

City of
Lynn



Community Resilience Building Workshop

Summary of Findings

June 2019

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Riley Way Erosion. Source: City of Lynn Waterfront Master Plan



1.0 INTRODUCTION

In 2017, the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) initiated the Commonwealth's Municipal Vulnerability Preparedness (MVP) grant program to help communities plan for and take action toward becoming more resilient to the impacts of climate change. The program provides Planning Grants to assist municipalities in preparing for the impacts of climate change through participation in a community climate vulnerability workshop and development of a climate change action plan. Communities that complete the planning grant program receive "a Certified MVP Community" designation, are then eligible for MVP Action Grants, and achieve increased standing in other state grant programs (Figure 1). MVP Action Grants fund the implementation of priority climate change adaptation actions that have been described in the municipality's MVP plan. In 2018, the City of Lynn, through the Economic Development & Industrial Corporation of Lynn (EDIC/Lynn) received an MVP Planning Grant to follow the Community Resilience Building (CRB) Workshop Guidance, developed by The Nature Conservancy. This grant has enabled Lynn to consider the impacts of climate change and plan for resilience.

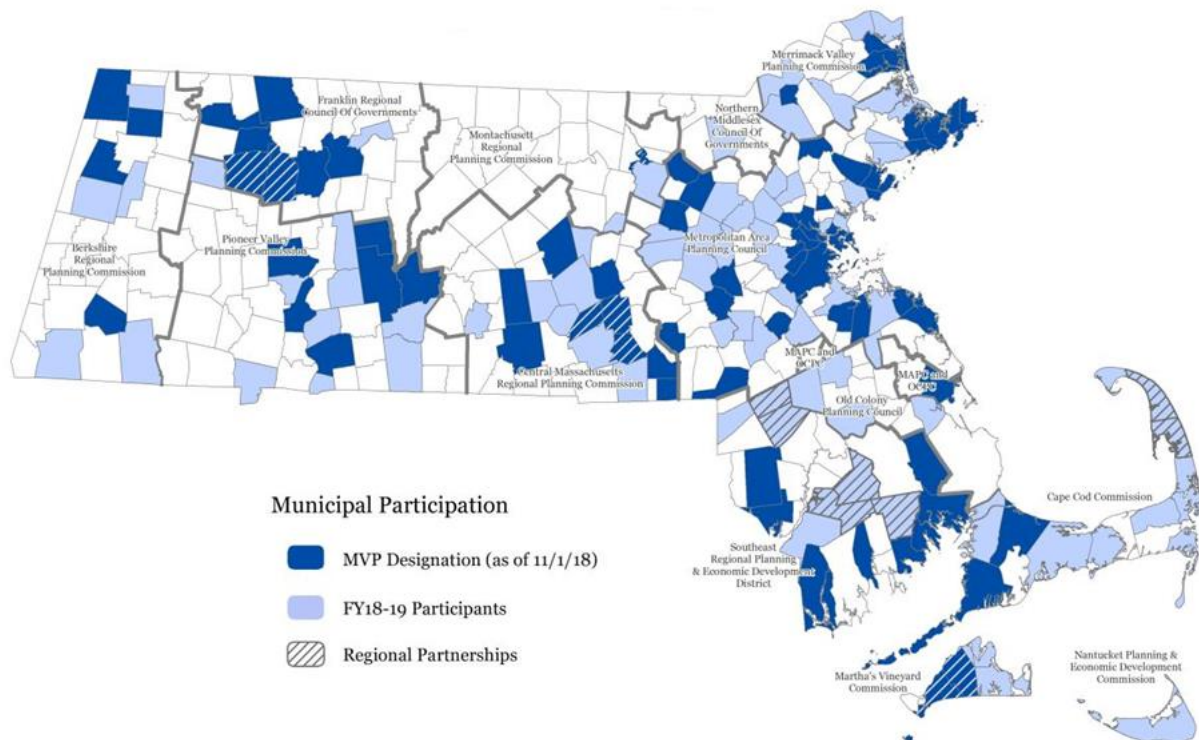


Figure 1. Massachusetts Communities Participating in the MVP Program

1.1 Environmental Risk in Lynn

The City of Lynn is already experienced the effects of climate change. Including increases in precipitation intensity and frequency, sea level, and temperatures. More extreme precipitation events are causing severe local flooding in Lynn. In the aftermath of past storms, main roads have been inundated and residents have been left without power for several days. A storm on August 12, 2018 dumped eight inches of rain in Lynn over a period of a few hours. Flooding made portions of the Lynnway, and Boston, Marion and Commercial streets were impassable at the height of the flooding. Areas of significant standing water also occurred on Bennett, Ford, Munroe Street and River Street (<https://www.itemlive.com/2018/08/12/flash-flood-submerges-parts-of-lynn/>). This storm caused flooding damage to residences and businesses, interrupted power supply, and caused several people to be stranded and in need of rescue by local emergency responders. A month later, remnants of Hurricane Florence brought another two inches of rainfall, causing the Lynnway to close. In addition to flooding, these extreme precipitation events affect water quality through the discharge of stormwater and combined sewer overflows.



Figure 2. Boston Street in Lynn, MA.
Source: The Boston Globe, 2017

An estimated four miles of Lynn's coastline is directly exposed to open ocean waves; the remaining shoreline is semi-protected by natural structures including coastal dunes and beaches, and by manmade structures. Eleven bulkhead/seawalls and revetments, ranging in condition from good to poor, provide significant protection against coastal surge and sea level rise to Lynn roadways and properties along 2.7 miles of the coastline (<https://www.mass.gov/files/documents/2016/08/pa/marblehead-revere.pdf>). Flooding here is often due to tidal impacts and the drainage system does not function at high tides. Relative sea level in Massachusetts increased more than nine inches (2.79 millimeters or 0.11 inches annually) between 1921 and 2006 (MA Coastal Zone Management, 2013). Climate change projections indicate that by 2100, sea level at the Boston tide gate is "likely" to rise by 1.5 to 4.0 feet and could be as high as 9.7 feet (NECASC, 2018) and the threat of flooding in Lynn are predicted to intensify with climate change.

Lynn, along with the entire northeastern United States has also been experiencing the effects of temperature increases. Since 1970, annual average temperatures in this region have increased by 2° F. Globally, the five warmest years on record occurred in the past five years (2014-2018) and 18 of the 19 hottest years have occurred since 2001 (<https://climate.nasa.gov/news/2841/2018-fourth-warmest-year-in-continued-warming-trend-according-to-nasa-noaa/>). This poses significant health risks to vulnerable populations who are susceptible to, or are not able to find relief from, heat.

Sections 7.5 and 7.6 of this report, Works Cited and Additional Resources, respectively, present more information on climate change projections and adaptation plans in Massachusetts and Lynn.

1.2 Ongoing Planning Efforts and Land Use in Lynn

Located in southern Essex County, 10 miles northeast of Boston, the City of Lynn is bordered by Nahant to the south, Swampscott to the east, Salem to the northeast, Peabody to the north, Lynnfield to the northwest, Saugus to the west and Revere to the southeast. The City has a total area of 13.5 square miles, of which 10.8 square miles is land and 2.7 square miles is water. Lynn is adjacent to Massachusetts Bay and the Atlantic Ocean. The City is in the Saugus River watershed, with tributaries

that include Strawberry Brook, where significant flooding occurs during heavy rainfall. There are two beaches in Lynn - Lynn Beach and King's Beach - which lie along Nahant Bay.

The City of Lynn's land use is primarily made up of residential development, forest, and commercial/industrial development (Figure 3). The forested area comprises over one-third of the City's area and includes Lynn Woods Reservation, a 2,200-acre urban forest designed by Frederick Law Olmsted.

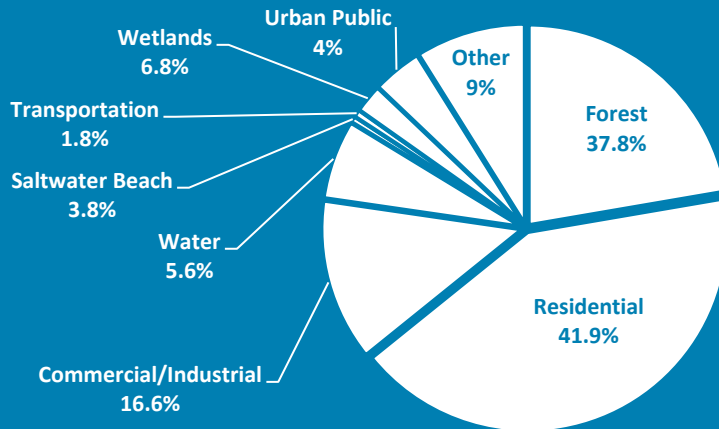


Figure 3. Land Use in Lynn. Source: MassGIS

As Lynn faces a range of environmental risks, the adaptation strategies it implements will need to consider the City's varying landscape conditions. The City's beach, forest, and residential developments will be impacted differently by coastal riverine and stormwater flooding, extreme temperatures, and wind, and will require localized solutions. Considering the full scope of Lynn's environmental risks can lead to a comprehensive set of strategies to prepare for extreme events and mitigate their impacts.

The Northern Strand Community Trail (Figures 4 and 5), a 12-mile bicycle path and walking trail, connects the cities of Everett, Malden, Revere, Saugus, and Lynn along the former Boston & Maine Railroad's Saugus Branch Railroad which operated from 1853 to 1958. Leading to Lynn's waterfront, the pathway connects neighborhoods, linking residents to business districts and, in general, economic and lifestyle benefits for people in five communities. Sections of the trail in Everett, Malden, Saugus and Revere were opened between 2012 and 2015. With a commitment of \$1.5 million in February 2018 from the Commonwealth, the final segment through Lynn of the \$12 million trail was scheduled has been designed and is expected to be constructed by 2020.



Figure 4. Completed Portion of Northern Strand in Malden
(Source: <http://www.cityofmalden.org/content/northern-strand-community-trail-design-work-april-11-early-may>)

The City is also revising its Waterfront Master Plan. Lynn's waterfront area is a 300+ acre site (Figures 6 and 7) where a mixed use of

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Figure 5. Northern Strand Community Trail.

Source: <http://www.cityofmalden.org/content/northern-strand-community-trail-design-work-april-11-early-may>

residential, commercial, industry, and open space land uses is planned. The plan builds off \$90 million in redevelopment at the former Beacon Chevrolet that will result in 322 new apartments. Currently, the site is occupied by large retailers; around 25% of the site is either is undeveloped or parking lots.

Building off the City's 2007 Waterfront Master Plan, the ongoing Waterfront Open Space Master Plan, and recent or planned development, the revised Waterfront Master Plan will create a regulatory framework that enables the implementation of these previous

planning efforts. It will steer private development towards fulfilling goals for open space, public access, and improved infrastructure. The revised Waterfront Master Plan will help to implement the goals of the 2007 Waterfront Master Plan, which are:

- Maximize the success and impact of activities and planning efforts already underway
- Create a mixed-use district that provides public access to the waterfront and works for housing, retail,
- commercial, and industrial uses
- Connect the downtown and surrounding neighborhoods to the waterfront area
- Clean up and develop areas that have been seriously underutilized
- Identify options to buffer conflicting uses so they can comfortably function in close proximity



Figure 6. City of Lynn Waterfront Zone

<https://lynnwaterfrontopenspacemasterplan.wordpress.com/context/>

The revised Waterfront Master Plan will also help to implement the goals of the Waterfront Open Space Master Plan:

- Establish a cohesive vision for connected open spaces along Lynn's waterfront
- Safeguard public access to and along the waterfront
- Provide open space design guidelines for future development along the waterfront in order to ensure open spaces are appealing and accessible to all members of the public
- Plan for climate resiliency in all developments

The Waterfront Master Plan will help the City identify and solicit sources of public investment for implementation of the plan and will serve to update the 2010 Lynn Municipal Harbor Plan.

With plans for development and open space in Lynn's waterfront and an inter-community pathway leading to the waterfront, the City of Lynn understands how critical it is to incorporate climate change resiliency measures into its planning, thus ensuring that a revitalized waterfront remains intact and vibrant. To protect the substantial investment being made in Lynn's waterfront and to protect public health and safety, measures such as changing the topography of the landscape – raising it to provide flood protection in some areas while designing other areas, such as parks, to temporarily convert to flood storage areas; elevating buildings and their utilities; and installing green infrastructure will need to be incorporated into the City's development of the waterfront. And although this MVP Planning Project precedes the final plans for the waterfront development, its open space, and the community trail, it is critical that the priority actions that are developed through the MVP Project support the City's vision for a thriving waterfront where people work, live, and recreate.



Figure 7. City of Lynn Waterfront Envisioned
 Source: <https://lynnwaterfrontopenspacemasterplan.files.wordpress.com/2018/06/public-meeting-3-presentation-slides->

1.3 Demographics in Lynn

The rainstorm on August 12, 2018 left 600 people temporarily without power and 10 people who needed to be rescued by local emergency responders (<https://www.itemlive.com/2018/08/12/flash-flood-submerges-parts-of-lynn/>). The needs of vulnerable populations should be carefully considered when planning for environmental risk. Vulnerable populations can include the elderly, children, the infirmed, residents with language barriers, residents with special needs, the homeless, undocumented residents, and residents with low or moderate income. 2010 Census data for the City of Lynn shows that of the 92,463 residents of Lynn, approximately 22,674 are children and 27.2% of these children live in poverty. Of the 10,424 residents who are age 65 or older, 9.8% live in poverty (American Community Survey (ACS), 2017).

Other demographic information for the City of Lynn is summarized below:

Population

- 90,329 residents were recorded by the 2010 Census (U.S. Census Bureau, 2010)
- 92,463 residents were estimated in 2017 (ACS, 2017)
- 95,931 residents are projected by 2030 (Metropolitan Area Planning Council [MAPC], 2016)

Age

- 24.5% of residents are under age 18 (ACS, 2017)
- 11.3% of residents are 65 or older (ACS, 2017)

Education

- 79.2% of residents have a high school diploma (U.S. Census, 2013-2017)
- 19.6% of residents have a bachelor's degree (U.S. Census, 2013-2017)

Income

- Median household income is \$53,513 (ACS, 2017)
- 18.2% of residents are below the poverty level (ACS, 2017)
- 58.66% of population is low to moderate income (ACS, 2006)

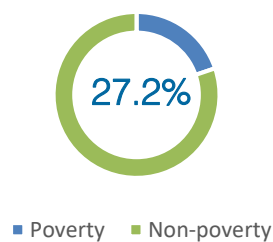
Employment

- 22,179 jobs were recorded by the 2010 Census (2012 Economic Census of the U.S., <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>)
- 24,979 jobs are projected by 2030 (MAPC, 2016)

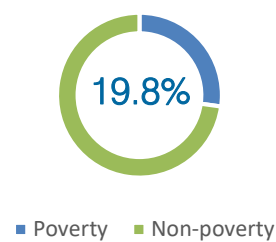
Residential Property Values

- There are 34,374 housing units (ACS, 2016)
- The median property value is \$263,700 (ACS, 2016)

Seniors (65 and over)



Children (under 18)



2.0 COMMUNITY RESILIENCE BUILDING WORKSHOP: SUMMARY OF FINDINGS

The timeline of climate adaptation and mitigation efforts in Lynn extend for several years. Lynn introduced a Multi-Hazard Mitigation Plan in 2012, which was later updated in 2016 (MAPC, 2016). The Federal Emergency Management Agency (FEMA) updated the area's Flood Insurance Rate Maps (FIRM) in 2014, including Lynn's shoreline along the Atlantic Ocean and the Saugus River in the floodplain. A Lynn Coastal Resiliency Assessment was developed for the city in July 2016 (Weston & Sampson, 2016).

Lynn's application to the Municipal Vulnerability Preparedness (MVP) Planning Grant continues the City's history of climate change planning. The MVP program helps support Massachusetts communities in preparing for extreme weather and implementing priority resilience projects. Communities that complete the MVP program become certified and are eligible to apply for MVP Action grant funding. As a participating community, Lynn can use this funding to improve resilience and preparedness for natural and climate-driven hazards; collaborate with stakeholders regarding climate change, natural hazards and impacts; and increase education, planning, and implementation of priority actions.

Lynn's MVP application outlined the impact of extreme weather events and pledged to incorporate findings from the MVP Project into future planning efforts. There is considerable synergy between the planning of the MVP Project, the revised Waterfront Master Plan, the Waterfront Open Space Plan, and the Northern Strand Community Trail. Findings of the MVP Planning Project will be incorporated into future updates of the City's Hazard Mitigation Plan.

To plan for Community Resilience Building Workshop, the City of Lynn followed the process described in the Community Resilience Building Workshop Guidebook (The Nature Conservancy, undated). The Guidebook presents a clear approach on how to organize the public process for mitigating the impacts of and increasing resilience against natural hazards and climate change. An important aspect of the planning process is the discussion it promotes among community members about creating a safer, more resilient community. The project used three tiers for project planning and public outreach: 1) the Core Team, with representation from municipal leadership at the City of Lynn, that planned the CRB Workshop, 2) stakeholders who represented entities that could be vulnerable to, or provide strength against, natural hazards and climate change, and 3) the general public, who live and work in the City. Developing a resilience plan that reflects the values and priorities of stakeholders and the general public of the City of Lynn is likely to produce greater community support and result in greater success in implementing mitigation strategies that reduce risk.

2.1 The Core Team

The City of Lynn, with support from EDIC/Lynn and leadership from Mayor Thomas McGee, convened Core Committee to act as a steering committee for the development of the MVP Plan. The Core Committee met on December 20, 2018 to establish goals for the plan, and to provide reports, maps, and other pertinent information related to natural hazards and climate change impacts in Lynn. The Core Committee developed the invitation list for the Community Resilience Building Workshop at which key stakeholders would help the City identify hazards, vulnerabilities, strengths, and propose actions to mitigate the impacts of natural hazards and climate change. The Core Committee sought to include municipal leaders as well as politicians, representatives from local nonprofit organizations, local universities, other local jurisdictions, regional organizations, and state government. The Committee also

reviewed the list of priority actions developed CRB Workshop. Agendas and notes from the Core Team meetings are presented in Appendix E. Members of the Core Committee are listed in Section 7-3.

Prior to the Core Team meeting, Weston & Sampson held separate meeting with representatives from the Lynn Water & Sewer Commission (October 26, 2018), Lynn Emergency Management (November 8, 2018), and the Department of Public Works (November 27, 2018). The purpose of these meetings was to inform these key stakeholders of the MVP project and to gather background information on hazards and climate change conditions threatening the City. The threats and damage caused by flooding was a common topic at all three meetings. Localized areas of flooding were identified; notably Strawberry Brook was identified as an area of concern in all three meetings. Notes from these meetings are presented in Appendix F.

2.2 Community Resilience Building Workshop

Stakeholders with subject matter expertise and local knowledge and experience, including public officials, regional organizations, environmental organizations, local institutions, and state and federal government, were invited to engage in an all-day Community Resilience Building Workshop, held on February 26, 2019. The workshop's central objectives were to:

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

During the first part of the Workshop, Weston & Sampson provided information about natural hazards and climate change, and participants identified top hazards; infrastructural, societal and environmental features in the City that are vulnerable to or provide strength against these challenges. During the second part of the Workshop, participants identified and prioritized key actions that would improve the City's resilience to the natural and climate-related hazards (Figure 8). A list of all invitees and attendees is included in Section 7.1 of this Plan.

Twenty-five stakeholders participated in the event, working alternatively in large and small groups to identify hazards, at-risk areas, and recommendations related to environmental risk and climate adaptation.



Figure 8. Discussions During the Community Workshop

2.3 Public Listening Sessions

To gather information from the general public and to educate the public on climate change and vulnerability preparedness, the City of Lynn hosted two public listening sessions. The Community Resilience Building Workshop process and findings were presented at listening sessions open to the general public on April 30, 2019 at Lynn City Hall and May 21, 2019 at the Lynn Housing Authority & Neighborhood Development. The draft Summary of Findings Report was posted online, and the public comment period was from April 30 – May 30, 2019. The May 21 meeting was publicized in accordance with the Massachusetts Public Meeting Law (see public meeting notices in Appendix G).

Comments at the April 30 Listening Session included the need to use the pond system of Flax, Sluice, and Cedar Ponds in the Strawberry Brook watershed, dredging them so that they can provide more upstream storage, thus preventing or mitigating downstream flooding, during flood events. Another commenter suggested consideration of a stormwater fee associated with impervious surfaces to encourage developers to minimize the construction of impervious surfaces and to generate funds that could be used as matching funds to future grant applications. Finally, several residents of Canal Street described extensive flooding from the brook that underlays their homes.

At the May 21 Listening Session, one person commented that implementation measures can sometimes conflict with environmental regulations. A commenter agreed with the report that the City needs an Area of Critical Environmental Concern (ACEC) Management Plan. Suggestions included use of tidal energy as a source of renewable energy when it comes commercially available and engaging students such as those at the North Shore Community College.

Also, on April 30, a meeting was held with City Council President Darren Cyr to review the draft Summary of Findings Report and receive public comment. He offered the priority action of coordinating with the Town of Swampscott on flooding issues that originate in Swampscott but also affect Lynn. As examples, he cited the overtopping of the seawall at Fishermen's Beach in Swampscott that allows saltwater to flood the adjacent area in Lynn and the culvert that runs under Windsor Avenue near Foster's Dam that causes flooding in areas that include Valley Road, East Park Avenue, Pacific Street, and Arbor Street.

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3.0 TOP HAZARDS AND VULNERABLE AREAS

Natural hazards in Lynn include sea level rise and storm surge, heavy precipitation, flooding, wind, drought, erosion, and winter storms. The 2016 Hazard Mitigation Plan summarized the following natural hazards:

Table 1. Lynn Risks Summary		
Hazard	Frequency	Severity
Flooding	High	Serious
Dam Failures	Low	Serious
Coastal Hazards	High	Serious
Tsunami	Very Low	Extensive
Winter Storms	High	Serious
Hurricanes	Medium	Serious
Tornadoes	Low	Serious
Brush Fires	Medium	Minor

(Source: MAPC, 2016)

3.1 Top Hazards

Workshop participants reviewed all the climate risks during the CRB workshop. They expect that these hazards will worsen in the future and may even lead to new risks. Floods have had a significant impact on the City of Lynn, but flooding is not Lynn's only concern. During the CRB workshop, long-term residents expressed concern about erosion along the shoreline, which they had observed after storms. The top five hazards identified by participants during the workshop are:



Sea level rise, coastal storm surge, and erosion



Heavy precipitation/flooding



High Winds



Winter Storms



Extreme heat

1.1.1 Sea Level Rise, Coastal Storm Surge, and Erosion

This hazard includes sea level rise, storm surge, and erosion. While sea level rise projections vary depending on emission scenarios and time horizons (NECASC, 2018), the region has identified 40" of sea level rise by 2070 as a planning benchmark. Increased coastal flooding will lead to increased shoreline erosion, which is also a serious concern in Lynn. The Lynn shoreline has experienced erosion during extreme weather during previous storm events.

1.1.2 Heavy Precipitation and Flooding

Between 1961 and 2015, the 24-hour, 100-year rain event increased from 6.5 inches to 8.4 inches (NOAA, 2015; U.S. Department of Commerce, 1961). This increased precipitation causes both rivers and stormdrain systems to exceed their capacities, resulting in flooding. Both coastal and inland flooding has had the largest impact on Lynn within the last five years.

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1.1.3 High Winds

High winds will impact infrastructure, trees, and properties.

1.1.4 Winter Storms

Winter storms and associated snow and ice can damage infrastructure and properties. In the past few decades, more rain has been observed during the winter months. Winters are projected to become rainier and icier, which can increase the chances of damages like those caused by the December 2008 ice storm that struck central Massachusetts.

1.1.5 Extreme Heat

This hazard includes very high temperatures. Average temperatures in the area could increase by 2.8°F to 6.2°F by mid-century, and by 3.8°F to 10.8°F by the end of the century (NECASC 2018). There could also be an increase in days with temperatures above 100°F. The number of these extremely hot days could increase between 1 and 3 days by 2050, and between 1 and 13 days by 2100 (NECASC 2018).

3.2 Vulnerable Areas

Participants discussed vulnerable areas during the CRB Workshop. The impact of extreme events on the city's drainage system was cited as a concern. Stacey and Strawberry Brooks become overwhelmed during storms, because of the City's dense development, and the more intense rainstorms resulting from climate change. The Lynn Coastal Resiliency Assessment previously identified the Lynn coastline as a high-risk area for erosion and damage to coastal protection structures (Weston & Sampson, 2016). Vulnerable areas of concern identified in the CRB workshop are summarized in the table below:

Table 2. Vulnerable Areas in Lynn	
Category	Name
Streets	Munroe Street, Bennett Street, Chestnut Street, Western Ave
Drainage	Citywide, Strawberry Brook, Saugus River
Seawall	Waterfront
Bridge Access Points	Lynn Bridges
Marina	Marina



Figure 9. Ford Street after a Storm.
Source: The Boston Globe, 2017



Figure 10. Damaged Seawall near Riley Way, Source: Lynn Coastal Resiliency Assessment, 2016



Figure 11. Commercial Street after a Storm. Source: The Boston Globe, 2017

4.0 CURRENT CONCERNS AND CHALLENGES PRESENTED BY HAZARDS AND CLIMATE CHANGE

The main areas of concern were grouped within the following three categories or “features:” infrastructural, societal, and environmental.

4.1 Infrastructural

Workshop participants identified those key infrastructural features in Lynn that are most vulnerable to natural hazards and climate change impacts. They are:

- Stormwater drainage system (the most commonly cited infrastructural area of concern)
- Impervious surfaces
- Culverts, including Strawberry Brook culvert
- Wastewater collection and treatment system
- DPW facility including fueling station
- Streets, including Lynnway, Boston St, Summer St, River St, Alley St, Lynn/ Nahant Rotary, Bennett St, Munroe St, Chestnut, Western Ave.
- Bridges and bridge access points to City
- Railroad/commuter rail
- Schools
- Residential and commercial buildings
- Seawall
- Parking garages
- Fire Department
- New development
- Marina
- Dams
- Landfill
- Evacuation routes
- Water transportation
- Utilities, including energy supply and distribution



Figure 9. Areas of Concern Include the Fire Department, Transportation, Assisted Living Facilities, and the Seawall

4.2 Societal

Workshop participants discussed the impact of climate change on vulnerable populations. These vulnerable communities will need support and access to shelters, information, cooling centers, and evacuation plans in the event of an emergency. Concerns related to the societal category include:

- Homeless population
- Undocumented population
- Individuals with disabilities
- Elderly populations
- Homebound populations
- Children
- Low to moderate income population
- Immigrants and people with language barriers
- Mental health population
- People suffering emergency illnesses (no hospital in Lynn)
- Students and teachers
- People dependent on public transportation
- Lynn Public School Food Service Program
- Greater Lynn Senior Services (GLSS)
- Pets
- Industry and downtown businesses
- Commuters
- Senior centers and assisted living facilities
- Poor quality of housing stock

4.3 Environmental

Workshop participants identified those key environmental features in Lynn that are most vulnerable to natural hazards and climate change impacts. They are:

- Beach, coastline and estuaries
- Marshes, estuaries, and wetlands
- Erosion, including along Riley Way
- Forest system, including Lynn Woods
- Flooding and water quality contamination
- Reduced green space (increased impervious area)
- Saugus River
- Strawberry Brook
- Ponds
- Drinking water supply, including reservoir system
- Invasive species including phragmites and black algae
- Canada geese
- Contamination
- Insects and rodents

5.0 CURRENT STRENGTHS AND ASSETS

Despite the range of risks that Lynn faces, participants in the workshop were able to identify several existing strengths and assets within the city.

