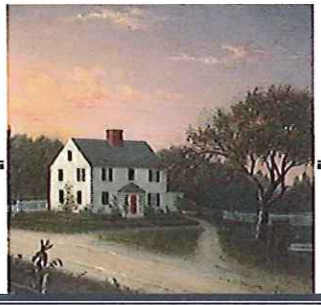
Municipal Vulnerability Preparedness:
Community Resilience Building Workshop Summary of Findings

September 2020

Town of Sterling, MA



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OVERVIEW

The Town of Sterling has taken an important first step toward building societal, environmental, and infrastructure resilience within their community by participating in the Municipal Vulnerability Preparedness (MVP) program executed through the Executive Office of Energy and Environmental Affairs (EEA). An MVP Planning Grant was awarded to the Town from the EEA, allowing Sterling to complete the planning steps required to earn designation as an "MVP Community" and begin the process of updating their Local Hazard Mitigation Plan (LHMP). This approach to municipal resilience and climate adaptation planning will allow Sterling to undertake a comprehensive planning process that employs local knowledge to identify natural and weather-related hazards, recognize the community's strengths and vulnerabilities, and prioritize actions to help mitigate damages and prepare them for the future. This successful MVP Planning effort results in a list of clear actions that Sterling can incorporate into the Town's Master Plan, the LHMP and work toward implementing to improve community resilience, thus reducing disaster recovery time and cost for the Town, the region, and the Commonwealth.

Domenica Tatasciore, the MVP Project Manager and Town Planner for Sterling, initiated the MVP planning process by assembling a Core Team to help lead the effort within the community. The Core Team met in February 2020 and in July 2020 to outline the primary goals and objectives for the MVP process, discuss integration with the LHMP and Town planning efforts, and plan for the right workshop format. The original workshop format was planned to be a full-day in person workshop on April 2, 2020. The in-person workshop was postponed due to COVID-19 restrictions on in person gatherings. Throughout the spring of 2020 discussion among the Core Team and the Regional MVP coordinator led to the decision to host the workshop in a virtual format. With the assistance of Pare Corporation, a certified MVP Provider, the Town prepared for the workshop by developing a list of attendees, compiling community background resources and mapping data, and setting an agenda that meets the goals of the program.

STERLING CORE TEAM

- Domenica Tatasciore, Town Planner
- Ross Perry, Town Administrator,
- Chief David Hurlbut, EMA Director and Fire Chief,
- Lieutenant Thomas Kokernak, Fire Prevention Officer
- Paul Lyons, DPW Superintendent
- Sean Hamilton, General Manager of the Sterling Municipal Light Dept
- Susan Aldrich, Sustainability Advocate and Community Member
- Veronica Buckley, Senior Center Director

A two-part virtual Community Resilience Building (CRB) Workshop was held on September 10, 2020 and September 17, 2020 from 9:00am-12:00pm via Zoom. A total of 26 community stakeholders in addition to the core team participated in the CRB Workshop (see full list of Attendees at the end of this document), divided into five breakout groups. Pare Corporation with assistance from Linnean Solutions provided one facilitator and one scribe for each group, which were also supplied with PDF reference map package (see Attachments). After an introductory presentation by the Lead Facilitator and the Town Administrator, the breakout groups dove into the main portion of the workshop.

The workshop followed the CRB framework, guiding each of the breakout groups through the following steps in the planning process:

- Identify past, current, and future impacts from natural hazards *(session #1)*
- Determine the highest-priority hazards *(session #1)*
- Identify the **infrastructural** vulnerabilities and strengths *(session #1)*
- Identify **societal** vulnerabilities and strengths *(session #1)*
- Identify **environmental** vulnerabilities and strengths *(session #1)*
- Identify and prioritize infrastructural actions *(session #2)*
- Identify and prioritize societal actions *(session #2)*
- Identify and prioritize environmental actions *(session #2)*
- Identify highest-priority actions for Sterling *(session #2)*

A Summary of Findings for the workshop is transcribed in the following pages, and outlines the thoughts, comments, and dialogue of the stakeholders that participated in the workshop. These findings were presented to the Town for public comment. A primary goal of the workshop was to identify the "Top Recommendations to Increase Resilience" in Sterling – a comprehensive list of these recommendations can be found in the following sections. At the conclusion of the CRB Workshop, the top four priorities for increasing community resilience were identified by workshop participants:

I. Water Supply System and Groundwater Quality
II. Roadway Improvements and Stormwater Management
III. Development Planning
IV. Emergency Services

The MVP process will allow the Town of Sterling to identify actions that can help address each of these priorities and incorporate them into the Town's long-term planning. This document outlines the process by which these priorities were identified, and which actions can be taken by the Town. The findings of the MVP workshop are anticipated to be integrated into the LHMP, creating a comprehensive planning document to guide the hazard mitigation and climate adaptation planning efforts within the Town of Sterling.

TOP HAZARDS FOR THE COMMUNITY

Top hazards for the community of Sterling were identified through an iterative process and input from a variety of community sources. Firstly, as part of the Community Characterization Survey that was distributed to workshop invitees, respondents answered two questions about past and future hazards impacting Sterling. The survey answers were compiled and presented in a word cloud to identify themes that emerged from the 15 respondents. The survey results and the graphic above were reviewed by the Core Team for discussion. The discussion from the Core Team resulted in a proposal for the top four hazards in the Town of Sterling. The Core Team's proposal, in addition to the above referenced resources, was presented to all workshop attendees. Discussion of the recent impacts that these natural hazards have had upon the Town of Sterling and the potential of increased threats due to climate change followed.

With minor adjustments to the Core Team's proposed top hazards, the workshop participants identified the final four hazards as the highest priority: **Extreme Weather Events, Loss of Biodiversity and Agriculture, High Intensity Rainfall**, and **Droughts (Lowering of the Water Table)**.

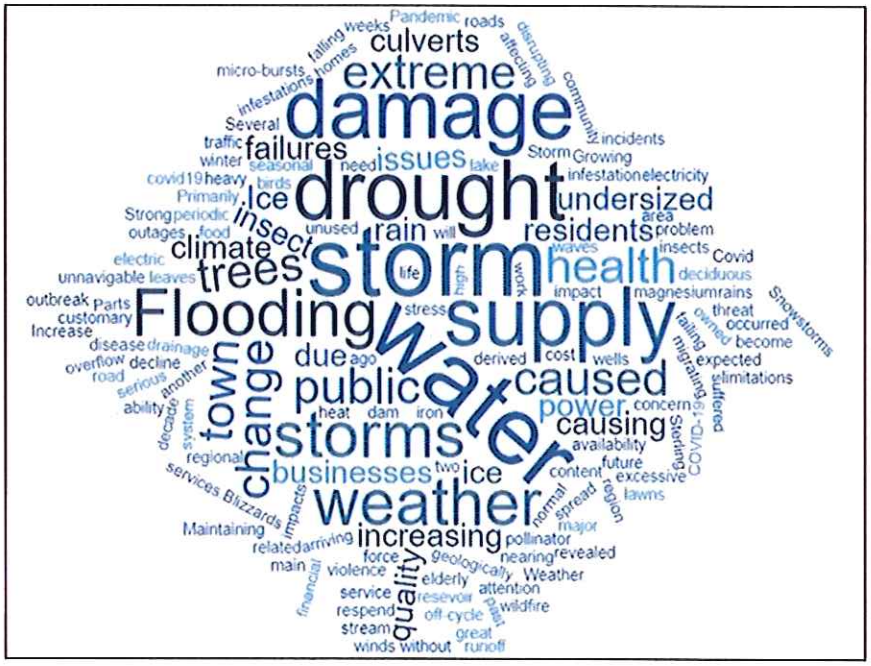


FIGURE 1 COMMUNITY CHARACTERIZATION SURVEY WORD CLOUD

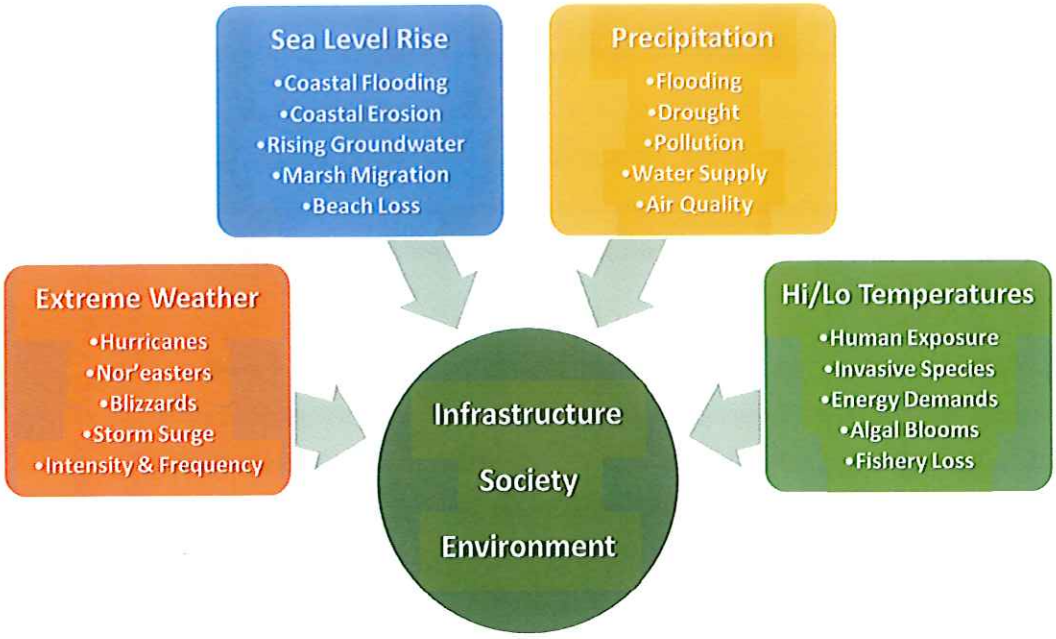


FIGURE 2 CLIMATE CHANGE HAZARDS IN MASSACHUSETTS

- **Extreme Weather Events:** Extreme weather events have the potential to interrupt the functioning of critical infrastructure including transportation networks, communication, and utilities. The frequency and intensity of extreme weather events is projected to keep increasing across New England.
- **Loss of Biodiversity and Agriculture:** Temperature increases projected over time have the potential to change the growing seasons and types of wildlife and crops that are able to persist in Massachusetts. The number of days with temperatures above 90°F is projected to increase by 6 to 22 days by 2050. Diseases within the flora and fauna can threaten biodiversity and disrupt agriculture and natural resources.
- **High Intensity Rainfall:** Increased precipitation has the potential to exacerbate Sterling's issues with flooding as a result of infrastructure capacity. The number of days with over 1" of precipitation is projected to increase by 8-10 days by 2050.
- **Drought (Lowering of the Water Table):** Drought conditions present an increased risk of wildfires, threaten biodiversity, impact town wells (Water supply), impact the local agricultural economy, and put vulnerable populations at risk of exposure.

TOP VULNERABILITIES AND AREAS OF CONCERN

During the CRB workshop, each group discussed vulnerabilities in each of the categories being addressed: infrastructure, society, and environment. Although there were vulnerabilities and strengths identified in each category by each group, there were three primary areas of concern that became evident during the discussion of the past impacts from natural hazards. These areas of concern, as identified by all workshop participants, are:

- **Wells and Water System:** The Town of Sterling's Water system consist of 4 wells, 2 water towers, and 68 miles of water main throughout Town. Approximately 80% of Town is serviced by the public water system and 20% of town is serviced through private wells. Every year, water capacity and quality in Town is a concern. Furthermore, as development in town expands, the permitted withdrawal rate through MassDEP is only projected to grow by 5% over time. The capacity, quality, and age of the infrastructure is a vulnerability for residents, especially for the fire protection system.
- **Roadways, Culverts and Stormwater Management:** The roadways throughout Town are in degraded condition primarily as a result of drainage concerns. Culverts and drainage network throughout Town are inadequate and lack the capacity to convey stormwater resulting in flooding during rain events and erosion leading to degradation of roadway quality. Particular areas of concern are Kendall Hill Road, Chace Hill Road, Swett Hill Road, and the Town Beach. Storm events can leave local roads impassable and not only washes out portions of the road itself, but the runoff contributes to washouts downstream at the Town Beach.
- **Land Use:** The various land uses currently existing in the Town of Sterling are an asset that is currently at risk. The Farming Land and farming community is vulnerable to economic and environmental pressure to convert land away from agricultural uses. The open space and forested land are currently owned primarily by DCR and provide ecological value and community character. Preservation of the agricultural land and open space is currently in conflict with the Town's interest in encouraging and enabling residential and industrial growth. Proper planning can set the Town of Sterling up for success to preserve land uses important to the town and efficiently enable growth.

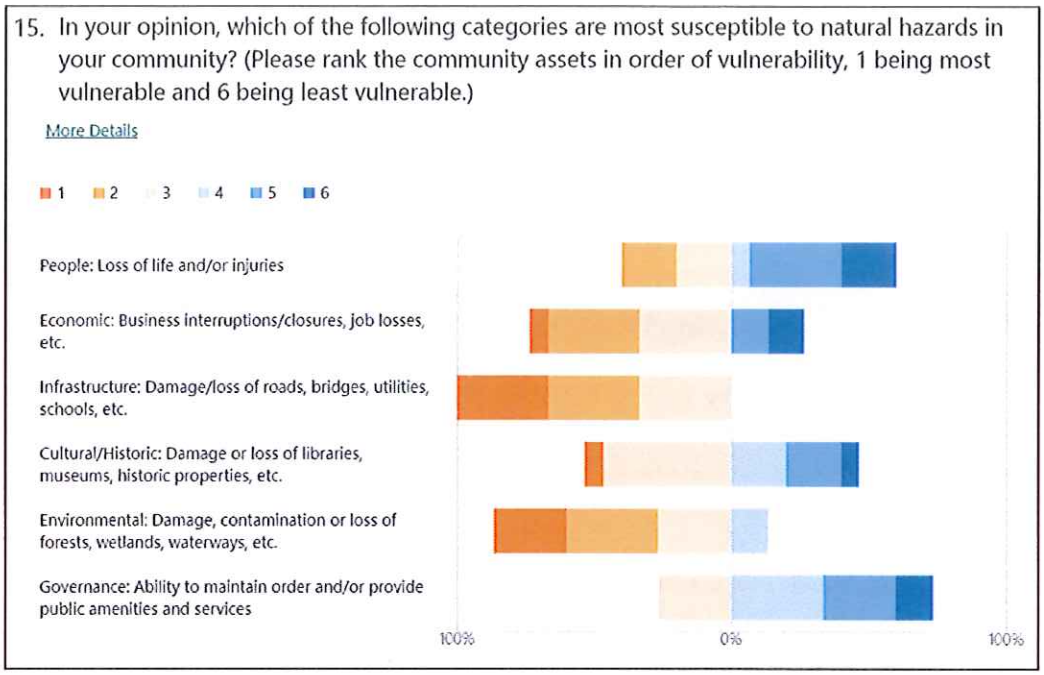


FIGURE 3: RESULTS OF THE COMMUNITY CHARACTERIZATION SURVEY QUESTION 15.

WORKSHOP RISK MATRICES

The risk matrices developed during the workshop have been transcribed and consolidated. The following tables include this compiled data, arranged by priority level:

Higher Priority

Category	Action
Infrastructure	**Water Utilities** • Implement an integrated water management plan to address vulnerabilities. (Create new well fields/update aged infrastructure/increase footprint) • Explore incentives for individual properties reusing grey water and stormwater • Build redundancy in water systems • Continue ongoing work to reduce salt use • Drill new municipal wells to bring them online (add to system for emergency and dry times • Consider incentives or requirements for the use of private irrigation wells instead of connection to potable water supply • Encourage water conservation (water ban, conserving fixture, meeting requirements, efforts have been successful) • Partner with Department of Conservation and Recreation (DCR) on stormwater Best Management Practices (BMPs), identify how to take advantage of rain to recharge aquifer • Start discussions with Massachusetts Water Resources Authority (MWRA) about buying in.
	Roadway Network/ Traffic Signals/Traffic • Asset Management Plan on roadways • Integrate local evacuation routes into regional plan (evaluate additional signage) • Additional mobile variable message signs • Consider impact/betterment fees • Dedicate town funding to maintenance & projects (match Ch90) • Plan for stormwater management strategically and identify funding for projects and maintenance
	Weather impact on routes in and out of town • Define forward-looking precipitation amounts for planning and design

	• Evaluate salt usage on winter roads • Resize culverts and stormwater system along with green infrastructure
	Culverts – Capacity/structure concern • Inventory of size and condition/compare to current design requirements and storms (Hydrology & Hydraulics), determine impact from dams • Culvert assessment/hydraulic analysis at specific locations • Asset Management Plan on culverts • Prioritize criteria (value provided by the culvert) • Seek financial assistance/complete design • Implementation • Plan for stormwater management strategically and identify funding for projects and maintenance • Consider impact/betterment fees • Upkeep relationship with DCR (permissions, training, etc.) • Improve conditions at the existing drainage outfall(s) at the center of town
	Power and Communication Systems • Place/relocate utilities underground (already underway in some locations) • Tree maintenance - continue and improve and find funding (work with DPW & SMLD) • Explore opportunities for higher quality internet service • Evaluate plan for local broadband, communication system through SMLD (fiber optic to each town building already ongoing)
Society	**Shelters** • Continue with annual emergency planning • Upkeep for Code Red system and radio system • Continue funding for upkeep of shelters • Evaluate alternative shelter facilities • Generator maintenance, establish approach for supplies (e.g., cots within the facility for various events) • Senior Center/Community education from EMD regarding responses • Develop Transportation plans to the shelters
	Evacuation Routes • Update/educate/mark route/publicize/ alternate route
	Sterling Village Nursing/Rehab • Assess capacity to assist the Town with special/higher need individuals - develop partnerships

	Domestic Animal Sheltering • Establish animal friendly shelters and communicate this to the public • Educate public about "go kits" necessary for domestic animals
Environmental	**Agriculture** • Generate methods to help keep farms in a position of future success (for example, matching future farmers with farms that may be in need, or funding creation of exit/succession strategy) • Share resources and collaborate with other local Towns for Agricultural preservation and long term planning
	Residential & Industrial Development & addressing "Sprawl" • Review opportunities for "smart growth" • Develop OSRD and cluster zoning bylaws • Forward looking planning (20+ years) & re-think zoning; promote certain kinds of development in certain locations (more attention to the northern edge of Rt. 12 and other areas)
	Stormwater Runoff • Address water quality, which is leading to turbidity, algae, and other problems • Bolster development permitting requirements with a focus on Low Impact Development and Green Infrastructure best management practices • Work with DCR to address watershed wide pollution concerns • Reduce salt use. Work to advance regional efforts in collaboration with DCR to address reduction of salt use • Pursue outfall drainage improvements • Increase homeowner education about stormwater runoff

Moderate Priority

Category	Action
Infrastructure	**Electric Utilities (Town owned with vulnerable substations)** • Revisit several streets with several old trees (forest management plan) • Review of substation locations to ensure they are not susceptible to flooding • Consider more battery backup • Assess/inventory/prioritize of current system

	• Encourage alternative power sources/preventive actions/demonstration projects • Conservation guidance from Town (education/promotion)
	Dams • Dams not in Town Ownership - Develop agreements to review reports as a major stakeholder • Work to fix the dams that are considered in serious condition • Carefully study impacts of dams and dam removal on water table elevations as it relates to water supply.
	I- 190 • Partner with DCR and other Wachusett watershed towns on getting state DPW and others to consider alternative salting and other road maintenance systems
	Bridges maintenance and structures • Inventory: How many State owned/how old/when inspected/impact from dams • Develop prioritization/Sterling communicate with MassDOT regarding state bridge concerns • Secure financial assistance and engage in design • Implementation
	Town Beach • Study drainage improvement • Utilize $1M bond for improvements (fix drainage & improve on strengths); Improvements to building at the beach (old buildings can be updated)
	Wastewater Disposal • The town is reliant entirely on aging septic systems. The Town has previously completed a Feasibility Study that recommends installing sewers to serve Route 12 and possibly the industrial park. Consider advancing work towards implementing new sewer system.
Society	**Faith based/community organizations/food bank** • Provide a bigger seat at the table as a stakeholder in town-wide issues • Formalize/identify partnerships to assess capacity, services, and accessibility • Assess partnerships to establish financial assistance • Assess partnerships to establish continued food distribution during storm events

	Recreation Facilities/Activities • Help the Recreation Department match the infrastructure to the projected program • Match the recreation plan with the open space plan
	Volunteer participation in town governance • Work more with natural volunteer organizations in town (e.g. Friends of the Library) • Be more clear about what a volunteer might do on a committee • Refresh the culture of volunteerism in town
	MART District Transportation Services • Enhance services with public/private partnership • Expand public transportation options, negotiate with Montachusett RTA
	Elderly Population (Sholan Terrace) • Plan for evacuation developed and implemented
	HMEA (adult daycare facility) • Education - make town residents aware of this facility (50+/- clients daily) • Plan for evacuation to be developed and implemented • Increase cooperation of the Town with the Facility owners
	Farming Community • Consider revisions to zoning, policy, or bylaws to reduce the pressure of development (e.g. change parcel size requirements) • Support farmers market and farm stands - continue to promote use of local products
Environmental	**Conservation Land – Open Space** • Generate accurate inventory of existing properties (prepare acquisition/protection plan for future green spaces) • Explore opportunities for Community Preservation Act • Provide tools for access to quicker funding in case properties become available
	Contamination • Updated contingency plan to account for potentials of contamination • Explore salt reduction techniques on roads • Explore chemical use reduction in orchards • Training/education materials outlining contamination impacts on the community
	Flooding • Join mosquito control efforts at the State level • Work across agencies to identify and implement solutions

	• Consider forming an Environmental Advisory Committee (with potential purview in conjunction with Conservation Commission and Department of Public Works Board)
	Chemical/Fertilizer runoff from residential land and agriculture • Educate community on proper practices for fertilizers and gardening practices • Restrict pesticides
	Wildlife • Development management & restrictions on development considering wildlife corridors

Lower Priority

Category	Action
Infrastructure	**Medical Facilities/Emergency Management/Shelters** • Explore backup generators at sheltering locations
	Airport/Sterling Fair/Town Mtg Location • Determine how protect the wide open field • Improve snow removal
Society	**Code Red System/Alert System** • Explore backup system in case of power outages/phone outages • Advertise/marketing for people to sign up and to receive information • Define an emergency contact protocol for town-wide communications • Town website updates potentially needed
	Vulnerable Populations • Explore consolidated mental health/public health plan for the community
	"Isolated Neighborhoods" (outside of hydrant district) • Explore ways to reduce response times to these areas for first responders
Environmental	**Soil Erosion/Crop Damage** • Collaborate with Farmers to develop educational resources about farming techniques inclusive of plowing and irrigation
	Trees/Biodiversity/Habitat • Maintenance of both open space and woodland space to provide diverse habitats • Develop open space, residential, cluster bylaw

	• Uphold cooperation with Land Trusts and DCR who currently manage and plan forest land to prevent biodiversity loss • Consider managed replanting • Consider a forest management plan
	Orchards/Farms • Collaborate with Farmers to develop educational resources about farming techniques inclusive of crop selection, pesticides etc.
	Fire access to forested areas • Establish right-of-ways/agreements for fire access (discontinued or abandoned roads) • Currently have 4 fire vehicles for woods - maintain this fleet • Continue to monitor fire towers • Increase public education
	Surface Water (Wachusett Reservoir) • Work with managers of Wachusett Reservoir as needed

TOP RECOMMENDATIONS TO INCREASE RESILIENCE:

The last portion of the CRB workshop engaged all stakeholders in a discussion of the actions and priorities identified by each of the five break out groups. Each of the groups identified three actions as their highest-priority actions to increase community resilience in Sterling. The actions as they were being reported by each group representative were recorded on a virtual note board. As part of the overall discussion, the actions listed by each group were sorted into four categories and color coded to aid in the identification of themes. The actions presented by each group varied in breadth and scope but seemed to fall within four major categories: Water Supply System and Groundwater Quality, Roadway Improvements and Stormwater Management, Emergency Services, and Development Planning. Top recommendations to increase resilience have been identified by workshop participants and are presented in the following categories:

I. Water Supply System and Groundwater Quality:

Wrap-up discussions among all five workshop breakout groups identified the following actions as top priorities under this category:

- Inventory and assess the existing infrastructure components and identify and prioritize improvements.
- Increase redundancy of the water system by investigating and establishing additional wells and exploring opportunities to work with MWRA.
- Engage in cross agency planning and implementation of Low Impact Development and Green Infrastructure as a way to use stormwater to recharge groundwater and protect groundwater quality.
- Identify and implement ways to reduce town wide water use over time such as required water efficient design, removal of irrigation systems from town water, and encouraging greywater and stormwater reuse.

