHORE DRIVE	MAIN ST	CUL DE SAC



Questions??

Wakefield Public Works

Joseph Conway
Public Works Director

William Renault, Jr., P.E.
Town Engineer

Strategic Road Repair & Maintenance Plan

Town Council Meeting | February 24, 2020

Wakefield Center Neighborhood Association 10/15/2019

Playground Entrance Proposal

A. Sequence of Events

Mtg with DPW Director for overall approval and commitment to help with concrete foundation

Mtg with Town Administrator to discuss overall project and sequence of events

Mtg with Traffic Study team for coordination

Mtg with Town Council for project approval

Select granite pieces and order drilling

Modify existing chain link fencing

Install foundations and granite posts

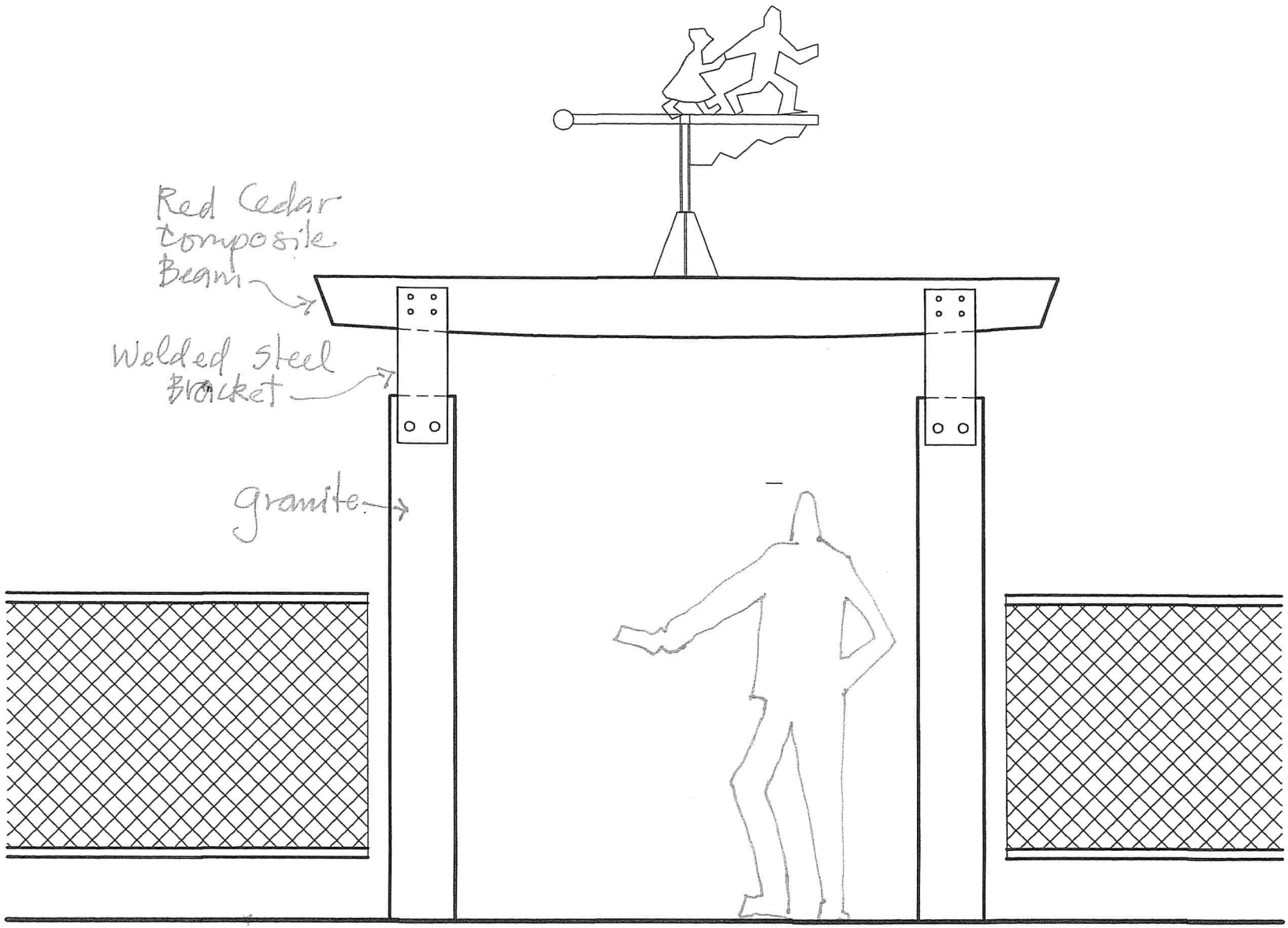
Based on actual size of granite and location of holes, and actual installed height and orientation (i.e. are they properly aligned?), order manufacture of steel brackets

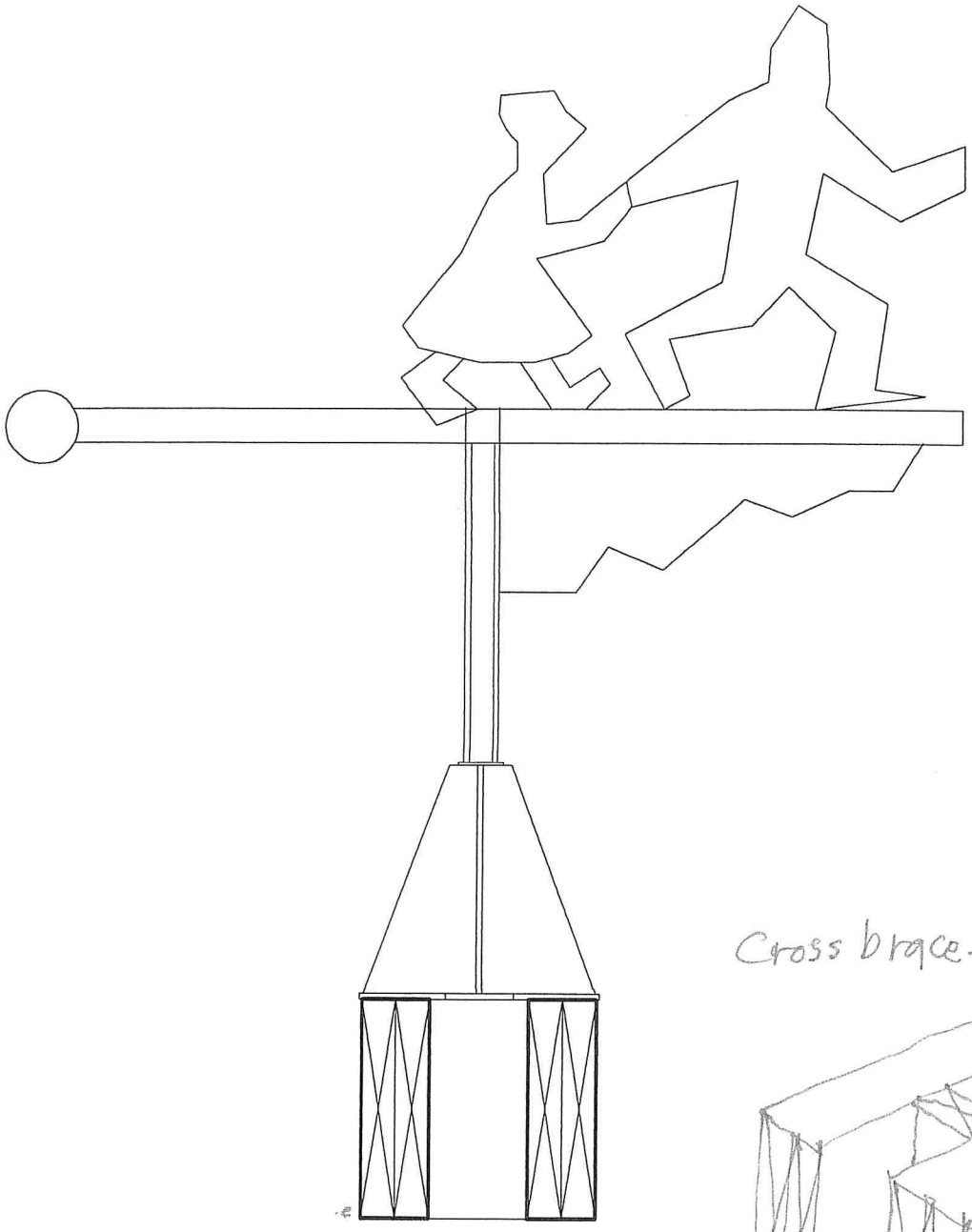
Purchase red cedar planks and manufacture composite beam to fit actual steel brackets

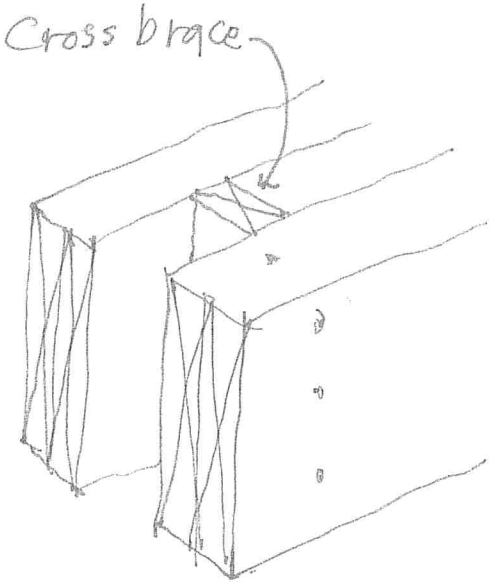
Complete final assembly

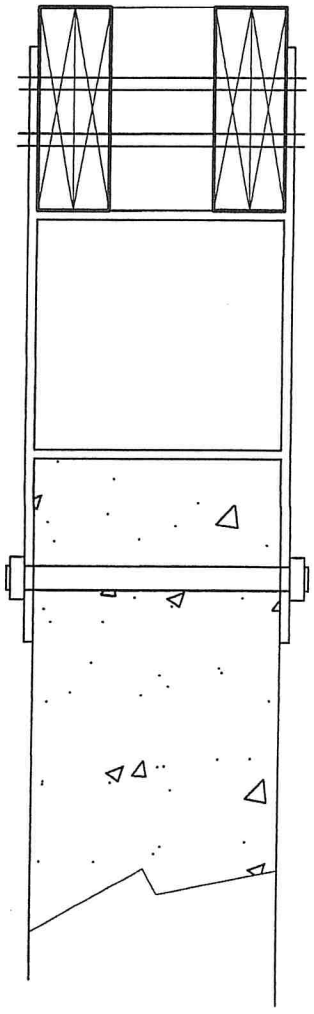
B. Proposed Budget

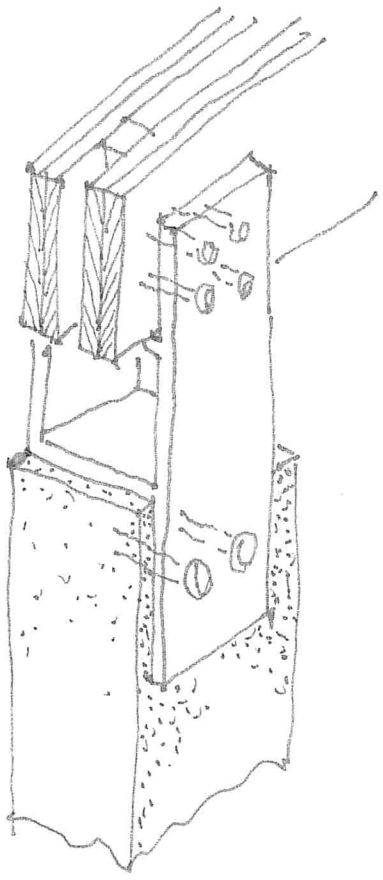
Granite and holes	2,000
Concrete foundation	1,000
Red cedar planks	560
Steel brackets	600
Total	**$ 4,160**


Red Cedar
Composite
Beam
Welded Steel
Bracket
granite




Cross brace





Google Maps

Imagery ©2019 Google, Imagery ©2019 MassGIS, Commonwealth of Massachusetts EOEA, Maxar Technologies, Map data ©2019 50 ft

Google Maps

 20 ft

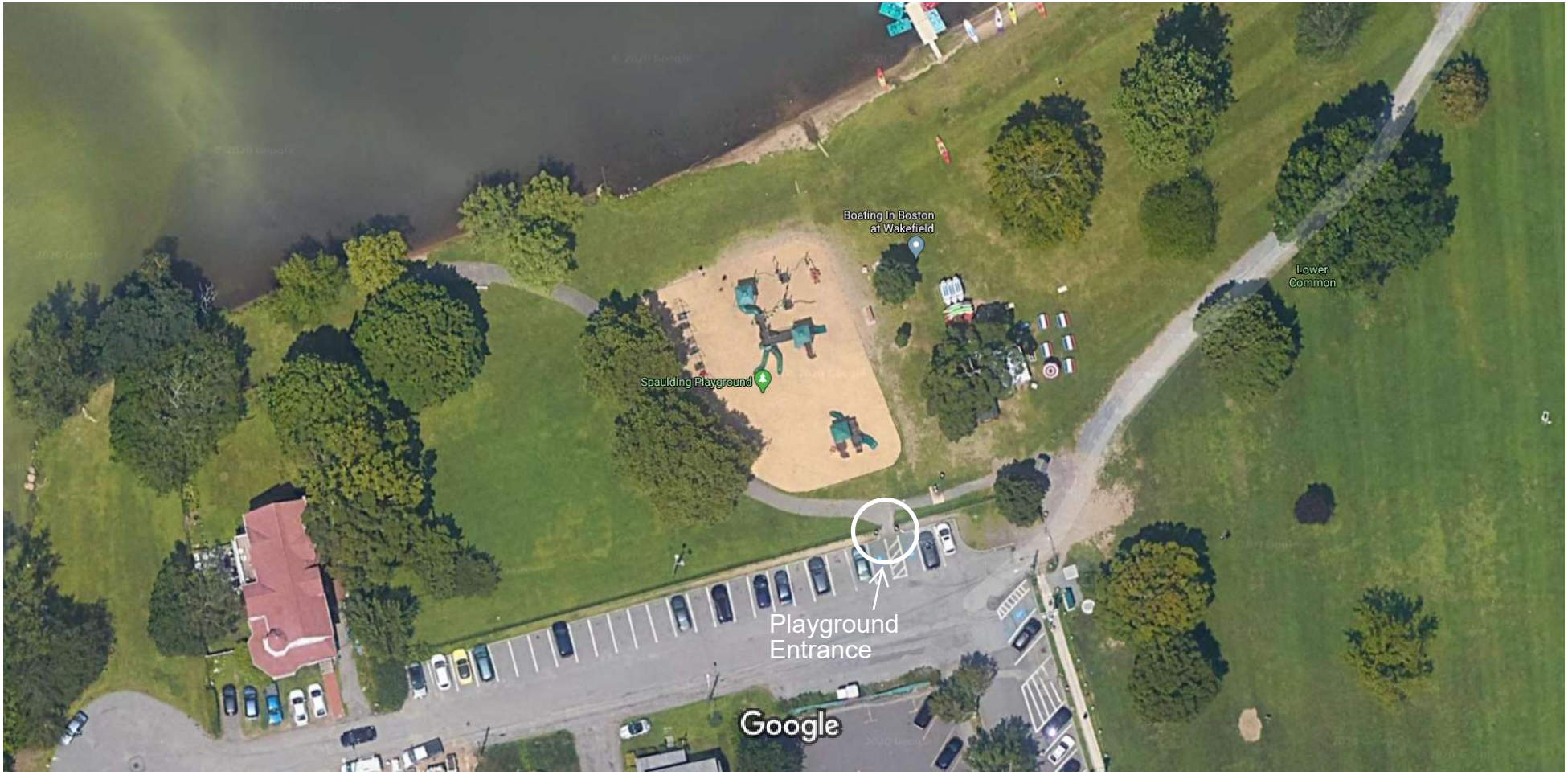
Gateway

to

Spaulding Street Playground

A Wakefield Center Neighborhood Association Project

Google Maps



Map data ©2020 , Map data ©2020 20 ft

Spaulding Street Playground Site


Existing entrance is 55 inch
opening in chain link fence

CONCEPT PLAN INCLUDES PROVIDING NEW WALK AT RE-ALIGNED CURB (NOT INDICATED HERE, FOR CLARITY)

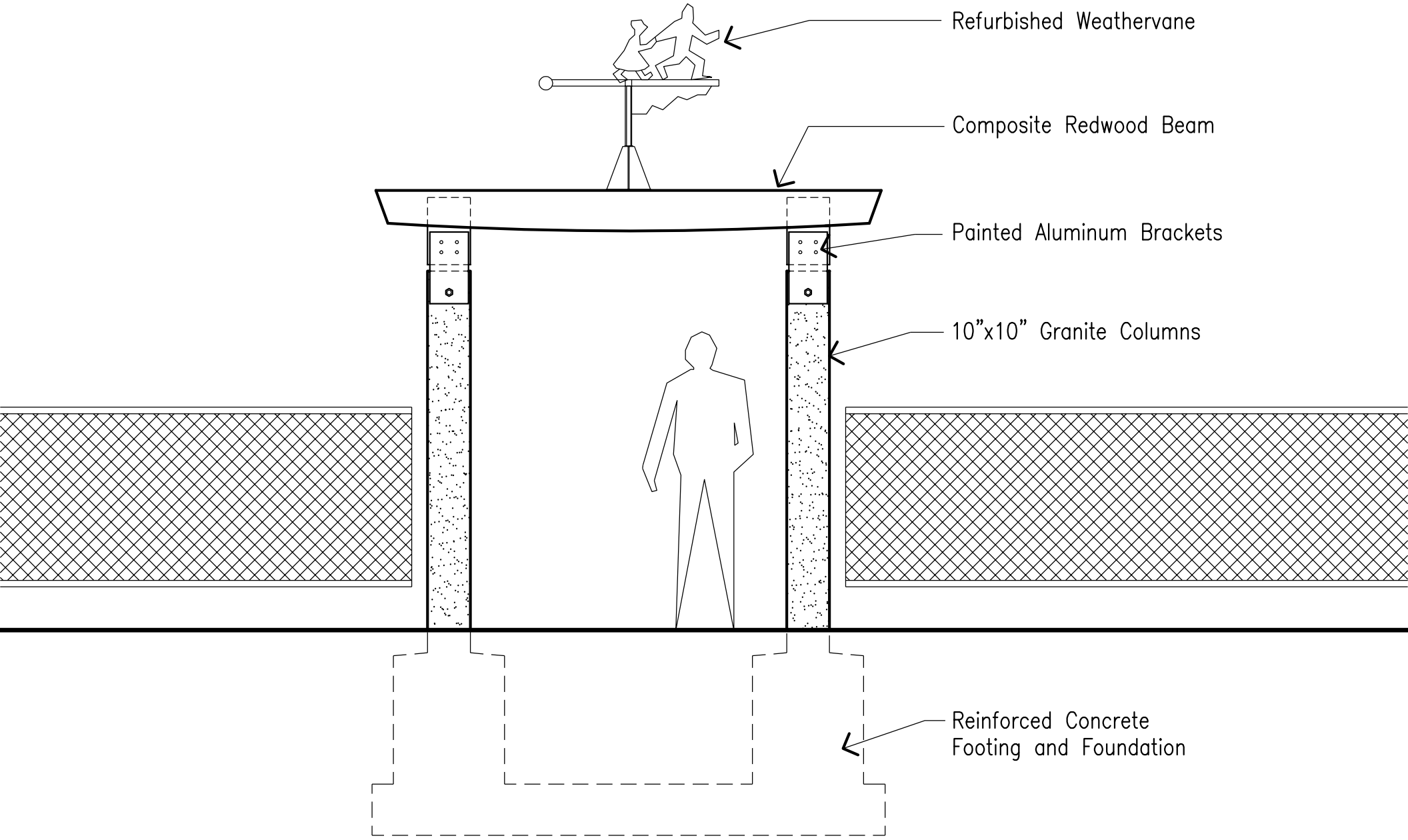
PERHAPS CREATE A GATEWAY THAT WOULD TIE ALL WALKS TOGETHER - BOTH CURRENT AND FUTURE

RED LINE INDICATES EXISTING CURB LINES

CONCEPT PLAN INCLUDES REVISING LOCATION OF EXISTING CURB AND SIDEWALK ON LAKE AVE TO ALLOW PARALLEL PARKING, SO APPROACH WALK TO PARK WOULD DIFFER FORM CURRENT LOCATION.

ENVISION WAKEFIELD
EXCERPT FROM CONCEPT PLANS PRESENTED AT APRIL 2019 TOWN MEETING
VHB 1-30-2020

The existing weathervane was on top of the large pavilion in the original playground. It will be restored and installed on top of the new Gateway.



Spaulding Street Playground
Elevation of Proposed Gateway

Proposed design has been reviewed with

- ☑ DPW Director Joseph Conway
- ☑ Town Administrator Stephen Maio
- ☑ Patricia Domigan, Director, Municipal Services and Kathleen Lynch, Senior Landscape Architect at VHB
- ☑ Friends of Lake Quannapowitt
- ☑ Interested neighbors

Wakefield Youth Council Proposal

As adults and leaders in Wakefield, we have a collective responsibility to build a healthy, vibrant, and inclusive community for our youngest residents. Our community characteristics, including how local government is structured and responsive to all ages, have a significant impact on the lives of our Town's youth. A Wakefield Youth Council creates an important opportunity to engage the voices and perspectives of younger residents, enabling better participation in local decision making. The Youth Council provides a platform for adult leaders to educate and inform younger residents on how Town government makes decisions and how we can more effectively problem solve and improve the lives of friends and neighbors.

By establishing a Youth Council, we are contributing to the healthy development of Wakefield youth and promoting meaningful civic engagement.

Goals:
The Wakefield Youth Council is a platform for Wakefield residents ages 13-18 to serve as youth leaders empowered to share policy ideas and youth comment in the community.
Wakefield Youth Council members will:

- learn the process to effectively advocate
- be engaged in town issues
- actively participate in local government
- communicate and advocate for youth issues in the appropriate forum(s)
- represent a cross-section of the town's neighborhoods, sexes, races/ethnicities, sexual orientations, gender identities, and ages
- implement projects that will benefit the town's youth population, schools, and the community at large

Youth Council Proposed Structure:

Youth Council Membership

- One adult advisor to be appointed by the Town Council
- An eleven (11) member Youth Council shall be appointed by the Town Council (following the usual appointment procedures as other town committees). A Youth Council member application will be developed by the adult advisor and shall be available online and in paper form. Resumes will not be required but applicants will be encouraged to identify qualities and reasons why they should be appointed.
- The terms shall be one (1) year.
- Youth Council members will include:
    - 3 middle school age students (7th and 8th graders)
    - 8 high school age students

- Once established, in years that follow it is the intention of the Youth Council to interview and recommend new and/or returning members to the Town Council for appointment, for the Town Council to duly consider in making future appointments.
- School Superintendent and Town Administrator to be ex-officio members
- All Wakefield residents age 13-18 are encouraged to participate in any meetings of the Youth Council and to raise any ideas, issues, or concerns to the Youth Council

Youth Council Expectations

As a fully-appointed committee of the Town, Youth Council Members will:

- Meet at least monthly in duly posted meetings.
- Maintain meeting minutes
- Elect a Chair and Vice Chair
- Create Agendas including public participation so any non-member youth or adults can present issues for the Council's consideration
- Assign liaisons to other Town Committees or Departments (Town Administrator to ensure that the Liaisons are allowed to actively participate at meetings)
- Report at least annually to the Town Council on activities.
- Invite town leaders to their meetings to engage in conversation regarding Town government issues and process.

Proposed Budget:

- $1,000 for training and supplies

Proposed Next Steps:

- Present proposal to Town Council with goal of officially establishing a Wakefield Youth Council
- Town Council to appoint an adult advisor for the Youth Council
- Adult advisor to develop the application and determine the application process
- Town Council to advertise and appoint Youth Council in Spring 2020.
- Youth Council members will work with adult advisor to refine mission, goals, and structure

Wakefield, Massachusetts

2019 Hazard Mitigation Plan Update

July 2019

BETA
315 Norwood Park South
2nd Floor
Norwood, Massachusetts 02062
781.255.1982
www.BETA-Inc.com

2019 Hazard Mitigation Plan Update

Wakefield, Massachusetts

Prepared by: BETA GROUP, INC.
Prepared for: Town of Wakefield

July 2019
Updated to align with MVP: February 2020

TABLE OF CONTENTS

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1.0 EXECUTIVE SUMMARY

Wakefield's Natural Hazard Mitigation Plan (the Plan) was created to assist the Town in mitigating losses from natural hazard events and identify areas of potential improvement. Originally developed by Town personnel in 2007, the Plan was updated in 2019 by the Town with the assistance of BETA Group, Inc. (BETA) to reflect changes in critical facilities, hazards and the mitigation efforts required to protect these facilities against the identified hazards. The Wakefield Hazard Mitigation Team, the Engineering Division, and BETA developed the following Plan. The 2019 version of this Hazard Mitigation Plan was revised in early 2020 to incorporate the results of a vulnerability assessment developed as part of the Massachusetts Executive Office of Energy and Environmental Affairs' Municipal Vulnerability Preparedness (MVP) grant program. The MVP additions to this Plan are focused on enhancing Wakefield's resilience to a changing climate. While all four hazards identified through the MVP process were also included in the Hazard Mitigation Plan process, the MVP lens looks at both past trends and future projections, based on climate science.

The following natural hazards were discussed during the planning process:

- Winter Storms
- Nor'easters
- Hurricanes/Tropical Storms
- High Winds
- Dam Failures
- Ice Storms
- Drought
- Extreme Temperatures
- Invasive Species
- Earthquakes
- Thunderstorms
- Tornadoes
- Wildfires
- Urban Fires

The Wakefield Hazard Mitigation Team has identified 156 critical facilities within the town that fall into one of the following categories:

- Banks
- Cemeteries
- Churches
- Community Centers
- Department of Public Works
- Roadways
- Pharmacies
- Electrical Substations
- Grocery Stores
- Schools
- Wastewater Stations
- Fire Department
- Police Department
- Hotels
- Libraries
- Media
- Mortuaries
- Nursing Facilities
- Offices
- Gas Stations
- Parks
- Special Needs
- Water Infrastructure

Existing hazard mitigation measures and programs are identified within the Plan. Potential mitigation measures are addressed in regard to benefit and feasibility.

The Natural Hazard Mitigation Plan is a working document. The plan should be revisited on a continuous basis by municipal departments to evaluate the feasibility of the suggested Plan and mitigation measures.

2.0 INTRODUCTION

2.1 FEDERAL DISASTER MITIGATION ACT

Congress enacted the Disaster Mitigation Act of 2000 (DMA 2000) on October 10, 2000. The bill was signed into law on October 30, 2002, creating Public Law 106-390. Under the law, all communities are required to have a Hazard Mitigation Plan in place to qualify for future federal mitigation funding and the plan must be updated in five year intervals. This requirement does not affect disaster assistance funding.

The Federal Emergency Management Agency (FEMA) administers hazard mitigation planning and grants programs in Massachusetts in collaboration with the Massachusetts Emergency Management Agency (MEMA).

2.2 HAZARD MITIGATION PLAN PURPOSE

This plan identifies natural hazards impacting the town of Wakefield, assesses the town's vulnerability to these hazards and recommends actions to mitigate the effects identified hazards may have on the town.

This Hazard Mitigation Plan has been prepared based on FEMA's "Local Mitigation Planning Handbook" (March 2013) and was designed to meet the requirements of DMA 2000. The Town of Wakefield has received a FEMA Hazard Mitigation Planning Grant (HMGP) from MEMA to update the Hazard Mitigation Plan. Wakefield and BETA developed this Plan to focus specifically on the local issues affecting the town.

Objectives of this plan include the following:

- Detail the planning process and identify members of the local Hazard Mitigation Planning Team;
- Create hazard profiles for each hazard with a description and prioritization;
- Prepare an inventory of critical facilities;
- Complete a risk assessment for each specified hazard and estimate potential losses;
- Identify existing hazard mitigation measures already in place;
- Develop proposed mitigation actions and strategies based on risk assessment;
- Prepare an implementation schedule with procedures ensuring the plans implementation, updating, and revision every five years; and
- Detail the process where Wakefield formally adopts the plan.

Implementation of this plan prior to a major disaster occurring can help reduce property damage, loss of life, and interruption of critical services. In addition, adoption of this plan allows funding through FEMA for additional mitigation funding.

2.3 METHODOLOGY – 2007 PLAN

Beginning around June 2002 the Engineering Division began gathering information to develop an initial draft of the natural hazard mitigation plan. Using the Natural Hazard Mitigation Planning: A Community Guide handbook prepared by MEMA, the ten-step process was used to develop the content of the Plan.

This step process was used to initially identify existing natural hazards and future natural hazards. In addition, the Town of Wakefield's Emergency Management Plan was used to help identify critical facilities.

The following is a brief summary of the ten-step process used:

Step 1 Map the Hazards

Step 2 Determine Potential Damage

Step 3 Identify Existing Measures

Step 4 Identify What Is Not Being Done

Step 5 Develop an Action Plan

Step 6 Evaluate Actions

Step 7 Coordinate with Others

Step 8 Select Actions

Step 9 Develop a Strategy

Step 10 Adopt and Monitor the Plan

Using data collected from FEMA, MEMA and MassGIS, mapping was developed to identify past natural hazards and potential future hazards. This mapping was overlaid on the town's base map to present a graphic representation of the natural hazards. In addition, the Town used local resources to identify numerous hazard prone areas, mostly flood prone. DPW Highway Division crews, the DPW Town Engineer, Conservation Agent and Board of Health were all used in gathering this data.

Numerous meetings were conducted between the Director of Public Works, the DPW Town Engineer and DPW Engineering Division personnel to review the data collected and draft the plan.

The Technical Review Committee (TRC), which no longer exists, served as the Wakefield Hazard Mitigation Team.

Prior to the meeting all TRC attendees were sent a draft copy of the Plan for review and comment. The meeting convened on March 14, 2007 to review and comment on Wakefield's draft Hazard Mitigation Plan. The agenda was as follows:

- Overview of Natural Hazard Mitigation Planning
- Develop Natural Hazard Index
- Develop List of Existing Natural Hazard Locations
- Identify Existing Protection Measures
- Develop List of Mitigation Measures
- Develop List of Potential Funding Sources
- Discuss Completion and Annual Updating

The TRC meeting was guided by the DPW Engineering Division. The committee identified hazards, areas of concern and critical facilities using the worksheets and matrices included in this report. The report was reviewed by all members of the TRC. The Director of Public Works and Town Engineer additionally performed an extensive review of the plan.

In addition, the Town of Wakefield Public Works Department met and corresponded with businesses and residents during administration of the National Pollution Discharge Elimination System (NPDES) Phase II

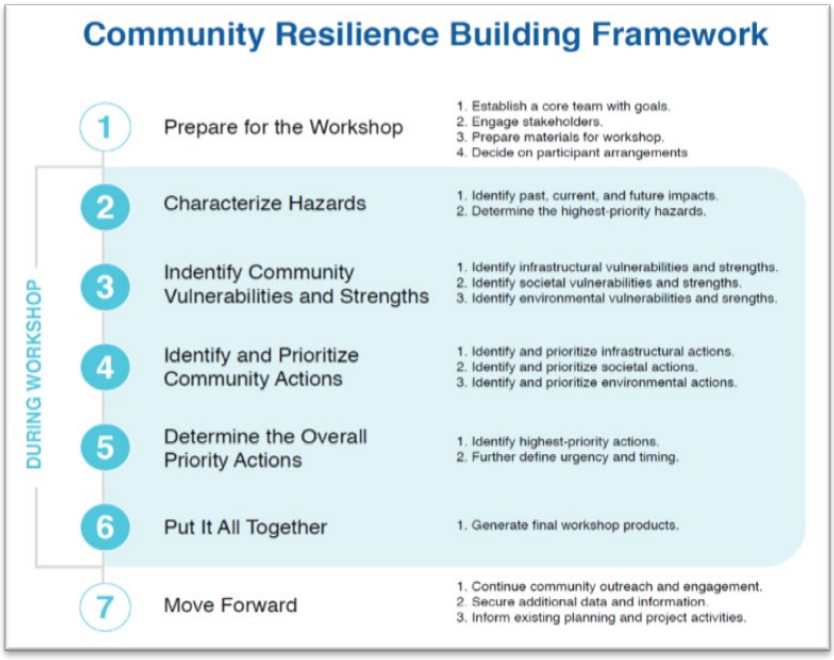
stormwater discharge permitting process. Newsletters were sent out in the water bills to request concerns regarding flooding issues. Also, as part of the NPDES program the Town advertised on the local CATV to inform residents about flooding concerns and potential mitigation measures to implement including keeping catch basins clear in the winter, removing debris from streams and ditches, and calling the Town to notify of flooding hazards.

2.4 METHODOLOGY – 2019 PLAN UPDATE

In February of 2019, the Town of Wakefield and BETA began the process of updating the Plan. The following is a brief summary of the nine-step process used during the update:

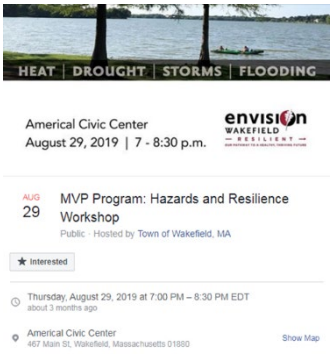
Step 1: Review of the existing plan
Step 2: Review of critical facilities inventory; Removal of facilities no longer in existence; and Addition of new facilities
Step 3: Review of Hazards identified in the original plan and development of new Hazard Profiles with Committee
Step 4: Vulnerability Assessments
Step 5: Creation of Mitigation Goals and Actions
Step 6: Public Outreach
Step 7: Review of Update Plan by Committee
Step 8: Public Comment Meeting
Step 9: Finalization of Plan

Figure 2-1: Community Resilience Building Framework



Additionally, in 2019, the Town of Wakefield engaged in the MVP Program of the Commonwealth of Massachusetts and followed the Community Resilience Building (CRB) Framework to complete a community vulnerability assessment. **Figure 1-1** shows the steps in the CRB process.

BETA and the newly established Hazard Mitigation Team met on February 28, 2019, March 14, 2019, and May 14, 2019 and followed the above described process to update the 2007 Hazard Mitigation Plan. Sign in sheets and meeting agendas can be found in **Appendix A.** The Hazard Mitigation Team was utilized as the MVP Core Team. Additional local and regional stakeholders were also invited to participate in the MVP Workshops. The full list of participants in the MVP Planning process and the text from the invitation email they received can be found in **Appendix F**.



The MVP Process also provided for deeper engagement with the general public. The Envision Wakefield Resilient Team engaged residents, businesses, and commuters with surveys for both Hazard Mitigation and Municipal Vulnerability Preparedness online, at the public library, through environmental grassroots organizations, committees, and groups. Following the surveys, The Team set up booths at multiple

festivals throughout the summer months (Festival by the Lake, Festival Italia, etc.) with hardcopy surveys and poster boards to describe hazards: heat waves, flooding, intense storms, and drought. Passersby were encouraged to write about their concerns, what the Town can do to better prepare for the hazard, and the actions they have already or would be willing to take to better protect themselves from each respective hazard. Following the events, Envision Wakefield Resilient hosted a public listening session in order to ascertain additional feedback for the MVP planning process. The input from the various community engagement activities was incorporated into the final MVP Summary of Findings report. Images, boards, and sign in sheets from the public listening session and the results of the community survey and other engagement activities are attached in **Appendix G**.

2.5 Hazard Mitigation Goals of the Town of Wakefield

The goals of the Town of Wakefield with respect to Natural Hazard Mitigation are stipulated here in the following order:

1. To improve upon the protection of the residents, businesses, and Town Infrastructure from all natural hazards
2. To reduce the potential impact of natural hazards on critical facilities within the town of Wakefield
3. To improve upon emergency preparedness by identifying potential areas of concern prior to a Natural Hazard event and determining appropriate actions to mitigate impacts
4. To identify and implement cost effective mitigation measures to reduce future impacts.

3.0 Community Profile

3.1 Location and Topography

The town of Wakefield is located approximately 8 miles north of Boston, Massachusetts. The town is bordered by Lynnfield and Reading to the north, Stoneham on the west, Melrose on the south and Saugus on the east. Wakefield consists of approximately 8 square miles, 96 linear miles of roadway, over 9,000 parcels of land with a population of approximately 24,800.

The topography of the town consists of two lakes (classified in Massachusetts as Great Ponds), Lake Quannapowitt and Crystal Lake and a large marsh on the northeast border of the town. The elevation of the town center is approximately 98 ft above sea level and the highest elevation is 263 ft above sea level. Vegetation throughout the town is plentiful. Many neighborhood areas have tree-lined streets and small-forested areas or wetlands. The town also consists of over 12 parks including the spacious Town Common.

Crystal Lake is approximately 81 acres and serves as a town reservoir supplying approximately 15% of the town's daily potable water. Lake Quannapowitt is a recreational lake used for sailing and other non-motorized (under 10 HP) recreation. The lake is approximately 246 acres and a maximum of 15 feet deep. Reedy Meadow is a large marshland located on the northeastern edge of the town and contributes to the North Coastal Watershed. The majority of the town is located in the North Coastal Watershed. The southwestern tip of the town is in the Mystic River Watershed.

In addition to the lakes, Wakefield has two rivers, the Saugus River and Mill River. Both rivers' headwaters are primarily located within the town of Wakefield. The Mill River runs southerly through the geographical center of the town for approximately 2.7 miles and flows east to connect to the Saugus River. The Saugus River runs from the northerly discharge of Lake Quannapowitt, through Reedy Meadow, and then flows east into Saugus. Both rivers run through residential neighborhoods and commercial areas. Numerous properties are impacted by these waterways during flooding events.

3.2 Development Trends

Wakefield's pre-1940's housing stock gives the town its classic New England village character. The 2010 census counted 10,500 housing units. Almost 4,000 units or 37.7% predate World War II, and a total of 6,878 units or almost two-thirds of all units were constructed prior to 1960. These single-family structures on individual lots were updated with oil heating systems after World War II, and most have been converted to gas and electric heating systems. Built primarily of wood clapboards, these homes require conscientious repairs, remodeling and painting to be maintained in New England's climate. The Metropolitan Area Planning Council and the Town Planner completed a build-out analysis located approximately twenty single-family subdivisions constructed between 1995 and 2005. While vacant tracts of land are non-existent, as many as 1,072 additional single-family units could be added to vacant sites under existing zoning. Currently, developers are buying older homes on the larger lots and tearing them down to build newer, larger homes or duplexes were zoning allows. The Town's 2003 Housing Master Plan recognized sites around the commuter rail stations as opportunities to encourage transit-oriented development. Town policies were shifted to encourage walkable neighborhoods and more housing near the commuter rail stations and downtown. In 2015, the Town adopted zoning changes intended to focus and encourage growth near the commuter rail stations; within three years, approximately 200 condominiums and apartments were built. Permits for approximately 600 additional units are currently under review. These projects are intended to be mixed-use projects with active street-level, first floor commercial uses.

Wakefield's commercial development included extensive suburban office park buildings near the Interstate 95/Route 128 exits. Like other communities along Route 128, Wakefield experienced substantial commercial development in the 1980s and 1990s. Under new ownership, the older office buildings may be replaced with newer commercial uses, better suited to the current real estate trends. Currently, sites along the northern end of Lake Quannapowitt are being evaluated by new owners. Much of the development along Route 128, was constructed on previously unbuildable areas and are adjacent to flood plains and wetlands.

4.0 Hazard Identification

4.1 Overview of Hazards

All natural hazards have the potential to cause property damage and loss of human life, as well as limit access to essential services in a community, including potable water, wastewater collection, and electrical power.

Wakefield identified a number of natural hazards that have occurred or could occur in town and analyzed the hazard risk for each. The MVP process enhanced the hazard identification process. Preparing for the MVP workshops involve pulling from State climate data, reviewing existing Town documents and technical information, and collaborating with the Core Team members to identify the four most significant climate hazards facing Wakefield. The team landed on drought, flooding, heat waves, and intense storms. The hazards identified below go beyond these four to examine all hazards that effect Wakefield. Analysis for the Hazard Mitigation Plan included determining the likely frequency, severity, and area of impact for each hazard. The methodology used to classify each category was based on the following criteria:

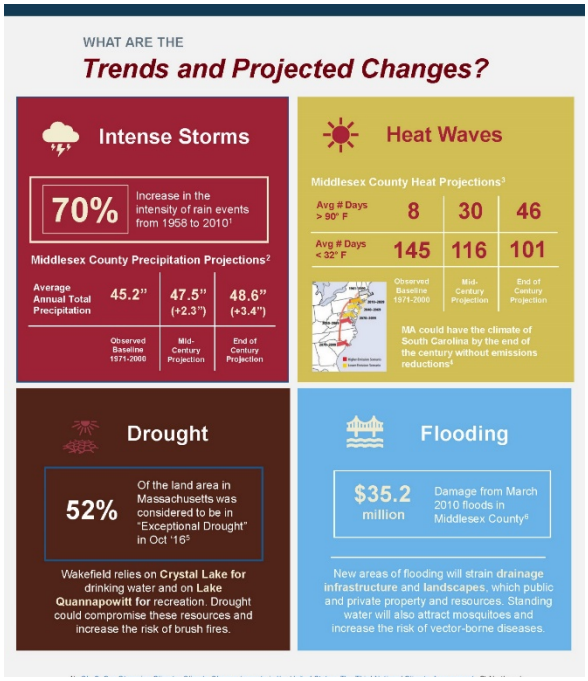


Figure 4-1: Climate Summary from MVP Process

Table 4-1: Hazard Classification Index

Classification	Description
	Frequency
Very Low	Events that occur less often than once in 100 years
Low	Events that occur from once in 50 years to once in 100 years
Medium	Events that occur from once in 5 years to once in 50 years
High	Events that occur more frequently that once in 5 years
	Severity
Minor	Limited and scattered property damage, limited damage to public infrastructure and essential services not interrupted, limited injuries or fatalities
Serious	Scattered major property damage, some minor infrastructure damage, essential services are briefly interrupted, some injuries and/or fatalities
Extensive	Widespread major property damage, major public infrastructure damage (up to several days for repairs), essential services are interrupted from several hours to several days, many injuries and/or fatalities.
	Area of Impact
Negligible	Less than 10% of town impacted or single-point occurrence
Limited	10% - 25% of town impacted or limited single-point occurrences

Significant	25% - 75% of town impacted or frequent single-point occurrences
Extensive	75% - 100% of town impacted or consistent single point occurrences
	Overall Significance
Low	Two or more criteria fall in lower classifications or the event has minimal impact on the town. Can be used for hazard with minimal or unknown record of occurrences.
Medium	Criteria fall mostly in the middle ranges of classifications and event's impacts are noticeable but not devastating. Typically hazards with high area of impact but low frequency.
High	Criteria consistently falls in high classifications and the event is likely or highly likely to occur with severe strength over a significant portion of the town.

Based on the Town's ranking of each category, an overall risk assessment for each hazard was determined. The four hazard categories identified as most likely to significantly impact Wakefield are:

- Nor'easters
- High Winds
- Hurricanes/Tropical Storms
- Winter Storms

Table 4-2 below summarizes the overall hazard risks for Wakefield.

Table 4-2 : Wakefield's Hazard Risk Summary

Hazard	Frequency	Likely Severity	Area of Impact	Overall Significance Ranking
Flooding	High	Minor	Limited	Medium
Dam Failures	Very Low	Serious/Extensive	Limited	Medium
Winter Storms	High	Minor-Serious	Extensive	High
Ice Storms	Medium	Extensive	Extensive	Medium
Nor'easters	High	Extensive	Extensive	High
Hurricanes/ Tropical Storms	High	Extensive	Extensive	High
Thunderstorms	High	Serious	Limited	Low
Tornados	Very Low	Extensive	Limited	Low
High Wind	High	Serious	Extensive	High
Drought	High	Minor	Extensive	Medium
Extreme Temperature	High	Minor	Extensive	Medium
Wildfires	High	Minor	Limited	Low
Urban Fires	High	Serious	Negligible	Low
Earthquakes	Very Low	Serious	Extensive	Low
Invasive Species	High	Serious	Limited	Medium

4.2 FLOODING

Flooding in Wakefield is typically concentrated along the path of the Saugus and Mill Rivers. The Saugus River begins at the Lake Quannapowitt spillway and flows into the southwest section of Reedy Meadow. The Saugus River travels east through Reedy Meadow and out to the Saugus town line. The Mill River originates near the intersections of Vernon and Lowell Streets, then flows southerly through the middle of Wakefield and heads easterly to the Wakefield/Saugus town lines where it flows into the Saugus River. Crystal Lake discharges to the Wakefield Brook, which flows easterly into the Mill River.

Additional isolated areas of flooding exist throughout the town along drainage ditches, culverts and low-lying areas. The most prominent areas of concern are:

- **Broadway and North Ave** – drainage ditch from Crystal Lake to North Ave has debris problems where trash rack needs constant maintenance to prevent flooding into area businesses, streets, and parking lot. The Town installed an upgraded trash rack, greatly reducing the problematic flooding as an early implementation of flooding hazard mitigation.
- **Greenwood Street at Melrose town line** – drainage is restricted by undersized outlet culvert flowing into Melrose and restrictions in the Melrose drainage system.
- **Grafton Street and Maple Street Area** – drainage ditch runs through residents' backyards. Ditch has a tendency to overflow due to both debris and capacity issues in Melrose's drainage system.
- **West Park Drive** – Easterly end of West Park Drive is in a low-lying area where Crystal Lake backs up to properties located nearby, including a newly renovated sewer pump station.
- **Water Street** – Easterly end of Water Street heading toward the Saugus town line. The Saugus River flows through a culvert under a bridge on Water Street. This roadway floods over and cuts off access to and from the town of Saugus and traffic must be rerouted 4 miles in a different direction.
- **New Salem Street** – Mill River crosses under the street through a culvert. Blockages and flow restrictions cause New Salem Street to flood over in large storm events. The roadway is closed down and flooding and loss of business impact numerous businesses.
- **Wiley Street** – Continuous flooding of a residential home located in the floodplain. 25-year storm impacts this location significantly. This home has been flooded out over 4 times in the last 8 years.

Much of the flooding problems in Wakefield are due to restrictions downstream in other municipalities. This restricts Wakefield from greatly enhancing the discharge capacity of the rivers and waterways. Almost 90% of the town's drainage flows into the Saugus River. The Saugus portion of the river impacts Wakefield's properties due to backwater flooding and upstream municipal drainage system.

A map of the town overlaid with FEMA flood mapping is shown in **Appendix B.**

4.2.1 REPETITIVE LOSS PROPERTIES

A Repetitive Loss Property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) within a 10-year period since 1978. Severe Repetitive Loss Properties are residential properties with four or more NFIP claim payments of more than $5,000 each, with at least two of those payments occurring in a 10-year period, and with the total claims paid exceeding $20,000, or two or more claim payments that cumulatively exceeded the building's value.

FEMA reports that as of February 28, 2019, there are 12 properties in Wakefield that are considered Repetitive Loss Properties, and 1 Severe Repetitive Loss Property. The majority of these properties are located in the eastern portion of Wakefield along the Mill River.

Reviewing this information in terms of the areas where these repetitive losses have occurred, as opposed to exact location, helps to inform the community of the areas where hazard mitigation assistance may be most warranted to prevent losses in the future, recognizing that additional properties may have also experienced repetitive losses, but did not necessarily have a flood insurance policy through the NFIP.

4.3 Dam Failures

The Massachusetts Department of Conservation and Recreation (DCR) Office of Dam Safety is responsible for regulating dams in Massachusetts. There are over 2,900 publicly and privately owned dams in Massachusetts. To be regulated, dams must be greater than 6 feet tall and have storage capacity greater than 15 acre-feet. DCR classifies regulated dams as high, significant, or low hazard. These classifications are defined below.

DCR Dam Hazard Classification

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

Under 302 CMR 10.00 Dam Safety, low hazard dams shall be formally inspected every ten years, significant hazard dams every five years, and high hazard dams every two years.

Dam failure or overspills are an infrequent occurrence in Wakefield. The Town owns and maintains two dams in Wakefield, the Crystal Lake Spillway and the Lake Quannapowitt Spillway. Both dams are classified as significant hazard dams. Another dam is located on the border of Lynnfield but is not owned by Wakefield. The Quannapowitt Spillway is located at the northeast corner of Lake Quannapowitt and the Crystal Lake Spillway is located at the northerly point of Crystal Lake. The spillway bordering Lynnfield is located on the Colonial Hilton Hotel property and is owned and operated by Lynn Water and Sewer Commission. This spillway directly impacts downstream properties along the Saugus River.

4.4 Winter Storms

A blizzard is a winter storm with sustained winds of 35 mph or more with visibility reduced to 0.25 miles or less for 3 hours. Cold temperatures are also usually associated with blizzards. When temperatures drop below 20 degrees Fahrenheit, the risk associated with blizzards increases significantly. Winter storms often include wind, ice, and heavy snow fall. Heavy snowfall is considered to be an event where at least four inches of snow falls within a 12-hour period.

NOAA's National Climatic Data Center (NCDC) is now producing the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two thirds of the United States. The RSI ranks snowstorm impacts on a scale from 1 to 5 and includes societal impacts. RSI ranking categories are listed in **Table 4-3** below.

Table 4-3: Regional Snowfall Index Rankings[1]

Category	Description	RSI Value
1	Notable	1-3
2	Significant	3-6
3	Major	6-10
4	Crippling	10-18
5	Extreme	18+

Winter storms are a common occurrence in Wakefield. Since 1988 there have been multiple storms that have been categorized with an RSI of 3 or higher in the Northeast that impacted Wakefield. Storms are listed in **Table 4-4** below.

Table 4-4: Significant Snow Events in the Northeast[2]

Storm Date	RSI Value	RSI Category
March 12, 1993	22.117	5
January 6, 1996	21.708	5
February 15, 2003	14.671	4
December 4, 2003	9.398	3
February 8, 2013	9.212	3
January 25, 2015	6.158	3
March 12, 2017	10.658	4

Wakefield maintains records from 2002 thru the current fiscal year of local winter storms. From Fiscal Year 2002 thru Fiscal Year 2019, Wakefield has received 1,132 inches on snow and responded to 375 snow and ice events, 137 of which have required sand or salt and plowing. The average snowfall over the past 17 years is 66.59 inches and the average snowfall over the last 5 years is 72.95 inches. The amount expended on snow and operations since 2001 is $14,251,378 or an overage of $793,965 per year. The average cost per year over the last five years is $1,091,357. While the number of events per year stay fairly constant, the average snowfall and cost have increased significantly.

Wakefield does not keep local records of winter storms for property damage. The best available data is for Middlesex County. According to NCDC records, from 1998 to 2018, Middlesex County experienced 69 blizzard or heavy snowfall events, resulting in $1,298,000 worth of property damage. No deaths or injuries were reported[3].

All of Wakefield is susceptible to winter storms. Typical impacts from winter storms are snow and ice build-up on power lines. This can affect water and sewer pump stations. Most stations have emergency power, but extended outages would present issues. Travel on roadways is hampered if snowplow crews cannot keep main roadways clear. The disruption to travel and its effect on businesses was of particular concern to MVP participants. Additional issues occur when temperatures drop below 15°F, when sodium

[1] National Centers for Environmental Information, Regional Snowfall Index (RSI), https://www.ncdc.noaa.gov/snow-and-ice/rsi/
[2] National Centers for Environmental Information, Regional Snowfall Index (RSI), Map Viewer, https://gis.ncdc.noaa.gov/maps/ncei/rsi
[3] National Centers for Environmental Information, Storm Events Database, https://www.ncdc.noaa.gov/stormevents/

chloride, or road salt, does not work. Extended cold spells can cause additional problems with infrastructure including water main breaks, which become a safety issue and detract personnel and resources from dealing with other storm related issues, including snow plowing.

4.5 Ice Storms

Ice storms occur when rain falls and freezes on contact with cold objects (land, trees, wires, etc.) creating ice-build ups or 1/4th inch or more. The buildup can cause major damage to trees and wires and result in poor road conditions. Ice storms can also be in the form of ice pellets or sleet.

Ice storms are more frequently in higher elevations of Western and Central Massachusetts. Between 1998 and 2018, only 4 ice storm events have impacted Middlesex County.

The entire town of Wakefield is susceptible to ice storms. Impacts are primarily public safety issues. Road and sidewalk conditions can make driving and walking dangerous. The weight of ice on tree branches can result in fallen branches and power lines making roads impassable or damaging buildings.

4.6 Nor'easter

A nor'easter, or northeast coastal storm, is typically a large counter-clockwise wind circulation around a low-pressure center that results in heavy snow, high winds, and rain. Nor'easters are relatively common in New England during winter months, occurring one to two times per year. The typical duration ranges between 12 hours and 3 days with speeds averaging 25 mph with a radius of 1,000 miles. Wind gusts can be up to 70 mph and sustained winds are typically between 10 to 40 mph.

Table 4-5 lists some previous nor'easters to impact Middlesex County as well as a short description of the event and property damage amounts for Middlesex County[4].