5.1 Infrastructural

Workshop participants identified those key infrastructural features in Lynn that provide strength against natural hazards and climate change impacts. They are:

- New development
- Fire Department
- Schools
- Utilities
- Dams
- Seawall
- Evacuation Routes
- Water Transportation
- Parking garages

5.2 Societal

Workshop participants identified those key societal aspects of Lynn that provide strength against natural hazards and climate change impacts. They are:

- Elderly populations, living in retirement homes, assisted living, nursing homes, single family homes
- Children
- Ability to speak languages other than English
- City Agencies
- Nonprofit organizations such as YMCA, Salvation Army, schools, churches, GLSS, Lynn Community Health Care, Lynn Public School Food Service Program, Visiting Nurses Association, Lynn Housing Authority and Neighborhood Development
- Schools and daycares
- People able to use public transportation
- Industry and downtown businesses

5.3 Environmental

Workshop participants identified those key environmental features in Lynn that provide strength against natural hazards and climate change impacts. They are:

- Beach
- Saugus River
- Ponds
- Drinking water supply, including reservoir system
- Forest system, including Lynn Woods
- Parks
- Wetlands



Figure 10. Waves Crashing on the Seawall at Kings Beach. Source: Huffington Post, 2018

6.0 TOP RECOMMENDATIONS TO IMPROVE RESILIENCE

After listing vulnerabilities, hazards, and possible actions, participants ranked their recommendations from high to low priority. A summary of findings from the final group matrix is included below.



Figure 11. Participants Created Matrices of Risk and Vulnerabilities at Each Table, Before Consolidating Findings into One Matrix and Ranking Priority Actions

6.1 Highest Priorities

- Protect the City's waterfront and marina from sea level rise and coastal surge.
 - Support implementation of resiliency measures developed through planning efforts related to the revised Waterfront Master Plan and the Waterfront Open Space Master Plan.
 - Protect beaches, coastlines, and the landfill from sea level rise, storm surge, and erosion by promoting living seawalls and shorelines, berms, green roofs and other strategies to increase resilience.
 - Protect the City-owned marina with a wave attenuator, living shoreline, or other energy dissipator.
 - Continue ongoing evaluations of the seawall and implement recommendations which could include additional studies, developing an action plan, and repairing the seawall.
- Reduce coastal, riverine and stormwater flooding.
 - Restore the Strawberry Brook watershed, and redesign and replace the brook's culvert system to increase water retention, decrease flows, and reduce flooding of the brook. Dredge the system of Flax, Sluice, and Cedar Ponds in the Strawberry Brook watershed to provide more upstream storage, thus preventing or mitigating downstream flooding.
 - Promote the reduction of impervious surfaces and installation of green infrastructure to reduce heat, including urban heat island, and increase water retention and recharge. Design for low impact development using more pervious surfaces and incorporate more green space.
 - Design and implement multi-purpose flood storage areas that provide co-benefits of habitat (such as marshes and wetlands), open space, and/or recreation.
 - Evaluate culverts and increase their conveyance capacities.
 - Raise roads and bridges
 - Upgrade and maintain drainage systems, including at Route 1A and Boston Street.
 - Continue combined sewer overflow separation and infiltration/inflow removal. Manage increased stormwater flows resulting from this work.
 - Restore wetlands and explore options for using wetlands to mitigate flooding and rejuvenating habitat

- Evaluate the City's planning tools, including ordinances, regulations, zoning and planning documents, and adopt changes that promote the use of green infrastructure, Low Impact Development, and climate change resilience.
- Explore and implement opportunities to enhance communication with and provide temporary shelter for vulnerable populations, including those people who are elderly, young, students and teachers, low- to moderate-income, transient, homeless, homebound, immigrant, commuting public, infirmed, and disabled. Strategies include:
 - Provide and generate increased awareness of places of congregation/cooling/warming during emergencies.
 - Encourage the development of personal emergency and evacuation plans.
 - Develop outreach and support programs to prepare homeless population for effects of natural hazards. Offer gathering points to homeless during serious weather-related events.
 - Provide equipment and resources during extreme heat, extreme cold, and winter storms.
 - Better identify and communicate with vulnerable populations using formats such as RAVE Mobile Safety (an emergency notification system), and expansion of the City's blue light and emergency signage systems.
 - Engage social service agencies such as Greater Lynn Senior Services (GLSS), Lynn public school food service, and Lynn Community Health for education and outreach assistance in emergencies, and for contingency planning.
- Support implementation of resiliency measures developed through planning efforts related to the Northern Strand Community Trail.
- Study the Saugus River area to evaluate strategies to reduce flooding, erosion and effects of extreme heat and water quality.
- Develop Area of Critical Environmental Concern Management Plan to enable protection of natural resources and projects in the coastal area (such as seawall or marina repairs).
- Coordinate with the Town of Swampscott on regional matters such as flooding issues that originate in Swampscott but also affect Lynn. For example, address the overtopping of the seawall at Fishermen's Beach in Swampscott that allows saltwater to flood the adjacent area in Lynn. Also, address the culvert that runs under Windsor Avenue near Foster's Dam that causes flooding in areas that include Valley Road, East Park Avenue, Pacific Street, and Arbor Street.

6.2 Moderate Priorities

- Protect Lynn Woods and surrounding area from brush fires through techniques such as brush clearing, clearing undergrowth, removing fallen tree, creating a green infrastructure buffer, and maintaining a new water tanker for fire-fighting.
- Comply with MS4 Stormwater Permit and upgrade the storm drainage system to reduce contamination.
- New development utilities should be buried.
- Protect the wastewater treatment plant.
- Relocate the Department of Public Works' fueling station.
- Develop innovative funding mechanisms to address stormwater, impacts of impervious surfaces, and climate resilience.
- Partner with developers to address stormwater and impacts of impervious surfaces

6.3 Additional Priorities

- Repair and maintain emergency utilization of the parking garage at Market Street.
- Encourage the MBTA to redesign and raise the commuter rail line.
- Encourage MA Department of Conservation and Recreation to study and remove algae on the beaches.

7.0 REFERENCES

7.1 CRB Workshop Participants:

Table 3. List of Workshop Invitees and Attendees

Name	Affiliation
Mayor Thomas McGee*	Mayor, City of Lynn
Al Wilson	Beyond Walls
Alan Peterson	U.S. Environmental Protection Agency
Allen Phillips*	MA Emergency Management Agency
Amy Hamilton*	U.S. Army Corps of Engineers
Andrew J. Hall, P.E.	Department of Public Works
Antonio Barletta	Town of Nahant
Arthur Richard	Lynn Fire
Bill Bochnak*	Lynn/EDIC
Birgitta S. Damo	Lynn Economic Opportunity, Inc.
Bob Fennell*	Lynn Water & Sewer Commission
Brendan Crighton	Massachusetts Legislature
Brian M. Field	Lynn City Council
Brian P. LaPierre	Lynn City Council
Buzzy Barton	Lynn City Council
Captain Jim Perry	City of Lynn
Captain Ray	Police Department
Chris Reddy*	Lynn Police
Coast Guard Representative	U.S. Coast Guard, District D1, Boston
Commuter Services Representative	Keolis
Customer Support Representative	Mass Bay Transit Authority
Dan Hamilton*	National Guard
Dan Small	Lynn Woods Park Ranger & Tree Warden
Daniel Cahill	Massachusetts Legislature
Darren P. Cyr	Lynn City Council
David J. Solimine, Jr.	Solimine, Landergan, and Richardson Funeral Homes
Debra Surface*	Cataldo Ambulance Services
Dianna M. Chakoutis	Lynn City Council
Donald Wong	Massachusetts Legislature
Dr. Patrick Tutwiler	Lynn Public Schools
Drew Russo	Lynn Museum and Lynn Arts
Ed Price	Charter Environmental
Ed Reiner*	US Environmental Protection Agency

Table 3. List of Workshop Invitees and Attendees (cont.)

Name	Affiliation
Eric Worrall	MA Department of Environmental Protection
Faith Hassell	National Grid
Frances Martinez	North Shore Latino Business Association, Inc.
Fred Hogan*	Lynn City Council
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Henry Olbash*	Department of Community Development
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Jeff Weeden*	Lynn Housing Authority & Neighborhood Development
Joe Mulligan*	
John Flick*	Lynn Community Health Center
John Ladd*	Lynn Housing Authority & Neighborhood Development
John M. Walsh Jr.	Lynn City Council
John McCarthy	North Reading Transportation (NRT) Bus, Inc.
John Olson	Columbia Insurance Company / Lynn Area Chamber of Commerce Member
Kathryn Glenn*	MA Office of Coastal Zone Management
Kris Tecce*	Lynn Economic Opportunity
Lisa Herrera	Lynn City Council
Lisa Nerich*	Department of Public Works
Martin Pillsbury	Metropolitan Area Planning Council
Mary Lester	Conservation Commission/ Saugus River Watershed Council
Mary Monahan	Fuss & O'Neill
Meaghen Hamill*	Mayor's Office
Mia Mansfield*	MA Executive Office of Energy and Environmental Affairs
Michael J. Donovan, PE	Inspectional Services
Michele Desmarais*	Public Health
Mikael Main	MA Emergency Management Agency
Nick Golden	Massachusetts Legislature
Norm Cole	Lynn Economic Opportunity, Inc.
Patricia Bowie	MA Office of Coastal Zone Management
Paul A. Ricchi*	Lynn Fire Department
Paul Crowley	Greater Lynn Senior Services
Pedro Soto*	Beyond Walls

Table 3. List of Workshop Invitees and Attendees (cont.)

Name	Affiliation
Priscilla Geigis	MA Department of Conservation and Recreation
Richard Gorham	General Electric
Richard Reney*	North Shore Community College
Robert Conlon	Lynn Business Partnership
Robert F. Tucker	Friends of Lynn and Nahant Beach
Robert Stilian	Planning Board
Son Wooten*	Zoning Board of Appeals
Stacey Minchello	Senior Center/Council on Aging
Stephen Archer	Fire Department
Steven Babbitt*	Parks and Recreation Commission
Susan Hefler Downey	Park Commission
Teri Krawitz*	Zoning Board of Appeals
Theresa C. Young	Lynn City Council
Thomas M. McGee*	City of Lynn
Thor Jourgensen*	Daily Item
Vallery Cardoso	MA Executive Office of Energy & Environmental Affairs
Wayne A. Lozzi*	Lynn City Council/ MA Department of Environmental Protection
William Klag	North Shore Medical Center

Notes:

Asterisks (*) are placed next to attendees

7.2 Citation

City of Lynn. 2019. *Community Resilience Building Workshop Summary of Findings*. Prepared by Weston & Sampson. Lynn, Massachusetts.

7.3 Project Core Committee

City of Lynn, Municipal Leadership:
Thomas M. McGee, Mayor

City of Lynn, Core Team Members:

Table 4. Members of the Core Team	
Name	Affiliation
Bill Bochnak	Project Manager, Lynn EDIC
Stephen Archer	Fire Chief
Jamie Cerulli	Inspectional Services Department
Michele Desmarais	Public Health
Michael Donovan, P.E.	Inspectional Services/Building Commissioner
Bob Fennell	Lynn Water & Sewer Commission
Charles Gaeta	Lynn Housing Authority & Neighborhood Development
Andrew Hall	Public Works Department
Meaghen Hamill	Chief of Staff, Mayor's Office
Mary Lester	Conservation Commission/ Saugus River Watershed Council
Michael Mageary	Police Chief
James Marsh	Department of Community Development
Mary Monahan	Fuss & O'Neill
Lisa Nerich	Parks & Recreation
Daniel O'Neill	Lynn Water & Sewer Commission
Paul Ricchi	Emergency Management

Note: for contact information for the Core Team Members, please refer to the meeting minutes included in Appendix E.

Weston & Sampson, Team Assisting with the Workshop:

Kathleen Baskin, Project Manager/Facilitator
Lindsey Adams, Table Facilitator
Adria Boynton, Table Facilitator
Lydia Kifner, Table Facilitator
Alex Gaspar, Table Facilitator
Jill Getchell, Table Facilitator
Deanna Lambert, Table Facilitator
Steve Roy, Table Facilitator

7.4 Acknowledgements

A special thanks to the Massachusetts Executive Office of Energy and Environmental Affairs for providing the grant that funded the Community Resilience Building Workshop. Additional thanks to all the participants and to the Workshop Project Team for a successful event.

7.5 Works Cited

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https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_17_5YR_S1701&prodType=table).
- CBS News (CBS). 2018. "Snowstorm floods Boston Harbor and coastal Massachusetts streets with icy water." ([cbsnews.go.com/US/snowstorm-floods-boston-harbor-coastal-massachusetts-streets-icy/story?id=52142213](https://www.cbsnews.go.com/US/snowstorm-floods-boston-harbor-coastal-massachusetts-streets-icy/story?id=52142213)).
- City of Lynn Waterfront Master Plan. Public Meeting #1 Presentation, September 26, 2018
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- Weston & Sampson and Anchor QEA. 2016. *Lynn Coastal Resiliency Assessment*
<https://www.ediclynn.org/documents/Lynn%20Coastal%20Resiliency%20Assessment.pdf>).

7.6 Additional Resources

Massachusetts Climate Change Adaptation Report (Massachusetts Executive Office of Energy and Environmental Affairs, Adaptation Advisory Committee, 2011)

APPENDIX A

Workshop Materials

Agenda

Attendance

Base Map used for participatory mapping exercises



City of Lynn
Municipal Vulnerability Preparedness Project
Community Resilience Building Workshop
Community Room, Lynn Housing Authority & Neighborhood Development
10 Church Street, Lynn, MA 01902
Tuesday, February 26, 2019
8:30 am – 4:30 pm


8:30 am – 9:00 am	Registration and Refreshments
9:00 am – 9:20 am	Welcome and Introductions <ul style="list-style-type: none">• Mayor Thomas McGee• Bill Bochnak, Project Manager, Lynn EDIC• MVP Committee Members• Weston & Sampson Team• Participant Introductions
9:20 am – 9:30 am	MVP Workshop Purpose and Overview <ul style="list-style-type: none">• MVP Program Background• Purpose, Desired Outcomes, Objectives, Expectations• Review Agenda• Logistics
9:30 am – 10:10 am	Data Resources and Overview of Science <ul style="list-style-type: none">• Hazards• Existing Climate Change• Projected Climate Change• Recent Planning Efforts• Overview of Data and Maps Being Used During Workshop
10:10 am – 10:35 am	Large Group Exercise #1 <ul style="list-style-type: none">• Identify Major Hazards in Community• Prioritize Top Four Hazards
10:35 am – 10:50 am	BREAK
10:50 am – 11:05 am	Risk Matrix <ul style="list-style-type: none">• Hazards• Features<ul style="list-style-type: none">• Infrastructure, Societal, Environmental• Vulnerability or Strength• Location• Ownership• Actions
11:05 am – 11:25 am	Small Group Exercise #1 <ul style="list-style-type: none">• Infrastructure and Buildings Features<ul style="list-style-type: none">• Vulnerability or Strength, Location, Ownership
11:25 am – 11:45 pm	Small Group Exercise #2 <ul style="list-style-type: none">• Societal Features<ul style="list-style-type: none">• Vulnerability or Strength, Location, Ownership
11:45 pm – 12:05 pm	Small Group Exercise #3 <ul style="list-style-type: none">• Environmental Features<ul style="list-style-type: none">• Vulnerability or Strength, Location, Ownership



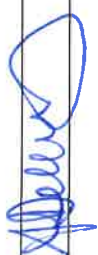


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12:05 pm – 1:05 pm	LUNCH
1:05 pm – 1:35 pm	MVP Community Actions <ul style="list-style-type: none">• Infrastructure• Nature-Based Solutions
1:35 pm – 2:35 pm	Small Group Exercise #4 <ul style="list-style-type: none">• Define MVP Community Actions
2:35 pm – 2:50 pm	BREAK
2:50 pm – 3:50 pm	Large Group Exercise #2 <ul style="list-style-type: none">• Identify MVP Priority Actions
3:50 pm – 4:30 pm	Wrap-up and Closing Remarks

Community Resilience Building Workshop
City of Lynn
Lynn Housing Authority, 10 Church Street, Lynn, MA
Municipal Vulnerability Preparedness Planning
February 26, 2018 - 8:30 am to 4:30 pm

Name	Affiliation	Signature	Table #
Al Wilson	Beyond Walls		7
Alan Peterson	U.S. Environmental Protection Agency		
Allen Phillips	MEMA		7
Amy Hamilton	U.S. Army Corps of Engineers		6
Andrew J. Hall, P.E.	Department of Public Works		2
Antonio Barletta	Town of Nahant		
Bill Bochnak	Lynn/EDIC		7
Birgitta S. Damo	Lynn Economic Opportunity, Inc.		
Bob Fennell	Lynn Water & Sewer Commission		1
Brendan Crighton (to arrive at 12:30)	Massachusetts Legislature		5
Brian M. Field	Lynn City Council		3
Brian P. LaPierre	Lynn City Council		
Buzzy Barton	Lynn City Council		
Captain Jim Perry	City of Lynn		4
Captain Ray	Police Department		5
Charles J. Gaeta	Lynn Housing Authority & Neighborhood Development		
Coast Guard Representative	U.S. Coast Guard, District D1, Boston		
Commuter Services Representative	Keolis		
Customer Support Representative	MBTA		
Dan Small	Lynn Woods Park Ranger & Tree Warden		
Daniel Cahill	Massachusetts Legislature		
Darren P. Cyr	Lynn City Council		

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Debra Surface	Cataldo Ambulance Services		3
Dianna M. Chakoutis	Lynn City Council		
Donald Wong	Massachusetts Legislature		
Dr. Patrick Tutwiler	Lynn Public Schools		
Drew Russo	Lynn Museum and Lynn Arts		
Ed Price	Charter Environmental		
Eric Worrall	MA Department of Environmental Protection		
Faith Hassell	National Grid		2
Frances Martinez	North Shore Latino Business Association, Inc.		
Fred Hogan	Lynn City Council		5
Gannon Golf Course Representative	Gannon Golf Course		
Henry Olbash	Department of Community Development		6
Hong L. Net	Lynn City Council		
James Marsh	Department of Community Development		1
Jamie Cerulli	Conservation Commission/Planning Bd		2
Jane Kelley	Friends of Lynn Woods		
Joe Mulligan			
John Flick	Lynn Community Health Center		3
John M. Walsh Jr.	Lynn City Council		4
John McCarthy	North Reading Transportation (NRT) Bus, Inc.		
John Olson	Columbia Insurance Company/Lynn Area Chamber of Commerce Member		

Kris Telle

Lynn Economic Opportunity

2

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Chris Tecce

Lynn Economic Opportunity

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Kathryn Glenn	MA Office of Coastal Zone Management		7
Lisa Herrera	Lynn City Council		
Lisa Merrick Nerich	Lynn Special Needs Camp		4
Lisa Nerich (beginning of the day)	Department of Public Works		5
Martin Pillsbury	MAPC		
Mary Lester	Conservation Commission		6
Mary Lester (same as above)	Saugus River Watershed Council		
Mary Monahan	Fuss & O'Neill		3
Meaghan Hamill	Mayor's Office		7
Mia Mansfield	MA Executive Office of Energy and Environmental Affairs		2
Michael J. Donovan, PE	Inspectional Services		
Michele Desmarais	Public Health		1
Mikael Main	MEMA		
National Guard Representative	National Guard		3
Nick Golden	Massachusetts Legislature		1
Norm Cole	Lynn Economic Opportunity, Inc.		
Patricia Bowie	MA Office of Coastal Zone Management		
Paul A. Ricchi	Lynn Fire Department		4
Paul Crowley	Greater Lynn Senior Services		
Priscilla Geigis	DCR		
Richard B. Starbard	Lynn City Council		
Richard C. Colucci	Lynn City Council		
Richard Gorham	General Electric		

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Richard B. Starbard	Lynn City Council		
Richard C. Colucci	Lynn City Council		
Richard Gorham	General Electric		

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Robert F. Tucker	Friends of Lynn and Nahant Beach		3
Robert Stilian	Planning Board		
Son Wooten	Zoning Board of Appeals		1
Stacey Minchello	Senior Center/Council on Aging		
Stephen Archer	Fire Department		
Steven Babbitt	Parks and Recreation Commission		6
Susan Hefler Downey	Park Commission		
Teri Krawitz	Zoning Board of Appeals		6
Theresa C. Young	Lynn City Council		
Thomas M. McGee (Mayor attending at 9am)	City of Lynn		
Vallery Cardoso	MA Executive Office of Energy & Environmental Affairs		3
Wayne A. Lozzi	Lynn City Council		2
Wayne Lozzi (same as above)	MA Department of Environmental Protection		
William Klag	North Shore Medical Center		4
ARMA RICHARD	LYNN FIRE		
Deanna Lambert			
Jill Getchell	weston & Sampson		
Alex Gaspar			
Lindsey Adams			

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William Klag	North Shore Medical Center		4
Ed Reines	USEPA		1
Jeff Wreden	LAND		7
Kathay Baskin	Weston + Sampson		
Lydia Kirtner	Weston + Sampson		3
Don Hummel	MA NATIONAL GUARD		
Capt Chris Reddy	LYNN POLICE		
Thor Jorgensen	Daily Item		

Mia Mansfield
Pedro Soto

ckA
Beyond Walls

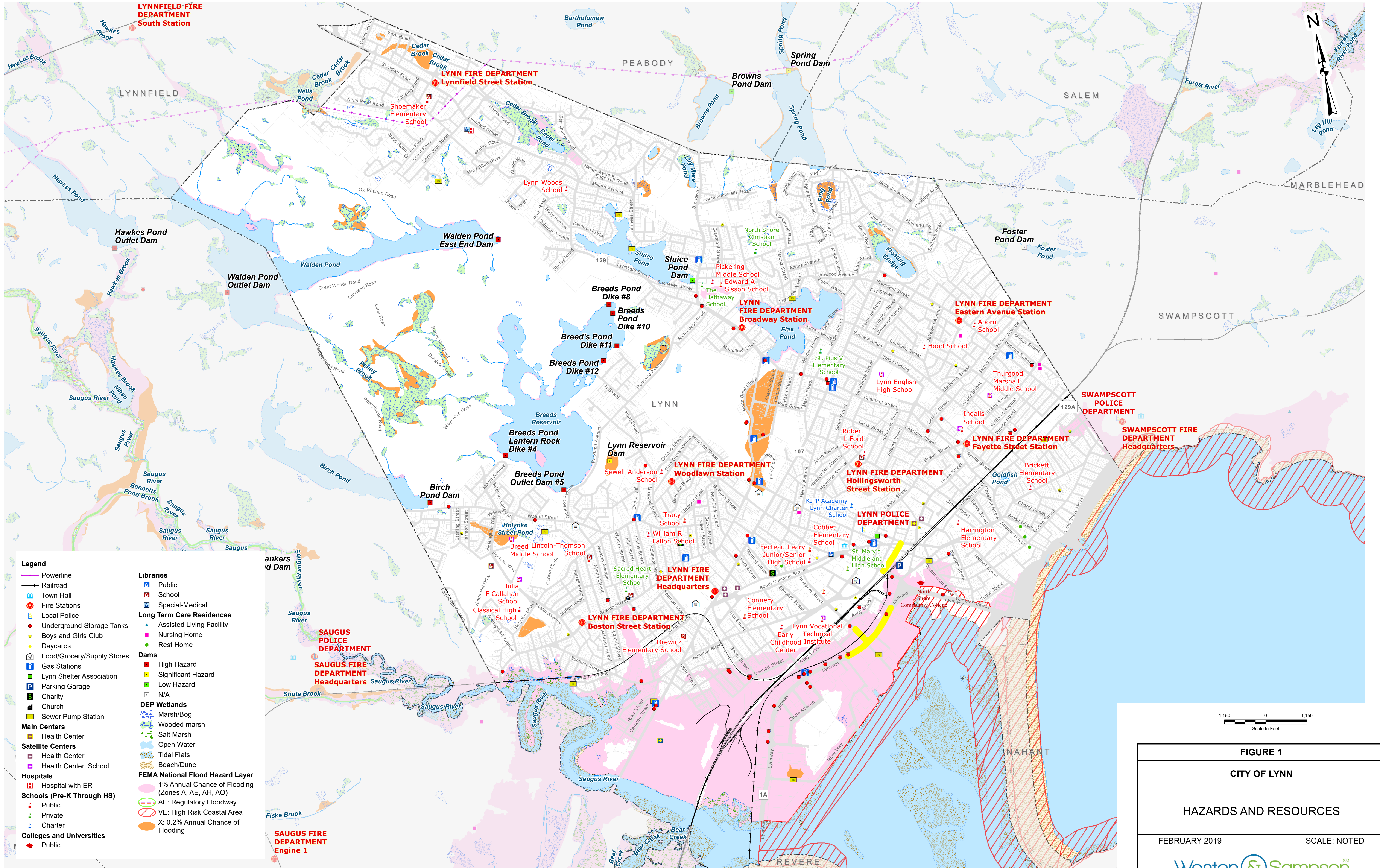


FIGURE 1
CITY OF LYNN
HAZARDS AND RESOURCES
FEBRUARY 2019 SCALE: NOTED
Weston & SampsonSM

APPENDIX B

Workshop Presentation

welcome

1

Community Resilience Building Workshop



Lynn, Massachusetts

2

Welcome & Introductions

3

Lynn Introductions: Municipal Leadership

Mayor Thomas McGee

Core Team Members

- Project Manager Bill Bochnak, Lynn EDIC
- Stephen Archer, Fire Chief
- Jamie Cerulli, Inspectional Services Department
- Michele Desmarais, Public Health
- Michael Donovan, Inspectional Services/Building Commissioner
- Charles Gaeta, Lynn Housing Authority & Neighborhood Development
- Andrew Hall, Public Works Department
- Meaghen Hamill, Chief of Staff
- Mary Lester, Fuss & O'Neill
- Michael Mageary, Police Chief
- James Marsh, Department of Community Development
- Lisa Nerich, Parks & Recreation
- Dan O'Neill, Lynn Water & Sewer Commission
- Paul Ricchi, Emergency Management

4

Weston & Sampson Introductions

Kathy Baskin, Project Manager/Facilitator

Table Facilitators

- Lindsey Adams
- Adria Boynton
- Lydia Kifner
- Alex Gaspar
- Jill Getchell
- Deanna Lambert
- Steve Roy

5

Participant Introductions

- Your name
- Relationship to Lynn
- Why you are here today

6

Workshop Outline

Workshop-Wide

- Overview of Science & Data Resources
- Characterize Hazards

BREAK

Individual Tables

- Identify Community Features
 - Infrastructure
 - Societal
 - Environmental

LUNCH

Individual Tables

- Identify and Prioritize Actions

BREAK

Workshop-Wide

- Determine Overall Priority Actions

Post-Workshop

- Combine Ideas
- Prepare Report

7

What is the Municipal Vulnerability Preparedness (MVP) Program?