II. Roadway Improvements and Stormwater Management:

Concerns surrounding roadway conditions and stormwater management also ranked as a top priority, and included several actions to help improve resilience:

- Implement local regulation changes requiring updated rainfall standards to be used for the hydraulic design of stream crossings and other stormwater related infrastructure, so that climate change is adequately captured in the design conditions.
- Work with MassDOT and DCR to address water quality from I-190.
- Study and implement resizing of culverts and stormwater system.
- Consider a wholistic approach for design, implementing, and maintaining Green Infrastructure Stormwater systems throughout Town. Particularly funding and programs for maintenance will need to be identified.
- Consider the use of impact/betterment fees for new development to support public infrastructure funding.
- Develop an Asset Management Plan for Roadways, Culverts, and Stormwater Infrastructure.
- Execute projects to address roadway drainage issues and downstream washout at critical areas including Swett Hill Road and the Town Beach.

III. Development Planning:

Protecting Agricultural Land and forested open space through development planning emerged as the third highest priority category for potential actions. Actions in this category relate to supporting the farming community, protecting the natural resources of the Town, while also encouraging responsible development. In this category, the following actions emerged as priorities:

- Establish an Environmental Advisory Committee in Town to consider environmental impacts of land use and development decisions in Town.
- Review opportunities for "smart growth." Consider updating land use planning and zoning to plan for future development including growth of uses including residential, industrial, etc. Work to address sprawl control to help densify, encourage affordable housing, preserve open space.
- Work to disincentivize the loss of farms. Encourage water saving farming techniques, work to alleviate the pressure of development, and foster continuity of farming across generations.

IV. Emergency Services:

Concerns surrounding emergency response and providing security in the event of acute events within Sterling also ranked as a top priority, and included several actions to help bolster the existing Emergency

Response efforts for the future. Specific discussion and consideration was given to the fact that Sterling has an aging population that needs to be considered and accommodated in cases of emergency and otherwise:

- Increase upkeep and awareness around the existing evacuation routes, shelters, and emergency plans that are already in place.
    - Consider developing a central repository for Town information and a marketing plan for Municipal and Townwide dissemination.
- Address financial burden of extreme weather events by mitigating impacts and funding recovery.
- Establish animal friendly shelters and communicate this to the public, educate public about "go kits" necessary for domestic animals.
- Identify and engage vulnerable populations (e.g. Sholan Terrace population and HMEA Adult Daycare Facility) to improve access to essential emergency services during a major hazard event.
- Conduct a facilities inventory and assessment to assess sheltering capacity and identify potential improvements to expand capacity.

Core Team:

- Domenica Tatasciore, Town Planner (and project manager)
- Ross Perry, Town Administrator
- Chief David Hurlbut, EMA Director and Fire Chief
- Lieutenant Thomas Kokernak, Fire Prevention Officer
- Paul Lyons, DPW Superintendent
- Sean Hamilton, Gen Manager – Sterling Municipal Light Department
- Susan Aldrich, Sustainability Advocate and Community Member
- Veronica Buckley, Senior Center Director

Facilitation Team:

PARE CORPORATION

- Lindsey Machamer, PE – Lead Facilitator, Pare Corporation
- Matthew Bellisle, PE – Pare Corporation
- Lance Hill, PE – Pare Corporation
- Andrew Cummings – Pare Corporation
- Jim Newman – Linnean Solutions
- Amy Gerhard – Pare Corporation
- Nicole Capistran – Pare Corporation
- Brandon Barry – Pare Corporation
- Patricia Teeter – Pare Corporation
- Lydia Neitlich – Pare Corporation

Workshop Participants:

- Sarah Culgin – Building Commissioner
- Arden Sonnenberg – Select Board
- Kimberly Archambault – Sterling Skilled Nursing
- Cathie Ryan – Resident
- Neal Davidson – Hope Chapel
- Peder Pedersen – OSIC
- Bob Kimball – Resident
- Janet Segur – Sterling Grange
- Gerson Cintron - North Central Mass Housing Authority - Director of Facilities
- Jim Emerton – Fire/EMT
- Linda Woodland – School Committee
- Lou Massa – Animal Control
- Phil Holman – First Church
- Pat Campebell – Library Director
- Matt Marro – Conservation Agent
- Kelley Freda – DCR
- Pete Monchamp – Resident
- John Kilcoyne – Resident
- Weymouth Whitney – SHA & Resident
- Dick Maki – Resident
- Joyce Hinkley – Resident
- Erik Ares – Fire/EMT
- Kristen Dietel – Recreation Director
- Everett Heller – Finance Committee
- Lacy Gillotti – NEADS, Inc.
- Bob Dumont – MPC

Acknowledgements:

The Sterling MVP Workshop has been funded in part by the Massachusetts Executive Office of Energy and Environmental Affairs through an MVP Planning Grant, awarded to the Town of Sterling during the fiscal year of July 2019 through June 2020 with an extension through June 2021.

The Town of Sterling contracted with Pare Corporation to assist in planning and conducting the CRB workshop in Originally planned for April 2020 and rescheduled to be September 2020. Pare Corporation and Linnean Solutions partnered to provide MVP-certified staff to facilitate the workshop and prepare this Summary of Findings.

Integration with the Local Hazard Mitigation Plan:

A Local Hazard Mitigation Plan was approved for the Town of Sterling in 2016 and requires an update. This Community Resilience Building process will be utilized as a first step in updating the Local Hazard Mitigation Plan. The hazard assessment and mitigation goals of the 2016 plan will be updated to reflect mitigation actions taken to date. In addition, the findings outlined in this report will be incorporated into the Updated Local Hazard Mitigation Plan, so that resilience and climate adaptation are reflected in the Town's mitigation goals and implementation plan.

Suggested Citation:

Town of Sterling. 2020. Sterling Municipal Vulnerability Preparedness Workshop Summary of Findings. Prepared by Pare Corporation, Foxborough, MA.

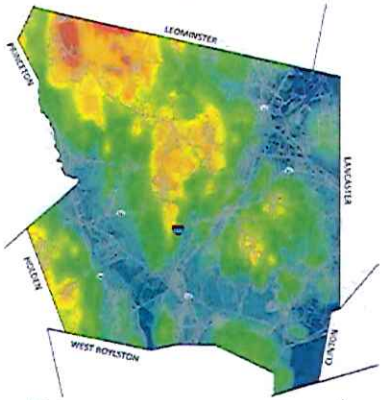
Appendices

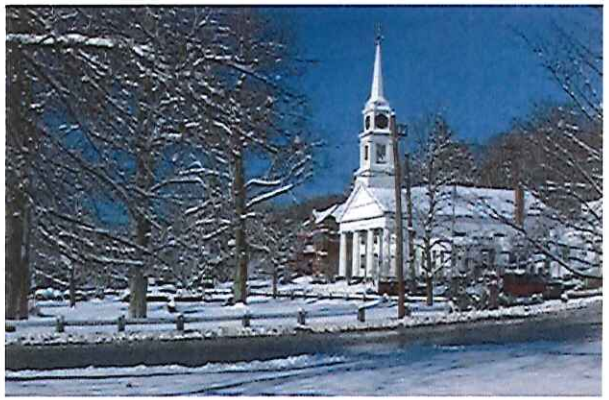
- Workshop Introductory Slide Show
- Workshop Agenda
- Reference Maps
- Base Maps
- Workshop Group Matrices
- Survey Results
- Prioritized Actions

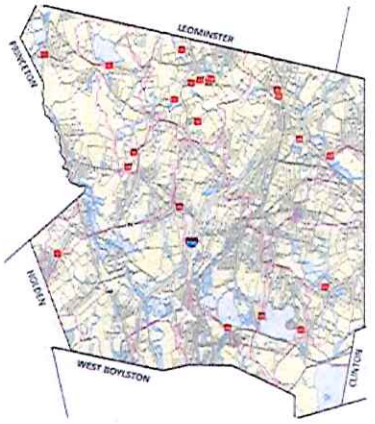
Appendix A: Workshop Presentation

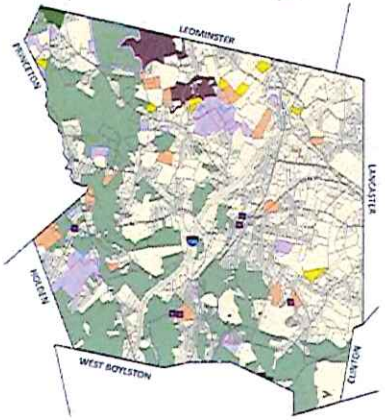
TOWN OF STERLING, MA

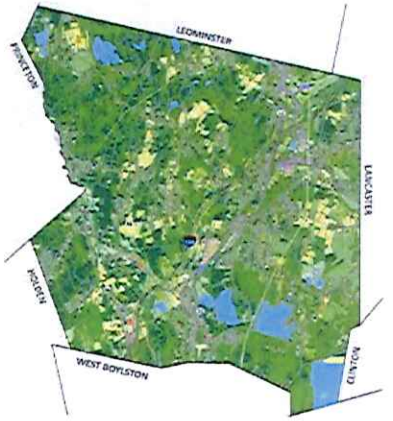
Municipal Vulnerability Preparedness





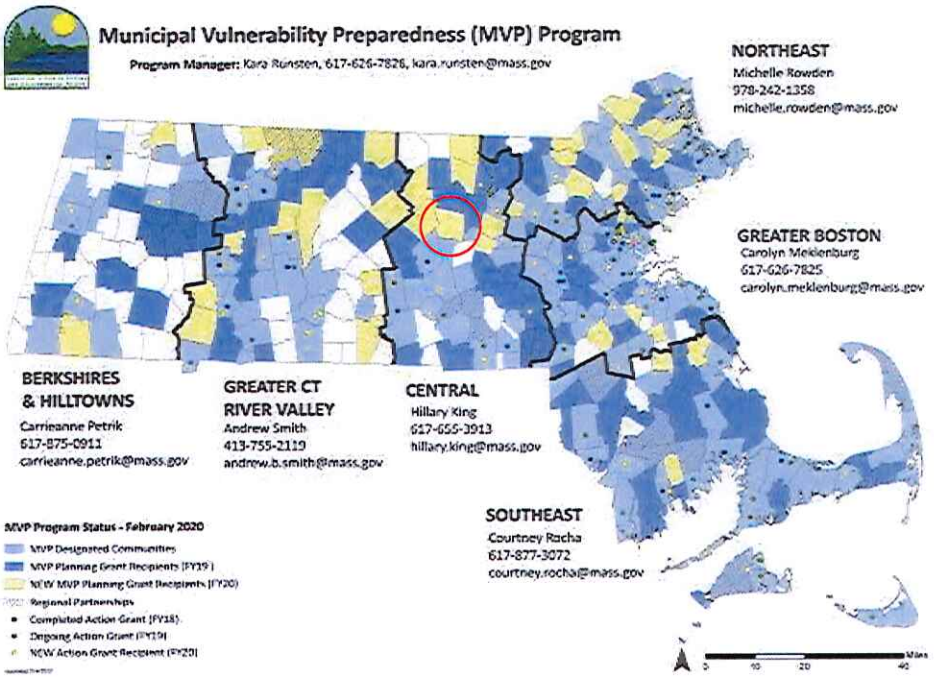






What is the MVP Program?

- **Community** led process
- Reinforces Town **partnerships**
- Informs **statewide** efforts
- Additional **funding** opportunities
- Designated **"MVP Community"**
- **Leverages existing efforts**
- Integrates MVP with **Hazard Mitigation Plan**



MVP Planning Outcomes

- MVP Summary of Findings / **Resilience Plan**
- Public **Listening Sessions**
- Prioritized **implementation plan**
- **MVP Action Grant candidate projects**
- Updates every five years
- Community **accountability**
- **Updated HMP Plan**, incorporating resilience and climate adaptation

The MVP Planning Format

- The Core Team & Background Materials
- Characterization Survey
- **Characterize Hazards**
- **Small Group Workshop**
  - Identify Community Vulnerabilities & Strengths
  - Identify Community Actions
  - Prioritize Community Actions
- **Discuss & Identify Top Three Actions**
- Combine Information, Prepare Draft Reports
- Public Engagement Period
- **IMPLEMENTATION**

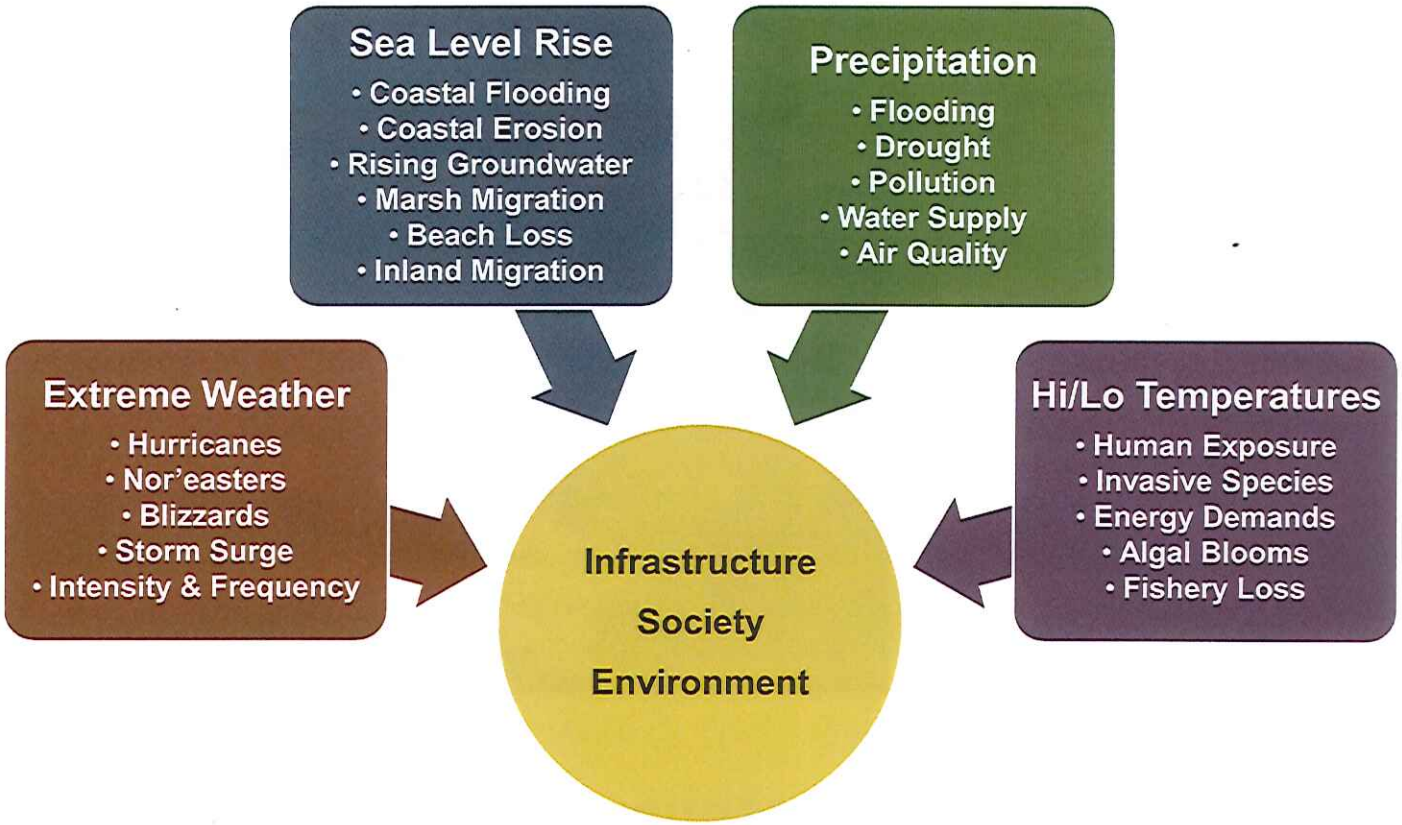
Today's Agenda

September 10th, 2020

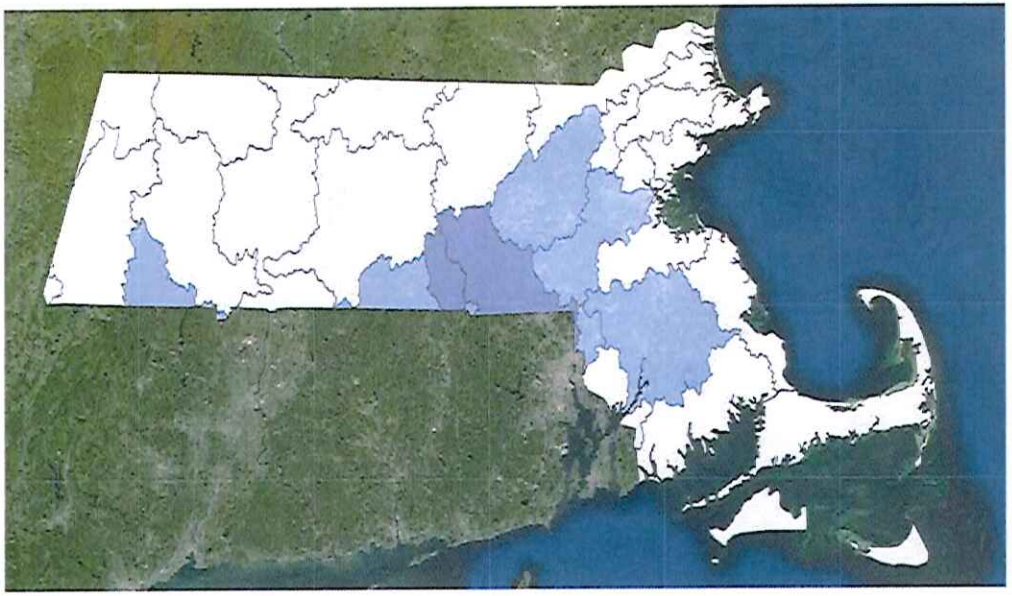
8:50-9:00	*Logon & Zoom Familiarity*
9:00-9:30	Welcome & Introduction • Workshop Overview • Climate Change introduction
9:30-9:45	Characterize Community Hazards & Select Priority Hazards (Full Group)
9:45-10:00	Review community resources • Overview of Maps & Matrix • Group Facilitator Introductions, Group Instructions
10:00-11:30	Breakout Groups: • Identify Community Vulnerability & Strengths - ~30 minutes per category (Environment, Infrastructure, and Society) • ***15 minute break at 10:30*
11:30-11:55	Reconvene in Full Group • Report from each Breakout Group
11:55-12:00	Closing Remarks & Wrap Up & Best Participation Prize!

WHY WORRY ABOUT CLIMATE CHANGE IF WINTERS ARE STILL COLD??

Perceived Natural Hazards

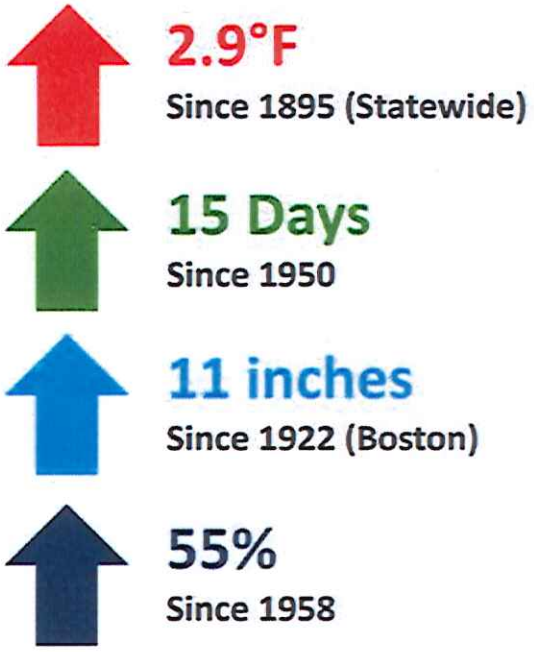


Climate Change in Massachusetts



- Extreme Weather
- Sea-level Rise
- Changes in Precipitation
- Rising Temperatures

Massachusetts
Observed Climate Changes



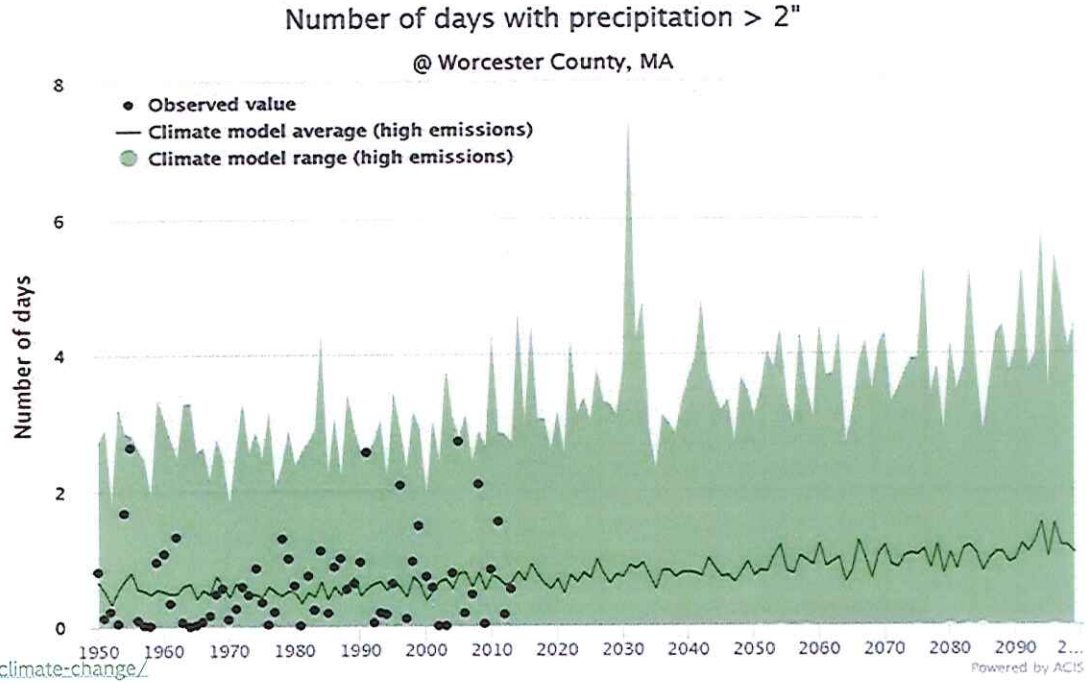
Extreme Weather

- **Mar – Apr 2010:** A series of severe storms and flooding events throughout Massachusetts
  - Widespread rainfall, causing small streams to rise above their flood stages
  - Over $145 million received in individual and public assistance
- **Aug 2011, Tropical Storm Irene:** tropical storm producing heavy rain in Western Massachusetts
  - Average of 10 inches of rain in Western Mass
  - Power outages peaked at more than 500,000
- **Feb 2013, Winter Storm Nemo:** Blizzard producing widespread heavy snowfall throughout the state
  - Widespread snowfall greater than two feet, with snowfall rates of one to two inches per hour at time
  - Nearly 400,000 customers lost power
  - Over $43 million received in public assistance
- **Jan 2015, Winter Storm Juno:** Winter storm breaking daily snowfall records throughout MA