Table 4-5

Table 4-5: Nor'easter Events in Wakefield

Nor'easter Event	Description	Property Damage
Dec 2005	A fast-moving winter storm passing south of New England produced between 1 and 3 inches of snow across interior Massachusetts.	$100,000
Feb 2006	Snowfall totals ranged between 12 and 18 inches across central and eastern Massachusetts. Strong winds brought down tree limbs and wires and visibility was reduced to less than ¼ mile at times.	$10,000
Nor'easter Event	**Description**	**Property Damage**
Feb 2011	A series of significant heavy snow events occurred between December 26, 2010 and February 2, 2011. Snow for the winter season totaled 86.4 inches, most of which fell during this period. Across Massachusetts, numerous roof collapses due to heavy snow load occurred following the February 2nd storm.	$183,500
Mar 2018	This storm brought heavy snow to northwest Massachusetts, heavy rain and strong winds to central and eastern Massachusetts, and coastal flooding to the coastline. Moderate to major coastal flooding took place over three tide cycles due to astronomically high tides and a persistent northeast wind. This built a storm surge of two to four feet along the Massachusetts East Coast.	$75,000

[4] National Centers for Environmental Information, Storm Events Database, https://www.ncdc.noaa.gov/stormevents/

High winds that develop during nor'easters can cause damage to buildings and result in fallen trees and downed power lines. Rainfall can result in localized flooding of rivers as well as stormwater ponding from overwhelmed drainage catch basins. Flooding as well as downed trees and wires can block roadways and evacuation routes.

The entire town of Wakefield is at risk from the high wind, rain, or snow from a nor'easter.

4.7 HURRICANES/TROPICAL STORMS

Hurricanes are classified as a type of tropical cyclone and defined as closed circulation developing around a low pressure system which rotates counterclockwise in the Northern Hemisphere (clockwise in the Southern Hemisphere).

The National Hurricane Center classifies tropical cyclones into different categories based on the storm's intensity and wind speed. The weakest are tropical depressions, which are organized systems of clouds and thunderstorms with a defined surface circulation and sustained winds of 38 mph or less. A tropical storm is similar to a tropical depression but has sustained winds of 39-73 mph.

A hurricane has sustained winds of 74 mph or higher and contains strong thunderstorms. Hurricanes are categorized by wind speed. **Table 4-6** shows the Saffir-Simpson Hurricane Scale which is used to organize hurricanes into their 5 different categories as well as the classifications for tropical cyclones[5].

Table 4-6: Saffir-Simpson Hurricane Scale

Saffir-Simpson Scale for Hurricane Classification			
Strength	**Wind Speed (Kts)**	**Wind Speed (mph)**	**Typical Damage**
Category 1	64- 82	74- 95	*Some damage:* Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days
Category 2	83- 95	96-110	*Extensive damage:* Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Category 3	96-113	111-130	*Devastating damage:* Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Category 4	114-135	131-155	*Catastrophic damage:* Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months

[5] National Hurricane Center, https://www.nhc.noaa.gov/aboutsshws.php

Category 5	>135	>155	*Catastrophic damage:* A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Tropical Cyclone Classification			
Tropical Depression			20-34kts
Tropical Storm			35-63kts
Hurricane			64+kts or 74+mph

According to the Northeast States Emergency Consortium (NESEC), 25 hurricanes and 14 tropical storms have impacted New England since 1900. Of the 25 hurricanes to impact New England, 9 made landfall and 7 of those were classified as a category 2 or 3.

Table 4-7 lists hurricanes and tropical storms that have affected Wakefield since 1998.

Table 4-7: Hurricanes Affecting Wakefield 1998-2017

Hurricane/Tropical Storm Name	Date	Saffir/Simpson Category
Floyd	September 18, 1999	Tropical Storm
Irene	August 28, 2011	Tropical Storm
Sandy	October 29-30, 2012	"Super Storm"
Jose	September 20, 2017	Tropical Storm

Because of the regional nature of hurricanes and tropical storms, all of Wakefield is at risk. The town is impacted by high winds and rain of hurricanes and tropical storms, regardless if the storm tracks through the town.

Falling trees and branches from high winds are a significant problem because they can result in power outages or block traffic and emergency routes. Areas susceptible to flooding are also likely to be affected by heavy rainfall.

4.8 THUNDERSTORMS

Thunderstorms produce lightning and have the potential to create high winds, hail, and rain. They are typically 15 miles in diameter and last approximately 30 minutes. Severe thunderstorms can be much larger and last significantly longer. Thunderstorms are classified as severe when they produce wind gusts greater than 58 mph (50 knots), hail that is greater than 1 inch in diameter, or a tornado[6].

The three basic components for a thunderstorm to form are: moisture, rising unstable air, and a lifting mechanism. The sun heats the surface of the earth, which warms the air above it. If that warm air is forced to rise, it transfers heat to the upper levels of the atmosphere. The water vapor in that air begins to cool, releasing heat and condenses into a cloud. The cloud rises up, where the water vapors turn into ice and rain droplets. The ice particles have a positive charge and the rain droplets have a negative charge. Since they have opposite charges they build up and lightning is formed.

Thunderstorms are a common occurrence in southeastern Massachusetts. According to the State Hazard Mitigation Plan, Southern New England typically experiences 10 to 15 days per year with severe

[6] The National Severe Storms Laboratory, Thunderstorm Basics, https://www.nssl.noaa.gov/education/svrwx101/thunderstorms/

thunderstorms. **Table 4-8** lists previous occurrences of thunderstorms with measured winds of at least 50 knots in the Wakefield region since 1998 along with associated property damage costs.

Table 4-8: Thunderstorms in Wakefield Since 1998[7]

Date	Magnitude (knots)	Property Damage Reported
June 30, 2001	50	$0
July 31, 2009	50	$10,000
May 28, 2015	50	$2,000
August 4, 2015	50	$15,000

Severe thunderstorms are a town-wide hazard for Wakefield. Previous damage from severe thunderstorms in town has primarily been to trees and power lines. High winds can lead to fallen branches, power outages, and road blockages. Heavy rain during thunderstorms can also result in localized flooding.

4.9 TORNADOES

A tornado is a narrow, violently rotating column of air that extends from the base of a cumulonimbus cloud to the ground. There are two types of tornadoes: those that come from a super-cell thunderstorm and those that do not. Tornadoes that form from a super-cell thunderstorm are the most common and often the most dangerous.

A super-cell is a long-lived (greater than 1 hour) and highly organized storm feeding off an updraft that is tilted and rotating. This rotating updraft, as large as 10 miles in diameter and up to 50,000 feet tall, can be present as much as 20 to 60 minutes before a tornado forms.

Prior to 2007, Tornado damage severity was measured by the Fujita Tornado Scale, in which wind speed is not measured directly but rather estimated from the amount of damage. As of February 01, 2007, the National Weather Service rates tornadoes using the Enhanced Fujita-scale (F-scale). It is considerably more complicated than the original F-scale and allows surveyors to create more precise assessments of tornado severity. **Table 4-9** below illustrates the EF-scale.

Table 4-9: Tornado Fujita and Enhanced Fujita Scale and Typical Effects[8]

Fujita (F) Scale			Enhanced Fujita (EF) Scale		
F Number	**Fastest ¼ mile (mph)**	**3-second gust (mph)**	**EF Number**	**3-second gust (mph)**	**Description of Damage**
0	40 – 72	45 – 78	**0**	65 – 85	Light damage, tree branches broken, chimneys damaged, shallow-rooted trees toppled
1	73 – 112	79 – 117	**1**	86 – 110	Moderate damage, windows broken, roof surfaces peeled off, some tree trunks snapped, unanchored manufactured home overturned, attached garages may be destroyed

[7] National Centers for Environmental Information, Storm Events Database, https://www.ncdc.noaa.gov/stormevents/
[8] National Weather Service, Storm Prediction Center, https://www.spc.noaa.gov/faq/tornado/ef-scale.html

2	113 – 157	118 – 161	**2**	111 – 135	Considerable damage, roof structures damaged, manufactured homes destroyed, debris becomes airborne, large trees snapped or uprooted
3	158 – 207	162 – 209	**3**	136 – 165	Severe damage, roofs and some walls torn from structures, some small buildings destroyed, non-reinforced masonry buildings destroyed, most trees uprooted
4	208 – 260	210 – 261	**4**	166 – 200	Devastating damage, well-constructed homes destroyed, some structures lifted from foundations and blown some distance, cars blown some distance, large debris becomes airborne
5	261 – 318	262 – 317	**5**	Over 200	Incredible damage, strong frame homes lifted from foundations, reinforced concrete structures damaged, automobile-size debris becomes airborne, trees completely debarked

According to the Massachusetts State Hazard Mitigation Plan, areas at greatest risk of a tornado touchdown in Massachusetts run from central to northeastern part of the state. On average, six tornadoes touch down in the Northeast every year.

The most destructive tornado in New England history was the Worcester tornado of June 9, 1953. The F4 tornado hit at about 3:30 p.m. The funnel quickly intensified, carving a 46-mile path of death and destruction as it moved through seven towns. The twister tore through Barre, Rutland, Holden, Worcester, Shrewsbury, Westborough, and Southborough. It killed 94 people and left approximately 1,300 people injured. The National Storm Prediction Center has ranked this as one of the deadliest tornadoes in the nation's history. With wind speeds between 200 to 260 mph, the force of the tornado carried debris miles away and into the Atlantic Ocean. A music box and a 3-foot aluminum trap door were found about 35 miles away, according to the National Oceanic and Atmospheric Administration. Based on the extent of destruction, it was believed that this tornado may have been an EF5 — the most severe on the Enhanced Fujita Tornado Scale. Two other deadly tornadoes occurred later: the May 29, 1995 Great Barrington tornado, an EF4, which claimed 3 lives and injured 24; and the August 28, 1973 West Stockbridge tornado, an EF4, which killed 4 and injured 36.

Since 1968, there have been ten total tornadoes in Middlesex County. These ten tornadoes resulted in 1 death, 6 injuries and up to $4,301,000 in damages. **Table 4-10** summarizes these events.

Table 4-10: Tornado Events in Middlesex County[9]

Date	Fujita Scale	Fatalities	Injuries	Width (yds)	Length (mi)	Damage
7/11/1970	1	0	0	50	0.1	$25,000
10/3/1970	3	1	0	60	0	$250,000
7/1/1971	1	0	1	33	25.2	$25,000
11/7/1971	1	0	0	33	0.1	$250
7/21/1972	2	0	4	37	7.6	$2,500,000

[9] National Centers for Environmental Information, Storm Events Database, https://www.ncdc.noaa.gov/stormevents/

9/29/1974	3	0	1	33	0	$250,000
7/18/1983	0	0	0	20	0.4	$250
9/27/1985	1	0	0	40	0.1	$250
8/7/1986	1	0	0	73	4	$250,000
8/22/2016	1	0	0	400	0.85	$1,000,000

Tornadoes and their associated winds can cause damage to buildings, trees, and power lines. Evacuation routes may be blocked by downed trees and other debris.

Tornadoes are a town-wide hazard for Wakefield however damage due to tornadoes depends on the track of the tornado and is limited.

4.10 High Winds

According to the Massachusetts State Hazard Mitigation Plan, winds over 30 mph are considered to be potentially hazardous. As shown in **Figure 4-1**, Massachusetts is located within Wind Zone II, with wind speeds up to 160 mph. The entire state is also located within the hurricane-susceptible region.

Figure 4-2: Wind Zones in the United States[10]

[10] FEMA, Understanding the Hazards, https://www.fema.gov/pdf/library/ism2_s1.pdf

All of Wakefield is susceptible to high winds. Local hazards related to wind would most likely be due to falling trees and branches. Falling trees and branches can also impact power lines. The majority of structures would be less affected by any wind events because the State Building Code incorporates engineering standards to withstand specified wind load.

4.11 DROUGHT

A drought is a period of months or years when a region receives less than the normal amount of rainfall and develops a deficiency in its water supply. Drought is a normal, recurrent feature of climate. It occurs in virtually all climatic zones, yet its characteristics vary significantly from one region to another. It originates from a deficiency of precipitation over an extended period of time, usually two winters or more. This deficiency results in a water shortage for some activity, group, or environmental sector. The beginning of a drought is difficult to determine. Several weeks, months, or even years may pass before people know that a drought is occurring.

Massachusetts uses a multi-index system to determine the severity of a drought or extended dry period conditions. Drought levels are declared on a regional basis. Wakefield is within the northeast region of Massachusetts. A determination of drought is based on seven indices:

- Standard Precipitation Index (SPI) reflects soil moisture and precipitation
- Crop Moisture Index (CMI) reflects soil moisture conditions for agriculture
- Keetch Byram Drought Index (KBDI) is designed for fire-potential assessment
- Precipitation Index is a comparison of measured precipitation amounts to historic normal precipitation
- The Groundwater Level Index is based on the number of consecutive months groundwater levels below normal (lowest 25% of period of record)
- The Stream flow Index is based on the number of consecutive months that stream flow levels are below normal (lowest 25% of period of record)
- The Reservoir Index is based on the water levels of small, medium, and large index reservoirs across the state, relative to normal conditions for each month

Wakefield does not collect data relative to drought events. Because droughts are typically regional in nature, state data is the best available data for drought events.

Massachusetts is often considered a "water-rich" state. Under normal conditions, regions across the state annually receive between 40 and 50 inches of precipitation. The precipitation occurs nearly evenly throughout the year. However, Massachusetts can experience extended periods of dry weather, from single season events to multi-year events such as experienced in the mid-1960s. Historically, most droughts in Massachusetts have started with dry winters, rather than a dry summer.

Massachusetts has experienced multi-year drought periods in 1879-83, 1908-12, 1929-32, 1939-44, 1961-69, and 1980-83. During the summer of 2002, one-third of the country, including Massachusetts, experienced drought conditions. From July 2016 to January 2017, Massachusetts was under drought warning levels for most of the state.

The most severe drought on record in the northeastern United States was during 1961-69. Water supplies and agriculture were affected because of the severity and long duration of the drought. Precipitation was less than average beginning in 1960 in western Massachusetts and beginning in 1962 in eastern Massachusetts.

Since 1850, Massachusetts has reached a drought emergency five times and a drought warning five times.

Drought conditions affect Wakefield town-wide, but are especially visible around Crystal Lake, Lake Quannapowitt, and the Mill and Saugus Rivers. Based on previous occurrences, emergency drought conditions are a low frequency event.

The primary impact to a community from a drought is increased risk of wildfires and forest fires, damage to agricultural businesses, damage to the ecosystem, and reduction in water for human consumption.

4.12 Extreme Temperatures

Wakefield has four well-defined seasons. The town is susceptible to extreme heat in summer (June to August) and extreme cold in winter (December to February). Average temperatures for Boston for summer and winter are available through NOAA's National Weather Service Forecast Office. The average temperature for summer in Boston is 71.3°F. The average temperature for winter in Boston is 35.6°F. Record high temperature in Boston of 104°F occurred in July 1911. Record low temperature in Boston of -18°F occurred in February 1934.

4.12.1 Extreme Heat

Extreme heat for this region is typically defined as three or more consecutive days above 90° F, often accompanied by high humidity.

The National Weather Service issues a Heat Advisory if the heat index is measured at 100°F to 104°F for two or more hours. An excessive heat advisory is issued if the heat index reaches 105°F or greater for two or more hours. The heat index is shown in **Table 4-11.**

Table 4-11: Heat Index

	Temperature (°F)																
Relative Humidity (%)		80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
	40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
	45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
	50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
	55	81	84	86	89	93	97	101	106	112	117	124	130	137			
	60	82	84	88	91	95	100	105	110	116	123	129	137				
	65	82	85	89	93	98	103	108	114	121	128	136					
	70	83	86	90	95	100	105	112	119	126	134						
	75	84	88	92	97	103	109	116	124	132							
	80	84	89	94	100	106	113	121	129								
	85	85	90	96	102	110	117	126	135								
	90	86	91	98	105	113	122	131									
	95	86	93	100	108	117	127										
	100	87	95	103	112	121	132										

Category	Heat Index	Health Hazards
Extreme Danger	125 °F – Higher	Heat stroke highly likely

Danger	103 °F – 124 °F	Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity
Extreme Caution	90 °F – 103 °F	Heat stroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
Caution	80 °F – 90 °F	Fatigue possible with prolonged exposure and/or physical activity

Wakefield does not collect data on extreme heat events. The best available local data is for Middlesex County, through the National Climactic Data Center. From 1998 to 2018, there has been only one excessive heat day: July 6, 2010. No deaths, injuries, or property damages were reported in association with this event.

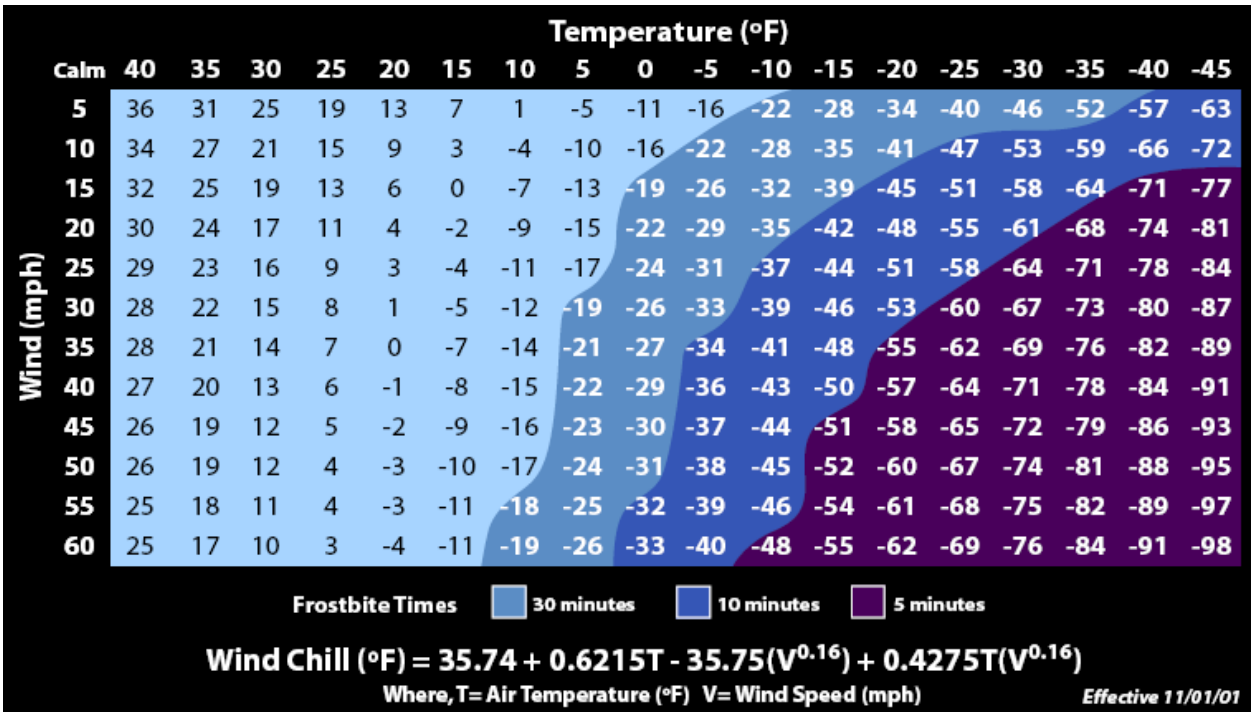
4.12.2 Extreme Cold

Extreme cold for this region is considered to be when temperatures are well below normal and accompanied by winds, which introduce wind chill factor that can be extremely harmful to exposed skin.

Extreme cold is typically measured through the Wind Chill Temperature Index. The National Weather Service issues a wind chill advisory if the wind chill is between -15°F to -24°F for three or more hours. A wind chill warning is issued if the wind chill is -25°F or colder for three or more hours.

The National Weather Service implemented a new Wind Chill Temperature Index in 2001 to more accurately calculate how cold air feels on human skin. The new Wind Chill Temperature Index is shown in **Table 4-12**. The Index also shows how long a person can be exposed to the cold and wind before frostbite develops.

Table 4-12: Wind Chill Temperature Index



Wakefield does not collect data on extreme cold temperature events. The best available local data is for Middlesex County, through the National Climactic Data Center. From 1998 to 2018, there have been three

extreme cold days: February 15, 2015; February 16, 2015; and February 14, 2016. No deaths, injuries, or property damages were reported in association with these events.

Extreme temperatures pose the greatest risk to human life. Elderly, children, and those without effective heating and cooling systems are at a greater risk, making senior housing and public housing especially vulnerable; however, everyone can be impacted by both extreme heat and extreme cold. The effects are experienced town-wide.

4.13 Wildfires

Fire hazards may be the result of lightning strikes, drought conditions, careless disposal of smoking materials and possible malicious acts. Wakefield has numerous areas throughout town that are large wooded forests.

These areas could pose accessibility issues for fire department crews. Crystal Lake, the Town's reservoir, has a large wooded perimeter which helps protect the water source. In addition, the Town has numerous parks that include wooded property. Most of these wooded areas are located within residential neighborhoods. Although the majority of past fires have been small brush fires the possibility of a forest fire endangering homes is possible. Some of the larger wooded areas within the town of Wakefield are:

- Mapleway Park (Town Forest)
- Crystal Lake (Town Reservoir)
- Breakheart Reservation
- West of North Avenue
- Southwest of Spring St
- East of Montrose Ave

Fire officials consider pitch pine, mixed conifer, oak and oak mixed forests to be the highest risk for wildfires.

4.14 Urban Fires

Structure fires are caused in many ways from human carelessness or intentional acts of arson, to accidents or natural causes, such as lightning strikes or earthquakes. As urban sprawl develops into wildland interface, structure fires can also affect nature if they cause the adjacent wildland to catch fire as well. Structure fires, depending upon their type, location and surrounding exposures may affect utilities, businesses and commerce, and transportation; cause injuries and/or fatalities; and cause the release of hazardous materials. Even though improved building codes and materials, fire alarm systems, sprinkler systems, code enforcement, fire service equipment and practices and public awareness have all combined to reduce the overall number of structure fires, they will never be eliminated from possibility.

In 2017, Fire Department records indicate 8 structure fires, 3 of which were two-alarm fires.

4.15 Earthquakes

Earthquakes occur without warning and may be followed by aftershocks. Earthquakes begin with slip of rock on either side of a fault, or crack in the earth. New England is located in the middle of the North American Plate where earthquakes appear to be the result of cracking of crustal rocks. The Richter scale is used to measure the magnitude of an earthquake. It expresses the seismic energy released by the

earthquake by determining the size of the greatest vibration recorded. Typical effects of earthquakes of various magnitudes are summarized in **Table 4-13** below[11].

Table 4-13: Earthquake Richter Scale and Typical Effects

Richter Magnitude	Earthquake Effects
<3.5	Generally not felt, but recorded.
3.5 – 5.4	Often felt, but rarely causes damage.
5.4 – 6.0	At most slight damage to well-designed buildings.
6.1 – 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 – 7.9	Major earthquake. Can cause serious damage over large areas.
≥8	Great earthquake. Can cause serious damage in areas several hundred meters across.

There have been three significant earthquakes in northeastern Massachusetts. A 4.3 earthquake, as measured on the Richter Scale, occurred in 1817 located in Woburn and two occurred in Cape Ann (Lynn), a 4.7 in 1744 and a 4.6 in 1761. According to the Massachusetts State Hazard Mitigation Plan, New England experiences an average of five earthquakes per year, although earthquakes of less than 3.0 are rarely felt.

There are five seismological faults in Massachusetts, but there is no discernable pattern of previous earthquakes along these fault lines. Fill, sandy, silty and clayey soils are more vulnerable to earthquake pressures than other soils.

Earthquakes precipitate several potentially devastating secondary effects including failure of bridges, roadways, buildings, utilities, water storage tanks, dam failure, train derailments, and motor vehicle accidents.

Wakefield is located on a fault line. A thrust fault runs directly through the northwest corner of Wakefield. A fault in which the hanging wall is the up-thrown side is called a thrust fault because the hanging wall appears to have been pushed up over the footwall. Such faults are formed by compressional forces that push rock together and are by far the most common of the dip-slip type faults.

The Town of Wakefield has numerous facilities that may be directly affected by an earthquake. Some of the possible facilities include the Harts Hill Water Tank, rupture of existing underground water and sewer lines, gas lines, and possible failure of the spillway structures at Lake Quannapowitt, Crystal Lake and Colonial dams. Wakefield also has a commuter rail line passing through the west side of town. These rail lines could be affected along with their bridges. Wakefield also has numerous bridges, particularly overpasses for Interstate 95/Route 128 that could be affected. Most buildings in the town were constructed without specific earthquake resistant design features.

4.16 Invasive Species

Invasive species are non-native species that cause or are likely to cause harm to ecosystems, economies, and/or public health. These species can monopolize natural communities, displacing native species because they are not restricted by the biological controls of their natural habitat.

[11] Michigan Technical University, Geological and Mining Engineering and Sciences, http://www.geo.mtu.edu/UPSeis/magnitude.html

In open freshwater ecosystems invasive species can spread quickly. There are generally no barriers to prevent establishment of the species. Increased rates of global trade and travel have significantly increased the frequency of invasive species introduction into natural environments.

Waterbodies, such as Crystal Lake and Lake Quannapowitt could be impacted if invasive species clog infrastructure and can impact recreational use of the Lake in addition to impacting public health and water quality.

5.0 CRITICAL FACILITIES

The original critical facilities list for the Town of Wakefield was compiled from the Comprehensive Emergency Management Plan (CEMP) and the Engineering Division. As part of the 2019 plan update, the Hazard Mitigation Planning team reviewed and revised the original list. The Critical Facilities Map in the **Appendix C** shows locations of critical facilities throughout the town. Critical facilities include emergency response facilities, schools, special needs facilities, utilities, and commercial facilities.

Appendix D lists critical facilities within Wakefield.

6.0 VULNERABILITY ASSESSMENT

The above described hazards affect the town differently. Certain areas and structures are more or less susceptible to various hazards. Town infrastructure is also affected differently by each type of hazard. These hazards and types of facilities have been ranked high (3) to low (1) vulnerability using the matrix below. This helps determine what type of facilities are most susceptible to what type of hazard. The vulnerability matrix is shown in **Table 6-1**

Using the scoring system helped identify the most significant type of natural hazard likely to affect critical facilities in town. Although earthquakes and tornadoes score higher than all other hazards they are less likely to occur than some others hazards that scored second highest including winter storms, nor'easter's, hurricanes/tropical storms, and high wind. Significant impact from these storms is related to flooding and wind hazards. This helps the Town determine which type of storms could impact the town more frequently with resulting damages and facilitates management to identify mitigating actions.

Table 6-1 Vulnerability Matrix

Critical Infrastructure	Winter Storms	Nor'easters	Hurricanes/ Tropical Storms	High Wind	Riverine Flooding	Dam Failures	Ice Storms	Drought	Extreme Temperatures	Invasive Species	Earthquakes	Thunderstorms	Tornadoes	Wildfires	Urban Fires	
Schools	3	3	3	3	1	1	3	1	3	1	3	1	3	1	1	31
Banks	1	1	1	1	1	1	1	1	1	1	3	1	3	1	1	19
Churches	1	1	1	1	1	1	1	1	1	1	3	1	3	1	1	19
Community Centers	1	1	1	1	1	1	1	1	3	1	3	1	3	1	1	21
DPW	3	3	3	3	1	1	3	1	1	1	3	1	3	1	1	29
Fire/Police	3	3	3	3	1	1	3	3	2	1	3	1	3	3	3	36
Gas Stations	2	2	2	2	1	1	2	1	1	1	3	1	3	1	1	24
Grocery Stores	2	2	2	2	1	1	2	1	1	1	3	1	3	1	1	24
Hotels	2	2	2	2	1	1	2	1	1	1	3	1	3	1	1	24
Library	1	1	1	1	1	1	1	1	1	1	3	1	3	1	1	19
Media	2	2	2	2	1	1	2	1	1	1	3	1	3	1	1	24
Mortuary	1	1	1	1	1	1	1	1	1	1	3	1	3	1	1	19
Nursing	3	3	3	3	1	1	3	1	3	1	3	1	3	1	1	31
Offices	1	1	1	1	1	1	1	1	1	1	3	1	3	2	1	20
Pharmacies	2	2	2	2	3	1	2	1	1	1	3	1	3	1	1	26
Sewer	3	3	3	3	1	1	3	1	1	1	3	1	3	1	2	30
Special Needs	3	3	3	3	1	1	3	1	3	1	3	1	3	1	1	31
Water	3	3	3	3	1	1	3	3	1	3	3	1	3	3	3	37
Water Tanks	3	3	3	3	1	1	3	3	1	3	3	1	3	3	3	37
Parks	1	1	1	1	1	1	0	1	1	3	3	1	3	1	1	20
Cemeteries	1	1	1	1	1	1	1	1	1	1	3	1	3	1	1	19
Wakefield Gas & Light Dept.	3	3	3	3	3	1	3	1	3	1	3	3	3	1	1	35
Galvin MS	1	1	1	1	1	1	1	1	1	1	3	1	3	1	1	19
Major Roads	3	3	3	3	3	1	3	1	1	1	3	1	3	1	1	31
Railroad	1	1	1	1	1	3	1	1	1	1	3	1	3	1	1	21
Breakheart Reservation	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	17
	51	51	51	51	32	28	50	32	37	32	76	28	76	35	33	

7.0 Existing Mitigation Actions

A lot has changed between the years 2007 and 2019. The 2019 Plan expands on its definition of hazard and includes more than the floods, winds, fires, earthquakes, and snow and ice hazards the 2007 Plan called out. The 2019 Plan also focuses a great deal more on sustainable development in its prioritization of recommendations than the 2007 Plan. The 2007 Plan allowed for the Town to prioritize routine maintenance while the 2019 Plan focuses itself on looking forward: communications, asset management, policy, large-scale replacement/ redevelopment projects, and energy upgrades. The table below describes existing mitigation measures in place in Wakefield. It includes a brief description of each measure.

Mitigation Measure	Summary
Floodplain District Zoning Bylaw	The Town has implemented a zoning bylaw to ensure land subject to 100 year storm flooding shall not be used for residence or endanger health, safety, or welfare. The Town bylaw provides that any part of a roadway or utility system within the floodplain is designed to minimize flood damage.
Fire Burn Permits	Permits are issued by the Fire Department during low-risk times to mitigate any unintentional fire hazards.
Tree Trimming Program	The Town has a yearly tree-trimming program conducted town-wide by the Forestry Division of the DPW. This program maintains trees to prevent damage during storms.
Catch Basin Cleaning Program	The Town currently has a catch basin cleaning program in place. The program is a 2-year cycle in which ½ of the Town's catch basins are cleaned by a clamshell truck each year. This removes debris that will ultimately reduce the capacity of the system. Approximately 200 catch basins located near water bodies are cleaned once a year.
Storm Maintenance	During significant rainfall events, DPW crews are deployed to maintain and monitor culverts and catch basins to prevent blockage from debris.
Waterway Maintenance Program	A brook maintenance program has been implemented to clear debris from the waterways in town.
Participation in the NFIP	Wakefield is a part of the NFIP. FEMA is currently updating FIRM mapping for the town. Updated mapping will allow for more accurate drainage and flood studies.
Stormwater Master Plan	Wakefield's Stormwater Master Plan was completed in April 2016. The plan identifies flooding areas within the town and recommends projects as well as operation and maintenance measures to improve the overall stormwater system.
Drainage System Mapping	Drainage System Mapping is currently an active project, started around June 2005, with potential mitigation measures. The program is a priority due to the fact this will help identify areas of concern due to blockages or flow restriction issues. These issues are more likely to be addressed due to the minimal economic and administrative costs. The mitigation impact in most cases would cover a broader area as compared to a single point.
Storm Culvert Trash Rack Project	Storm culvert trash racks have been installed to protect culverts and pipes from debris accumulations and clogs. The SOP for trash rack maintenance was recently updated.

Addition of a Stormwater Manager Position	With the Phase II MS4 NPDES permit requirements and the other challenges associated with the complex stormwater system in town; a stormwater manager was hired for the Town.

8.0 Potential Mitigation Actions

The table below describes potential mitigation measures identified by the Wakefield Hazard Mitigation Planning Team. It includes a brief description of each measure and evaluates potential impact and feasibility.

8.1 Impact

The planning team analyzed mitigation impact of each proposed action, regardless of cost and other constraints. The goal was to determine if cost were a non-issue, which actions would have the most benefit. Impacts were categorized as high, medium, or low based on the following parameters:

- **High Impact** – actions that help mitigate several hazards, substantially reduce loss of life and property, and/or aid a relatively large portion of the community.
- **Medium Impact** – actions that help mitigate multiple hazards, somewhat reduce loss of life and property, and/or aid a sizeable portion of the community.
- **Low Impact** – actions that help mitigate a single hazard, lead to little or no reduction in loss of life and property, and/or aid a highly localized area.

8.2 Feasibility

After ranking each mitigation action based on its potential impact, other factors were considered such as cost and cost effectiveness, project timing, political and public support, and the local administrative capabilities.

- **High** – actions that have obvious impacts that clearly justify costs and can be funded to a large degree, can be completed in an appropriate timeframe, can be administrated efficiently and are supported locally.
- **Medium** – actions that have some clear impacts that generally justify costs and generally can be funded, can be completed in an appropriate timeframe, can be administrated effectively, and are locally supported
- **Low** – actions that have low impacts that do not necessarily justify costs and may have difficulty being funded, completed in an appropriate timeframe, administrated effectively, and locally supported.

8.3 Estimated Costs

A rough cost estimate was developed for each mitigation action based on available third-party or in-house estimates and past experiences. Cost estimates include construction, engineering, and Town staff time as appropriate. In cases where detailed and current estimates were not generally available, costs were summarized within the following ranges:

- **Low** – less than $50,000
- **Medium** – between $50,000 and $100,000
- **High** – more than $100,000

8.4 Proposed Mitigation Actions

Mitigation Measure	Summary	Mitigation Impact	Cost	Feasibility
Flow Gauging Installation	3 Permanent flow gauging stations are recommended to assist in providing real-time monitoring of storm events and their direct impacts on critical locations in the drainage system. They are recommended for the outlet from Crystal Lake, Colonial dam, and the confluence of the Mill and Saugus Rivers. It will allow the Town to fine tune the pre-releases of water from Crystal Lake and Lake Quannapowitt.	High	Low	High
Improve Asset Management	Improving the inventory though expanded GIS will allow the Town to make better decisions regarding the deficiencies in the system and track maintenance of the system.	High	Low	High
Implement 10-year Stormwater Cleaning System	It is recommended to begin routine inspection and cleaning of the Town's stormwater system. The Town should implement a 10-year program to clean and inspect all stormwater pipelines in the system. This will assist in the identification of potential system failures due to maintenance and condition issues.	High	Low	High
Increase Public Outreach	Public Education is important. The Town has considerable information available on the stormwater system. Increasing the methods and frequency of outreach will improve the public's understanding and assistance in the management of the community's stormwater system. This is in conformance with the Phase II MS4 NPDES permit.	High	Low	High
Update Development Regulations	The Town regulations for Development/ Redevelopment should be updated. Current regulation and standards are limited in their ability to reduce the impacts of development on the stormwater system. Increased requirements will allow the Town to return the stormwater system to more stable function.	High	Low	High
Include Green Infrastructure in Town projects	Include Green and Low Impact Development (LID) infrastructure in Town projects. The Town is the largest owner of impervious surface and reducing the impacts of the impervious area is a key component of the long-term sustainability of the stormwater system. The construction of this infrastructure will also counteract the impacts from pervious development. This is also a key component of the draft Phase II MS4 NPDES permit. An annual budget should be developed to provide funds to be added to the ongoing roadway improvements projects such that Green/LID improvements can be incorporated.	High	Low	High
Expansion of the Hydraulic Model	The expansion of the GIS will allow for the improvement to the model to provide for better assessments of the impacts from private developments. It will provide the Town with specific information on the conveyance system to prevent negative impacts from the development and redevelopment that occurs within the community.	High	Medium	High
Improving GIS System	Improved GIS will assist in the operation of the system and provide information to staff in a timely and efficient manner.	High	Medium	High

Mitigation Measure	Summary	Mitigation Impact	Cost	Feasibility
Snow Removal Equipment	It would help the Town immensely to have equipment for snow removal in order to be better prepared for winter storms, to keep the public right of ways safe and accessible for all vehicles, especially emergency vehicles.	High	Medium	High
New Salt Shed	A salt shed is extremely important in order to prevent the salt from washing away during inclement weather. It also protects the habitats and the animals in the surrounding areas by ensuring that the salt does not end up in the water bodies or in the soils in those areas.	High	Medium	High
Repair Piped Conveyance at New Salem Street	Repairs to the piped conveyance are recommended in the New Salem Street Area.	High	Medium	High
Wireless Communication	Wireless Communication Devices between departments will ensure the safety throughout the Town, and will encourage better communication between departments.	High	Medium	High
I/I Projects	Projects that reduce the amount of water inflow and infiltration into the sewer system are critical and will help the environment and public health, by making sure there is no system overflow during heavy rain events and ensuring capacity exists to meet wastewater needs.	High	High	High
Replace Cast Iron and Steel Gas Mains	This initiative will ensure newer and safer gas mains for the entire town	High	High	High
Annual Catch Basin Cleaning	The catch basin cleaning program currently consists of annual cleaning of half of the town. The potential mitigation measure would be to complete the entire town cleaning annually.	Medium	Low	High
Generator at Town Hall	Providing a generator to the Town Hall would allow for important functions of the Town to continue in the event of power loss.	Medium	Low	High
Updated Town wide Drainage Study	Drainage studies help give a clearer understanding of the flooding potential in town and would allow the Town to create better solutions to that flooding based on the additional knowledge.	Medium	Medium	High
I/I Studies	I/I studies help decide where to work and what method is most effective to fix the I/I problem.	Medium	Medium	High
Generators at Schools without them	Providing Generators to schools without in the event of emergencies. Additionally in the event of an extreme weather event, having generators at these locations would help residents if the town lost power for an extended period of time.	Medium	Medium	High
Upgrade Generator at Greenwood School	Upgrading the generator at Greenwood School is essential to protecting an especially vulnerable community in the event of a power outage caused by extreme weather or other causes.	Medium	Medium	High
Generator at pump stations	Having a generator at the pump stations is essential so that in the event of a power failure there is no back up of sewage.	Medium	Medium	High

Mitigation Measure	Summary	Mitigation Impact	Cost	Feasibility
Portable pumps	Portable Pumps would be an asset to Wakefield in the event of major flooding at critical facilities	Medium	Medium	High
Generator for Media	Providing a generator for media is important to be able to send out critical messages and alerts even in the event of a power outage caused by extreme weather or other causes.	Medium	Medium	High
Water Treatment Enhancement	Enhancing the water treatment in Wakefield would be important to be able to ensure that the residents of Wakefield have clean safe drinking water at all times and protect against bacteria in water sources.	Medium	Medium	High
Upgrade Pipe Network at Grafton Street Area	Upgrades to the major pipe network to increase capacity to meet the 10-year, 24-hour storm are recommended.	Medium	High	High
Replace 1928 Water Tank	Replace old water tank that is deteriorating and if collapsed would reduce availability of potable water and risk human life.	Medium	High	Medium
Farm Street Sewer Pump Station Flooding Alleviation Design	The sewer pump station is at risk of flooding, which could damage the pumps and equipment inside the station and lead to sewage backups. A design of a new sewer pump station is critical to ensure continued operation of the existing system.	High	Medium	Medium
New Public Works Facility	A new Public Works facility would be an improvement to the town at large because it would improve the day to day operations of the Public Works department, which would then affect the operations of the town at large.	High	High	Medium
Upgrade/ Increase Capacity of Major Pipe network	Emerson Street, North Avenue, Church Street Area. Upgrades to the major pipe network to increase capacity.	High	High	Medium
Upgrade the conveyance capacity on the Wakefield Brook Conduit	Upgrades to the conveyance capacity on the Wakefield Brook Conduit are needed which will alleviate flooding in Foundry Street Area & Galvin Middle School Area. Project includes construction of a parallel conduit to meet the 10-year, 24-hour storm.	High	High	Medium
Increase Tree Trimming	The Town currently trims trees on a yearly basis. A program that allows for tree trimming on a 2 or 3 times a year cycle would benefit the town throughout the year and prevent additional incidents. This program would also allow for the inspection and documentation of the trees within town to better identify potential hazard areas.	Medium	Low	Medium
Tank Replacement Study	This study would better inform the decision of whether or not to replace the 1928 tank.	Medium	Low	Medium
Equipment Storage	Equipment storage is extremely important in order to prevent the dirt, grease, and oils from washing away during inclement weather. It also protects the habitats and the animals in the surrounding areas by ensuring that the debris from the trucks does not end up in the water bodies or in the soils in those areas.	Medium	Medium	Medium

Mitigation Measure	Summary	Mitigation Impact	Cost	Feasibility
Flood-proofing	Flood proofing is recommended to mitigate flood damage to houses in the Ware Street and Greenwood Street Area.	Medium	Medium	Medium
Upgrade Pipe Network at Farm Street Brook	Upgrades to the major pipe network to increase capacity to meet the 10-year, 24-hour storm are recommended.	Medium	High	Medium
Flooding at Wiley Street	A resident's home continually has flooding issues severely impacting the property. A possible mitigation measure is to obtain funding to alleviate some of the flooding issues to possible include raising home and dredging drainage channels.	Low	Low	Medium
Establish a Stormwater Utility	Establishing a stormwater utility will provide a source of revenue for the additional expenses required to fund the program improvements.	High	Low	Low
Wallace Sub-Station Flooding Alleviation Design	Replacement of the Wallace electric sub-station is necessary to alleviate flooding concerns at the existing station.	High	Medium	Low
Redevelopment of the Channel in Reedy Meadow	Improvements in the Paon Boulevard area included the redevelopment of the channel in Reedy Meadow and the elimination of the flow diversion through the abandoned railroad.	High	High	Low
Install Weir Control at the Colonial Dam	In the Saugus River area, it is recommended that a weir control is installed at the Colonial Dam.	High	High	Low
Restoration of the Mill River Channel	The existing channel contains significant sediments, which increases the likelihood of flooding from relatively minor storm events. This affects the Mill River at New Salem Street area, Mill River at Water Street, and Wiley Street Area.	High	High	Low
Increasing Water Storage	Increased water storage is another way to safeguard against drought and water shortage and is important in making sure residents are never out of water.	Medium	High	Low
Increase Water Supply	Increasing the water supply will ensure that the residents of Wakefield are never without water. In the event of a drought or a fire that uses a lot of water the town is at greater risk of a water shortage.	Medium	High	Low
Snow Melt Equipment	New snow melt equipment allows the Town to be better prepared for winter storms, to keep the public right of ways safe and accessible for all vehicles, especially emergency vehicles.	Medium	High	Low
Construct outlet to Reading Drainage Canal	Create a formal flow channel across the Putnam Avenue Pipeline on its way to the Reading Drainage Canal. This project provides for the construction of an outlet from the area to the Reading Drainage Canal.	Medium	High	Low
Pipe Upgrade in Sunset Drive Area	The 10 year, 24-hour pipe upgrade should be implemented in this problem area.	Medium	High	Low

Mitigation Measure	Summary	Mitigation Impact	Cost	Feasibility
Improve System Hydraulics	In the Crescent Street area it is recommended to upgrade and improve the system hydraulics and convey a 10-year storm.	Low	High	Low
Broadway culvert and North Ave drainage ditch	The possibility of culverting of the drainage ditch would improve the flow and minimize the backups. This area has been improved using a modified trash rack that allows for easy clearing of debris.	Low	High	Low

8.5 MVP Mitigation Actions

As part of the MVP process, stakeholders at the Workshop identified additional strategies to address vulnerabilities caused by climate hazards. Below are the top actions that came out of those workshops for each of the three MVP categories. The complete Summary of Findings Report for MVP can be found in **Appendix H.**

Infrastructure:

- Build a new DPW facility, potentially with neighboring town
- Expand and promote energy efficiency and solar programs, including PACE with the utility
- Seek grant funding to fulfill road rehabilitation priorities
- Build a storage facility for deicers and a new salt shed
- Asset management for sewer system

Societal:

- Inventory at-risk populations to help prioritize services during/after emergencies
- Install generators at critical facilities
- Create an “emergency equipment” trade program (sump pumps, dryers, etc.) for residents
- Develop a pet evacuation plan
- Start a town-wide education and engagement campaign on preparedness including providing preparedness kits with targeted messages to different audiences

Environmental:

- Finish and implement Lake Quannapowitt study
- Develop and implement a Lake Quannapowitt Protection Overlay Zone that restricts fertilizer use and promotes appropriate tree, shrub, and plant species
- Pursue purchase of water supply land for permanent protection
- Implement a tree replacement program

9.0 Plan Adoption and Maintenance

9.1 Plan Adoption

A public meeting was held on May 30, 2019 as part of the Town Council meeting in order to detail the planning process to date and to solicit comments and feedback from the public on the draft Wakefield Hazard Mitigation Plan then being developed. An online public opinion survey was created and a link was provided on the Town's website as well as social media outlets to solicit input from the public on natural hazards as they relate to the town of Wakefield. Hard copies of the survey were also made available at the Town library. Results from the survey can be found in **Appendix E**. The final plan was presented to the Wakefield Town Council and adopted on June 10, 2019. The Plan was then revised to include comment from MVP's Summary of Findings Report in February 2020.

9.2 Plan Monitoring and Evaluation

Monitoring, evaluating and updating the Hazard Mitigation Plan are an important step in creating an effective plan. The DPW Engineering Division, with the assistance of the Hazard Mitigation Team, shall monitor, evaluate and update the plan.

A scheduled annual review of the plan by the Hazard Mitigation Team will be conducted. The Hazard Mitigation Team will review the hazard mitigation measures that have been implemented to that date and determine if these measures have impacted the overall hazard. This review will include site visits to appropriate locations where these measures have been implemented. Mitigation measures that have not been implemented will be reviewed to determine if they will still minimize natural hazards or if they are no longer a viable option. Additionally, the Hazard Mitigation Team will determine any new options to include in an update of the plan. Through the MVP process, the Town of Wakefield, developed a Climate Resilience Framework that can be used specifically for evaluation and prioritization of actions. The Framework consists of 4 Value Areas- Equity, Greenhouse Gas Reduction, Regional Collaboration, and Resilience. Each Value Area was built out into criteria in four themes- Community Engagement, Infrastructure, Social-Economic, Environmental. The complete Climate Resilience Framework can be found in **Appendix I**.

Evaluation of the Hazard Mitigation Plan in its entirety will be done on a 5-year basis in accordance to the Disaster Mitigation Act of 2002 or any significant natural hazard disaster. The plan will be updated with possible new mitigation measures and plans of action as determined from the review. This allows for updates to be made as the town grows and changes. The DPW Engineering Division will oversee the Hazard Mitigation Team's involvement in the review and updating process. Updating the priorities and status of mitigation measures will also be readjusted accordingly at that time also. Progress reports from the responsible departments will be submitted for review on current mitigation measures that have been implemented.

In addition to the periodic evaluation of the Hazard Mitigation Plan, the Town will take steps to integrate the data, goals, and actions from the Hazard Mitigation Plan and the MVP Summary of Findings Report into other planning processes going forward. This will be accomplished by coordination and engagement of the Core Team members and application of the Climate Resilience Framework. The Town also anticipates establishing a checklist for how to incorporate climate data and hazards into daily operations.

The public will have numerous opportunities to submit feedback and solicit comments from the Town regarding the plan. The residents and businesses shall be notified when Hazard Mitigation issues are brought to the Town Council. This will be done using local papers, the Daily Item and The Chronicle, and the Town's website. In addition, a quarterly newsletter is sent out by the DPW containing any important

new information. This newsletter is sent to all water and sewer customers. Through the MVP process, the Town is developing an Envision Wakefield Resilient Community Dashboard that will highlight the work completed through both processes and be a resource for the community on climate hazards and easy steps they can take to be part of the solution. The dashboard will also track progress toward Wakefield's identified goals. By including the continued involvement of the residents and businesses, the Town can identify if mitigation measures are working or if new measures will need to be adopted. These recommendations will be brought through the DPW Engineering Division for review. Any notifications or bulletins will be posted on the Town's website and at the Town Hall. Additional information or meetings may be combined with the Town Council's Meetings, Annual Town Meeting or public meetings may be held for specific events or issues as determined by the Hazard Mitigation Team.

APPENDIX A

- **HMP Meeting #1 Agenda**
- **HMP Meeting #1 Sign-In Sheet**
- **HMP Meeting #2 Agenda**
- **HMP Meeting #2 Sign-In Sheet**
- **HMP Meeting #3 Agenda**
- **HMP Meeting #3 Sign-In Sheet**

IMPROVING COMMUNITIES TOGETHER

MEMORANDUM

Date: February 19, 2019 Job No.: 6451

To: Hazard Mitigation Plan Update Committee

Cc:

From: Andrew Dennehy, PE

Subject: Committee Meeting No. 1 – Agenda and Required Information

What needs to be done to complete hazardous mitigation plan:

A. Create Hazard Profiles
    a. Update 2011 Risk Assessment
    b. Include all natural hazards identified in Massachusetts State Hazard Mitigation Plan

B. Critical Facility Inventory
    a. List of 'critical facilities' in Town
    b. How are they impacted by identified hazards

C. Vulnerability Assessment
    a. What hazard is Town most vulnerable to
    b. What populations are most impacted
    c. Current hazard protection measures and regulations

D. Mitigation Goals and Actions
    a. List of goals that focus on reducing risk from natural hazards
    b. Mitigation actions and projects to meet mitigation goals

BETA
IMPROVING COMMUNITIES TOGETHER

MEETING SIGN-IN SHEET

Date: February 28, 2019 **Town:** Wakefield **Job No.:** 5816

Time: 3:00 PM **Mtg Location:** Wakefield Town Hall

Meeting Topic: Hazardous Mitigation Plan

NAME	AFFILIATION	EMAIL	PHONE
Chris Pierce	Buildings manager	CPierce@wakefield.ma.us	781-760-1325
RICHARD STINSON	DPW Director	rstinson@wakefield.ma.us	781 246-6307
Claire Moss	public works	cmoss@wakefield.ma.us	781.246.4110
JOE CONWAY	Public Works	JCONWAY@WAKefield.MA.US	781-246-6306
Todd Bowden	IT	tbowden@wakefield.ma.us	781-246-6350
Katie Lafferty	DPW Engineering	~~Kat~~ Klafferty@ " " "	246 6309
Ruth Clay	Health Dept	rclay@ "	246-6375
BILL RENAULT	PUBLIC WORKS	wrenault e " "	" " -6308
Douglas J. Lyons	Wakefield Public Schools	doug.lyons@wpsk12.org	781.246.6400
Gene Sullivan	WMGLD	esullivan@wmgld.com	781 224 5068
steve maio	Town Admin	SMaio@Wakefield.MA.US	781-246-6390
PAUL READIE	TOWN PLANNER	preadie@wakefield.ma.us	781-246-6397
Julie Smith-Galvin	town Council	councilor.galvin@wakefield.ma.us	781 606 1233

MEMORANDUM

Date: March 3, 2019 Job No.: 6451

To: Hazard Mitigation Plan Update Committee

Cc:

From: Andrew Dennehy, PE

Subject: Committee Meeting No. 2 – Agenda and Required Information

What needs to be done to complete hazardous mitigation plan:

A. Risk/Vulnerability Assessment
   a. Review hazards the Town is most vulnerable to
   b. What populations are most impacted
   c. Current hazard protection measures and regulations

B. Mitigation Goals and Actions
   a. List of goals that focus on reducing risk from natural hazards
   b. Current mitigation actions and projects to meet existing mitigation goals
   c. Future mitigation actions and projects to meet updated mitigation goals

BETA
IMPROVING COMMUNITIES TOGETHER

MEETING SIGN-IN SHEET

Date: March 14, 2019 **Town:** Wakefield **Job No.:** 5816

Time: 2:00 PM **Mtg Location:** Wakefield Town Hall

Meeting Topic: Hazardous Mitigation Plan –Meeting 2 Sheet **1** of **2**

NAME	DEPARTMENT	EMAIL	PHONE
Tom Walsh	Emergency Mgmt	twalsh@wakefield.ma.us	339-219-4614
Gene Sullivan	WMGLD	gsullivan@wmgld.com	781-246-6362
Kara Runsten	KLA	krunsten@kimlundgrenassociates.com	
David West	DPW Advisory Board	DAWest1701@aol.com	781-246-4927
Claire Moss	Public Works	cmoss@wakefield.ma.us	781-246-4110
Chris Pierce	DPW	CPierce@WAKefield.MA.US	781-760-1325
Bill Renault	DPW	wrenault@wakefield.ma.us	781-246-6308
Todd Bowden	IT	tbowden@wakefield.ma.us	339-219-4545
Paul Reavis	Town Planner	preavis@wakefield.ma.us	781.246.6397
Michael Sullivan	Fire Chief	msullivan@wakefield.ma.us	781-246-6435

IMPROVING COMMUNITIES TOGETHER

MEMORANDUM

Date: May 14, 2019 Job No.: 6451

To: Hazard Mitigation Plan Update Committee

Cc:

From: Andrew Dennehy, PE

Subject: Committee Meeting No. 3 – Agenda and Required Information

What needs to be done to complete hazardous mitigation plan:

A. Prioritization of Proposed Mitigation Actions
   a. Discuss impact and feasibility of Stormwater Projects
   b. Review actions and rank
   c. Assign responsibility

B. Address BETA Questions
   a. Should we name individual committee members?
   b. Does additional Planning information existing?