Massachusetts program:

- Helps municipalities plan for climate change resiliency and implement priority projects

Steps:

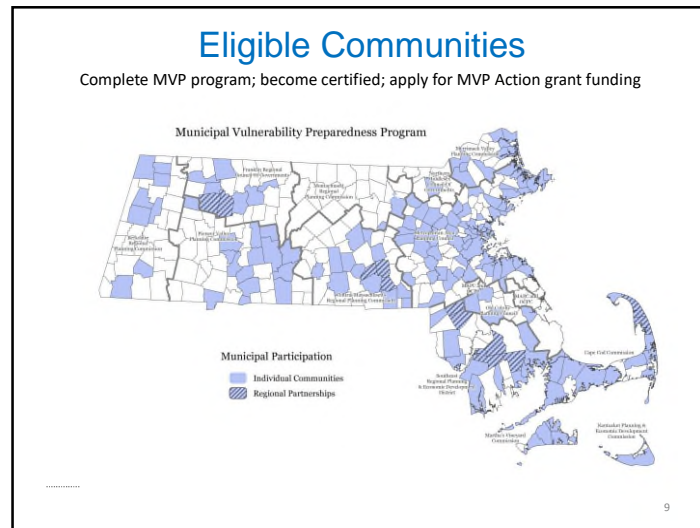
- Define extreme weather hazards and climate change impacts
- Identify key features
- Determine vulnerabilities and strengths
- Develop and prioritize actions
- Complete vulnerability assessments
- Implement key actions



Commercial Street

(Source: The Boston Globe, 2017)

8



9

What the MVP Program offers Lynn

- Improved **resilience and preparedness** of natural and climate-driven hazards
- Collaboration with stakeholders** about climate change, natural hazards and impact
- Increased education, planning, and implementation** of priority actions
- Grant funding** to implement priority actions

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Data Resources & Overview of Science

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Data Resources

Lots of great work has already taken place recently!

- City of Lynn Hazard Mitigation Plan 2016 Update (MAPC, 2016)
- Lynn Coastal Resiliency Assessment (Lynn EDIC, 2016)
- Massachusetts Climate Change Projections (NECSC, 2018)
- Massachusetts Climate Change Adaptation Report (MA EEA, 2011)
- Underwater: Rising Seas, Chronic Floods, and the Implications for US Coastal Real Estate (UCS, 2018)

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Ongoing: Revised Waterfront Master Plan

- 300 acre site
- Plan for residential, commercial, industrial development & open space
- Public access
- Currently: giant retailers, ~25% is undeveloped or parking lots
- Builds off \$90M redevelopment at former Beacon Chevrolet (322 apts)
- Municipal Harbor Plan, too



Source: https://www.edcitynn.org/documents/2018-12-10_Lynn%20Revised%20Waterfront%20Master%20Plan_Public%20Meeting%202.pdf

13

Ongoing: Open Space Master Plan

- 305 acre site
- Envisioning the future of Lynn's Waterfront
- Robust public process



<https://lynnwaterfrontopenspacemasterplan.wordpress.com/context/>
https://lynnwaterfrontopenspacemasterplan.files.wordpress.com/2018/06/public-meeting-3-presentation-slides-final_reduced.pdf

14

Ongoing: Northern Strand Community Trail

- 10 mile path through:
 - Everett, Lynn, Malden, Revere, Saugus
- Former Saugus Branch RR line
- \$1.5M grant from EEA for design, permitting
- 2020: anticipated completion



Completed Portion of Northern Strand in Malden

Source: <https://biketothesea.com/wp-content/uploads/2018/01/8Path1.jpg>

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Lynn's Land Use

- 4 mile long shoreline on Nahant Bay
- Coastal infrastructure: Seawalls, bulkheads, earthen berms, retaining walls, beaches, tidal flats
- Forest (22.3%)
- Residential (41.9%)
- Commercial/Industrial (13.1%)
- Water (6.4%)
- Saltwater Beach (0.5%)
- Transportation (0.6%)
- Wetlands (2.3%)
- Urban Public (4.0%)
- Other (8.9%)




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Natural Hazards in Lynn

Current and future under climate change


Extreme Heat




**Sea Level Rise/
Storm Surge**




**Heavy
Precipitation/
Flooding**




Wind




Drought



Snow/Ice



Erosion



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Hazards in Lynn

Hazard	Frequency	Severity
Flooding	High	Serious
Dam	Low	Serious
Coastal Hazards	High	Serious
Tsunami	Very Low	Extensive
Winter Storms	High	Serious
Hurricanes	Medium	Serious
Tornadoes	Low	Serious
Brush Fires	Medium	Minor
Earthquakes	Low	Extensive
Landslides	Low	Minor
Drought	Low	Minor
Extreme Temperature	Medium	Minor


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Flooding



- Essex County (includes Lynn) experienced 22 coastal flooding events from 1950-2014
- Total property damage assessed at \$7.015M



Ford Street




(Source: The Boston Globe, 2017)


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Repetitive Loss Properties: Flooding



	Number of Claims	Building Losses \$	Contents Losses \$	Total Losses Paid \$
Single Family	20	174,896.42	26,009.65	200,906.07
2-4 Family	9	62,066.61	-	62,066.61
Other Residential	3	53,371.44	-	53,371.44
Non-Residential	14	5,256.00	201,630.02	206,886.02
TOTAL	46	\$295,590.47	\$227,639.67	\$523,230.14



(Source: City of Lynn Hazard Mitigation Plan, 2016)

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Existing Climate Change

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Increased Temperatures in Northeast



- Warmer annual temperatures - up 2°F since 1970
- Warmer winters - up 1.3°F per decade since 1970
- Decreasing winter snowpack
- Earlier flowering plants
- More frequent extreme summer heat



(Source: City of Lynn Open Space Plan, 2016)

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Heavy Precipitation Riverine and Stormwater Flooding



- Lynn's most prevalent and costly natural disaster
- Affects infrastructure, property damage, natural resources



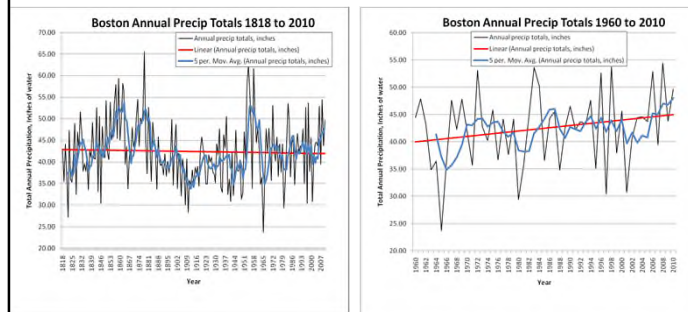
(Source: The Boston Globe, 2017)

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Annual Precipitation in Boston January 1818 to December 2010



(Source: MA Climate Change Adaptation Report)

The blue line represents a five-year moving average and the red line a least squares regression.

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Change in Precipitation

6-hour, 10-year event

- 1961 = 3.2 inches
- 2015 = 3.35 inches

24-hour, 100-year event

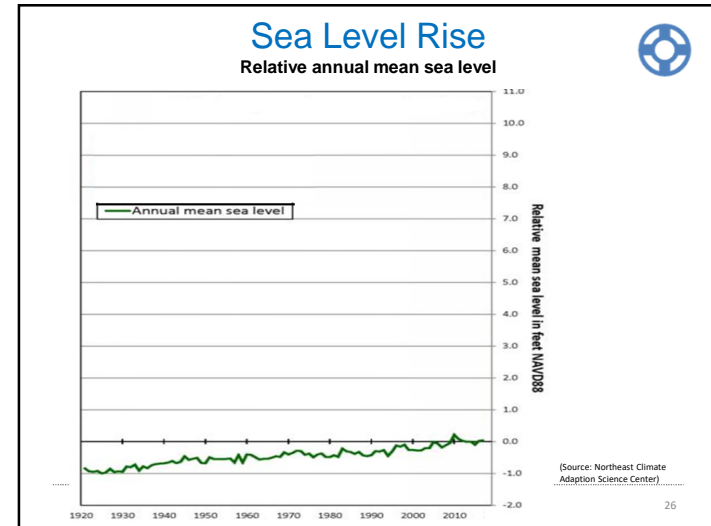
- 1961 = 6.5 inches
- 2015 = 8.40 inches

(Sources: NOAA TP-40, 1961 and NOAA Atlas Volume 10, 2015)

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Beach Road



(Source: ABC News, 2018)

Kings Beach



(Source: The Salem News of Salem)

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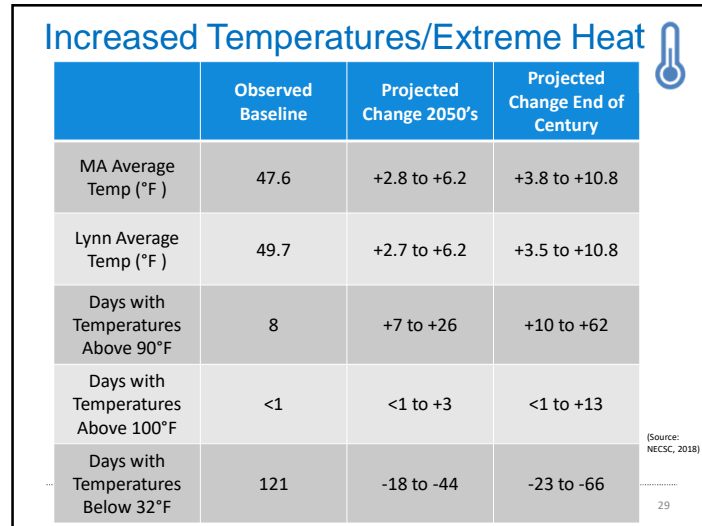
27

Predicted Climate Change

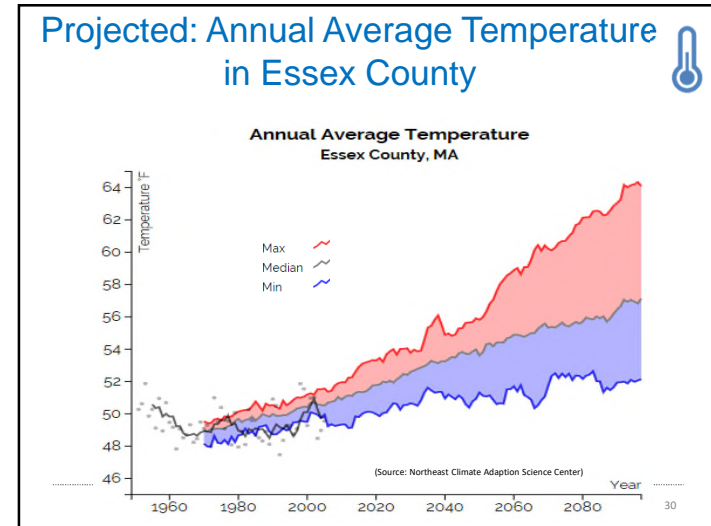
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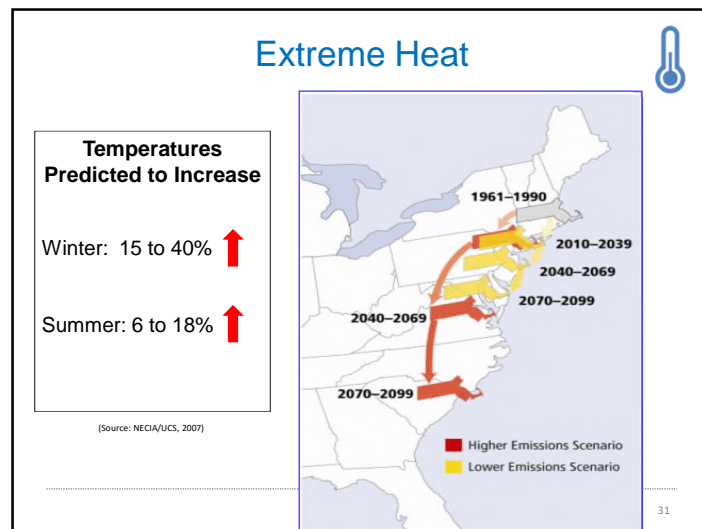
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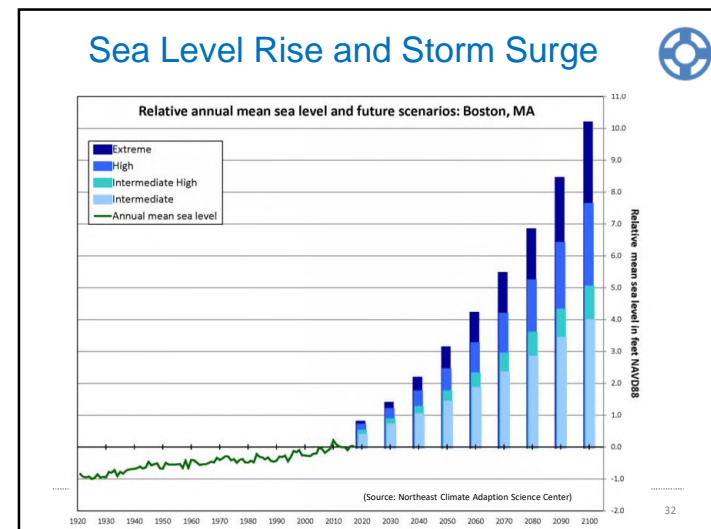
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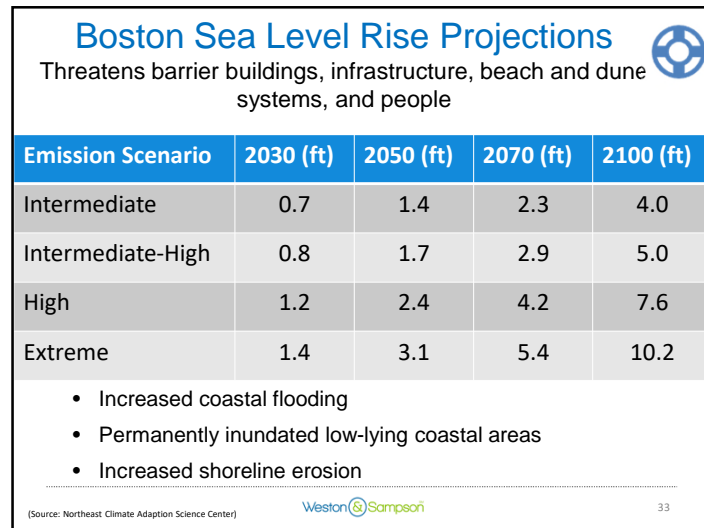
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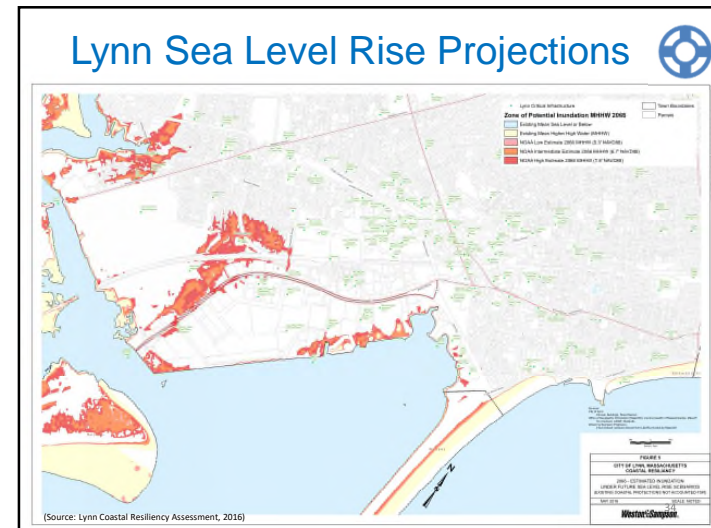
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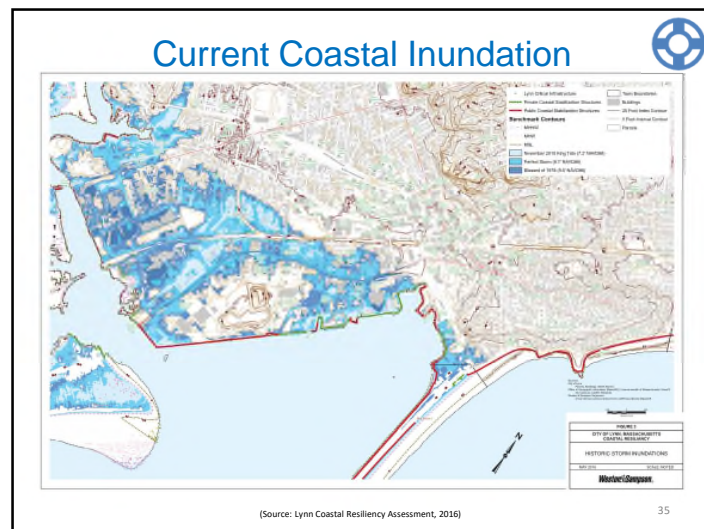
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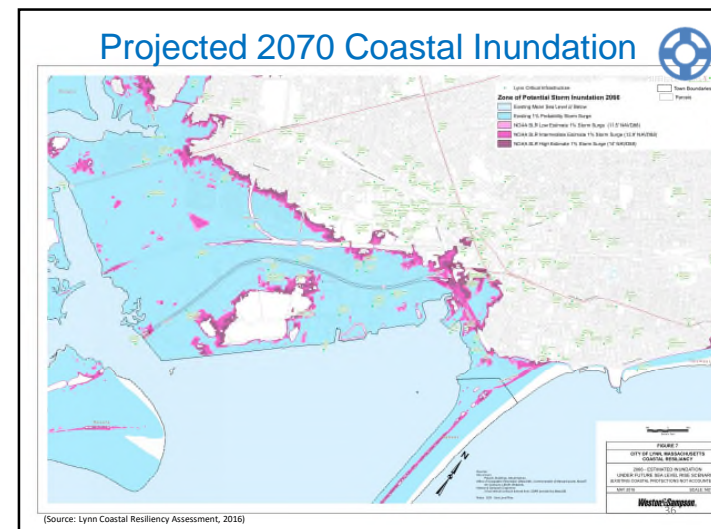
33



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Potential Costs in Coastal Hazard Zones Underwater Report (UCS, 2018)					
Year	Emissions Scenario	Homes at Risk	Value at Risk	Population currently housed in at risk homes	% Population currently housed in at risk homes
2030	High	35	\$5,763,200	88	0.1
	Intermediate	7	\$1,220,900	18	0.02
2100	High	1,051	\$307,024,900	2,628	2.9
	Intermediate	564	\$145,032,700	1,410	1.6
	Low	83	\$20,272,100	208	0.23

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Erosion

Lynn shoreline erosion

Damaged seawall near Riley Way due to erosion

- Potential erosion near closed landfill at the Riley Way Extension
- 46% of Massachusetts' shore is eroding at a rate of 1 foot per year

(Source: Lynn Coastal Resiliency Assessment, 2016)

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Heavy Precipitation

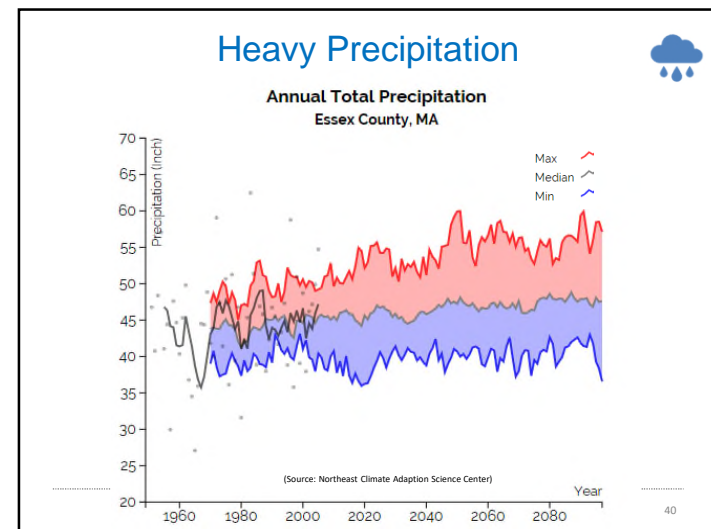
Predicted:

- Higher winter flows and flooding
- Earlier peak flows in spring
- Extended summer low flows
- Increased flooding, polluted stormwater and wastewater discharges

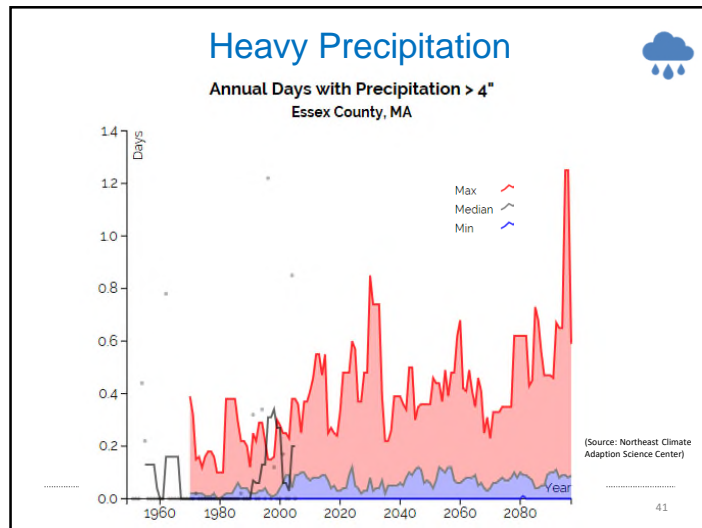
(Source: CBS Boston, 2017)

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Drought



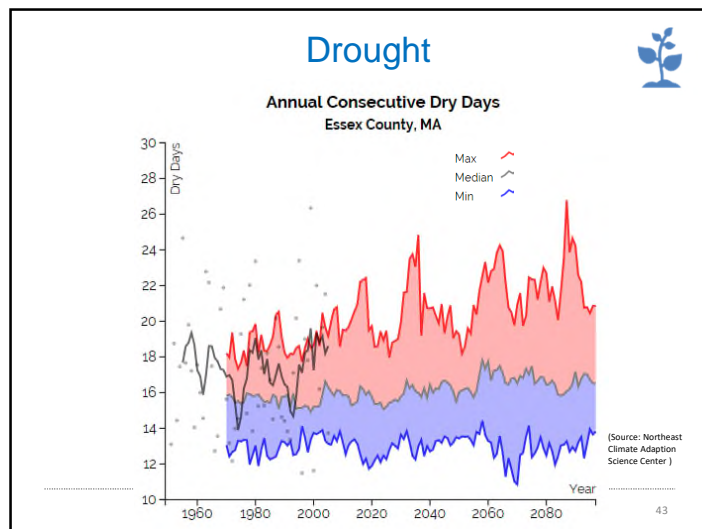
- Higher risk of drought in summer and fall
- Projected impacts to:
 - Water supply
 - Rivers, streams, wetlands
 - Vegetation and crops



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Ice/Snow Storms



- Past few decades, more rain in winter
- Projected, more rainy and icy winters

(Example: serious damage caused by Dec 2008 ice storm)



Kings Beach

(Source: Huffington Post, 2018)

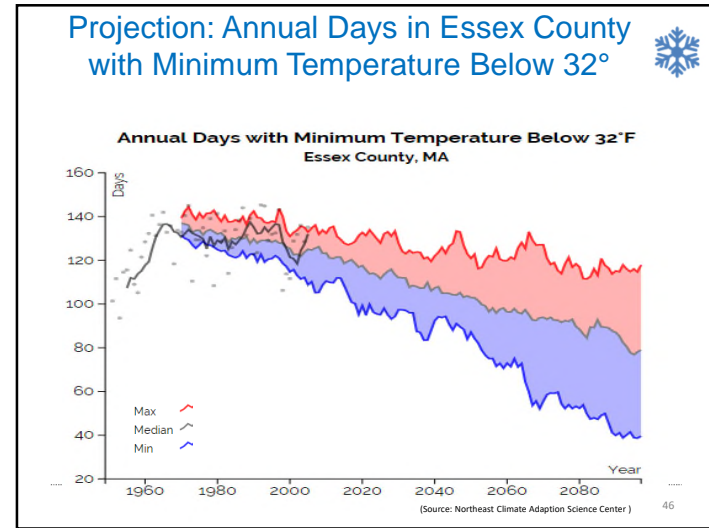
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Wind

(Source: WGNs Radio)

- NWS Wind Advisory:
 - 31 to 39 mph for at least one hour
 - Any wind speed between 46 to 57 mph
- NWS High Wind Warning:
 - 58 mph or higher