Changes in Precipitation

› Projections show increasing days of higher precipitation totals per year

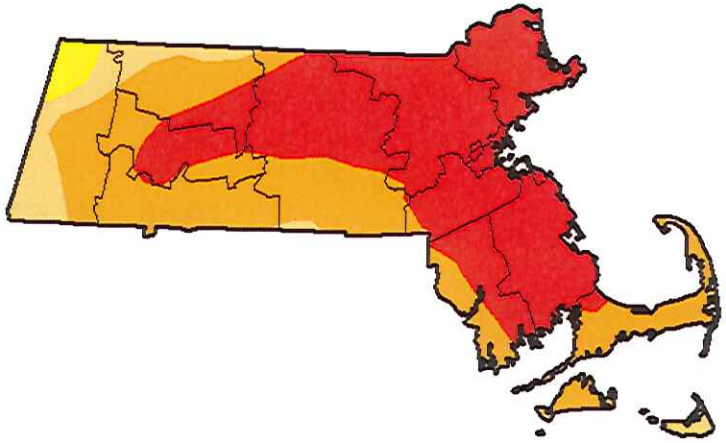
Climate Indicator		Observed Value 1971-2000 Average	Mid-Century Projected Change in 2050s	End of Century Projected Change in 2090s
Days with Precipitation >1"	Annual	7 days	Increase by 10-42% 8-10 more days per year	Increase by 15-55% 8-11 more days per year



http://climatesmartfarming.org/tools/csf-county-climate-change/

U.S. Drought Monitor

Massachusetts



October 4, 2016

(Released Thursday, Oct. 6, 2016)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	98.15	89.95	52.13	0.00
Last Week 9/27/2016	0.00	100.00	98.15	89.95	52.13	0.00
3 Months Ago 7/5/2016	0.70	99.30	54.99	29.65	0.00	0.00
Start of Calendar Year 12/29/2015	22.85	77.15	26.34	0.00	0.00	0.00
Start of Water Year 9/27/2016	0.00	100.00	98.15	89.95	52.13	0.00
One Year Ago 10/6/2015	22.34	77.66	13.81	0.00	0.00	0.00

Intensity:

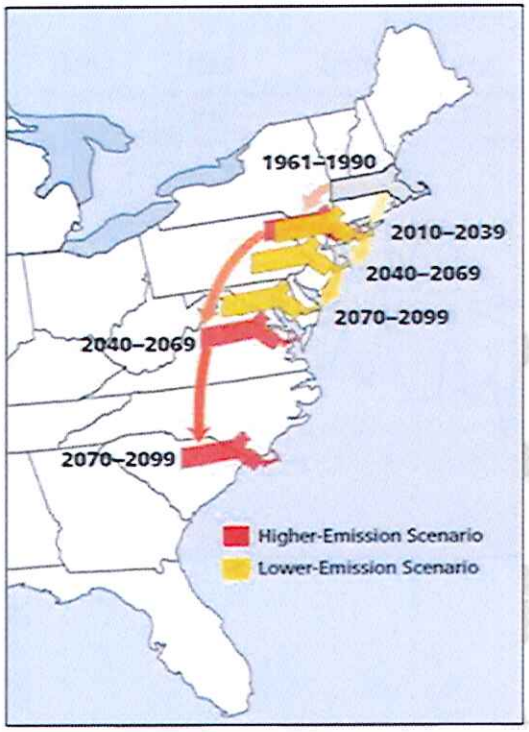
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

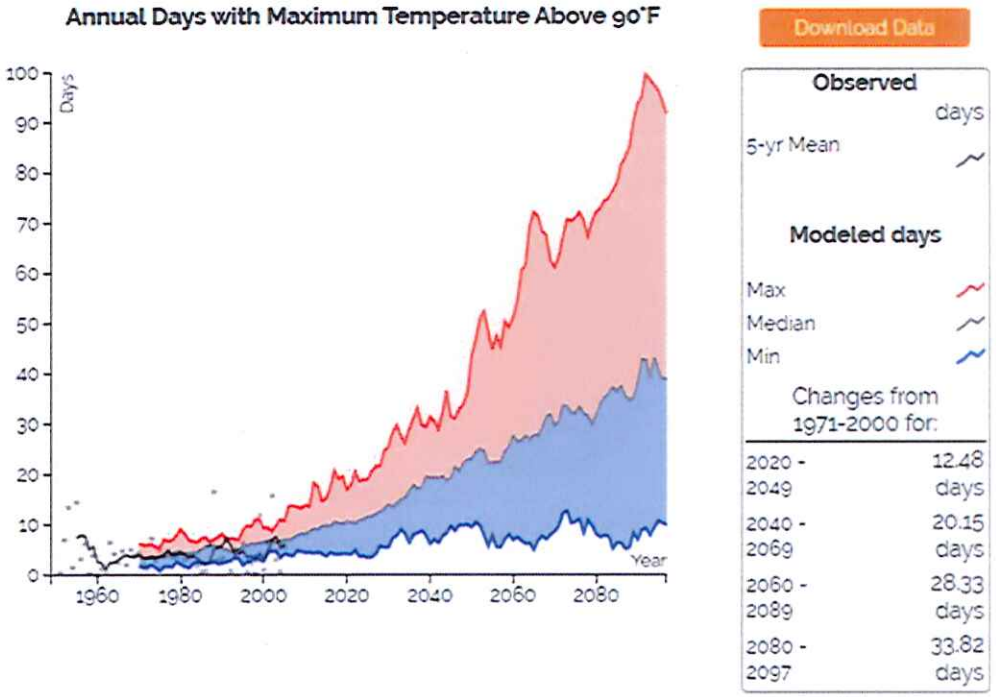
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Brian Fuchs
National Drought Mitigation Center

http://droughtmonitor.unl.edu/

Rising Temperatures





Download Data

Observed

days

5-yr Mean

Modeled days

Max

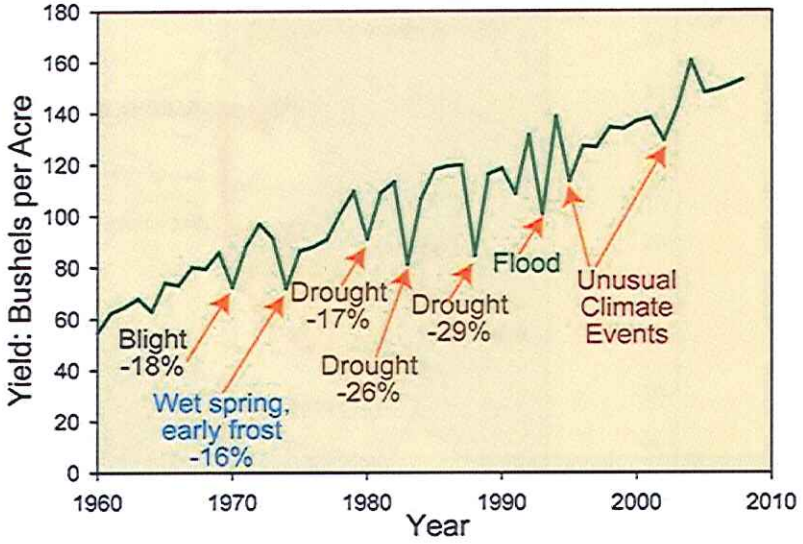
Median

Min

Changes from 1971-2000 for:

2020 - 2049	12.48 days
2040 - 2069	20.15 days
2060 - 2089	28.33 days
2080 - 2097	33.82 days

AGRICULTURE



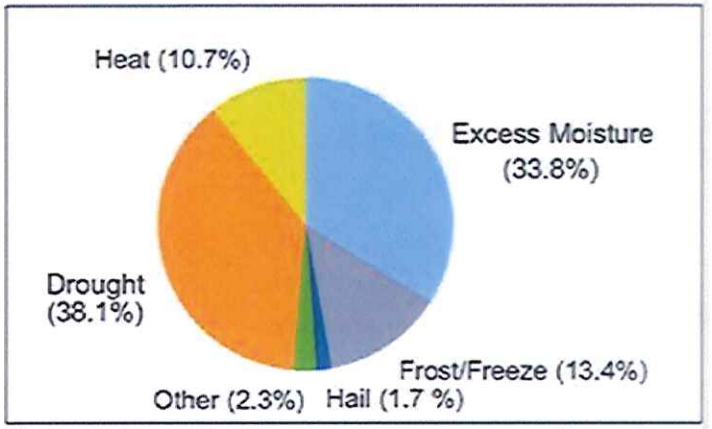
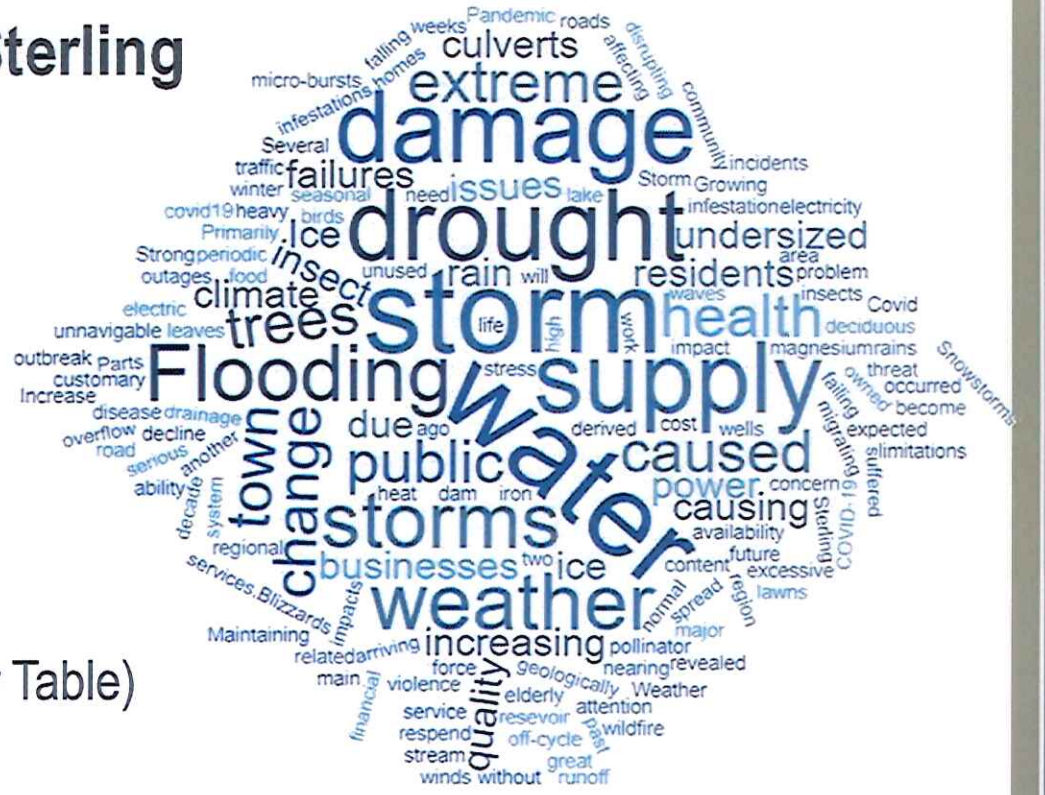


Figure 4. Categorization of weather-related crop losses in the northeastern U.S. from 2013 through 2016 (Wolfe et al., 2018)

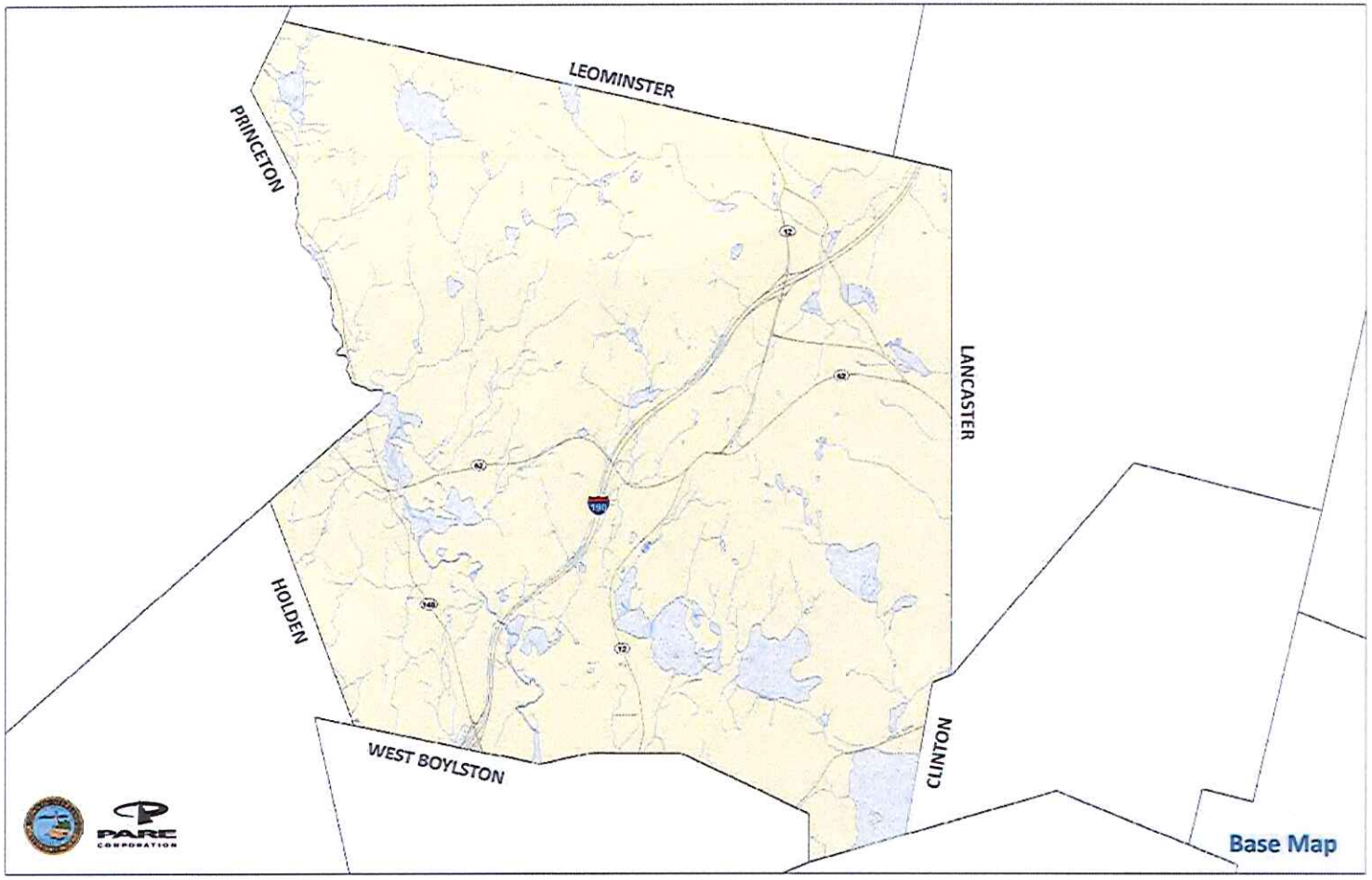
Priority Hazards in Sterling

- Extreme Weather Events
  - Ice storms, microburst, tornadoes
- Loss of biodiversity and agriculture
  - Temperature changes
  - Pest and disease
- High Intensity Rainfall
  - Stormwater control, flooding
- Droughts (Lowering Water Table)
  - Drinking water supply and quality
  - Fire risk



Workshop Resources

- Base Map
- Map Booklet:
  - Facilities
  - Land Use
  - Hydrology & Flooding
  - Topography
  - Natural Resources
  - NE Landscape Futures
- Nature Based Solutions