C. Implementation and Responsibility

D. Receive Committee Comments

E. Discuss Public Outreach and Plan Implementation

BETA
IMPROVING COMMUNITIES TOGETHER

MEETING SIGN-IN SHEET

Date: May 14, 2019 **Town:** Wakefield **Job No.:** 5816

Time: 2:00 PM **Mtg Location:** Wakefield Town Hall

Meeting Topic: Hazardous Mitigation Plan –Meeting 3

NAME	DEPARTMENT	EMAIL	PHONE
David West		DAWest1701@aol.com	617 620 3620
Andy Dennehy	BETA	adennehy@beta-inc.com	781.255.1982
Kim Lundgren	KLA	kim@kimlundgrenassociates.com	617 820 8038
Maggie Peard	KLA	maggie@kimlundgrenassociates.com	(203) 907-9995
Angela Cleveland	KLA	angela@kimlundgrenassociates.com	603-305-5385
Christopher Pierce	Building Manager	CPierce@WAKEfield.MA.US	781-760-1325
Bill Renault	Public Work-Engineering	wrenault@	(978)500-2245
Tom Walsh	Emergency Mgmt	twalsh@wakefield.ma.us	339-219-4614
Claire Moss	Public Works	cmoss@wakefield.ma.us	339.246.4110
Jennifer McDonald	Communications	JMcDonald@wakefield.ma.us	339-219-4035
Richard Stinson	Public Works	rstinson@wakefield.MA.US	781-246-6307
Elaine Vreeland	Conservation	JGREEN@Wakefield.ma.US	781.224-5015
Ruth Clay	Health	rclay@wakefield.ma.us	781-246-6375
Gene Sullivan	WMGLD	esullivan@wmgld.com	781-224-5068

Meeting Sign-In Sheet (Continued)
Hazardous Mitigation Plan –Meeting 3
May 14, 2019

NAME	DEPARTMENT	EMAIL	PHONE
Bob Schiaroli	WPS Dept.	bob.schiaroli@wpsk12.org	781-258-0764
Steve Maio	Town Adm.	smaio@wakefield.ma.us	781-246-6350
Paul Reavis	Town Planner	preavis@wakefield.ma.us	781-246-6397

APPENDIX B

- **Wakefield FEMA Flood Zone Map**

FEMA FLOOD ZONES

TOWN OF WAKEFIELD

MIDDLESEX COUNTY, MASSACHUSETTS

N

W E

S

Legend

- Town Boundary
- Buildings

FEMA National Flood Hazard Layer

Flood Zone Designations

- A: 1% Annual Chance of Flooding, no BFE
- AE: 1% Annual Chance of Flooding, with BFE
- AE: Regulatory Floodway
- D: Possible But Undetermined Hazard
- X: 1% Drainage Area < 1 Sq. Mi.
- X: Reduced Flood Risk due to Levee
- Area Not Included
- Area with no DFIRM - Paper FIRMs in Effect

MAP CREATED BY: BEAT GROUP, INC. IN FEBRUARY OF 2019
DATA MAY BE PROVIDED BY MASSGIS, EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS AND THE TOWN OF WAKEFIELD

BETA

APPENDIX C

- **Wakefield Critical Facilities Map**

CRITICAL INFRASTRUCTURE

TOWN OF WAKEFIELD

MIDDLESEX COUNTY, MASSACHUSETTS

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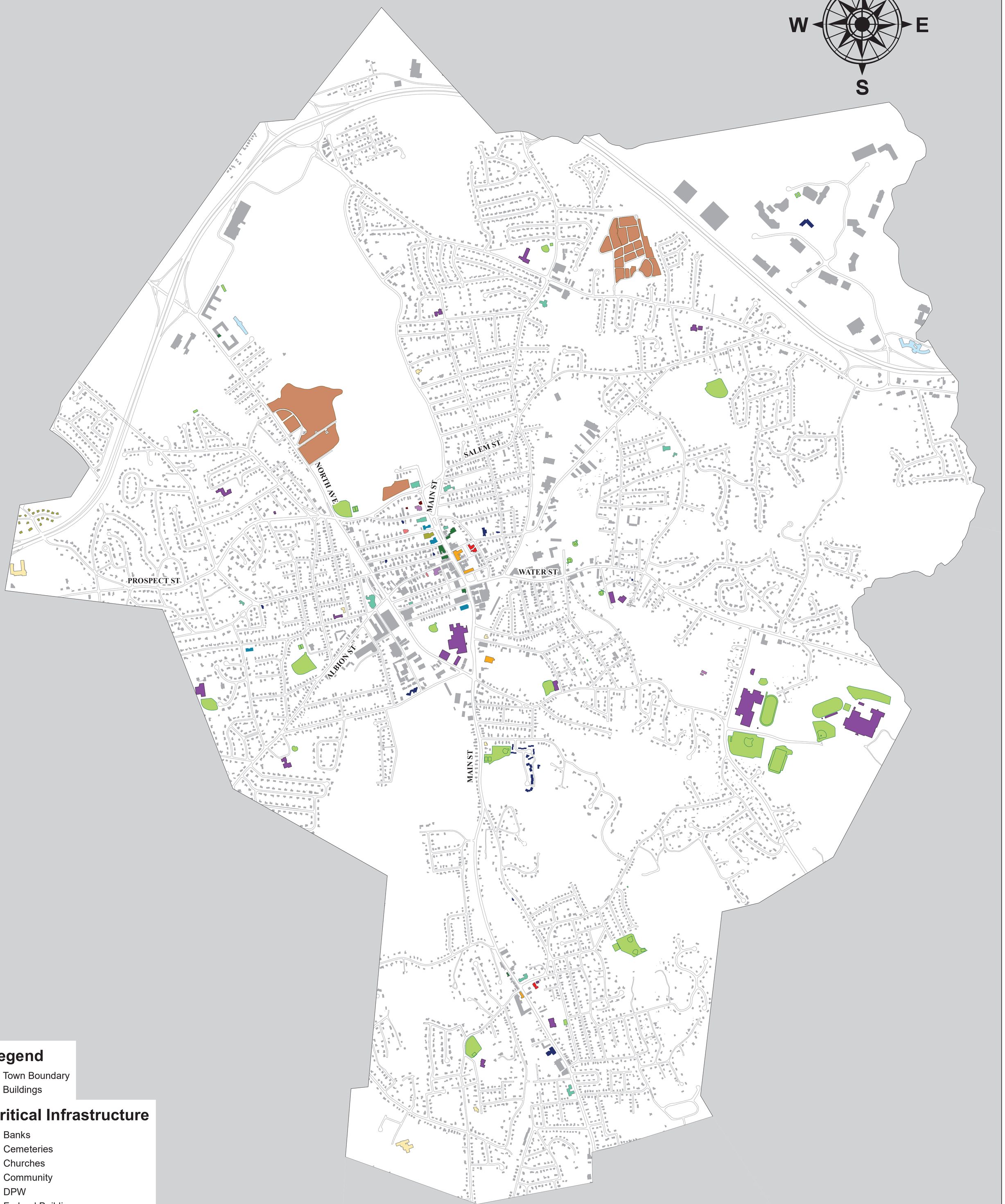


Legend

- Town Boundary
- Buildings

Critical Infrastructure

- Banks
- Cemeteries
- Churches
- Community
- DPW
- Federal Buildings
- Hotels
- Media
- Mortuary
- Nursing
- Offices
- Parks
- Pharmacy
- Policea nd Fire
- Schools
- Special Needs

MAP CREATED BY: BEAT GROUP, INC. IN FEBRUARY OF 2019
DATA MAY BE PROVIDED BY MASSGIS, EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS AND THE TOWN OF WAKEFIELD

BETA

APPENDIX D

- **Wakefield Critical Facilities List**

Wakefield Critical Facilities

Category	Description
Banks	Cooperative Bank
	Eastern Bank
	Savings Bank
	Savings Bank Greenwood
	Savings Bank Lakeside
	Santander
Cemetery	Forest Glade Cemetery
	Lakeside Cemetery
Church	Emmanuel Episcopal Church
	First Parish Congregational
	Greenwood Union Church
	Mansusa Buddhist Temple
	Most Blessed Sacrament Church
	St. Florence Church
	St. Joseph's Chruch
	St. Sava Serbian Orthodox Church
	Temple Emmanuel
	Unitarian Universalist Church
	Wakefield-Lynnfield United Methodist
Community Center	Americal Civic Center
	Senior Center
	Food Pantry
	Boys and Girls Club
	McCarthy
DPW	DPW Facility - North Avenue
	Nahant Street Pit
	William J. Lee Memorial Town Hall
Roadway	Farm Street Bridge
	Salem Street/Lynnfield Bridge
	Meriam Street Bridge
	Water Street/Rte. 129 Bridge
	Wiley Street Bridge
	Main St/Lowell St
Pharmacy	CVS Pharmacy
	Medicine Store Pharmacy
	Smith Drug
	Walgreens Pharmacy
Substation (Electric)	National Grid - underground line
	Farm St
	Wallace - Salem St
	National Grid - Montrose
	Farm St Solar Substation
	McGrail Substation
Mortuary	McDonald Funeral Service
Other	VCA Wakefield Animal Hospital
	MLD Light & Gas
	Cell Phone Towers
	9-11 Albion St
	Ngrid Lynnfield
	Best Friends Pet Hospital
Schools	Dolbeare School
	Doyle School
	Galvin Middle School
	Greenwood School
	Northeast Regional Vocational School
	St. Joseph's School
	Wakefield Memorial High School
	Walton School
	Woodville School
	Post Academy
	Warren School
	Wakefield KinderCare
	Harris M. Dolbeare School
	Happy Hearts Preschool
	Golden Rule Preschool
	Canterbury Children's Center
	Children's Gathering
	Doyle Early Childhood Center
	Children's Center
	Bee Happy Home Daycare
Sewer Stations	Baystate Road Sewer Lift Station
	Farm Street Sewer Pumping Station
	Lakeview Avenue Sewer Lift Station
	Main and Central Street Sewer Lift Station
	Plaza Road Sewer Lift Station
	Pleasure Island Sewer Pump Station
	Spaulding Street Sewer Lift Station
	West Park Drive Sewer Pump Station
	Findley

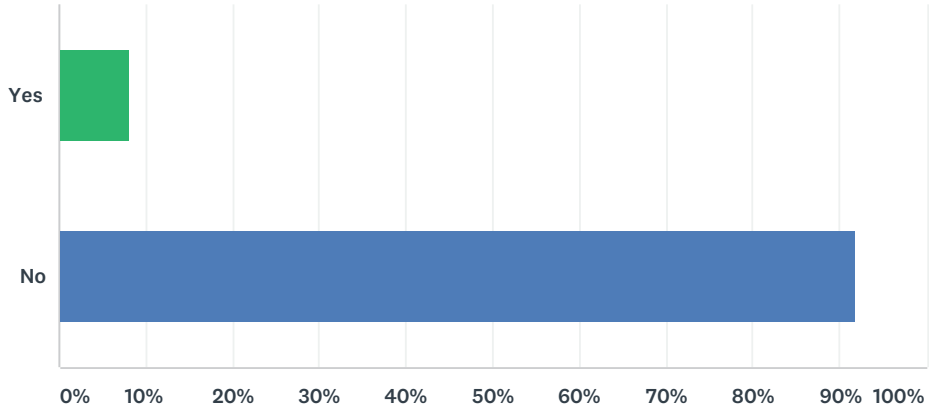
Category	Description
Library	Lucius Beebe Memorial Library
Media	Wakefield Daily Item
	WCAT
Fire Department	Greenwood Fire Station
	Public Safety Building Fire Department
Hotels	Colonial Sheraton Hotel
	Lord Wakefield Hotel
Parks	Colonel Connolly Park
	Elm Street Plot Grounds
	Floral Way & Cemetery Grounds
	Gertrude Spaulding Park
	Hall Park
	Indian Hill Park
	JJ Round Park
	Landrigan Field
	Lantern Lane Grounds
	Lower Common Park
	Mapleway Playground
	Melvin Park
	Moulton Park
	Nasella Playground
	Park Gates Grounds
	Sullivan Park
	Upper Common Park
	Veterans Field
	Vinton Street Field House
	Weber City Grounds
	Dog Park - North Ave
Special Needs	Colonial Point Apartments
	Community Group Home
	Community Home Group
	Crystal View Apartments
	Elderly Housing
	Elderly Housing
	Eliot Community Services
	Garden Crest Apartments
	Group Home
	Group Home
	Group Home
	Lincoln School House
	Lodging House
	Northeast Family Institute
	Riverside Community Care Group
	Riverside Community Mental Health
	Special Needs Home
	Wild Acre Inn
Tree Nursery	Forest Tree Nursery
Water	Linden Street Pump Station
	Albion Street MWRA
	Broadway Treatment Plant
	Crystal Lake Spillway
	Harts Hill Storage Tank
	Lake Quannapowitt Dam
	Colonial Dam
	Pump Station
	Montclaire
	Water tank
	Communication Building - Sydney St
	MWRA - Prospect ST
	Farmland?
Nursing	Bear Hill Nursing Home
	Greenwood Nursing Home
	Oosterman Rest Home
	Brightview
Office	Common Street Office
	Lafayette Street Office
Police Department	Public Safety Building Police Department
Gas Stations	Cumberland Frams - 200 Lowell St
	Shell - 356 Lowell St
	Prime - 319 Salem St
	Irving - 448 Salem St
	Sunoco - 493 Salem St
	Depot Automotive - 221 North Ave
	Elite Gas and Servce - 30 Water St
	Wakefield Gas and Service Station - 454 Water St
	Irving Oil - 448 Salem St
	Mobil - 950 Main St
Grocery	Shaw's 134 W Water St
	The Produce Connection - 96 Audubon Rd

APPENDIX E

- **Public Participation Survey Results**

Q1 During the past five years where you currently reside, have you or someone in your household directly experienced a natural disaster such as an earthquake, severe windstorm, flood, wildfire, or other type of natural disaster?

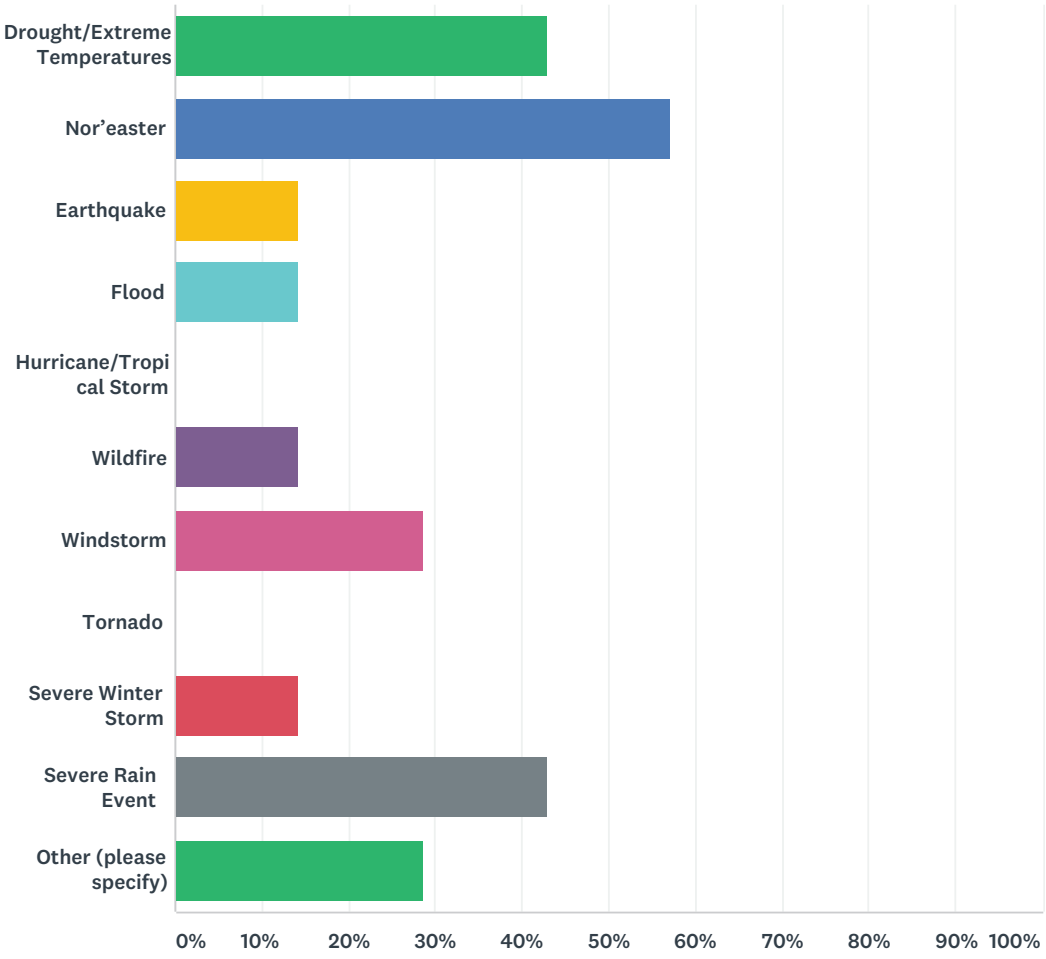
Answered: 97 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	8.25%	8
No	91.75%	89
TOTAL		97

Q2 If "YES", which of these natural disasters have you or someone in your household experienced in the past 5 years? (Please check all that apply)

Answered: 7 Skipped: 90



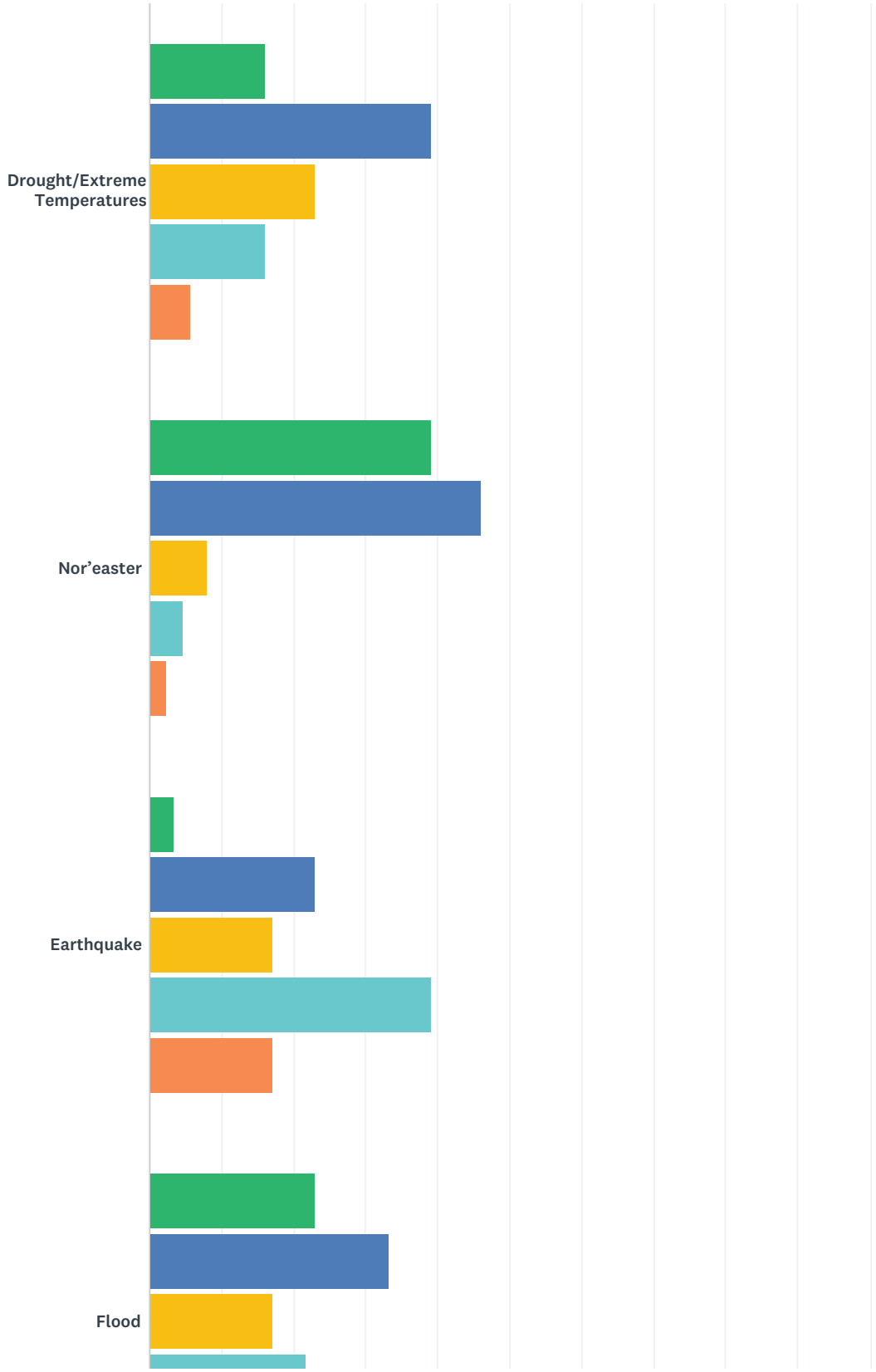
ANSWER CHOICES	RESPONSES	
Drought/Extreme Temperatures	42.86%	3
Nor'easter	57.14%	4
Earthquake	14.29%	1
Flood	14.29%	1
Hurricane/Tropical Storm	0.00%	0
Wildfire	14.29%	1
Windstorm	28.57%	2
Tornado	0.00%	0
Severe Winter Storm	14.29%	1
Severe Rain Event	42.86%	3

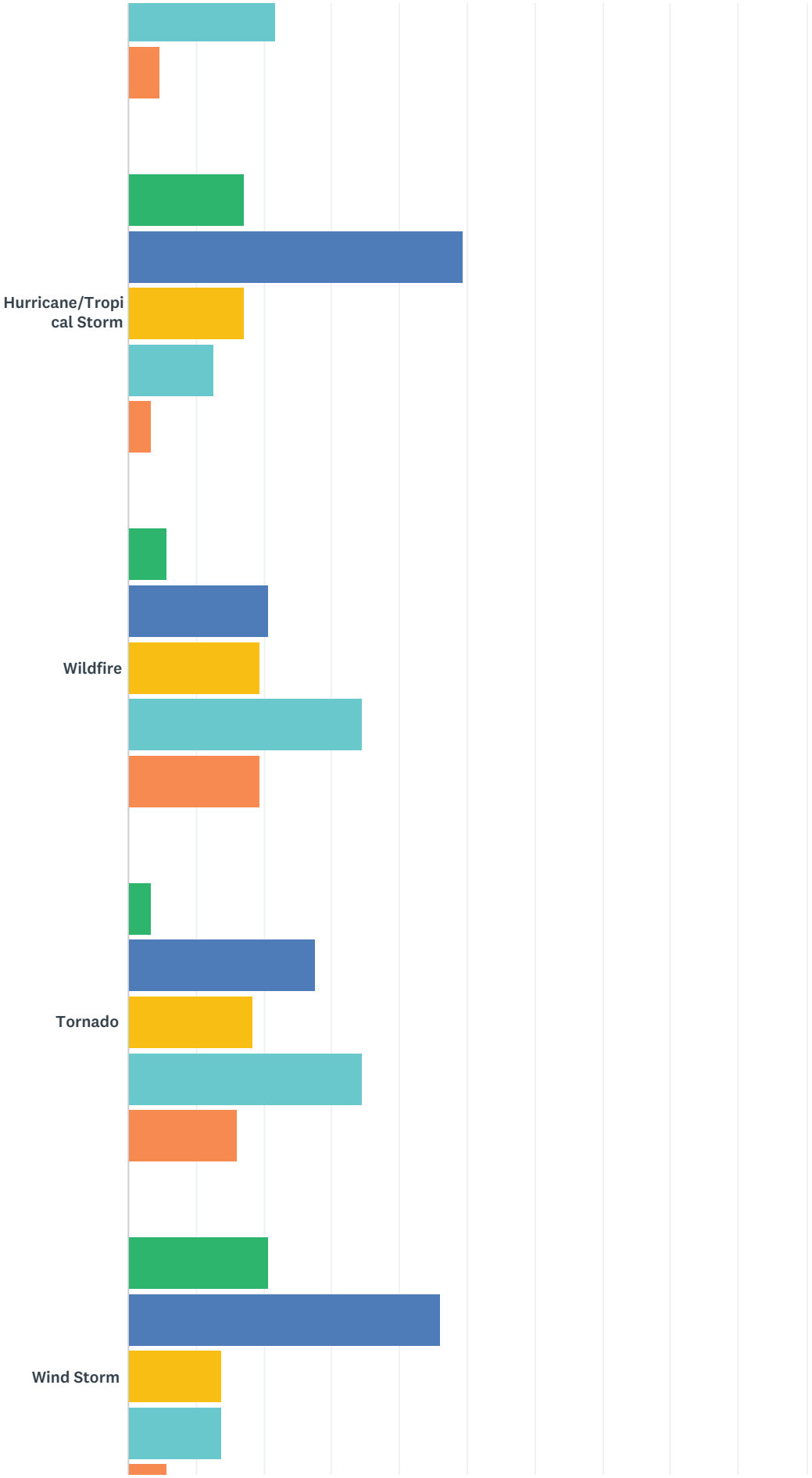
Other (please specify)	28.57%	2
Total Respondents: 7		

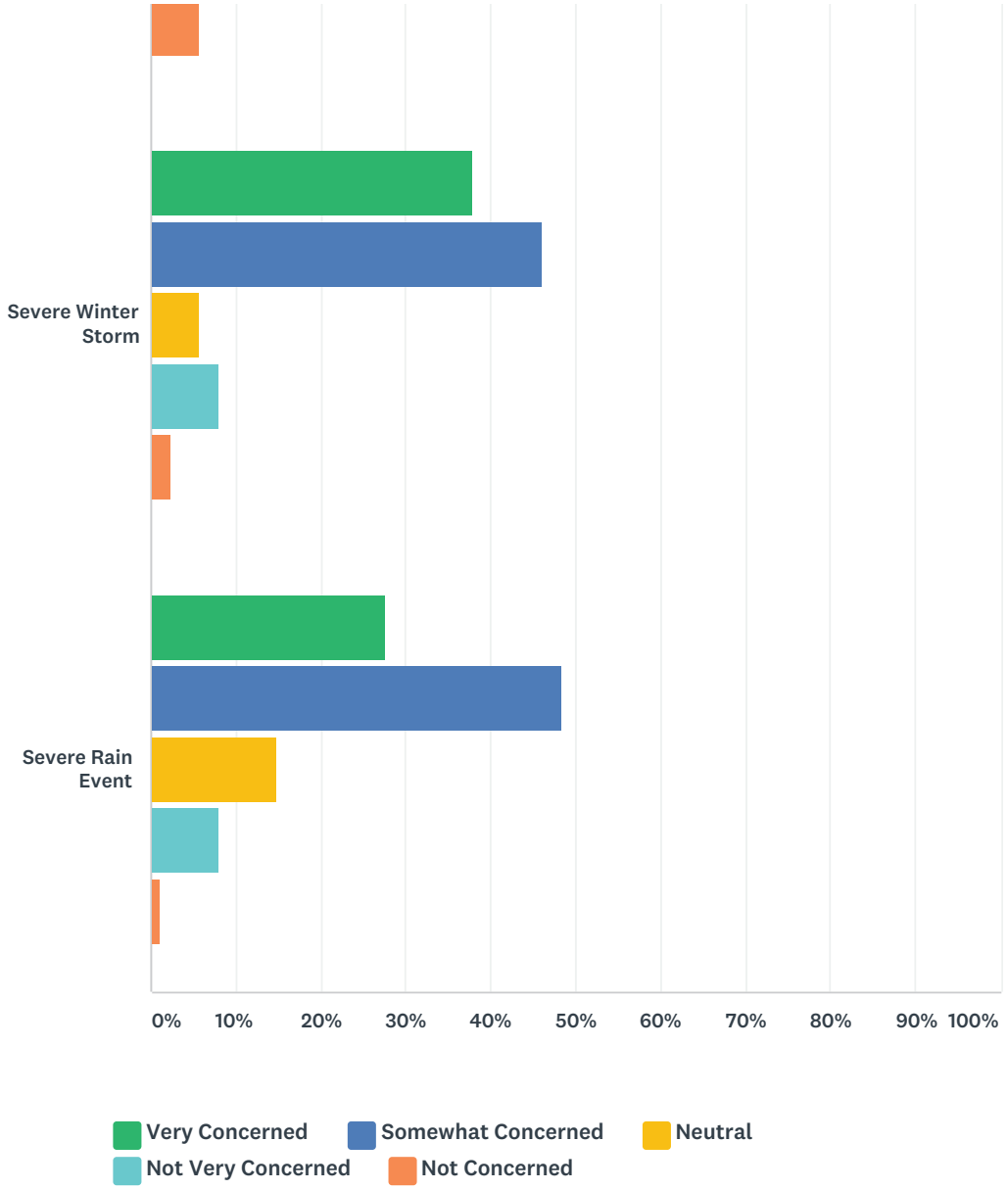
#	OTHER (PLEASE SPECIFY)	DATE
1	Flash Flood/mud slide from wildfire	5/13/2019 6:05 AM
2	Water main break	5/11/2019 8:44 AM

Q3 How concerned are you about the following natural disasters affecting Wakefield? (Check the corresponding box for each hazard)

Answered: 87 Skipped: 10




Hurricane/Tropical Storm
Wildfire
Tornado
Wind Storm

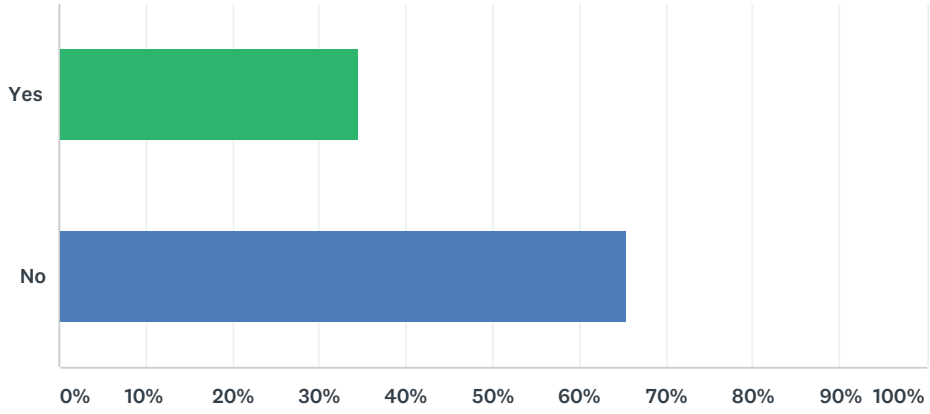


	VERY CONCERNED	SOMEWHAT CONCERNED	NEUTRAL	NOT VERY CONCERNED	NOT CONCERNED	TOTAL
Drought/Extreme Temperatures	16.09% 14	39.08% 34	22.99% 20	16.09% 14	5.75% 5	87
Nor'easter	39.08% 34	45.98% 40	8.05% 7	4.60% 4	2.30% 2	87
Earthquake	3.45% 3	22.99% 20	17.24% 15	39.08% 34	17.24% 15	87
Flood	22.99% 20	33.33% 29	17.24% 15	21.84% 19	4.60% 4	87
Hurricane/Tropical Storm	17.24% 15	49.43% 43	17.24% 15	12.64% 11	3.45% 3	87
Wildfire	5.75% 5	20.69% 18	19.54% 17	34.48% 30	19.54% 17	87
Tornado	3.45% 3	27.59% 24	18.39% 16	34.48% 30	16.09% 14	87

Wind Storm	20.69% 18	45.98% 40	13.79% 12	13.79% 12	5.75% 5	87
Severe Winter Storm	37.93% 33	45.98% 40	5.75% 5	8.05% 7	2.30% 2	87
Severe Rain Event	27.59% 24	48.28% 42	14.94% 13	8.05% 7	1.15% 1	87

Q4 Have you ever received information about how to make members of your household and your home safer from natural disasters?

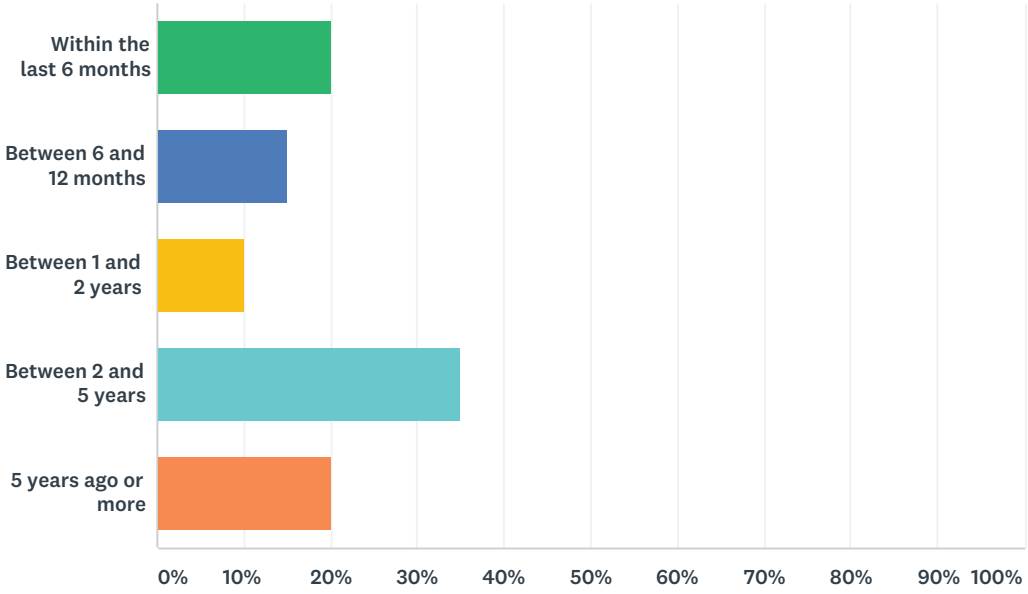
Answered: 87 Skipped: 10



ANSWER CHOICES	RESPONSES	
Yes	34.48%	30
No	65.52%	57
TOTAL		87

Q5 If "Yes" how recently?

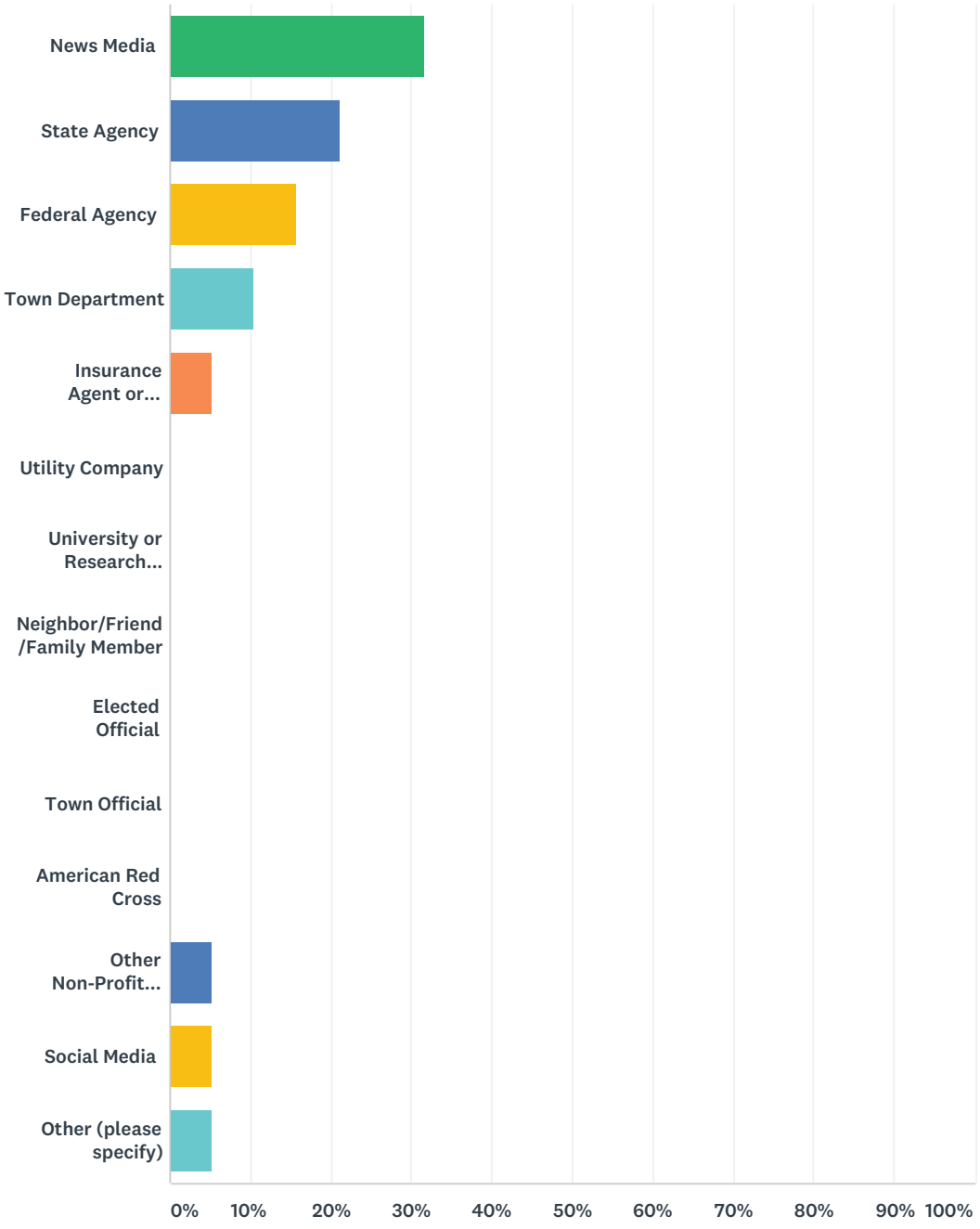
Answered: 20 Skipped: 77



ANSWER CHOICES	RESPONSES	
Within the last 6 months	20.00%	4
Between 6 and 12 months	15.00%	3
Between 1 and 2 years	10.00%	2
Between 2 and 5 years	35.00%	7
5 years ago or more	20.00%	4
TOTAL		20

Q6 From whom did you last receive information about how to make members of your household and our home safer from natural disasters? (please check only one)

Answered: 19 Skipped: 78



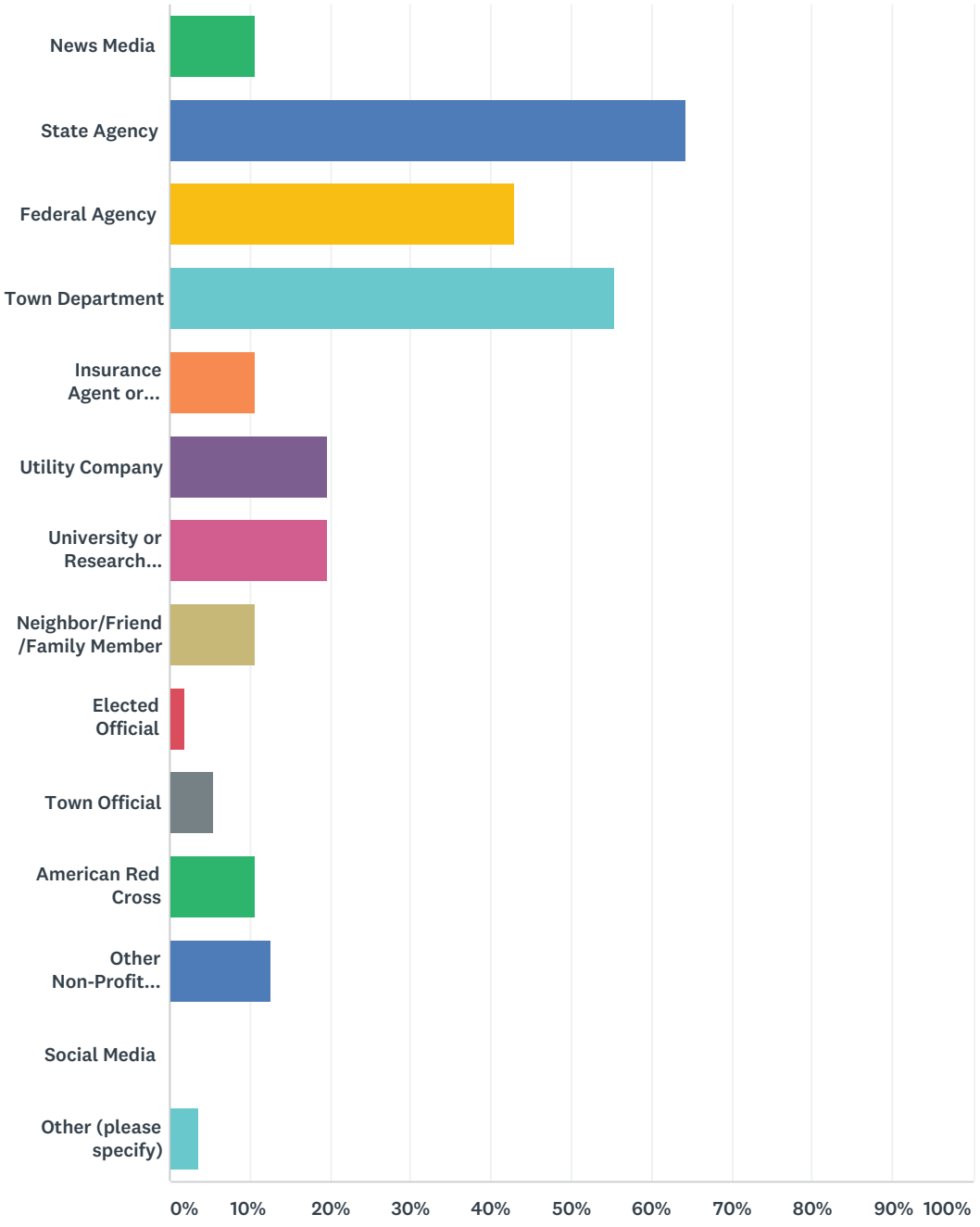
ANSWER CHOICES	RESPONSES	
News Media	31.58%	6
State Agency	21.05%	4
Federal Agency	15.79%	3

Town Department	10.53%	2
Insurance Agent or Company	5.26%	1
Utility Company	0.00%	0
University or Research Institution	0.00%	0
Neighbor/Friend/Family Member	0.00%	0
Elected Official	0.00%	0
Town Official	0.00%	0
American Red Cross	0.00%	0
Other Non-Profit Organization	5.26%	1
Social Media	5.26%	1
Other (please specify)	5.26%	1
TOTAL		19

#	OTHER (PLEASE SPECIFY)	DATE
1	Workplace / work in preparedness	5/9/2019 4:15 PM

Q7 Whom would you most trust to provide you with information about how to make your household and home safer from natural disasters? (Please check up to three)

Answered: 56 Skipped: 41



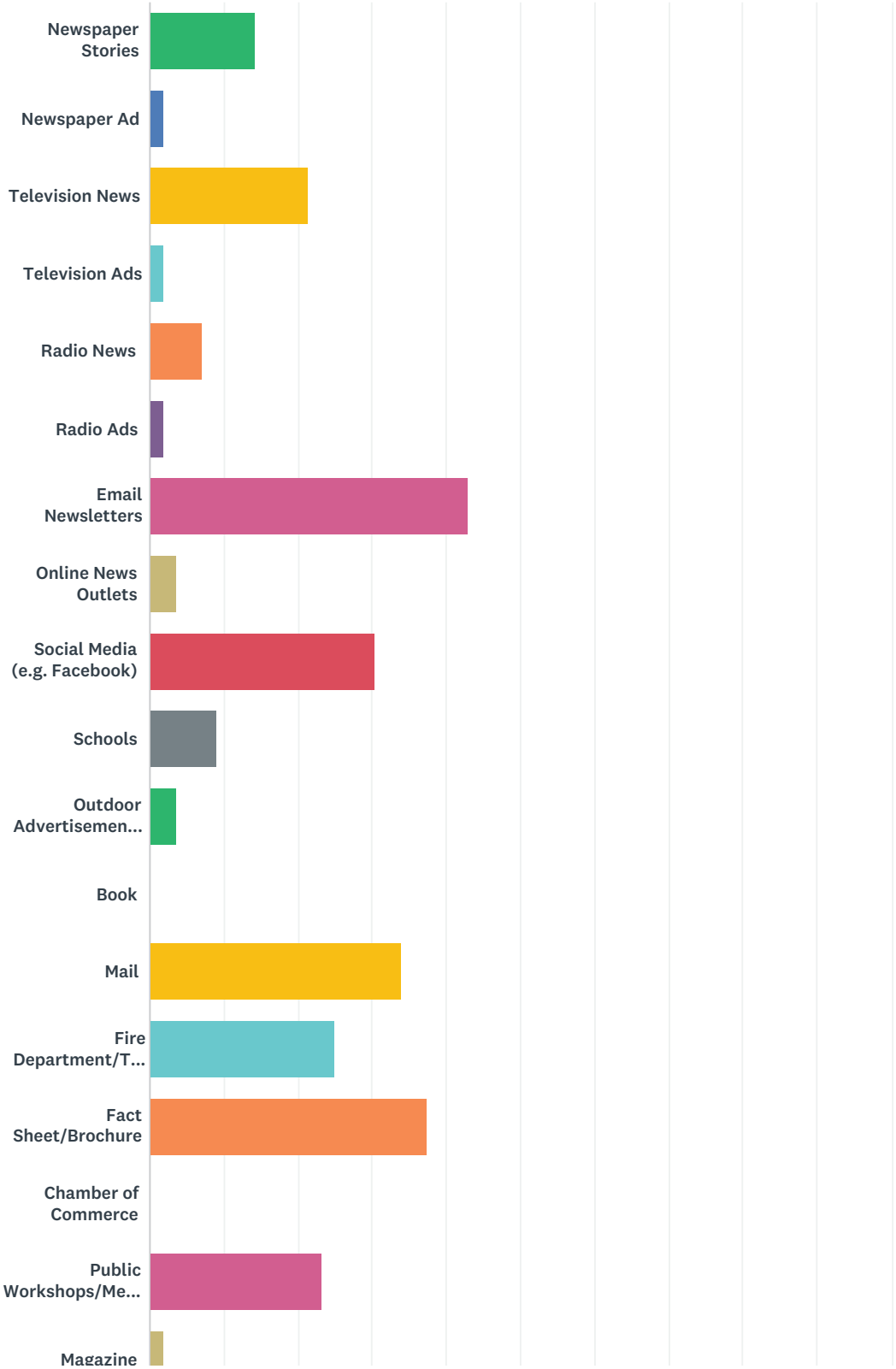
ANSWER CHOICES	RESPONSES	
News Media	10.71%	6
State Agency	64.29%	36
Federal Agency	42.86%	24

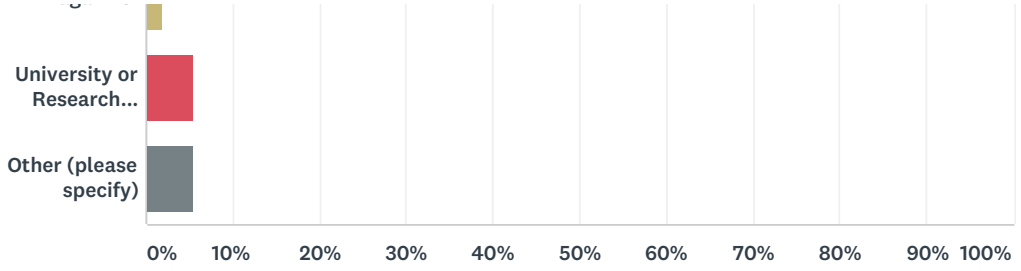
Town Department	55.36%	31
Insurance Agent or Company	10.71%	6
Utility Company	19.64%	11
University or Research Institution	19.64%	11
Neighbor/Friend/Family Member	10.71%	6
Elected Official	1.79%	1
Town Official	5.36%	3
American Red Cross	10.71%	6
Other Non-Profit Organization	12.50%	7
Social Media	0.00%	0
Other (please specify)	3.57%	2
Total Respondents: 56		

#	OTHER (PLEASE SPECIFY)	DATE
1	Depends on the type of natural disaster	5/12/2019 11:26 PM
2	Architect/Engineer	5/10/2019 10:52 AM

Q8 What is the most effective way for you to receive information about how to make your household and home safer from natural disasters? (Please check up to three)

Answered: 56 Skipped: 41



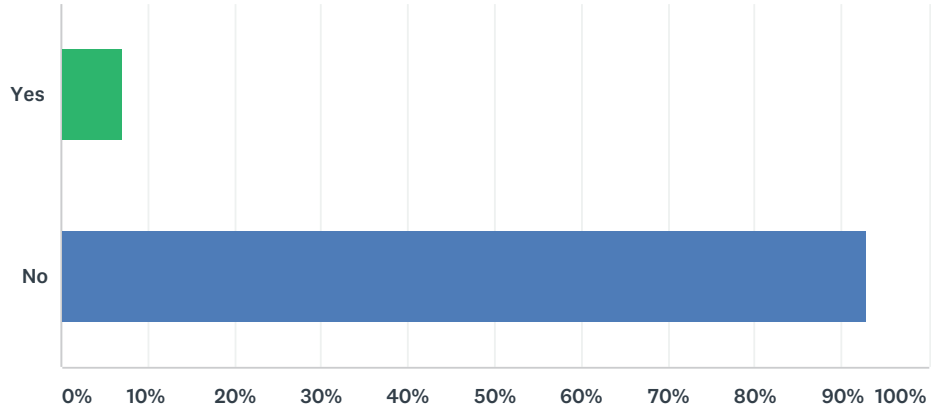


ANSWER CHOICES	RESPONSES	
Newspaper Stories	14.29%	8
Newspaper Ad	1.79%	1
Television News	21.43%	12
Television Ads	1.79%	1
Radio News	7.14%	4
Radio Ads	1.79%	1
Email Newsletters	42.86%	24
Online News Outlets	3.57%	2
Social Media (e.g. Facebook)	30.36%	17
Schools	8.93%	5
Outdoor Advertisements (Billboards, etc.)	3.57%	2
Book	0.00%	0
Mail	33.93%	19
Fire Department/Town Department	25.00%	14
Fact Sheet/Brochure	37.50%	21
Chamber of Commerce	0.00%	0
Public Workshops/Meetings	23.21%	13
Magazine	1.79%	1
University or Research Institution	5.36%	3
Other (please specify)	5.36%	3
Total Respondents: 56		

#	OTHER (PLEASE SPECIFY)	DATE
1	video that's on social media/local cable access	5/20/2019 1:08 PM
2	Text alerts	5/15/2019 11:20 AM
3	Text or phone call	5/9/2019 7:16 PM

Q9 Prior to receiving this survey, were you aware of Wakefield's Natural Hazard Mitigation Plan (NHMP)?

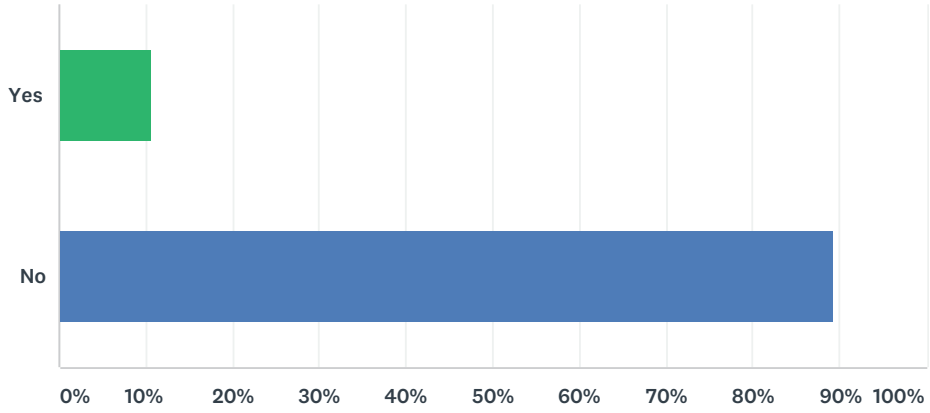
Answered: 56 Skipped: 41



ANSWER CHOICES	RESPONSES	
Yes	7.14%	4
No	92.86%	52
TOTAL		56

Q10 Prior to receiving this survey, were you aware that the Federal Emergency Management Agency (FEMA) requires Wakefield to update its NHMP every five years in order for Wakefield to be eligible for federal pre- and post-disaster hazard mitigation funds?