Impacts: town resources, infrastructure, trees, private and public property

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Choose Four Hazards

Extreme Heat

Sea Level Rise/
Storm Surge

Heavy
Precipitation

Wind

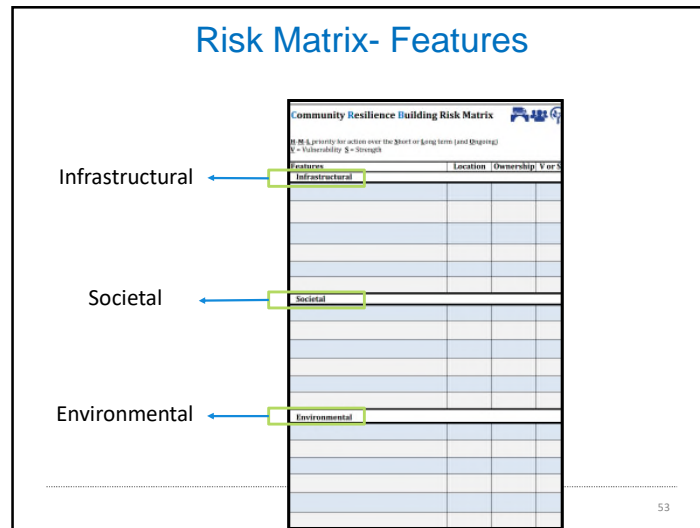
Drought

Snow/Ice

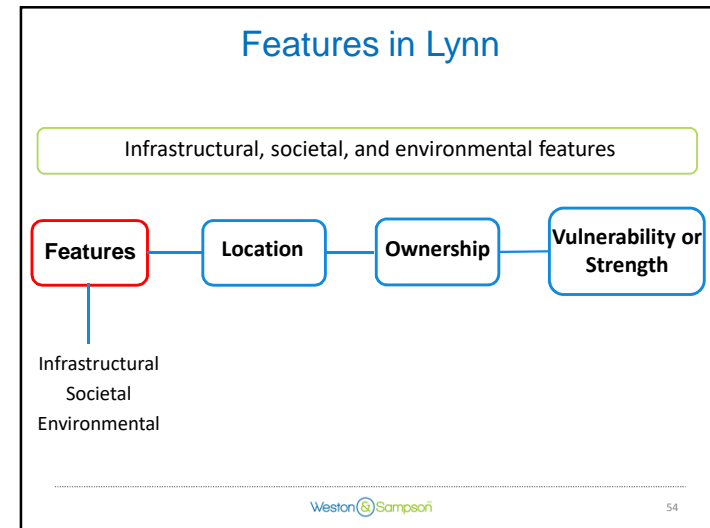
Erosion

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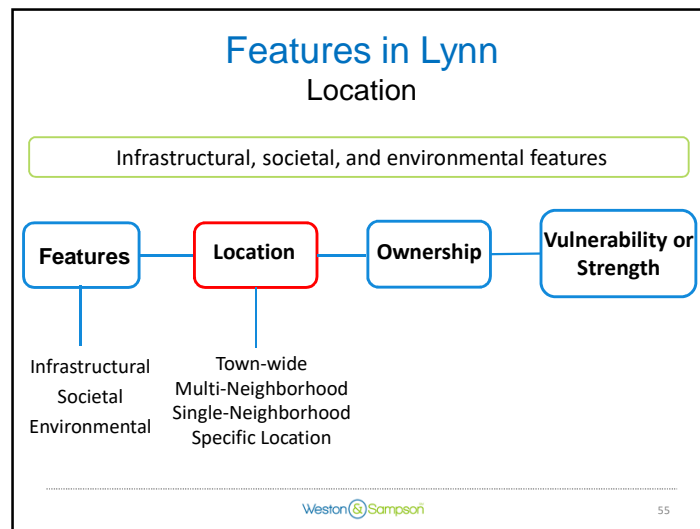
48



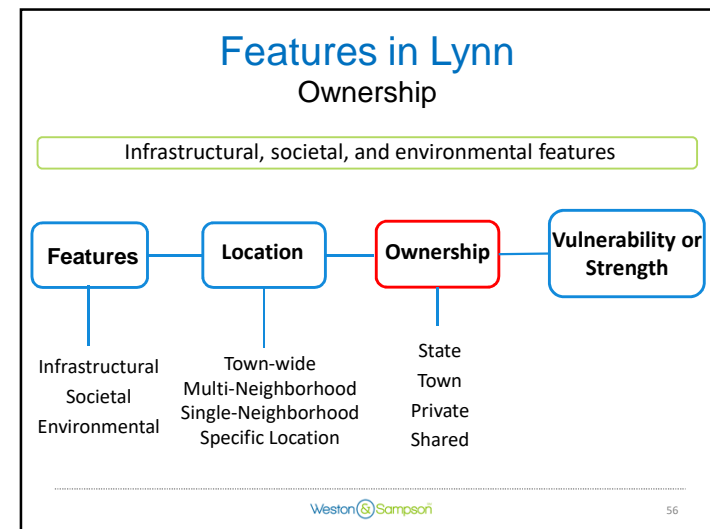
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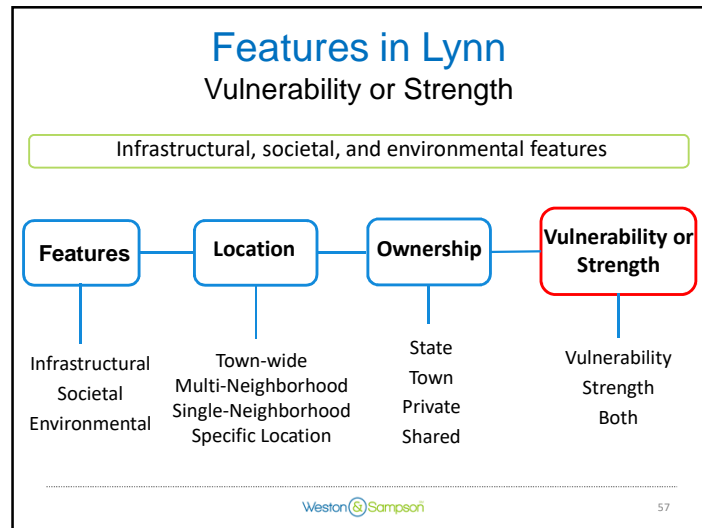
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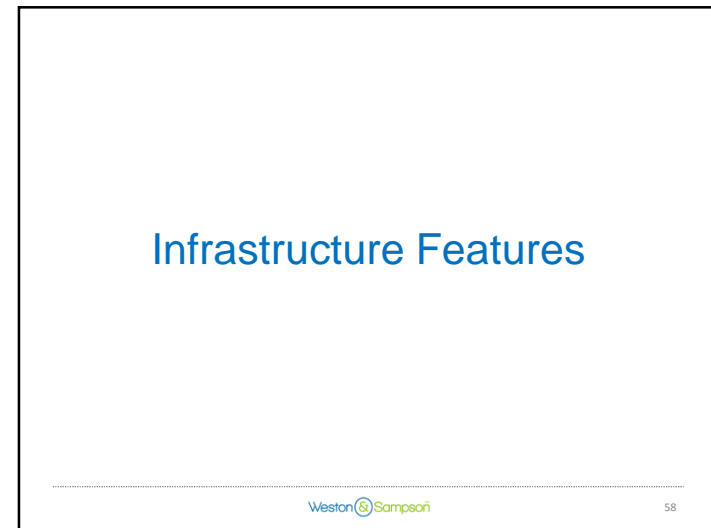
55



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Infrastructure

- Utilities such as electric power, gas, water, hydraulics, compressed air, municipal
- Water supply and treatment plants
- Wastewater treatment plants, sanitary & stormwater sewer systems
- Energy
- Manufacturing equipment and pollution control equipment
- Communication, data and voice computer networks
- Transportation

Weston & Sampson (Source: Boston Herald, 2018)

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Infrastructure: Police



(Source: The Bay State Examiner)

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Infrastructure: Fire Department

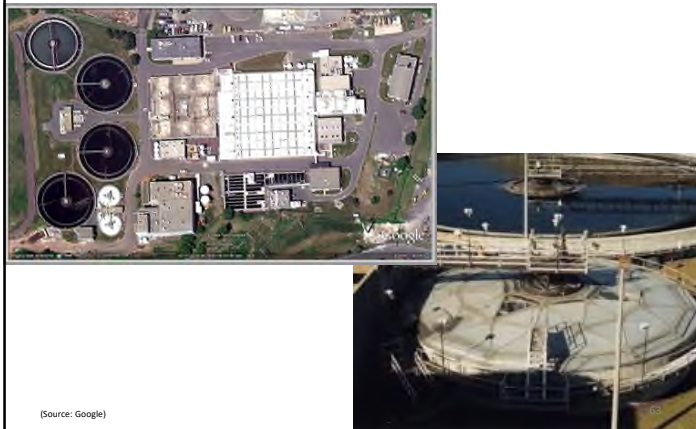


Photo by John Galla www.firnnews.org

62

62

Infrastructure: Wastewater Treatment and Collection



(Source: Google)

63

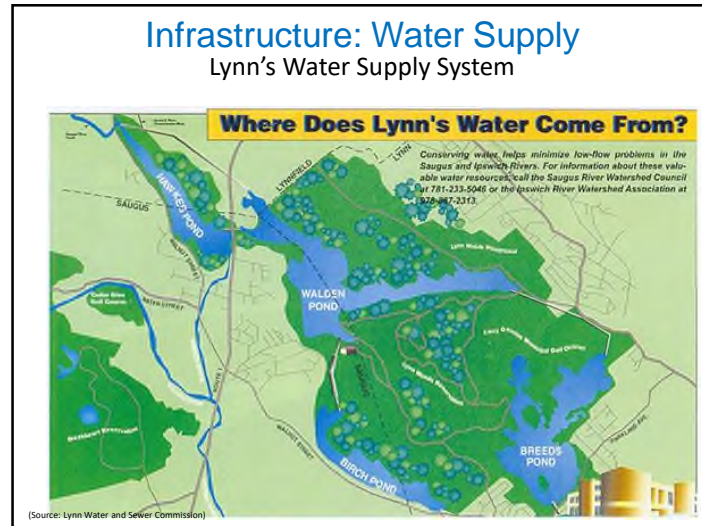
63

Infrastructure: Roadways



64

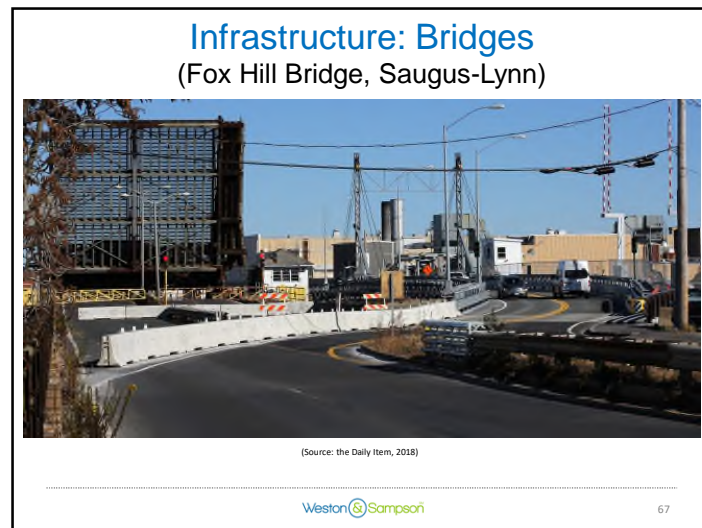
64



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Proposed Hazard Mitigation (HMP 2016)

ACTION	DESCRIPTION
Drainage System on Surfside Road	Area impacted by high tides/storm surge/sea level rise. Drainage System expected to be raised and pump station installed
Seaport Landing Facility	Install wave attenuator
Culvert on Valley Road	Upgrade undersized culvert that causes flooding during high precipitation events
Lower Western Interceptor	Low elevation issue and tidal backup
Ipswich River Pumps Station	Install levee to protect pump station
Foster Pond Dam	Upgrade headwall

(Source: City of Lynn Hazard Mitigation Plan Update, 2016)

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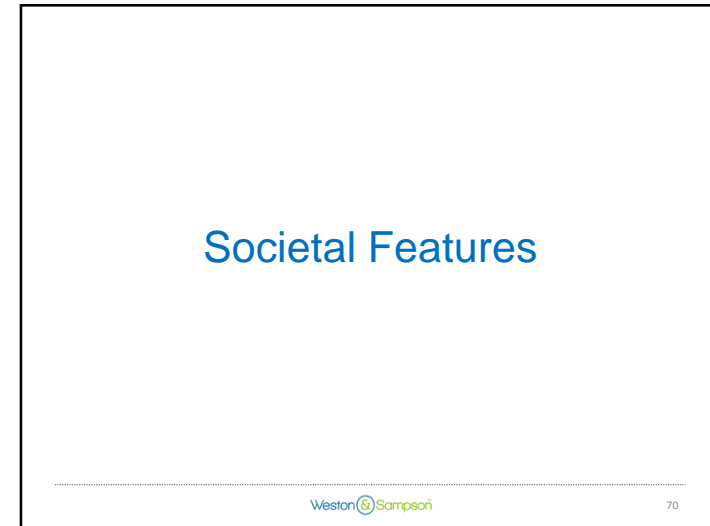
68

Dams in Lynn, MA

Dam	Rating	Condition
Walden Pond East End Dam	High Hazard	Fair
Birch Pond Dam	High Hazard	Fair
Breed's Pond Outlet Dam #5	High Hazard	Poor
Breed's Pond Lantern Rock Dike #4	High Hazard	Fair
Breed's Pond Dike #10	High Hazard	Fair
Breed's Pond Dike #11	High Hazard	Fair
Breed's Pond Dike #12	High Hazard	Fair
Breed's Pond Dike #8	High Hazard	Satisfactory
Hawkes Pond Outlet Dam	High Hazard	Fair
Lynn Reservoir Dam	Significant Hazard	Satisfactory
Sluice Pond Dam	Low Hazard	Fair
Saugus River Dam	Low Hazard	Fair

Source: City of Lynn Hazard Mitigation Plan Update, 2018

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Societal: Lynn's People

- Population
 - 2010 Census: 90,329
 - 2035 Projection: 112,884
- Age
 - Under age 20 = 35.8%
 - Age 65 or older = 11.2%
- Education
 - 79.3% high school
 - 19.6% Bachelors degree
- Income
 - Median household = \$50,774
 - 58.66% low to moderate income
 - 20.0% below poverty level

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Societal: Lynn's Jobs

- Number of Jobs
 - 2010 Census: 27,074
 - 2040 Projection: 29,410
- 2,221 Businesses
 - Health Care & Social Assistance
 - Retail
 - Construction
 - Accommodation & Food Service

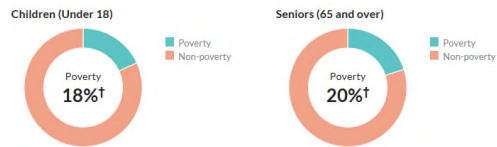
(Source: Executive Office of Labor and Workforce Development; MAPC)

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Societal: Lynn Vulnerable Populations

Elderly, low/moderate income, special income, language barriers, infirmed



58.66% of Lynn's population is low to moderate income

Sources: Censusreporter.com, ACS 2016 5-year, US Department of Housing and Urban Development, 2018;
https://www.hudexchange.info/programs/acs-low-mod-summary-data/acs-low-mod-summary-data-local-government/

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Societal: Assisted Living & Senior Centers



(Source: www.lynnhomeforelderly.org)

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Environmental Features

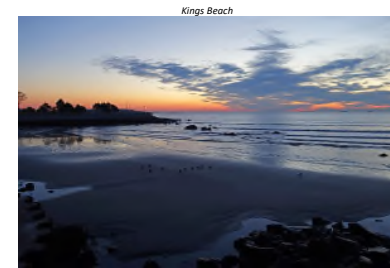
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75

75

Environmental: Natural Resources

- Lynn Beach
- Kings Beach
- Coldwater Streams
- Forests (Lynn Woods Reservation)
- Marshes & Wetlands
- Aquifers



(Source: photograph by Toby McGuire, 2015)

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Environmental: Climate Stressors

- Flooding
- Erosion
- Water quality/quantity impacts
- Invasive fauna and flora
- Wetland soil impacts
- Increase in stormwater runoff
- Less groundwater recharge
- Disruption of salt marsh
- Vector-borne diseases



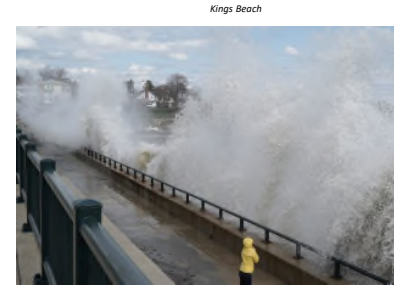
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Environmental: Lynn Beach

- 4 mile shoreline
- Densely developed
- High exposure to erosion
- Defense against storm surge and sea level rise



(Source: Youtube)

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Environmental: Saugus River

- Watershed
 - ✓ 13 miles
 - ✓ 47 square miles
 - ✓ 11 communities: Everett, Lynn, Lynnfield, Malden, Melrose, Peabody, Reading, Revere, Saugus, Stoneham, and Wakefield
- Lynn's Strawberry Brook is a tributary



Source: <http://lynnhappens.com/event/cleanup-along-saugus-river/>

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Environmental: Marshes

- Marsh attenuates, reduces wave height
- Marshes and dune can migrate inland as a response to sea level rise
- Residential and commercial development has intensified effects of storm surge and erosion by damaging marshes and vegetated dunes



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1-Hour Lunch

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Community Actions

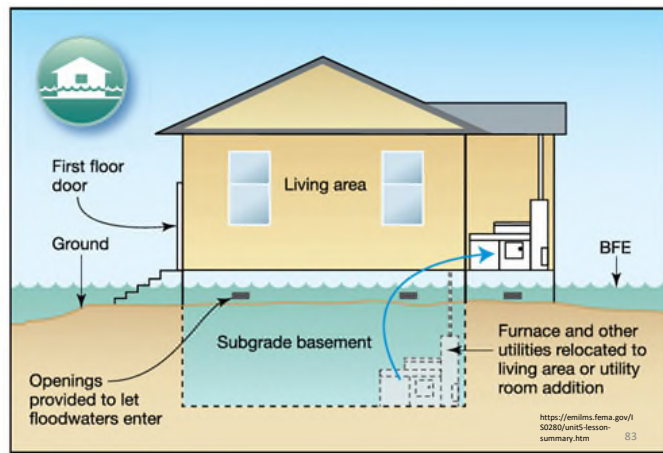


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Wet Floodproofing



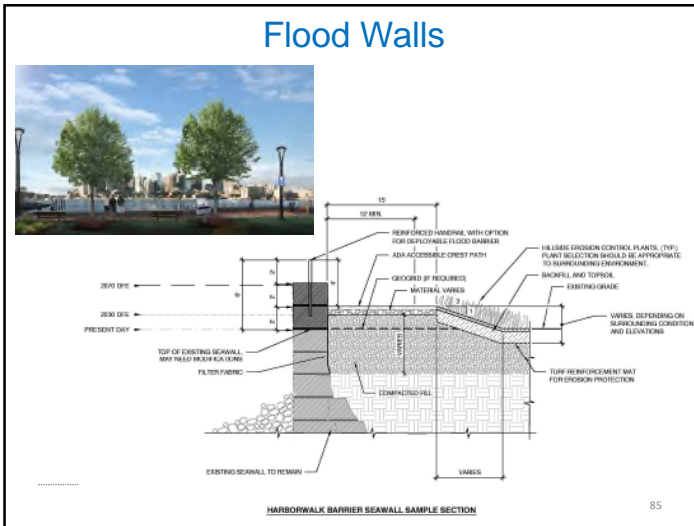
83

Raised Buildings

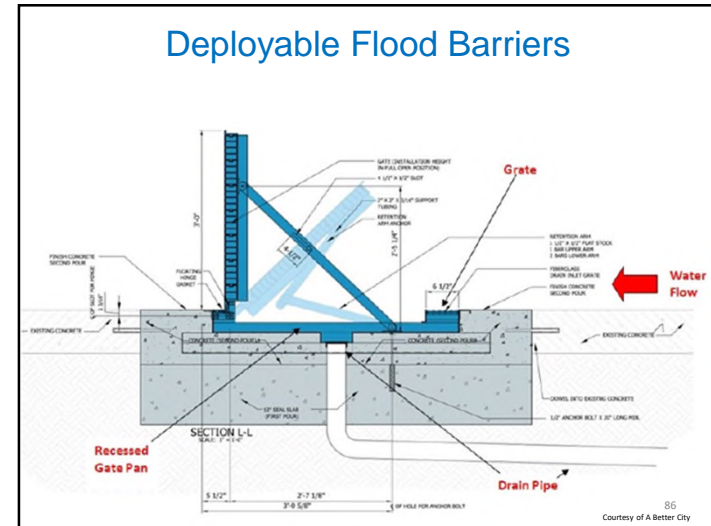


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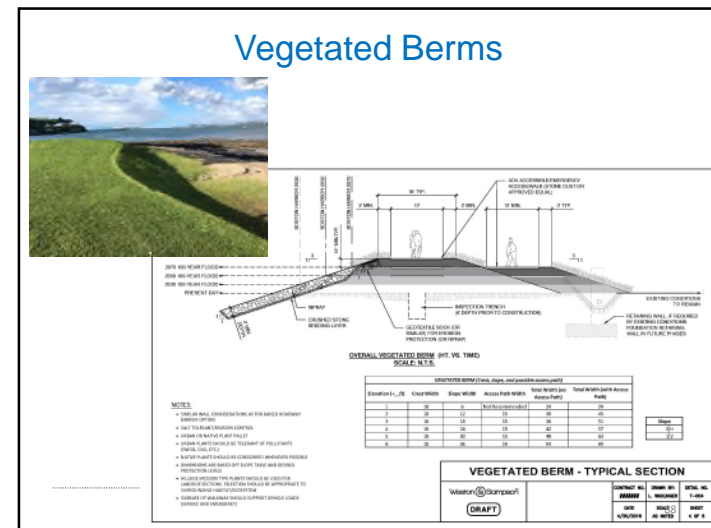
85



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Multi-Purpose Flood Storage



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Low Impact Development (LID)



An innovative, ecosystem-based approach to land development and stormwater management

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Porous Asphalt and Permeable Pavers



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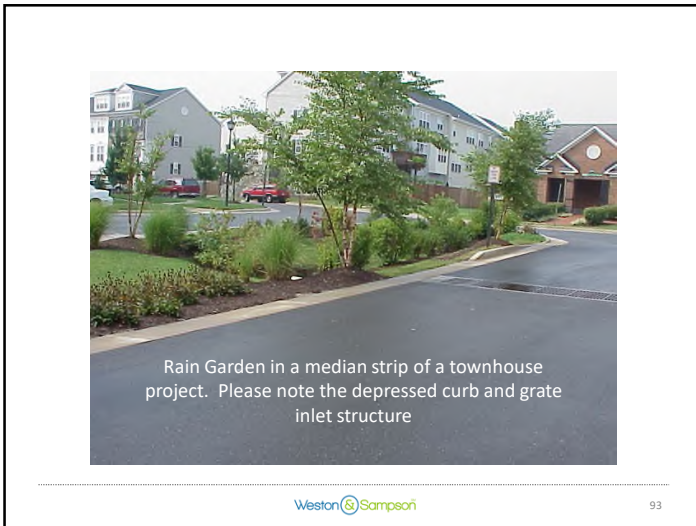
Street Trees & Tree Box Filters



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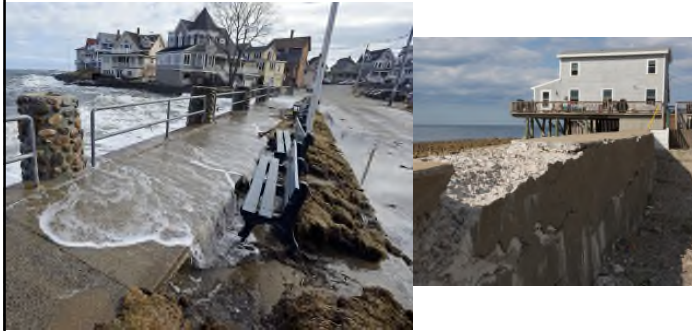


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Seawall Repair



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Living Shorelines



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Cloudburst Streets



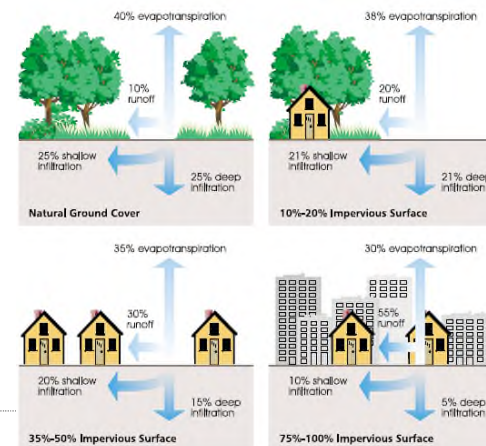
MATTHEW USGADE "CLOUDBURST STREET"

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Reduce Impervious Areas



Source: Federal Stream Corridor Registration Handbook (1998)

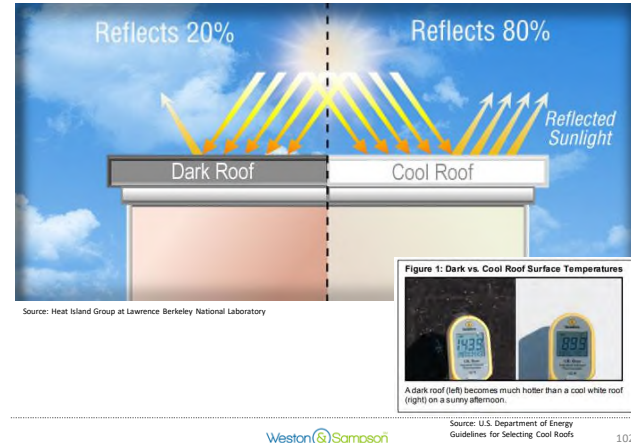
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Green Roofs



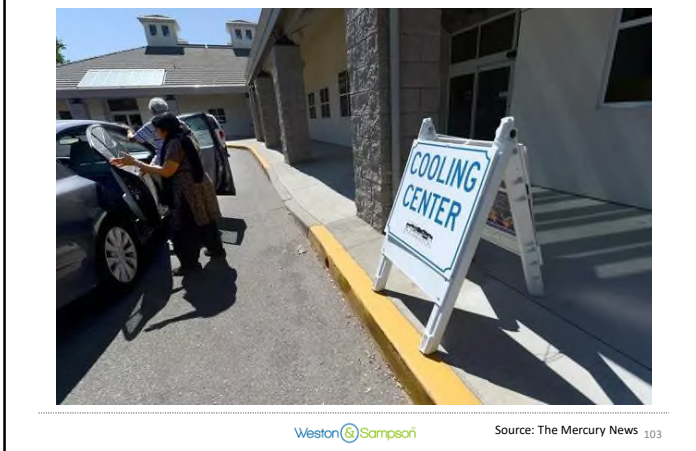
101

Cool Roofs



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Cooling Centers



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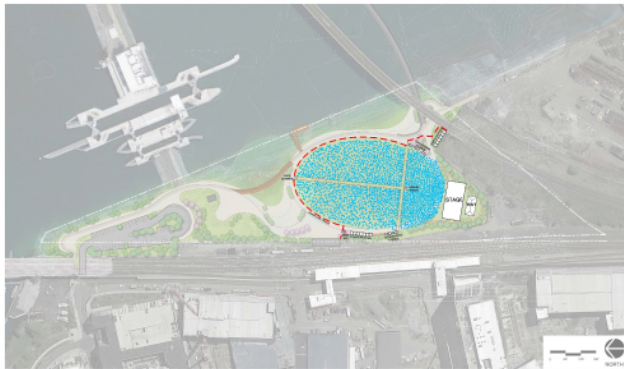
Renewable Micro-Grids



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Landscape Design to Accommodate Water

Draw Seven Park, Somerville – Existing Conditions

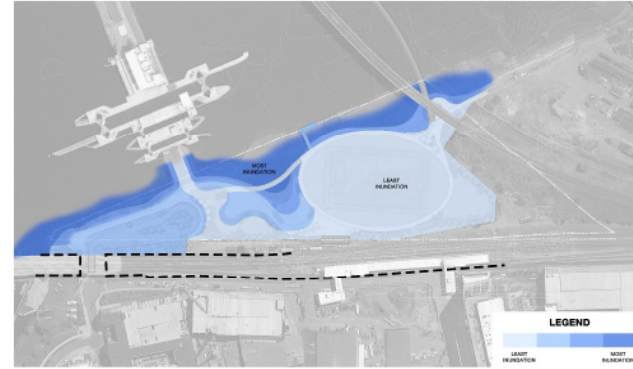


dcrr
DRAW SEVEN PARK
February 2016
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Landscape Design to Accommodate Water

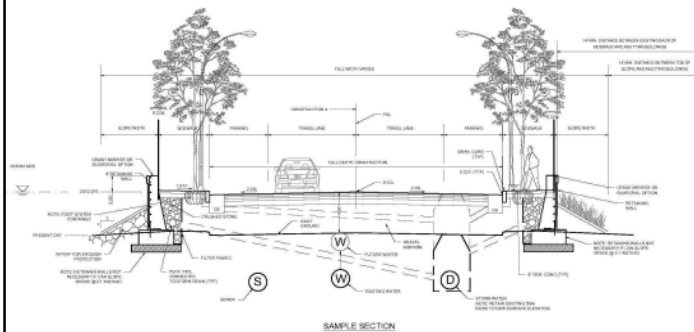
Draw Seven Park, Somerville – Flooded Conditions



dcrr
DRAW SEVEN PARK
February 2016
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Raised Roadways



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Retrofitted Floodproof Doorways



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Re-evaluate Local Regulations & Policies



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15-Minute Break!