LEOMINSTER
PRINCETON
LANCASTER
HOLDEN
WEST BOYLSTON
CLINTON
Base Map

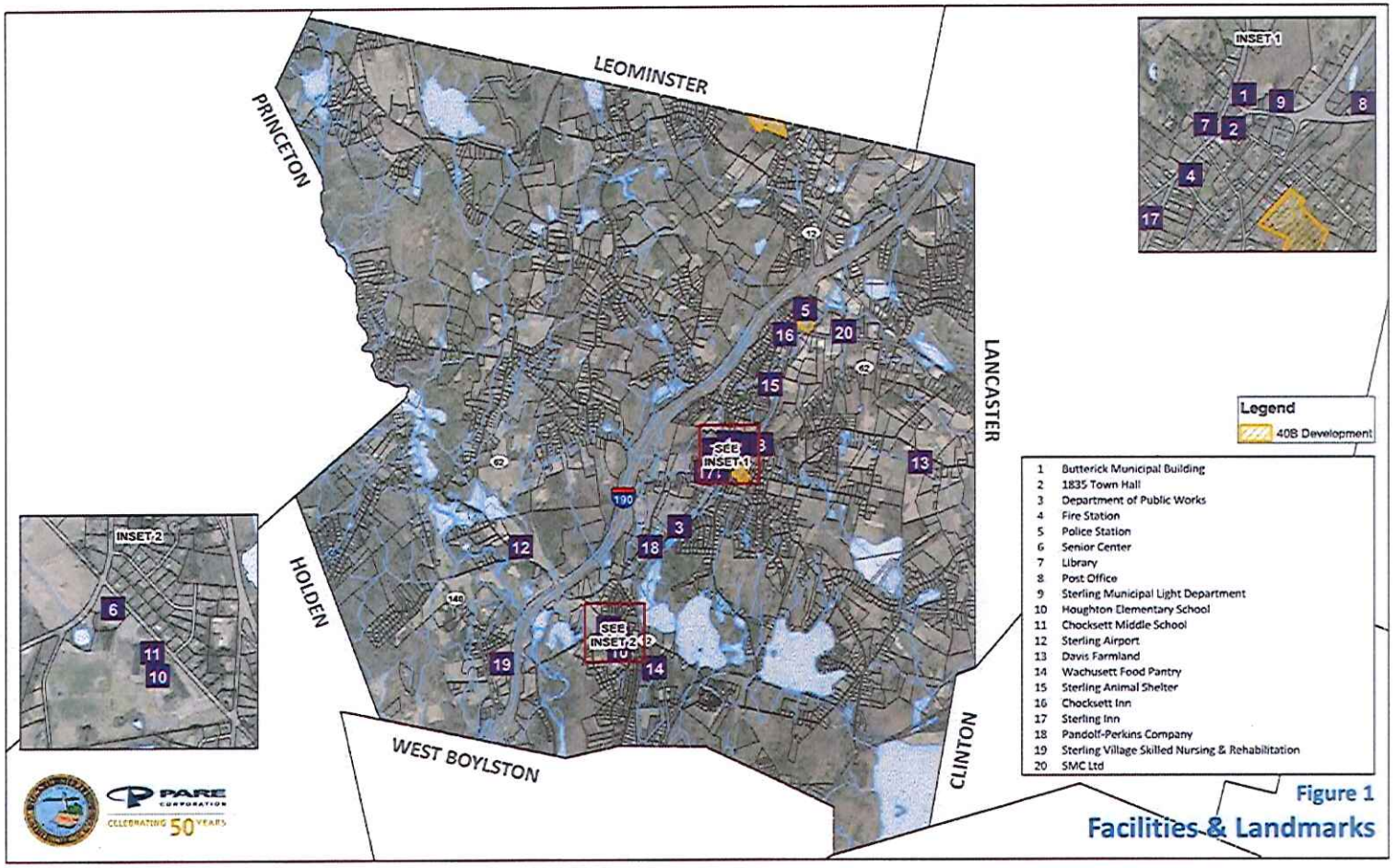


Figure 1

Facilities & Landmarks

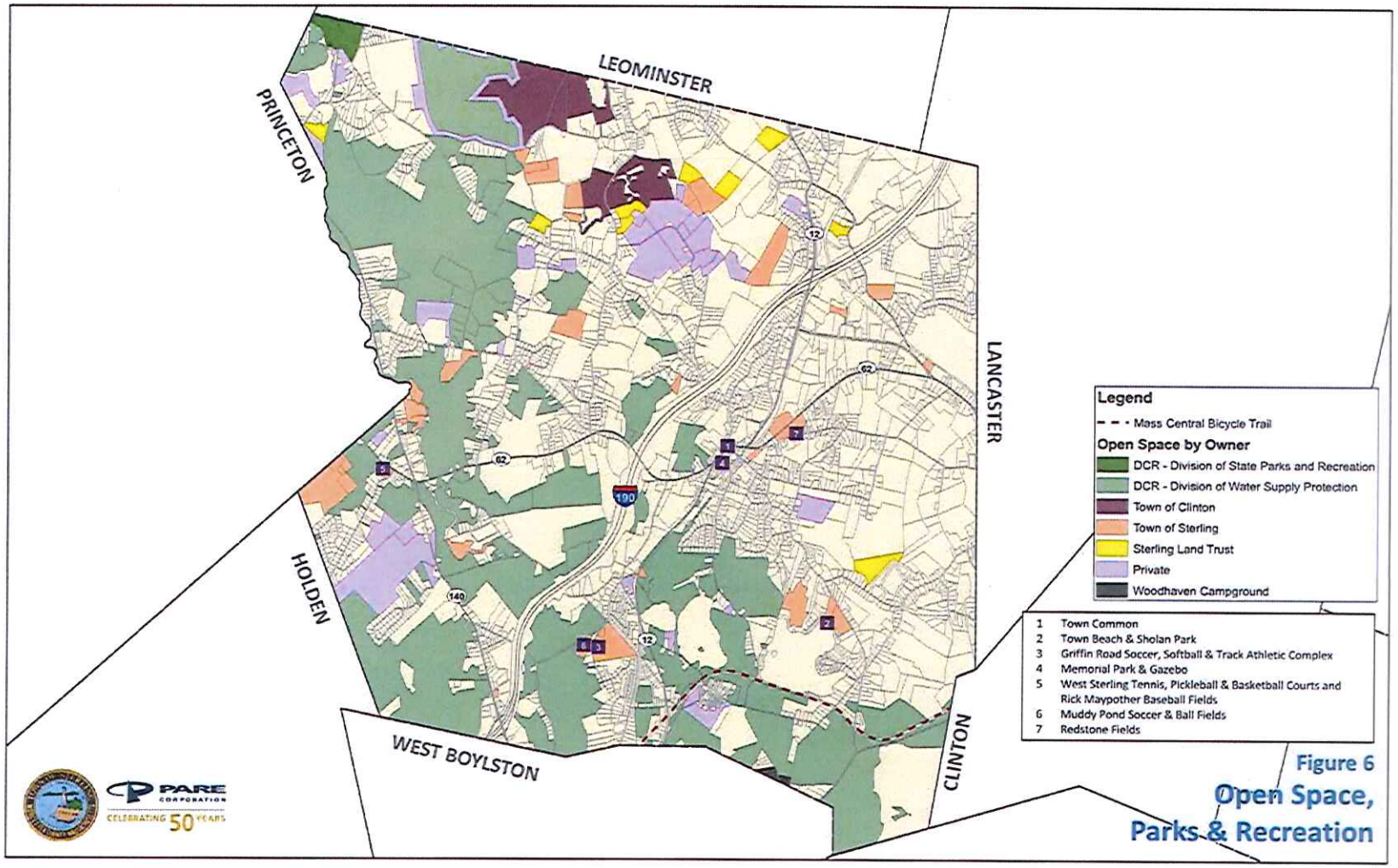


Figure 6

Open Space, Parks & Recreation

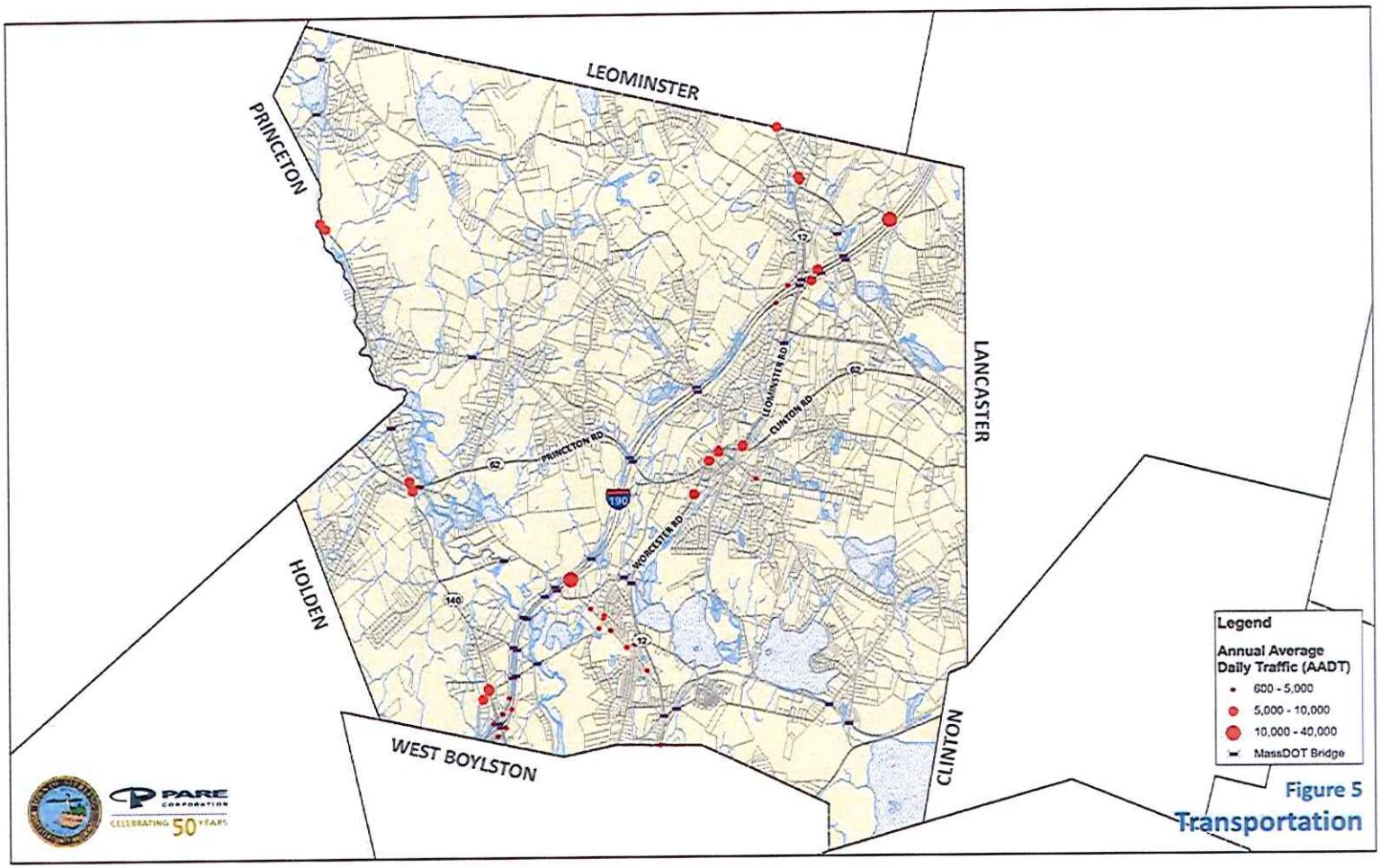
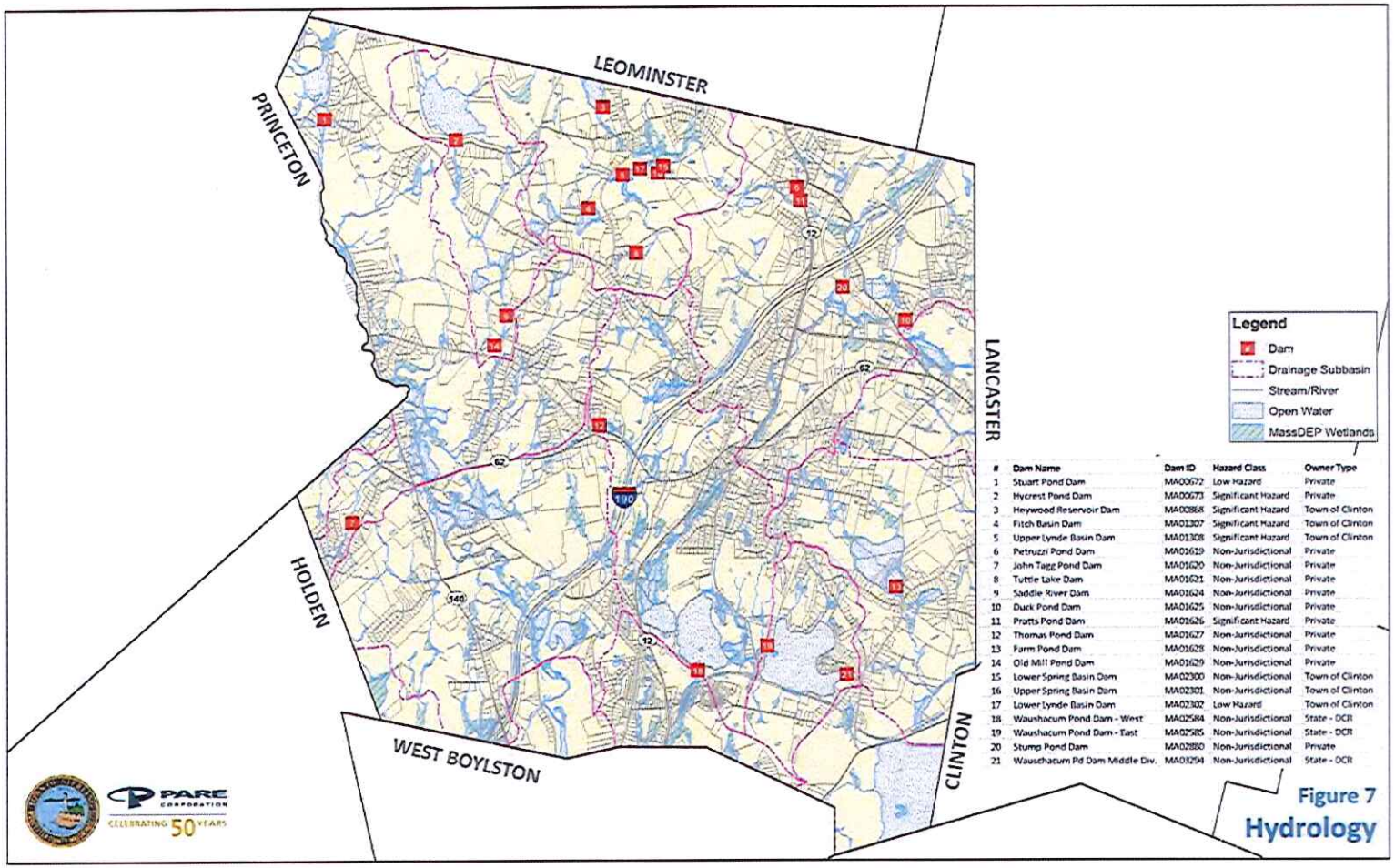


Figure 5
Transportation



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21	Waushacum Pd Dam Middle Div.	MA01294	Non-Jurisdictional	State - DCR

PARE CORPORATION
CELEBRATING 50 YEARS

Figure 7
Hydrology

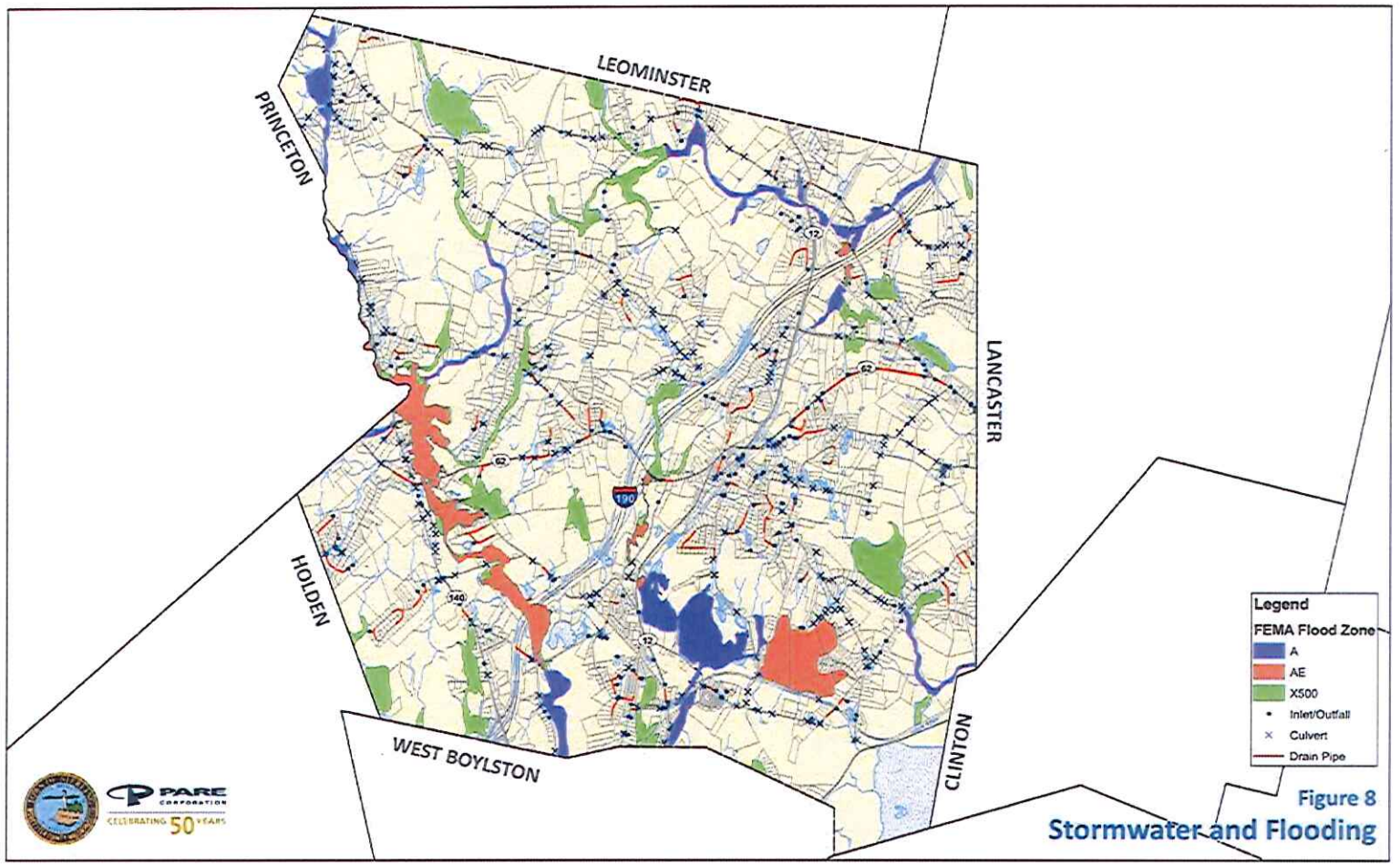


Figure 8
Stormwater and Flooding

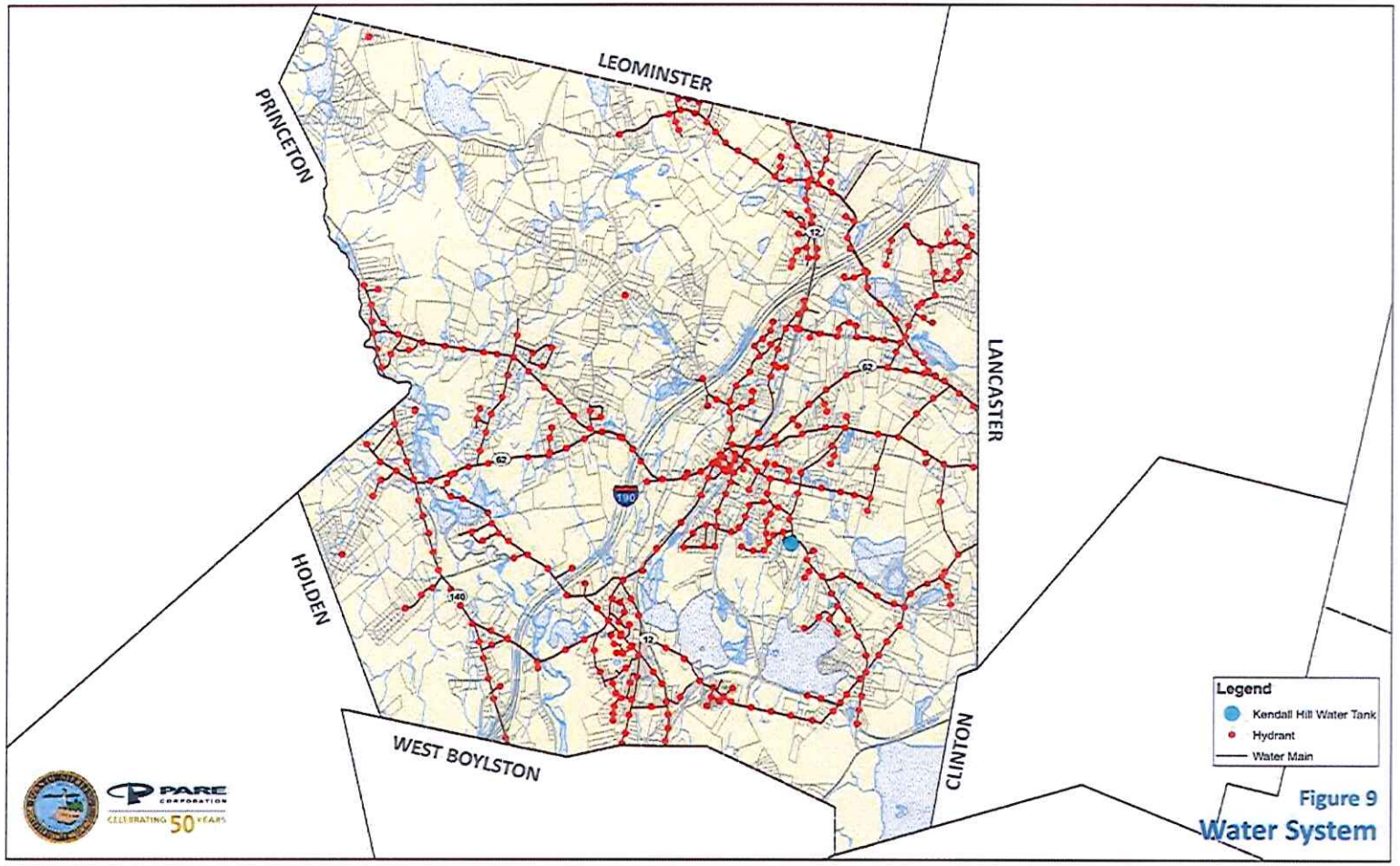


Figure 9
Water System

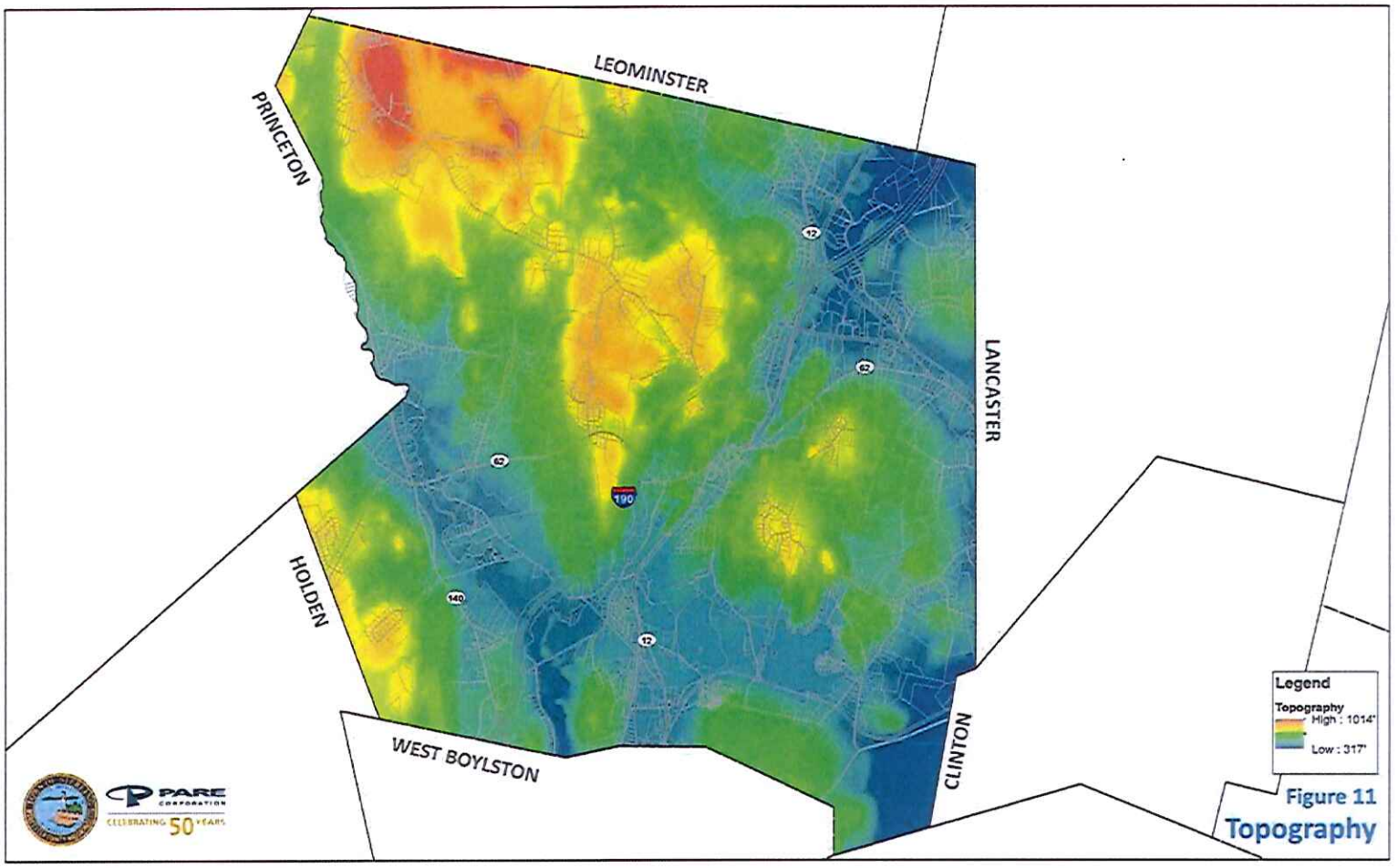


Figure 11
Topography

Nature Based Solutions

- "sustainable planning, design, environmental management, and engineering practices that weave **natural features or processes** into the built environment to build more resilient communities"
  - Watershed scale
  - Neighborhood scale
  - Coastal
- "While gray infrastructure provides only the service for which it was designed, nature-based solutions yield additional community and ecosystem benefits."

- Business Case
  - Hazard Mitigation Benefits
  - Community Co-Benefits
  - Community Cost Savings

Example Project

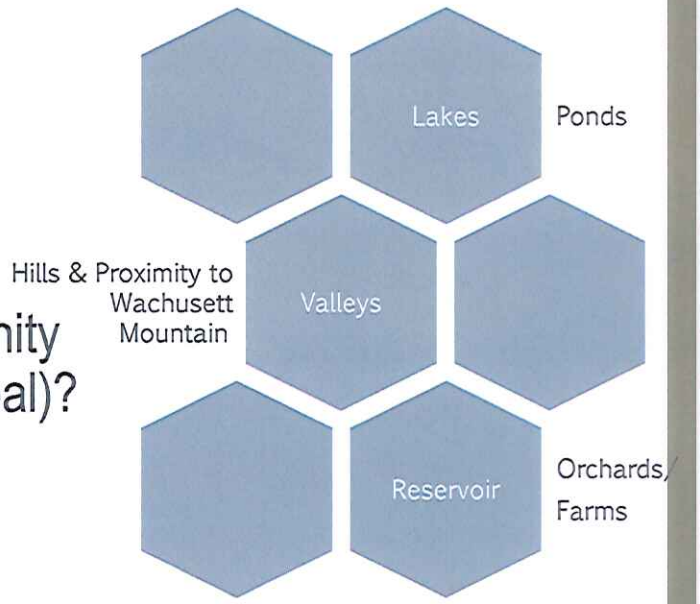
Falmouth **FY19** **$760,000**	Falmouth is restoring the lower Coonamessett River. The project includes removal of an aging dam; restoration of floodplain wetlands; replacing failing culverts with a storm-smart culvert that provides passage for fish and wildlife.	Inland Flooding	Increased flood storage: Safer road	Improved fish and wildlife passage: Improved salt marsh migration
Mattapoisett **FY19** **$960,000**	Mattapoisett partnered with the Mattapoisett Land Trust and the Buzzards Bay Coalition to purchase 120 acres of forest, streams, freshwater wetlands and coastal salt marsh in the Pine Island Pond area to limit future development in this vulnerable location.	Extreme Weather: Coastal Flooding	Storm protection: Reduced chance of future development in harm's way	Recreational opportunities: Natural resource conservation
Spencer **FY19** **$370,492**	Spencer is implementing green stormwater infrastructure techniques as part of a parking lot redevelopment project. The design will incorporate rain gardens/bioretention and belowground infiltration systems to reduce runoff and pollutant loads from the lot.	Inland Flooding	Increased flood storage	Improved water quality: Additional recreational areas

Survey Results

- Input from 14 different communities/companies/organizations/institutions/agencies throughout town
  - Small and large entities
  - Variable participation from town residents in each
  - ~8,000 residents

Survey Results

- How economically and demographically diverse is your community?
  - Rural community
  - Somewhat economically diverse
  - Aging community
  - Divide in older farming roots/young middle/upper-middle migration
- What is the land use profile in your community (%commercial/industrial/residential/municipal)?
  - Majority residential/farm
  - Industry in northeast
  - Small business/municipal services centralized downtown
- What are prominent geographic features of your community?



Survey Results

› What are the most important/influential institutions, organizations, or businesses in your community?