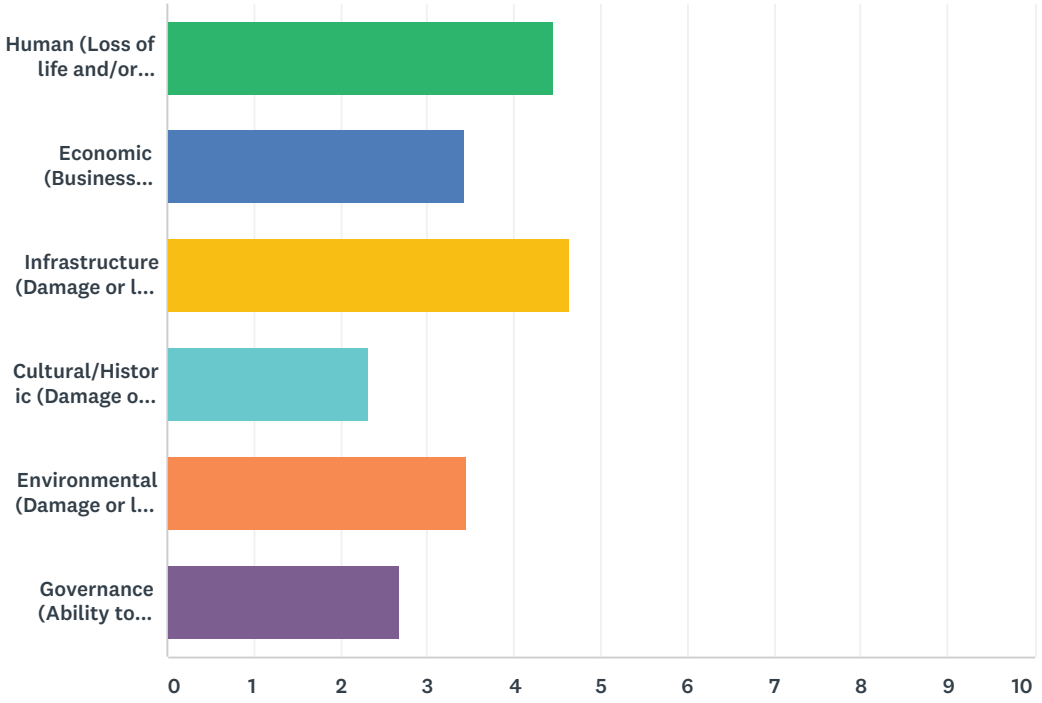
Answered: 56 Skipped: 41



ANSWER CHOICES	RESPONSES	
Yes	10.71%	6
No	89.29%	50
TOTAL		56

Q11 Community assets are features, characteristics, or resources that either make a community unique or allow the community to function. In your opinion, which of the following categories are most susceptible to the impacts caused by natural hazards in Wakefield. (Please rank the community assets in order of vulnerability, 1 being most vulnerable and 6 being least vulnerable)

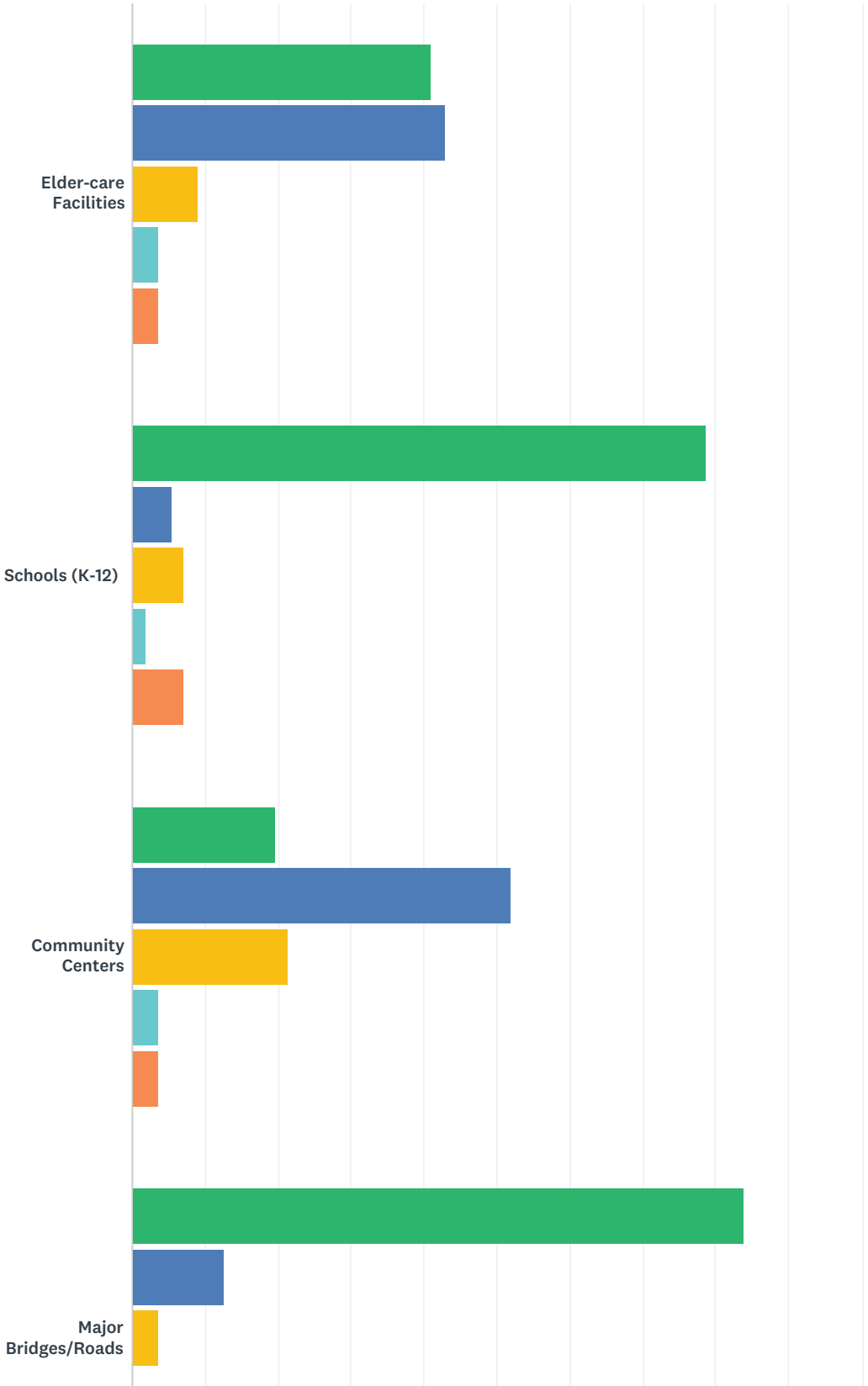
Answered: 56 Skipped: 41

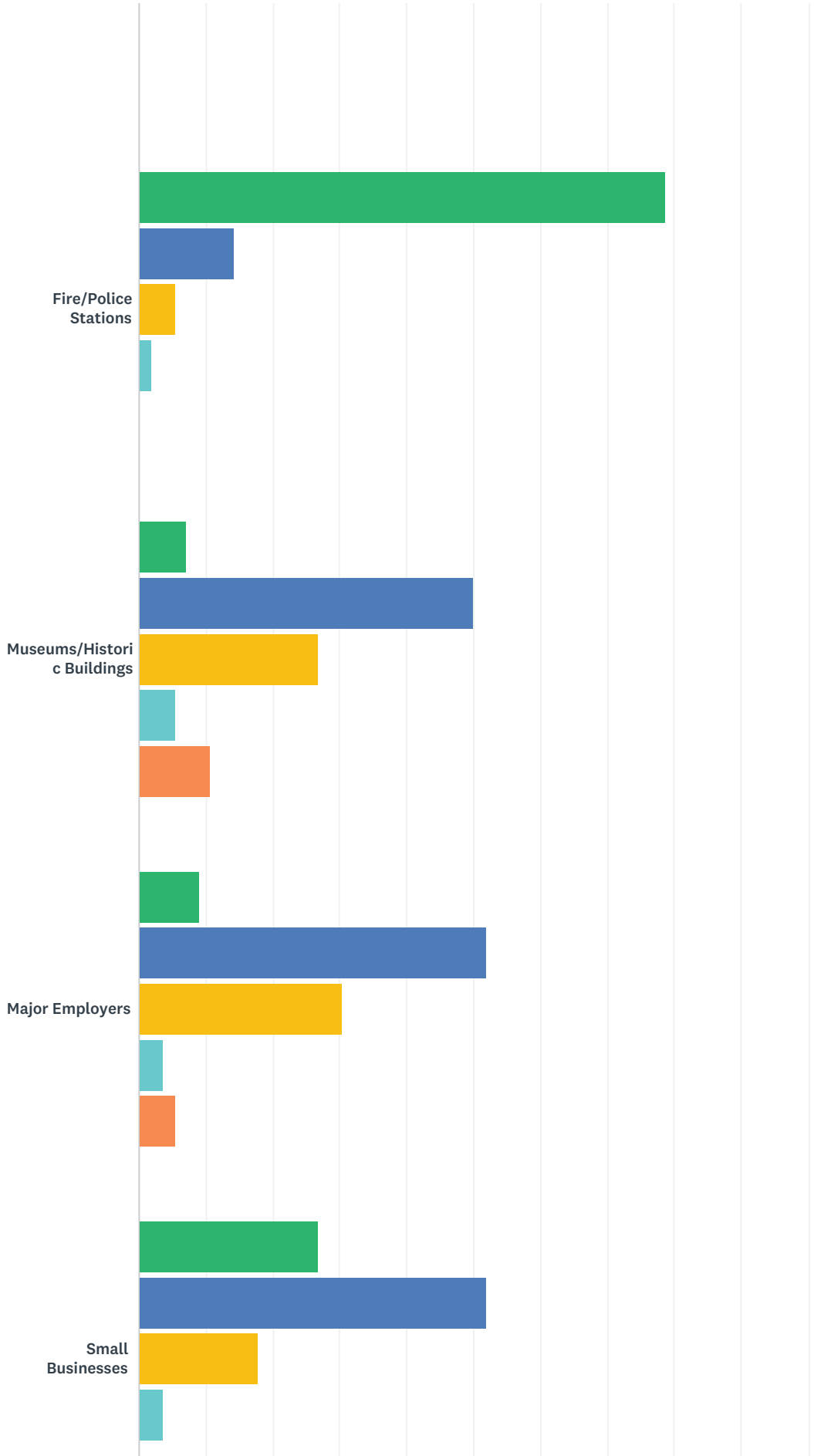


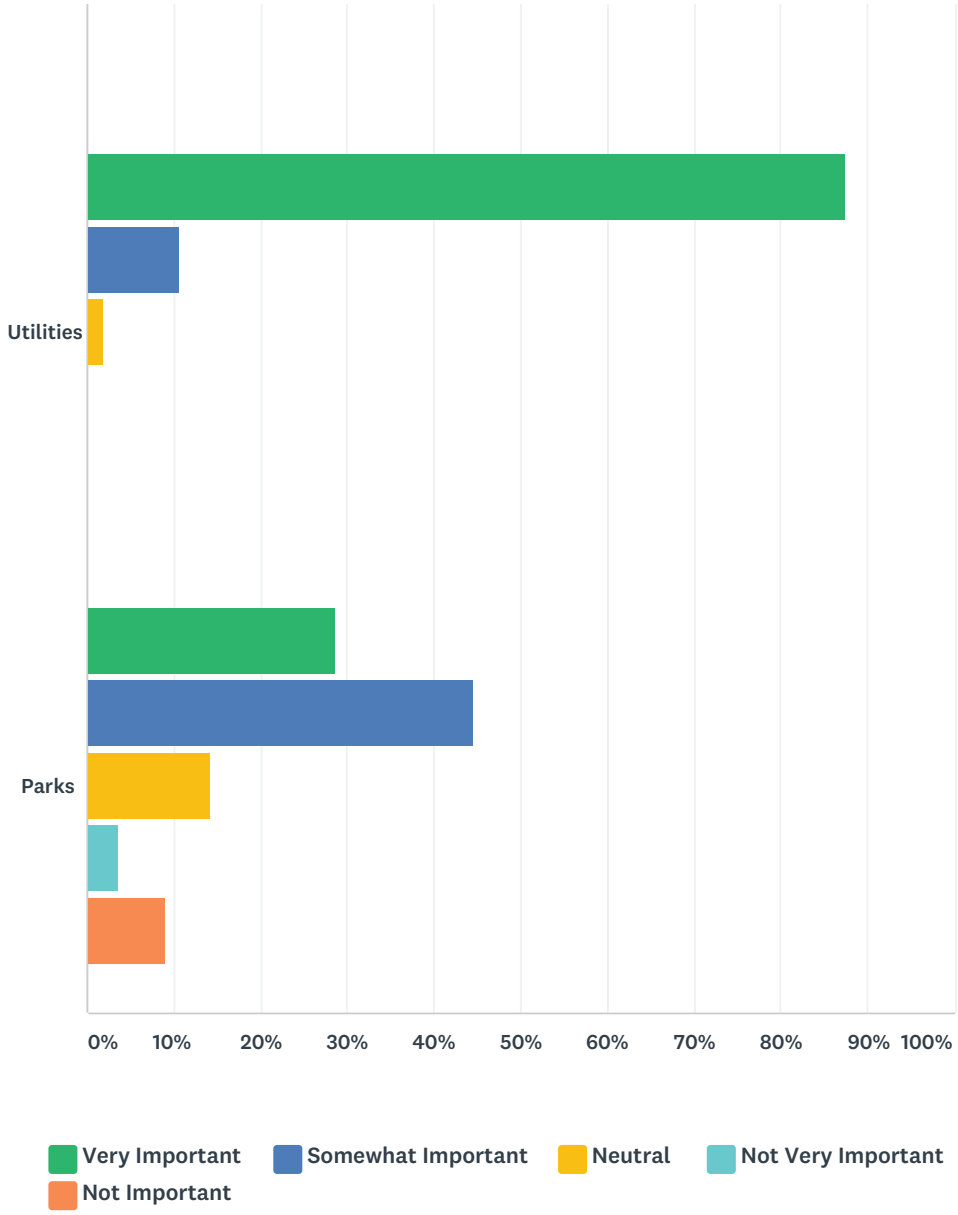
	1	2	3	4	5	6	TOTAL	SCORE
Human (Loss of life and/or injuries)	50.00% 28	7.14% 4	14.29% 8	8.93% 5	7.14% 4	12.50% 7	56	4.46
Economic (Business closures and/or job losses)	8.93% 5	17.86% 10	17.86% 10	28.57% 16	16.07% 9	10.71% 6	56	3.43
Infrastructure (Damage or loss of bridge, utilities, school, etc.)	23.21% 13	35.71% 20	26.79% 15	12.50% 7	0.00% 0	1.79% 1	56	4.64
Cultural/Historic (Damage or loss of libraries, museums, fairgrounds, etc.)	1.79% 1	7.14% 4	7.14% 4	21.43% 12	30.36% 17	32.14% 18	56	2.32
Environmental (Damage or loss of forests, rangeland, waterways, etc.)	8.93% 5	17.86% 10	23.21% 13	17.86% 10	25.00% 14	7.14% 4	56	3.46
Governance (Ability to maintain order and/or provide public amenities and services)	7.14% 4	14.29% 8	10.71% 6	10.71% 6	21.43% 12	35.71% 20	56	2.68

Q12 Next we would like to know what specific types of community assets are most important to you. (Check the corresponding box for each asset)

Answered: 56 Skipped: 41




Fire/Police Stations
Museums/Historic Buildings
Major Employers
Small Businesses



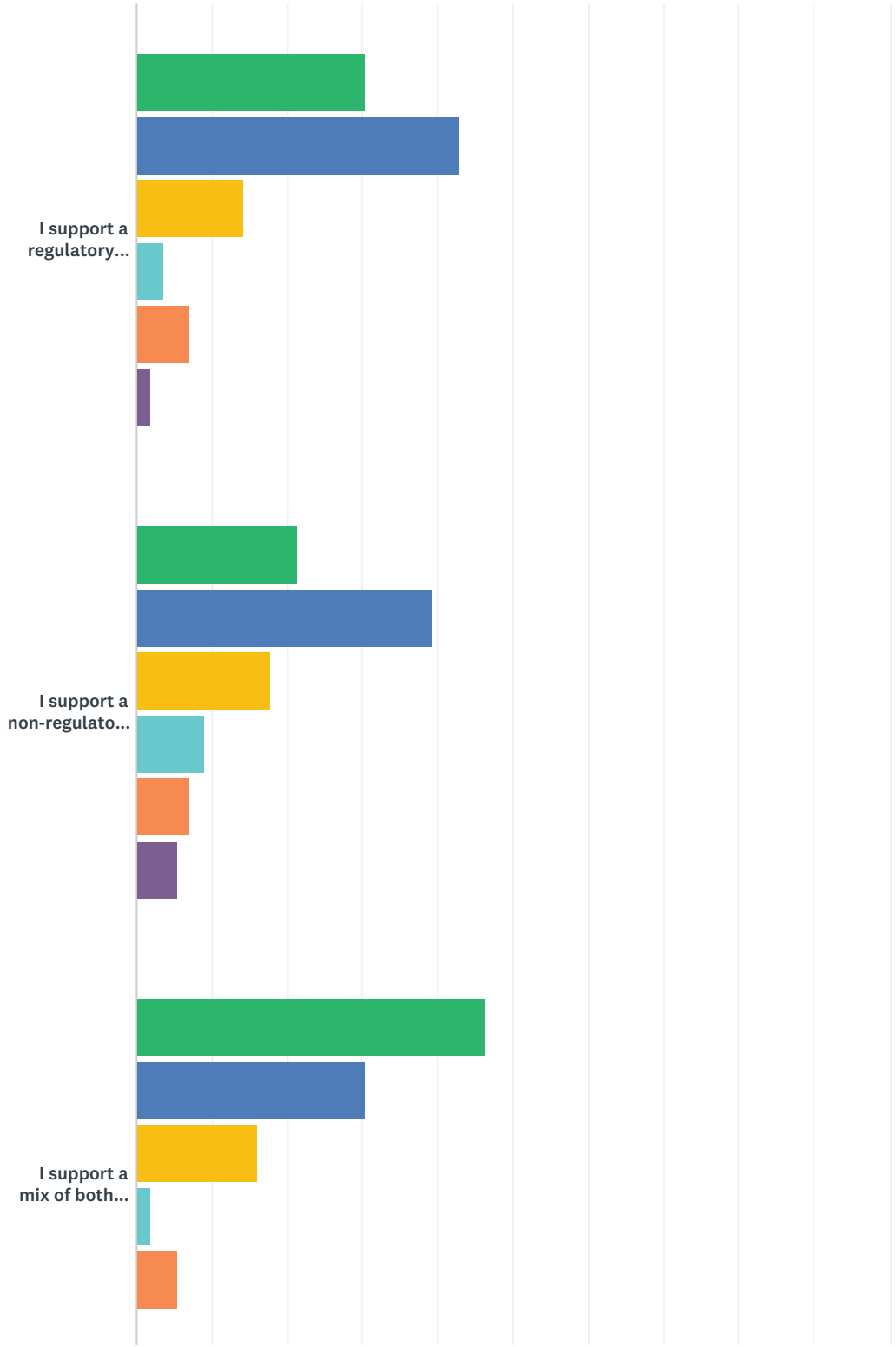
	VERY IMPORTANT	SOMEWHAT IMPORTANT	NEUTRAL	NOT VERY IMPORTANT	NOT IMPORTANT	TOTAL
Elder-care Facilities	41.07% 23	42.86% 24	8.93% 5	3.57% 2	3.57% 2	56
Schools (K-12)	78.57% 44	5.36% 3	7.14% 4	1.79% 1	7.14% 4	56
Community Centers	19.64% 11	51.79% 29	21.43% 12	3.57% 2	3.57% 2	56
Major Bridges/Roads	83.93% 47	12.50% 7	3.57% 2	0.00% 0	0.00% 0	56
Fire/Police Stations	78.57% 44	14.29% 8	5.36% 3	1.79% 1	0.00% 0	56
Museums/Historic Buildings	7.14% 4	50.00% 28	26.79% 15	5.36% 3	10.71% 6	56
Major Employers	8.93% 5	51.79% 29	30.36% 17	3.57% 2	5.36% 3	56

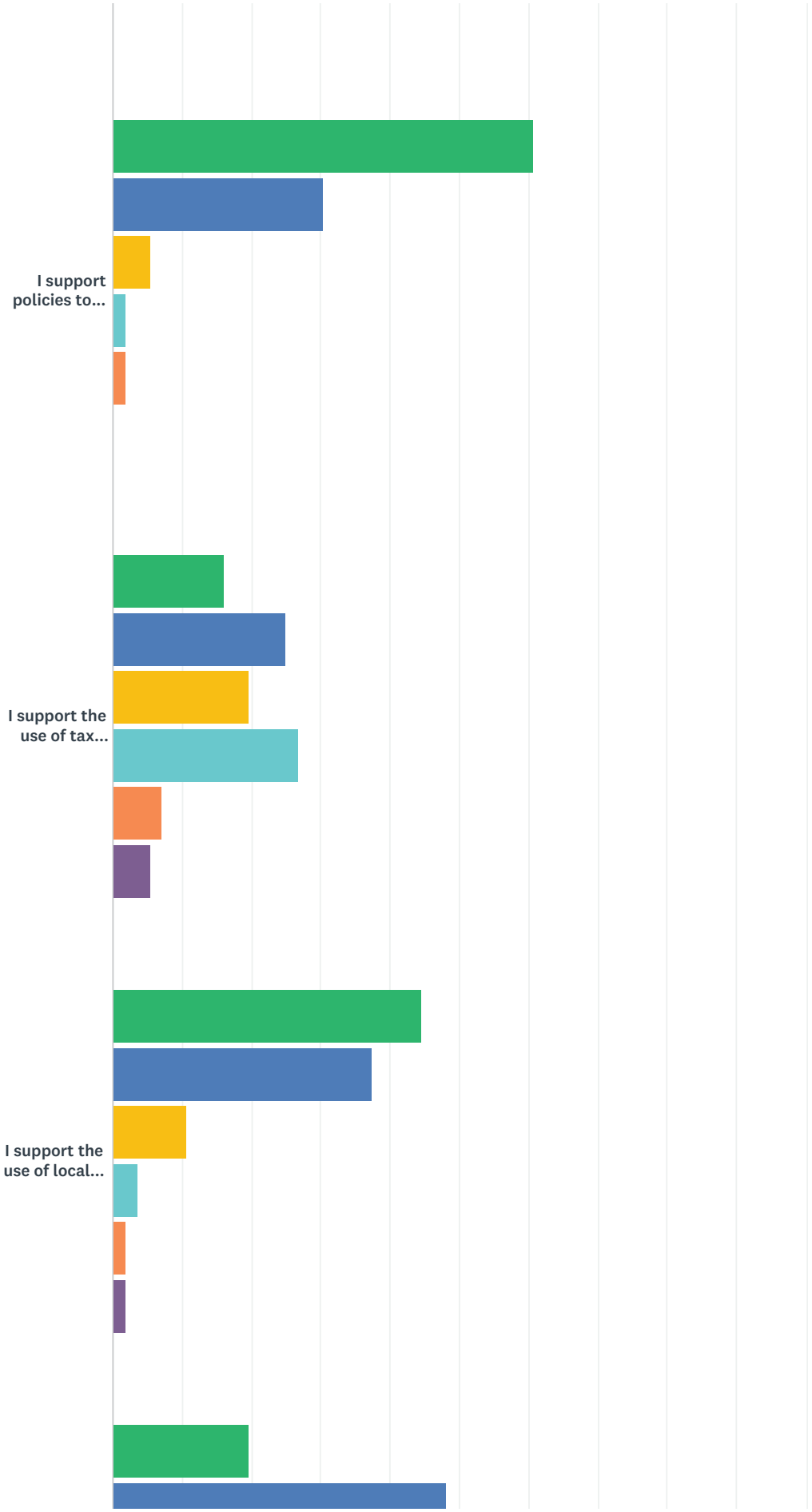
Small Businesses	26.79% 15	51.79% 29	17.86% 10	3.57% 2	0.00% 0	56
Utilities	87.50% 49	10.71% 6	1.79% 1	0.00% 0	0.00% 0	56
Parks	28.57% 16	44.64% 25	14.29% 8	3.57% 2	8.93% 5	56

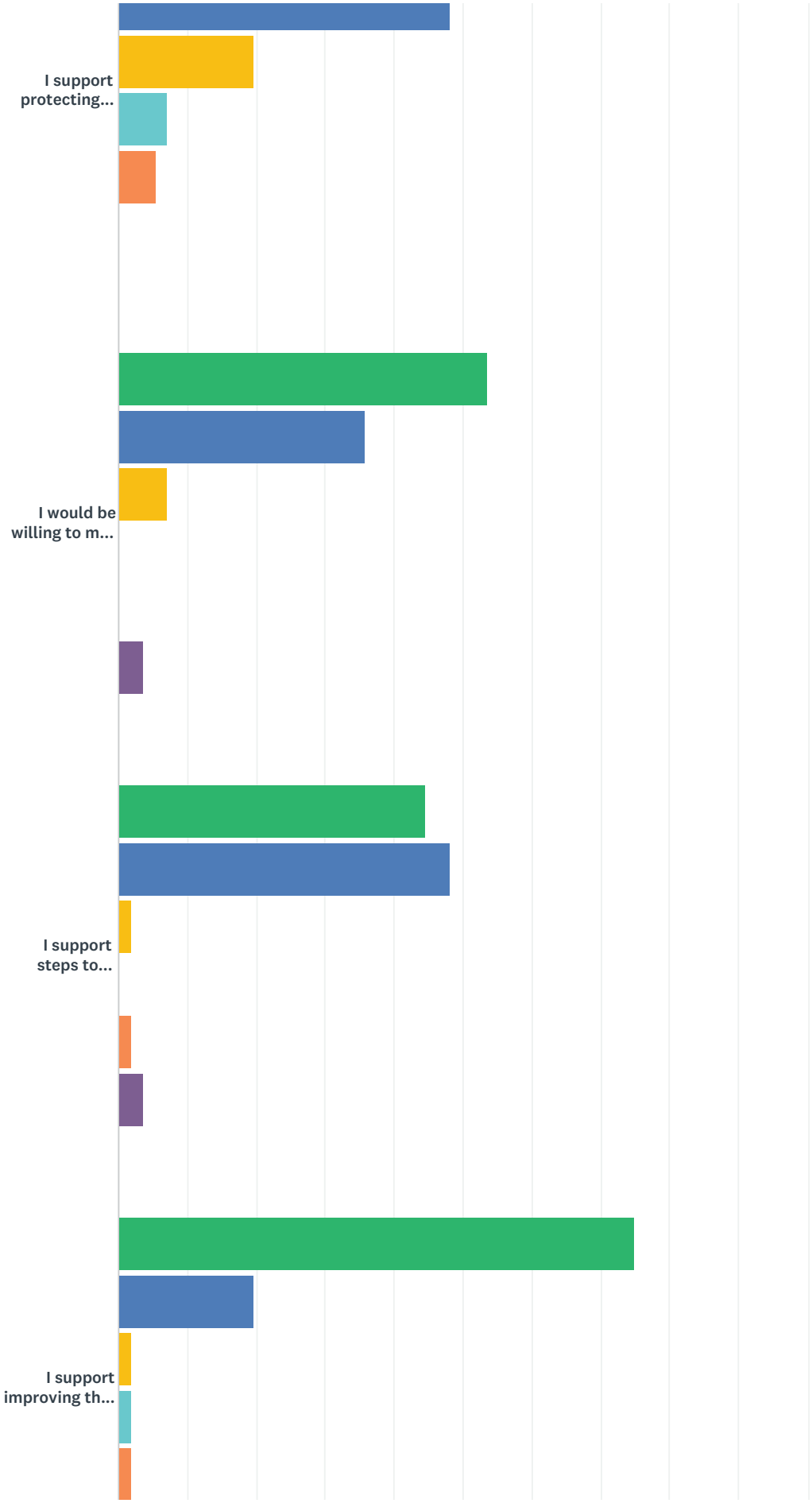
#	OTHER (PLEASE SPECIFY)	DATE
1	grocery stores, drug stores, medical care facilities	6/1/2019 7:27 PM
2	Sidewalks	5/16/2019 12:48 PM
3	Lake, Open Spaces	5/10/2019 11:23 AM

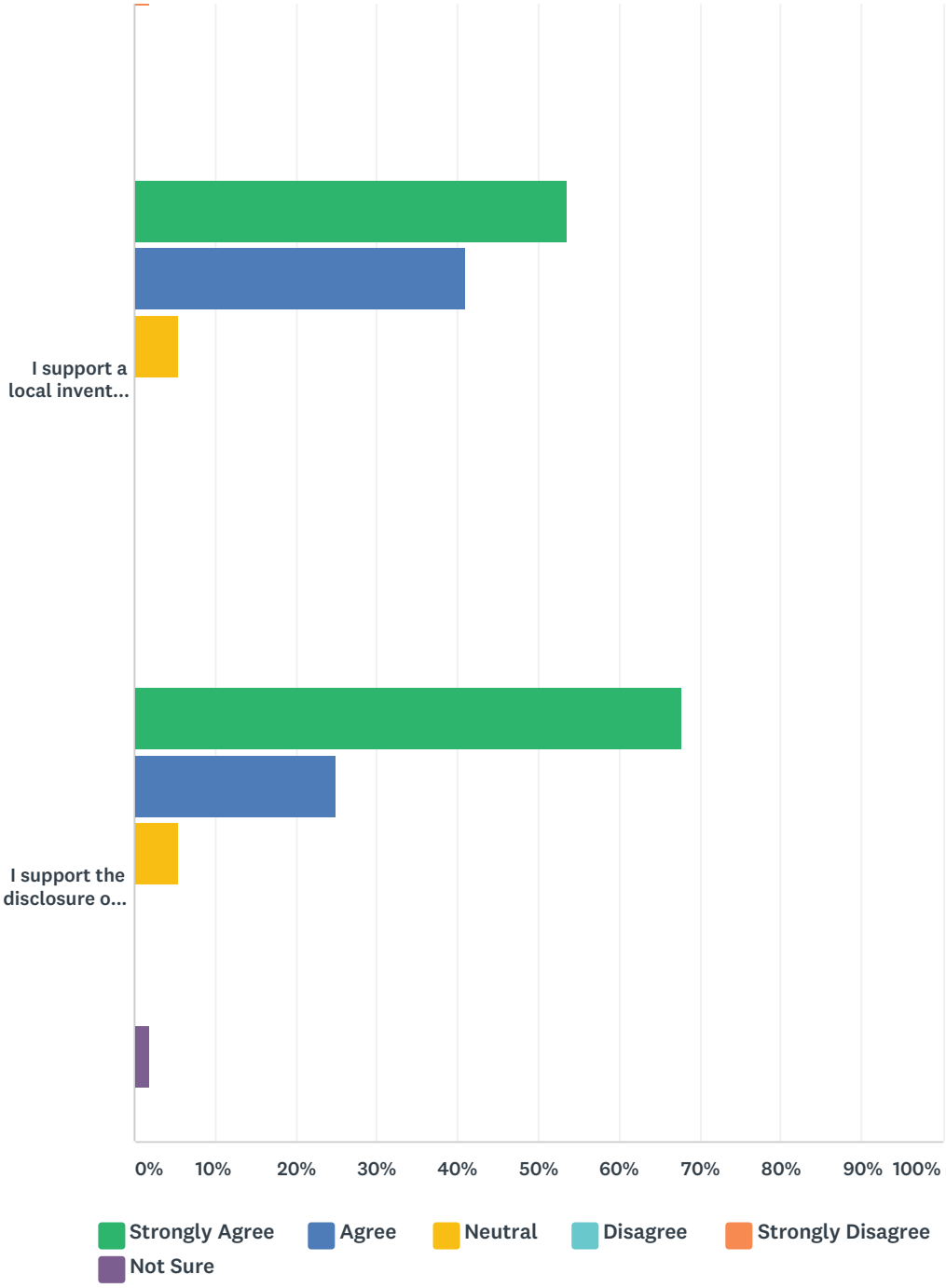
Q13 A number of activities can reduce your community's risk from hazards. These activities can be both regulatory and non-regulatory. Please check the box that best represents your opinion of the following strategies to reduce the risk and loss associated with natural disasters.

Answered: 56 Skipped: 41




I support policies to...
I support the use of tax...
I support the use of local...


I support protecting...
I would be willing to m...
I support steps to...
I support improving th...

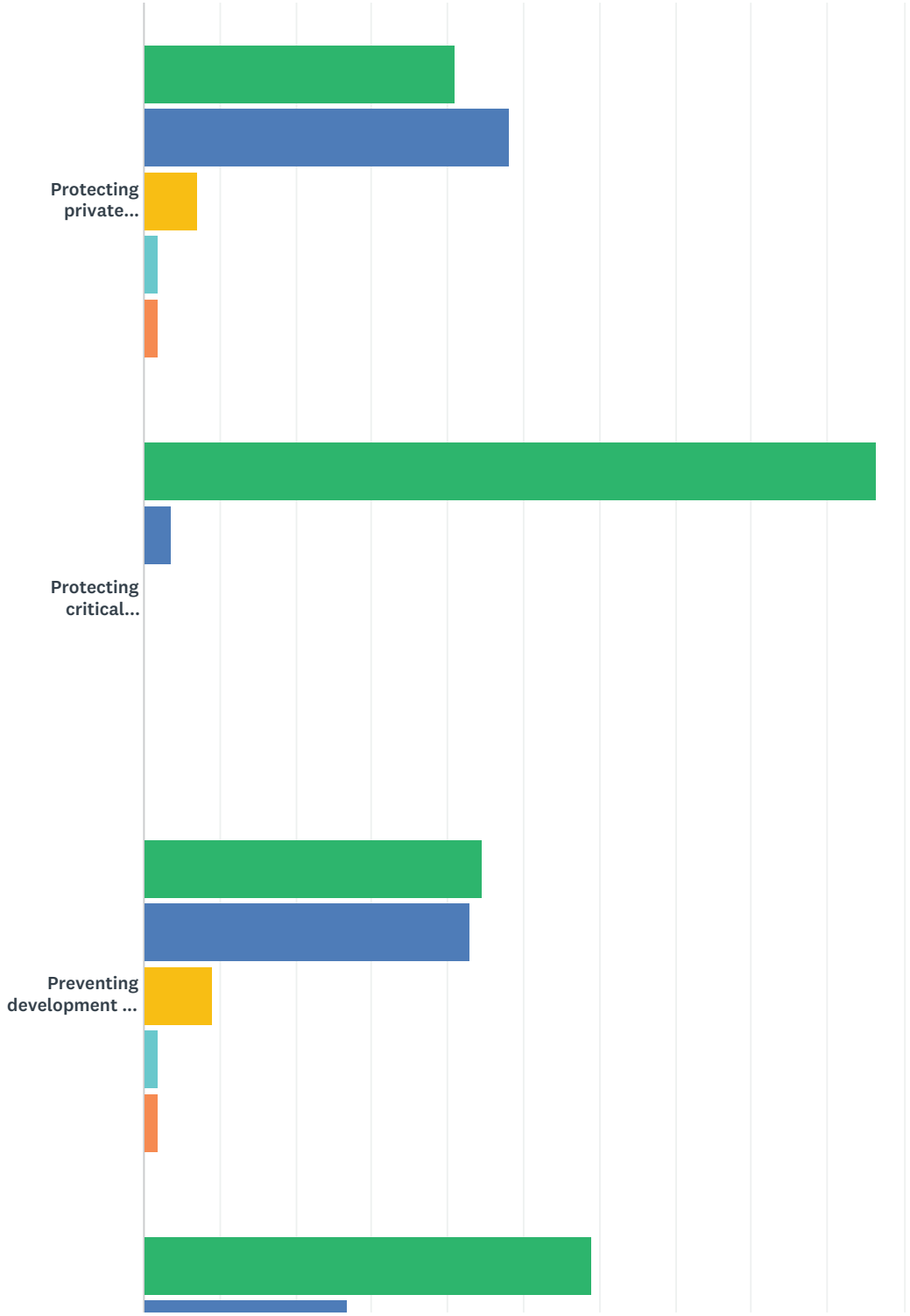


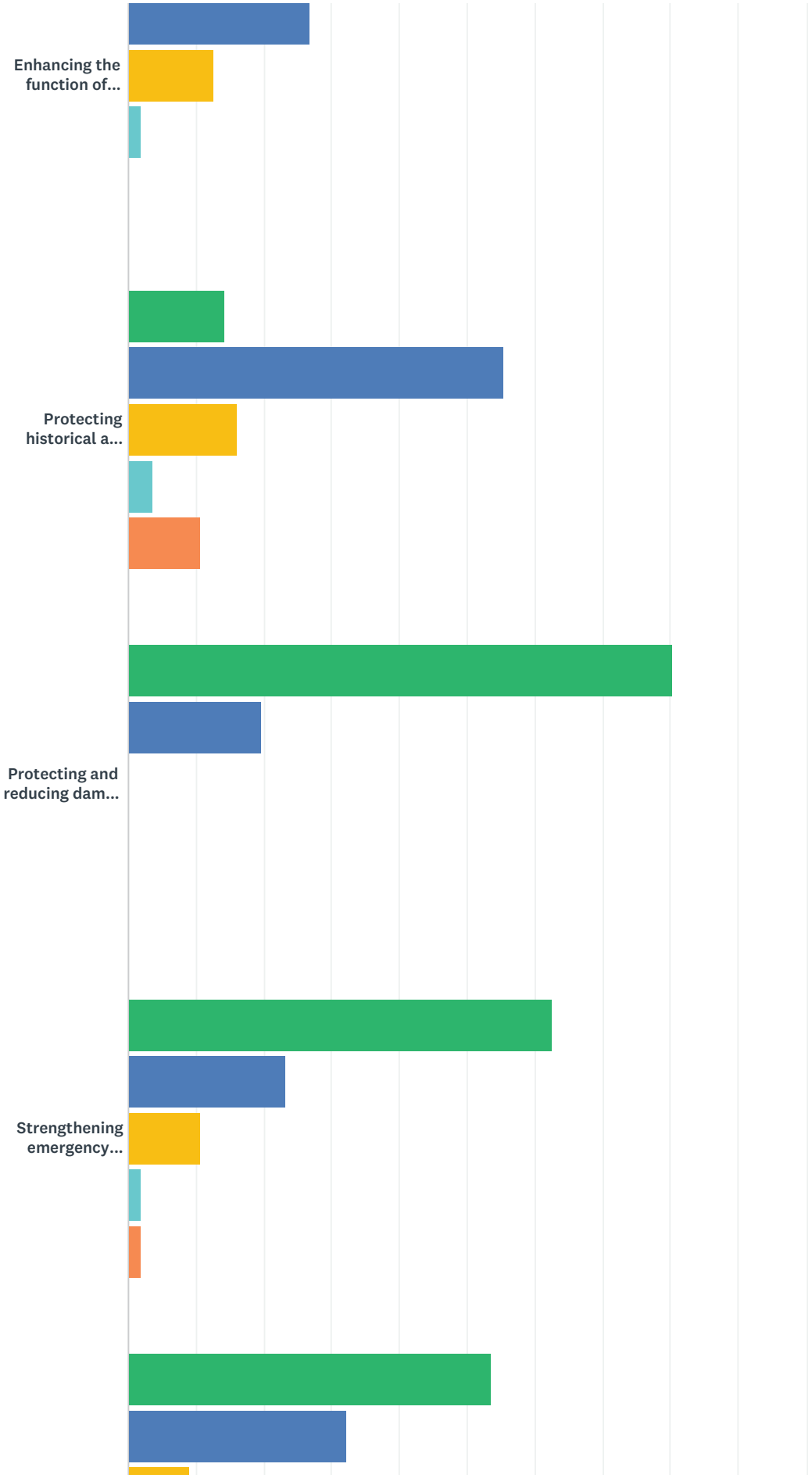
	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE	NOT SURE	TOTAL
I support a regulatory approach to reducing risk	30.36% 17	42.86% 24	14.29% 8	3.57% 2	7.14% 4	1.79% 1	56
I support a non-regulatory approach to reducing risk	21.43% 12	39.29% 22	17.86% 10	8.93% 5	7.14% 4	5.36% 3	56
I support a mix of both regulatory and non-regulatory approaches to reducing risk	46.43% 26	30.36% 17	16.07% 9	1.79% 1	5.36% 3	0.00% 0	56
I support policies to prohibit development in areas subject to natural hazards	60.71% 34	30.36% 17	5.36% 3	1.79% 1	1.79% 1	0.00% 0	56
I support the use of tax dollars (federal and/or local) to compensate land owners for not developing in areas subject to natural hazards	16.07% 9	25.00% 14	19.64% 11	26.79% 15	7.14% 4	5.36% 3	56

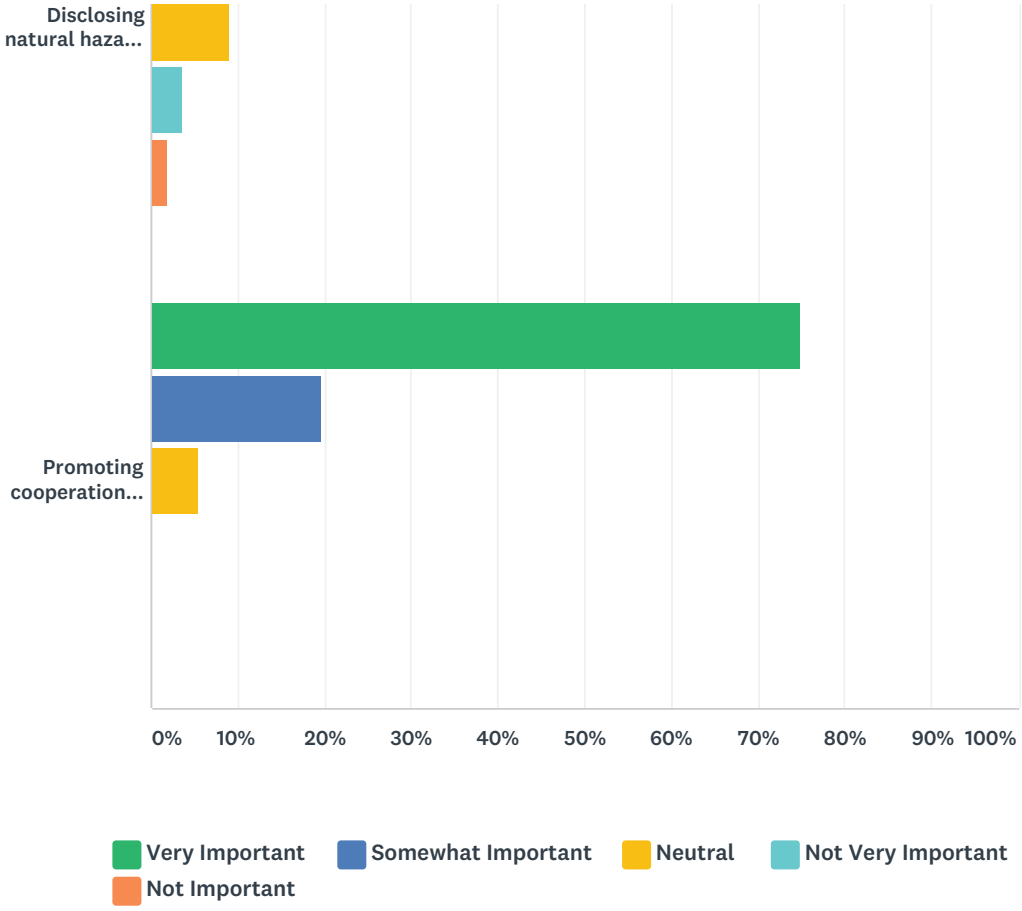
I support the use of local tax dollars to reduce risks and losses from natural disasters	44.64% 25	37.50% 21	10.71% 6	3.57% 2	1.79% 1	1.79% 1	56
I support protecting historical and cultural structures	19.64% 11	48.21% 27	19.64% 11	7.14% 4	5.36% 3	0.00% 0	56
I would be willing to make my home more disaster-resistant	53.57% 30	35.71% 20	7.14% 4	0.00% 0	0.00% 0	3.57% 2	56
I support steps to safeguard the local economy following a disaster event	44.64% 25	48.21% 27	1.79% 1	0.00% 0	1.79% 1	3.57% 2	56
I support improving the disaster preparedness of local schools	75.00% 42	19.64% 11	1.79% 1	1.79% 1	1.79% 1	0.00% 0	56
I support a local inventory of at-risk buildings and infrastructure	53.57% 30	41.07% 23	5.36% 3	0.00% 0	0.00% 0	0.00% 0	56
I support the disclosure of natural hazard risks during real estate transactions	67.86% 38	25.00% 14	5.36% 3	0.00% 0	0.00% 0	1.79% 1	56

Q14 Natural hazards can have a significant impact on a community, but planning for these events can help lessen the impacts. The following statements will help determine citizen priorities regarding planning for natural hazards in Wakefield. Please tell us how important each one is to you.

Answered: 56 Skipped: 41



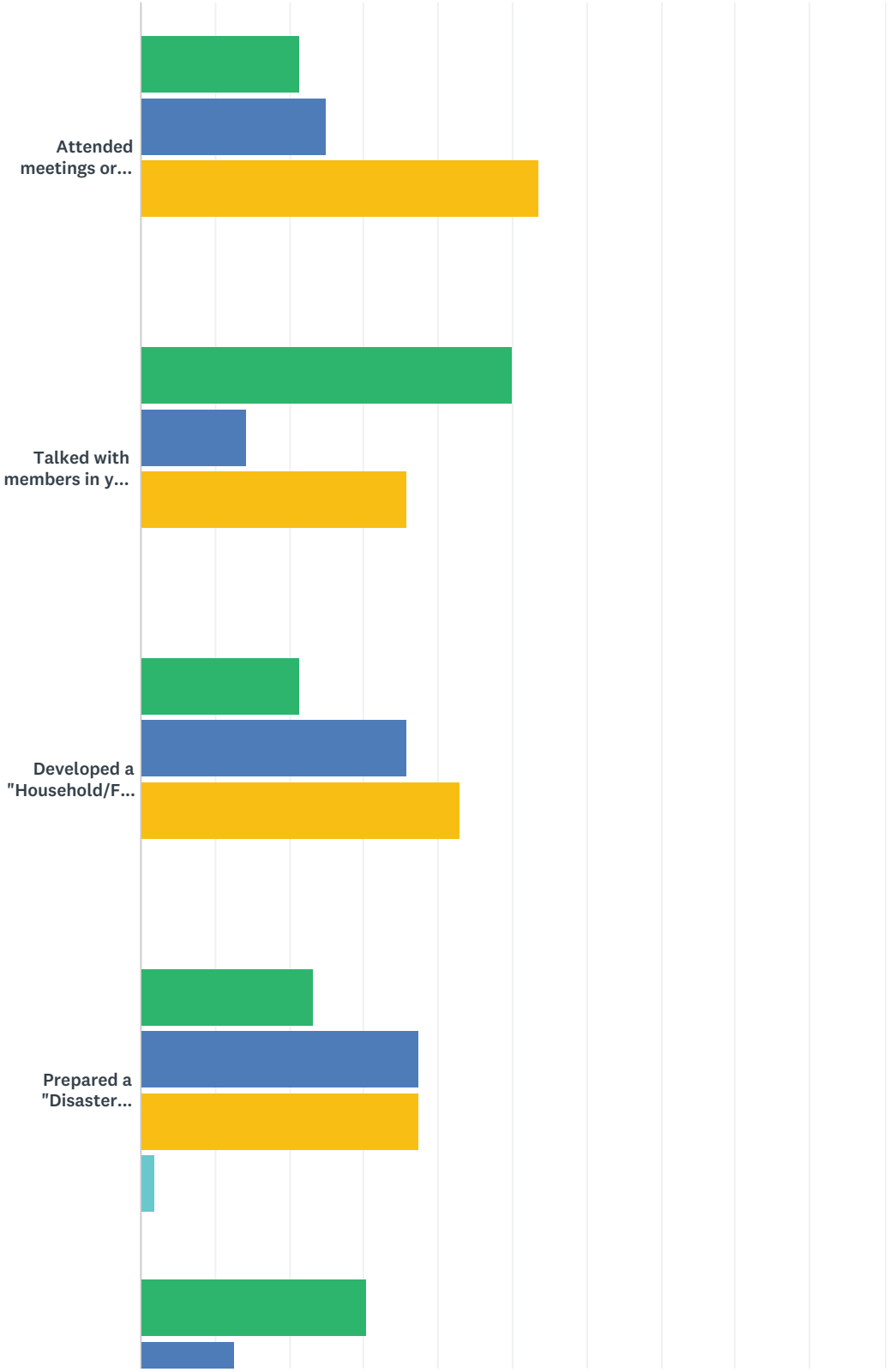

Enhancing the function of...
Protecting historical a...
Protecting and reducing dam...
Strengthening emergency...

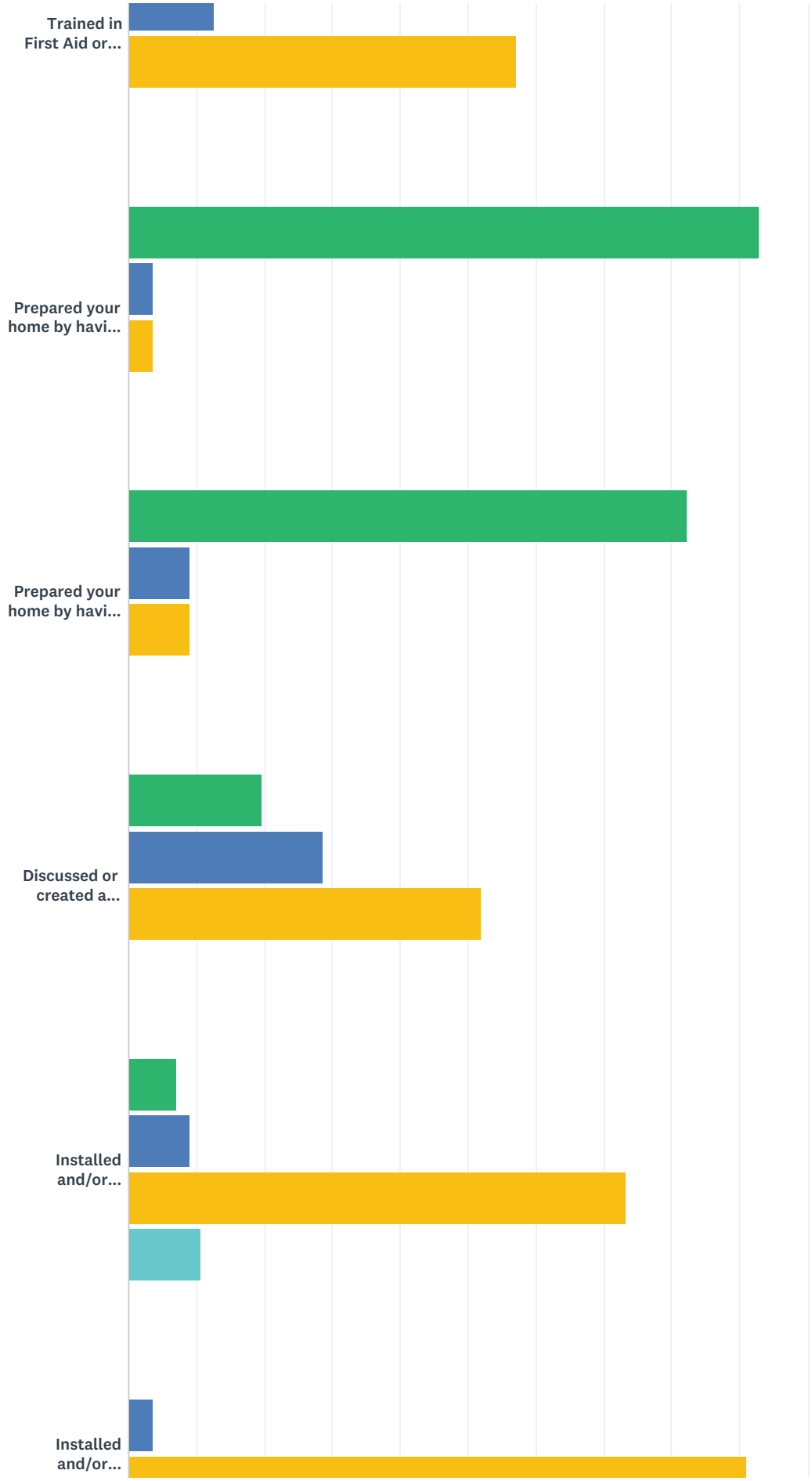


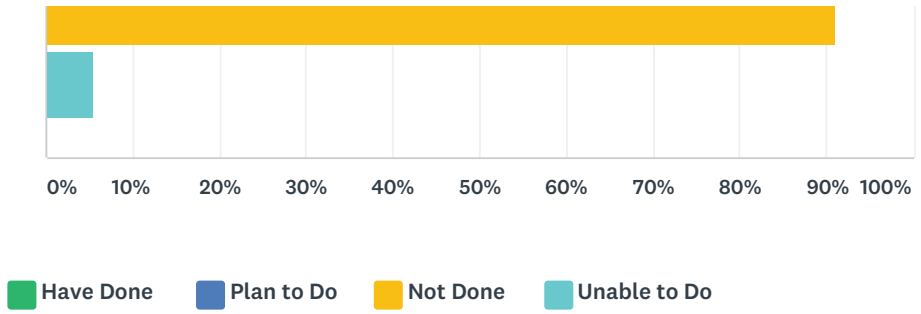
	VERY IMPORTANT	SOMEWHAT IMPORTANT	NEUTRAL	NOT VERY IMPORTANT	NOT IMPORTANT	TOTAL	WEIGHTED AVERAGE
Protecting private property	41.07% 23	48.21% 27	7.14% 4	1.79% 1	1.79% 1	56	1.75
Protecting critical facilities (e.g. transportation networks, hospitals, fire stations)	96.43% 54	3.57% 2	0.00% 0	0.00% 0	0.00% 0	56	1.04
Preventing development in hazard areas	44.64% 25	42.86% 24	8.93% 5	1.79% 1	1.79% 1	56	1.73
Enhancing the function of natural features (e.g. streams, wetlands)	58.93% 33	26.79% 15	12.50% 7	1.79% 1	0.00% 0	56	1.57
Protecting historical and cultural landmarks	14.29% 8	55.36% 31	16.07% 9	3.57% 2	10.71% 6	56	2.41
Protecting and reducing damage to utilities	80.36% 45	19.64% 11	0.00% 0	0.00% 0	0.00% 0	56	1.20
Strengthening emergency services (e.g. police, fire, ambulance)	62.50% 35	23.21% 13	10.71% 6	1.79% 1	1.79% 1	56	1.57
Disclosing natural hazard risks during real estate transactions	53.57% 30	32.14% 18	8.93% 5	3.57% 2	1.79% 1	56	1.68
Promoting cooperation among public agencies, citizens, non-profit organizations, and businesses	75.00% 42	19.64% 11	5.36% 3	0.00% 0	0.00% 0	56	1.30

Q15 In the following list, please check those activities that you have done in your household, plan to do in the near future, have not done, or are unable to do. (Please check one answer for each preparedness activity)

Answered: 56 Skipped: 41




Trained in First Aid or...
Prepared your home by havi...
Prepared your home by havi...
Discussed or created a...
Installed and/or...
Installed and/or...