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Define Community Actions

111

Identify Priority Actions

112

[illegible]

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Wrap-up & Closing Remarks

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transform your environment

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APPENDIX C

Participant Risk Matrices and Maps

Table 1

Table 2

Table 3

Table 5

Table 6

Table 7

Master Risk Matrix

Marked-up GIS Map



Table 1

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

[illegible]

Community Resilience Building Risk Matrix



Table 2

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.)						
				Heavy Precipitation and Flooding	Sea Level Rise/ Surge/ Erosion	Extreme Heat	High Wind	Winter Storms	Priority	Time
									H - M - L	Short Long Ongoing
Features	Location	Ownership	V or S							
Infrastructural										
Residential Buildings/ Commercial Buildings	East Lynn/ Downtown	Public & Private	V	Increase drain size, flood storage		Cooling centers and cool roofs in municipal buildings			H	S
Streets (Munroe, Bennett, Chestnut, Flaw & Sluice, Western Ave)	Commercial, Boston, Neighborhods	Public	V	Increase drain size, flood storage, porous surfaces, low impact development					H	S
School Buildings	Citywide	Public	V							
Insufficient Conveyance	Citywide	Public	V							
New Development	Citywide	Private	V/S	Waterfront development should include living shorelines and berms					H	L
Utilities	Citywide	Private	V/S							
Societal										
Elderly	Citywide		V/S			Cooling spots and cool roofs in elderly housing			M	
Children	Citywide		V/S			Cooling spots in schools			M	
Language Barriers	Citywide		V/S							
Low Income	Citywide		V							
Nonprofit	Citywide		S							
Schools and Daycares	Citywide		S							
Homeless	Citywide		V							
Undocumented	Citywide		V							
Environmental										
Parks	Citywide	Public	V/S							
Beach		Public	V/S							
Water Supply		Public	V/S							
Lynn Woods			V/S							
All Dams			V/S							
Wetlands (Coastal and Inland)			V/S							
Invasive Species			V							
Canada Geese (Overpopulation)			V							

Community Resilience Building Risk Matrix



www.CommunityResilienceBuilding.org

Table 3

H-M-L priority for action over the <u>S</u> hort or <u>L</u> ong term (and <u>O</u> ngoing) <u>V</u> = Vulnerability <u>S</u> = Strength				Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)						
				Heavy Precipitation and Flooding	High Winds	Sea Level Rise/ Surge/ Erosion	Extreme Heat	Winter Storms	Priority	Time
									H - M - L	Short Long Ongoing
Features	Location	Ownership	V or S							
Infrastructural										
Drainage System●●●●●	Citywide & Downtown	Lynn Water & Sewer	V	Permeable pavement/ CSO seperation●●●●●		Upgrade Systems		Cleaning culverts	H	O
Seawall	Waterfront	DCR/ City/ Private	V/S	Reinforce seawall		Build higher, living seawalls●●			M	O
Evacuation Routes	107/ Lynnway/ 1A/ Boston St.	State & City	V/S	Raise roads/ bridges		Install proper/ better drainage			L-M	L
Utility Supply	Waterfront	Utility	V	Berming Stations, microgrids●					L-M	L
Utility Distribution	Citywide	Utility	V	Make below grade/ new development, microgrid●					M-H	S-O
Water Transportation	Ferry Terminal/ Waterfront	City	V/S	Water detention		Improving access during flood events				
Societal										
Homeless	Citywide		V	Shelter					H	O
Elderly	Facility/ Private	Institutional/ Private/ Public	V/S	Evacuation/ EM plan, messaging in multiple languages	Involve local ag. Comm. Planning		Cooling centers	Shelters	H	O
Youth (under 20)	Citywide, Schools	LPS/ Residents	V/S	Evacuation/ EM plan, messaging in multiple languages	Involve LPS				H	O
Low and Moderate Income Folks●●●	Lowlands	City- General Public	V	Evacuation/ EM plan, messaging in multiple languages	Involve local ag. Comm. Planning●●				H	O
Poor Quality of Housing Stock	Citywide	Private	V	Personal EM plan					H	O
Commuters●	Citywide/ Region	Private/ Institutional	V	Personal EM plan					H	O
People with Disabilities/ Language Barrier●	Citywide	City- General Public	V	Personal EM plan					H	O
Environmental										
Lynn Woods	Lynn Woods	City	V/S		Tree removal		Forest management		H	O
Reservoir●	Lynn Woods	City	V/S	Maintenance of facility			Water restriction		H	O
Coast Line/ Beach●	Waterfront	City/ State/ Private	V/S	Closure	Beach fence	Berms, living seawall - no building●			H	O
Saugus River/ Marsh	Waterfront	City/ State/ Private	V/S			Berms, living seawall - no building			H	O
Landfill	Waterfront	Private	V			Berms, living seawall - no building			H	O
Contamination●	Citywide	City/ State/ Private	V	Increase drainage●		Berms, living seawall - no building	Decrease fires - air quality		H	O

Community Resilience Building Risk Matrix



Table 4













H-M-L priority for action over the **S**hort or **L**ong term (and **U**ngoing)
V = Vulnerability **S** = Strength

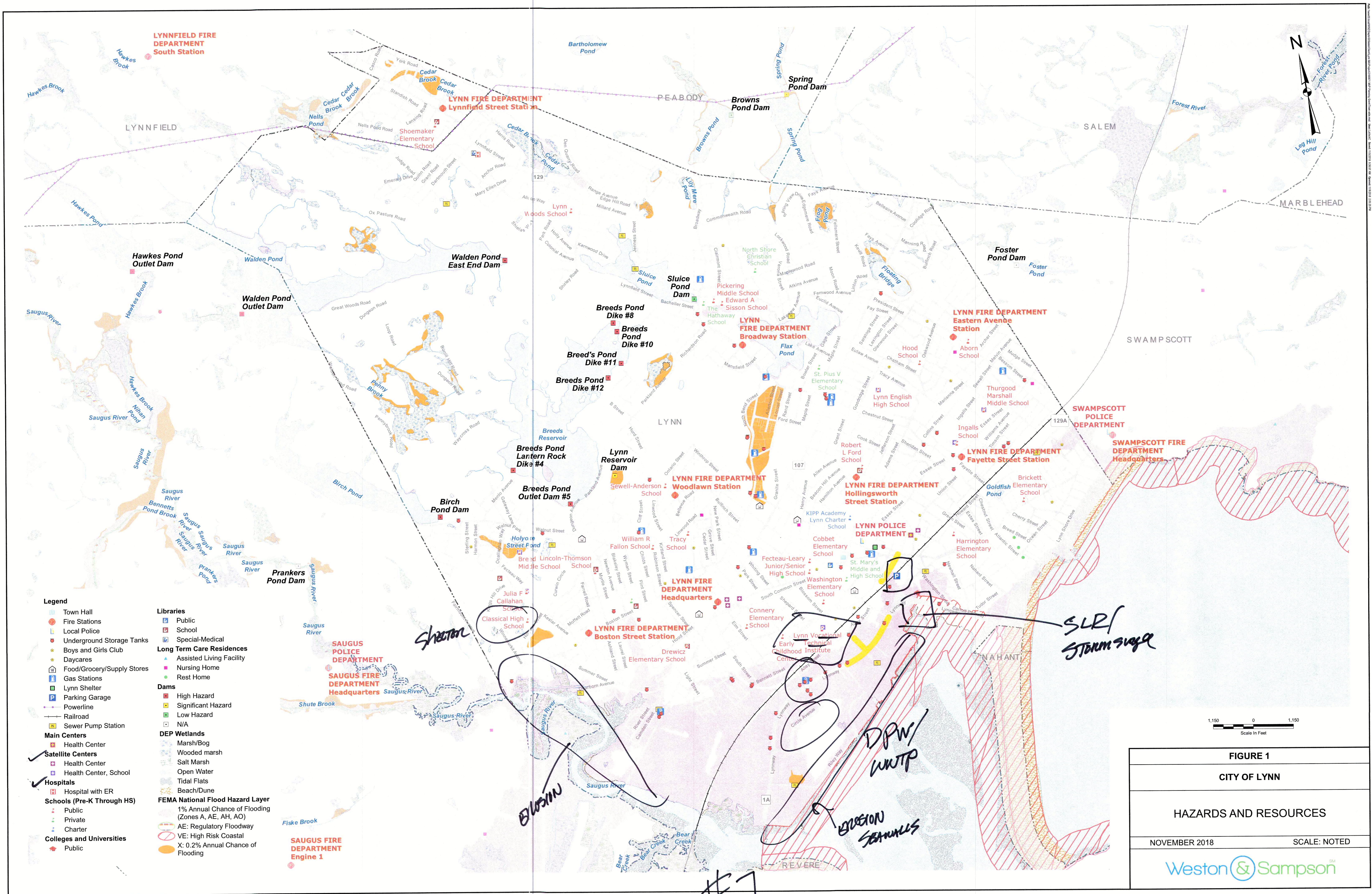
Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

H - M - L priority for action over the Short or Long term (and Ongoing) V = Vulnerability S = Strength				Heavy Precipitation/ Flooding	Sea Level Rise/ Surge/ Erosion	Extreme Heat	High Winds	Winter Storms	Priority	Time
Features									H - M - L	Short Long Ongoing
Infrastructurel										
Roads (prone to flooding) ●●●	Citywide	City (DPW)	V	Better drainage, address stormwater runoff, greenspace option ●●			Pre-event preparation		H	O ●
Stormwater Drainage System ●●	Citywide (College)	City/ State (Lynn Water)	V	Better drainage, address stormwater runoff, greenspace option ●				Pre-event preparation, clean catch basins	H	O ●
New Developments (along coast)	Specific Locations	City	V	Living shoreline, new mitigation plan ●	Regulate building standards for coastal developments ●	Greenspace on top of buildings, green building regulations		Pre-event preparation	M	O ●
Seawall	Harbor Seawall	DCR (State)	V/S	Explore environmentally friendly options					M	L
DPW Facility & WTP	Specific Locations	City/ Lynn Water	V	Relocate to higher ground (Parkland Ave)					M	L
Lynn Public Schools	Citywide	City	V/S	Regulatory/ building plans (hazard planning)					L	L
Bridges	Citywide	City	V							
Societal										
Students/ Teachers	Citywide	City	V	Transportation safety, education on emergency protocol/ environmental concerns					M	O
Lynn Community Health	Citywide	Private	S	Education/ contingency planning					M	L
Lynn Public School Food Service Program	Citywide	City	V/S	Education/ contingency planning					L	L
GLSS (Greater Lynn Senior Services) ●	Citywide	Private	V/S	Education/ contingency planning					M	L
Communication (Non-english Speakers) ●	Citywide		V	Continuing/ evolving the platform for communication ●					H	O
People Dependent on Public Transportation	Citywide		V/S	Emergency evacuation plan, alternative route plan					H	L
At Risk Population/ Homeless Population	Citywide		V	Engage social service agencies for outreach					H	O
Mental Health Population	Citywide		V						M	O
Environmental										
Large Ponds/ Tributaries	Citywide	City	V/S	Pre-event preparation, mitigation - weed removal, drainage	Surge control methods for tributaries	Water testing for public health			M	O
Reservoir System	Citywide	City	V/S	Open/ close gates, pre-event preparation, mitigation - weed removal, drainage		Implement water restrictions as needed			L	O
Lynn Woods	Citywide	City	V/S	Self sustained		Early warning/ control planning		Fallen trees	L	O
Reduced Green Space (Impervious Area) ●	Citywide	City	V	Add green space for recreation and flooding dual purpose					M	O
Coast/ Beaches ●	Citywide	DCR (State)	V/S	Explore options for tidal surge mitigation					H	O
Wetlands	Citywide	City	V/S	Explore options for tidal surge mitigation, habitat rejuvenation, culvert expansion					H	O

Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.org				Table 5		
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.)					Priority	Time
				Heavy Precipitation/ Flooding	Sea Level Rise/ Surge/ Erosion	Extreme Heat	Snow/ Ice/ Winter Storms	High Wind	H - M - L	Short Long Ongoing
Features	Location	Ownership	V or S							
Infrastructural										
Storm Drains (Including in Pond Locations) ●●●●	Citywide	Lynn	V	Regular cleaning schedule, enlarging and redesigning system ●●●●					M	L
Marina ●●●●	Off Lynnway	Lynn	V	Wave attenuator ●					H	SL
Seawall	Lynn Shore Dr	DCR	V	Repair/ rebuild raised ●					H	O
RR- Commuter Rail/ Roads: Lynnway, Boston St, Summer St, River St, Alley St, Lynn/ Nahant Rotary, Bennet St, Munroe St	Various		V	Raising rail line, redesign ●					H	L
Drains & Watershed as they Effect Water Supply	Various	Lynn	V	Maintain regularly or remove					M	L
Power Lines ●●	Various	National Grid	V	Bury all powerlines as appropriate - tree maintenance program					H	L
Erosion	Coast	Private & Public	V	Code issue - Revere					H	
Residences ●●●●	Various	Various	V	City relook at tax breaks for reuse of grey roof water					L	L
Societal										
Elderly: Retirement Homes/ Assisted Living/ Nursing Homes/ Single Family Homes			S	Places of congregation, safe zone					L	L
Children: Daycare/ In School			V	Websites - city horn system, EM notification system					M	M
YMCA/ Salvation Army/ Schools/ Churches			S	Places of congregation, safe zone					L	L
Emergency Illnesses (no hospital in Lynn)			V	Distribution of urgent care centers in orderly fashion					L	L
Foreign Speaking Population			V	Website to accommodate					H	S
Commuters			V	Go to places of congregation/ stay home					L	L
Environmental										
Insect & Rodent Breed Diseases			V	Trash control/ control of standing water					H	SLO
Water Quality/ Water Supply/ Storm Pollution Runnoff			V	Regular maintenance and regular testing ●					H	SLO
Lynn Woods			V/S	Regular maintenance and clearing of undergrowth ●●●●					H	SLO
Beaches/ Waterfront ●			V/S	Protect marshlands and estuaries/ berms/ living seawall					H	SLO
Estuaries			V/S	Protect marshlands and estuaries/ berms/ living seawall					H	SLO
Phragmites			V	Remove on regular basis					M	S
Black Algae/ On Beaches			V	Need data on what can be done - Bridge to Nahant instead of casueway?					H	SLO

Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.org							Table 6
<div><div></div><div></div><div></div></div> <div>H-M-L priority for action over the Short or Long term (and Ungoing) V = Vulnerability S = Strength</div>				Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)							
				Heavy Precipitation/ Flooding	Sea Level Rise/ Surge/ Erosion	Extreme Heat and Drought	High Winds	Winter Storms	Priority	Time	
									H - M - L	Short Long Ongoing	
Features	Location	Ownership	V or S								
Infrastructural											
Fire Department <div><div></div><div></div><div></div></div>	All Stations	City	V/S		Equipment and resources	Equipment, resources, tanker <div><div></div></div>			M	SLO	
DPW (Fueling) <div><div></div></div>	Commercial St	City	V		Relocate/ alternative site?				M-H	S	
Waste Water Treatment Plant	Circle Ave	City	V		Protect				M	L	
Stormwater Drainage <div><div></div><div></div></div>	Citywide	City/ LWS	V	Identify multi-purpose flood storage/ separate sewer drainage					H	O	
Seawall (Rotary - Saugus River)/ <u>Waterfront</u> <div><div></div></div>	Rotary - Saugus River	City/ Private	V		Develop action plan from ongoing studies/ plans - <u>implementation</u>	<div><div></div><div></div><div></div><div></div></div>			H	O	
Schools	LVTH/ LCH/ NSCC	City/ State	V		New schools - plan for emergencies				M	L	
Parking Garage <div><div></div></div>	Market St	MBTA	V/S					Repair/ maintain emergency utilization	M	O	
Societal											
Homebound (Seniors, Disabilities, Mental Health) <div><div></div></div>	Citywide	City	V			Equipment/ resources		Equipment/ resources	M	O	
City Agencies, Non Profits (GLSS, VNA, LCHC, LHAND) <div><div></div><div></div></div>	Citywide	City/ Non Profit	S	Coordination and identify resources					L	O	
Language Other Than English	Citywide	City	V	Promote current "RAVE" system					L	O	
Homeless/ Extremely Low Income	Citywide	City	V								
Industry/ Downtown Business/ Waterfront (Seawall) <div><div></div></div>	Waterfront/ Downtown	City/ Private	S/V		Develop action plan from ongoing studies/ plans - <u>implementation</u>	<div><div></div><div></div><div></div></div>			H	O	
Commuters/ Transient	Citywide	City	V	Planning/ preparedness - promote "RAVE"					L	O	
Environmental											
Lynn Woods	North of City	City	S/V			Equipment/ resources, tanker			M	O	
Lynn Beach	Waterfront	DCR	S/V								
Saugus River/ Strawberry Brook	West Lynn	State	S/V		Execute Saugus area study, leverage MVP	<div><div></div><div></div></div>			H	O/S	
Ponds (Flax/ Sluice) Goldfish	Flax, Sluice, GF	City	S/V		Zoning, stormwater permits, alternative drainage - better <u>city wide alignment</u>	<div><div></div></div>			H	O/S	
Parks/ Open Space	Citywide	City	S/V		Multi-purpose water storage "marshy"				M	O	
Reservoirs (Walden, Breeds)	Walden, Breeds	City	S/V								

Community Resilience Building Risk Matrix				  			www.CommunityResilienceBuilding.org					Master
H-M-L priority for action over the S hort or L ong term (and U ngoing) V = Vulnerability S = Strength				Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)							Priority	Time
				Heavy Precipitation/ Flooding	Sea Level Rise/ Surge/ Erosion	Extreme Heat	High Winds	Winter Storms	H - M - L	S hort L ong U ngoing		
Features	Location	Ownership	V or S									
Infrastructural												
Residential/ Commercial Buildings		Private/ Public	V	Increase drain size and storage	New regulation for coastal buildings	Cooling centers and cool roofs on municipal buildings			H	S		
Streets: Munroe, Bennett,	Citywide	Public	V	Porous surfaces and LID, increase drain size and storage	Explore green space options				H	S		
Drainage System	Citywide/ Downtown		V	CSO seperation, permeable pavement, maintenance and cleaning, upgrade systems (same as streets)					H	O		
Utility Supply/ Distribution (Energy)			V	Microgrids					L-M-H			
Seawall	Waterfront		V	Repairs and rebuild, ongoing studies - develop action plan 					H	L		
Fire Department (Ex. Lynn Woods)						Lynn Woods equipment/ resources, new tanker 						
New Development	Citywide	Private	V/S	Waterfront development should include living shoreline, berms, mitigation plan					H	L		
Marina	Marina				Wave attenuator 							
Bridge Access Points	Lynn Bridges				Change traffic patterns, raise road/ bridge heights 				H	L		
Strawberry Brook Culvert	Strawberry Brook		V		Restoration, redesign, increase retention 				M	L		
Societal												
Elderly 	Citywide		V/S	Work with elderly housing facilities, GIS updating where elderly live		Cooling centers and cool roofs, support systems			M			
Low to Moderate Income	Citywide		V	Personal emergency plan, evacuation plan, generating awarenesss 								
Individuals with Disabilities	Citywide		V									
Downtown Businesses	Downtown		V		Implementing plans already in place							
Homeless			V	Outreach and support programs, gathering points								
Commuters	Citywide/ Regional		V/S	Personal emergency plan, evacuation plan, generating awarenesss					H	O		
People with Language Barriers/ Immigrants	Citywide		V	Communication from city, using social media, cooling centers, alert system (RAVE), emergency/ evacuation plan, evolving/ continue platform for communication					H	O		
Environmental												
Beach/ Coastline				Upgrade drainage system	Berms and living shorline, seawall				H	L		
Marshes/ Estuaries/ Wetlands				Restoring wetlands	Berm and living seawall				H	L		
Water Quality				Frequent testing/ source of pollution					H	O		
Saugus River/ Strawberry Brook				Execute Saugus area study, zoning, stormwater permits 					H	O		
Reservoir	Citywide		V/S	Maintain facility, water conservation in extreme heat					H	O		
Contamination	Citywide		V	Upgrade drainage system					H	O		



APPENDIX D

Core Team Meetings

Meeting December 20, 2018

- Agenda
- Notes
- Attendance

Meeting March 28, 2019

- Agenda
- Notes
- Attendance



City of Lynn
Municipal Vulnerability Preparedness Planning Grant Project
Core Team Meeting
Lynn City Hall, Room 302, 3 City Hall Square, Lynn, MA 01901
Thursday, December 20, 2018
9:00 am – 12:00 pm

Agenda

1. **Introductions** 10 minutes
2. **Project Overview** 15 minutes
 - a. MVP Planning Grant
 - i. Municipal and stakeholder driven process
 - ii. Workshop(s) to identify strengths and vulnerabilities
 - iii. Matrix and report identifying MVP Key Actions
 - b. MVP Action Grants
3. **Core Team Role** 10 minutes
 - a. Develop schedule
 - b. Organize implementation of the Community Resilience Building Workshop
 - c. Inform community priorities/Determine how decisions from Workshop will be used
4. **Community Resilience Building Workshop(s)** 20 minutes
 - a. Overview of climate projections
 - b. Map of key resources/assets
 - c. Discuss hazards and key features (infrastructure, society, environment)
 - d. Prioritize MVP Key Actions
 - e. MVP Risk Matrix
5. **Data Needs and Sources** 20 minutes
 - a. Interviews with municipal officials
 - b. Applicable reports and materials
 - i. City of Lynn Hazard Mitigation Plan 2016 Update (MAPC, 2016)
 - ii. Lynn Coastal Resiliency Assessment (Lynn EDIC, 2016)
 - iii. Emergency operation plans
 - iv. Other ongoing planning efforts
 - c. Critical assets and infrastructure

W&S Action Item: Review materials and incorporate into Workshop and Report(s)

Lynn Action Item: Identify and provide any additional resources



6. Workshop Participants

- a. Prepare list of workshop invitees, for example: 20 minutes
 - i. Lynn City Government (Mayor, Mayor's Office, City Council, Planning, Public Works, Conservation, Health, Inspection Services, Fire, Police, Emergency Management Agency, Lynn Water and Sewer Commission, and more)
 - ii. State Government (DCR, CZM, MassDEP, State Representatives, State Senators, MAPC)
 - iii. Federal Government (US Environmental Protection Agency, Army Corps of Engineers)
 - iv. Institutions (hospitals, schools, other)
 - v. Businesses (Chamber of Commerce, realtors, and more)
 - vi. Neighborhood/Community/Environmental Groups (Saugus River Watershed Council)
 - vii. Neighboring Communities
- b. Invitations and RSVPs
- c. Table Assignments

W&S Action Item: Draft invitation to stakeholders

Lynn Action Item: Finalize list of invitees; send invitation and track RSVPs, assign participants to tables

7. Workshop Schedule

10 minutes

- a. One 8-hour or two 4-hour meetings
- b. Weekday or weekend
- c. Day or evening

Lynn Action Item: Determine format and schedule of Workshop

8. Workshop Materials

45 minutes

- a. Draft Powerpoint
- b. Draft map for discussion at tables
- c. Other

W&S Action Item: Finalize Workshop materials based on Core Team input

Lynn Action Item: Help to fill mapping and Powerpoint gaps

9. Workshop Staffing

15 minutes

- a. Facilitators – Weston & Sampson
- b. Note-Takers – City of Lynn (Core Team)

W&S Action Item: Identify six table facilitators

Lynn Action Item: Identify six table note-takers

10. Wrap Up and Next Steps

15 minutes

City of Lynn
Municipal Vulnerability Preparedness (MVP) Planning Grant Project
Core Team Meeting Notes
Thursday, December 20, 2018
9:00 am – 11:00 am

Attendance

Lynn

Bill Bochnak, EDIC-Lynn, MVP Project Manager
Meaghen Hamill, Mayor's Office
Captain Chris Reddy, Lynn Police
John Ladd, Lynn Housing Authority and Neighborhood Development (LHAND)
Lisa Nerich, DPW
Paul Ricchi, EMD
Jamie Cerulli, ISD
Bob Fennell, LWSC
Michele Desmauris, ISD – Public Health

Weston & Sampson

Kathy Baskin, Project Manager
Adria Boynton, Resiliency Specialist

Discussion

Other Resilience-Related Work in Lynn

- The City applied for a CZM grant in 2016 to look at climate impacts and produced a report with climate data and recommendations
- Lynn Waterfront Open Space Master Plan
- Lynn Waterfront Master Plan
- Creation of Overlay Districts to Support Open Space and Economic Development (EEA Land Use Planning Assistance Grant)
- MIT Land Use Study in West Lynn
 - This includes information related to vulnerability and resilience, including a proposal to flood the GE field
- Hazard Mitigation Plan
- Emergency Operations Plan
- The Health Department is working on a project related to community resilience and heat

MVP Planning Grant Project Timeline

- Core Team Meeting on December 20, 2018
- 8-hour MVP workshop, date TBD
 - This will be scheduled on a weekday, possibly during the first two weeks of February. We will be careful to avoid scheduling the workshop during the February school vacation, which will likely be during the third week of the month.
 - We will also schedule a backup date in case of snow.
 - Potential location for the workshop: the Housing Authority community room on Church Street.
 - We will send a follow up email with the location and date for the workshop.
- One or two Core Team Meetings, date TBD (these will be scheduled after the MVP workshop)

- 1-hour Public Listening Session, date TBD (this will be scheduled during the public comment period for the draft of the final report).
 - There will be language translation services at this meeting.
 - This could become a 2-hour public meeting if we need more time.
- There could also be a future meeting after Lynn becomes certified to discuss opportunities for funding synergies related to the Action Grants.