- UN Sustainable Development Group
- Town government
- Police
- Fire
- Schools
- Senior Center
- Library
- DPW
- Water Department
- Churches
- MassDOT
- Sterling Municipal Light Department
- LKQ
- Pandolf Perkins Quarry
- Gandalf
- Sterling National Country Club
- Davis Farmland
- Town Hall
- Altec
- Sterling Skilled Nursing
- Admore, Inc.
- Fiber Optic Components Inc.
- Horace Mann Educational Assoc.
- Ideal Industries Inc.
- Webster Veterinary Supply
- Laddawn Inc.
- Northeast Poly Bag Co.
- Meadowbrook Orchards
- Rota Springs Farm
- Clearview Farm
- The Brick

Survey Results

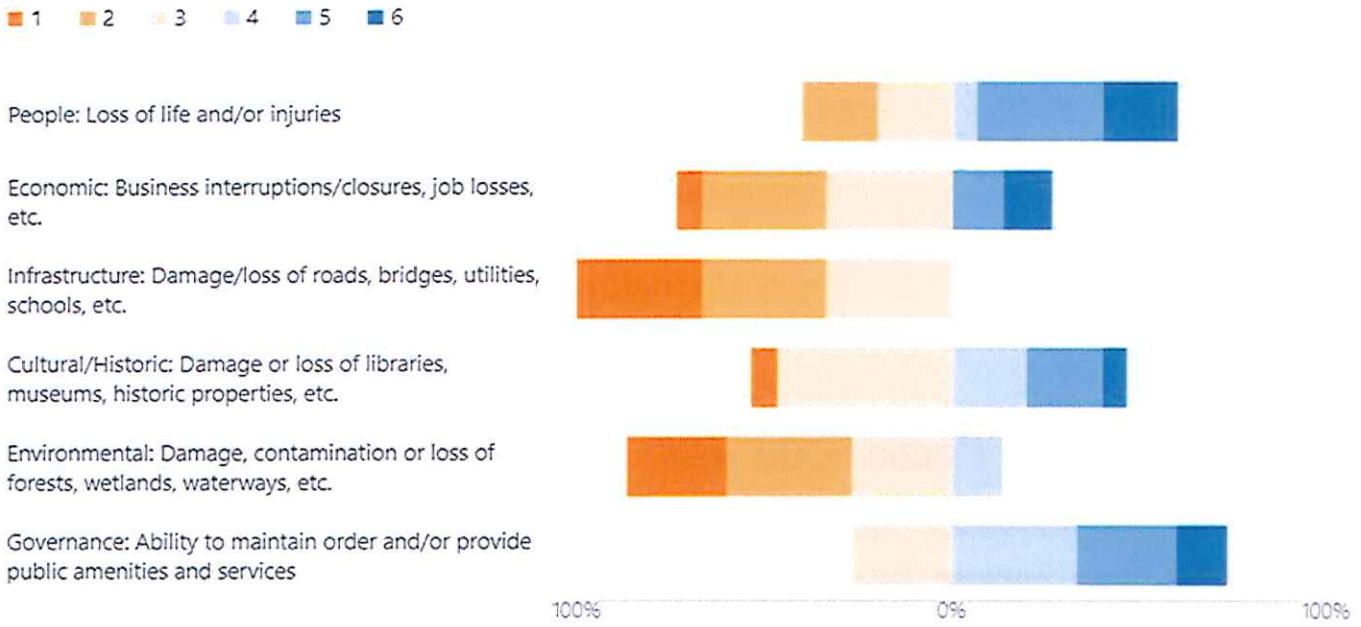
› What are the "hot-button" social/political/leadership issues? Have these changed substantially over the past 5-10 years?

Survey Results

- What local/regional/global management challenges are you currently dealing with?
  - Weather
  - Stormwater runoff/water quality
  - Infrastructure
  - Flooding
  - Transportation
  - Cesspools/lack of sewer
  - Ticks and mosquitoes
  - Water supply
  - Accidents on Rt. 190
  - Limited opportunity for development
  - Pandemic responses
  - Budget and taxes
  - Municipal building maintenance
  - Rural/development balance
  - Aging population

15. In your opinion, which of the following categories are most susceptible to natural hazards in your community? (Please rank the community assets in order of vulnerability, 1 being most vulnerable and 6 being least vulnerable.)

More Details



Today's Agenda

10:00-11:30 Breakout Groups:

- Identify Community Vulnerability & Strengths
  - ~30 minutes per category (Environment, Infrastructure, and Society)
- ***15 minute break at 10:30*

11:30-11:55 Reconvene in Full Group

- Report from each Breakout Group

11:55-12:00 Closing Remarks & Wrap Up & Best Participation Prize!

Community Resilience Building Risk Matrix

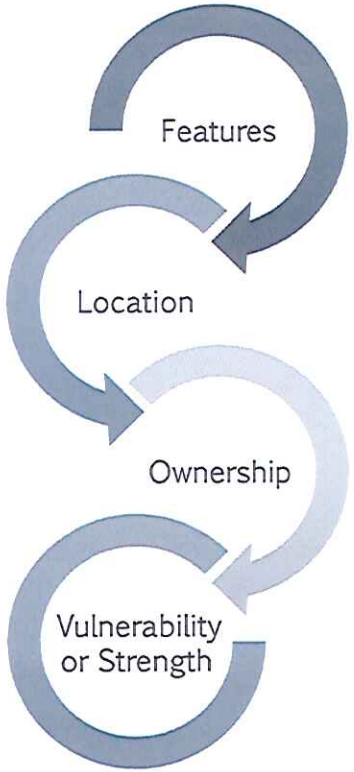
H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Features	Location	Ownership	V or S
Infrastructural			
Societal			
Environmental			

Infrastructural

Societal

Environment



Questions?

Appendix B: Workshop Agenda

Municipal Vulnerability Preparedness Workshop Schedule

September 10th, 2020

8:50-9:00	*Logon & Zoom Familiarity*
9:00-9:30	Welcome & Introduction • Workshop Overview • Climate Change introduction
9:30-9:45	Characterize Community Hazards & Select Priority Hazards (Full Group)
9:45-10:00	Review community resources • Overview of Maps & Matrix • Group Facilitator Introductions, Group Instructions
10:00-11:30	Breakout Groups: • Identify Community Vulnerability & Strengths - ~30 minutes per category (Environment, Infrastructure, and Society) • ***15 minute break at 10:30*
11:30-11:55	Reconvene in Full Group • Report from each Breakout Group
11:55-12:00	Closing Remarks & Wrap Up & Best Participation Prize!

September 17th, 2020

8:50-9:00	*Logon & Zoom Familiarity*
9:00-9:20	Welcome & Recap
9:20-11:10	Breakout Groups: • Identify Community Actions • ***15 minute break at 10:30* • Prioritize Community Actions
11:10-11:55	Reconvene in Full Group • Report from each Breakout Group • Determine Overall Priority Actions • Final Thoughts & Discussion with Q&A
11:55-12:00	Closing Remarks & Wrap Up

Appendix C: Sterling Map Package

Town of Sterling
Municipal Vulnerability Preparedness

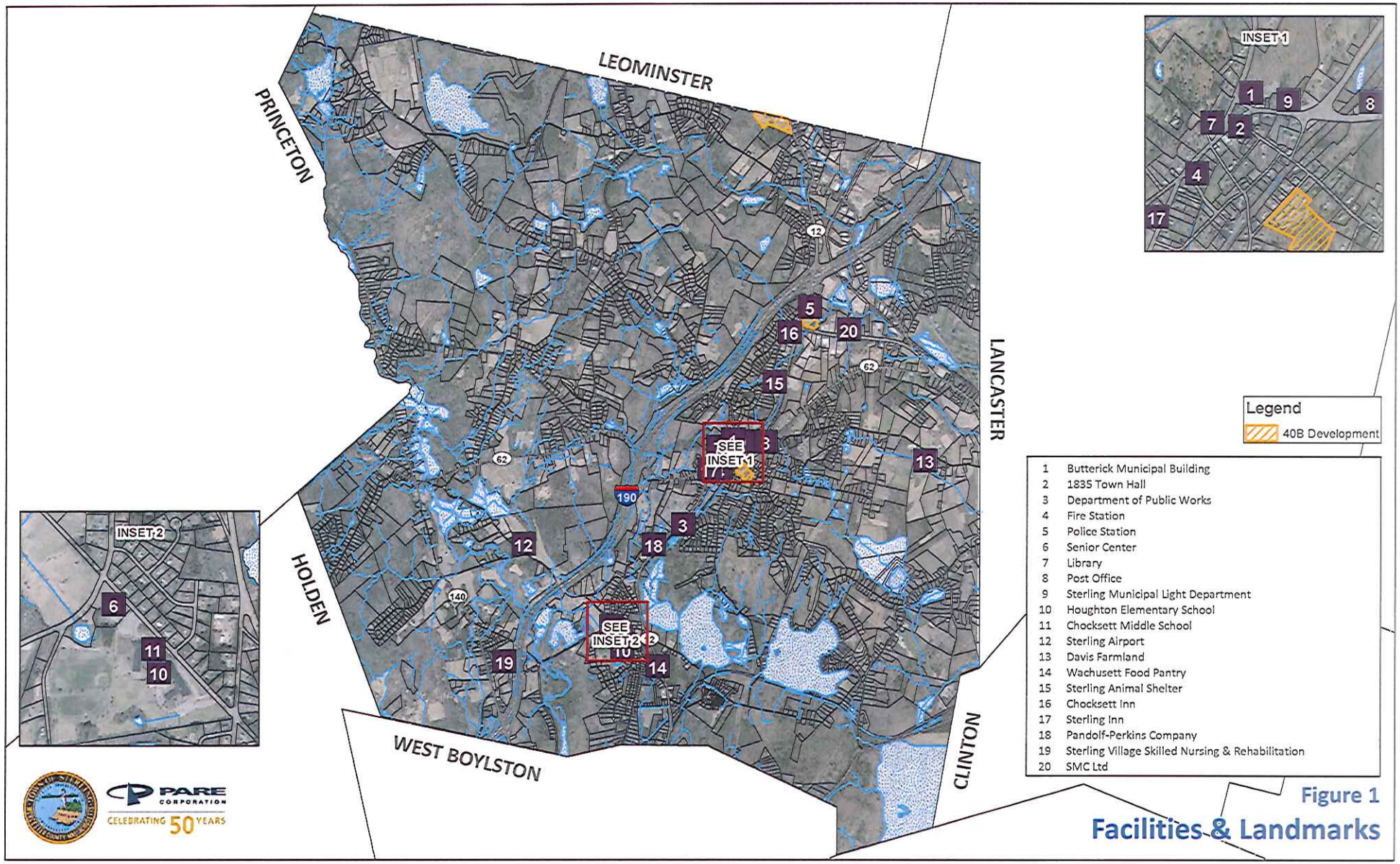
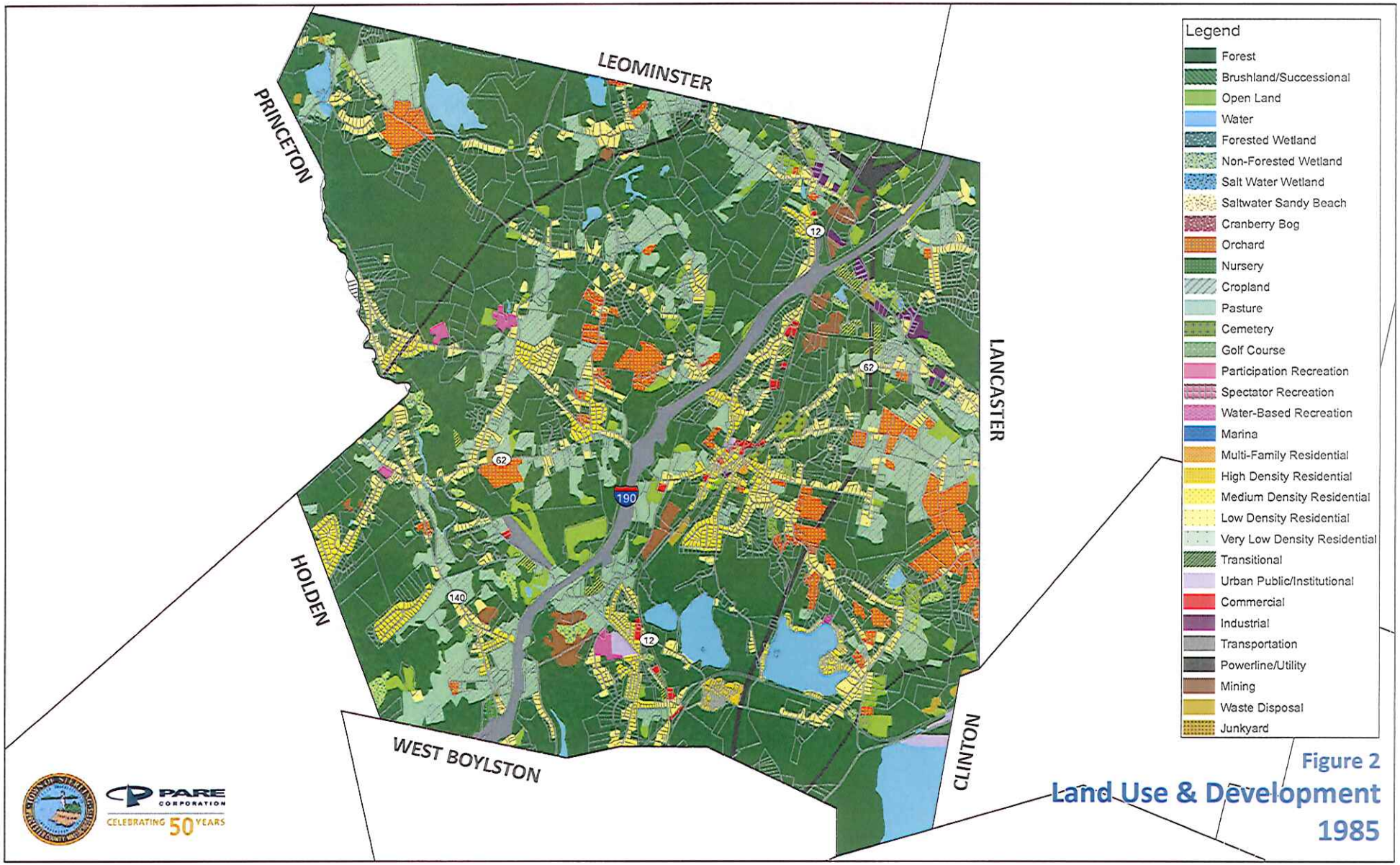


Figure 1

Facilities & Landmarks



PARE CORPORATION
CELEBRATING 50 YEARS

Figure 2
Land Use & Development
1985

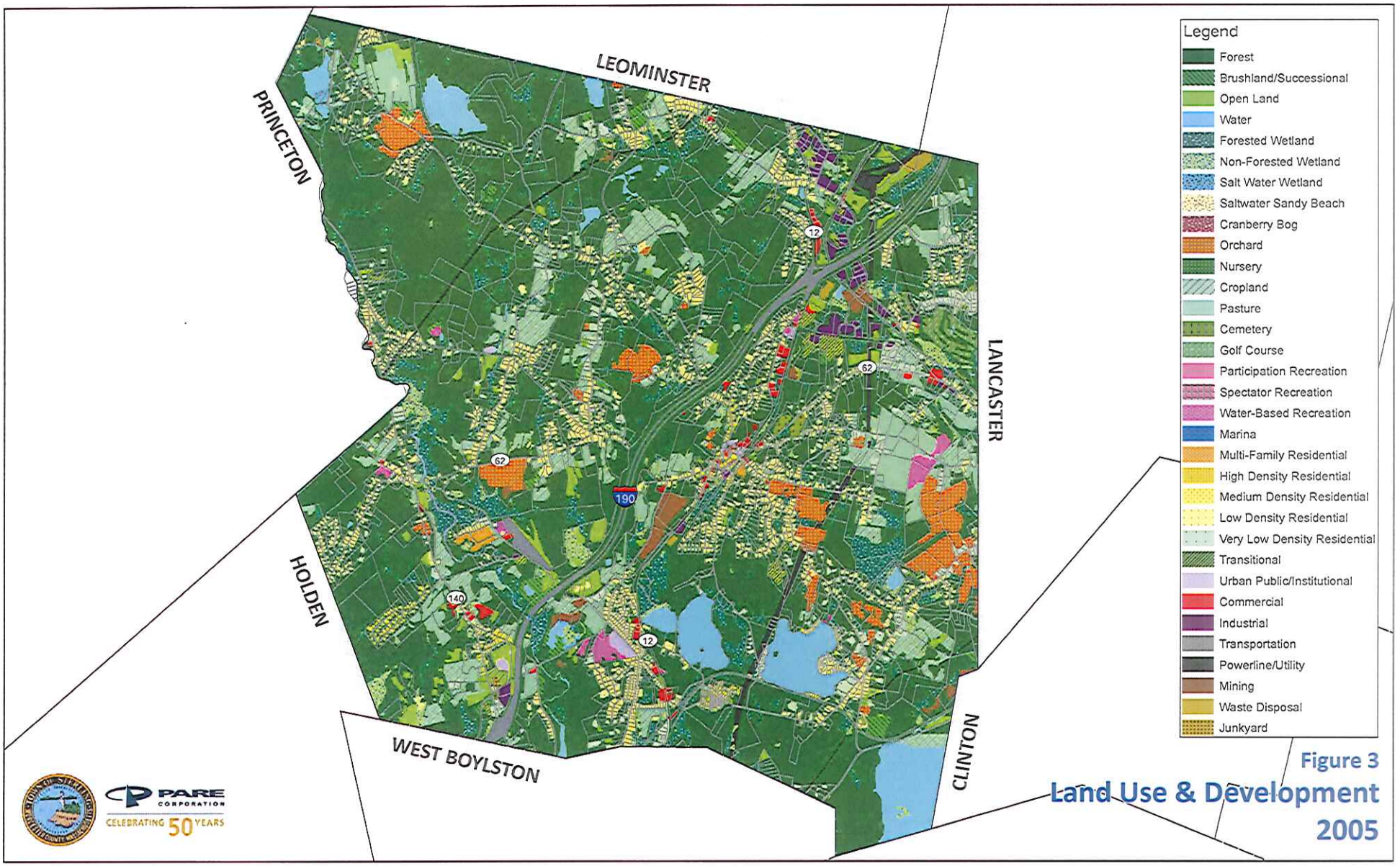
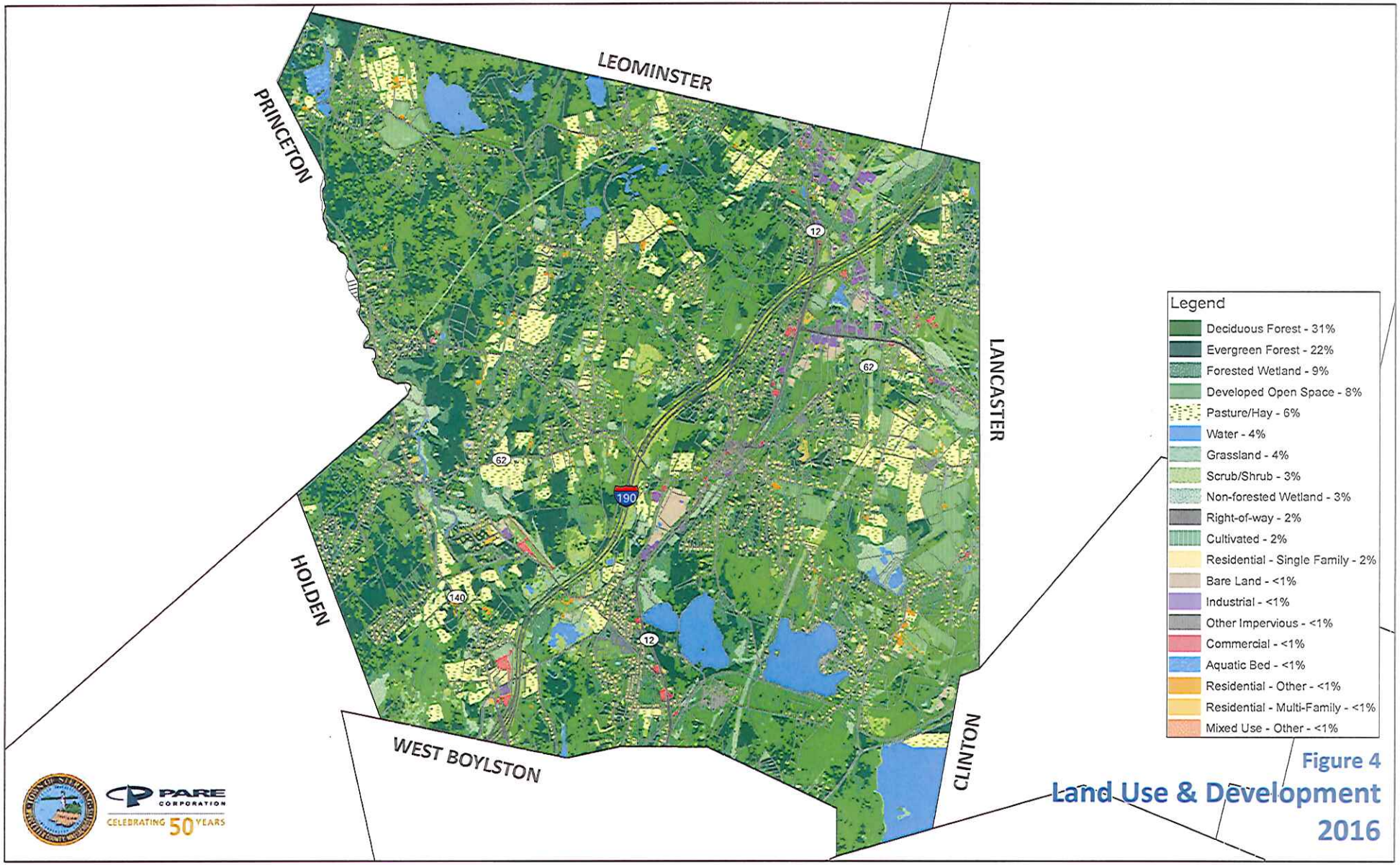