	HAVE DONE	PLAN TO DO	NOT DONE	UNABLE TO DO	TOTAL
Attended meetings or received written information on natural disasters or emergency preparedness	21.43% 12	25.00% 14	53.57% 30	0.00% 0	56
Talked with members in your household about what to do in case of a natural disaster or emergency	50.00% 28	14.29% 8	35.71% 20	0.00% 0	56
Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster	21.43% 12	35.71% 20	42.86% 24	0.00% 0	56
Prepared a "Disaster Supply Kit" (stored extra food, water, batteries, or other emergency supplies)	23.21% 13	37.50% 21	37.50% 21	1.79% 1	56
Trained in First Aid or Cardio-Pulmonary Resuscitation (CPR) within the last year (you or anyone in your household)	30.36% 17	12.50% 7	57.14% 32	0.00% 0	56
Prepared your home by having smoke detectors on each level of the house	92.86% 52	3.57% 2	3.57% 2	0.00% 0	56
Prepared your home by having carbon monoxide detectors on each level of the house	82.14% 46	8.93% 5	8.93% 5	0.00% 0	56
Discussed or created a utility shut off procedure in the event of a natural disaster	19.64% 11	28.57% 16	51.79% 29	0.00% 0	56
Installed and/or purchased a generator	7.14% 4	8.93% 5	73.21% 41	10.71% 6	56
Installed and/or purchased hurricane shutters	0.00% 0	3.57% 2	91.07% 51	5.36% 3	56

Q16 Please feel free to provide any additional comments in the space provided:

Answered: 8 Skipped: 89

#	RESPONSES	DATE
1	protect our emergency equipment and vehicles.and protect our natural gas and electrical power stations and water and sewer pumping stations.clear roads for essential services	5/31/2019 8:34 PM
2	protecting the water and sewer capabilities is the most important	5/30/2019 11:36 PM
3	As a renter, some of the preparedness activities are out of my control. The landlord would be the appropriate person/persons to take those actions.	5/13/2019 10:53 AM
4	Given climate change predictions and observed changes already, inland flooding is a big risk for infrastructure, mobility, and emergency access in town. Green infrastructure (bioswales) as well as gray infrastructure (permeable hardtop) should be considered and emphasized at all points. Residents and businesses should get some financial support for replacing large areas of driveway hardtop with permeable paving.	5/13/2019 7:37 AM
5	Only resident for almost 2 years. Came from area with wildfires which reflects some of my answers and may not apply to Wakefield	5/13/2019 6:16 AM
6	I think the community is likely fairly well prepared for smaller events, but do we have planning in place for a large, unexpected event that requires shelters, evacuation, food supply for shelters, etc.? I have not seen any info on these items as a resident if they do exist. I would have no idea where to go.	5/11/2019 6:10 PM
7	Thank you for taking public opinion. Please repeat survey multiple times to gather as much data and provide as much opportunity for response as possible. The community is not prepared.	5/10/2019 11:35 AM
8	None	5/10/2019 11:11 AM

APPENDIX F

- **List of MVP Participants**

APPENDIX F: Participants of Wakefield's MVP Process & Invitation

Participants of Wakefield's MVP Planning Process

Name	Title	Affiliation
Town Lead		
Claire Moss	Environmental Manager	Department of Public Works
Consulting Team		
Kim Lundgren	Lead Facilitator	KLA
Angela Cleveland	Facilitator	KLA
Kara Runsten	Facilitator	KLA
Maggie Peard	Facilitator	KLA
Core Team and Workshop Attendees		
Chris Burne		Riverside Community Care, Inc.
Ruth Clay	Director	Health Department
Joe Conway	Assistant Director	Department of Public Works
Andy Dennehy	HMP Consultant	BETA Group
Hannah Gawrys	Safety Specialist	Bridgewell
Dave Hatfield	Chairperson	Board of Appeals
Meaghan Kinton-Beebe	Head of Circulation	Wakefield Public Library
Steve Maio	Town Administrator	Town of Wakefield
Jennifer McDonald	Content and Communications Manager	Town of Wakefield
Claire Moss	Environmental Manager	Department of Public Works
Maria Palomino	Member	Advisory Board of Public Works
Christopher Pierce	Building Manager	Building Division
Paul Reavis	Town Planner	Town of Wakefield
Bill Renault	Engineer	Department of Public Works
Adam Rodgers	Executive Director	Boys & Girls Club of Stoneham & Wakefield
Bob Schiaroli	Director of Facilities	Wakefield Public Schools
Gene Sullivan	Assistant Management	Wakefield Municipal Gas & Light Department
Michael Sullivan	Chief	Fire Department
Catherine Taatjes	Program Director	Horizon House
Tom Walsh	Director	Emergency Management
Julie Wormser	Deputy Director	Mystic River Watershed Association

Email Invitation

Local and regional stakeholders were contacted by phone and email to be personally invited to the HMP/ MVP planning process. Each received the following invitation.

> The Town of Wakefield is excited to be participating in the Massachusetts Municipal Vulnerability Preparedness (MVP) Program. This program helps communities to:
>
> - Define extreme weather and natural and climate related hazards;
> - Identify existing and future vulnerabilities and strengths;
> - Develop and prioritize actions to reduce risk and build resilience.
>
> Communities who complete the MVP program become certified as an MVP Community and are eligible for follow-up grant funding and other opportunities to enhance resilience to climate-related events and further sustainability initiatives. Wakefield wants to take full advantage of this grant funding to support our existing community planning efforts, including the Hazard Mitigation Planning process. Specifically, we see MVP as the foundation for a future Climate Action and Adaptation Plan.
>
> We hope your department or organization will accept this invitation to participate as a key stakeholder in our MVP Workshops. We ask that you send only one representative to the workshops. In these workshops, we will review essential components (infrastructural, socioeconomic, and environmental) of our community, discuss how potential hazards will impact them and develop actions to improve our resilience to those hazards. As a key stakeholder, we are interested in your input in this process and invite you to commit to attend two 4-hour workshops, to be facilitated by our consultant team. It is important that your department or organization's representative commit to attending both days as we will review different content each day. The workshops will be held:
>
> Monday, June 3, 2019 ~ 12pm - 4pm
>
> Tuesday, June 4, 2019 ~ 12pm – 4pm

APPENDIX G

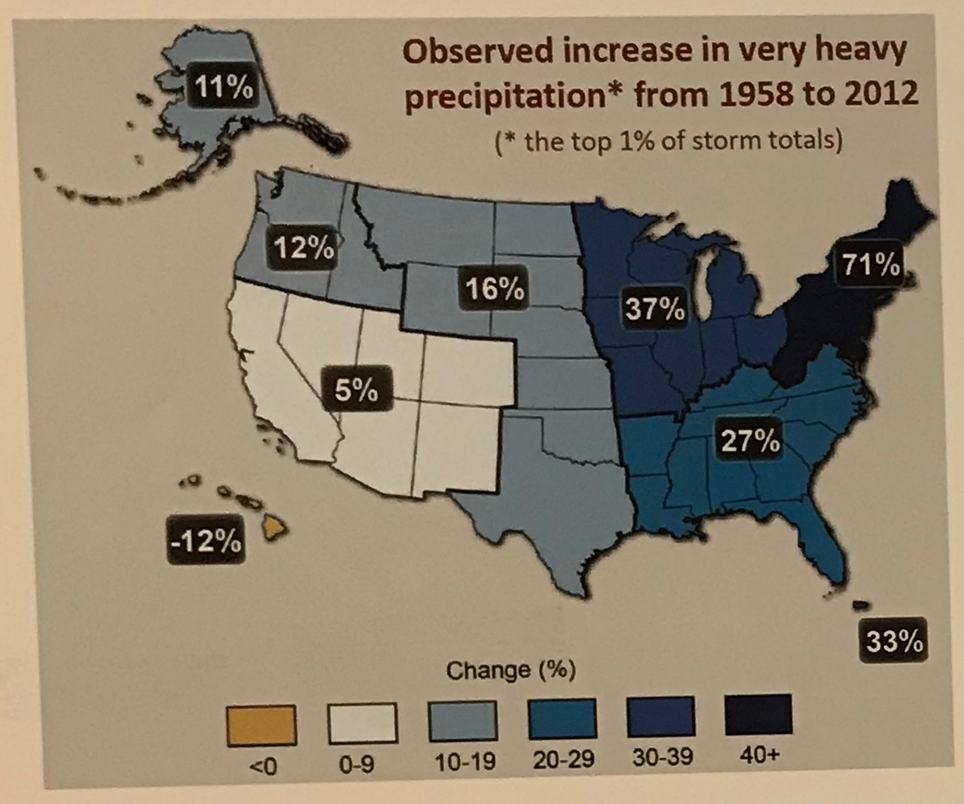
- **MVP Public Listening Session Photos and Sign In Sheet**
- **MVP Community Engagement Results**


DAVID
PODOT

Hazard: Intense Storms

Storms are expected to increase in the amount of precipitation, intensity, and [illegible]. We are likely to see more Nor'easters, stronger winds, persistent winter cold spells, and heavier [illegible] packed snow. Downed trees, flooding, and snow packed or icy roads delay commutes and [illegible] movement of goods, hindering our local economy. In addition, these [illegible] can damage [illegible] roads, bridges, and private property. They can also cause [illegible] for emergency [illegible] used for evacuation and ambulances.

What we have already seen



[illegible]ected t[illegible]

Mid[illegible]unty Precipitation Projections

	Observed Baseline 1971-2000	Mid-Century Projection	End of Century Projection
Average Annual Total Precipitation	45.2"	47.5" (+2.3")	48.6" (+3.4")

- More hurricanes, Nor'easters, tropical storms, and tornadoes
- Stronger winds during Nor'easters and thunderstorms
- Heavier, moisture packed snow

1. What concerns you most about this hazard?

property damage

utilities in flood prone basement!

safety injuries + death

Intense run off into Lake Q

Electric lines

Secondary impacts to businesses, families (school closures, etc.)

Not having access to refrigeration - access to medication

older, sicker citizens being isolated in need

2. What could be done to help community members be better prepared for this hazard?

Stop snow plows from plowing us in.

Snow plow drivers need to be more aware of not plowing people in

Electric utilities should be underground to have less power outages

new construction should meet requirements for absorbing run-off, use of permeable surfaces

educate stay away from/near water w/ lines etc.

Not at the town level, but jobs you can miss for a few days & not get fired...

Warming/ cooling centers - check-in protocols

awareness - kiosk

ID people vulnerable during storms and who need extra help.

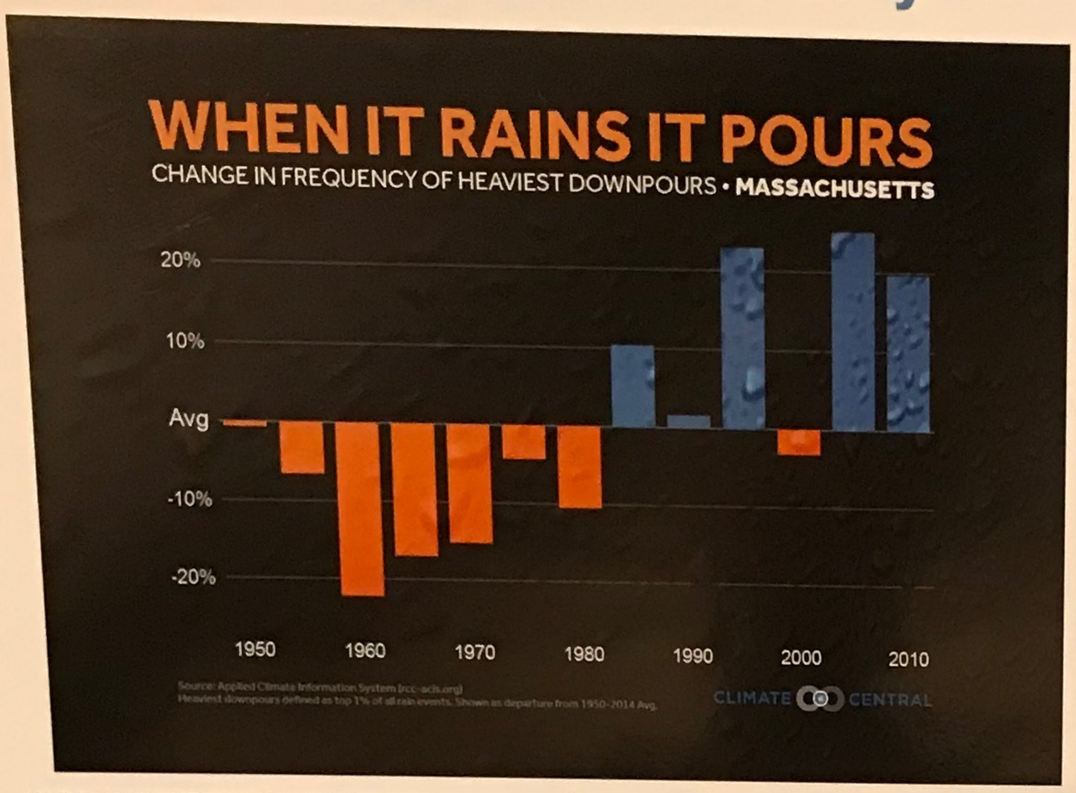
What actions have you already taken or would you be willing to take to better protect yourself from this hazard?

change political thought → climate change is real!

work from home policy for staff

What we are expected to see

35.2 million Damage from March 2010 floods in Middlesex County



Average days per year in Middlesex County with precipitation greater than 1 inch

Observed Baseline 1971-2000	7 days
Mid-Century Projection	Up to 11 days
End of Century Projection	Up to 12 days

1. What concerns you most about this ha

2. Wh ould be done to help community members be better prepared for this h rd?

3. ctions have you already r would willing to take to better protect yourself from this hazard?

sewer backups

Toxic substances in flood waters soil, waste, chemicals, heavy metals, gas, battery

Poor STORM WATER management into Lake Q

lack of open space

Transit challenges due to flooded roads

Control the water level of lake Q so my bsmt does not flood

Catch Basin maintenance into Lake Q next to house from run off behind car dealership

Over-building

Better coordination between Conservation Comm ZBA Planning –

Identify & Clean up toxic sites & Sources in Flood Prone areas

- And Educate About the Risk

Stop Building on wetlands

Supply Sump pumps

Permeable pavement

up: stop building in wet lands

think of zoning changes

Rain gardens bioswales stormwater wetlands

Land trust - buy up wetlands

Design low lying buildings to flood & be OK

Utilities Controls moved to upper floors

Leaving basements unfinished

We bought a house on top of a hill

us too, and a grass strip drive

I have replaced lawn with plants

Rainbarrels to store rainwater

I am considering replacing driveway with porous surface.

Healthy soils/sponges

Focus on healthy soils

STRONGER Zoning ENFORCEMENT

Hazard: Heat Waves

Annual temperatures and the number of heat waves are rising, which changes how we will experience every season. We will see greater days above 90°F in the summer and fewer days falling below 32°F in winter. The nation's leading deadliest type of weather is not hurricanes or tornadoes, but heat, and this risk is only expected to grow. Additionally, new temperature patterns have the potential to impact our ecosystems and biodiversity and spread invasive species. We may also see changes in our energy demand required to maintain livable and comfortable temperatures in our homes.

We can't Air Condition our way out of this one!

What we have already seen

+1.43° F

Change in temperature in the Northeast comparing the average annual temperature in 1986–2016 to 1901–1960

What we are expected to see

Middlesex County	Observed Baseline 1971-2000	Mid-Century Projected Change	End of Century Projection
Average Number Days Below 32° F	145	116	101
Average Number Days Above 90° F	8	30	46

48°F

Average annual temp 1971-2000

Middlesex County

+4.2°F

Projected change in average annual temp 2020-2049

Effects on Animals

Old schools built w/o A/C.

half days at schools w/c of heat

unhealthy AC filters etc

Schools/ some public buildings no a/c

homeless

Buildings built to keep IN heat

added cost of LEED buildings

added energy and cost of A/C

insect bourne illness: EEE & W. Nile Virus

A/C units "heating" the outside

better enforcement of Crystal Lake CATVs riding around it)

concerns you most about this hazard?

2. What could be done to help community members be better prepared for this hazard?

building efficiency standards to accommodate more AC

lack of trees - more trees

Tree replacement

ACs that actually Condition the air

Well-funded tree program

Passive Survivability (ability to sustain livable temps with no electricity)

Transportation to ↗

Planned Cooling Centers?

applying efficiency codes to new construction

cooling focus for energy audits

better insulation, roof gardens

3. W…ons have you already taken or would you be willing to take to better protect yourself from this hazard?

line-drying laundry

Are there designated sites w/ A/C for vulnerable populations during extreme heat events - schools? Arenas?

Added insulation

Drought can stress our water supply and impact ecosystems and crop production by altering soil moisture and water depth (and temperatures) that plants and animals rely on to flourish. The potential for brush fires also increases during drought.

What we have already seen

52% Of the land area in Massachusetts was considered to be in "Exceptional Drought" in Oct '16

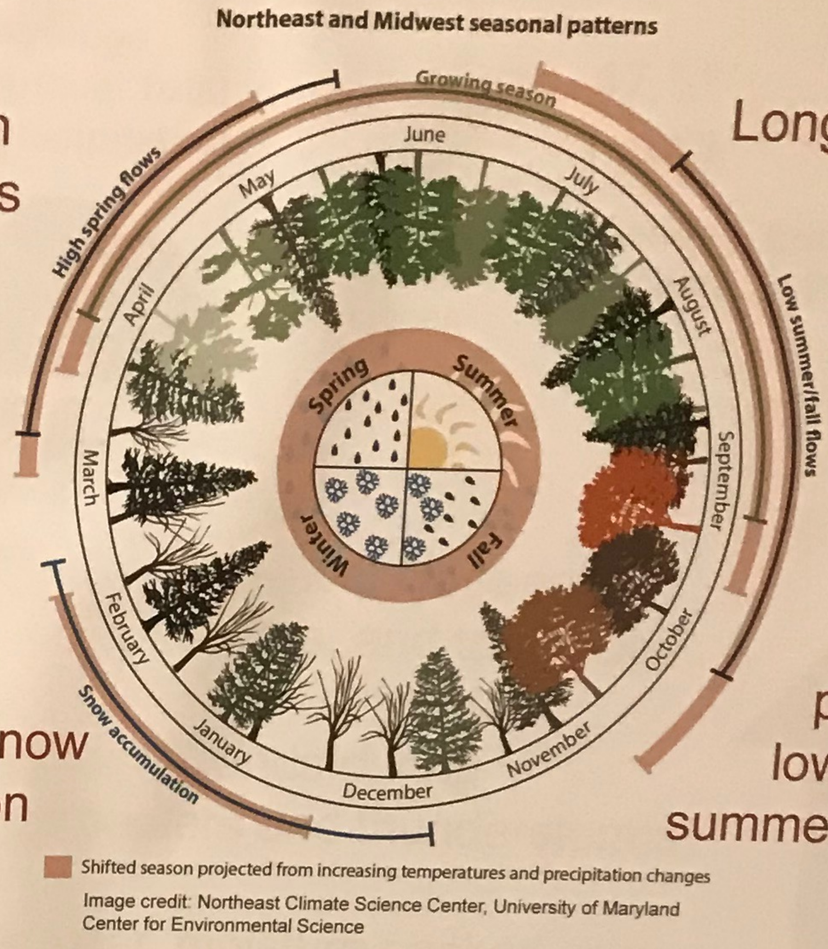
48 weeks

the longest duration of drought in MA since 2000 (Jun '16- May '17)

What we are expected to see

Earlier high spring flows

Shorter periods of snow accumulation



Longer growing season

Longer periods of low flows in summer and fall

Wakefield relies on **Crystal Lake** for drinking water and **Lake Quannapowitt** for recreation. Drought could compromise these resources and increase the **risk of brush fires**.

1. What concerns you most about this hazard?

erosion & topsoil loss

erosion

Impact on lakes

loss to unmanaged forests and municipal trees

our trees are not being replaced Drought stress trees & they cut down - more ha

2. What could be done to help community members be better prepared for this hazard?

Xera culture as part of building code, considered in special permits

increase awareness, Social Media & info campaigns

for home gardens rain barrels free/low cost

More demonstration Gardens for Tawwa Food

Offer Water (Bottles, et when need

Micro Clover Black beauty blend

Reduction of "grass" lawns that need a lot o water/irrigation

Community Education Drought-resistant plants/ Species

3. What actions have you already taken or would you be willing to take to better protect yourself from this hazard?

Limit travel & plant based diet.

no ground watering

Rain barrels

I have rain barrels and so many native, drought flowers/plants in my limited "grass" lawn. I have a few in my "veggie" garden beds w/ irrigation system

envision
WAKEFIELD
— RESILIENT →
OUR PATHWAY TO A HEALTHY, THRIVING FUTURE

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RESILIENT
OUR PATHWAY TO A HEALTHY, THRIVING FUTURE

WAKEFIELD COMMUNITY ENGAGEMENT EVALUATION

December 2019

KLA
KIM LUNDGREN ASSOCIATES, INC.
Customized Solutions for the Community You Want

OVERVIEW

Since the launch of *Envision Wakefield Resilient* in the summer of 2019, the Town and Consultant Team have been busy getting the word out about the project, hosting events and trainings, and collecting feedback from Wakefield residents and businesses. This engagement report highlights the in-person and online engagement efforts made to-date, presents the results of the survey, and reports progress on meeting engagement goals. To the right are the overarching goals for the project's community engagement efforts.

The engagement highlights include attending Festival by the Lake and Festival Italia, hosting a Business Resilience Workshop and a Vulnerable Populations Focus Group, collecting 71 survey responses, and posting weekly to social media.

GOALS FOR COMMUNITY ENGAGEMENT

PHASES OF THE ENGAGEMENT PROCESS

Phase One

- Open conversation about climate change with the community
- Assess baseline knowledge about the topic
- Learn about resident concerns

Phase Two

- Assess results from community engagement
- Establish priorities to create an evaluation framework
- Complete an evaluation framework and dashboard to measure progress

IN-PERSON **ENGAGEMENT: Events**

Pop-Ups at Events: Festival Italia & Festival by the Lake

The Town has seen great success from pop-ups and has leveraged this model at the various events throughout Town including the Festival by the Lake in June and the Festival Italia in August. Events like this provided an opportunity to engage with a wide range of community members, not just those that are inclined to attend an event on climate change. The team compiled the responses collected from these events and incorporated them into the Summary of Findings Report and informed the development of the evaluation criteria.

Preparedness Drive

In coordination with the Wakefield Food Pantry, the Town held a preparedness drive that was paired with education about how to make sure you are prepared for up to 72 hours without power. Participation was limited, but the Town walked away with concrete action steps to improve this kind of drive in the future, such as better publicizing and additional partnering with community organizations.

IN-PERSON **ENGAGEMENT:**
Focus Groups

Focus Group: Chamber Workshop

The Town and Consultant Team partnered with the Wakefield/Lynnfield Chamber of Commerce to host a preparedness training and discussion with businesses in October. Discussion centered on businesses biggest needs after an emergency, where they turn to for information, and generally how they can build resilience in the face of climate impacts. There were around 15 people in attendance.

Focus Group: Vulnerable Populations

The Town and Consultant Team hosted an informal conversation with the Police Chief, Fire Chief, and Emergency Management Director to learn more about who the vulnerable populations are in Wakefield, the current outreach techniques and protocol to these residents, and what resources are available to provide assistance and support to both the vulnerable residents and emergency service providers to help them. The biggest takeaway was around community engagement and education, specifically using CodeRed, the Town's website, and providing orientation to key personnel to assist vulnerable populations.

SURVEYS & ONLINE **ENGAGEMENT**

Survey
The survey was used to assess the baseline knowledge of and community concerns about climate change and determine a vision for a resilient Wakefield and the actions needed to get there. The survey was available online, promoted through social media, and distributed at in-person events and through partner organizations. The team collected 71 survey responses. Results can be found on the following pages.

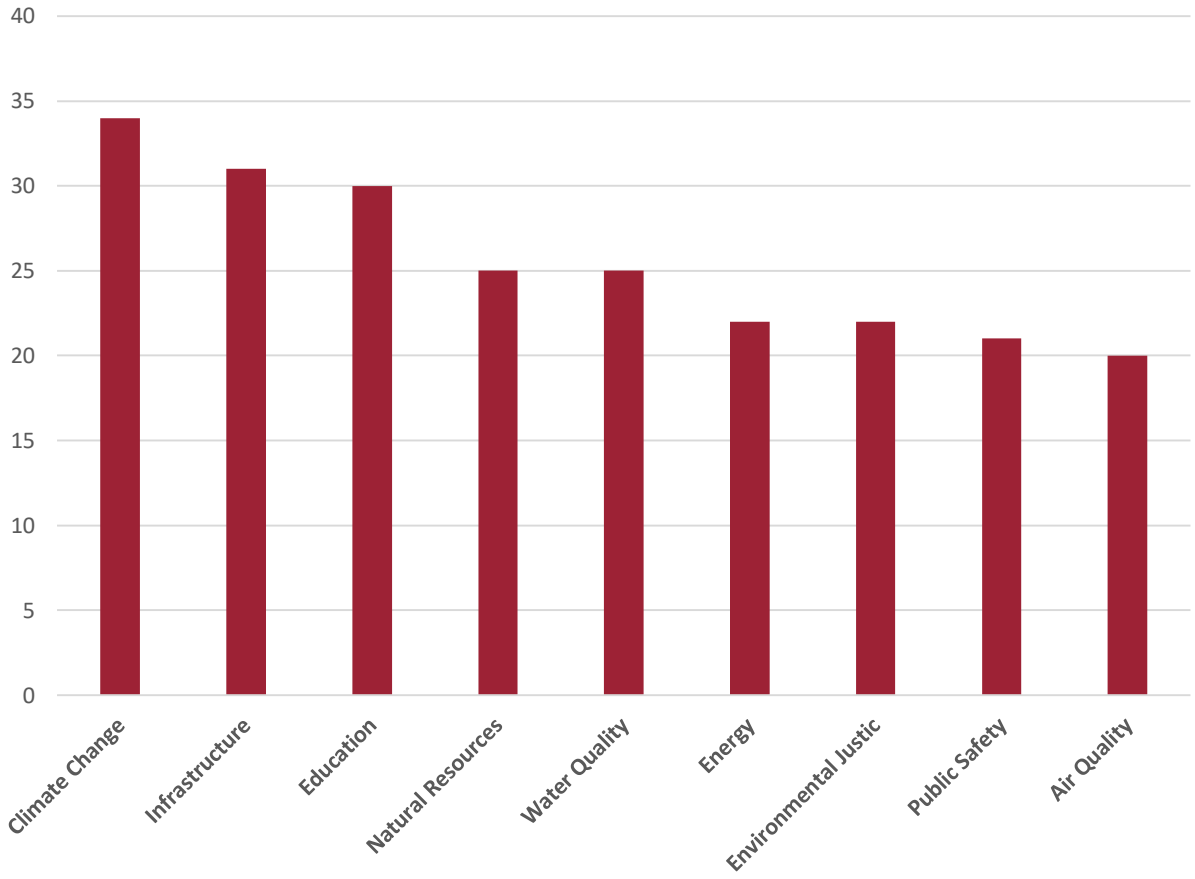
Social Media, Blogs, and Newsletters
The KLA Team provided 2-3 social media posts per week to highlight why Wakefield needs to take action on climate change and how community members can do it together, as well as promoting *Envision Wakefield Resilient* events. Posts generated 5-15 engagements (likes, shares, comments). Social media was especially helpful in publicizing the survey: 31% of survey respondents reported hearing about the survey through social media—second only to taking the survey at an in-person event.

Business Resilience Checklist
To support the Business Resilience Focus Group co-sponsored with the Chamber, a Business Resilience Checklist was help communities prepare for the impacts of climate change and other emergency situations. The Checklist is on the Town's website and was distributed through QR codes at the Focus Group.

SURVEY RESULTS: What's Important?

71 Total Responses

Respondents were asked to choose up to 5 issues that they feel are most important to address. Below are the topics that received 20 votes or more.

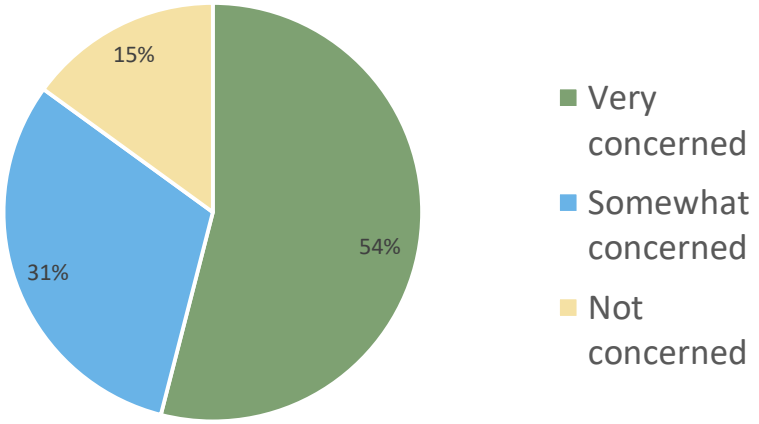


Survey respondents were given the space to elaborate on what is most important to address. Here is what we heard:

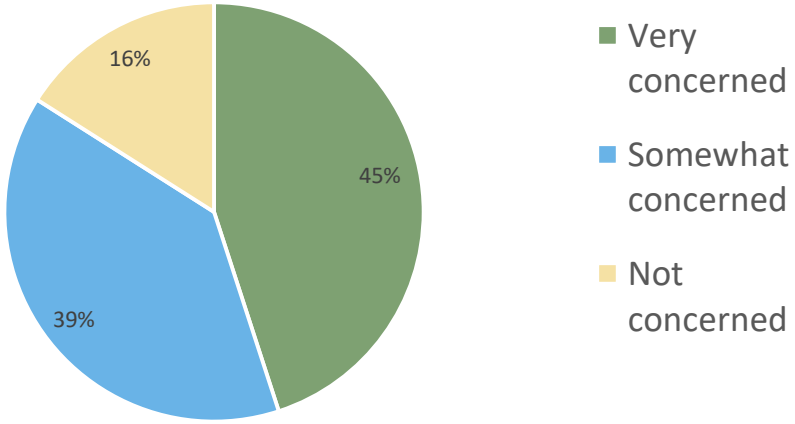
- Improve quality of Lake Q, maintain quality of Crystal Lake
- Replace aging infrastructure
- Increase renewable energy supply
- Add public transportation options
- Reduce municipal waste
- Educate the public about all of these issues
- Assess impact of development
- Protect open space
- Eliminate food insecurity
- Reducing the throw-away mentality
- Hold education in schools to a higher standard
- Manage loitering downtown
- Provide well paying jobs for college graduates

SURVEY RESULTS: Concerns and Visions

How concerned are you that climate change will affect you personally?



How concerned are you that climate change will affect the Town of Wakefield?



What is your vision of resilience in Wakefield?

"A town where people come together to help each other, support the environment and face the future with confidence and the ability to adapt to change"

"I want Wakefield to embrace change when it comes to protecting our planet for future generations. So that there will still be a Wakefield in 100 years."

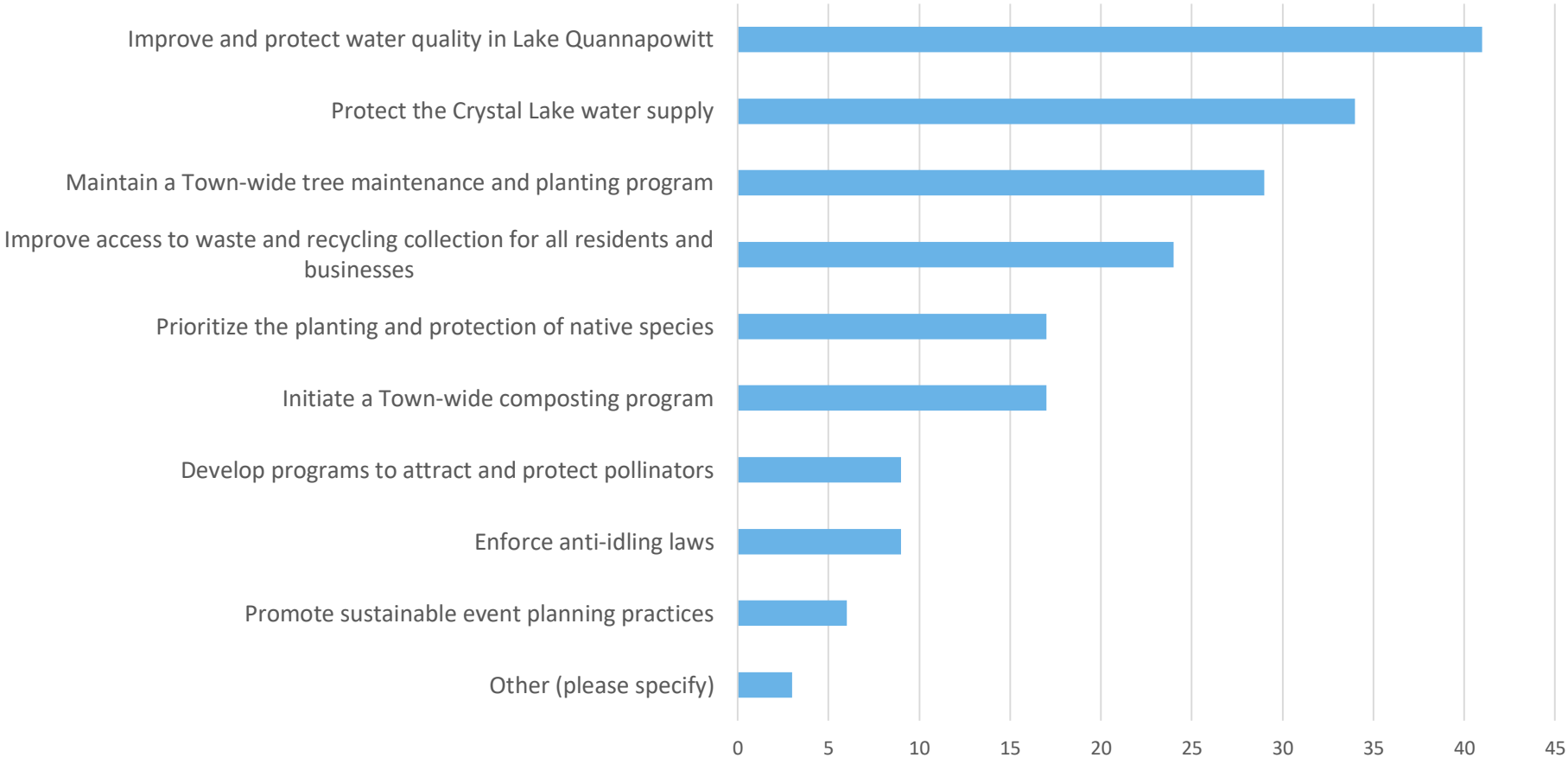
"To be knowledgeable about climate change and its effects and being prepared for them; having a Plan B and C; be aware of the effects of what we do now and how it will affect us later."

"Neighbors helping neighbors"

"In the event of a disaster, how our citizens, business and town government get back to where we were."

SURVEY RESULTS: Environmental Actions

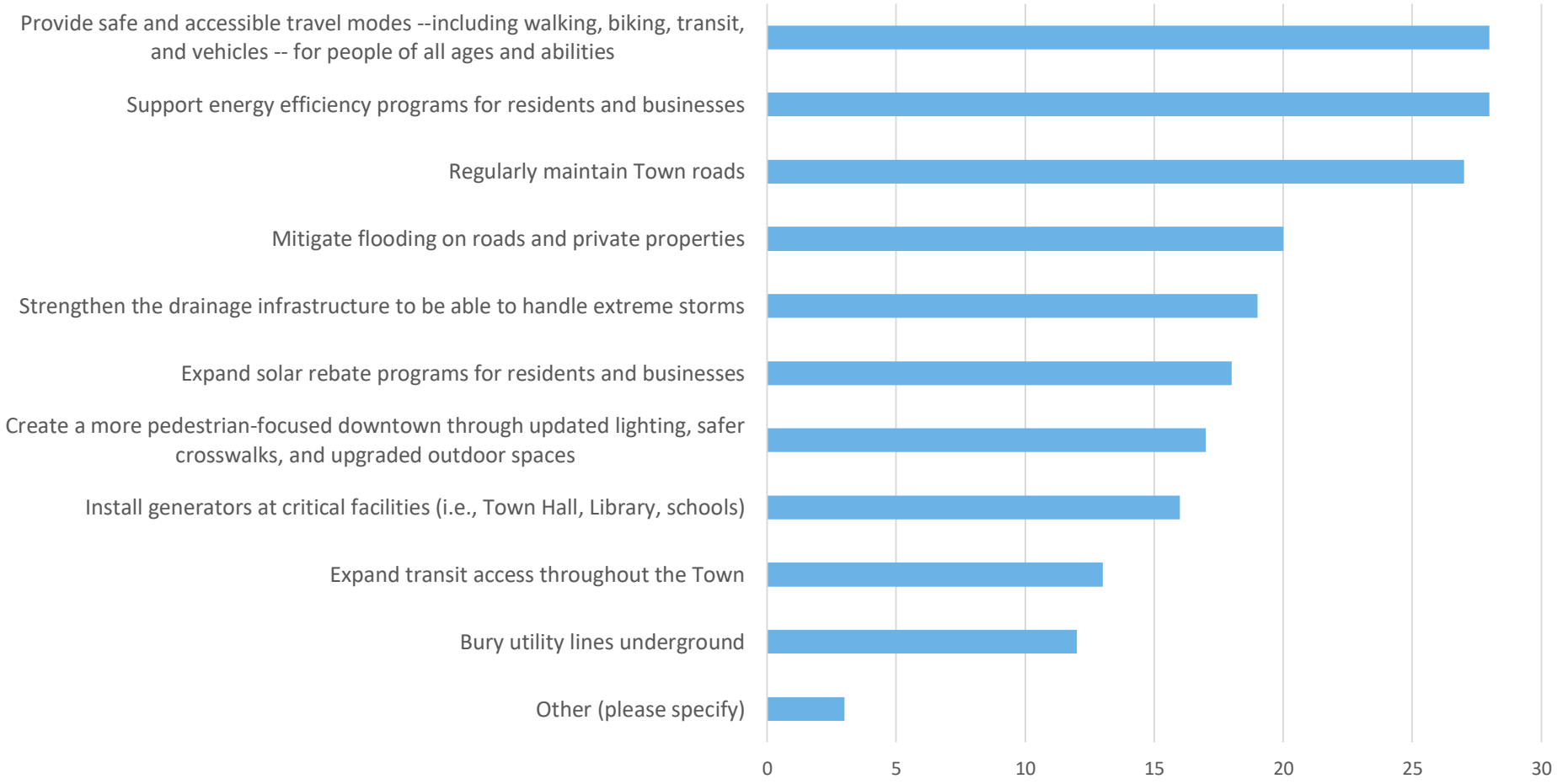
Environmental: Which of the following actions will help to ensure that Wakefield's environmental features are able to withstand the impacts of climate change?



Other ideas included: Monitor roads and infrastructure; and change the salt product used on the roads in the winter

SURVEY RESULTS: Infrastructure Actions

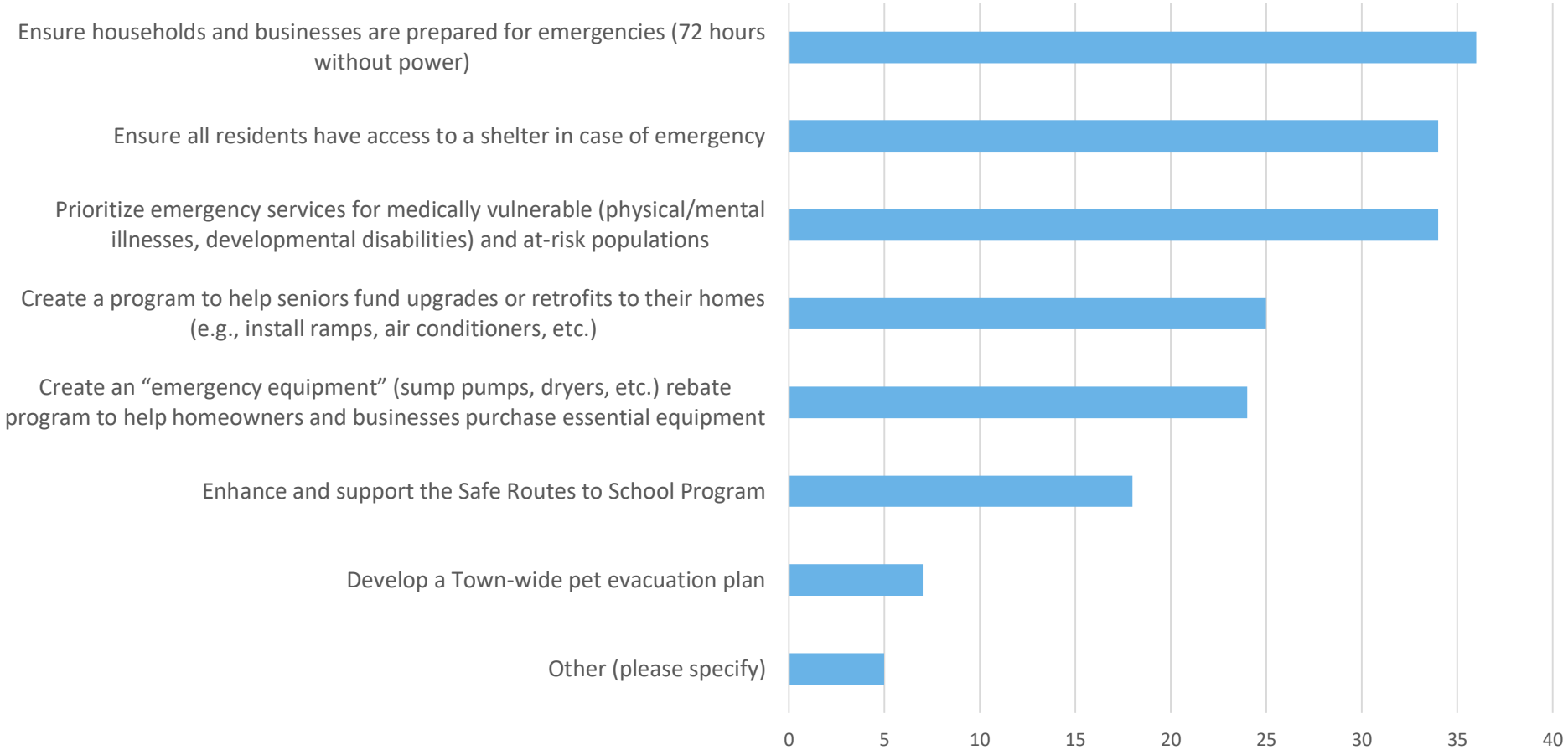
Infrastructure: Which of the following actions do you think will strengthen Wakefield's infrastructure and prepare the community to withstand the effects of climate change?



Other ideas included: implement a composting program; ban single-use plastics; localize the energy supply; and make Wakefield more walkable

SURVEY RESULTS: Societal Actions

Societal: Which of the following actions would you like to see to ensure Wakefield is prepared to protect our societal assets?



Other ideas included: provide parking downtown to help businesses prosper; combat loneliness in the elderly community; prioritize community policing in neighborhoods; build trust in Town government

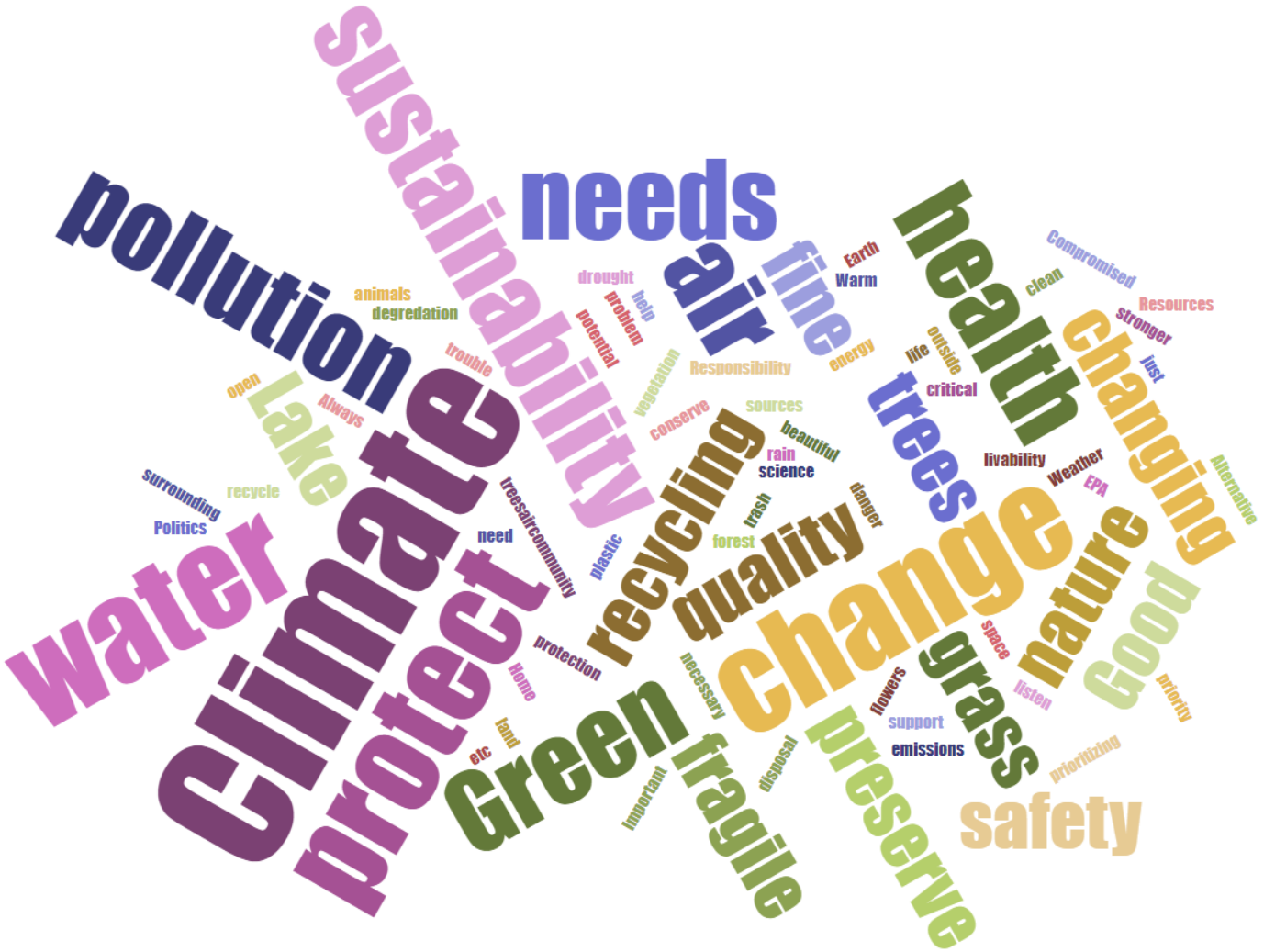
SURVEY RESULTS: Word Association

To get a baseline evaluation of residents' impressions and priorities, we asked participants to list the words they associated with five specific topics. The responses are below; the larger texts indicates more frequently included words.