MVP Program Process

- The team will be drawing from the 2016 study and will expand that work with the help of participants at the 8-hour MVP workshop.
 - The 2016 CZM grant project looked only at coastal flooding and infrastructure. It did not look at inland flooding, heat, or vulnerable populations.
- Workshop participants will help articulate potential strategies to address climate change; including risks related to flooding, heat, vulnerable populations, and more.
- This process is mandated by the state.
- We will wrap up the process by producing a final report. Ultimately, the City decides how to prioritize action items.
 - The final report can include a section on related planning efforts, to show how MVP can help support, fund, or link to that related work. One broad action item in the final report could be to ensure that MVP efforts are coordinated with, and support, other related planning efforts.
- After submitting the final report, Lynn becomes certified, and becomes eligible for additional grants (action grants) up to \$400,000. This is a great opportunity to fund work that was already planned. This could include planning updates related to climate management, park revitalization, or more.
- Question: how many times can you apply for the action grants?
Answer: you can apply every year.
- Question: do they cap the number of recipients?
Answer: even if you apply and do not receive the funding, you're still eligible for future funding. As far as the numbers go, roughly 150 communities are certified or are about to be certified. The funding was \$5 million last year and \$15 million this year. The ratio of funding to communities is as good or better than it was last year. This is a priority for Governor Baker.
Comment: funding is subject to appropriation, so we will have to advocate for Lynn.

MVP Workshop

- We will invite a range of community leaders, including municipal staff and other key figures in the City. During the workshop, they will work at their table during small group sessions, and they will collaborate with the other tables during large group sessions.
 - Bill and Kathy will work on creating table assignments.
- Could Mayor McGee say a few words at the start of the workshop?
- Towards the beginning of the presentation, Bill could give an overview of all the ongoing planning initiatives. These should also be listed in our final report so that they're eligible for action grant funding later.
 - Bill will send a list of related planning efforts, so that it can be added to the workshop powerpoint.
- We will present climate projects using state climate data and Lynn-specific data from city planning. If the Core Team knows of other available resources, please share them.
- We will also have large-scale plots of a map showing key communities features and flood extents. Some features that could be added to the current draft map include:
 - A notation indicating that the hospital is moving

- The location of GE
- Northshore Community College
- Schools: Sacred Heart, St. Pius, St. Mary's, Kipp High School
- Catholic Charity Nursery of North Federal Street (which is in a flood area) and other daycares
 - Comment: there is a need to warn local non-profits about climate risks
- Nursing homes, including Abbott House on Essex Street, Phillips Manor, and others. Michele can share information about local nursing homes.
- Participants will choose four main hazards to include in their Risk Matrix. Sometimes, participants group multiple risks into one category (for example, "extreme storms" might include hurricanes and Nor'easters).
- Participants will identify at-risk "features" in their community. For example, there is a municipal refueling station in a flood pathway.
- Then, they will identify actions and strategies to address the identified risks. For example, how can you help elderly citizens get to a cooling center during a heat wave?
- The Core Team will review these suggested strategies in order to create a list of priority actions.
- Question: will people really stay for the whole 8-hour event?
Answer: Most people do. We could plan on two 4-hour workshops instead, but there are benefits to completing the workshop when everyone is available on one day. We will provide food.
- Workshop staffing: there will be one W&S employee at each table to facilitate. It would be great to have one City person at each table to help fill in the matrix with the participants' suggestions. People can volunteer in advance or we will ask them on the day.

MVP Workshop Invitees

Suggested additions to the original invitee list include:

- Consultants working on the FEMA project
- Friends of Lynn and Nahant Beach
- Someone from the funeral industry
- The Council on Aging contacts will need to be updated
- Someone from the Lynn Area Chamber of Commerce
- The Lynn Business Partnership
- North Shore Community College
- National Grid
- DCR
- Friends of Lynn Woods
- Dan Small, the Lynn Woods Ranger
- Dr. Patrick Tutwiler, Superintendent of Public Schools
- Lynn Community Health Center
- CZM
- Hank Olbash and Jim Perry, the Harbormaster and the Head of the Marina
- Bill Klagg, Emergency Management Coordinator at the North Shore Medical Center
 - There is concern about access to hospitals during storms, and next year there won't be a hospital in Lynn
- Cataldo Ambulance Service
- Property owners of waterfront land
- General Electric
- Paul Crowley, Greater Lynn Senior Services (GLSS)
- EPA
- Army Corps of Engineers

- There is interest in working with the Army Corps to dredge the harbor
- Coast Guard
- Charter Environmental (relationship with National Grid)
- Northeast regional office at DEP
- MBTA
- Keolis - Trains
- Someone from the insurance industry
 - John Olsen, Columbia Insurance Agency (also a Chamber of Commerce member)
- Mikael Main, MEMA Region 1 Director
- MassDEP
- Lynn Special Needs Camp
- Gannon Golf Course
- Nahant City Manager
- National Guard
- Drew Russo, Executive Director of Lynn Museum and Lynn Arts
- Al Wilson, Executive Director of Beyond Walls
- North Reading Transportation (NRT) Bus
- Bill will share the list of contacts generated for the master planning effort.
- Email Bill or Kathy with other suggested names and contact information.
- We will send an updated list to the Core Team, so that they can fill in any contact information blanks.

Additional Notes

- Resilience doesn't just mean the coastal impacts of climate change.
Comment: we've been dealing with inland flooding more than coastal flooding.
- There's a seawall in disrepair in Lynn. Can developers help pay for the repair? Peabody is using an MVP grant to design their seawall.
- There is a need to make an evacuation plan for Lynn.

CITY OF LYNN

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City of Lynn
Municipal Vulnerability Preparedness Planning Grant Project
Core Team Meeting
Lynn City Hall, Room 302, 3 City Hall Square, Lynn, MA 01901
Thursday, March 28, 2019
9:30 am – 11:30 am

Agenda

- | | |
|-------------------------------|------------|
| 1. Introductions | 5 minutes |
| 2. Draft MVP Priority Actions | 90 minutes |
| a. Missing Actions | |
| b. Order of Priority | |
| c. Redundancies | |
| 3. Review Draft MVP Report | 20 minutes |
| 4. Wrap Up and Next Steps | 5 minutes |



City of Lynn
Municipal Vulnerability Preparedness Planning Grant Project
Core Team Meeting
Lynn City Hall, Room 302, 3 City Hall Square, Lynn, MA 01901
Thursday, March 28, 2019
9:30 am – 11:30 am

Meeting Notes

Attendance

Lynn

Bill Bochnak, EDIC-Lynn, MVP Project Manager
Michele Desmauris, ISD – Public Health
Meaghen Hamill, Mayor's Office
John Ladd, Lynn Housing Authority and Neighborhood Development (LHAND)
Mary Lester – Conservation and Saugus River Watershed Council
Hank Olbash, Marina
Paul Ricchi, EMD

Weston & Sampson

Kathy Baskin, Project Manager

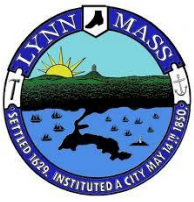
Discussion

Review Options for Applying for MVP Action Grant

- RFR was issued for MVP Action Grants. Applications are due on April 19, 2019. Applicants must have completed their Planning Grants, including hosted the Workshop and Listening Session and submitted a final report.
- There will be a second round of MVP Action Grant later this summer.
- Discussion centered around pros and cons of moving quickly to meet the April 19 deadline. In general, the group thought that would be too fast.
- The group envisioned a few projects including repairing the marina, making the waterfront more resilient, and relieving flooding in the Strawberry Brook watershed. The marina has some federal funding that could be leveraged as matching funds for the marina and waterfront projects. The CSO separation project, which will likely result in more stormwater being discharged to the stormdrains, could possibly be used as matching funds for the Strawberry Brook project.

Review Draft Priority Actions and Municipal Vulnerability Preparedness Report

- The Team reviewed a draft list of the Draft MVP Report's recommended Actions, which were developed during the February 26, 2019 Workshop
- The Team proposed revisions to the language, to remove redundant Actions and to ensure that the Actions represented the intent of Workshop participants
- Actions were reorganized slightly, to differentiate between Priority Actions and Other Actions.
- Weston & Sampson will make the suggested changes and sends the revision to the Core Team.
- The Core Team will provide comments on the draft report.
- The draft report will be made available to the public for public comment period associated with the Listening Session.



Plan for Outreach

- A public listening session must be held before the end of May 2019.
- The Team suggested that a presentation be given at an upcoming City Council meeting.

City of Lynn

Municipal Vulnerability Preparedness Planning Grant Project

Thursday, March 28, 2019, 9:30 am – 11:30 am

Core Team Meeting Sign-In Sheet

Name	Affiliation	Email Address
Meaghan Hamill	Mayers Office	meaghen.hamill@lymma.gov
John Ladd	LHARD	JLadd@LHard.org
Bill Bochnak	EDIC-Lynn	wbochnak@EDICLynm.org
Hank Ohashi	OCD / Seaport	hankobashi@gmail.com
Paul Ricci	Emergency Management Director	paul.ricci@lymma.gov
Michele Desmarais	Public Health Director	mdesmarais@lymma.gov
Mary Lester	SERC Conservation	Marylaster@saugusriver.org
Kathy Baskin	Weston + Sampson	baskink@wseinc.com

APPENDIX E

Municipal Official Meeting Notes

Meeting with Lynn Water & Sewer Commission October 26, 2018

Meeting with Lynn Emergency Management November 8, 2018

Meeting with Department of Public Works November 27, 2018

City of Lynn
Municipal Vulnerability Preparedness (MVP) Grant Project
Summary of Meeting with Lynn Water & Sewer Commission
October 26, 2018

Attendees:

Lynn Water & Sewer Commission

Dan O'Neil

Anthony Marino

Rae Hughes

Weston & Sampson

Kathy Baskin

David Elmer

Summary

Weston & Sampson met with officials at the Lynn Water and Sewer Commission to introduce officials to the MA Municipal Vulnerability Preparedness (MVP) Program and the City's recent receipt of an MVP Planning Grant, and to learn about resilience issues that concern Lynn Water and Sewer Commission. Kathy described the MVP Program, explaining that by participating in the Planning Grant and developing a vulnerability report for approval by the state, the City will become eligible for MVP Action Grants.

LWSC officials wondered how they fit into the process as they are not actually a municipal entity. Weston & Sampson assured them that they would have a seat on the Core Team, which is responsible for driving the process and reviewing priorities developed during the MVP Community Resiliency building Workshop. LWSC would have a role in defining what projects should go forward and what projects might be prioritized for an MVP Action Grant application(s).

Priorities that came to mind include:

1. Washington Street pump station – took on a lot of water which caused a lot of damage
2. Hansen and Camden pump stations
3. Strawberry Brook study – a major flooding issue, discharges through a series of pipes, ponds to Little River, cascades through back yards, collects stormwater
4. Reed pump station
5. Flood doors at wastewater treatment plant; (Rae Hughes has the necessary elevations.)

We also reviewed progress on High Priority Hazard Mitigation Measures proposed in the City's Hazard Mitigation Plan (2016).

Flooding, Drainage Infrastructure and Dams

Upgrade drainage system on Surfside Road. This area is heavily impacted by high tides, storm surge and sea level rise. The drainage system for this area needs to be raised and a pump station installed.

Status: Complete. An additional high level system was constructed.

Install wave attenuator at Seaport Landing facility.

Status: No update on this item was provided.

Upgrade Valley Road culvert.

Previously Medium Priority. The Valley Road culvert is undersized for the amount of stormwater flow it handles during high precipitation events. It backs up and causes localized flooding.

Status: Cost is \$1M. This needs to be done.

Mitigate low elevation issue and tidal backup Lower Western Interceptor. The

combined sewer overflow system (CSO) in place in Lynn creates a capacity problem in the drainage system. When there are heavy flows to the treatment plant, the plant is not able to pump as much water and the wet wells flood in the lower areas of the collection system. This situation is being alleviated by sewer separation which will eventually cost in the range of \$50 -54 million. The City would like to conduct a study on how to best mitigate the low elevation, tidal backup and inflow and infiltration problems that create the wet well flooding issues.

Status: Cost is \$200M.

Install Ipswich River pumps station levee. The Ipswich River waters provides drinking water to 350,000 people and thousands of businesses in 14 communities, including Beverly, Danvers, Hamilton, Ipswich, Lynn, Lynnfield, Middleton, North Reading, Peabody, Salem, Topsfield, Wenham and Wilmington. The Lynn Water and Sewer Commission makes permitted withdrawals from the Ipswich and needs to install the levee around the pump station to protect it from river flooding events.

Status: Is this for a moat around the pump station? LWSC is not familiar with this proposed measure.

Finish digital mapping of city drainage system.

Status: This is 95% complete.

Upgrade the Foster Pond Dam headwall in conjunction with Swampscott DPW.

Previously Medium Priority- There is flooding in the eastern part of the City inadequate and it gets blocked with debris. The City of Lynn has offered to replace the grate.

Status: No plans to move forward with this project.

CITY OF LYNN HAZARD MITIGATION PLAN 2016 PLAN UPDATE

boundaries as sand and other materials are moved along the coast. Shoreline protection measures such as sea walls, jetties, and others have an impact on this process with the potential of building up materials in some areas while stripping it away from others. In Lynn, a shoreline issue of regional concern is the need for additional storm water and storm surge storage capacity

Municipalities along the North Shore should work to understand how these processes and others associated with sea level rise and storm surge are at work locally and consider mutually beneficial means of protecting their shore side communities from the impacts of storm damage and sea-level rise. Lynn should consider participating within a regional sea level rise action work group to help plan for and address sea level rise, storm surge and related climate adaptation issues on a regional basis.

Proposed Hazard Mitigation Measures

Changes in Mitigation Priorities from 2005 Plan

Mitigation measures in the 2005 Hazard Mitigation Plan were assigned a priority of high, medium or low by the local Hazard Mitigation Planning Committee for that plan. Each mitigation measure from the 2005 plan that has been retained in this plan update has been marked with an asterisk (*) and a note made if the priority level has changed according to the prioritization process in this plan update.

High Priority Mitigation Measures

Flooding, Drainage Infrastructure and Dams

- Upgrade drainage system on Surfside Road. This area is heavily impacted by high tides, storm surge and sea level rise. The drainage system for this area needs to be raised and a pump station installed.
- Install wave attenuator at Seaport Landing facility.
- * Upgrade Valley Road culvert. Previously Medium Priority. The Valley Road culvert is undersized for the amount of stormwater flow it handles during high precipitation events. It backs up and causes localized flooding.
- Lower Western Interceptor: mitigate low elevation issue and tidal backup. The combined sewer overflow system (CSO) in place in Lynn creates a capacity problem in the drainage system. When there are heavy flows to the treatment plant, the plant is not able to pump as much water and the wet wells flood in the lower areas of the collection system. This situation is being alleviated by sewer separation which will eventually cost in the range of \$50 -54 million. The City would like to conduct a study on how to best mitigate the low elevation, tidal

CITY OF LYNN HAZARD MITIGATION PLAN 2016 PLAN UPDATE

backup and inflow and infiltration problems that create the wet well flooding issues.

- Install Ipswich River pumps station levee. The Ipswich River waters provides drinking water to 350,000 people and thousands of businesses in 14 communities, including Beverly, Danvers, Hamilton, Ipswich, Lynn, Lynnfield, Middleton, North Reading, Peabody, Salem, Topsfield, Wenham and Wilmington. The Lynn Water and Sewer Commission makes permitted withdrawals from the Ipswich and needs to install the levee around the pump station to protect it from river flooding events.
- Finish digital mapping of city drainage system.
- *Upgrade the Foster Pond Dam headwall in conjunction with Swampscott DPW. Previously Medium Priority- There is flooding in the eastern part of the City from Foster's Pond in Swampscott. The design of the grate at the headwall is inadequate and it gets blocked with debris. The City of Lynn has offered to replace the grate.

Measures to Ensure Compliance with NFIP and Mitigate for Coastal Hazards/Tsunami

- The City should participate in the FEMA Community Rating System (CRS) program to lower flood hazard risk, raise community awareness and quality for lower flood hazard insurance premiums. . See information at:
<http://ma.stormsmart.org/home/community-rating-system-crs-primer/>
- Floodplain District Management: Update this district to remain consistent with FEMA guidelines and floodplain mapping. See more information on model bylaw development for MA coastal floodplains at:
<http://ma.stormsmart.org/2010/11/05/great-model-bylaw-for-managing-coastal-floodplain-development/>
- Floodplain Mapping: Maintain up to date maps of local FEMA identified floodplains. The effective date for the current FIRM map is 7/16/2014.
- Acquisition of Vacant Flood Prone Lands: Acquire priority open space parcels in floodplain areas in order to maintain flood storage and water infiltration capacity. The 2010 Lynn Open Space and Recreation Plan includes the acquisition of land along the Saugus River as one its goals.

Multi Hazards

City of Lynn
Municipal Vulnerability Preparedness (MVP) Grant Project
Summary of Meeting with Lynn Emergency Management
November 8, 2018

Attendees:

Lynn Emergency Management

Paul Ricchi

Weston & Sampson

Kathy Baskin

Summary

Weston & Sampson met with Paul Ricchi to introduce him to the MA Municipal Vulnerability Preparedness (MVP) Program and the City's recent receipt of an MVP Planning Grant, and to learn about resilience issues that concern Emergency Management. Kathy described the MVP Program, explaining that by participating in the Planning Grant and developing a vulnerability report for approval by the state, the City will become eligible for MVP Action Grants.

Flooding is the major issue, especially in the past few years.

Need public education about flood insurance; should be emphasized; people spend a lot of time moving boxes out of basements.

A potential project for an MVP Action Grant (and possibly a PARC grant) is at a former park on Ames Street near the Saugus River. The area is near residences and floods. Could be redesigned to reduce impact on neighborhood.

Strawberry Brook, which runs from Flax Pond, is a problem area, particularly at Boston Street (Route 129) and Granite Street, Boston and Ford Streets, Boston and Stetson Streets, and Boston Street and Sacred Heart School. The brook is culverted and is always flooding.

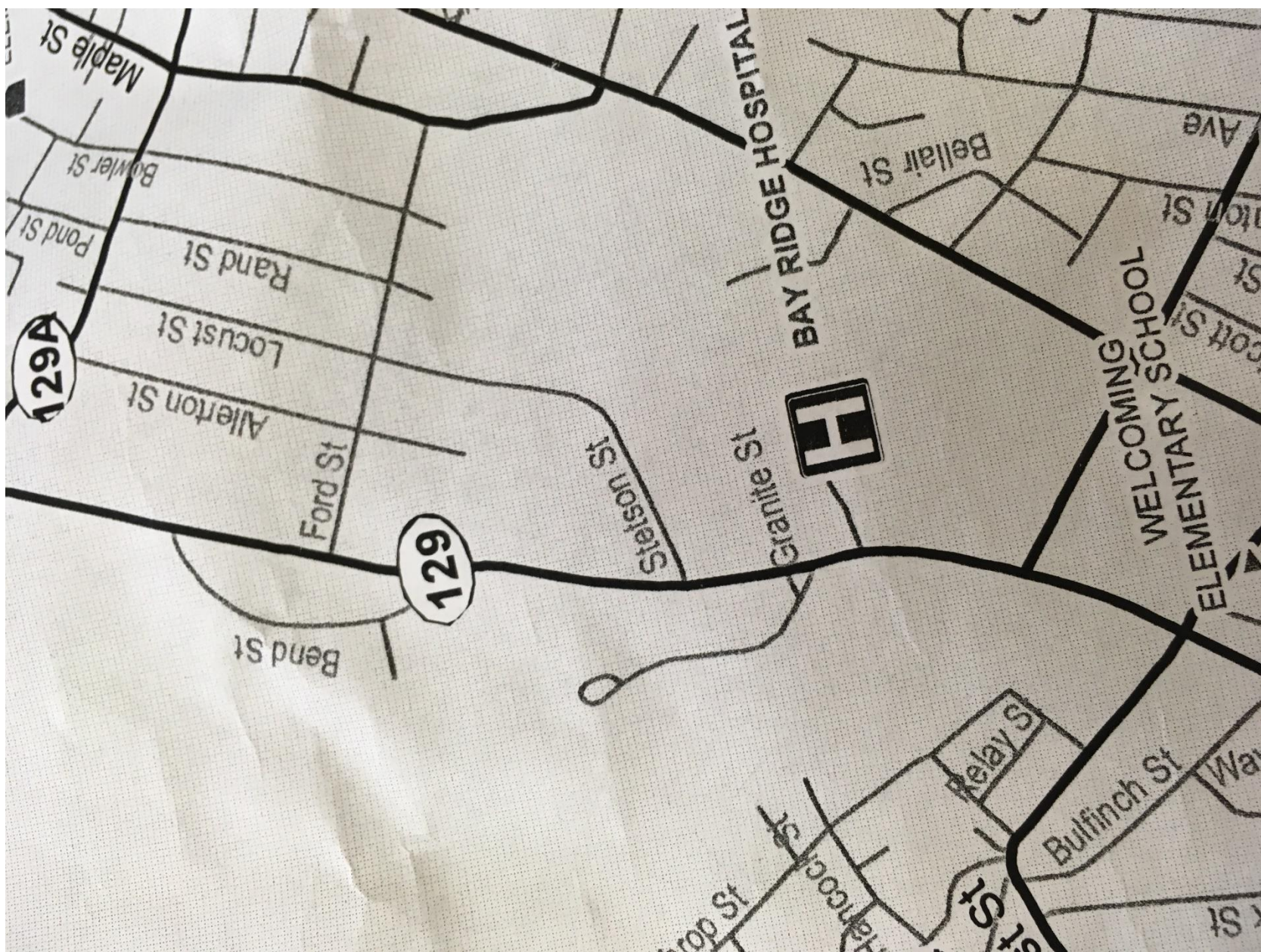
Other areas that flood frequently are: Commercial Street, near the Lynnway, the industrial area on the coastline where Kettle Cuisine is and Garelick Farms (which is leaving) was, and General Electric – River Works plant.

The industrial area has lots of toxics that could get swept up in a coastal surge.

Paul is definitely interested in participating in the MVP Core Team. He also suggested that the Ward 6 City Councilor be engaged (as that is an area that floods), and that the Mayor's office be involved.







**Municipal Vulnerability Preparedness (MVP) Grant Project
Summary of Meeting with Lynn Department of Public Works
November 27, 2018**

Attendees:

Lynn Department of Public Works

Andy Hall

Weston & Sampson

Kathy Baskin

Summary

Weston & Sampson met with Andy Hall to introduce him to the MA Municipal Vulnerability Preparedness (MVP) Program and the City's recent receipt of an MVP Planning Grant, and to learn about resilience issues that concern the Department of Public Works. Kathy described the MVP Program, explaining that by participating in the Planning Grant and developing a vulnerability report for approval by the state, the City will become eligible for MVP Action Grants.

DPW is responsible for streets, sidewalks, trees, trash, parks, cemetery, and all city vehicles (fire, police, and DPW).

Areas that flood are Ford Street and Bridge Street along Strawberry Brook. The area is at a low elevation and flooding also occurs at River Street/Camden/ Bates/Canal/Cooper along Boston Street, which is parallel to Strawberry Brook. The brook runs from Flax Pond through Hood Park to the Saugus River.

On the map that the LWSC provided, those areas prone to flooding that are marked in yellow will be addressed by sewer separation.

Other project ideas/problem areas (in addition to Strawberry Brook) are:

The Lynnway (DCR is owner) could use pedestrian and bicycle access to make it more friendly to development.

Access to the municipal fuel depot is affected by flooding on Commercial Street. The depot does not flood but vehicles cannot access it in large floods. May need satellite fueling station(s).

LWSC's wastewater treatment plant is at the same elevation as the fuel depot; this could be vulnerable to sea level rise.

Flooding at Commercial Street and the Lynnway also prevent access to the DPW. Makes it difficult to provide service to the community.

The ice rink could be used as a morgue in an emergency.

Lynn Shore Drive at Surfside Road has some flooding at the Nahant Rotary.

Flooding also occurs at Maple Street near Gage and Mystic.

Gowdey Park floods (underdrain issue) but nearby houses do not.

APPENDIX F

Public Listening Sessions

April 30, 2019

May 21, 2019

PUBLIC MEETING NOTICE

City of Lynn

Municipal Vulnerability Preparedness (MVP) Plan

The City of Lynn recently prepared a draft Municipal Vulnerability Preparedness (MVP) Plan to help the City increase its resilience against climate change. Lynn's MVP Plan helps to reduce the City's vulnerability to the impacts of natural hazards such as flooding, winter storms, and extreme temperatures, which are predicted to intensify under climate change. Please join the City for a presentation and discussion of the Plan's update.