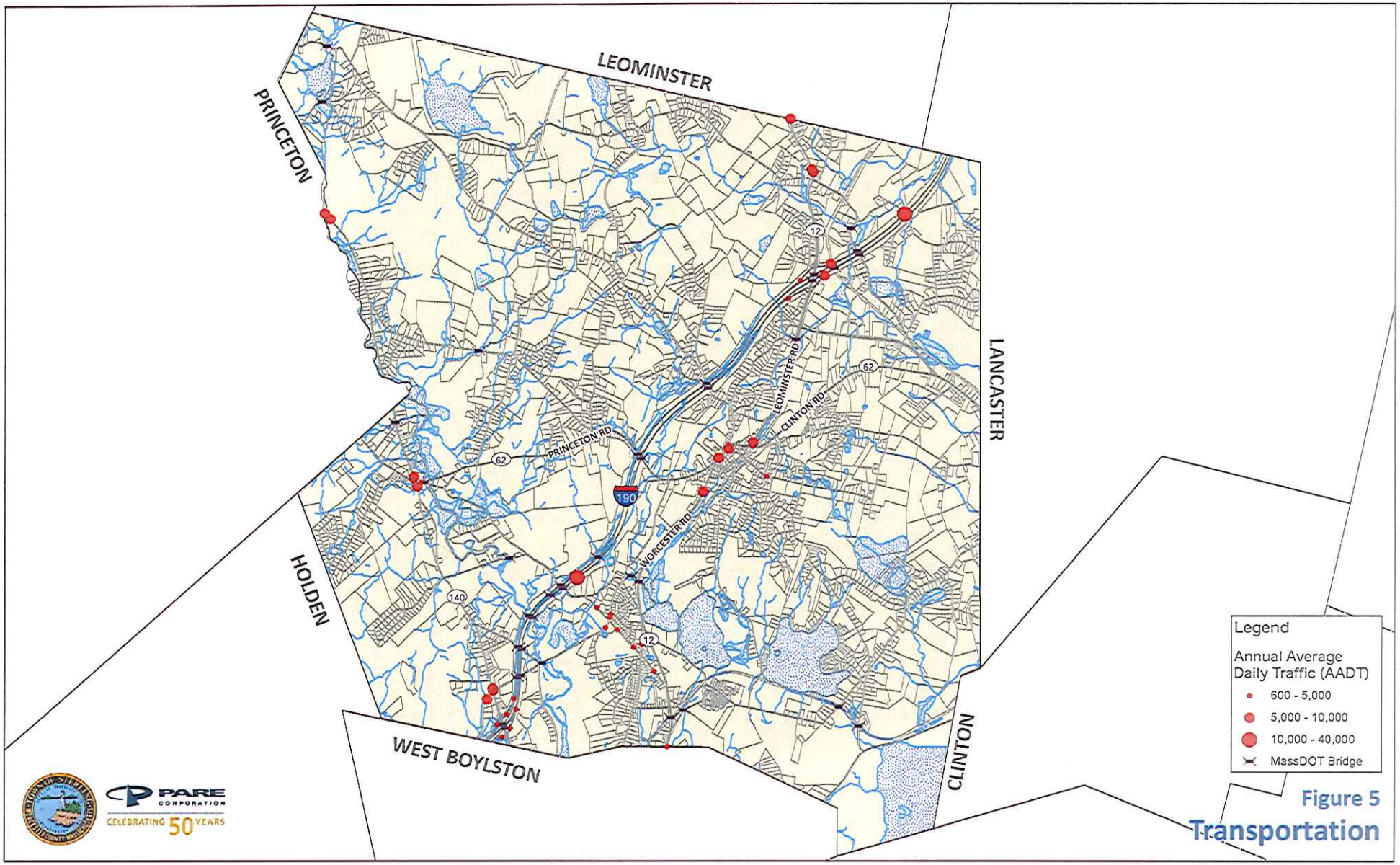
Figure 3

Land Use & Development 2005



PARE CORPORATION
CELEBRATING 50 YEARS

Figure 4
Land Use & Development 2016



PARE CORPORATION
CELEBRATING 50 YEARS

Figure 5
Transportation

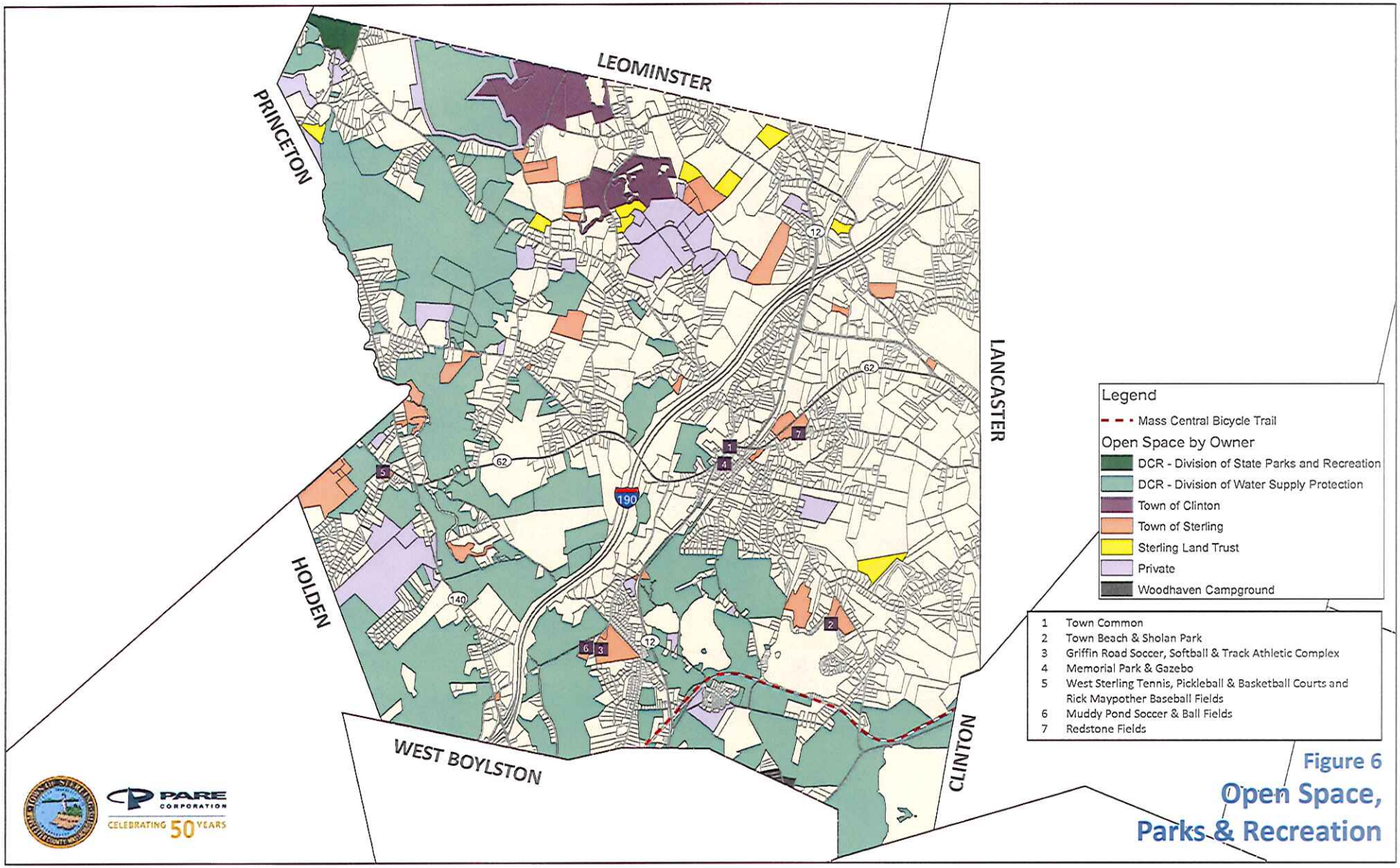
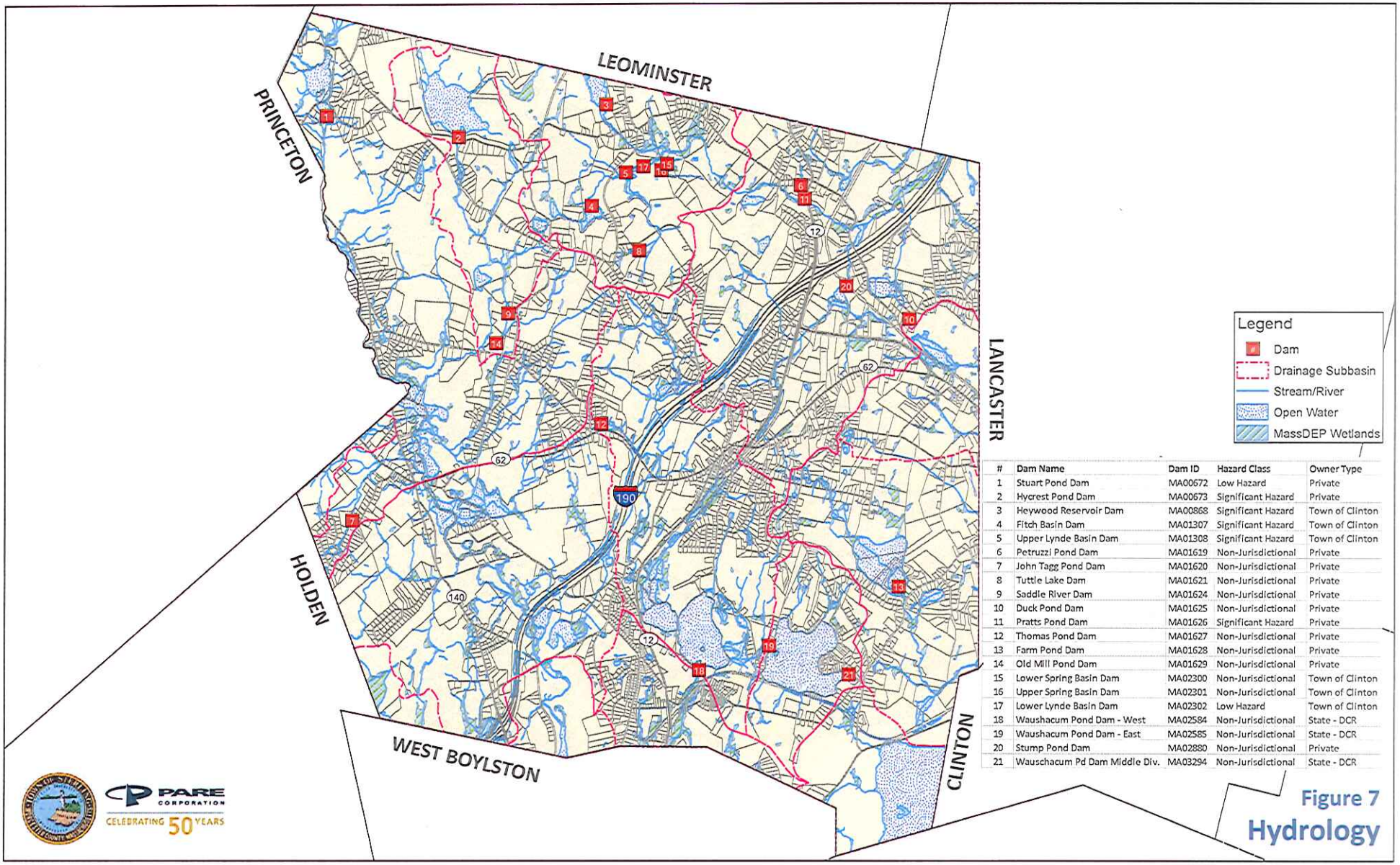


Figure 6

Open Space, Parks & Recreation



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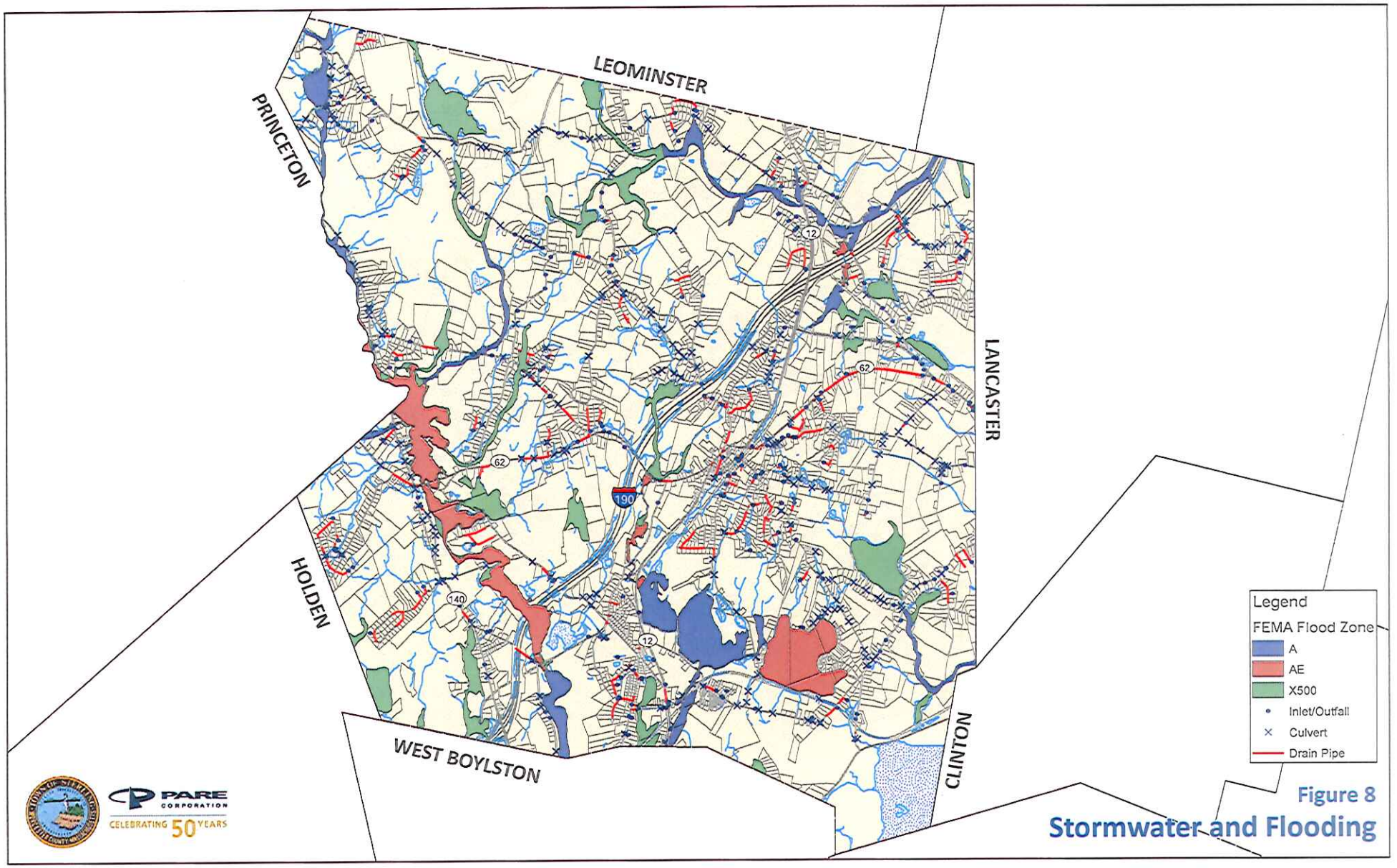
PARE CORPORATION
CELEBRATING 50 YEARS

Figure 7
Hydrology



PARE CORPORATION
CELEBRATING 50 YEARS

Figure 8
Stormwater and Flooding

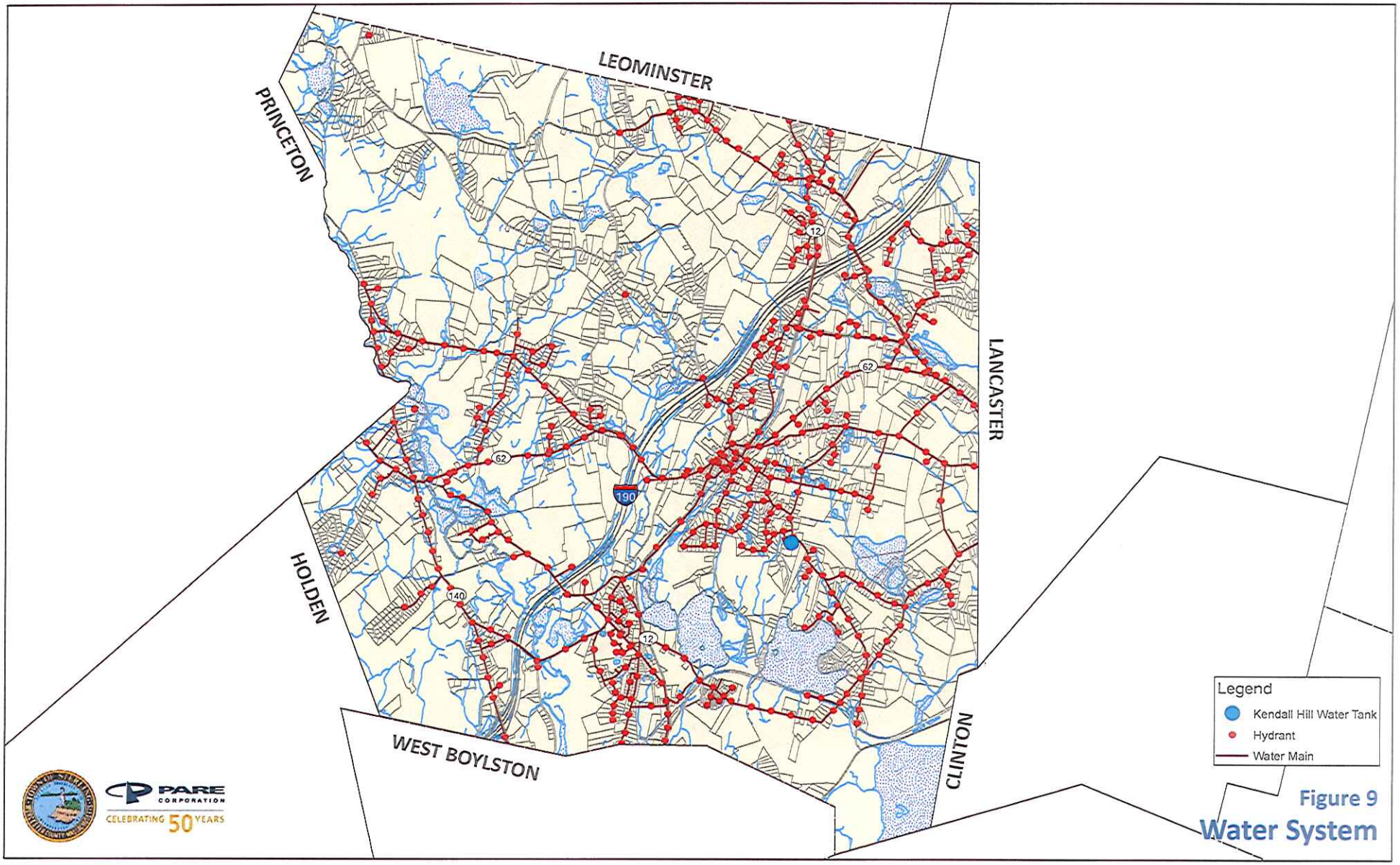
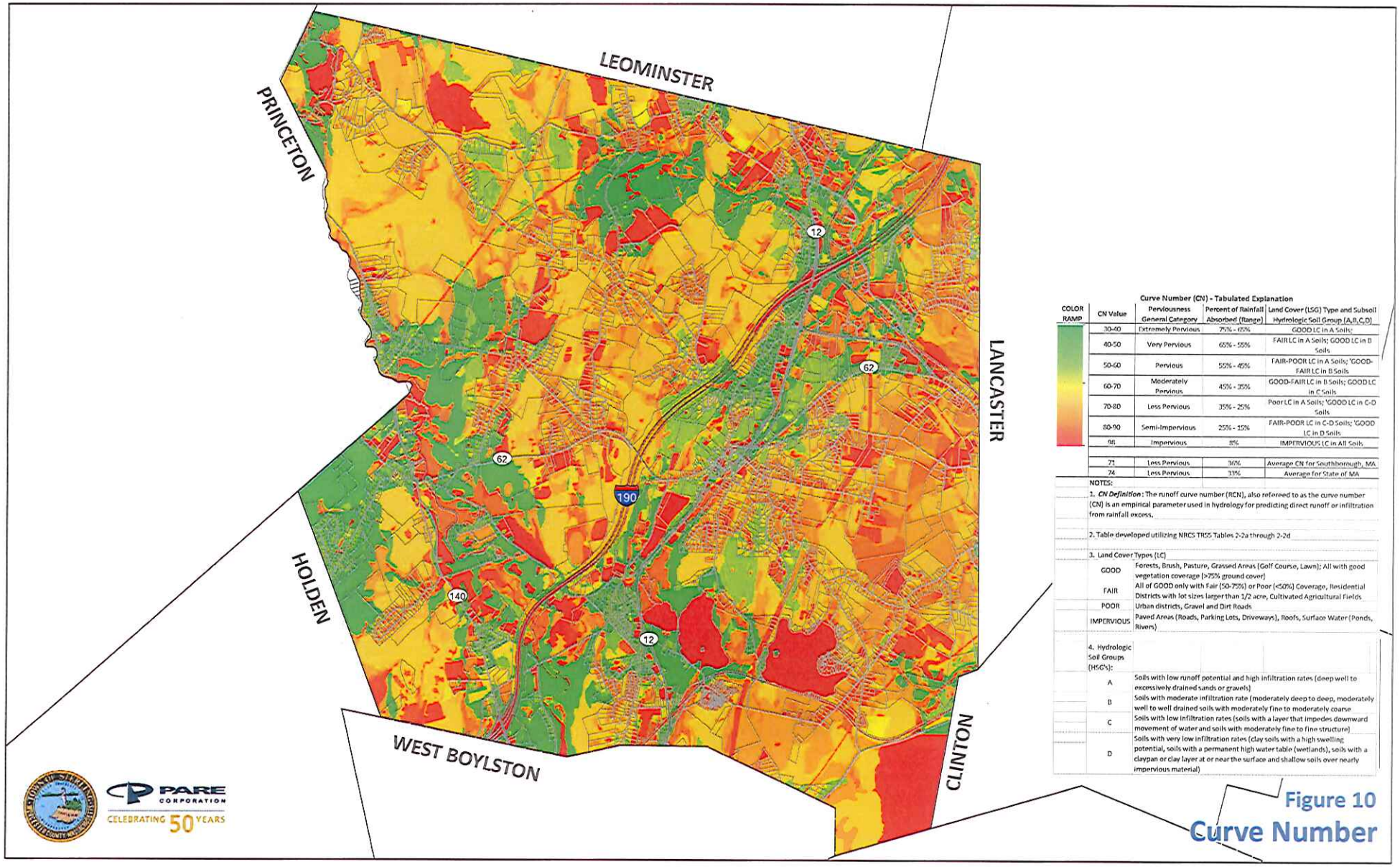


Figure 9
Water System



Curve Number (CN) - Tabulated Explanation

COLOR RAMP	CN Value	Perviousness General Category	Percent of Rainfall Absorbed (Range)	Land Cover (LSG) Type and Subsoil Hydrologic Soil Group (A,B,C,D)
	30-40	Extremely Pervious	75% - 65%	GOOD LC in A Soils
	40-50	Very Pervious	65% - 55%	FAIR LC in A Soils; GOOD LC in B Soils
	50-60	Pervious	55% - 45%	FAIR-POOR LC in A Soils; 'GOOD-FAIR LC in B Soils
	60-70	Moderately Pervious	45% - 35%	GOOD-FAIR LC in B Soils; GOOD LC in C Soils
	70-80	Less Pervious	35% - 25%	Poor LC in A Soils; 'GOOD LC in C-D Soils
	80-90	Semi-Impervious	25% - 15%	FAIR-POOR LC in C-D Soils; 'GOOD LC in D Soils
	98	Impervious	8%	IMPERVIOUS LC in All Soils
	71	Less Pervious	36%	Average CN for Southborough, MA
	74	Less Pervious	33%	Average for State of MA

NOTES:

1. ***CN Definition***: The runoff curve number (RCN), also refereed to as the curve number (CN) is an empirical parameter used in hydrology for predicting direct runoff or infiltration from rainfall excess.