Resilience:

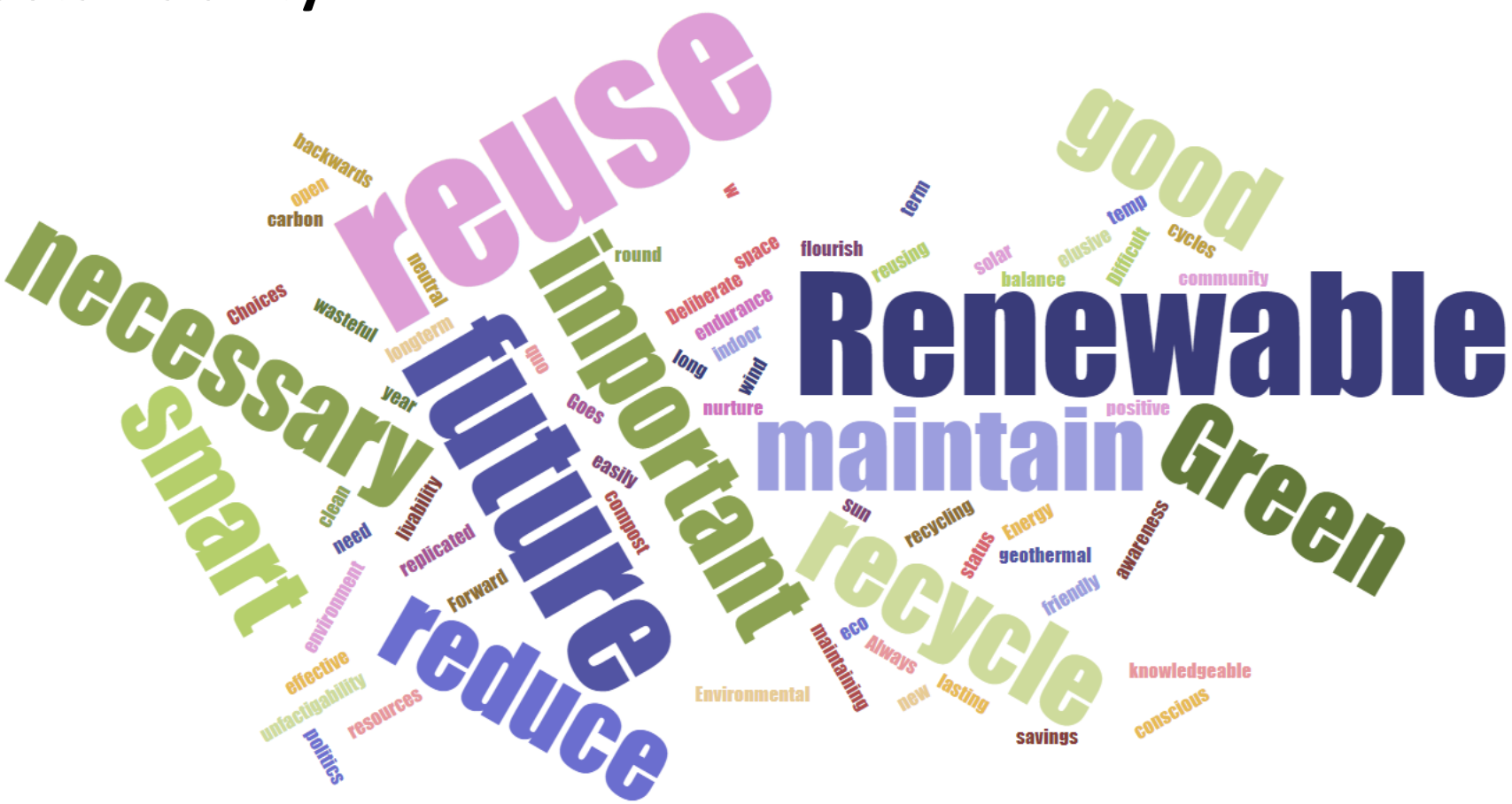
SURVEY RESULTS: Word Association

Environment:



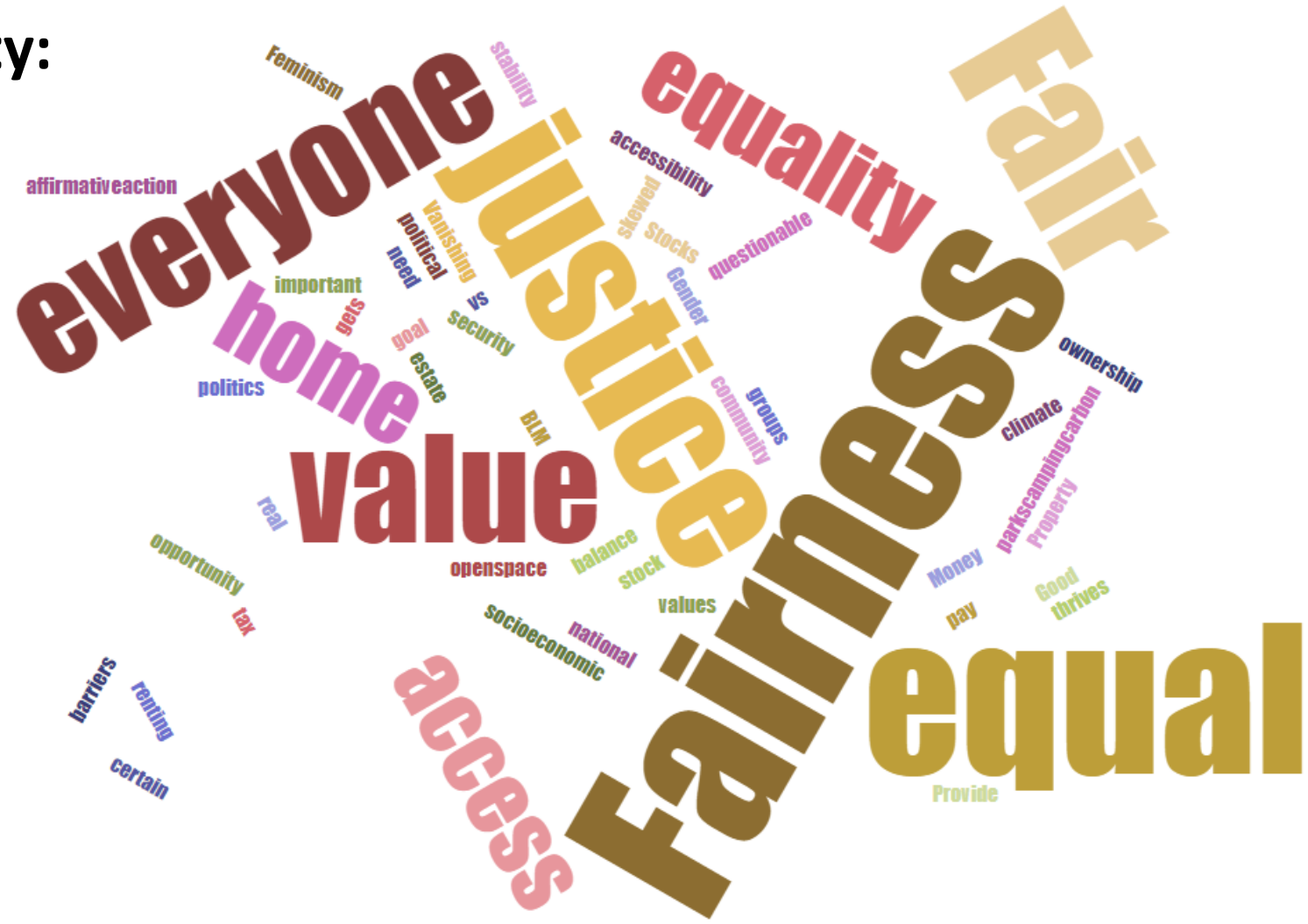
SURVEY RESULTS: Word Association

Sustainability:



SURVEY RESULTS: Word Association

Equity:



SURVEY RESULTS: Word Association

Economy:

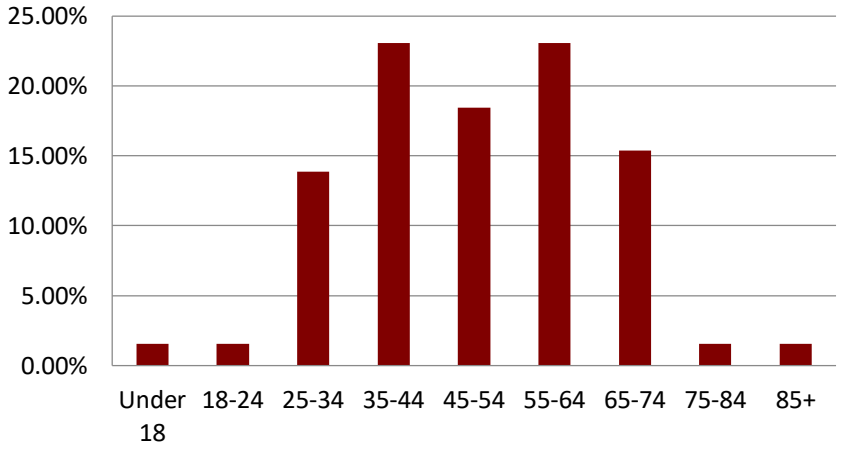
SURVEY RESULTS: Wakefield ESC Actions

The survey gave respondents the option to share what actions they want the Town's Environmental Sustainability Committee to take. Below are top actions mentioned:

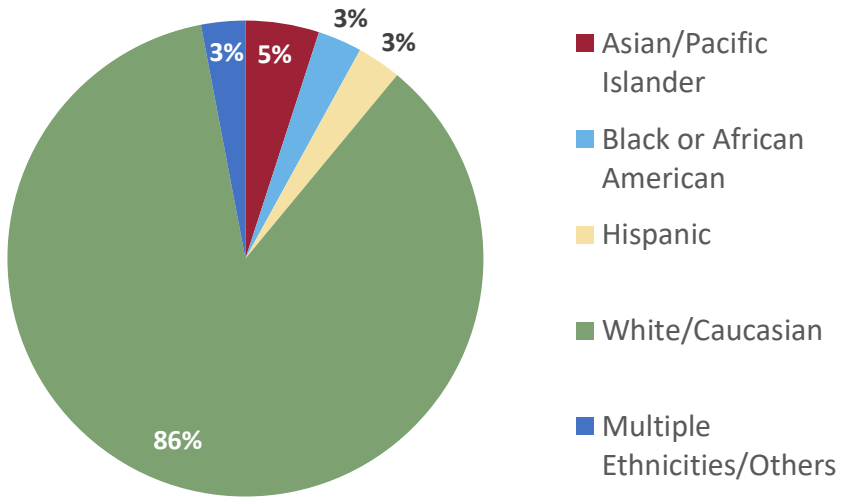
- Expand recycling and composting programs (weekly town recycling, town composting, programs in schools, require businesses to recycling)
- Climate plan that reduces emissions to net zero
- More renewable energy (municipal energy supply, better incentives for residential solar)
- Ban single-use plastics
- More electric vehicle charging stations
- Education campaigns and events
- Reduce litter
- Assessment of development on the environment
- Clean up Lake Q
- New LEED certified high school with a climate-focused curriculum
- Regionalization of climate action
- Improvement of multimodal transportation options
- Reduction of landscaping chemicals
- Preparedness trainings targeted at vulnerable populations

SURVEY RESULTS: Demographics

Age of Respondents



Race/Ethnicity of Respondents

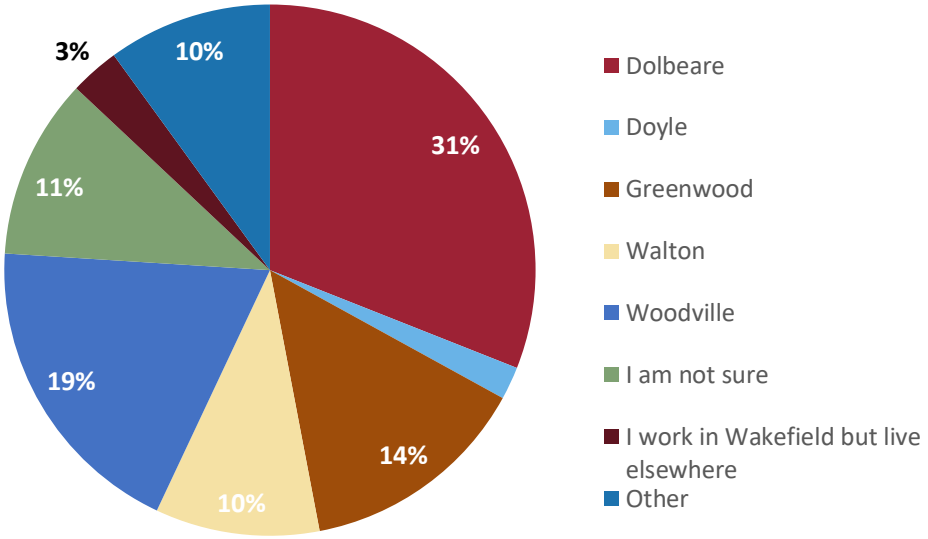


Race/Ethnicity of Residents in Wakefield, 2017	
Asian/Pacific Islander	2.0%
Black/African American	1.1%
Hispanic	3.9%
White/Caucasian	91.6%
Multiple Ethnicities/Other	1.3%

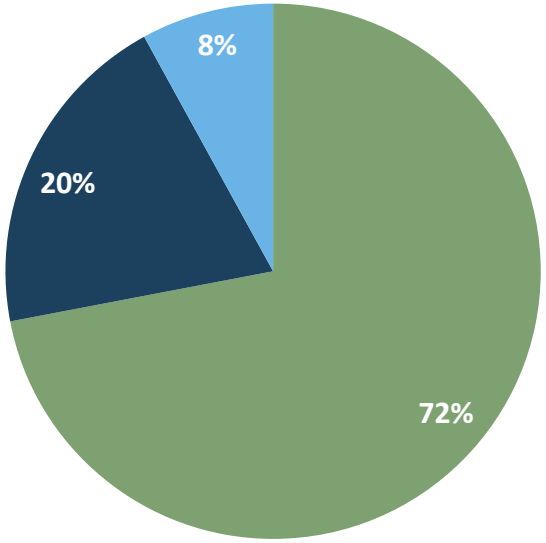
Source: American Community Survey, 2013-2017

SURVEY RESULTS: Demographics

School District of Respondents



Housing Status of Respondents



Target Population	Number*	Organizations	Specific Tactic(s)	Metrics of Success	Progress To Date
Low-Income	1,097	• Wakefield Housing Authority • Wakefield Food Pantry	• Pop-up at events • Preparedness training	• Host 1 preparedness training	• Hosted Preparedness Drive • Hosted a Vulnerable Populations Focus Group
Non-English Speakers/ Immigrants	2,262	• Wakefield Housing Authority	• Pop-up at events	• Attend 1 event geared toward this community	• Not complete
Seniors	4,648	• Senior Center • Council on Aging • Retirement Communities	• Pop-up at events • Preparedness training	• Host 1 preparedness training (could be combined with the low-income community training); 17% of survey respondents 65 or older	• Hosted Preparedness Drive • Hosted a Vulnerable Populations Focus Group • 18.5% of survey respondents were 65 or older
Small Business Owners	N/A	• Wakefield Lynnfield Chamber of Commerce	• Attendance at an event (Focus group)	• Hold 1 focus group	• Attended BYOB Event hosted by the Chamber • Hosted a Business Resilience Workshop • Created a Business Resilience Toolkit
Youth (Under 18)	5,127	• Schools • Boys and Girls Club • Americal Civic Center • Wakefield High Green Coalition • Back to School Nights in September	• Presentation at related classes or clubs • Pop-up at events	• Hold 1 presentation or attend 2 events	• Attended high school environmental studies class

**Numbers based on American Community Survey, 2017*

APPENDIX

I. Full Survey Results
II. Notes from the Chamber Focus Group
III. Notes from the Vulnerable Populations Focus Group

APPENDIX H

- **MVP Summary of Findings Report**

TOWN OF WAKEFIELD

Municipal Vulnerability Preparedness Program

Community Resilience Building Workshop
Summary of Findings Report
February 2020

Prepared for the Town of Wakefield, MA, by Kim Lundgren Associates, Inc. with a grant from the Massachusetts Executive Office of Energy & Environmental Affairs

KLA KIM LUNDGREN ASSOCIATES, INC.

TABLE OF CONTENTS

Town of Wakefield
Community Resilience Building Workshops
Summary of Findings

I. OVERVIEW

Lake Quannapowitt on a summer day.

Photo Credit: KLA

This Summary of Findings Report presents the results of a six-month effort by the Town of Wakefield to start the conversation about climate change within the community. In the spring of 2019, Wakefield received funds from the Massachusetts Municipal Vulnerability Preparedness (MVP) Program to begin the conversation. The MVP program provides funding for cities and towns in Massachusetts to plan for climate change resilience and implement priority projects. The state awards communities with funding to complete vulnerability assessments and develop action-oriented resilience plans. Communities who complete the MVP program become certified as an MVP community and are eligible for action grant funding. In June 2019, Wakefield convened two workshops where local and regional stakeholders assessed current and future strengths and vulnerabilities and identified potential actions to create a more resilient community. This report summarizes the results of the two workshops and a public listening session as well as the input received from community members through an enhanced scope that included an online survey and in-person engagement activities.

Changes in climate are becoming more apparent in Wakefield, taking shape through four primary hazards:

- ***Heat Waves**: The Northeastern United States has experienced just over a 1.4°F increase in average annual temperature since the early- to mid-1900s,[1] and the number of hot days in Wakefield has been on the rise.*

[1] U.S. Global Change Research Program. 2017. Climate Science Special Report: Fourth National Climate Assessment. Chapter 6. U.S. Global Change Research Program. Retrieved from https://science2017.globalchange.gov/chapter/6/

- ***Drought**: Wakefield (along with the rest of Massachusetts) experienced the impacts of drought during the latter half of 2016.[2] In October 2016, 52% of the land area in Massachusetts was considered to be in "Exceptional Drought."[3] This is especially relevant to Wakefield as drought impacts Crystal Lake, the Town's water supply.*

- ***Intense Storms**: Another notable change is the increase in the intensity and frequency of rain events. The northeast has already seen a 70% increase in the intensity of rain events from 1958 to 2010.[4]*

- ***Flooding**: Flooding is not only an inconvenience and a public safety issue, but it also takes an economic toll on Wakefield. In March of 2010, flooding caused $35.2 worth of damage in Middlesex County.[5]*

Combined, these hazards have inspired the Town to begin identifying and implementing actions that will enhance local resilience to these existing conditions and projected changes.

Wakefield has already taken several steps to adapt to the impacts of climate change and protect its natural resources. The Town has a tree trimming program to reduce the damage to power lines and other infrastructure during storms. Similarly, the Town has improved flood control and stormwater management by updating the Floodplain District Zoning Bylaw, creating a Stormwater Management Plan, hiring a Stormwater Manager, and implementing maintenance programs. Finally, the Town is also pursuing a Complete Streets program and Downtown Revitalization project to improve sustainable transportation options. The MVP program allows the Town to further its ability to address current and future climate impacts by proposing specific actions.

In May 2019, the Town of Wakefield partnered with Kim Lundgren Associates, Inc. (KLA) to design a process that would allow the Town to become an MVP Community. The work described in this report is a crucial step in Wakefield's journey to a more resilient future. To complete the work outlined in this report, the Town worked with KLA to:

- *Create a Core Team comprised of key internal stakeholders;*
- *Establish goals for the MVP process;*
- *Conduct research on historic and projected changes and impacts from climate change;*
- *Determine an initial set of high-priority hazards;*
- *Collaboratively design two MVP workshops using the Community Resilience Building process;*

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[2] National Oceanic and Atmospheric Administration. Massachusetts. Retrieved from https://www.drought.gov/drought/states/massachusetts
[3] National Oceanic and Atmospheric Administration. Massachusetts. Retrieved from https://www.drought.gov/drought/states/massachusetts
[4] City of Boston. 2016. Climate Ready Boston. Retrieved from https://www.boston.gov/sites/default/files/02_20161206_executivesummary_digital.pdf
[5] National Oceanographic and Atmospheric Association. Storm Events Database. 2016.

- *Identify and invite key stakeholders to participate in the MVP workshops;*
- *Host two MVP workshops where:*
    - *the highest priority hazards were confirmed;*
    - *the impacts, strengths, and vulnerabilities to infrastructure, socio-economic systems, and environmental systems were identified;*
    - *several adaptation actions were created; and*
    - *a final set of high priority action items were collectively defined and agreed upon by workshop participants;*
- *Prepare for and host a listening session to discuss the results from the workshop and solicit feedback from the community.*

The cornerstone of this work was the two MVP workshops hosted by the Town. The attendees of the workshops represented a diverse group of stakeholders that each brought a specific area of expertise to the table. The workshops served to collaboratively develop solutions that serve the entire Wakefield community.

This report provides greater detail about the MVP process that Wakefield followed, and the actions identified as high priorities to enhance local and regional resilience. The Town would like to thank the Massachusetts Executive Office of Energy and Environmental Affairs for their financial and technical support for this effort.

Americal Civic Center. Photo credit: KLA

MVP Planning Process

In May 2019, KLA worked with staff from Wakefield Public Works to identify individuals to serve on the MVP Core Team (see Appendix 2 for a list of the members). On May 14, 2019, the Core Team members met to learn about the MVP process which is based on the Community Resilience Building Framework (see Figure 1). This meeting was combined with the final meeting regarding the Town's Hazard Mitigation Plan since the two processes are closely related. They learned more about their role as a Core Team member, confirmed materials and logistics for the MVP Workshops, brainstormed the top hazards to be discussed at the workshops, and reviewed how Wakefield can leverage the results of MVP to spark greater community conversation and action on climate change. The Core Team also discussed maps that need to be created to support the MVP workshops. Maps were generated using data from the Hazard Mitigation Plan and the Town's GIS Department. These maps displayed environmental, socio-economic and infrastructural features of the Town. The maps are available in Appendix 1.

Figure 1: Community Resilience Building Framework

The Core Team identified individuals to participate in two MVP workshops. The Core Team was careful to ensure that invitees represented the diversity of the community, including key Town departments, schools, environmental groups, the Housing Authority, the Senior Center/Council on Aging, faith-based organizations, the Chamber of Commerce, and regional organizations.

Public Works Department staff sent invitations to the stakeholders for the MVP workshops for two, four-hour workshops, scheduled for June 3, 2019 and June 4, 2019 from 12:00pm to 4:00pm. In total, 46 individuals were invited to participate in the MVP workshops (see Appendix 2 for a list of stakeholders).

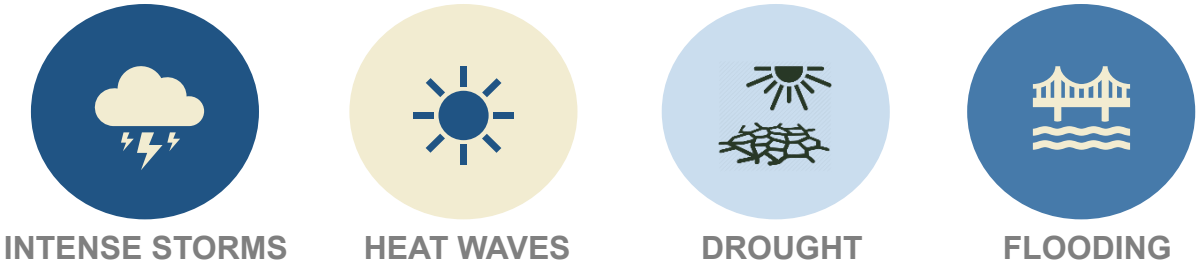
To engage the larger community in the conversation, the Town hosted a public listening session on August 29th. At this meeting, the consultant team presented on the identified hazards and the results of the previous workshops. The 24 meeting attendees then had the opportunity to share their concerns and proposed solutions through an open house engagement activity with posters for each of the hazards Outcomes and materials from the Listening Session can be found in Appendix 5.

Additionally, the Town conducted an online survey as well as several in-person engagement activities throughout the community. The full details on these additional community engagement activities can be found in Appendix 7. The priorities from the community are also reflected in various places throughout this report. In-person community engagement activities included:

- Pop Ups at Festival Italia & Festival by the Lake
- Preparedness Education Drive with the Wakefield Food Pantry
- Preparedness training with the Wakefield/Lynnfield Chamber of Commerce
- Emergency Management Focus Group on Vulnerable Populations

II. TOP HAZARDS AND VULNERABLE AREAS

The first step in the MVP process was to identify the four main hazards that have historically impacted the community and are projected to have notable impacts going forward due to climate change. The hazards were identified by the Core Team



and confirmed at the beginning of the MVP Workshops. The four hazards identified for Wakefield are:

Like most Massachusetts communities, Wakefield has seen an increase in the frequency and severity of intense storm events, flooding, and extreme heat. These impacts effect everything from the health of the Town's residents and natural environment, to the built environment and utilities. Appendix 3 provides a summary of the historic trends and projected changes in weather and climate experienced in Wakefield. This information was foundational to the MVP process as it helped to establish common ground for the stakeholders and discuss what types of changes and associated impacts to expect going forward.

At the MVP Workshops, participants discussed the impacts of the four hazards and articulated features they saw as community strengths and vulnerabilities. These features were discussed as they relate to three community components: Infrastructural, Societal, and Environmental. The workshop attendees were broken into four teams. Each team was tasked with reviewing the details of each feature identified under each of the components. Team members used a matrix to track each feature, whether it was a strength and/or a vulnerability, the hazard that affects it, the priority and timeline associated with implementation. Below are the features identified by the teams for the three community components:

Infrastructural Features:

- Bus Routes
- Communications and IT infrastructure
- Commuter Rail
- Drainage system
- Natural gas pipelines
- Power lines (and substations)
- Public buildings
- Public safety infrastructure (e.g. fire and police stations)
- Roads and highways
- Sewers (and substations)
- Sidewalks
- Stormwater systems
- Transit system
- Utilities
- Water systems
- Yard Waste Site

Societal Features:

- Average resident
- Businesses, especially small businesses
- Families and youth
- Ghost residents
- Houses of worship
- Outdoor workers
- Medically vulnerable residents (both physically and mentally)
- Non-English speakers
- People experiencing homelessness
- Renters
- Residents living in group homes
- Residents with disabilities
- Seniors
- Unemployed or underemployed community members

Environmental Features:

- Air quality
- Lakes (Lake Quannapowitt, Crystal Lake)
- Mill River Floodplain
- Parks and open space
- Rivers (Saugus, Mill, and others)
- Streams
- The Common
- Town forest
- Tree canopy/public trees
- Wetlands
- Wildlife and aquatic life

Most of these features were flagged as both strengths and vulnerabilities. As such, workshop participants discussed the specific strengths as well as vulnerabilities before identifying actions that sought to enhance strengths and mitigate vulnerabilities. Appendix 4 includes the completed matrices from the group discussions.

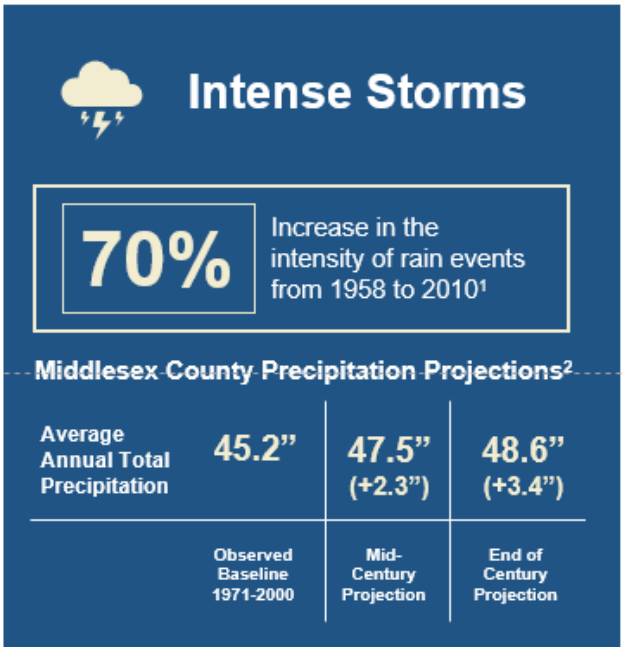
III. CURRENT CONCERNS AND CHALLENGES PRESENTED BY HAZARDS

Wakefield residents are already feeling the impacts of the four identified hazards. Participants in the Workshops discussed their biggest concerns and challenges presented by each hazard, including concern for vulnerable populations and

challenges around maintaining their current way of life. Those discussions are captured below, along with more details on each of the four identified hazards.

Intense Storms

Over the last several decades, the number and intensity of storms has been on the rise. This includes hurricanes, nor'easters, ice storms, and rainstorms. Research shows that these types of storms are likely to become more frequent, intense, and possibly longer in duration in the future.[6] There has already been a 70% increase in the intensity of rain events in this region from 1958 to 2010.[7] Under future climate projections, Middlesex County is expected to see an additional 2.3 inches of annual rainfall by mid-century and 3.4 inches by the end of the century.[8] Intense storms can lead to flooding, property damage, and downed trees and power outages, as well as significant economic disruption.



The MVP Workshop participants had several concerns relating to the increase of intense storms ranging from power outages to the effects of transportation and businesses. Regarding power outages, participants were especially concerned about the effect on seniors and medically vulnerable populations that are more likely to either live alone or be dependent on electricity to power medical devices. Power outages make communicating and reaching out for help far more difficult. This prompted a discussion on providing preparedness kits to residents, which the Town began to help support with the distribution of crank flashlights at public events.

The effect of intense storms on transportation was also raised as a concern. Participants noted that intense storms lead to accelerated wear on roads, obstruct critical routes for safety vehicles, and can increase the number of accidents—particularly during winter storms. Storms can also affect the health of small businesses if they are forced to close due to weather. Finally, several participants pointed to the lack of generators in town as a real issue. Only two of the seven schools have backup generators, which leaves Wakefield residents with limited shelter options in the case of a weather emergency. It was also noted that all of

[6] MA Climate Change Clearinghouse. 2019. "Changes in Precipitation." Retrieved from http://resilientma.org/changes/changes-in-precipitation
[7] City of Boston. 2016. Climate Ready Boston.
[8] Northeast Climate Adaptation Science Center. Resilient MA Datagrapher. MA Climate Change Clearinghouse.

these backup generators run on fossil fuels, which create greenhouse gas emissions and exacerbate the impacts on the town.

Heat Waves

Extreme heat and heat waves—defined as periods of 3 or more days over 90°F—are on the rise in Wakefield. The figure to the right demonstrates this point by showing how Massachusetts' climate may seem more like South Carolina's by the end of the century under a "business as usual" greenhouse gas emission scenario.[9] Between 1970 and 2000, an average of 8 days in one year were over 90°F in Middlesex County. By mid-century it could be closer to 30 days and by the end of the century it could reach 46 days.[10] Similarly, there will be a reduction in the average number of days below 32°F each winter. This information led the MVP Core Team and Workshop participants to prioritize heat waves as one of the four primary hazards in Wakefield.

Of particular concern to Wakefield's MVP participants was the effect of heat waves on vulnerable population. During heat waves, seniors and residents with certain medical conditions can be especially at risk. Workshop participants stated that some of these residents are without reliable access to air conditioning. Accordingly, there was much discussion about the lack of public and municipal buildings with air conditioning that could serve as impromptu cooling stations. In addition, some municipal facilities, such as the Department of Public Works building and public housing, get especially hot during times of extreme heat. The effect of heat on youth in schools was also a concern given that several of the public schools do not have air conditioning.

In addition to keeping residents cool, workshop participants pointed to a couple of other public health issues caused by extreme heat. Heat can cause an elevated level of Manganese in drinking water, which causes staining and an undesireable taste and odor in water. Heat also leads to an increase in mosquito and tick populations, which spread vector-borne diseases. Finally, heat waves were also noted to have an effect on transit: the lack of shade at stops and the potential for interrupted Commuter Rail service were common topics of discussion.

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[9] Confronting Climate Change in the Northeast. 2007. Union of Concerned Scientists. Retrieved from https://www.ucsusa.org/sites/default/files/legacy/assets/documents/global_warming/pdf/confronting-climate-change-in-the-u-s-northeast.pdf

[10] Northeast Climate Adaptation Science Center. 2019. "Days with Maximum Temperature Above 90°F." Resilient MA Datagrapher. MA Climate Change Clearinghouse. Retrieved from http://resilientma.org/datagrapher/?c=Temp/county/tx90/ANN/25017/

Drought

Even though more annual precipitation is projected overall, it is anticipated to fall in fewer, more intense events in the winter and spring rather than in smaller more sporadic events throughout the year. Therefore, there will be longer periods of time that experience no rainfall, especially in the summer and fall, increasing the potential for drought. In October 2016, 52% of the land area in Massachusetts was considered to be in "Exceptional Drought,"[11] and Core Team members indicated that Wakefield's lakes were highly affected by this drought. More of these types of events can be expected in the future.

Wakefield relies on Crystal Lake for its drinking water and Lake Quannapowitt for recreation, so participants were concerned about the effect of drought on the Town's lakes. Lower flow in the Saugus River and other waterways may also affect water quality and the risk of algae blooms. While most concerns over drought centered around water supply and quality, participants also noted that more frequent or longer periods of drought increase the risk of brushfires.

Flooding

Over the last several decades, the entire northeast has seen a remarkable increase in the amount of precipitation falling during extreme rainfall events. In fact, 55% more rain is falling during extreme events today compared to the mid-1900s. This massive increase in rainfall is causing significant localized flooding, which disrupts transportation systems, damages infrastructure and property, leads to public health concerns (e.g., standing water, flooding in basements, mold dissemination), and leads to more combined sewer overflows (CSOs) which impairs water quality and causes economic disruptions. In light of these concerns, MVP Workshop participants unanimously agreed that flooding was a serious hazard that warranted consideration.

Flooding in Wakefield is typically concentrated along the paths of the Saugus and Mill Rivers, although additional isolated areas of flooding exist throughout the Town along drainage ditches. The current drainage systems can only handle a 2-5-year storm, so larger storms stress the system and lead to significant flooding. In the

[11] National Oceanic and Atmospheric Administration. Massachusetts. Retrieved from https://www.drought.gov/drought/states/massachusetts

MVP Workshops, participants pointed to increased runoff into waterways, road blockages, larger insect populations, and flooding of houses and wetlands as the biggest causes of concern.

IV. CURRENT STRENGTHS AND ASSETS

One of the focal points of the MVP Workshops was identifying the Town's vulnerabilities and strengths for the features impacted by the four climate hazards outlined above. Through the workshop discussions, the Town's open space, water features, and its people came to the forefront as the biggest strengths. Participants were especially proud of its lakes and parks. Lake Quannapowitt is a major recreational destination for people from all over Wakefield and beyond. Crystal Lake provides the Town with drinking water. Looking to Wakefield's people, participants felt there was a lot of strength to be drawn from senior residents, as well as families and youth.

Other strengths that came up in the MVP Workshops include:

- Air quality
- Power grid
- Public buildings
- Public safety infrastructure
- Town forest
- Tree canopy/public shade trees
- Wetlands

V. TOP RECOMMENDATIONS AND STRATEGIES TO IMPROVE RESILIENCE

After identifying Town features, strengths and vulnerabilities, MVP Workshop participants brainstormed a list of potential adaptation actions Wakefield could take to combat the impacts from the four climate hazards. Actions were intended to build on the preexisting strengths of the Town, while addressing current or future vulnerabilities. This process was conducted individually in each group and then was followed by a full team prioritization of the actions to identify which steps the Town should take first.

MVP Workshop stakeholders generated a list of over 150 actions. Each participant was asked to vote on their top three priorities across the three community components. The following are the top four actions that were collectively identified as top priorities for Wakefield:

MVP Workshop participants choose their top priorities for resilience actions. Photo Credit: KLA

- Inventory at-risk populations to help prioritize services during/after emergencies (12 votes)
- Build a new Department of Public Works facility, potentially partnering with a neighboring town (10 votes)
- Finish and implement the Lake Quannapowitt study (10 votes)
- Expand and promote energy efficiency and solar programs, including Property Assessed Clean Energy (PACE) with the utility (6 votes)

Below are the top actions identified by each group from the Workshop and through community engagement activities. Each action is organized by community component.

<u>Infrastructure:</u>

- Build a new DPW facility, potentially with neighboring town
- Expand and promote energy efficiency and solar programs, including PACE with the utility
- Seek grant funding to fulfill road rehabilitation priorities
- Build a storage facility for deicers and a new salt shed
- Asset management for sewer system
- Provide safe and accessible travel modes for people of all ages and abilities
- Support energy efficiency programs for residents and businesses

<u>Societal:</u>

- Inventory at-risk populations to help prioritize services during/after emergencies
- Install generators at critical facilities
- Create an "emergency equipment" trade program (sump pumps, dryers, etc.) for residents

- Develop a pet evacuation plan
- Start a town-wide education and engagement campaign on preparedness including providing preparedness kits with targeted messages to different audiences
- Ensure households and businesses are prepared for emergencies and can safely make it through 72 hours without power
- Ensure all residents have access to a shelter in case of emergency
- Conduct a social vulnerability assessment

Environmental:

- Finish and implement Lake Quannapowitt study
- Develop and implement a Lake Quannapowitt Protection Overlay Zone that restricts fertilizer use and promotes appropriate tree, shrub, and plant species
- Pursue purchase of water supply land for permanent protection
- Implement a tree replacement program
- Improve and protect water quality in Lake Quannapowitt utilizing green infrastructure opportunities.
- Conduct an analysis of Wakefield's contribution to climate change and develop a plan of action to minimize it.

VI. CONCLUSION AND NEXT STEPS

In order to continue the momentum started during the MVP process, Wakefield has launched *Envision Wakefield Resilient*. Through this project, Town staff worked with consultant, KLA, to develop a pathway to a healthy, thriving future for Wakefield. The project team engaged residents and businesses in the development of this pathway through surveys, attendance at public events, focus groups with key stakeholders, workshops with Town committees and departments, and a social media campaign. The result is a Resilience Framework (see Appendix 6) that the Town can use to assess future projects, policies, and planning efforts. *Envision Wakefield Resilient*—and the final Resilience Framework—will help advance the actions presented in this report. The MVP process was an essential first step to start Wakefield down the path toward its resilient future.

VII. ACKNOWLEDGEMENTS

The Town of Wakefield would like to thank all the following Core Team members that made this project a success:

Name	Title/Affiliation
Ruth Clay	Health Department
Andy Dennehy	BETA Group
Steve Maio	Town Administrator
Jennifer McDonald	Communications
Claire Moss	Department of Public Works
Christopher Pierce	Building Manager
Paul Reavis	Town Planner
Bill Renault	Department of Public Works
Bob Schiaroli	Wakefield Public Schools
Richard Stinson	Department of Public Works
Gene Sullivan	Wakefield Municipal Gas & Light Department
Elaine Vreeland	Conservation Commission
Tom Walsh	Emergency Management
David West	Emergency Management

Report Citation

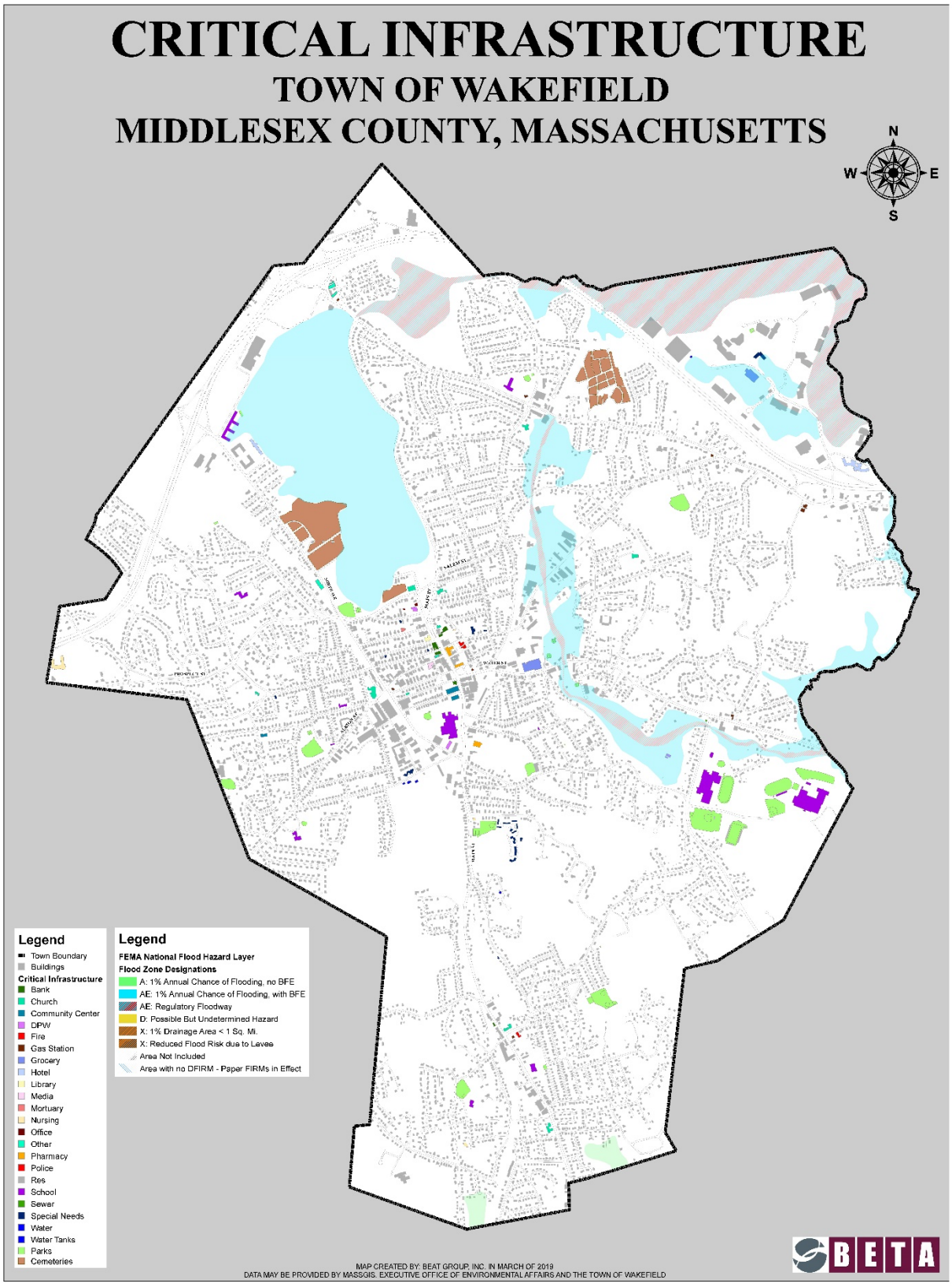
Town of Wakefield (2019). Community Resilience Building Workshop Summary of Findings. Wakefield, Massachusetts.

Community Resilience Building Project Team

Name	Title	Affiliation
Claire Moss	Environmental Manager	Department of Public Works
Jennifer McDonald	Content and Communications Manager	Town Manager's Office
Kim Lundgren	Lead Facilitator	KLA
Angela Cleveland	Facilitator	KLA
Kara Runsten	Facilitator	KLA
Maggie Peard	Facilitator	KLA

APPENDICES

Appendix 1: Maps for MVP Workshops



Town of Wakefield Municipal Vulnerability Prparedness (MVP) Map

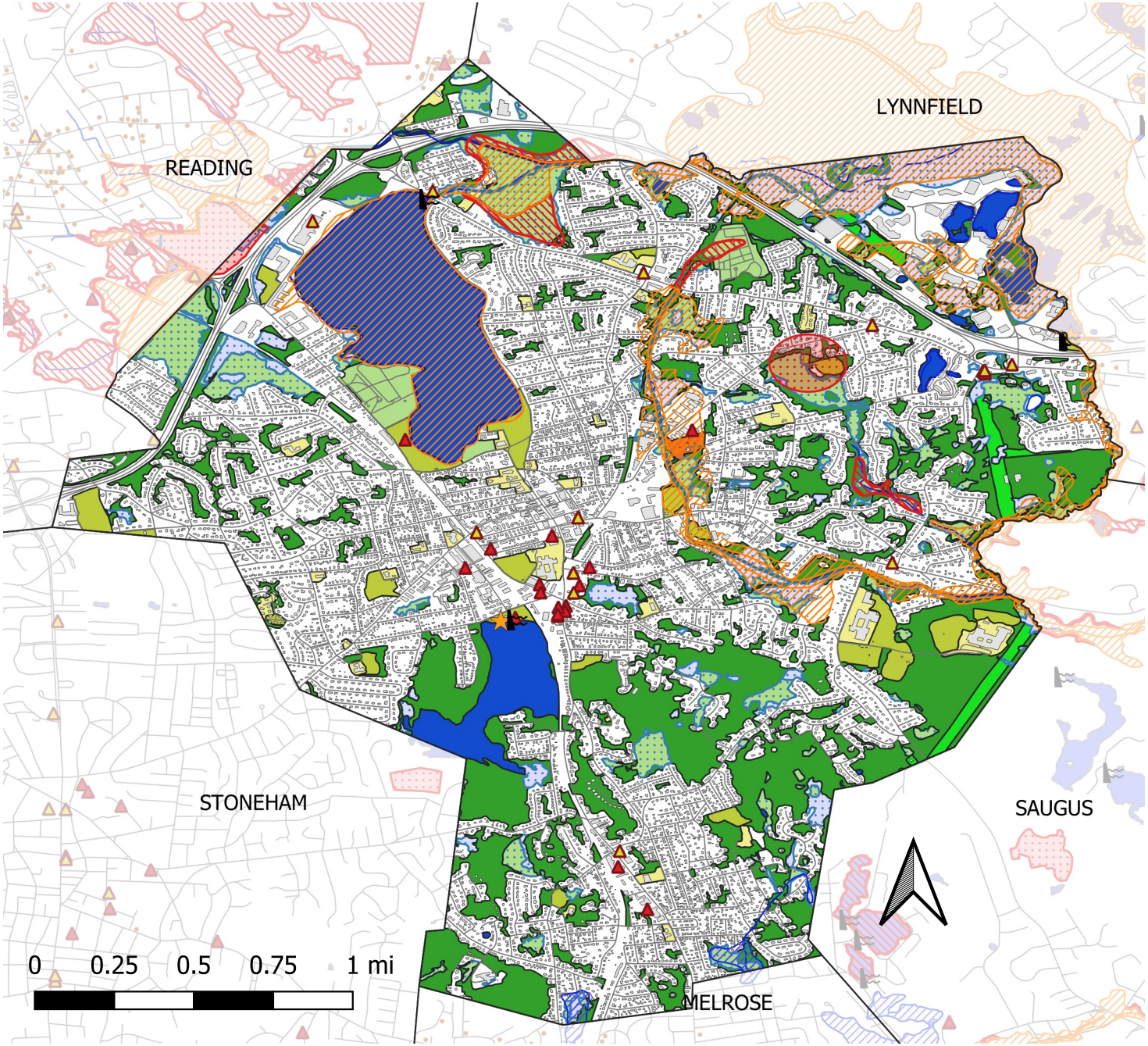
Environmental

Legend

Environmental Features
- Dams
- Underground Storage Tanks
- Activity Use Limitation Sites
- Public Wells
- Landfills
- Structures

FEMA Flood Designation
- A 100 Year w/o BFE
- AE 100 Yeear w/ BFE
- X 500 Year

Landuse
- Cemetery
- Forest
- Forested Wetland
- Junkyard
- Non-Forested Wetland
- Participation Recreation
- Powerline/Utility
- Urban Public/Institutional
- Water



Social

Town of Wakefield Municipal Vulnerability Prparedness (MVP) Map

Legend

Social Features

- EJ Population (Melrose)
- FIRE STATIONS
- LIBRARIES
- POLICE STATIONS
- SCHOOLS
- TOWNHALL
- Structures

FEMA Flood Designation

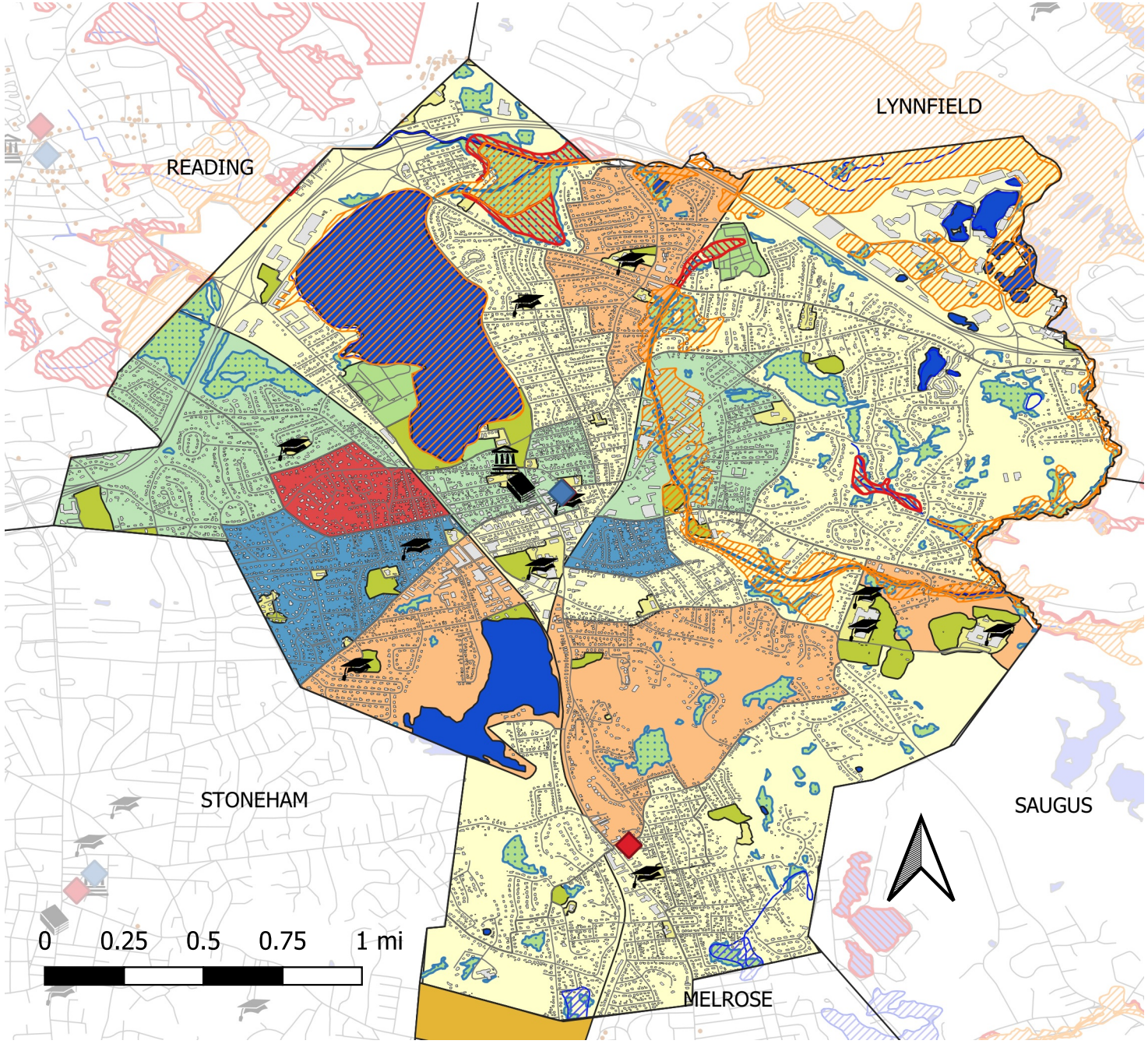
- A 100 Year w/o BFE
- AE 100 Yeear w/ BFE
- X 500 Year

Landuse

- Cemetery
- Forested Wetland
- Participation Recreation
- Urban Public/Institutional
- Water

Block Groups % 65+

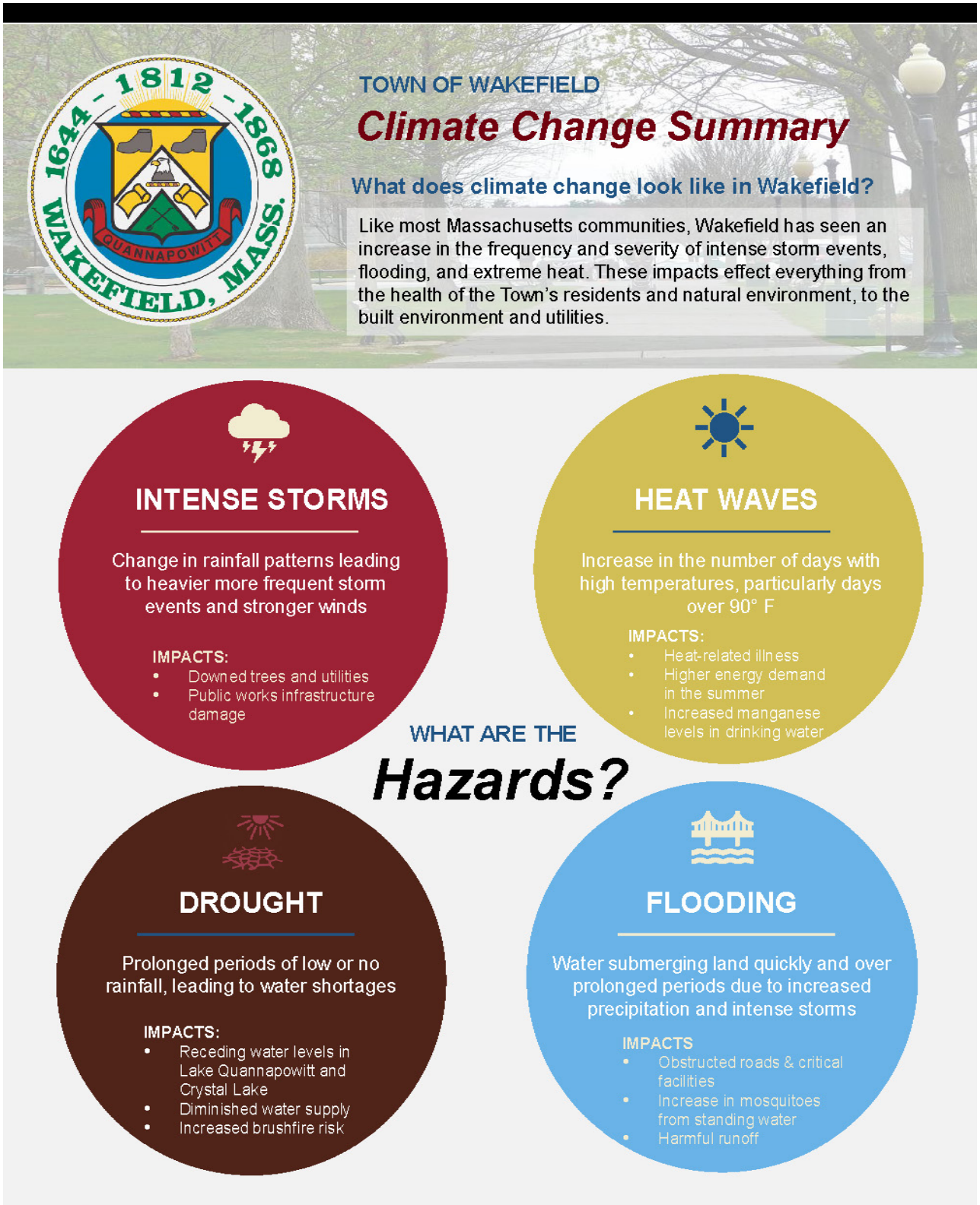
- 6 - 15
- 15 - 24
- 24 - 33
- 33 - 42
- 42 - 51



Appendix 2: MVP Workshop Attendees

Name	Title	Affiliation
Town Lead		
Claire Moss	Environmental Manager	Department of Public Works
Consulting Team		
Kim Lundgren	Lead Facilitator	KLA
Angela Cleveland	Facilitator	KLA
Kara Runsten	Facilitator	KLA
Maggie Peard	Facilitator	KLA
Core Team and Workshop Attendees		
Chris Burne		Riverside Community Care, Inc.
Ruth Clay	Director	Health Department
Joe Conway	Assistant Director	Department of Public Works
Andy Dennehy	HMP Consultant	BETA Group
Hannah Gawrys	Safety Specialist	Bridgewell
Dave Hatfield	Chairperson	Board of Appeals
Meaghan Kinton-Beebe	Head of Circulation	Wakefield Public Library
Steve Maio	Town Administrator	Town of Wakefield
Jennifer McDonald	Content and Communications Manager	Town of Wakefield
Claire Moss	Environmental Manager	Department of Public Works
Maria Palomino	Member	Advisory Board of Public Works
Christopher Pierce	Building Manager	Building Division
Paul Reavis	Town Planner	Town of Wakefield
Bill Renault	Engineer	Department of Public Works
Adam Rodgers	Executive Director	Boys & Girls Club of Stoneham & Wakefield
Bob Schiaroli	Director of Facilities	Wakefield Public Schools
Gene Sullivan	Assistant Management	Wakefield Municipal Gas & Light Department
Michael Sullivan	Chief	Fire Department
Catherine Taatjes	Program Director	Horizon House
Tom Walsh	Director	Emergency Management
Julie Wormser	Deputy Director	Mystic River Watershed Association

Appendix 3: Climate Change Summary



WHAT ARE THE

Trends and Projected Changes?

Intense Storms

70% Increase in the intensity of rain events from 1958 to 2010[1]

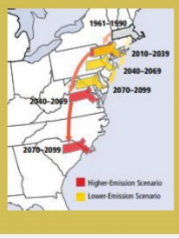
Middlesex County Precipitation Projections[2]

	Observed Baseline 1971-2000	Mid-Century Projection	End of Century Projection
Average Annual Total Precipitation	45.2"	47.5" (+2.3")	48.6" (+3.4")

Heat Waves

Middlesex County Heat Projections[3]

	Observed Baseline 1971-2000	Mid-Century Projection	End of Century Projection
Avg # Days > 90° F	8	30	46
Avg # Days < 32° F	145	116	101



MA could have the climate of South Carolina by the end of the century without emissions reductions[4]

Drought

52% Of the land area in Massachusetts was considered to be in "Exceptional Drought" in Oct '16[5]

Wakefield relies on **Crystal Lake for** drinking water and on **Lake Quannapowitt for** recreation. Drought could compromise these resources and increase the risk of brush fires.

Flooding

$35.2 million Damage from March 2010 floods in Middlesex County[6]

New areas of flooding will strain **drainage infrastructure** and **landscapes**, which public and private property and resources. Standing water will also attract mosquitoes and increase the risk of vector-borne diseases.