Date: Tuesday, April 30, 2019

Time: 7:00 pm – 8:00 pm

**Location: Lynn City Hall, Council Chamber, 3 City Hall Square,
Lynn, MA 01901**

Contact: Bill Bochnak of EDIC/Lynn at (781) 581-9399








Municipal Vulnerability Preparedness Program City of Lynn, MA

Overview

The purpose of the Massachusetts Executive Office of Energy & Environmental Affairs' Municipal Vulnerability Preparedness (MVP) grant program is to assist municipalities in preparing for the impacts of climate change through the participation in a community climate vulnerability workshop and development of a climate change action plan. Communities that complete the planning grant will be eligible for future implementation grants and will achieve increased standing in other state grant programs.

Project Components

Core Team Meetings	Community Resilience Building Workshop	Community Listening Session
Municipal leaders met to establish goals for the plan, and to provide reports, maps, and other pertinent information related to natural hazards and climate change impacts in Lynn.	Stakeholders with subject matter expertise and local knowledge: <ol style="list-style-type: none">1) Defined top climate-related hazards of concern.2) Identified existing and future strengths and vulnerabilities.3) Developed prioritized actions and opportunities to move forward.	Community members will be given the opportunity to contribute to the planning process and react to the results of the Community Resilience Building Workshop.

Top Hazards	 Sea level rise, coastal storm surge, and erosion	 Heavy precipitation/flooding	 Winter Storms
	 Extreme heat	 High Winds	



Highest Priorities

- Protect waterfront and marina from sea level rise and coastal surge.
- Reduce coastal, riverine and stormwater flooding.
- Explore and implement opportunities to enhance communication with and provide temporary shelter for vulnerable populations.
- Support implementation of resiliency measures developed through planning efforts related to the Northern Strand Community Trail.
- Study the Saugus River area to evaluate strategies to reduce flooding, erosion, and effects of extreme heat.
- Develop an Area of Critical Environmental Concern Management Plan.



City of Lynn
Municipal Vulnerability Preparedness Planning Grant Project
Lynn City Hall, Council Chamber, 3 City Hall Square, Lynn, MA 01901
Tuesday, April 30, 2019
7:00 pm – 8:00 pm

Agenda

- | | |
|--|------------|
| 1. Welcome and Introductions
Bill Bochnak, Project Coordinator at EDIC/Lynn and Project Manager | 5 minutes |
| 2. Overview of Municipal Vulnerability Preparedness Program
Bill Bochnak, Project Coordinator at EDIC/Lynn and Project Manager
Kathy Baskin PE, Project Manager, Weston & Sampson | 5 minutes |
| 3. Summary of Hazards, Vulnerabilities & Strengths, and Priority Actions
Bill Bochnak, Project Coordinator at EDIC/Lynn and Project Manager | 20 minutes |
| 4. Questions and Answers
All | 20 minutes |
| 5. Public Comment Period | 5 minutes |
| 6. Conclusions
Bill Bochnak, Project Coordinator at EDIC/Lynn and Project Manager | 5 minutes |

WELCOME



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Municipal Vulnerability Preparedness



*Workshop Findings and Priority Recommendations &
Review of Draft Municipal Vulnerability Preparedness Plan*

Lynn, Massachusetts
April 30, 2019

2

2

Lynn Introductions: Municipal Leadership

Mayor Thomas McGee

Core Team Members

- Project Manager Bill Bochnak, Lynn EDIC
- Stephen Archer, Fire Chief
- Jamie Cerulli, Inspectional Services Department
- Michele Desmarais, Public Health
- Michael Donovan, Inspectional Services/Building Commissioner
- Charles Gaeta, Lynn Housing Authority & Neighborhood Development
- Andrew Hall, Public Works Department
- Meaghen Hamill, Chief of Staff
- Mary Lester, Fuss & O'Neill
- Michael Mageary, Police Chief
- James Marsh, Department of Community Development
- Lisa Nerich, Parks & Recreation
- Dan O'Neill, Lynn Water & Sewer Commission
- Paul Ricchi, Emergency Management



3

3



What MVP offers Municipalities

Preparedness for natural & climate hazards

Collaboration with stakeholders

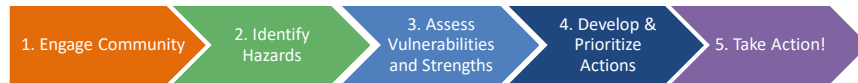
Education and planning

Grant funding for priority actions

4

4

MVP Workshop



- Defined natural hazards Identified key features
- Determined vulnerabilities and strengths
- Developed and prioritized actions
- Next: Implement actions

5

5

Workshop Participants

Municipal Government

- Mayor & Mayor's Office
- Lynn/EDIC
- Lynn Water & Sewer Commission
- Police
- City Council
- Community Development
- Conservation Commission
- Fire Department
- Lynn Community Health Center
- Lynn Economic Opportunity
- Lynn Housing Authority & Neighborhood Development
- Parks and Recreation Commission
- Planning Board
- Public Health
- Public Works
- Zoning Board of Appeals

Statewide

- MA Dept of Environmental Protection
- MA Emergency Management Agency
- MA Executive Office of Energy and Environmental Affairs
- MA Office of Coastal Zone Management

Federal

- National Guard
- U.S. Army Corps of Engineers
- US Environmental Protection Agency

Business

- Cataldo Ambulance Services

Academic Institution

- North Shore Community College

Media

- Daily Item

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Top Hazards Identified at the Workshop



**Heavy
Precipitation/
Inland Flooding**



**Sea Level Rise/
Coastal Surge/
Erosion**



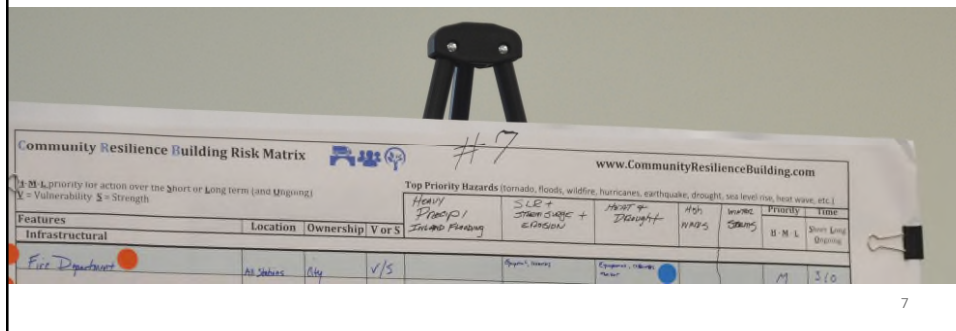
**Heat/
Drought**



**High
Winds**



**Winter
Storms**



7

Climate Change Impacts

Higher Temperatures

**More Extreme
Precipitation**
(More droughts,
more floods)

**Sea Level Rise &
Coastal Surge**

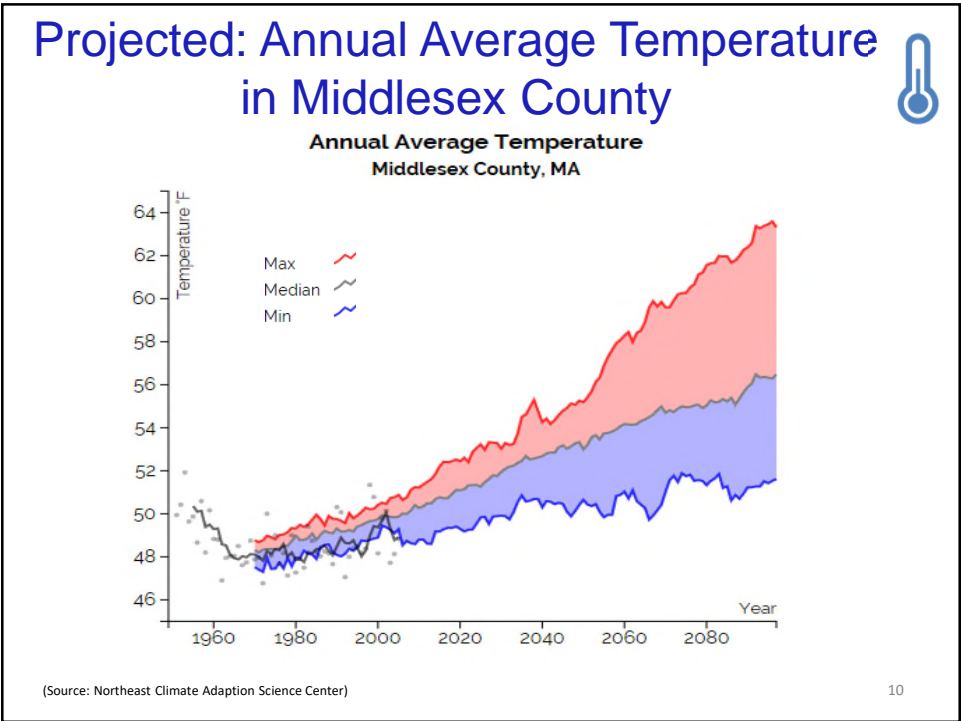
Goal: to protect infrastructure, environment, public health & safety, and economy

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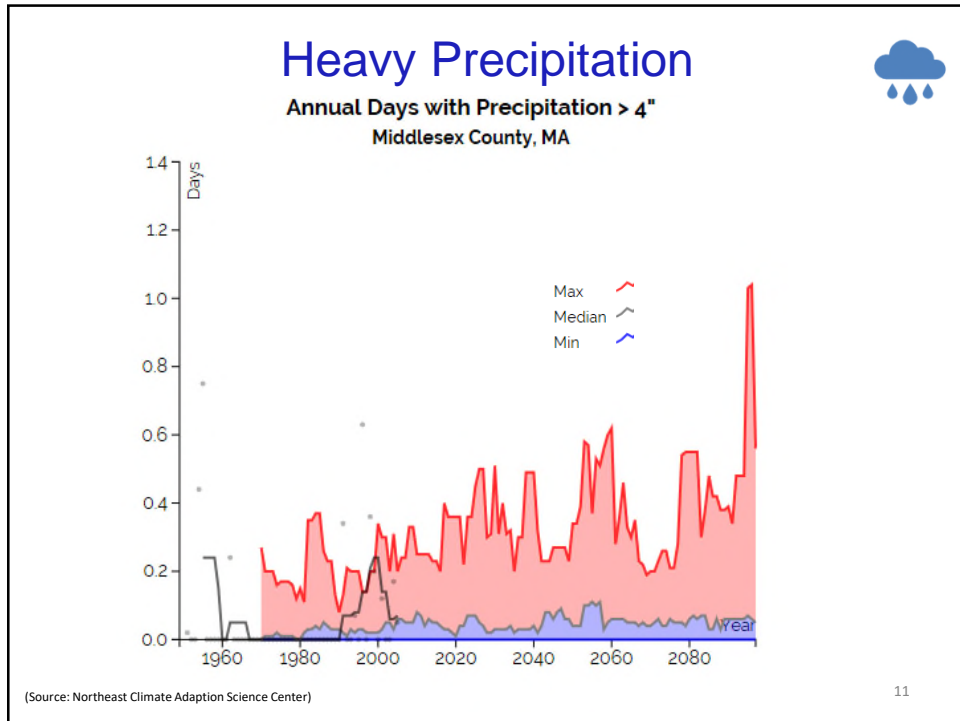
Predicted Climate Change

9

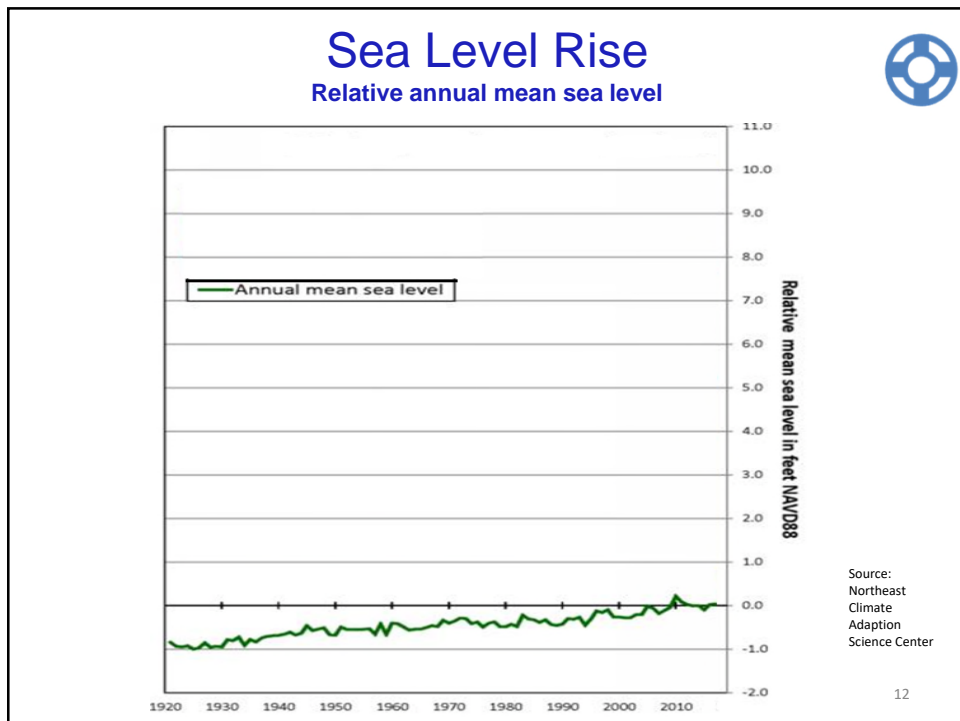


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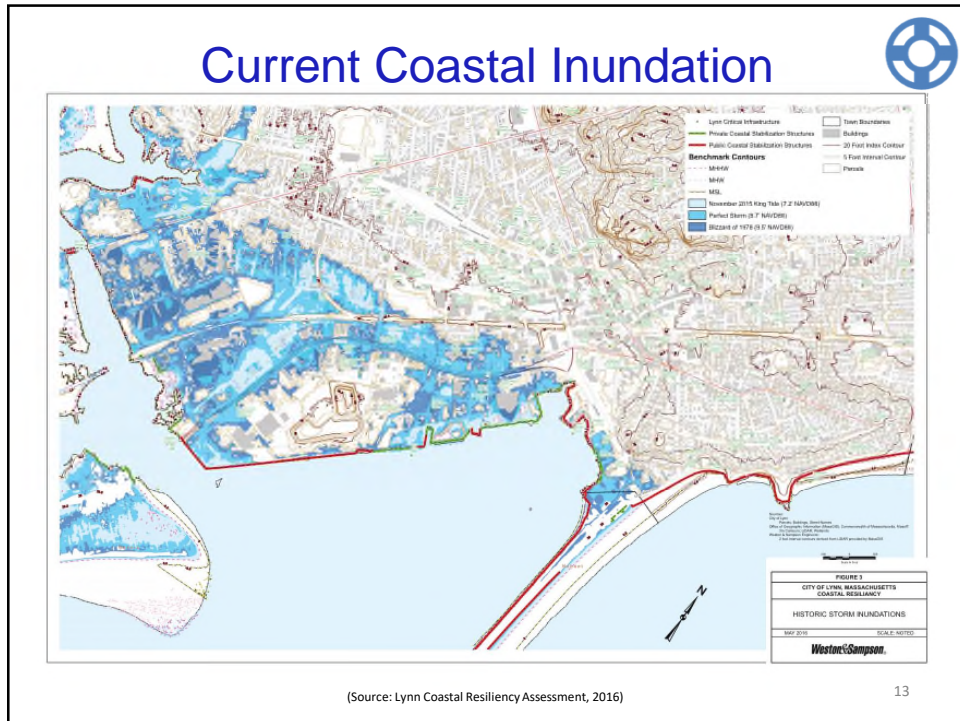
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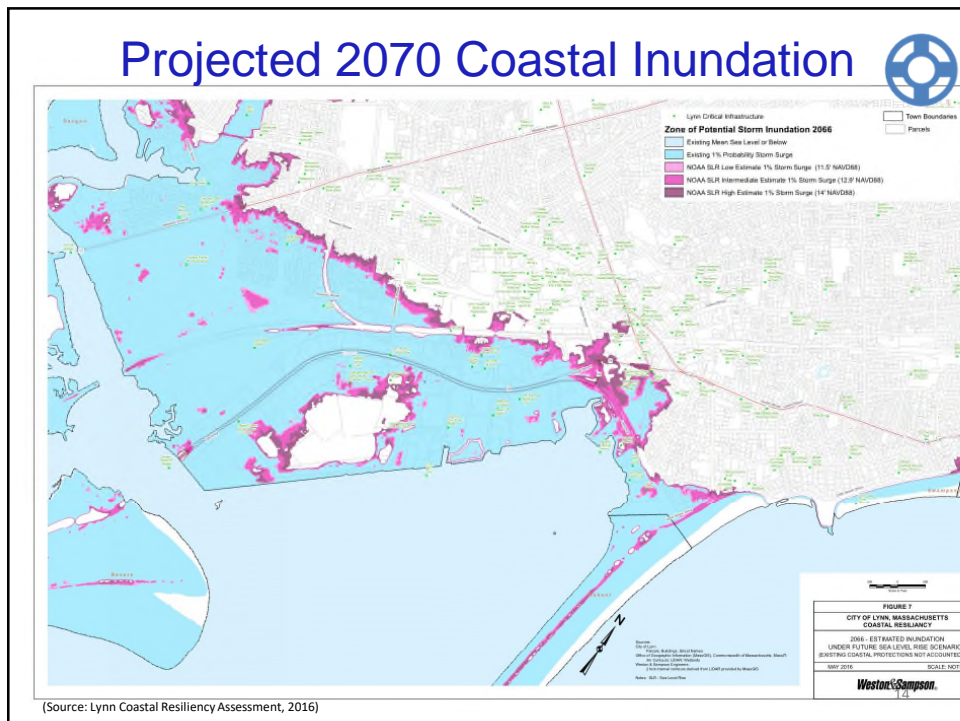
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Vulnerabilities



Infrastructural

- Stormwater drainage system & streets, including Lynnway, Boston St, Summer St, River St, Alley St, Lynn/ Nahant Rotary, Bennett St, Munroe St, Chestnut, Western Ave.
- Culverts, including Strawberry Brook
- Residential and commercial buildings, new development
- Wastewater collection and treatment system
- Utilities, including energy supply and distribution
- DPW facility including fueling station
- Bridges and bridge access points to City
- Railroad/commuter rail
- Schools
- Marina and seawalls
- Parking garages
- Fire Department
- Dams, Landfill
- Water transportation

Commercial Street



(Source: The Boston Globe, 2017)

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Vulnerabilities



Societal

- Students and teachers
- Low- to moderate-income population
- Immigrants and people with language barriers
- Mental health population
- People suffering emergency illnesses (no hospital)
- Commuters and people dependent on public transportation
- Pets
- Lynn Public School Food Service Program
- Greater Lynn Senior Services (GLSS)
- Industry and downtown businesses
- Senior centers and assisted living facilities
- Poor quality of housing stock
- Homeless
- Undocumented
- Disabled
- Elderly
- Children
- Homebound



16

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Vulnerabilities



Environmental

- Beach, coastline and estuaries
- Marshes, estuaries, and wetlands
- Erosion, including along Riley Way
- Forest system, including Lynn Woods
- Flooding and water quality contamination
- Reduced green space (increased impervious area)
- Saugus River
- Strawberry Brook
- Ponds
- Drinking water supply, including reservoir system
- Invasive species including phragmites and black algae
- Canada geese
- Contamination
- Insects and rodents



(Source: <https://lynnwoods.org>)

17

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Strengths



Infrastructure

- New development
- Fire Department
- Schools
- Utilities
- Dams
- Seawall
- Evacuation Routes
- Water Transportation
- Parking garages



Photo by John Galla www.firenews.org

18

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Strengths



Societal

- Elderly populations, living in retirement homes, assisted living, nursing homes, single family homes
- Children
- Ability to speak languages other than English
- City Agencies
- Schools and daycares
- People able to use public transportation
- Industry and downtown businesses
- Nonprofit organizations such as:
 - YMCA, Salvation Army, schools, churches, GLSS, Lynn Community Health Care, Lynn Public School Food Service Program, Visiting Nurses Association, Lynn Housing Authority and Neighborhood Development



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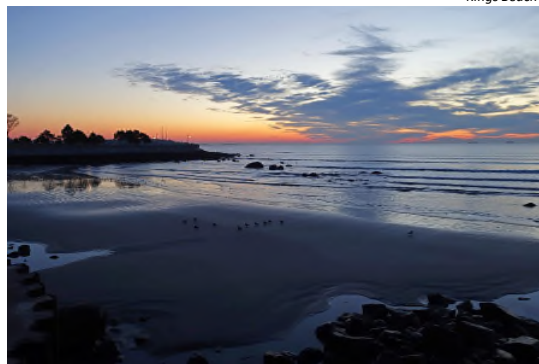
Strengths



Environmental

- Beach
- Saugus River
- Drinking water supply, including reservoir system
- Forest system, including Lynn Woods
- Ponds
- Parks
- Wetlands

Kings Beach



(Source: photograph by Toby McGuire, 2015)

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High Priority Actions

Protect the City's waterfront and marina from sea level rise and coastal surge.

- **Support implementation of resiliency** measures developed through planning efforts
- **Promote living seawalls and shorelines**, berms, green roofs and other strategies to increase resilience
- **Protect the City-owned marina** with a wave attenuator, living shoreline, or other energy dissipator
- **Continue ongoing evaluations of the seawall**

Kings Beach

(Source: Youtube)

21

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High Priority Actions

Reduce coastal, riverine and stormwater flooding

- Restore the **Strawberry Brook watershed**
- Promote the installation of **green infrastructure**
- Design and implement multi-purpose **flood storage** areas
- Evaluate **culverts** and increase their conveyance capacities.
- **Raise roads and bridges**
- Upgrade and maintain **drainage systems**
- Continue **combined sewer overflow separation**
- Restore **wetlands**
- Evaluate the City's **planning** tools and encourage use of green infrastructure, Low Impact Development, and climate change resilience

Kings Beach

(Source: Youtube)

22

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High Priority Actions

Explore and implement opportunities to enhance communication with and provide temporary shelter for vulnerable populations.

- Increased awareness of **places of cooling/warming** during emergencies
- Encourage personal **emergency and evacuation plans**
- Develop **outreach** and support programs to prepare homeless population for effects of natural hazards
- Better **identify and communicate with vulnerable**
- Engage **social service agencies** for education and outreach assistance in emergencies, and for contingency planning

Kings Beach

(Source: Youtube)

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High Priority Actions

- *Support implementation of **resiliency measures** developed through planning efforts*
- ***Study the Saugus River** area to evaluate strategies to reduce flooding, erosion and effects of extreme heat and water quality*
- ***Develop Area of Critical Environmental Concern Management Plan** to enable protection of natural resources and projects in the coastal area*



(Source: The Boston Globe, 2017)

24

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Medium Priority Actions



Source: https://www.ediclynn.org/documents/2018-12-10_Lynn%20Revised%20Waterfront%20Master%20Plan_Public%20Meeting%202.pdf

- ***Brush fire protection:*** clearing undergrowth and maintaining a new water tanker
- ***Comply with MS4 Stormwater Permit*** and upgrade the storm drainage system
- ***Bury utilities***
- ***Protect the wastewater treatment plant***
- ***Relocate the Department of Public Works' fueling station.***

25

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Additional Priority Actions

- ***Repair and maintain emergency utilization of the parking garage at Market Street***
- ***Encourage the MBTA to redesign and raise the commuter rail line***
- ***Encourage MA Department of Conservation and Recreation to study and remove algae on the beaches***

Neptune Boulevard Park



(Source: City of Lynn Open Space Plan, 2016)

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Public Comments



- Comments accepted:
 - April 30, 2019 – May 14, 2019
- Send comments to Bill Bochnak
 - Email: wbochnak@ediclynn.org
 - Mail: Bill Bochnak
Project Coordinator
EDIC/Lynn
Lynn City Hall, Room 405
3 City Hall Square
Lynn MA 01901
 - Phone: (781) 581-9399

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Next Steps

- April 30, 2019 Listening Session
- Comment Period April 30 – May 14, 2019
- Finalize Plan
- Send to the State for approval
- Apply for grants

28

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Thank You

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Name	Affiliation	Email Address
Darren Gyr.	Council Prez -	
Wayne Lozzi	city Councilor	
Sherry Pacewicz	Resident	55 Sherry @ verizon.net
James E. DeLong - Ewing	Resident	Ms Ellen 1158 @ aol.com
Milagros Vega	President	MUEGA5 @ partners.org
Shirley South		South497 @ gmail.com
Fred Hogan	WARD 6 Currier	Fred Hogan ward 6 lynne.com
Jay Quirk	Ward 7	16 Radin st lyns
STEPHEN ARCHER	LYNN FIRE	FIRECHIEF @ LYNN FIRE.ORG
Christopher Reddy	Lynn Police	CREDDY @ Lynn police.org

PUBLIC MEETING NOTICE

City of Lynn

Municipal Vulnerability Preparedness (MVP) Plan

The City of Lynn recently prepared a draft Municipal Vulnerability Preparedness (MVP) Plan to help the City increase its resilience against climate change. Lynn's MVP Plan helps to reduce the City's vulnerability to the impacts of natural hazards such as flooding, winter storms, and extreme temperatures, which are predicted to intensify under climate change. Please join the City for a presentation and discussion of the Plan's update.

Date: Tuesday, May 21, 2019

Time: 6:00 pm – 7:00 pm

**Location: Community Room, Lynn Housing Authority &
Neighborhood Development, 10 Church Street, Lynn, MA
01902**

Contact: Bill Bochnak of EDIC/Lynn at (781) 581-9399

CALENDAR LISTING / MEDIA ADVISORY

LYNN'S DRAFT CLIMATE CHANGE RESILIENCE PLAN TO BE PRESENTED AT MAY 21, 2019 PUBLIC MEETING

A meeting will be held to present an overview of Lynn's Municipal Vulnerability Preparedness Plan and to solicit public comments. The plan outline strategies for becoming more resilient to climate change.

Who: Lynn residents, business owners, representatives of non-profit organizations and institutions, and others who are interested in preventing and reducing damage from natural hazards and climate change.

What: Public meeting to present an overview of Lynn's draft Municipal Vulnerability Preparedness Plan. The plan will identify natural and climate change hazards affecting Lynn, including sea level rise and coastal surge, floods, drought, winter storms, and extreme temperature. It will also present strategies that the City can take to become more resilient to these impacts of climate change.

When: Tuesday May 21, 2019 from 6:00 PM to 7:00 PM

Where: Community Room, Lynn Housing Authority & Neighborhood Development, 10 Church Street, Lynn, MA 01902

Contact: Bill Bochnak of EDIC/Lynn at (781) 581-9399


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[Downtown Traffic Study](#)
[Lynn Properties To Lease](#)
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Latest News!