2. Table developed utilizing NRCS TR55 Tables 2-2a through 2-2d

3. Land Cover Types (LC)

GOOD	Forests, Brush, Pasture, Grassed Areas (Golf Course, Lawn): All with good vegetation coverage (>75% ground cover)
FAIR	All of GOOD only with Fair (50-75%) or Poor (<50%) Coverage, Residential Districts with lot sizes larger than 1/2 acre, Cultivated Agricultural Fields
POOR	Urban districts, Gravel and Dirt Roads
IMPERVIOUS	Paved Areas (Roads, Parking Lots, Driveways), Roofs, Surface Water (Ponds, Rivers)

4. Hydrologic Soil Groups (HSG's):

A	Soils with low runoff potential and high infiltration rates (deep well to excessively drained sands or gravels)
B	Soils with moderate infiltration rate (moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse
C	Soils with low infiltration rates (soils with a layer that impedes downward movement of water and soils with moderately fine to fine structure)
D	Soils with very low infiltration rates (clay soils with a high swelling potential, soils with a permanent high water table (wetlands), soils with a claypan or clay layer at or near the surface and shallow soils over nearly impervious material)

PARE CORPORATION
CELEBRATING 50 YEARS

Figure 10
Curve Number

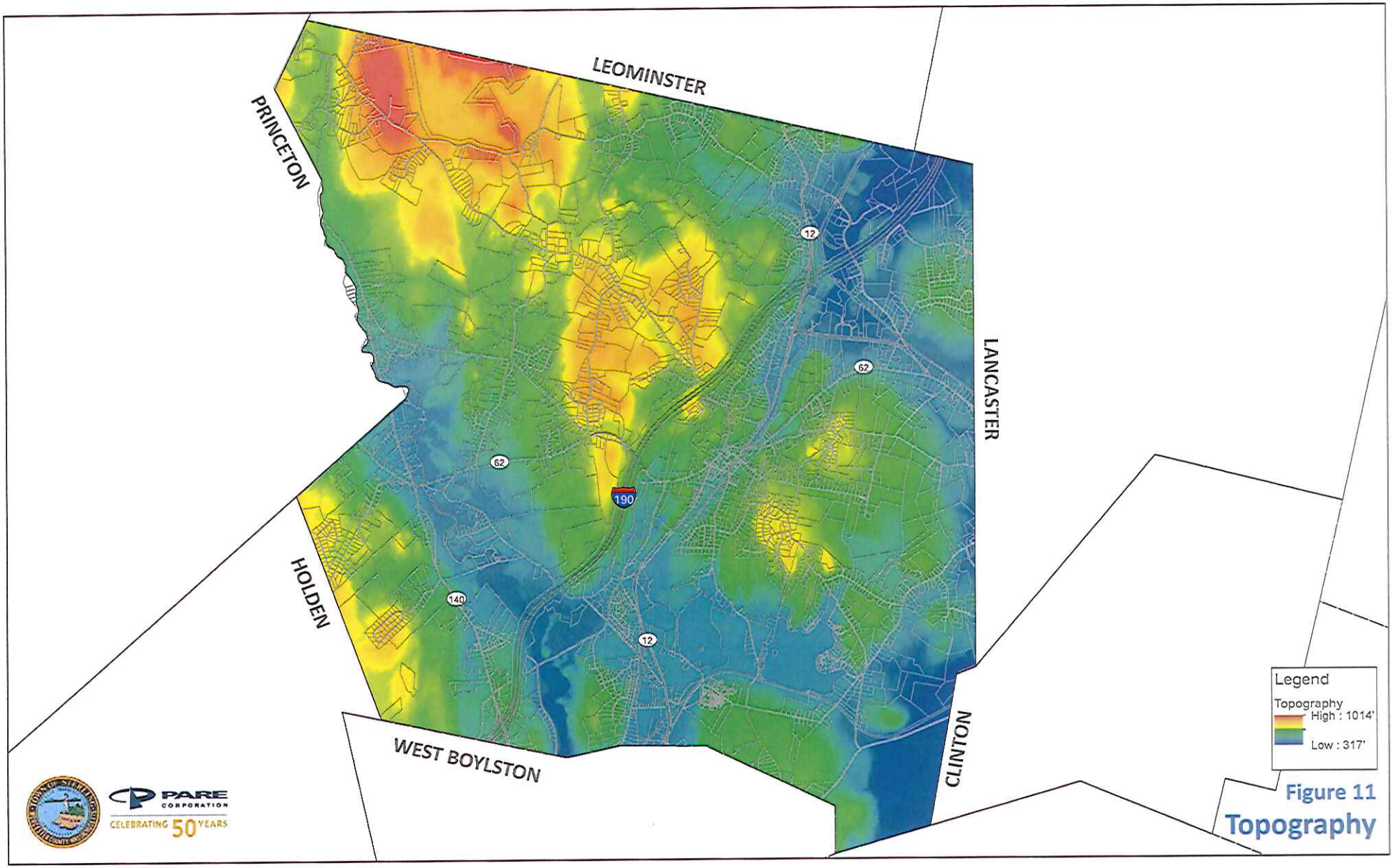
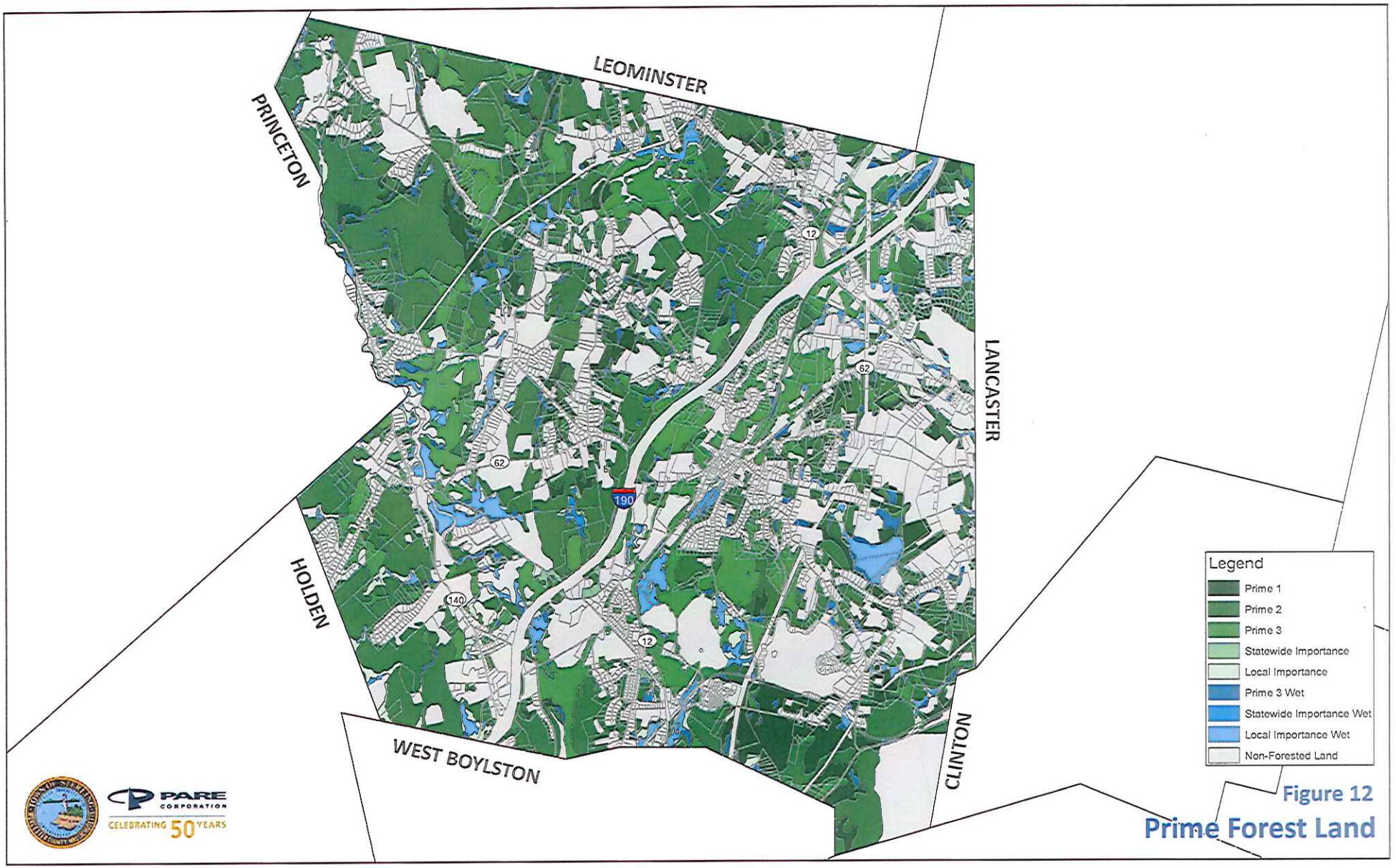


Figure 11
Topography



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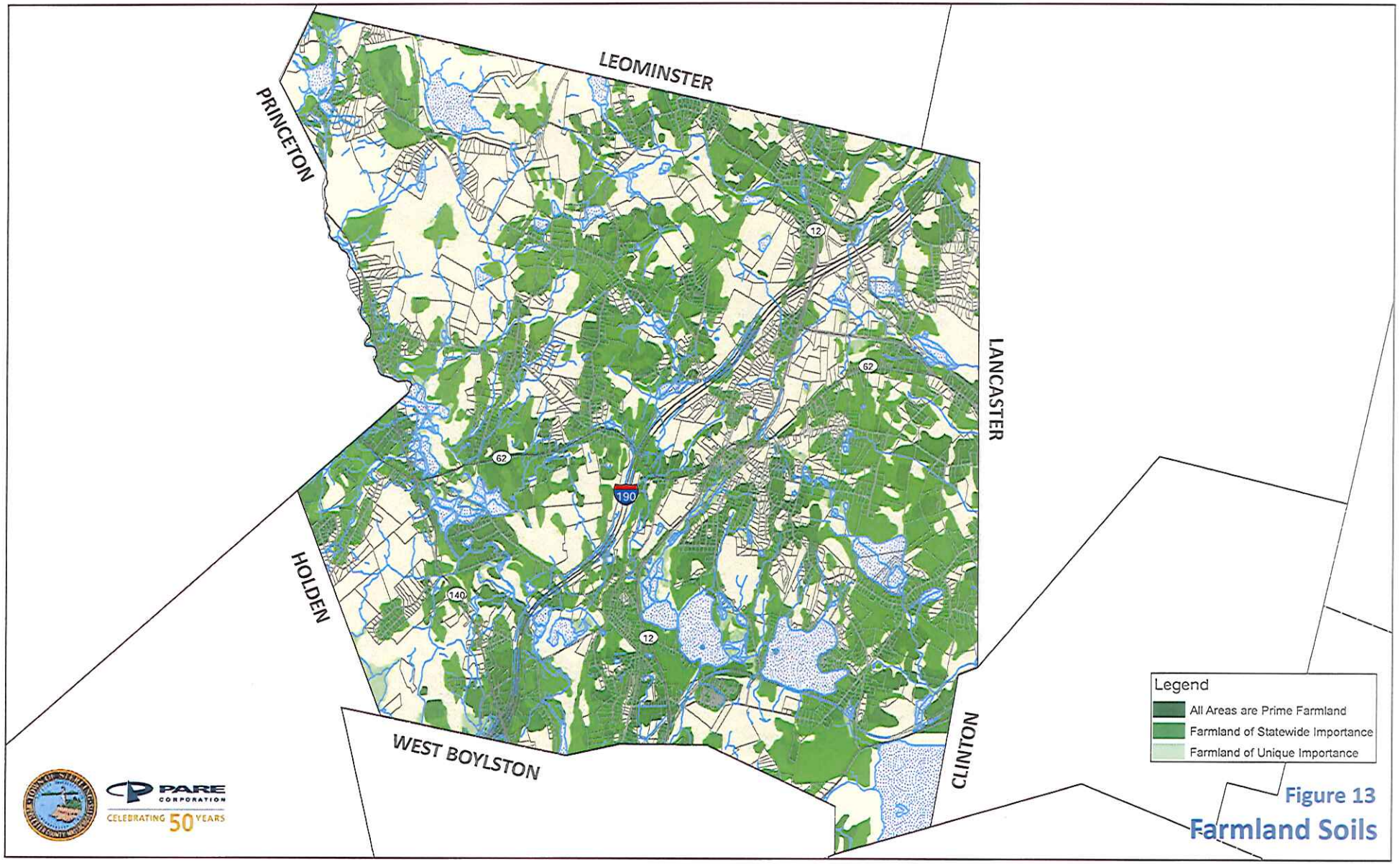
CELEBRATING 50 YEARS