1) *Ch. 2: Our Changing Climate. Climate Change Impacts in the United States: The Third National Climate Assessment*,; 2) Northeast Climate Adaptation Science Center. Resilient MA Datagrapher. MA Climate Change Clearinghouse; 3) Ibid 4) Confronting Climate Change in the Northeast. 2007. Union of Concerned Scientists 5) NOAA. Massachusetts. Drought.gov; 6) National Oceanographic and Atmospheric Association. Storm Events Database. 2016.

KLA KIM LUNDGREN ASSOCIATES, INC. Customized Solutions for the Community You Want

www.wakefield.ma.us

Appendix 4: Combined Matrices From Small Groups

The different colors indicate different groups (blue, green, red and yellow).

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

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	Intense Storms	Flooding	Heat Waves	Drought	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Water systems	Both town & regional	Town/MWRA	V/S	1. Educational campaign around emergency preparedness 2. City-wide emergency preparedness plan		3. Water ban implementation in times of drought	4. Explore desalinization options 5. Water conservation education campaign	1. H 2. H 3. H 4. L 5. L	1. O 2. O 3. S 4. L 5. S/O
Power lines (and substations)	Town wide	WMGLD/National Grid	V/S	1. Move town power lines underground 2. Continue the town tree trimming program and general maintenance of town trees		3. Add solar and wind power sources to bolster the electricity supply during periods of high demand 4. Identify populations especially vulnerable to the heat and develop a program to deliver air conditioning units to them	5. Identify critical facilities that can be used as heating and cooling centers 6. Create a communication plan for resources during heatwaves	1. L 2. H 3. M 4. H 5. H 6. H	1. L 2. O 3. L 4. L 5. S/O 6. O
Sewers (and substations)	Town wide	Town	V/S	1. Assets Management 2. Upgrade old systems 3. Education to homeowners to avoid pumping flooding basements into drainage systems	4. Identify highly susceptible areas to flooding and put in natural filtration systems 5. Clean ups of contaminated water bodies			1. H 2. H 3. H 4. M 5. H	1. O 2. O 3. O 4. L 5. O
Roadways	Town wide	Town/State	V/S	1. Storage facilities for deicers and a new salt shed 2. Continue proactive parking bans	3. Culvert replacements 4. Coordinating roadwork with repaving roads to avoid tearing up roads too many times			1. H 2. H 3. H 4. H	1. L 2. O 3. O 4. O
Railroads/commuter rail	Town wide	MBTA	V/S	1. Build shelters at bus stops 2. Identify populations that are using public transportation 3. Ensure ADA compliance of transportation routes		4. Implement real-time updates for public transit 5. Shade structures at transit stops		1. H 2. H 3. H 4. M 5. H	1. L 2. S 3. L 4. O 5. L
Drainage	Town wide	Town	V/S	1. Increase size of culverts	2. Natural filtration systems at outfalls 3. Use fields as additional natural retention systems around Mill River			1. H 2. M 3. M	1. O 2. O 3. L
Commuter Rail/Bus Routes	N/S along N. Ave	MBTA	V/S					M	L
Public Buildings (DPW, Public House, Public Safety, Schools, Senior Center, Americal)	Town wide	Town	V/S	Build new DPW Barn (potentially with another town) Complete rehabilitation of Public Safety Building Rebuild salt shed				H	S/L

Roads/I-95	Town wide		V/S	Seek funding to fulfill priorities				H	O
Utilities	Town wide	Town	V/S					H	O
Drainage System	Town wide	Town	V/S	Implement town-wide drainage plan Continue replacement of outdated piping Removal of sump pumps connected to sewer system Continue collaborating with neighboring towns on drainage				H	O
Yard Waste Site	Town wide	Town	V/S					H	L
Roads/highways/sidewalks/drainage	Town wide	Town	V/S	1. Grafton, Harrison, and Maple Ave culvert project 2. Assign evacuation routes and routes to get to shelters that are less likely to flood 3. Communications about areas prone to flooding 4. Water Street at Saugus town line--look at drain improvements to prevent flooding 5. Norter Ave by the Light plant drain improvements to prevent flooding				1. M 2. M 3. L 4. H 5. H	1. S 2. S 3. S 4. L 5. L
Electric transmission and generation	Town wide	Town	V/S	1. Bury electric transmission lines 2. Identify more solar/renewable energy sources 3. Look at making solar requirement for new development 4. Add battery storage				1. L 2. M 3. M 4. M	1. L 2. O 3. O 4. L
Public safety infrastructure (Fire, Police, DPW)	Town wide	Town	V/S	1. More generators for critical facilities 2. Inventory of where shut offs are 3. New DPW facility for equipment and staff 4. Energy efficiency				1. H 2. L 3. H 4. H	1. O 2. O 3. L 4. O
Communications and IT Infrastructure	Town wide	Town	V	Add redundancy (new cell tower, servers, etc.)				H	O
Natural gas pipelines	Town wide	Town	V	Convert steel gas lines to plastic				H	O
Stormwater systems	Town wide	Public	S/V	2. Storage systems at specific locations 3. Spillway and overbed assessment lowering water (Lake Q and Crystal)	1. Expand existing drainage study		6. Improve existing water ban bylaw	1. H 2. M 3. H 4. M 5. H 6. M 7. H 8. M 9. H 10. L 11. H 12. M 13. H 14. H	1. S/O 2. L 3. S 4. L 5. S 6. S 7. S/O 8. L 9. O 10. S 11. O 12. O 13. S/O 14. L/O
Water supply	Town wide	Public	S	4. Add holding tanks to slow the runoff into the lakes and brooks 5. By law to further protect Crystal Lake					
Parks and Open Space	Scattered throughout town	Public	S			11. Look at opportunity to add water features and trees to parks 12. Enhance + promote Safe Routes to School program			
Roads (Forrester Rd (potholes), Wiley St, New Salem (flooding), Water St, Spaulding St)	Town wide	Public	S/V	7. New facility for liquid deicer 8. New requirements for underground utilities	9. Clean out nearby rivers to reduce flooding on streets 10. Investigate different road materials				

Buildings	Town wide	Public/Private	S/V	13. Educational campaign on preparedness 14. Add more back up generators to critical facilities		16. Identify priority municipal buildings and schools with A/C, cool roofs program		15. H 16. H 17. H 18. H 19. L 20. H 21. M	15. S/L 16. L/O 17. L/O 18. O 19. S 20. O/L 21. L/O
Power Grid (electricity + gas)	Town wide	Public (mostly)	S	17. Identify vulnerable poles and upgrade or bury		15. Enhance EE and promote commercial PACE 18. Expand solar program			
Transit system	Main corridors	Public	S/V			19. Upgrade tech for timing 20. More shelters at stops and stations 21. Identify vulnerable populations to ensure clean buses go through their neighborhoods			

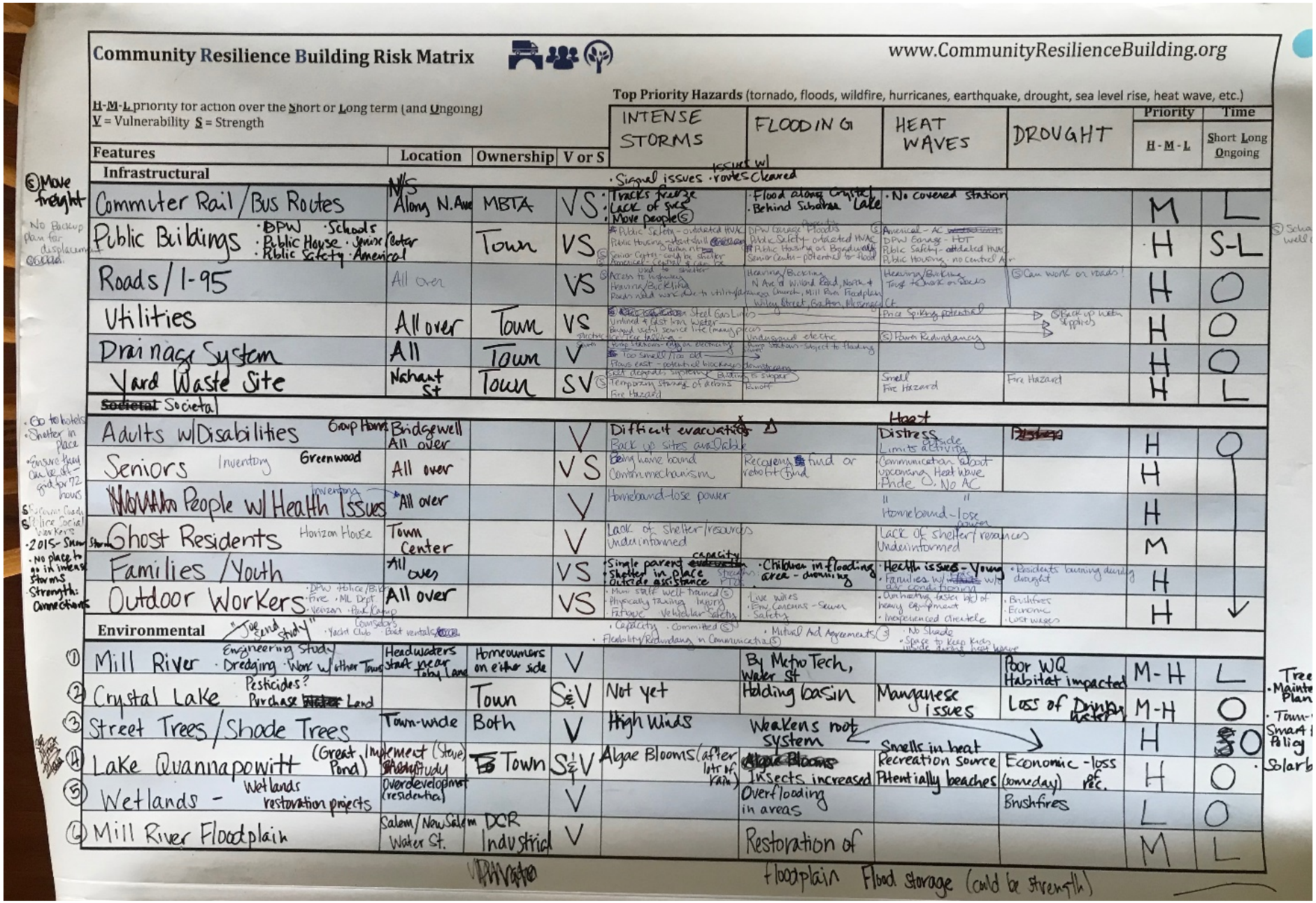
Adults w/ Disabilities	Bridgewell Town wide		V	Post disaster inspections Lake Q Emergency communication and evacuation plan during power outage Emergency education campaign for residents Public schools--online assignments during power outage (Learn Anywhere)	H	O
Seniors	Town wide		V/S	Outdoor Employee Training Pet evacuation plan (vet/doggie day care)	H	O
People with Health Issues	Town wide		V	Generators for Americal, senior centers, etc. Virtual village	H	O
Ghost Residents	Town Center		V	"Check on your neighbor" campaign A/C donation program	M	O
Families/Youth	Town wide		V/S	Inventory of vulnerable people (people with disabilities, seniors, parents with young kids, single parents, people with health issues) Town invest in "Emergency Equipment"-- sump pumps, AC, heaters, industrial dryers	H	O
Outdoor Workers (DPW, Police/bikes, fire, verizon, ML dept, park/camp)	Town wide		V/S	Share evacuation plans for nursing homes Learn from seniors and their experiences with extreme weather Partner with COA on vans and transportation	H	O
Medically vulnerable and seniors	Town wide		V	1. Adopt a senior/medically vulnerable program (perhaps teenagers matched with seniors) 2. Communications campaign about resources for vulnerable populations in the case of emergencies (translated in multiple languages) 3. Inventory of at-risk populations (including those with medical devices): where people live and where to prioritize services during/post disaster 4. Identify additional cooling stations (e.g. Horizon House) 5. Generator for critical facilities	1. H 2. H 3. H 4. M 5. L	1. O 2. O 3. O 4. S 5. S
People experiencing homelessness	Town wide		V	1. Identify a shelter in case of emergency and make sure it is well stocked with food, water, medical assistances, and has clear signage 2. Communications campaign, creative outreach at fast food restaurants, through police, message boards 3.Program to restock homeless after disasters	1. M 2. M 3. L	1. S 2. S 3. S
Small businesses	Town wide	Private	V/S	1. Improvement of arterial roads and infrastructure so people can reach businesses 2. Resources available for businesses to bounce back quickly from emergencies 3. Campaign to rally around small businesses after disaster 4. Small businesses as unofficial shelters during heatwaves	1. M 2. L 3. M 4. L	1. L 2. O 3. S 4. S
Average resident	Town wide		V/S	1. Communication and educational campaign about resources available during emergency, preparedness tips, where shelters are, etc. 2. Program to offer emergency kits at reduced costs	1. M 2. M	1. S 2. S

Youth	Town wide		V/S	1. Targeted online communications campaign on preparedness 2. Alternative programs for hot days for outdoor extracurriculars 3. Program for snow days for working parents	1. M 2. L 3. L	1. S 2. S 3. S
Population experiencing homelessness	Scattered throughout town		V	1. Research what other towns are doing to help keep the homeless populations safe during extreme events	1. H	1. S/O
Senior population	Town wide		S/V	2. Education campaign with preparedness kits 3. A/C take back and subsidy program 4. Create and provide access to a Public Information Officer Training	2. H 3. M 4. M	2. S 3. L 4. S
Youth	Town wide		S/V	5. Identify inability to access food year-round 6. Identify location and access to public cooling 11. Assess heat index around schools and identify sustainable solutions to cool (trees, insulation, etc.)	5. H 6. H 11. H	5. S 6. L 11. L/O
Renters	Town wide		S/V	7. Work with landlords to ensure units meet basic needs in a changing climate 8. Ensure renters know their rights	7. M 8. H	7. S 8. D
Businesses	Town wide	Private	S/V	9. Partner with the Chamber of Commerce to engage, train, and educate businesses on climate change and solutions, including EE	9. H	9. S
Medically vulnerable (both physically and mentally)	Town wide		V	10. Create a climate change policy to ensure all new development meets new needs based on a changing climate	10. H	10. L

Other: un/underemployed, those in group homes, non-English speakers, houses of worship

Environment						
Lakes	2 specific locations	State (Lake Q) Town (Crystal)	V/S	1. Invasive species removal day 2. Water supply land protection purchases at Crystal Lake 3. Water quality treatments (consolidate outfalls to both lakes) 4. Upper water management treatment project (water quality) 5. Aeration of Lake Q	1. L 2. H 3. H 4. H 5. M	1. S/O 2. L 3. L 4. L 5. O
Streams, Rivers, Wetlands	Town wide	Varies	V/S	1. Nitrogen and phosphorus communication/education plan 2. Expand dredging program to include Wiley St and Paon Boulevard 3. Culvert enhancements to meet stream crossing standards 4. Water quality treatment at existing outfalls 5. Developer contributions to enhance streams, rivers, wetlands	1. H 2. L 3. M 4. M 5. M	1. O 2. L 3. L 4. S/L 5. S
Parks	Town wide	Town	V/S	1. Improved agronomy in parks to enhance natural resources 2. Inspection and removal program for invasive species 3. Flood control projects at parks 4. Inspection protocol for droughts/brushfire	1. M 2. L 3. L 4. L	1. O 2. L 3. L 4. S
Town forest	Specific	Town	V/S	1. Preserve forests as wind blocks 2. Value resilience benefits 3. Balance renewable needs with effects of clean cutting	1. M 2. M 3. M	1. O 2. O 3. O
Tree canopy/public shade trees	Town wide	Varies	V/S	1. Replacement program 2. Removing invasive program 3. Structural pruning program	1. H 2. L 3. H	1. O 2. L 3. O
Lake Q	Specific	State owns lake Town maintains Abutters own land around	S/V	1. Conduct an engineering study to determine when to lower 2. Install SW mitigation measures 3. Minimize salt and sand in Lake area 4. Dredge lake to deepen and remove invasive species 5. Install erosion control measures	1. M 2. H 3. H 4. H 5. H	1. L 2. O 3. L 4. L 5. S

Crystal Lake	Specific	Town has permit State/Federal Authority	S/V	6. Enhance educational outreach and signage 7. Lake Q overlay zone with fertilizer restrictions and specific species locations 8. Develop a Quick Response Plan in case there is a contamination issue with the commuter rail (also applies to Lake Q and Saugus River)	6. H 7. H 8. H	6. S 7. L 8. L
Trees (street trees/urban canopy)	Town wide	Public/private	S/V	9. Promoting the benefits of trees and identifying appropriate species in changing climate	9. H	9. S
Rivers (Saugus, Mill, Other)	Specific	Public waterways Not all access is	S/V	10. Cleaning and dredging of rivers to remove debris 11. Study diversion opportunities between the two lakes 12. Install a trash boom to monitor and collect micro plastics in lakes and rivers	10. H 11. M 12. H	10. L 11. L 12. S
Wildlife/Aquatic life	Town wide		S/V	13. Identify and find ways to protect wildlife habitat and corridors	13. H	13. S/O
Wetlands	Specific	Public/private	S/V	14. Create a town-specific wetlands bylaw	14. H	14. S
Parks and Open Space and The Common	Specific	Public	S	15. Identify parks in flood plains or those that could be used as detention basins. Study for Saugus River watershed (regional approach to restore wetlands and hold more flood waters	15. H	15. S
Air Quality	Town wide		S	16. Identify "hot spots" for improvements to air and noise quality (trees, solar, etc.) 17. Best Practices Exchange Program with city in Europe	16. H 17. H	16. S 17. S
Mill River	Headwaters start near Toby Lane	Homeowners on either side	V	1. Implement a town-wide drainage study recommendation	M-H	L
Crystal Lake		Town	S/V	2. Purchase land around Lake	M-H	O
Street Trees/Shade Trees	Town wide	Both	V	3. Revise Tree Maintenance Plan 4. Town-wide smart tree planting policy	H	O
Lake Quannapowitt		Town	S/V	5. Implement/finish study	H	O
Wetlands			V	6. Find appropriate wetland restoration projects	L	O
Mill River Floodplain	Salem/New Salem/Water Street	DCR Industrial	V	7. Flood storage project	M	L



Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

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	INTENSE STORMS	FLOODING	HEAT WAVES	DROUGHT	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Commuter Rail / Bus Routes	N/S Along N. Ave	MBTA	VS	Tracks freeze; Lack of svc; Move people; Signal issues; Issues w/ routes Cleared	Flood along Crystal Lake; Behind Sibarco	No covered station		M	L
Public Buildings · DPW · Schools · Public House · Senior Center · Public Safety · Americal	Center	Town	VS	Public Sector – outdated HVAC; Public Housing – heat shield; Senior Center – could be shelter; Americal – could be shelter	DPW Garage – Floods; Public Safety – outdated HVAC; Public Housing on Broadway; Senior Center – potential to flood	Americal – AC; DPW Garage – HOT; Public Safety – outdated HVAC; Public Housing – no central Air		H	S-L
Roads / I-95	All over		VS	Access to highways; Heaving/Buckling; Roads need work due to utility/maintenance	Heaving/Buckling; N Ave & Wilbur Road, North & Church, Mill Pond Floodplain; Wiley Street, Bolton, Rosemary Ct	Heaving/Buckling; Tough to work on roads	Can work on roads!	H	O
Utilities	All over	Town	VS	Steel Gas Lines; Untimed + past their usage; Beyond useful service life (many pieces); Tree hazards		Price Spiking potential	Back up water supplies	H	O
Drainage System	All	Town	V	Pump stations – often electricity powered; Too small / too old; Flows east – potential backups	Pump stations – subject to flooding; Undersized – electric; Power Redundancy; Downstreams			H	O
Yard Waste Site	Nahant St	Town	SV	Soil degrades system; Blowing; Is super Runoff; Temporary storage of debris; Fire Hazard		Smell; Fire Hazard	Fire Hazard	H	L
Societal Societa									
Adults w/ Disabilities	Group Homes: Bridgewell All over		V	Difficult evacuation; Back up sites available		Heat Distress; Suicide; Limits activity		H	
Seniors	Inventory; Greenwood All over		VS	Being home bound; Comm. mechanism	Recovery fund or rebuilt fund	Communication about upcoming Heat Wave; Pride & No AC		H	
~~Medically~~ People w/ Health Issues	Inventory All over		V	Homebound – lose power		" " Homebound – lose power		H	
Ghost Residents	Horizon House; Town Center		V	Lack of shelter/resources; Uninformed		Lack of shelter/resources; Uninformed		M	
Families / Youth	All over		VS	Single parent capacity; Shelter in place; Outside assistance	Children in flooding area – drowning	Health issues – Young families w/ air conditioning	Residents burning during drought	H	
Outdoor Workers	DPW · Police/Bike · Fire · ML Dept · Verizon · Park Ranger	All over	VS	Must staff well trained; Physically taxing; Injury; Fatigue; Vehicular safety	Live wires; Env. Concerns – Sewer; Safety	Dehydrating faster; Use of heavy equipment; Inexperienced clientele	Brushfires; Economic; Lost wages	H	
Environmental	"Joe and study"	Counselors · Yacht Club · Boat rentals		Capacity · Committed; Flexibility/Redundancy in Communication	Mutual Aid Agreements	No Shade; Space to keep kids inside during heat waves			
① Mill River	Headwaters start near Toby Lane	Homeowners on either side	V		By Metro Tech, Water St		Poor WQ Habitat impacted	M-H	L
② Crystal Lake		Town	SV	Not yet	Holding basin	Manganese issues	Loss of Drinking water	M-H	O
③ Street Trees / Shade Trees	Town-wide	Both	V	High Winds	Weakens root system	Smells in heat		H	$ O
④ Lake Quannapowitt (Great Pond)	Implement (Steve) Study	Town	SV	Algae Blooms (after lots of rain)	~~Algae Blooms~~ Insects increased	Recreation source Potentially beaches	Economic – loss (one day) rec.	H	O
⑤ Wetlands – Wetlands restoration projects	Overdevelopment (residential)		V		Overflooding in areas		Brushfires	L	O
⑥ Mill River Floodplain	Salem / New Salem Water St.	DCR Industrial	V		Restoration of floodplain			M	L

Private

Flood storage (could be strength)

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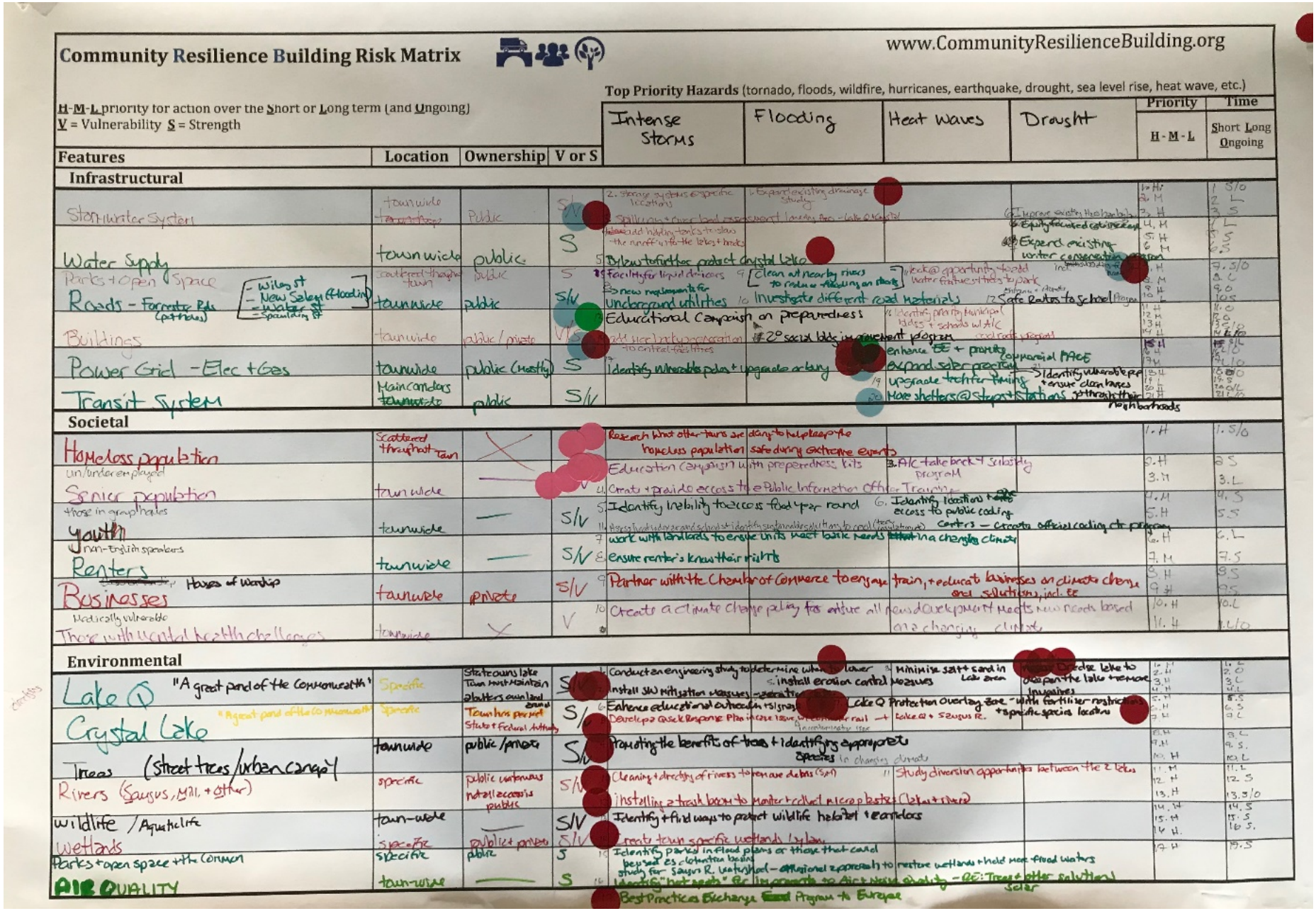
Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	INTENSE STORMS	FLOODING	HEAT WAVES	DROUGHT	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Roads/highways/Sidewalks/Drainage	Town-wide	Town	V/S	- Assign evacuation routes and routes to get to shelters that are less likely to flood (M,S) - Communications about areas prone to flooding (L,S) - Water street at Saugus Town Line – look at improvements to prevent flooding (H, L)					
Electric transmission + generation	Town-wide	Town	V/S	- Bury electric transmission (L,L) - Identify more solar/renewable energy sources → (M,O) - Look at making solar requirement for new development → (M,O) → (M,L)					
Public Safety Infrastructure (Fire, Police, DPW)	Town-wide	Town	V/S	- More generators for critical facilities (Town Hall, 11 Lafayette) (H,O) one renewable/battery - Inventory of where shut offs are (L,O) - New DPW facility for equipment + staff (H, L) - Energy efficiency (H,O)					
Communications + IT Infrastructure	Town-wide	Town	V	- Add redundancy (new cell tower, servers, etc.) → (H, O)					
Natural gas pipelines	Town-wide	Town	V	- Convert steel gas lines to plastic (H,O)					
Societal									
Medically vulnerable + Seniors	Town-wide	N/A	V	- Medical device operators (power outages) (H,S) - Identify vulnerable populations (H,S) - Generator for [illegible] facilities (L,S)					
~~Seniors~~ Homeless	Town-wide	N/A	V	- Identify a shelter in case of emergency, and make sure well stocked w/ food, water, medical assistance, clear signage (M,S) - Communications campaign, creative outreach at fast food restaurants through police, message boards (M, S) - Program to re-stock homeless after storms (L,S)					
Small businesses	Town-wide	Private	V/S	- Improvement of parking roads so people can reach businesses (M, L) - Resources available for businesses to bounce back quickly (L,O) - Campaign to rally around small businesses after storm (M,S)			- Small businesses as unofficial shelters during heat waves (L,S)		
Average resident	Town-wide	N/A	V/S	- Communications campaign (resources available, preparedness tips), where shelters are (M,S) - Program to offer emergency kits at reduced cost (M,S)					
Youth	Town-wide	N/A	V/S	- Targeted online communications campaign on preparedness (M,S) - Programs for snow days for working parents (L,S)		- Alternative programs for holidays for outdoor extracurriculars (L,S)			
Environmental									
Lakes	Specific Locations	State-Lake Q Town-Crystal	V/S	- Eco Nitrogen + phosphorus control program - Invasive species removal (L,S) - Expand	education (H,O)	- Water quality treatments (Consolidate outfalls for both lakes) (H, L) - Upper Sucker Brook management (L,L) - Elevation of Lake Q (H,O)	- Water supply land protection purchases @ Crystal (H,L)		
Streams, rivers, wetlands	Town-wide	Varies	V/S	- Dredging program to include Wiley st. stream bed (L,L) - Culvert enhancements to meet stream crossing standards (M,L) - Developer contributions to enhance streams, rivers, wetlands (M,S)		- Water quality treatment at existing outfalls (M,S/L)			
Parks	Town-wide	Town	V/S	- Improved agronomy in parks to enhance natural resilience (M,O) - Flood control projects at parks (L,L)		- Inspection + removal programs for invasives (L,L) Inspection protocol for fires/brush fires (L,S)			
Town forest	Specific	Town	V/S	~~- Passive forest as wind block~~ (M,O) - value ~~forest~~ benefits (M,O) - balance renewables needs w/ impact of clear cutting (M,O)			~~- Structural pruning program~~		
Tree Canopy/Public Shade Trees	Town-wide	Varies	V/S	- Replacement program (H, O) - Removing (invasive program) (L, L)			- Structural pruning program (H, O)		


Community Resilience Building Risk Matrix
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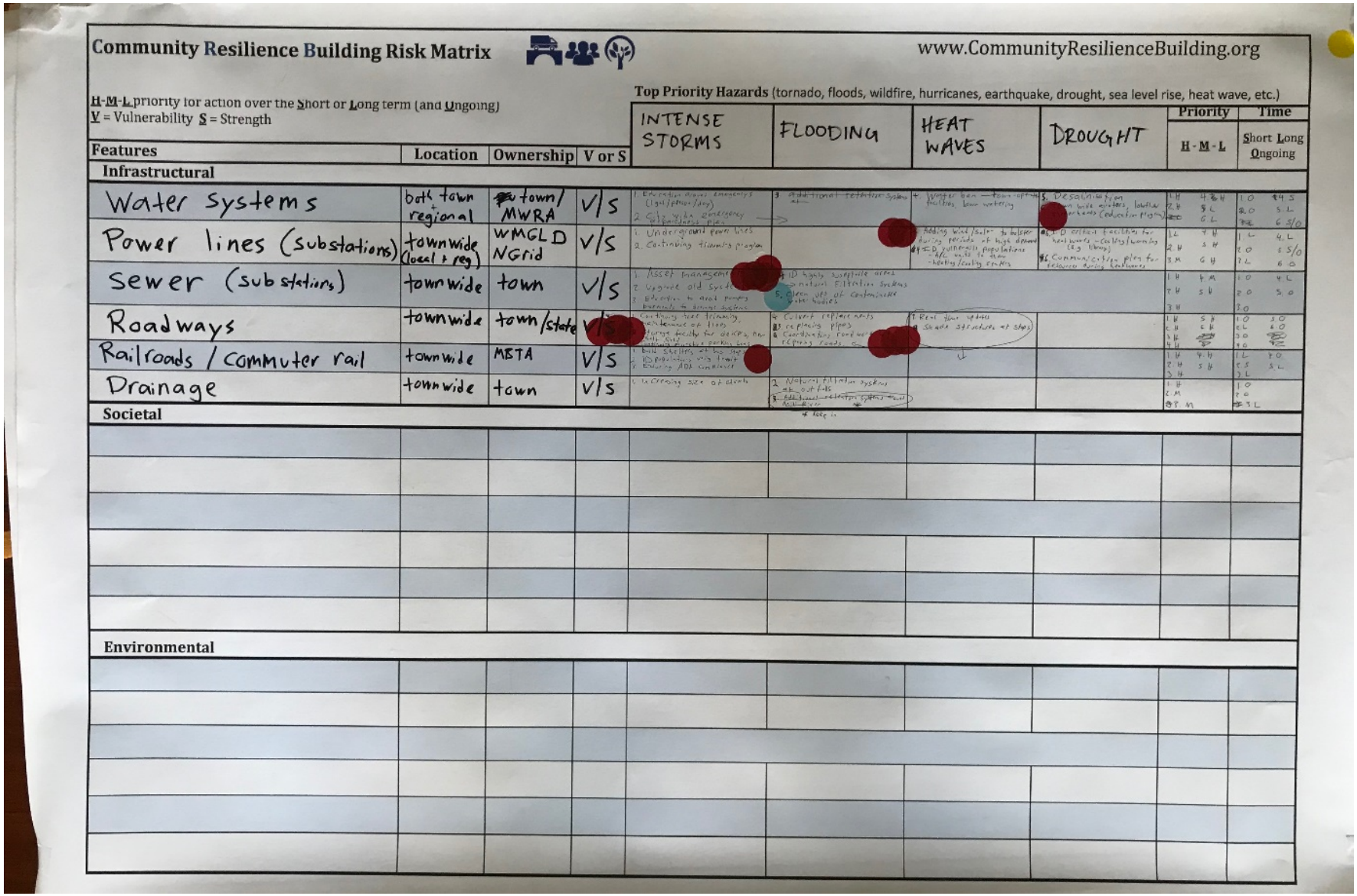
Intense Storms
Flooding
Heat Waves
Drought
Priority
Time
Features
Location
Ownership
V or S
H - M - L
Short Long Ongoing
Infrastructural
Societal
Environmental
Lake Q
Crystal Lake
Trees (Street trees/urban canopy)
Rivers (Saugus, Mill, + other)
wildlife / Aquatic life
wetlands
Parks + open space + the Common
AIR QUALITY



Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

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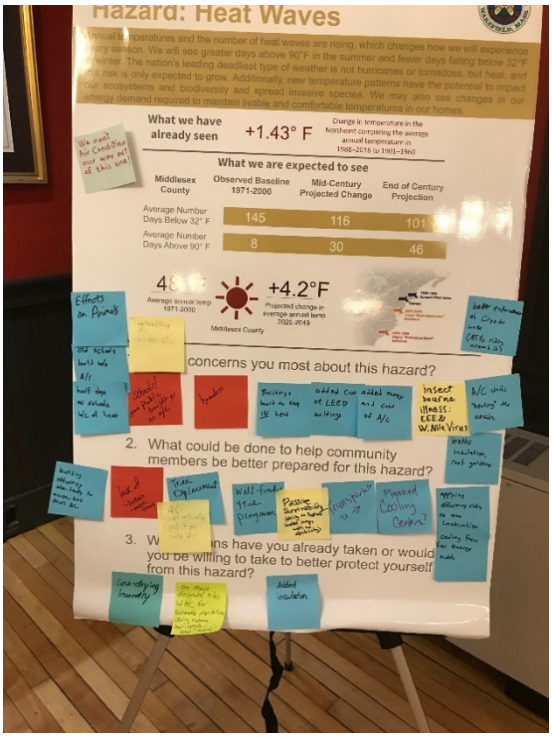
Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

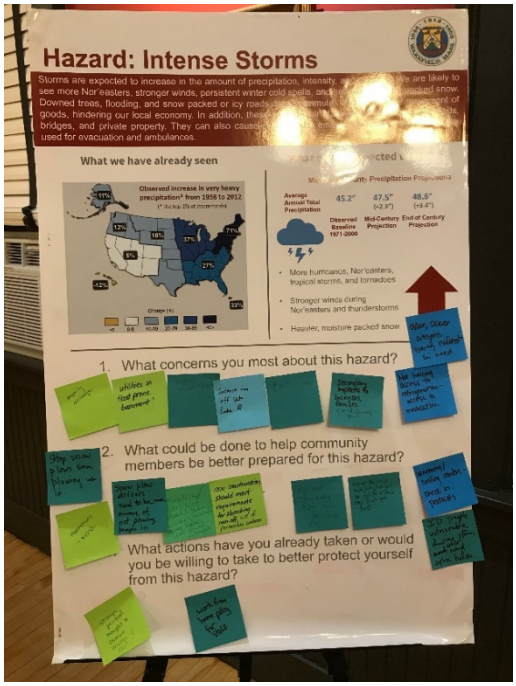
Features	Location	Ownership	V or S	INTENSE STORMS	FLOODING	HEAT WAVES	DROUGHT	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Water Systems	both town + regional	~~town~~/ MWRA	V/S						
Power lines (substations)	townwide (local + reg)	WMGLD NGrid	V/S						
Sewer (substations)	townwide	town	V/S						
Roadways	townwide	town/state	V/S						
Railroads / commuter rail	townwide	MBTA	V/S						
Drainage	townwide	town	V/S						
Societal									
Environmental									

*The second day of the MVP workshop consisted of three, rather than four, small groups. This matrix was from the additional group on the first day.

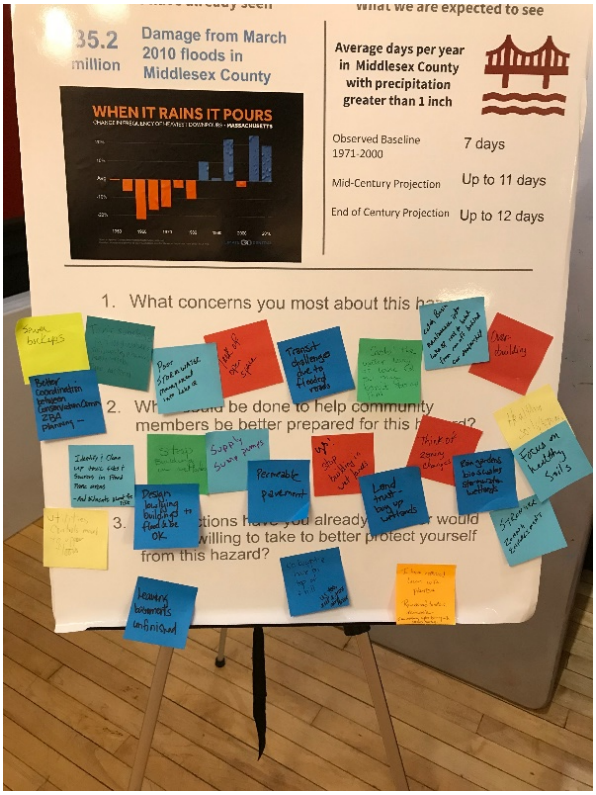
Appendix 5: Community Input at August 29th Listening Session



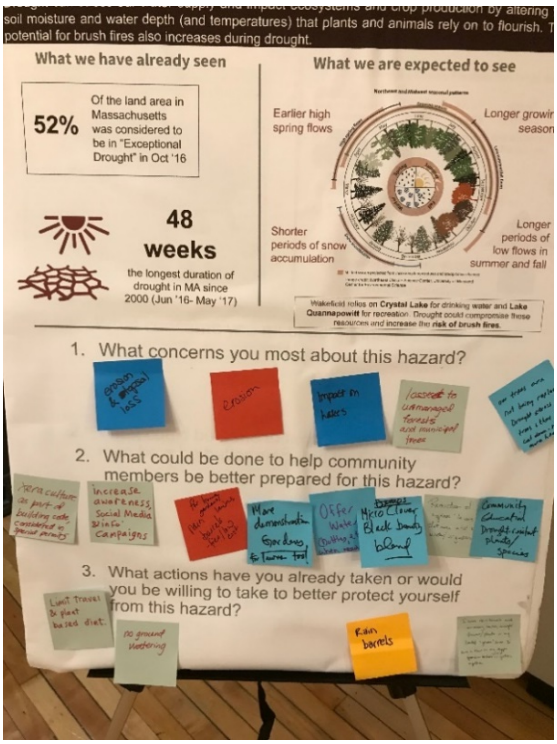
Heat Waves		
What concerns you most?	**What could be done?**	**What are you already doing?**
Effect on animals	Better insulation, roof gardens	Added insulation
Old schools built without A/C	Building efficiency standards to accommodate more AC	line-drying laundry
Half days at schools because of heat	More trees	
unhealthy AC filters	Tree replacement	
schools/some public buildings with no AC	AC that actually condition the air	
Homeless	Well-funded tree program	
Buildings around here built to keep heat IN	Passive survivability (ability to sustain high temps with no electricity)	
Added cost of LEED buildings	planned cooling centers (and transportation to them)	
added energy and cost of AC	Applying efficiency codes to new construction	
Insect borne illness: EEE and West Nile Virus	Cooling focus for energy audits	
Better enforcement of Crystal Lake (ATVs have been riding around it)	are there designated sites with AC for vulnerable populations during extreme heat events?	
AC units "heating" the outside		



Intense Storms		
What concerns you most?	**What could be done?**	**What are you already doing?**
Property damage	Stop snow plows from plowing us in	Change political thought: Climate change is real
Utilities in flood prone basement	Awareness kiosk	work from home policy for staff
Safety and injuries	Snow plow drivers need to be more aware of not plowing people in	
Intense run off into Lake Q	Electric/utilities should be underground to reduce power outages	
Electric lines	New construction should meet requirements for absorbing run off, use of permeable surfaces	
Older, sicker citizens being isolated in need	Educate to stay away from lines and water with lines, etc.	
Not having access to refrigeration--access to medication	Not at the town level, but jobs you can miss for a few days and not get fired	
	Warming/cooling centers	
	Check in protocols	
	ID vulnerable populations and when they need help	



Flooding		
What concerns you most?	**What could be done?**	**What are you already doing?**
Sewer backups	Better coordination between conservation commission, ZBA, planning	Leaving basement unfinished
Poor stormwater management into Lake Q	Control the water level of Lake Q so my basement does not flood	We bought a house on top of a hill
Toxic substances in flood waters: soil, waste, chemicals, heavy metals, algae, bacteria	Identify and clean up toxic sites and sources in flood prone areas (and educate about the risk)	Grass strip driveway
lack of open space	Design low lying buildings to flood and be OK	I have replaced lawn with plants
Transit challenges due to flooded roads	Stop building in wetlands	Rain barrels to store rainwater
Over-building	Supply sump pumps	I am considering replacing driveway with pervious surface
Catch basin maintenance into Lack Q next to hotel from run off behind car dealership	Permeable pavement	
	stop building in wetlands	
	Land trust should buy up wetlands	
	Think of zoning changes	
	Rain gardens, bioswales, stormwater wetlands	
	Stronger zoning enforcement	
	Healthy soil/sponges	
	focus on healthy soils	



Drought		
What concerns you most?	**What could be done?**	**What are you already doing?**
Erosion and top soil loss	Terraculture as part of building code, considered in special permits	Limit travel and plant based diet
Erosion	Increase awareness with social media info campaigns	no ground watering
Impact on lakes	Rain barrels at free/low cost	rain barrels
Losses to unmanaged forests and municipal trees	More demonstration gardens	I have rain barrels and as many native flowers/plants in my "gross" lawn
our trees are not being replaced	Offer water with needed	
Drought stresses trees and they are being cut down	Micro clover black beauty blend	
	reduction of "gross" lawns that need a lot of water/irrigation	
	Community education on drought-resistant plants/species	

Appendix 6: Wakefield's Resilience Framework

Town of Wakefield
Resilience Framework

Values	Organizing Structure	Criteria		
		Positive Contribution	Neutral Contribution	Negative Contribution
Equity	*Community Engagement*	Communications about the project are clear and **accessible** to all	There are available communications about the project, but all accommodations have not been made to make them accessible to all.	There are significant barriers to accessing communications about the project
	Infrastructure	The project provides a fair process to engage nontraditional stakeholders in decision making and/or engages the beneficiaries of the project in the measurement of its success	The project considers nontraditional stakeholders in its decision making, but does not considers the beneficiaries of the project in the measurement of its success	The project does not engage nontraditional stakeholders in decision making and does not engage the beneficiaries of the project in the measurement of its success
	Social-Economic	The project enhances economic opportunities or improves the living conditions of vulnerable populations (e.g. low-income, elderly, or children)	The project neither enhances nor diminishes economic opportunities and has and/or does not provide improvements to the living conditions of vulnerable populations	The project diminishes economic opportunities or lowers the living conditions of vulnerable populations
	Environmental	The project reduces physical and financial barriers to accessing community assets (lake, parks, open space and other natural resources) and services (i.e. improving ADA compliance)	The project neither reduces nor creates physical and financial barriers to accessing community assets and services	The project may create additional physical and financial barriers to accessing community assets and services
Greenhouse Gas (GHG) Emissions Reduction	*Community Engagement*	The project directly educates and/or informs the public and/or Town stakeholders on how to reduce GHGs	The project may lead to education of the public and/or Town stakeholders on how to reduce GHGs	The project does not educate or inform the public or Town stakeholders on how to reduce GHGs
	Infrastructure	The project reduces GHG emissions (or energy demand) for buildings, transportation, or other sectors and/or reduces consumption of resources, materials or products (e.g., through waste reduction, material use efficiency, using a shared economy)	The project will not affect GHG emissions (or energy demand) for buildings, transportation, or other sectors or reduce consumption of resources	The project may create additional GHG emissions (or energy demand) for buildings, transportation, or other sectors or cause an increase in consumption of resources
	Social-Economic	Emission reductions created by the project equally benefit all Wakefield residents and/or the cost of the reductions do not fall on an already disadvantage population (e.g. low income, minority)	Emission reductions created by the project benefit a majority of Wakefield residents and/or the cost of reductions is not absorbed disproportionality by an already disadvantaged population (e.g. low income, minority)	Emission reductions created by the project only benefit a small subsection of the Wakefield population and/or the cost of reductions is disproportionately absorbed by an already disadvantaged population (e.g. low income minority)
	Environmental	The project directly improves air quality in Wakefield and/or minimizes the urban heat island effect through incorporating restorative of nature-based solutions (e.g. planting street trees, reducing impervious surfaces)	The project will not effect air quality in Wakefield or address urban heat island	The project may degrade air quality in Wakefield and/or worsen the urban heat island effect (e.g. removing street trees, adding impervious surfaces)

Town of Wakefield
Resilience Framework

Values	Organizing Structure	Criteria		
		Positive Contribution	**Neutral Contribution**	**Negative Contribution**
Regional Collaboration	*Community Engagement*	The project creates new or enhances existing networks or systems that foster **regional collaboration**	The project does not effect regional collaboration networks or systems	The project may create a barrier to channels that foster regional collaboration
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	Social-Economic	The project contributes to the resilience of the regional economy through diversification of industries or workforce development	The project does not effect the resilience of the regional economy	The project may weaken the resilience of the regional economy
	Environmental	The project considers a regional (watershed or ecosystem) scale and collaborates with neighboring towns and regional entities on the protection of natural resources	The project considers a regional (watershed or ecosystem) scale but does not involve collaboration with neighboring towns and regional entities on the protection of natural resources	The project does not consider a relevant regional (watershed or ecosystem) scale when considering the protection of natural resources
Resilience	*Community Engagement*	The project directly improves public awareness and education around climate risks and adaptive responses	The project may indirectly lead to public awareness and education around climate risk and adaptive responses	The project does not increase public awareness and education around climate risk and adaptive responses
	Infrastructure	The project ensures new and existing infrastructure or development is built to standards that can withstand anticipated climatic changes	The project does not effect the ability of new or existing infrastructure or development to withstand anticipated climatic changes	The project may limit the ability of new or existing infrastructure or development to withstand anticipated climatic changes
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Appendix 7: Community Engagement Report

envision WAKEFIELD — RESILIENT → OUR PATHWAY TO A HEALTHY, THRIVING FUTURE

WAKEFIELD COMMUNITY ENGAGEMENT EVALUATION

December 2019

KLA KIM LUNDGREN ASSOCIATES, INC.

OVERVIEW

Since the launch of *Envision Wakefield Resilient* in the summer of 2019, the Town and Consultant Team have been busy getting the word out about the project, hosting events and trainings, and collecting feedback from Wakefield residents and businesses. This engagement report highlights the in-person and online engagement efforts made to-date, presents the results of the survey, and reports progress on meeting engagement goals. To the right are the overarching goals for the project's community engagement efforts.

The engagement highlights include attending Festival by the Lake and Festival Italia, hosting a Business Resilience Workshop and a Vulnerable Populations Focus Group, collecting 71 survey responses, and posting weekly to social media.

GOALS FOR COMMUNITY ENGAGEMENT

PHASES OF THE ENGAGEMENT PROCESS

Phase One

- Open conversation about climate change with the community
- Assess baseline knowledge about the topic
- Learn about resident concerns

Phase Two

- Assess results from community engagement
- Establish priorities to create an evaluation framework
- Complete an evaluation framework and dashboard to measure progress

2

IN-PERSON **ENGAGEMENT:** Events

Pop-Ups at Events: Festival Italia & Festival by the Lake
The Town has seen great success from pop-ups and has leveraged this model at the various events throughout Town including the Festival by the Lake in June and the Festival Italia in August. Events like this provided an opportunity to engage with a wide range of community members, not just those that are inclined to attend an event on climate change. The team compiled the responses collected from these events and incorporated them into the Summary of Findings Report and informed the development of the evaluation criteria.

Preparedness Drive
In coordination with the Wakefield Food Pantry, the Town held a preparedness drive that was paired with education about how to make sure you are prepared for up to 72 hours without power. Participation was limited, but the Town walked away with concrete action steps to improve this kind of drive in the future, such as better publicizing and additional partnering with community organizations.

4

IN-PERSON **ENGAGEMENT:** Focus Groups

Focus Group: Chamber Workshop
The Town and Consultant Team partnered with the Wakefield/Lynnfield Chamber of Commerce to host a preparedness training and discussion with businesses in October. Discussion centered on businesses biggest needs after an emergency, where they turn to for information, and generally how they can build resilience in the face of climate impacts. There were around 15 people in attendance.

Focus Group: Vulnerable Populations
The Town and Consultant Team hosted an informal conversation with the Police Chief, Fire Chief, and Emergency Management Director to learn more about who the vulnerable populations are in Wakefield, the current outreach techniques and protocol to these residents, and what resources are available to provide assistance and support to both the vulnerable residents and emergency service providers to help them. The biggest takeaway was around community engagement and education, specifically using CodeRed, the Town's website, and providing orientation to key personnel to assist vulnerable populations.

4

SURVEYS & ONLINE **ENGAGEMENT**

Survey
The survey was used to assess the baseline knowledge of and community concerns about climate change and determine a vision for a resilient Wakefield and the actions needed to get there. The survey was available online, promoted through social media, and distributed at in-person events and through partner organizations. The team collected 71 survey responses. Results can be found on the following pages.

Social Media, Blogs, and Newsletters
The KLA Team provided 2-3 social media posts per week to highlight why Wakefield needs to take action on climate change and how community members can do it together, as well as promoting *Envision Wakefield Resilient* events. Posts generated 5-15 engagements (likes, shares, comments). Social media was especially helpful in publicizing the survey: 31% of survey respondents reported hearing about the survey through social media—second only to taking the survey at an in-person event.

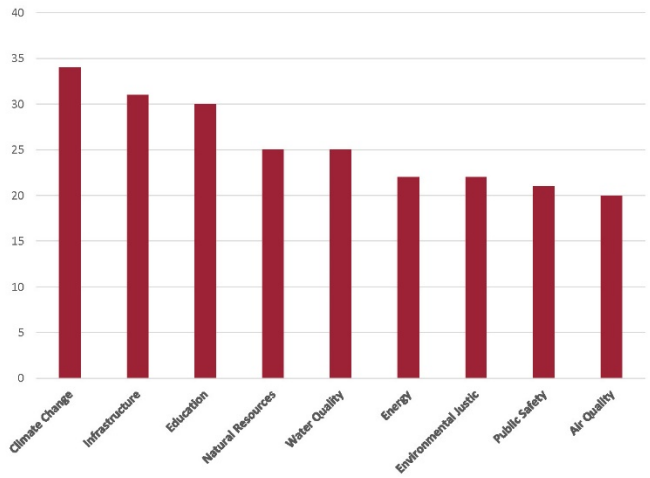
Business Resilience Checklist
To support the Business Resilience Focus Group co-sponsored with the Chamber, a Business Resilience Checklist was help communities prepare for the impacts of climate change and other emergency situations. The Checklist is on the Town's website and was distributed through QR codes at the Focus Group.

5

SURVEY RESULTS: What's Important?

71 Total Responses

Respondents were asked to choose up to 5 issues that they feel are most important to address. Below are the topics that received 20 votes or more.



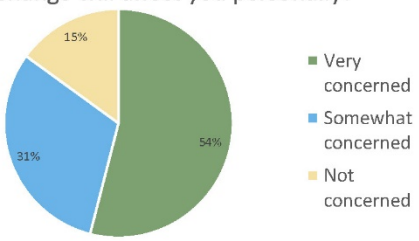
Survey respondents were given the space to elaborate on what is most important to address. Here is what we heard:

- Improve quality of Lake Q, maintain quality of Crystal Lake
- Replace aging infrastructure
- Increase renewable energy supply
- Add public transportation options
- Reduce municipal waste
- Educate the public about all of these issues
- Assess impact of development
- Protect open space
- Eliminate food insecurity
- Reducing the throw-away mentality
- Hold education in schools to a higher standard
- Manage loitering downtown
- Provide well paying jobs for college graduates

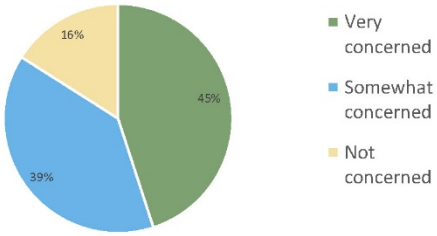
6

SURVEY RESULTS: Concerns and Visions

How concerned are you that climate change will affect you personally?