PUBLIC MEETING NOTICE
City of Lynn
Municipal Vulnerability
Preparedness (MVP) Plan

For more information and to
provide comments, [click here](#).

EDIC & City Receive \$850,000



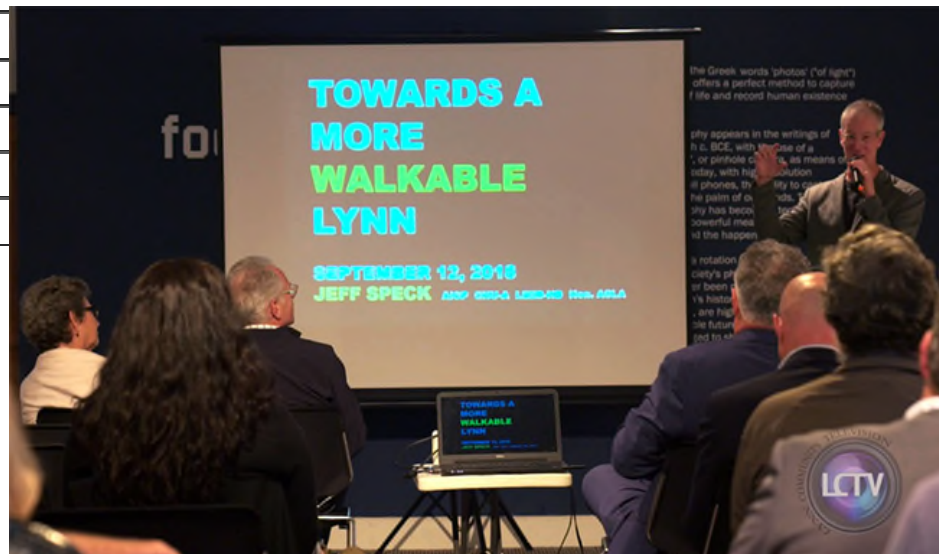
**Lynn Municipal Harbor
Plan & Waterfront Master
Plan Public Meeting**

Final Public Meeting

June 4, 2019

Click on image below to view
flyer

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Municipal Vulnerability Preparedness (MVP) Plan

	<p>Draft Municipal Vulnerability Preparedness (MVP) report</p>
	<p>Public Meeting Notice and information to provide comment</p>



Economic Development & Industrial Corporation
 Lynn City Hall ~ Room 405, 3 City Hall Square, Lynn
 MA 01901
 Phone: 781.581.9399 . Fax: 781.581.9731 . Email:
info@ediclynn.org



Municipal Vulnerability Preparedness Program






City of Lynn, MA

Overview

The purpose of the Massachusetts Executive Office of Energy & Environmental Affairs' Municipal Vulnerability Preparedness (MVP) grant program is to assist municipalities in preparing for the impacts of climate change through the participation in a community climate vulnerability workshop and development of a climate change action plan. Communities that complete the planning grant will be eligible for future implementation grants and will achieve increased standing in other state grant programs.

Project Components

Core Team Meetings	Community Resilience Building Workshop	Community Listening Session
Municipal leaders met to establish goals for the plan, and to provide reports, maps, and other pertinent information related to natural hazards and climate change impacts in Lynn.	Stakeholders with subject matter expertise and local knowledge: <ol style="list-style-type: none">1) Defined top climate-related hazards of concern.2) Identified existing and future strengths and vulnerabilities.3) Developed prioritized actions and opportunities to move forward.	Community members are given the opportunity to contribute to the planning process and react to the results of the Community Resilience Building Workshop.

Top Hazards	 Sea level rise, coastal storm surge, and erosion	 Heavy precipitation/flooding	 Winter Storms
	 Extreme heat	 High Winds	



Highest Priorities

- Protect waterfront/marina from sea level rise and coastal surge
- Reduce coastal, riverine and stormwater flooding.
- Explore and implement opportunities to enhance communication with and provide temporary shelter for vulnerable populations.
- Support implementation of resiliency measures developed through planning efforts related to the Northern Strand Community Trail.
- Study the Saugus River area to evaluate strategies to reduce flooding, erosion, and effects of extreme heat.
- Develop an Area of Critical Environmental Concern Management Plan.



City of Lynn
Municipal Vulnerability Preparedness Planning Grant Project Listening Session
Community Room, Lynn Housing Authority & Neighborhood Development
10 Church Street, Lynn, MA 01902
Tuesday, May 21, 2019
6:00 pm – 7:00 pm

Agenda

- | | |
|--|------------|
| 1. Welcome and Introductions
Bill Bochnak, Project Coordinator at EDIC/Lynn and Project Manager | 5 minutes |
| 2. Overview of Municipal Vulnerability Preparedness Program
Bill Bochnak, Project Coordinator at EDIC/Lynn and Project Manager
Kathy Baskin PE, Project Manager, Weston & Sampson | 5 minutes |
| 3. Summary of Hazards, Vulnerabilities & Strengths, and Priority Actions
Bill Bochnak, Project Coordinator at EDIC/Lynn and Project Manager | 20 minutes |
| 4. Questions and Answers
All | 20 minutes |
| 5. Public Comment Period | 5 minutes |
| 6. Conclusions
Bill Bochnak, Project Coordinator at EDIC/Lynn and Project Manager | 5 minutes |

WELCOME



1

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Municipal Vulnerability Preparedness



*Workshop Findings and Priority Recommendations &
Review of Draft Municipal Vulnerability Preparedness Plan*

Lynn, Massachusetts
May 21, 2019

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Lynn Introductions: Municipal Leadership

Mayor Thomas McGee

Core Team Members

- Project Manager Bill Bochnak, Lynn EDIC
- Stephen Archer, Fire Chief
- Jamie Cerulli, Inspectional Services Department
- Michele Desmarais, Public Health
- Michael Donovan, Inspectional Services/Building Commissioner
- Charles Gaeta, Lynn Housing Authority & Neighborhood Development
- Andrew Hall, Public Works Department
- Meaghen Hamill, Chief of Staff
- Mary Lester, Fuss & O'Neill
- Michael Mageary, Police Chief
- James Marsh, Department of Community Development
- Lisa Nerich, Parks & Recreation
- Dan O'Neill, Lynn Water & Sewer Commission
- Paul Ricchi, Emergency Management



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What MVP offers Municipalities

Preparedness for natural & climate hazards

Collaboration with stakeholders

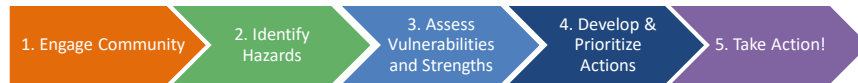
Education and planning

Grant funding for priority actions

4

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MVP Workshop



- Defined natural hazards Identified key features
- Determined vulnerabilities and strengths
- Developed and prioritized actions
- Next: Implement actions

5

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Workshop Participants

Municipal Government

- Mayor & Mayor's Office
- Lynn/EDIC
- Lynn Water & Sewer Commission
- Police
- City Council
- Community Development
- Conservation Commission
- Fire Department
- Lynn Community Health Center
- Lynn Economic Opportunity
- Lynn Housing Authority & Neighborhood Development
- Parks and Recreation Commission
- Planning Board
- Public Health
- Public Works
- Zoning Board of Appeals

Statewide

- MA Dept of Environmental Protection
- MA Emergency Management Agency
- MA Executive Office of Energy and Environmental Affairs
- MA Office of Coastal Zone Management

Federal

- National Guard
- U.S. Army Corps of Engineers
- US Environmental Protection Agency

Business

- Cataldo Ambulance Services

Academic Institution

- North Shore Community College

Media

- Daily Item

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Top Hazards Identified at the Workshop



**Heavy
Precipitation/
Inland Flooding**



**Sea Level Rise/
Coastal Surge/
Erosion**



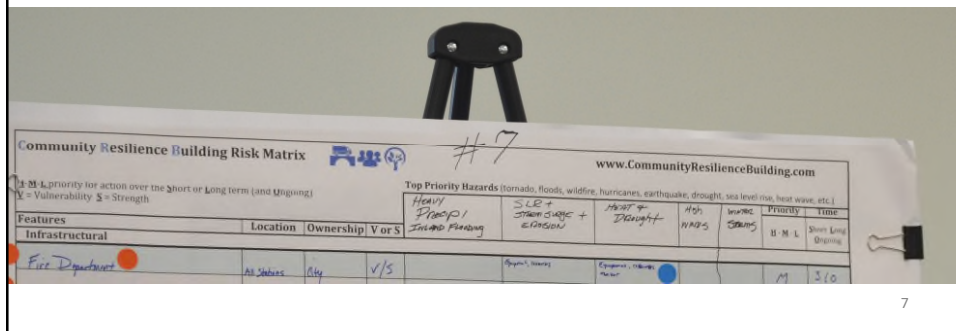
**Heat/
Drought**



**High
Winds**



**Winter
Storms**



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Climate Change Impacts

Higher Temperatures

**More Extreme
Precipitation**
(More droughts,
more floods)

**Sea Level Rise &
Coastal Surge**

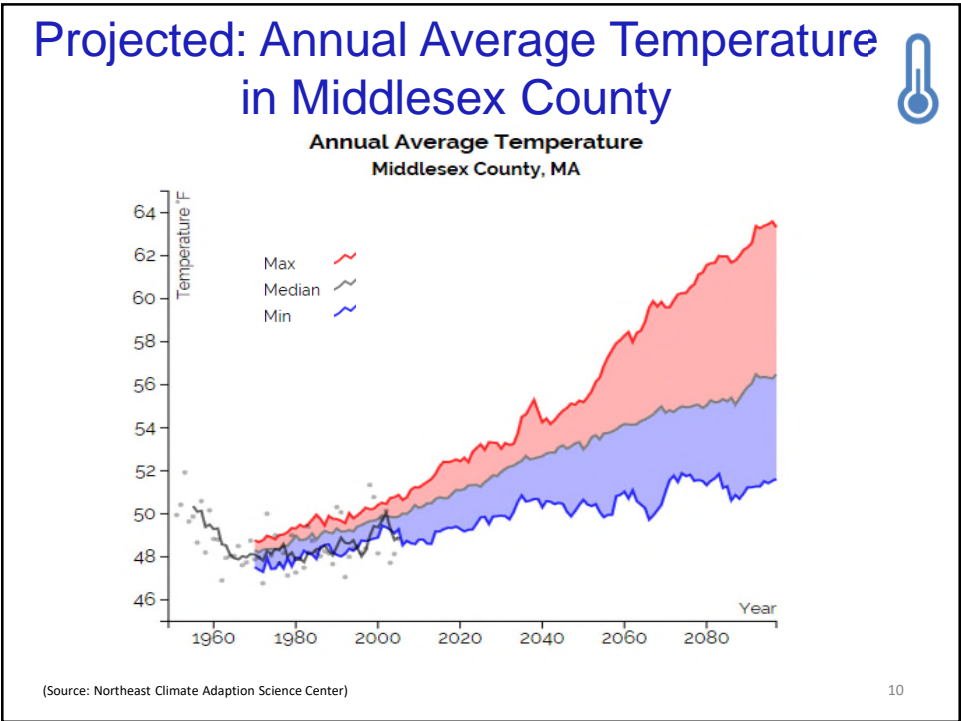
Goal: to protect infrastructure, environment, public health & safety, and economy

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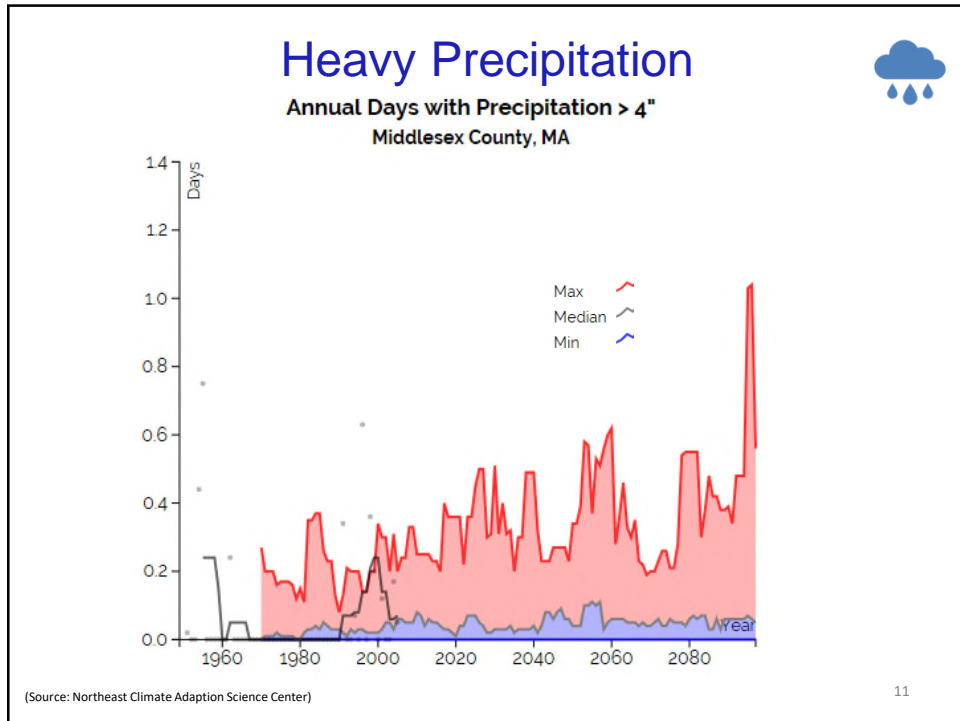
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Predicted Climate Change

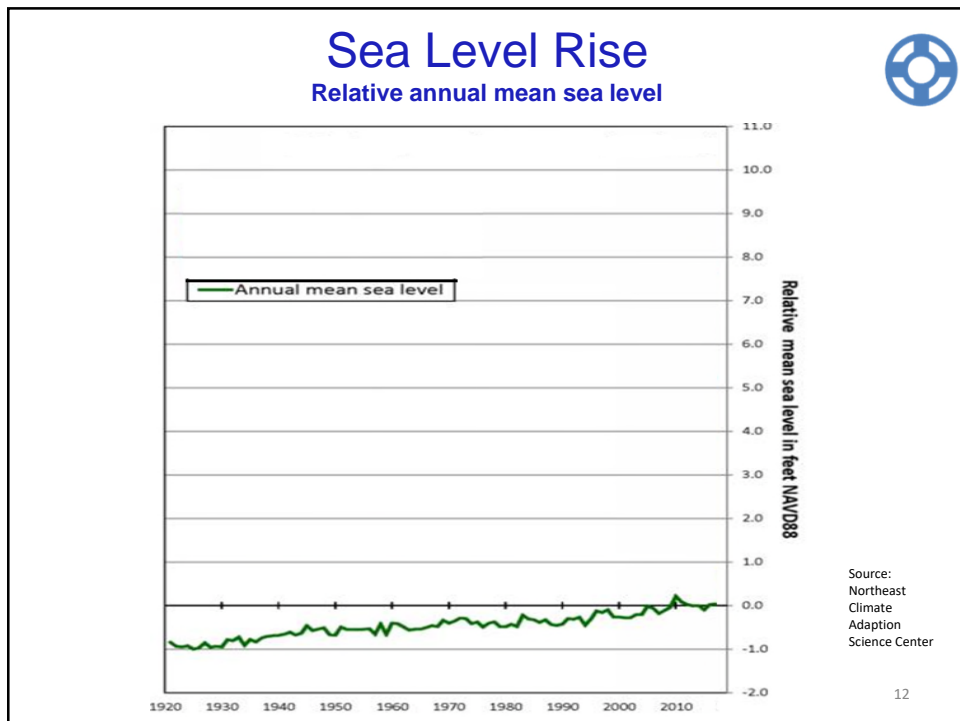
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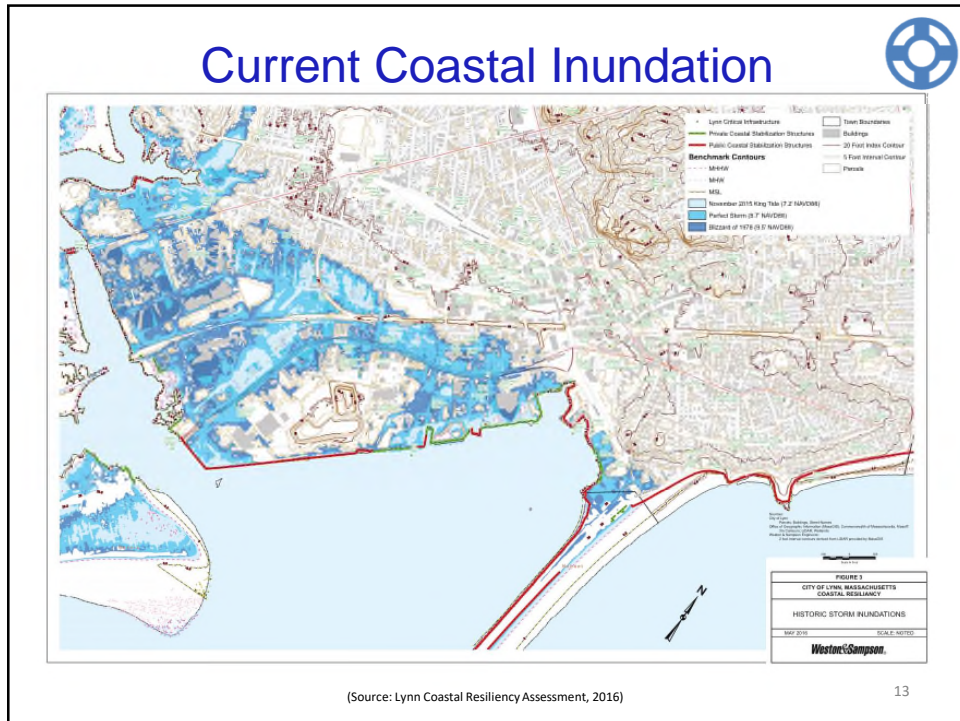
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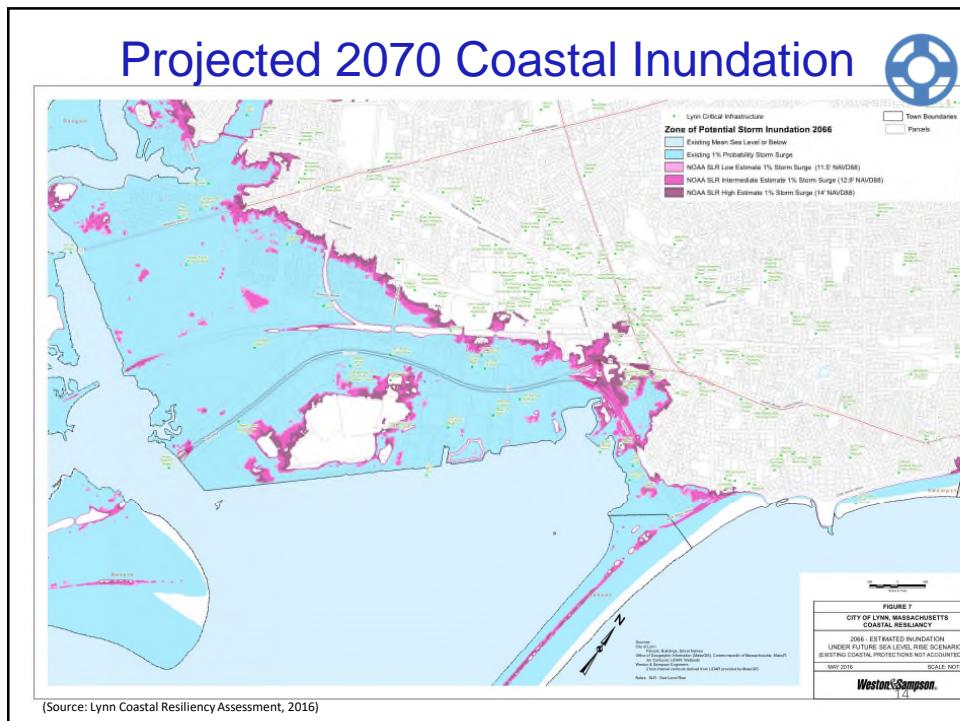
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Vulnerabilities



Infrastructural

- Stormwater drainage system & streets, including Lynnway, Boston St, Summer St, River St, Alley St, Lynn/ Nahant Rotary, Bennett St, Munroe St, Chestnut, Western Ave.
- Culverts, including Strawberry Brook
- Residential and commercial buildings, new development
- Wastewater collection and treatment system
- Utilities, including energy supply and distribution
- DPW facility including fueling station
- Bridges and bridge access points to City
- Railroad/commuter rail
- Schools
- Marina and seawalls
- Parking garages
- Fire Department
- Dams, Landfill
- Water transportation

Commercial Street



(Source: The Boston Globe, 2017)

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Vulnerabilities



Societal

- Students and teachers
- Low- to moderate-income population
- Immigrants and people with language barriers
- Mental health population
- People suffering emergency illnesses (no hospital)
- Commuters and people dependent on public transportation
- Pets
- Lynn Public School Food Service Program
- Greater Lynn Senior Services (GLSS)
- Industry and downtown businesses
- Senior centers and assisted living facilities
- Poor quality of housing stock
- Homeless
- Undocumented
- Disabled
- Elderly
- Children
- Homebound



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Vulnerabilities



Environmental

- Beach, coastline and estuaries
- Marshes, estuaries, and wetlands
- Erosion, including along Riley Way
- Forest system, including Lynn Woods
- Flooding and water quality contamination
- Reduced green space (increased impervious area)
- Saugus River
- Strawberry Brook
- Ponds
- Drinking water supply, including reservoir system
- Invasive species including phragmites and black algae
- Canada geese
- Contamination
- Insects and rodents



(Source: <https://lynnwoods.org>)

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Strengths



Infrastructural

- New development
- Police Department
- Fire Department
- Schools
- Utilities
- Dams
- Seawall
- Evacuation Routes
- Water Transportation
- Parking garages



Photo by John Galla www.firenews.org

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Strengths



Societal

- Elderly populations, living in retirement homes, assisted living, nursing homes, single family homes
- Children
- Ability to speak languages other than English
- City Agencies
- Schools and daycares
- People able to use public transportation
- Industry and downtown businesses
- Nonprofit organizations such as:
 - YMCA, Salvation Army, schools, churches, GLSS, Lynn Community Health Care, Lynn Public School Food Service Program, Visiting Nurses Association, Lynn Housing Authority and Neighborhood Development



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Strengths



Environmental

- Beach
- Saugus River
- Drinking water supply, including reservoir system
- Forest system, including Lynn Woods
- Ponds
- Parks
- Wetlands

Kings Beach



(Source: photograph by Toby McGuire, 2015)

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High Priority Actions

Protect the City's waterfront and marina from sea level rise and coastal surge.

- **Promote living seawalls and shorelines**, berms, green roofs and other strategies to increase resilience
- **Protect the City-owned marina** with a wave attenuator, living shoreline, or other energy dissipator
- **Continue ongoing evaluations of the seawall**

Kings Beach

(Source: Youtube)

21

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High Priority Actions

Reduce coastal, riverine and stormwater flooding

- Restore the **Strawberry Brook watershed**
- Promote the installation of **green infrastructure**
- Design and implement multi-purpose **flood storage** areas
- Evaluate **culverts** and increase their conveyance capacities.
- **Raise roads and bridges**
- Upgrade and maintain **drainage systems**
- Continue **combined sewer overflow separation**
- Restore **wetlands**
- Evaluate the City's **planning** tools and encourage use of green infrastructure, Low Impact Development, and climate change resilience

Kings Beach

(Source: Youtube)

22

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High Priority Actions

Explore and implement opportunities to enhance communication with and provide temporary shelter for vulnerable populations.

- Increased awareness of **places of cooling/warming** during emergencies
- Encourage personal **emergency and evacuation plans**
- Develop **outreach** and support programs to prepare homeless population for effects of natural hazards
- Better **identify and communicate with vulnerable**
- Engage **social service agencies** for education and outreach assistance in emergencies, and for contingency planning

Kings Beach

(Source: Youtube)

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High Priority Actions

- *Support implementation of **resiliency measures** developed through ongoing planning efforts*
- ***Study the Saugus River** area to evaluate strategies to reduce flooding, erosion and effects of extreme heat and water quality*
- ***Develop Area of Critical Environmental Concern Management Plan** to enable protection of natural resources and projects in the coastal area*



(Source: The Boston Globe, 2017)

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Medium Priority Actions



Source: https://www.ediclynn.org/documents/2018-12-10_Lynn%20Revised%20Waterfront%20Master%20Plan_Public%20Meeting%202.pdf

- ***Brush fire protection:*** clearing undergrowth and maintaining a new water tanker
- ***Comply with MS4 Stormwater Permit*** and upgrade the storm drainage system
- ***Bury utilities***
- ***Protect the wastewater treatment plant***
- ***Relocate the Department of Public Works' fueling station***

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Additional Priority Actions

- ***Repair and maintain emergency utilization of the parking garage at Market Street***
- ***Encourage the MBTA to redesign and raise the commuter rail line***
- ***Encourage MA Department of Conservation and Recreation to study and remove algae on the beaches***

Neptune Boulevard Park



(Source: City of Lynn Open Space Plan, 2016)

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Public Comments



- Comments accepted:
 - April 30, 2019 – May 30, 2019
- Send comments to Bill Bochnak
 - Email: wbochnak@ediclynn.org
 - Mail: Bill Bochnak
Project Coordinator
EDIC/Lynn
Lynn City Hall, Room 405
3 City Hall Square
Lynn MA 01901
 - Phone: (781) 581-9399

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Next Steps

- April 30, 2019 Listening Session
- May 21, 2019 Listening Session
- Comment Period April 30 – May 30, 2019
- Finalize Plan
- Send to the State for approval
- Apply for grants

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Thank You

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City of Lynn
Municipal Vulnerability Preparedness Planning Grant Project
Tuesday, May 21, 2019, 6:00 pm – 7:00 pm
MVP Listening Session Sign-In Sheet

Name	Affiliation	Email Address
MARY SWEENEY	LYNN RESIDENT	SUBSCRIPT@LYCOS.COM
Jeff Wheeler	LHAND	jwheeler@lhand.org
John Ladd	LHAND	jladd@lhand.org
Chris Reddy	Lynn Police	CHERRY@lynnpolice.org
Paul Ricci	LFD/EMD	PRICHI@lynma.gov
JAY WALSH	WARD 7	Codfish12361@yahoo.com
Joe MULLIGAN	TDI/MASDEV	jmuligan@masdevelopment.com
Kathy Baskin	Weston + Sampson	baskink@wseinc.com
William Buchna	EDIC-LYN	wbuchna@EDICLyn.org