Figure 12
Prime Forest Land



PARE CORPORATION
CELEBRATING 50 YEARS

Figure 13
Farmland Soils

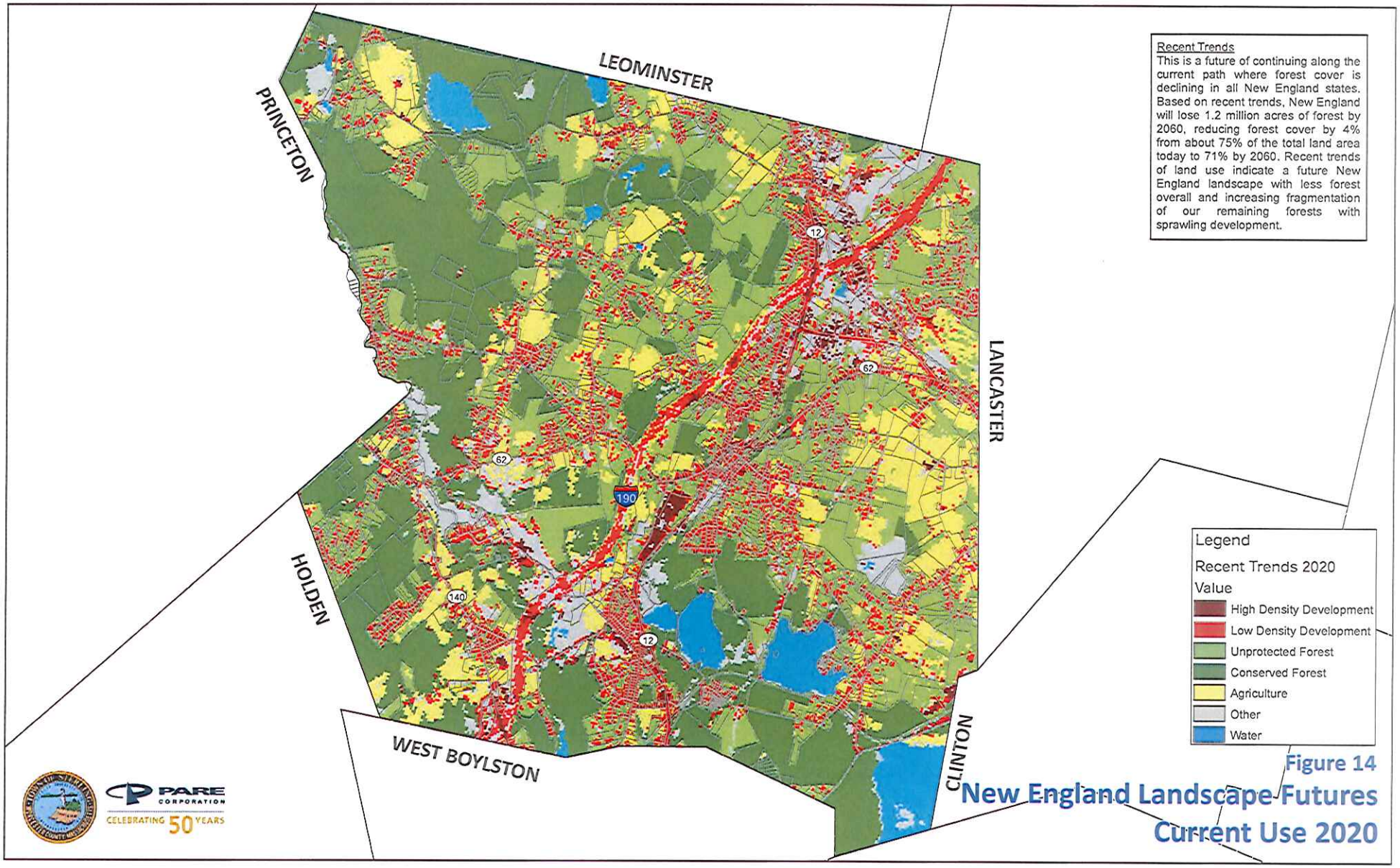


Figure 14

New England Landscape Futures
Current Use 2020

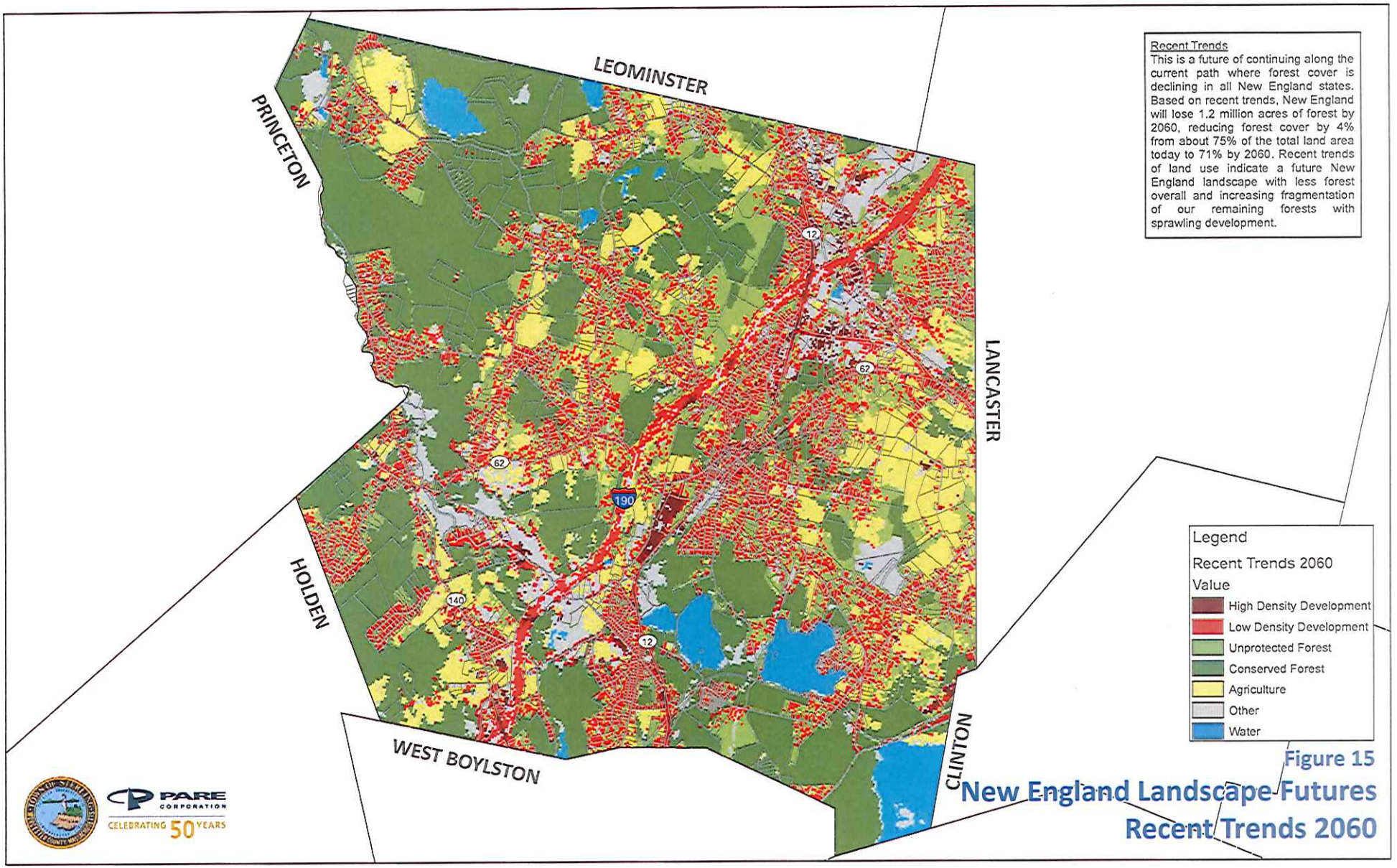


Figure 15

New England Landscape Futures
Recent Trends 2060

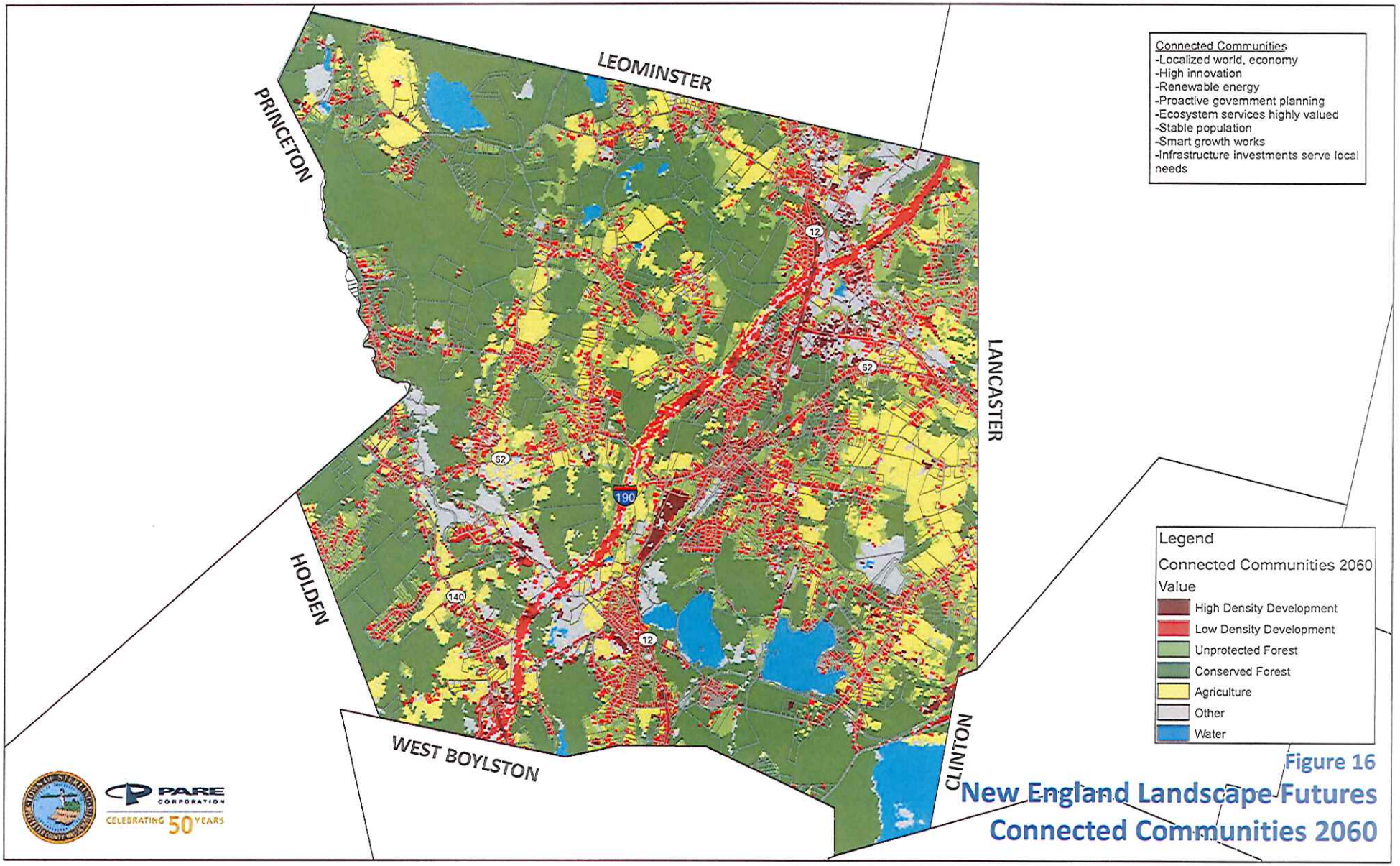


Figure 16

New England Landscape Futures
Connected Communities 2060

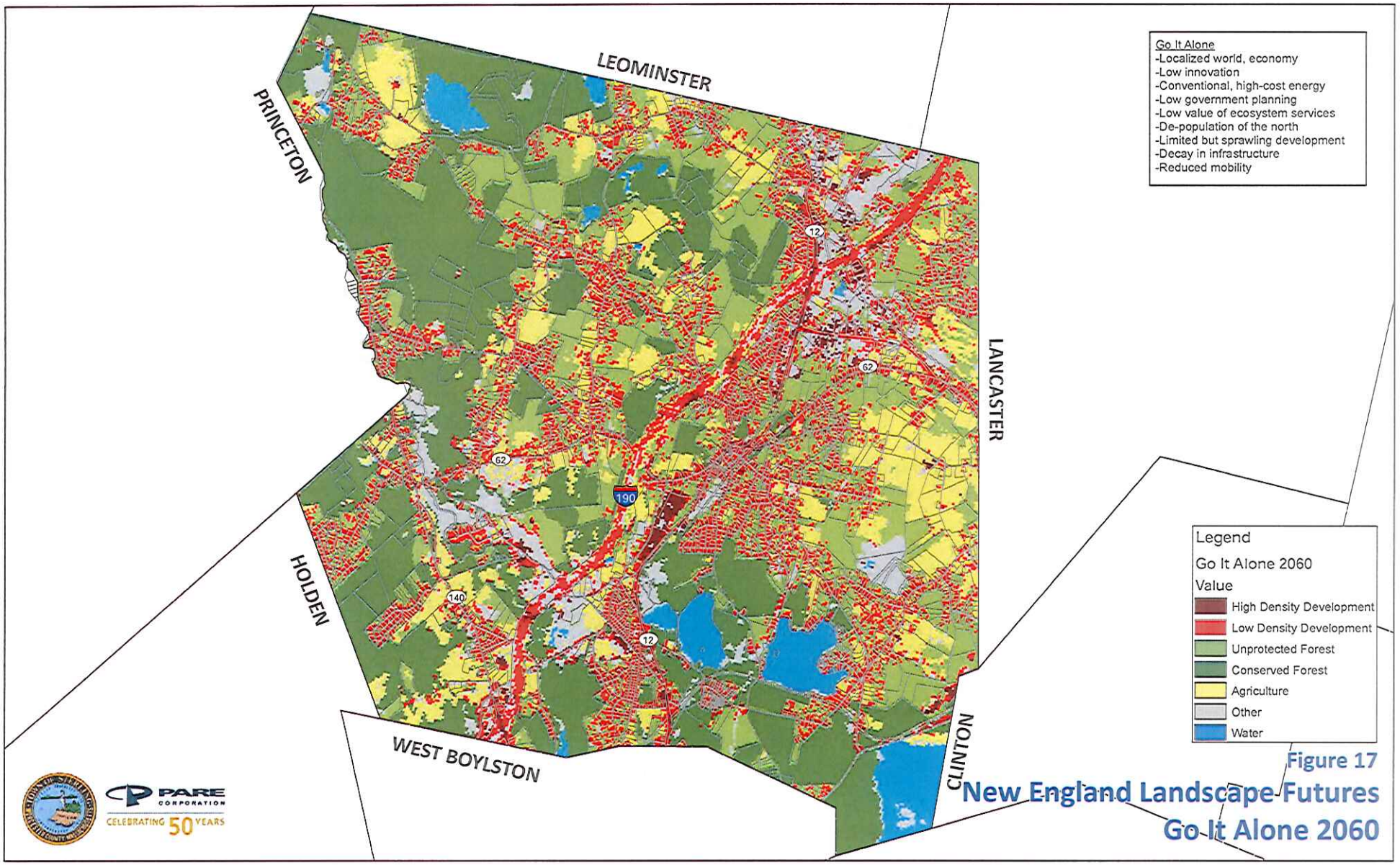


Figure 17

New England Landscape Futures
Go It Alone 2060

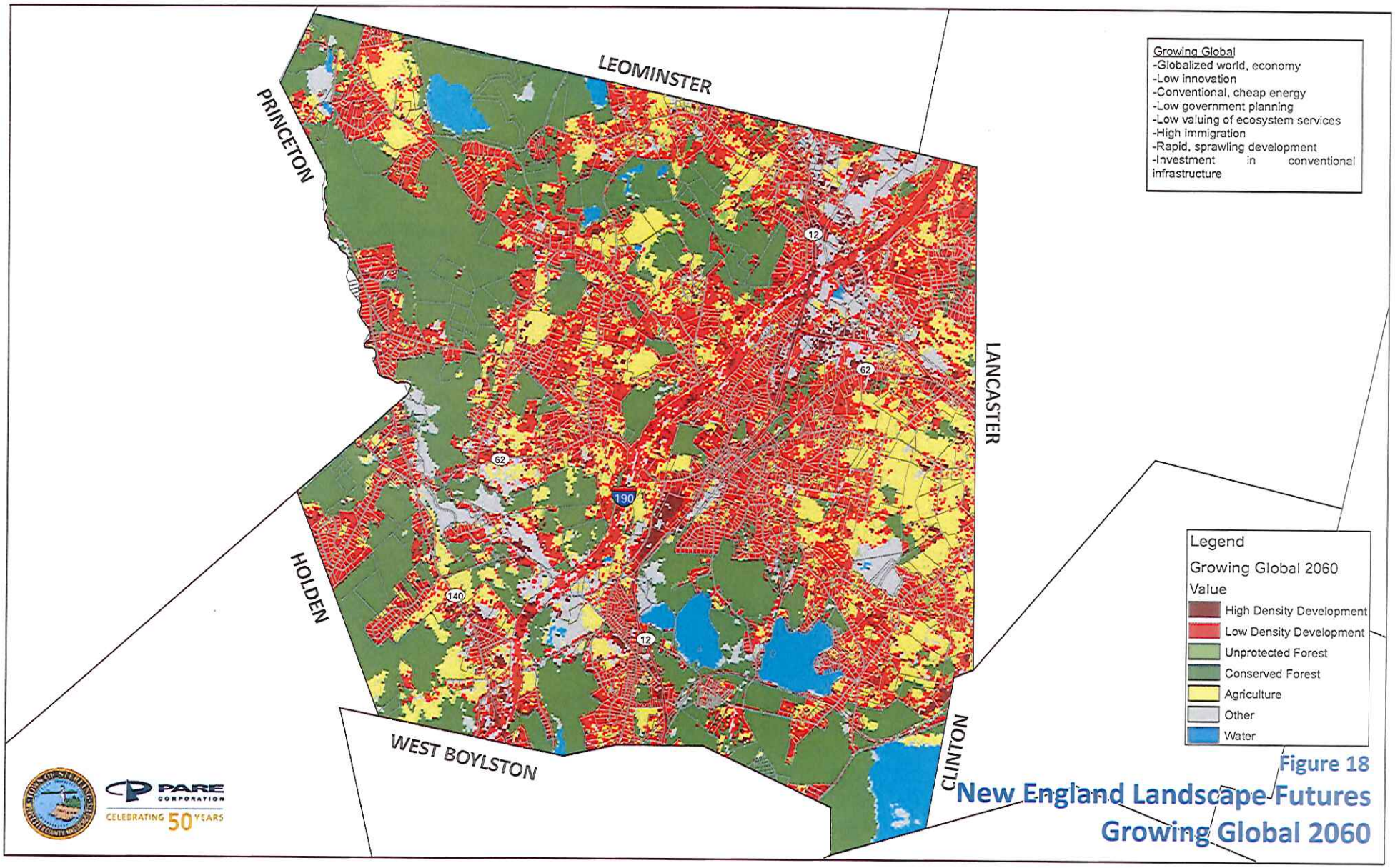
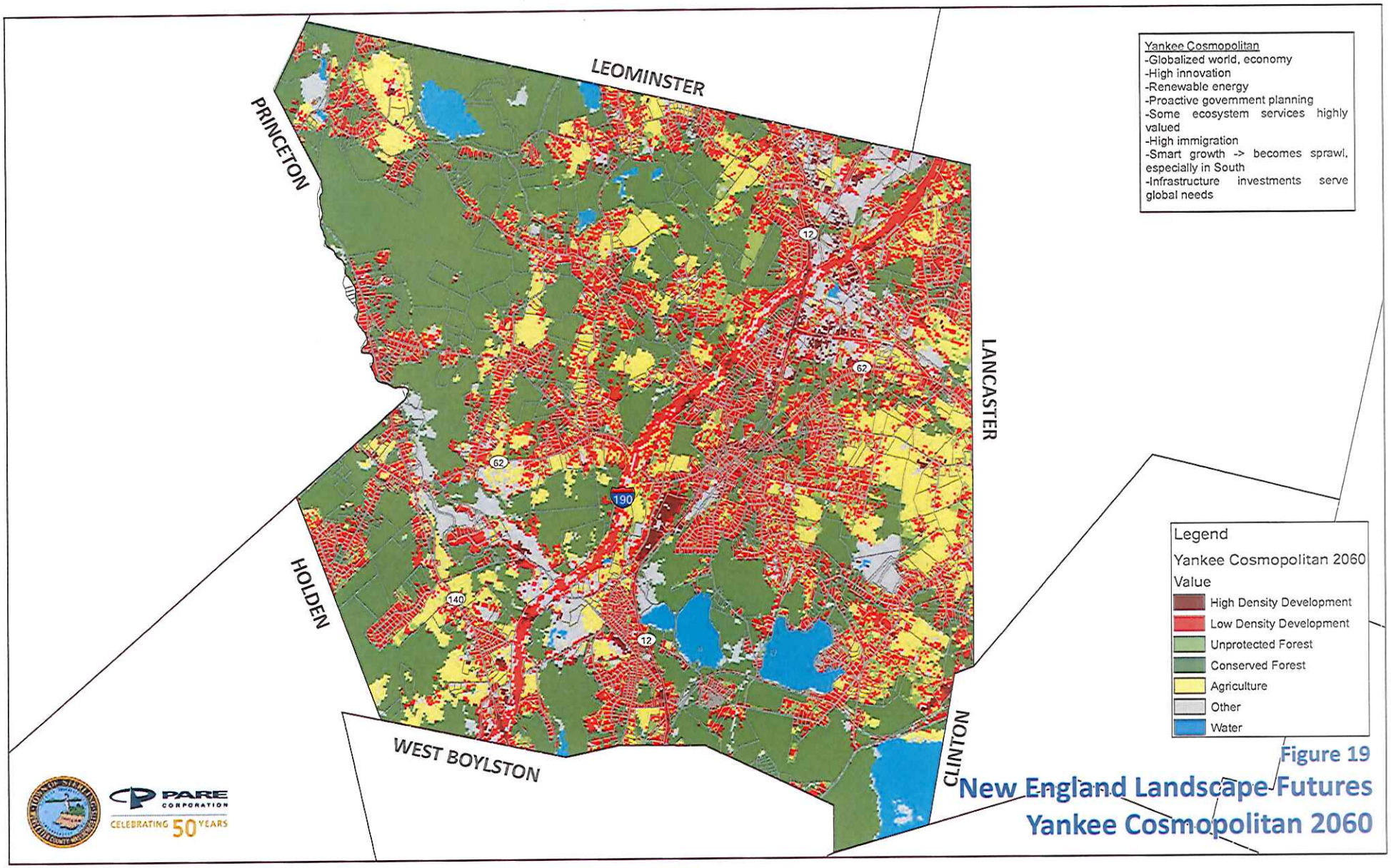


Figure 18

New England Landscape Futures

Growing Global 2060



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CELEBRATING 50 YEARS

Figure 19
New England Landscape Futures
Yankee Cosmopolitan 2060

Appendix D: Group Matrices from Workshops

Community Resilience Building Ri

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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
V = Vulnerability S = Strength

Features	Extreme Weather	Loss of Biodiversity Agriculture (temp change/pest/disease)	High Intensity Rainfall	Drought (lowering water table)	Priority H-M-L	Time Short Long Ongoing
Infrastructural						
Culverts - capacity/structure concern	1. inventory of size and condition/compare to current design requirements and storms (H&H), impact from dams. 2. prioritization criteria (value provided by the culvert) 3. seek financial assistance/complete design **{EW and HIR]** 4. implementation				H	ongoing
Bridges maintenance and structure	1. Answer the questions: How many state owned/how old/when inspected/impact from dams 2. Develop priorotization/Sterling communicate with MassDOT regarding state bridge concerns 3.financial assitance/design **[EW and HIR}** 4. implementation				M	s
Roads - wear and tear/sanding	1.inspect/volume of traffic 2. prioirtize maintenance/repairs/traffic managament, future storm events (drainage) 3. financial assistance to fund exisiting multi-year plan, state vs local **[EW and HIR]** 4. implementation /Pavement managmanet system				M	s
Electrical/Communication Infrastructure	**EW Risk:** 1. Assessment/inventory/prioritization 2. Encourage alternative power sources/preventive actions/demonstration projects 3. Conservation guidance from Town (education/promotion)				M	s
Drinking Water Infrastructure	**HIR and Drought:** identify new sources and tie ins; review/recommend conservation pactices				H	s
Airport/Sterling Fair/Town Mtg location	**EW Risk:** wide open paved field - how protect? Improve snow removal capabilities to mainatin use				L	l
Societal						
evacation routes (what is it, do we have one)	**EW, HIR:** update/educate/mark route/publicize/ alternate route				H	S
Shelters (schools)	**EW, HIR:** Senior Center shelter of choice - schools backup: Generator maintenance, establish approach for supplies, cots within the facility for various events Senior Center/Community education from EMD regarding responses transportation plans to the shelter				H	ongoing
Sterling Village Nursing/Rehab	assess capacity to assist the Town with special/higher need individuals - develop partnership - transportation					S
Domestic Animal Sheltering	establish animal friendly shelters and communicate this to the public, educate public about "go kits" necessary for domestic animals					ongoing
Churches	formalize/identify partnerships to assess cacpacity, services, and accessibility assess partnerships to establsh financial assistance				M	ongoing
Food Pantries	assess partnerships to establsh continued food distribution during storm events				M	ongoing
Environmental						
chem/fert runoff from agri/res land	1. educate community on proper practices for fertilzers and farming practices 2. restrict pesticides				M	Short
Soil Erosion/crop damage	education about farming techniques inclusive of plowing and irrigation				L	Ongoing
trees/biodiversity/habitat	maintenace of both open space and woodland space to provide diverse habitats - develop openspace, residential, cluster by-law				L	Short
orchards/farms	education about farming techniques inclusive of crop selection, pesticides etc.				L	Long
Fire access to forested areas	establish right-of-ways/agreements for fire access (existing, discontinued, or new)				L	Short

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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
V = Vulnerability S = Strength

Features	Increased Storm Severity/Frequency	Extreme Percipitation (Drought & Flooding)	Extreme Temperatures	Population Growth/Population Vulnerability (pandemic)	Priority H-M-L	Time Short Long Ongoing
Infrastructural						
Police/Fire Stations/Access to Clinton Hospital	Will increase calls for police & fire services; Increased response time;	Similar to previous hazard; increase wildfire risk	Similar to previous	Increase volume of requests for service; increased need for planning; (	M	O
Water Supply System/Water restrictions	Power outages could cause issues; contamination not really an issue	Could improve or exacerbate water supply and availability	Increased residential water line disruptions	Could impact availability and quality	H	O
DPW/Light/Power Department	Increased dependence on DPW; Increased budget	Increase dependence on DPW; Increase budget requirement; reduce access in flooding;	Higher demand	More demand for services and electricity		
Town Hall & School Buildings	Increased use as shelter; continuity of government operations	Minimally affected - increased use as shelter	Similar to extreme weather	Currently minimal impacts, but could be more severe in the future; may need		
Library/Senior Center	Increased use as shelter; Increase vulnerability to town historical items; Increase need for backup power	Minimally affected - increased use as shelter		Increases number of people to serve		
Recreational Facilities	Minimal impact - again, increasing dependence on DPW	Increase need for maintenance; susceptible to drought	Similar to previous	Increased demand		
Societal						
Aging population	Increased difficulty in meeting living needs of population at risk	Minimal impact	Could be detrimental to health/increased cost of	Could be affected by changes in tax base		
Urbanization (loss of farms)	Could increase financial risk;	Increases challenges of farm operation; decreases yeild; can	Similar to previous	Likley to increase urabization/reduce farmland		
Interagency support	Increases demand/reliance	Increased demand/reliance	Similar to previous	Minimal impact		
Social groups, churches	Increases demand/reliance	Increased demand/reliance	Increased need for reliable HVAC systems; increased cost	May increase capabilites		
Reduction in volunteerism	People will volunteer more, but managing more volunteers can be	Similar to previous hazard	Could further reduce volunteerism	Depending on population demographics, could increase or decrease		
Recreation programs	Increased disruptions	Disrupt access	Could necessitate a change in programs; increased cost	Increase demand for programs		
Environmental						
DCR Land/Private Dams/DCR interaction	Dams may be vulnerable/Increased fire risk/Increased flooding potential	Increases stresses to DCR infrastructure	Could increase fire risk in time of extreme heat	Increased demand		
Trail systems	Increased maintenance for trails following storm events; disruption of use	Detrimental, but low impact	Reduction in patronage	Increased demand/use		
Groundwater/surface water pollution	Minimal and short term	Could create major fluctuations in water table/water supply	Could be impacted is drought associated	Increased demand/use = reduction of groundwater availability		
Habitat loss/increased runoff	Increased runoff could pollute lake	Will stress natural habitats, flooding will increase runoff	Could be impacted is drought associated	Increases due to new construction		
Increased wildlife interaction	Could decrease wildlife populations; food availability	Will likely interact more often due to disruptions; could eventually	Could increase is drought associated	Increases with higher population		
Increased storm intensity/drought/incidents	Intersects with hazard description	Intersects with hazard description	Would likley increase severity of storm events	No effect		

Community Resilience Building Risk Matrix

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

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

Features	Location	Ownership	V or S	Extreme Weather Events	Loss of Biodiversity /Agriculture	High Intensity Rainfall	Drought (lowering groundwater table)	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Capacity of wells - water system	Townwide	Municipal &	V	Work with state to address water quality from Rt 190 (DCR&DOT), DPW working to reduce salt use, drill new municipal wells to bring the m online - add to system for emergency and dry times, encourage use of private irrigation wells (bylaw), encourage water conservation (water ban, conserving fixture, meeting requirements, efforts have been successful)					
Road systems	Townwide	Municipal &	V	consider impact/betterment fees, redstone chase hill, wetstone, (west side of town), , diate town funding to maintenance & projects (match Ch90), plan for stormwater management strategically and identify funding for projects and maintenance,					
Power and communication system (overhead	Townwide	SMLC (powe	S (SML	underground - already underway in some locations, tree maintenance - continue and improve and find funding (work with DPW & SMLC), explore opportunities for higher quality internet service, evaluate plan for local broadband, communication system through SMLC (fiber optic to each town building) already ongoing, get overhead wires underground					
Town Beach	Town Beach	Municipal	V (runo	study drainage improvement, utilize 1M bond for improvements (fix drainage & improve on strenghts), improvements to building at the beach (old buildings can be updated)					
Culverts	Townwide	Municipal	V	address road quality from the "bottom up", upkeep relationship with DCR (permissions, training, etc), improve center of town, all drainage contributes to swamp outside of center of town (state formerly maintained swamp, it does not drain now, on DCR property, mosquito control program, improve drainage)					
Societal									
Shelter (facilities & plan)	Senior cente	Senior Cente	S	continue with annual planning of emergency planning, upkeep for code red system and radio system, continue funding for upkeep, evaluate alternative shelter facilities.					
Elderly population (Sholan Terrace)	Bird St	Housing Aut	V - high	plan for evacuation developed and implimented					
Farming Community	Townwide	Private	S (V - at	zoning, policy, or bylaws to a farmer to resist the pressure of development (e.g. change parcel size requirements), planning for long term development, farmers market and farmstands - continue to promote use of local products,					
HMEA (adult daycare facility)	Chocksett Rd	Private	S - as a	education - make town residents aware of this facility (50+/- clients daily), plan for evacuation to be developed and implimented, increase coorperation of the Town with the Facility owners					
Public transportation (limited, but does have	Townwide (	Regional (pr	V	get some/ expand public transportation, negotiate with montechusett RTA					
Environmental									
Open Space / Forests	Townwide	Private, Mun	S	Land Trust does planning, DCR - uphold cooperation, biodiversity loss - insect management become involved with state planning, managed replanting, forest management plan,					
Surface Water (Wachusett Reserviour)	Southeast of	State	S	work with managers of Wachuett Reserviour as needed					
Brush Fires	Townwide	State (DCR)	V	currently have 4 fire vehicles for woods - maintain this, continue to monitor fire towers, increase public education					
Wildlife	Townwide	all	S & V	development management & restrictions considering wildlife corridors, building or zoning codes, public education - foster value of wildlife					
Drinking water quality	Townwide	all (municip	S (risk	irrigation system restrictions, reduce salt use on roadways, consider balance of private wells vs municpal (challenges with private water quality)					
Stormwater runoff quality	Townwide &	all	V	reduce salt use, outfall drainage improvements, homeowner education about water quality and lawns, planning for stormwater managemetn strategically					

Community Resilience Building Risk Matrix

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

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

Features	Location	Ownership	V or S	EXTREME WEATHER	LOSS OF BIODIVERSITY/AGRICULTURE	HIGH INTENSITY RAINFALL	DROUGHTS (LOWER WATER TABLE)	Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Water Utilities	-	Town	V	Implement an integrated water management plan to address vulnerabilities. (Create new well fields/update aged infrastructure/increase footprint). Explore incentives for individual properties reusing grey water and stormwater.				H	
Electric Utilities (Town Owned with vulnerable substations)	-	Town	S	Revisit several streets with several old trees (forest management plan); review of substation locations to ensure they are not succeptible to flooding; more batter backup.				M	
Roadway Network/Culverts/Traffic Signals/Traffic	-	Town/State	V/S	Culvert assessment/hydraulic analysis at specific locations; Asset Management Plan on roadways/culverts; Integrate local evacuation routes into regional plan (evaluate additional signage); Additional mobile variable message signs				H	
Town Meeting Spaces/Town Buildings	-	Town	S						
Dams	-	Mixed	V	Dams not in Town Ownership (also private owners) - Agreements needed to review reports as a major stakeholder				M	
Medical Facilities/Emergency Management/Shelters	-	Town/Private	S	Explore backup generators at sheltering locations				L	
Societal									
Code Red System/Alert Systems	-	Town	S	Explore backup system in case of power outages/phone outages; advertise/marketing for people to sign up and to receive information; define an emergency contact protocol for townwide communications; town website updates potentially needed				L	Town can implement a plan
Faith based/community organizations/food bank	-	Town/Private	S	Provide a bigger seat at the table as a stakeholder in town-wide issues.				L/M	
Vulnerable populations	-	N/A	V	Explore consolidated mental health/public health plan for the community				L	
"Isolated Neighborhoods" (outside of hydrant district)	-	Town/Private	V	Explore ways to reduce response times to these areas for first responders				L	
Recreation Facilities/Activities	-	Town/Private	V	Help the Rec department match the infrastructure to the projected program; help them meet their expected needs; match the rec plan with the open space plan				M	
Environmental									
Zoning - "Sprawl" eating up land	-	Private	V	Review opportunities for "smart growth"/revise zoning bylaws to allow for cluster developments/explore existing frontage requirements				H	
Conservation Land - Open Space	-	Town/State	S	Generate accurate inventory of existing properties (prepare acquisition/protection plan for future green spaces); explore opportunities for Community Preservation Act; provide tools for access to quicker funding in case properties become available				M	
Clean Drinking Water	-	Town/State	V						
Ponds/Lakes/Rivers	-	Town/State	S						
Contamination	-	N/A	V	updated contingency plan to account for potentials of contamination; explore salt reduction techniques on roads; explore chemical use reduction in orchards; training/education materials outlining contamination impacts on the community				M	
Agricuture	-	Town/Private	S	Generate methods to put farming to be in a position of future success (matching future farmers with farms that may be in need, or without a current exit strategy)				H/M	

Appendix E: Top Priority Actions Discussion Summary from Workshop

TOWN OF STERLING, MA
Municipal Vulnerability Preparedness

PARE CORPORATION CELEBRATING 50 YEARS

Top Priority Actions

Capacity of the Wells and Water System

Water availability and infrastructure - upgrade capacity and system

Water Supply and Water system

Groundwater system - building redundancy into water supply system, reduce water use over time, green infrastructure to help with recharge, precipitation to use for high priority

Culverts & Drinking water infrastructure - inventory of what we have & prioritization for improvements

cross agency planning and implementation for LID and green infrastructure

Power and Communication System - going below ground

roadway condition - drainage culverts

local roads - consider evacuation routes, high intensity precipitation impacts, salt alternatives

Road System - upgrading system and stormwater

Stormwater Runoff quality

Evacuation Route - increase awareness

Addressing financial burden of extreme weather events (providing security)

Shelters, sterling nursing rehab, animal sheltering - collaborate for proper emergency management

loss of farms - encourage water saving farming techniques, encourage shifting to high (pressure of development and continuity of generations)

zoning to plan for future development - residential, industrial, etc

zoning and sprawl control - help densify, encourage affordable housing, preserve open

establish environmental advisory committee