How concerned are you that climate change will affect the Town of Wakefield?



What is your vision of resilience in Wakefield?

"A town where people come together to help each other, support the environment and face the future with confidence and the ability to adapt to change"

"I want Wakefield to embrace change when it comes to protecting our planet for future generations. So that there will still be a Wakefield in 100 years."

"To be knowledgeable about climate change and its effects and being prepared for them; having a Plan B and C; be aware of the effects of what we do now and how it will affect us later."

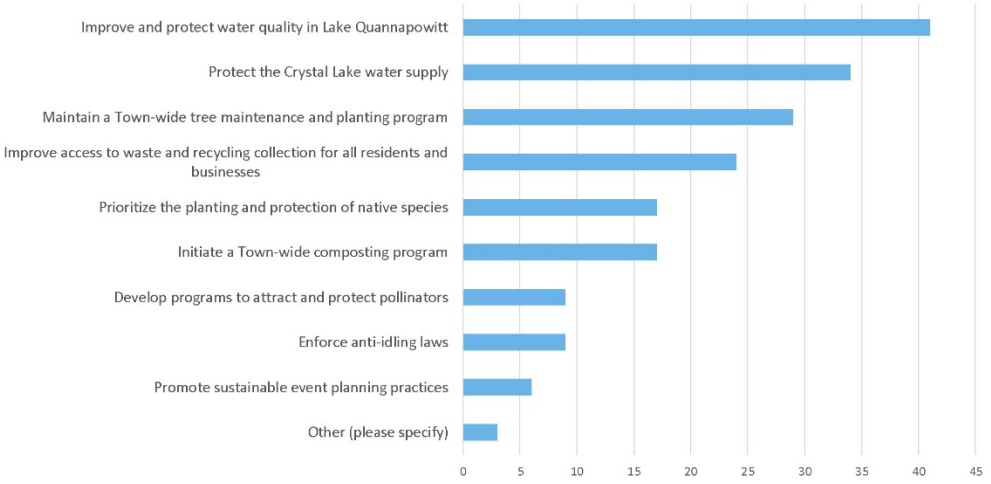
"Neighbors helping neighbors"

"In the event of a disaster, how our citizens, business and town government get back to where we were."

7

SURVEY RESULTS: Environmental Actions

Environmental: Which of the following actions will help to ensure that Wakefield's environmental features are able to withstand the impacts of climate change?

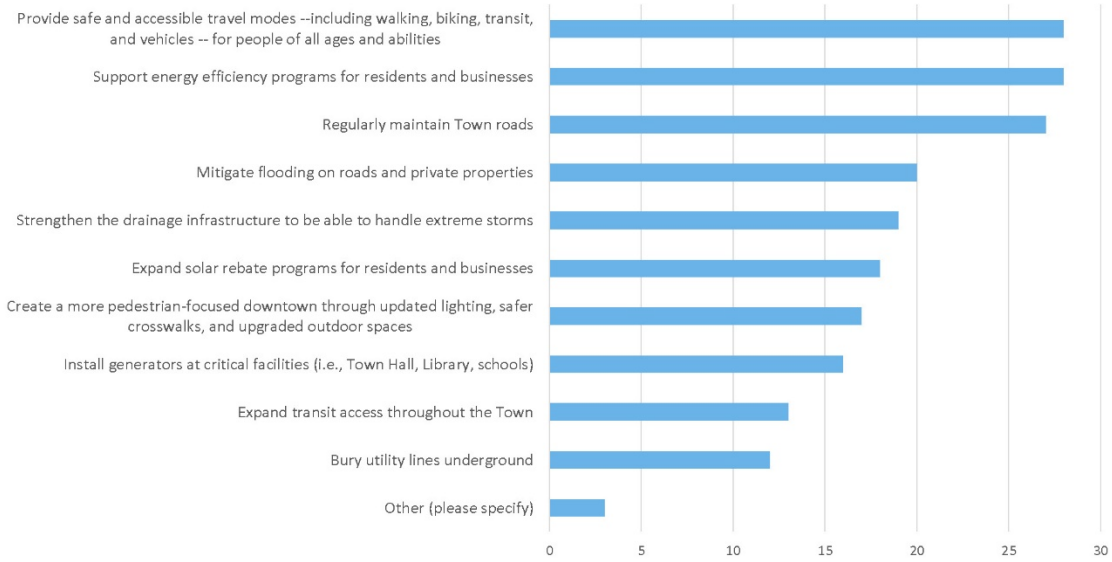


Other ideas included: Monitor roads and infrastructure; and change the salt product used on the roads in the winter

8

SURVEY RESULTS: Infrastructure Actions

Infrastructure: Which of the following actions do you think will strengthen Wakefield's infrastructure and prepare the community to withstand the effects of climate change?

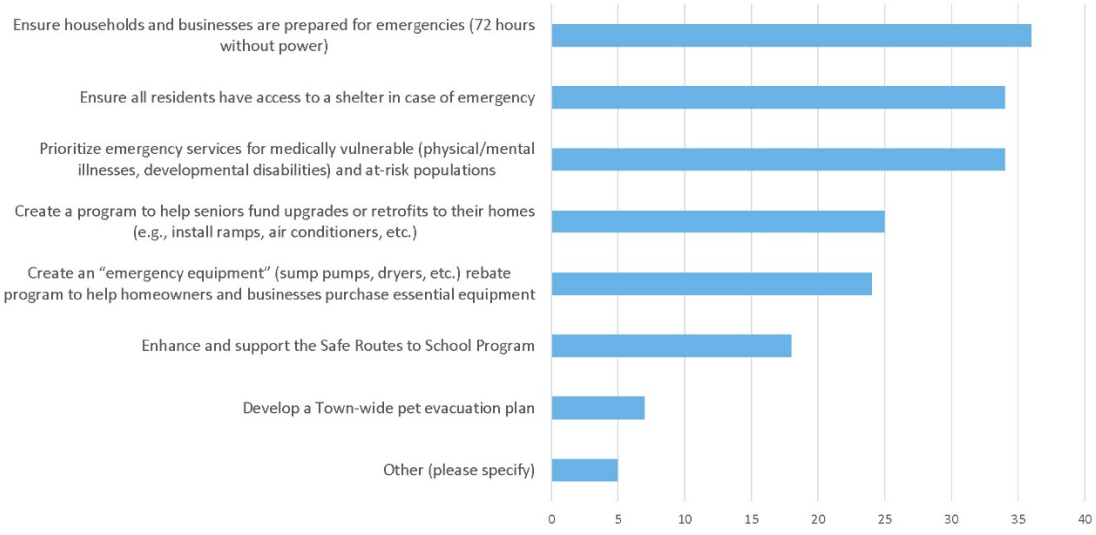


Other ideas included: implement a composting program; ban single-use plastics; localize the energy supply; and make Wakefield more walkable

9

SURVEY RESULTS: Societal Actions

Societal: Which of the following actions would you like to see to ensure Wakefield is prepared to protect our societal assets?



Other ideas included: provide parking downtown to help businesses prosper; combat loneliness in the elderly community; prioritize community policing in neighborhoods; build trust in Town government

10

SURVEY RESULTS: Word Association

To get a baseline evaluation of residents' impressions and priorities, we asked participants to list the words they associated with five specific topics. The responses are below; the larger texts indicates more frequently included words.

Resilience:

SURVEY RESULTS: Word Association

Environment:

SURVEY RESULTS: Word Association

Sustainability:

13

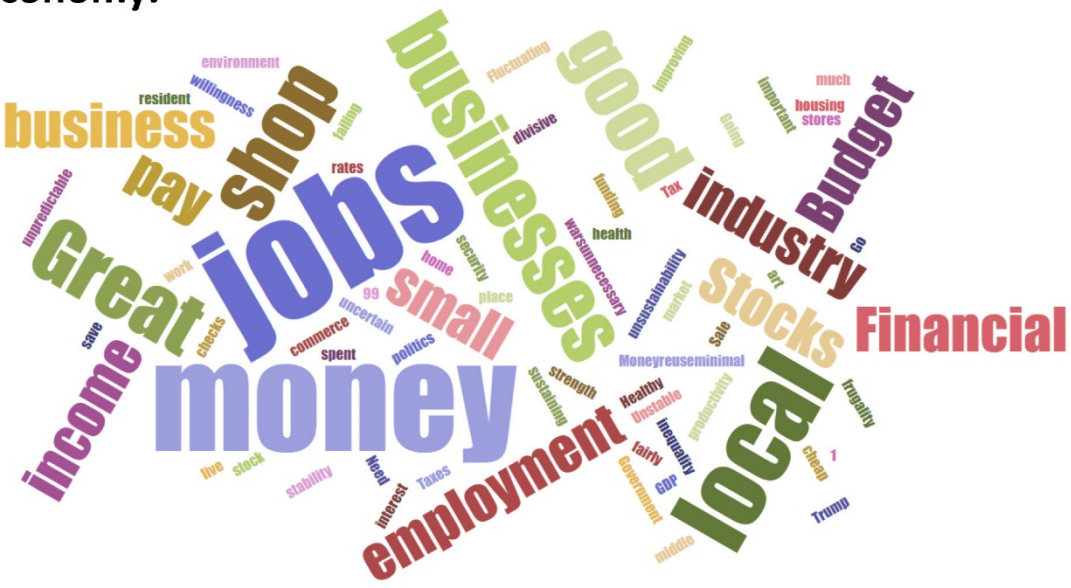
SURVEY RESULTS: Word Association

Equity:

14

SURVEY RESULTS: Word Association

Economy:



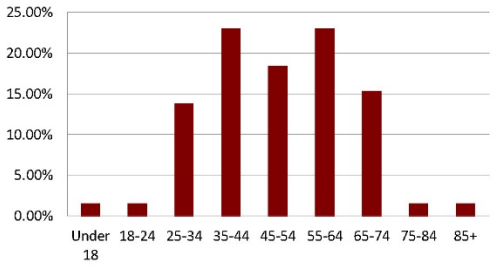
SURVEY RESULTS: Wakefield ESC Actions

The survey gave respondents the option to share what actions they want the Town's Environmental Sustainability Committee to take. Below are top actions mentioned:

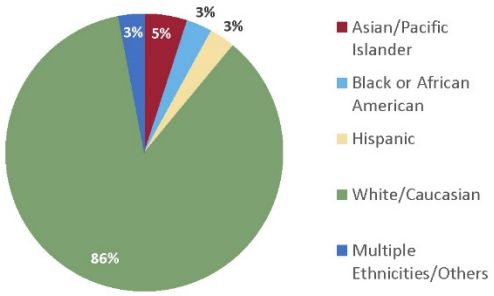
- Expand recycling and composting programs (weekly town recycling, town composting, programs in schools, require businesses to recycling)
- Climate plan that reduces emissions to net zero
- More renewable energy (municipal energy supply, better incentives for residential solar)
- Ban single-use plastics
- More electric vehicle charging stations
- Education campaigns and events
- Reduce litter
- Assessment of development on the environment
- Clean up Lake Q
- New LEED certified high school with a climate-focused curriculum
- Regionalization of climate action
- Improvement of multimodal transportation options
- Reduction of landscaping chemicals
- Preparedness trainings targeted at vulnerable populations

SURVEY RESULTS: Demographics

Age of Respondents



Race/Ethnicity of Respondents



Race/Ethnicity of Residents in Wakefield, 2017	
Asian/Pacific Islander	2.0%
Black/African American	1.1%
Hispanic	3.9%
White/Caucasian	91.6%
Multiple Ethnicities/Other	1.3%

Source: American Community Survey, 2013-2017

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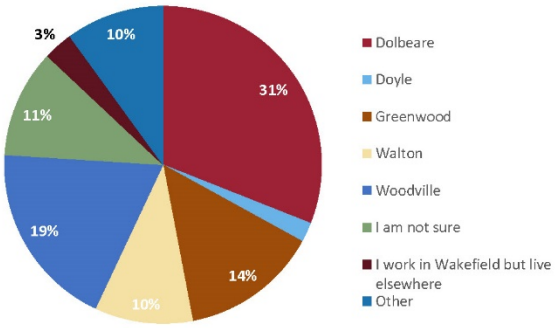
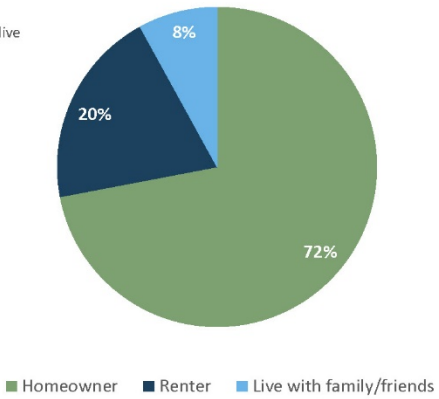
SURVEY RESULTS: Demographics

School District of Respondents



Housing Status of Respondents



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Target Population	Number*	Organizations	Specific Tactic(s)	Metrics of Success	Progress To Date
Low-Income	1,097	• Wakefield Housing Authority • Wakefield Food Pantry	• Pop-up at events • Preparedness training	• Host 1 preparedness training	• Hosted Preparedness Drive • Hosted a Vulnerable Populations Focus Group
Non-English Speakers/ Immigrants	2,262	• Wakefield Housing Authority	• Pop-up at events	• Attend 1 event geared toward this community	• Not complete
Seniors	4,648	• Senior Center • Council on Aging • Retirement Communities	• Pop-up at events • Preparedness training	• Host 1 preparedness training (could be combined with the low-income community training); 17% of survey respondents 65 or older	• Hosted Preparedness Drive • Hosted a Vulnerable Populations Focus Group • 18.5% of survey respondents were 65 or older
Small Business Owners	N/A	• Wakefield Lynnfield Chamber of Commerce	• Attendance at an event (Focus group)	• Hold 1 focus group	• Attended BYOB Event hosted by the Chamber • Hosted a Business Resilience Workshop • Created a Business Resilience Toolkit
Youth (Under 18)	5,127	• Schools • Boys and Girls Club • Americal Civic Center • Wakefield High Green Coalition • Back to School Nights in September	• Presentation at related classes or clubs • Pop-up at events	• Hold 1 presentation or attend 2 events	• Attended high school environmental studies class

**Numbers based on American Community Survey, 2017*

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APPENDIX I

- **Wakefield Resilience Framework**

Introduction

This Resilience Framework is designed to reflect Wakefield's values as it relates to a more resilient future for all. The Framework can be used to assess or screen a program, project, or initiative (collectively identified as project in this tool), to ensure that it is meeting Wakefield's priorities. The Framework is presented as a series of criterion that are provided as a positive (+1), neutral (0), or negative (-1) contribution to provide scores for each project. Alternatively, you could simply use the questions to guide the design of your strategies. A few things to note: Where a project falls short of meeting a particular criterion, consider revising the approach. If it is simply not possible to adjust the scope of the project, consider not moving forward with that project. The term "project" in the framework is meant to generally refer to any program, project, action, or initiative that may be considered by the Town for inclusion in a plan, budget, capital improvement, or in general for implementation.

This Framework is meant to be a "living" tool that evolves as the Town does. The more it is utilized, the more value it will bring. There should be periodic reviews and updates to the Framework based on the Town's experience utilizing it. Perhaps some of the criterion are not relevant in a few years or new ones need to be added. The Town should create a process to both review and update the Framework at least annually. The Definitions should also be updated so that the tool stays relevant. This will aid in the ease of use.

This workbook is split into 2 tabs. The first is the complete Framework with the detailed criterion associated with each score level. The second is the Definitions Tab which provides more detailed definitions for words that may be new to the users of the Framework or that could have multiple meanings. These words are in bold in the Framework to call attention to them.

This Framework is split into 4 priority areas: Equity, Sustainability, Regional Collaboration, and Resilience.

Each of those priority actions are further broken down into 4 subcategories: Community Engagement, Infrastructure, Social-Economic, Environmental.

Town of Wakefield
Resilience Framework

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Town of Wakefield
Resilience Framework

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Definitions

Accessible: Accessibility, when referring to communication materials, requires the information presented is explained at a sixth grade level, is available in multiple languages, can be accessed by the visually and hearing impaired, and is available through multiple channels (print, digital, TV, radio, etc.).

Community Engagement: This refers to intentional processes incorporated into each project that facilitate communication, interaction, involvement, and exchange between the municipality and their stakeholders to support the environmental, socio-economic and infrastructural goals of the community.

Environmental: This category considers all of the community's natural systems (air, lakes, forests, rivers, wetlands, etc.) and the beneficial functions they provide including: flood storage, recreation, tourism, elevated property values, cooling during heat waves, and water filtration.

Equity: Wakefield aims to be an inclusive community in which all can participate, prosper, and reach their full potential.

GHG Reductions: When we burn fossil fuels to power our homes, businesses, and automobiles, and place material in our landfill to decompose, we increase the level of greenhouse gases. Activities to reduce GHG emissions focus on energy efficiency, using alternative modes of transportation, and reducing, reusing and recycling our waste.

Heat Island Effect: When densely built areas are hotter than surrounding rural areas or green spaces. Materials such as asphalt and concrete retain more heat than vegetation, and waste heat from human activities tends to build up in urban areas. By contrast, trees provide shade and evapotranspiration, which creates a cooling effect.

Infrastructure: This category includes residential housing, schools, commercial building, churches, office parks/campuses, laboratories, roads, bridges, and utilities among others facilities that serve the community.

Nature-based solutions: These strategies use natural systems to address societal challenges and to provide environmental, social, and economic benefits. Examples include: green infrastructure, green roofs, wetland restoration, etc.

Non-traditional stakeholders: Individuals that are not traditionally involved or engaged in a given activity, often because of a historical legacy of barriers such as culture, language, history, past experience, lack of political power, and discrimination. Common non-traditional stakeholder groups include: people of color, low-income constituencies, native Americans, the disabled community, the working poor, the unemployed, and those for whom English is a second language.

Organizing Structure: The Municipal Vulnerability Preparedness (MVP) Program, guided the community through a process to consider assets that are or could be impacted by climate change under three categories: Environmental, Infrastructural and Socio-Economic. These are important organizing structures for the Town so they can consider all aspects of how a project will potential affect the community. The fourth category (Community Engagement) helps the Town prioritize the type, quantity and quality of outreach and communication as they consider and implement projects.
Regional Collaboration: Wakefield strives to work with neighboring communities and organizations to identify, communicate, and respond to regional needs, catalyze collaboration, and connect people and capabilities to increase efficiencies and address challenges and opportunities together. This includes the sharing of resources and information and taking advantage of economies of scale.
Resilience: Resilience is the ability of our residents, businesses, and municipal operations to prepare, mitigate, adapt, and endure shocks and chronic stressors. The resilience of our community depends on both our mitigation and adaptation actions.
Socio-Economic: This category is the human element and includes homeowners, renters, businesses, elderly, low/moderate income, special needs, non-English speakers, and others may need emergency and health care services and access to lifelines (food/water, emergency response personnel, etc.).
Values: Principles that are important to the Town. Each value has a set of definitions that will help staff, boards, and committees flesh out whether a project is consistent with what is important to the Town.
Vulnerability: Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change.

Why a Community Garden?

- Provides opportunity for residents to grow healthy foods, destress, exercise, and share knowledge
- An alternative to home gardens
  - Apartment, condo, and senior-living residents
- Already successful in surrounding towns and Wakefield Public Schools

Support and Management

- Wakefield awarded a $50,000 earmark from the Commonwealth of Massachusetts
  - Must be used by June 30, 2020
- Construction and setup performed by Wakefield DPW and private contractors
- Ongoing management by the Recreation Department

Proposed Layout

- 49 individual garden plots
  - 4’ x 8’ plots
- Raised beds, 2-feet high
- Shed
- Rain barrels
- Trash receptacles
- Compost bins

Location Requirements

- Available parking
- Accessible by public transportation
- Centrally located
- Already equipped with electricity and water supplies
- Visible

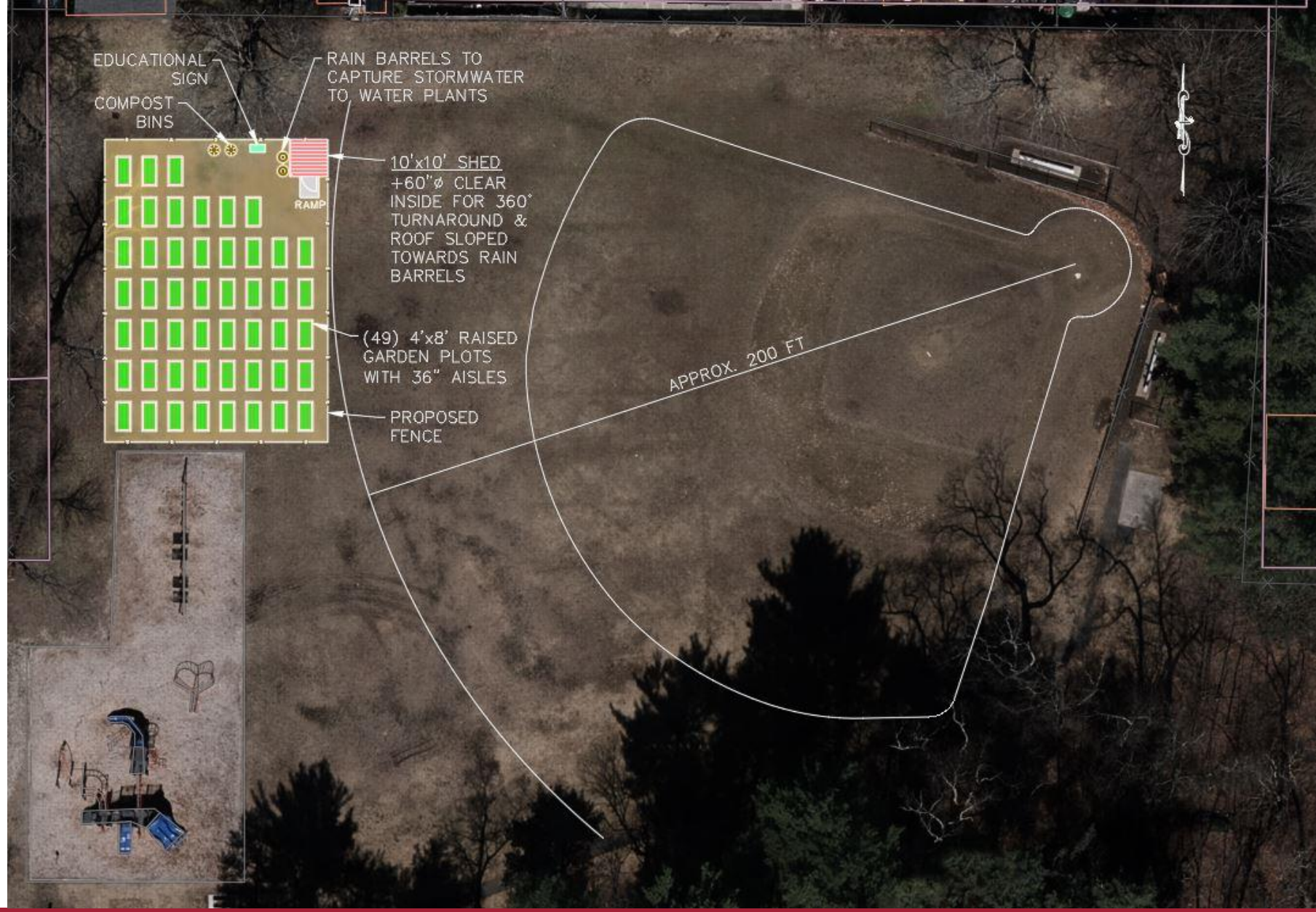
Areas Considered

- Hall Park
- Spaulding Street
- Crystal Lake area
- Stedman Street
- Little Red School House Museum
- Lincoln School
- Mapleway Playground
- Strong's Meadow
- Hartshorne House vicinity

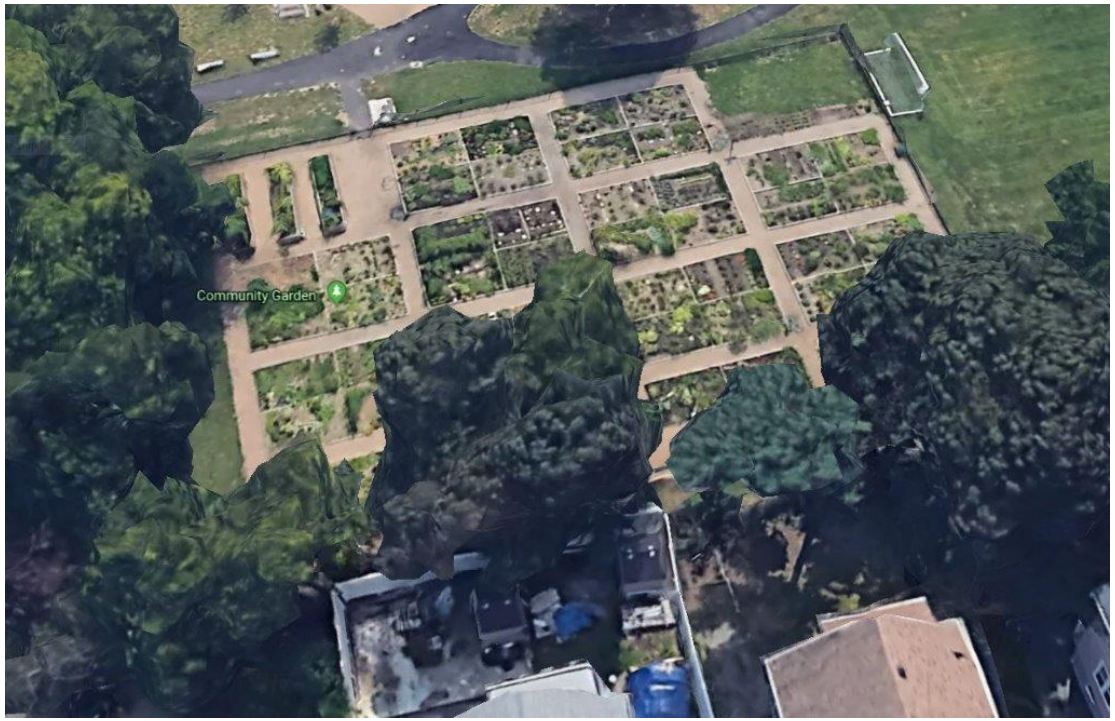
JJ Round Playground

This plan includes components to promote accessibility

- Ramp to shed
- Compliant aisle spacing
- ADA-compliant ground covering



Community Garden: Arlington



Proposed Rules and Regulations

- Plot permits assigned via lottery at a cost of $50 per year
- Permits valid April 20 to October 30
  - Abandoned and overgrown plots would be reassigned
- Garden would be open from 8 a.m. to dusk, 7 days a week
- No herbicides or pesticides could be used
- Only annuals could be planted
  - No cannabis could be grown

Proposed Rules and Regulations

- Trespassing on others' plots is prohibited
- Selling of produce on site is prohibited
- Permit holders are responsible for:
  - Supervising children brought on site
  - Leashing and controlling dogs brought on site
  - Removing litter and debris after each use
  - Clearing plot of all stakes and non-vegetative matter at end of season

Suggestions From Community Sessions

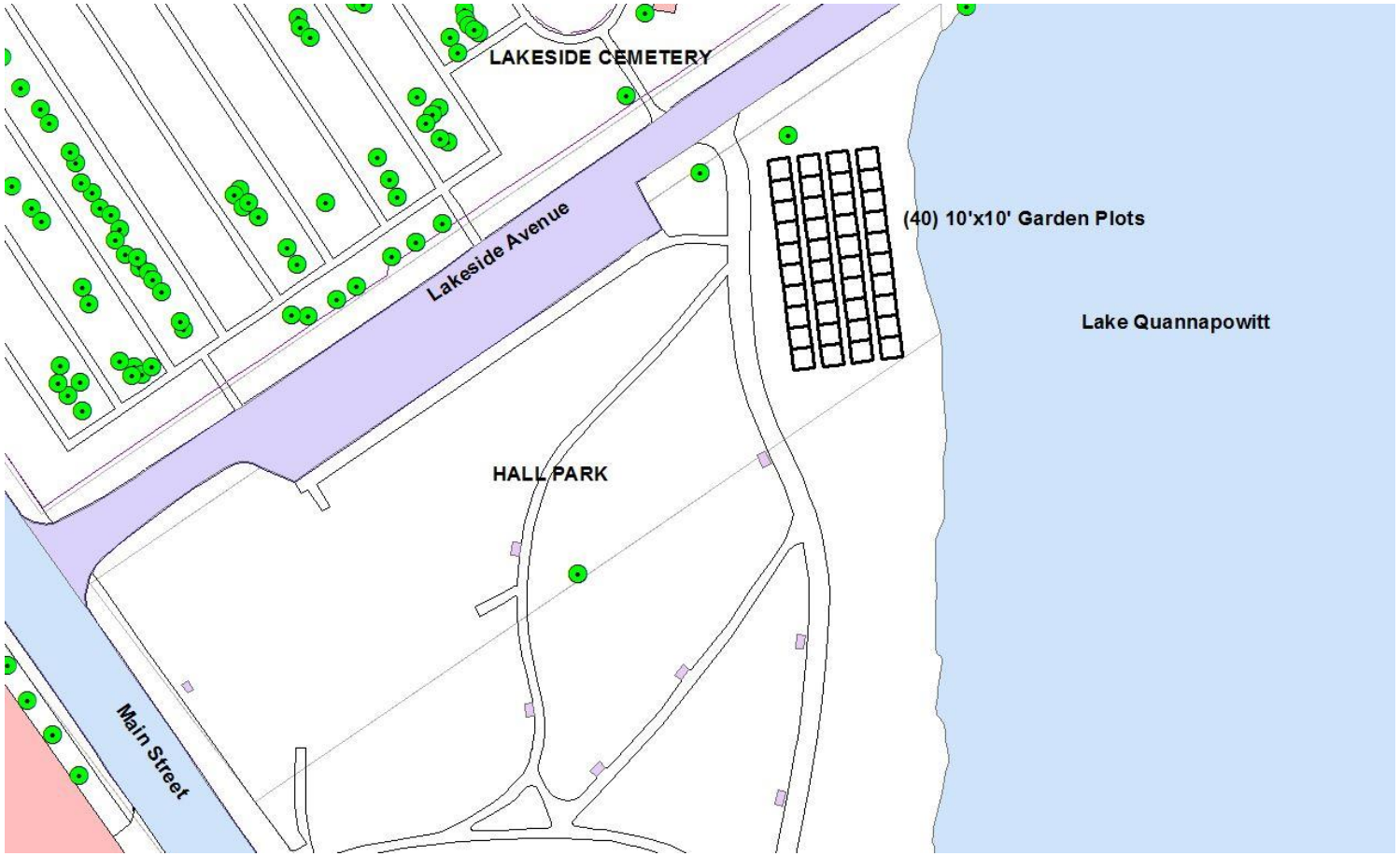
- No individual fencing
- No furniture (chairs, etc) left at plots
- No smoking or vaping

Next Steps

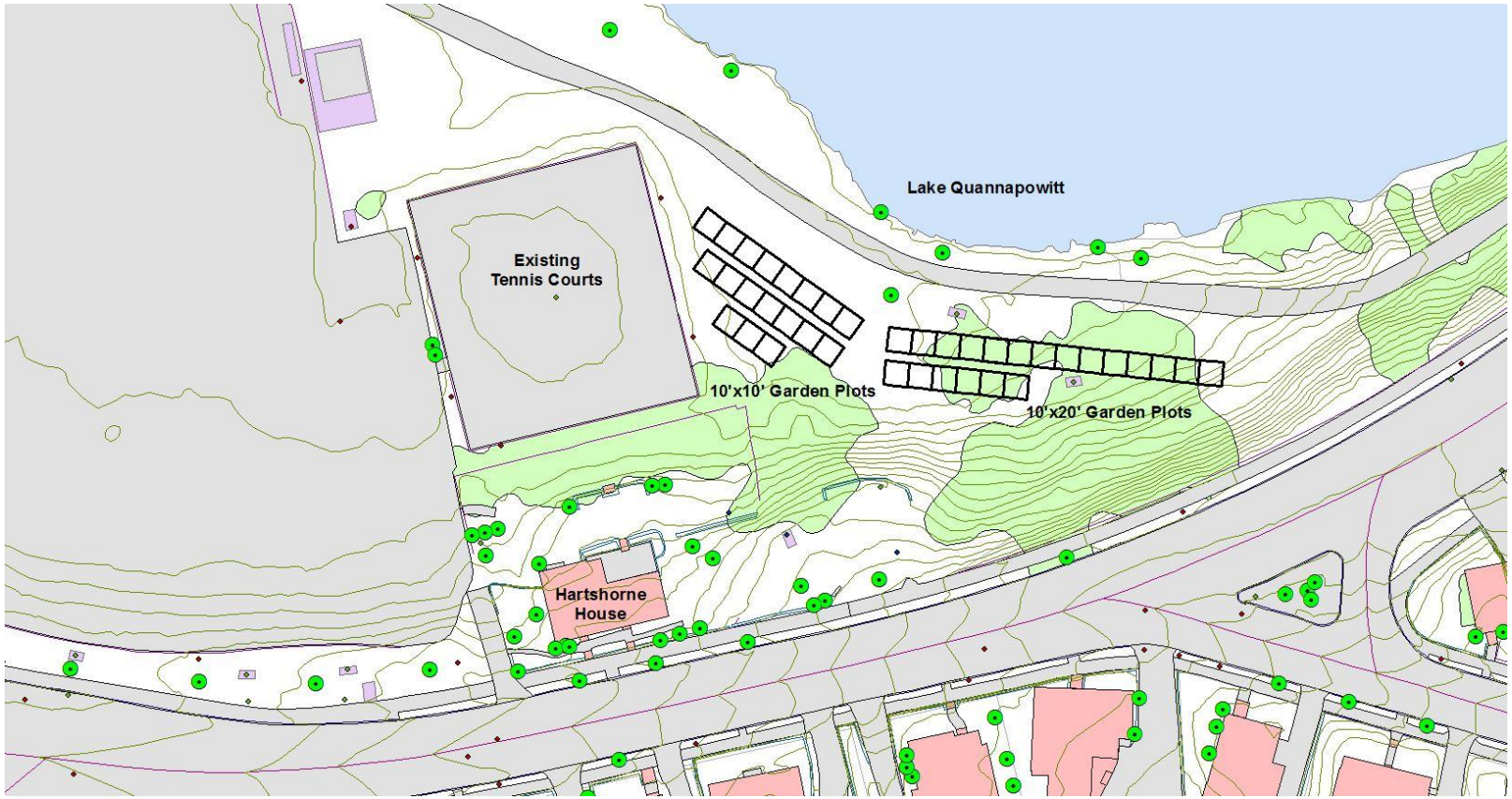
- Finalize location
- Present to Town Council with a two-week comment period
- Order beds, loam, barrels, etc
- Start planting and community conversation

Questions and Comments

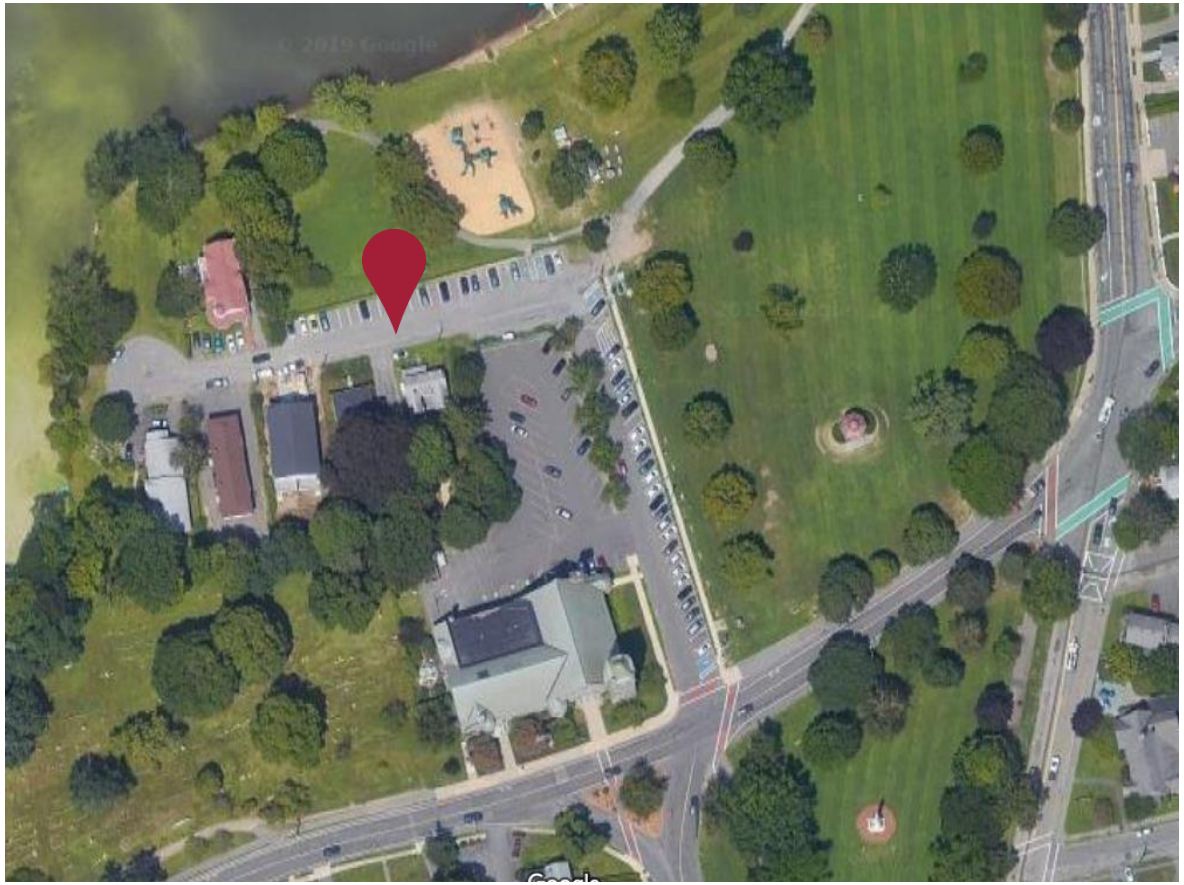
Hall Park


LAKESIDE CEMETERY
Lakeside Avenue
(40) 10'x10' Garden Plots
Lake Quannapowitt
HALL PARK
Main Street

Hartshorne House Vicinity

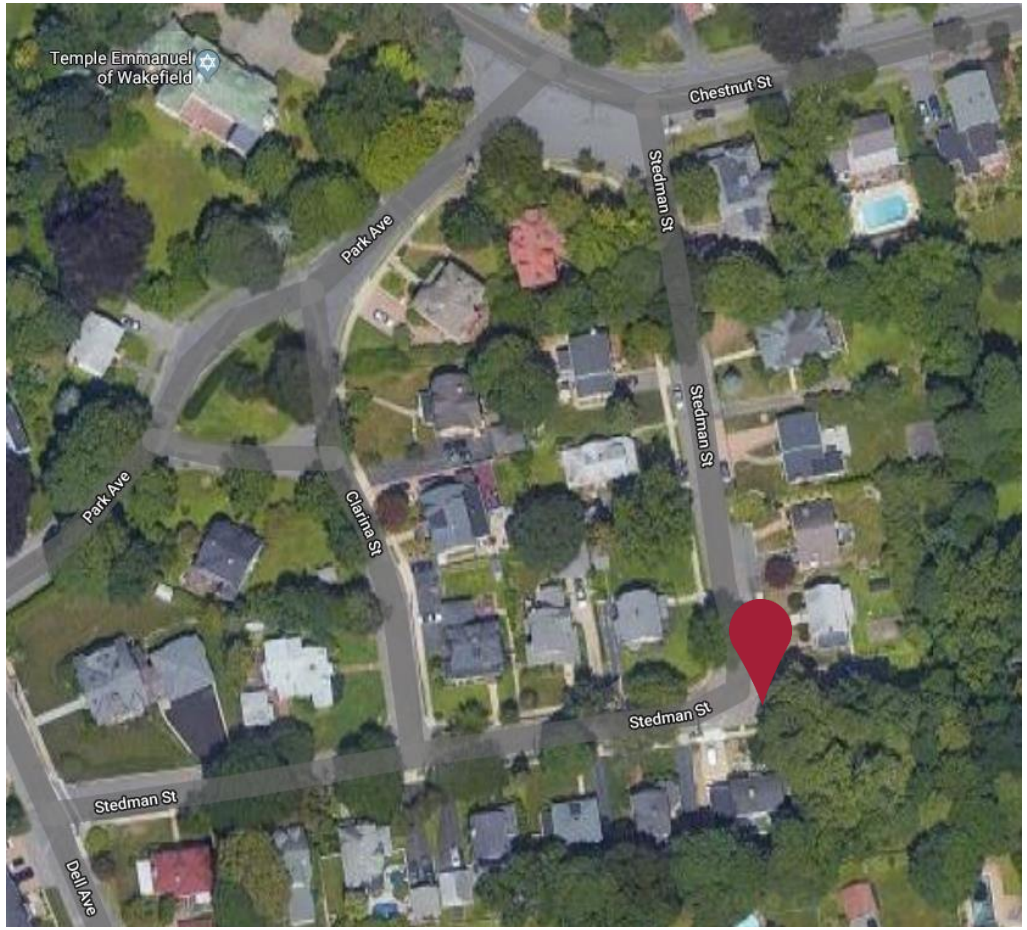


Spaulding Street



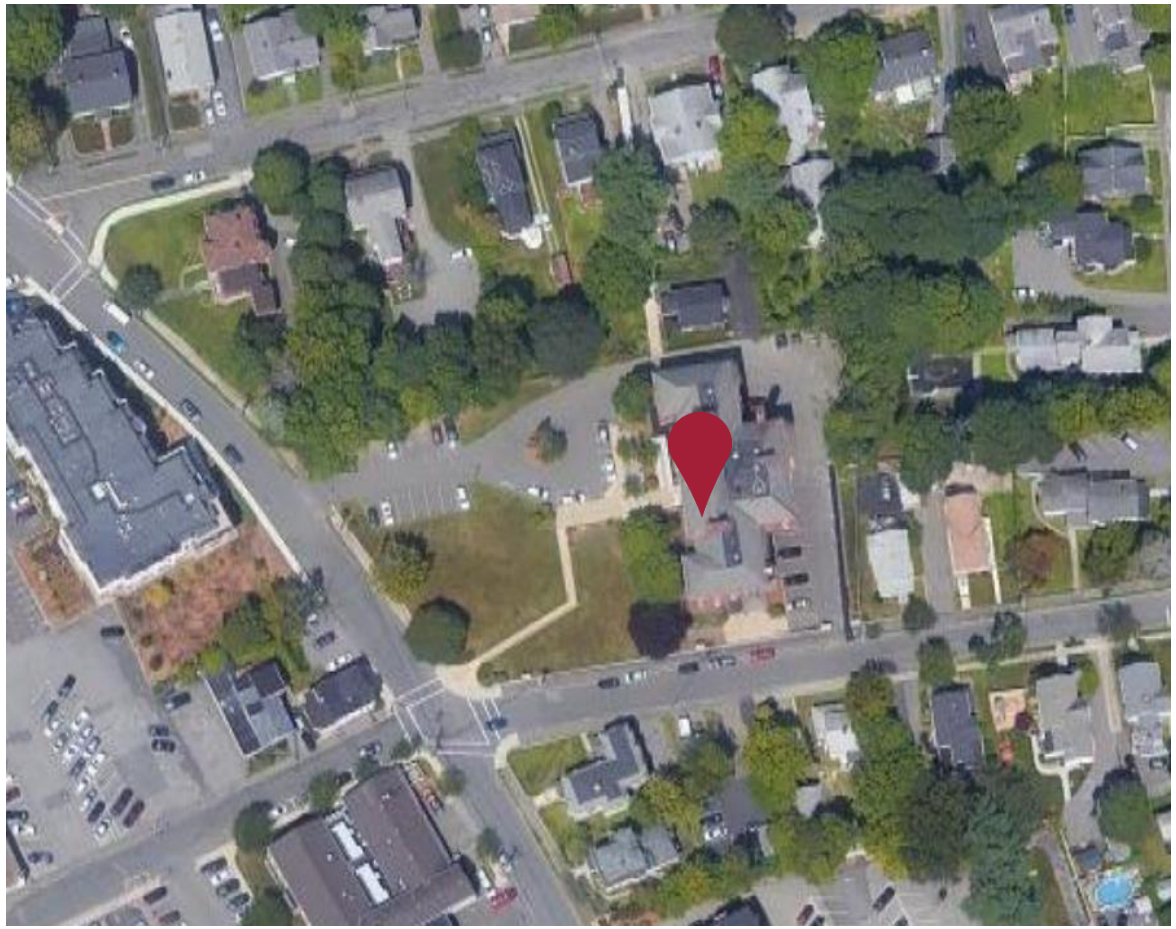
Crystal Lake, off Broadway

Stedman Street



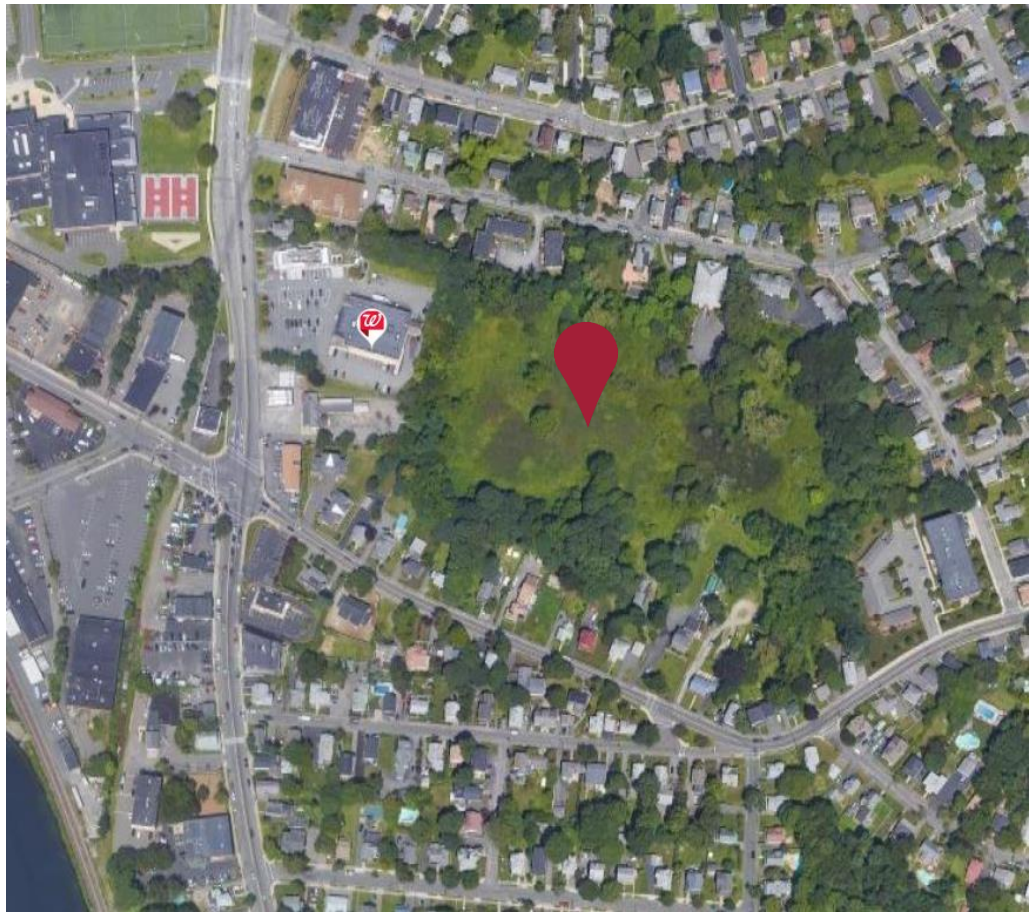
Little Red School House Museum

Lincoln School



Mapleway Playground

Strong's Meadow



Water Department Building Maintenance Garage Solar Project

108 Broadway Street

Partnership between WMGLD and Public Works Department

February 24,2020

TOWN OF WAKEFIELD

Project Summary

- Location 108 Broadway St – Water Department Garage
- Solar Array details
  - 60 Panels rated at 395 watts each
  - System size 23.7 KWdc
- Benefits
  - Return on investment <1 year
  - Annual electric consumption 19,811 KWH/Year
  - Solar array will generate 24,680 KWH/Year
  - Excess electricity generated sold back to WMGLD
  - 25 year electric savings projected to be $132,000+/-
- Installer BlueSel Home Solar
- Status – Application being processed (MMWEC)
- Installation scheduled 2nd quarter of 2020
- Financials

Total Project Cost	$78,440.00
Less State Grant	-$50,000.00
Less WMGLD/DOER Incentive (23,700 wattsDC * $1.20 per watt)	-$28,440.00
Final Cost to Public Works Department	**$0.00**

Existing Building

Building with Solar Installed

108 Broadway Street
Water Department Building

Equipment Summary

- SunPower Performance Panel Commercial Grade rated at 395Watts
  - 25 year warranty with an output of 82.6% at and of warranty period
- Inverters – SolarEdge with 25 year warranty

QUITCLAIM DEED

THE TOWN OF WAKEFIELD, a Municipal Corporation, duly established under the laws of the Commonwealth of Massachusetts, for consideration paid in the amount of **ONE DOLLAR and 00/100 ($1.00)**

Grants to **CHRISTINE E. CALER**, individually, now or formerly of 1 Hillside Avenue, Wakefield, Middlesex County, Massachusetts

WITH QUITCLAIM COVENANTS

All of the right, title and interest which the Town of Wakefield now has or ever did have or acquire in that portion of Hillside Avenue shown as Lot A-1 on "Plan of Land in Wakefield, Mass." dated April 4, 1977, by David E. Beede, R.L.S. recorded with the Middlesex South District Registry of Deeds at Book 13171, Page END and containing fifty-four (54) square feet of land, more or less.

For authority of the Town of Wakefield to abandon the portion of the Public Way as herein described and to make conveyance, see Article 2 of the Special Town Meeting held on June 20, 1977.

IN WITNESS WHEREOF, the said **TOWN OF WAKEFIELD** has caused its corporate seal to be hereto affixed and this instrument to be signed, acknowledged and delivered in its name by its Town Council this ___ day of February, 2020.

TOWN OF WAKEFIELD
By and through its Town Council

_____ _____

_____ _____

_____ _____

_____

COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss.

On this 24th day of February, 2020, before me, the undersigned notary public, personally appeared

_____
_____,
proved to me through satisfactory evidence of identification, which was personal knowledge, to be the persons whose names are signed on the preceding or attached document, and acknowledged to me that they signed it voluntarily as their free act and deed for its stated purpose as the Town Council of the Town of Wakefield, Massachusetts, or a majority thereof

_____
Notary Public
My commission expires:

c:\Wakefield\Deed-Caler

TOWN OF WAKEFIELD

TOWN ADMINISTRATOR'S OFFICE

Application For a One-Day Liquor License

Applications must be submitted with $50 application fee to Sherri Dalton, Executive Assistant, in the Town Administrator's office.

Application is made to the Town of Wakefield Licensing Authority in accordance with their rules and regulations made under authority of applicable statutes.

Applicant name: Amy Jellison ☐ Individual ☒ Business

Applicant address: 53 Bennett St. Wakefield, MA 01880 Non profit

Email: jellohouse1@verizon.net Phone: 339 927 0241

Business name and owner (if applicable): Wakefield Truck Boosters Club

Business address: 60 Farm St. Wakefield, MA 01880

Event date: 3/28/20 Start time: 6:00pm End time: 12:00 am

Address of event: Americal Civic Center
467 Main St. Wakefield, MA 01880

Purpose of event:
Cornhole Tournement to raise funds for our Boosters Club.

Amy Jellison 2/3/20

Signature of applicant Date

I, the undersigned, certify under the penalties of perjury that I, to my best knowledge and belief, have filed all State tax returns and paid all State taxes required by law.

This license will not be issued unless this certification clause is signed by the applicant. Your social security number or FID number will be furnished to the Massachusetts Department of Revenue to determine whether you have met tax filing or tax payment obligations. Licensees who fail to correct their non-filing or delinquency will be subject to license suspension or revocation. This request is made under the authority of MGL c. 62C, §49.

Amy Jellison 26-1447683 2/3/20

Signature of individual or corporate officer SSN / FID, as applicable Date

TOWN OF WAKEFIELD

TOWN ADMINISTRATOR'S OFFICE

Banner Application

With Town Council approval, banners can be hung across Main Street, just outside the Americal Civic Center. Applications must be submitted to Sherri Dalton in the Town Administrator's office at sdalton@wakefield.ma.us at least 30 days prior to the date the banner is to be featured.

Today's date: 1/31/2020 Requested display dates: 9/1/2020 - 9/12/2020

Organization name: The Angel Fund for ALS Research

Applicant name: Ann Hadley Email: theangelfundals@gmail.com

Address: 649 Main Street, Wakefield, MA Phone: 781-245-7070

Message / name featured on banner and purpose of display:

Walk of Hope for ALS - The Angel Fund for ALS Research

Signature of applicant 1/31/2020 Date

For Internal Use Only:

Town Council: ☐ Approved ☐ Denied

Date: _____ By: _____

Municipal Gas and Light Dept: ☐ Approved ☐ Denied

Date: _____ By: _____

Conditions and comments: _____