Town of Durham

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Community Resilience Building Workshop

Summary of Findings

September 2019

Town of Durham
Community Resilience Building Workshop
Summary of Findings

Overview

The need for municipalities, academic institutions, regional planning organizations, states and federal agencies to increase resilience and adapt to extreme weather events and a changing climate is strikingly evident amongst the communities of the state of Connecticut. Recent events such as Tropical Storm Irene and Sandy have reinforced this urgency and compelled leading communities like the Town of Durham to proactively collaborate on planning and mitigating risks. Ultimately, this type of leadership is to be commended because it will reduce the vulnerability of municipal residents, infrastructure, and ecosystems and serve as a model for other communities in Connecticut, New England, and the Nation.

In the spring of 2019, the Town of Durham embarked on certification via Sustainable CT. As part of that certification, Sustainable CT and the Nature Conservancy provided the Town with a voluntary process to conduct an assessment of climate change impacts. In August 2019, a municipal-based core team organized a Community Resilience Building Workshop facilitated by the Nature Conservancy in partnership with Sustainable CT. The core directive of this effort was the engagement with and between community stakeholders to facilitate the assessment of climate vulnerabilities and the education, planning and ultimately implementation of priority adaptation actions for Durham.

The Durham Community Resilience Building Workshop's central objectives were to:

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

For the Workshop, the Town of Durham employed a unique "anywhere at any scale", community-driven process known as Community Resilience Building (CRB) (www.CommunityResilienceBuilding.org). The CRB's Risk Matrix and various data and maps were integrated into the workshop process to provide both decision-support and risk visualization around shared values and priorities across Durham. The Durham section of the Multi-Jurisdictional Natural Hazard Mitigation Plan (2013) was also incorporated. Using this CRB process, rich with information, experience and dialogue, the participants produced findings which are outlined in this summary report. The following report provides an overview of the top hazards, current concerns and challenges, current strengths, and proposed actions to improve Durham's resilience to natural and climate-related hazards today, and in the future.

The summary of findings transcribed in this report, like any that concern the evolving nature of risk assessment and associated action, are proffered for comments, corrections and updates from workshop attendees and additional stakeholders alike. The leadership displayed by the Town of Durham on community resilience building will benefit from the continuous and expanding participation of all those concerned.

Summary of Findings

Top Hazards and Vulnerable Areas for the Community

During the CRB Workshop, community members were asked to identify the top hazards for the Town of Durham. The hazard of greatest concern to the participants was storms including Nor'easters and winter storms. The other hazards discussed included precipitation-driven flooding from rivers and streams and inland flooding away from waterbodies. In addition, concerns were raised around extreme temperatures or heatwaves. These hazards have direct and increasing impacts on Durham's residents and resources such as its neighborhoods, natural areas (river corridors, wetlands, watersheds, parks), farms, roads, bridges, places of employment, fair grounds, residential drinking and wastewater systems, social support service to vulnerable populations, and other critical infrastructure and community assets.

Top Hazards and Areas of Concern for the Community

Top Hazards

- Storms (Nor'easters, winter snow/ice storms, hurricanes, wind storms)
- Flooding (precipitation-driven inland)
- Flooding (riverine)

Other hazards discussed: Extreme Temperatures and/or Heatwaves

*Areas of Concern in Durham**

Ecosystems: Hazardous Trees (along transportation corridors and municipal-owned property), Insect/Disease Damaged and Drought Stress on Trees across Municipality, Riparian Buffers, Natural Storm Debris. Cockaponset Forest, Coginchaug River and Watershed, Millers Pond, Herzig Brook, Parmelee Brook, Ball Brook, Fowler Brook, Sawmill Brook, Allyn Brook, vernal pools, Whites Farms Open Space,

Roads, Road Networks, Bridges: Main Street, Culverts, Higganum Road/Cherry Hill Road, Meeting House Hill Road/Guilford Court, Haddam Quarter Road/Cesca Lane, Stagecoach Road on South End near Route 17, Parmelee Hill Road/Route 17, Herzig Brook/Guire Road Culvert, Parmelee Brook/Indian Lane Culverts, Ball Brook/Haddam Quarter Road Culverts, Fowler Brook/Higganum Road Culverts, Stagecoach Road/ Route 17 Culvert.

Infrastructure: Dams (Miller Pond, Cream Pot Pond), Repetitive Loss Properties, Truss Buildings, Drinking Water Sources, Superfund Site, Residential, Commercial, and Municipal Buildings in Floodplain, Municipal Well Field (Allyn Brook), Municipal Recreation Area, Water Company Well Field, Dam (Allyn Brook/Mill Pond Lane/Route 17), Mauro Meadows (55+ community).

Developments and Neighborhoods: Durham Center, Northwest Section, James Road.

Vulnerable Populations: Homebound/Isolated Elderly, Developmentally Disabled, Non-English Speaking, Working Poor, Volunteers (decline over time), Tourists, Fair Goers.

*Information above from workshop participants as well as from the Durham section of the Lower Connecticut River Valley Council of Governments NHMP (2013).

Current Concerns and Challenges Presented by Hazards

The Town of Durham has several concerns and faces multiple challenges related to the impacts of natural hazards and climate change. In recent years, Durham has experienced a series of highly disruptive and damaging weather events including Tropical Storm Irene (August 2011), Tropical Storm Sandy, (October 2012), winter Nor'easter Nemo (February 2013), and other impactful events in the last eight years. Impacts from Irene included heavy rain-induced inland flooding and wind damage. Sandy caused extended power outages across portions of Durham. Winter snow storms drop excessive snow on the Town knocking out power and isolating residents and neighborhoods. The magnitude and intensity of these events and others across Connecticut has increased awareness of natural hazards and climatic change, while motivating communities like Durham to comprehensively improve resilience.

This series of extreme weather events highlights that for Durham the impacts from hazards are diverse; they range from limited flooding of roads and low-lying areas near rivers and wetlands during intense storms and heavy precipitation events to property damage from trees, wind, snow, and ice. Longer periods of elevated heat, particularly in July and August, have raised concerns about vulnerable segments of the population including the elderly and disabled. The combination of these issues presents a challenge to preparedness, response and mitigation priorities and requires comprehensive yet tailored actions for particular locations and/or areas across Durham.

The workshop participants were generally in agreement that Durham is experiencing more intense and frequent storm events and heat waves. The impacts have affected the daily activities of most residents. Additionally, there was a general concern about the challenges of being prepared with contingency plans for worst case scenarios during different times of the year (i.e. major disasters, storms, major hurricanes (Cat-3 or above)) particularly in the fall/winter due to more intense storms.

(Credit: firenews.com)

(Credit: facebook.com)

(Credit: reddit.com)

Specific Categories of Concerns and Challenges

As in any community, Durham is not uniformly vulnerable to hazards and climate change, and certain locations, resources, and populations have and will be affected to a greater degree than others. Workshop participants identified the following items as their community's key areas of concerns and challenges across three categories - Infrastructure, Societal, and Environmental.

Infrastructure Concerns and Challenges

Roads, Road Networks, Bridges:

- Ongoing repairs to several key culverts with additional repairs over time in select areas of municipality.
- Ongoing flooding along various road segments.

Emergency Management and Preparedness:

- Major hurricane creating unmanageable challenges related to storm debris and staffing for sheltering facility.
- Need for more business continuity and recovery planning for major events.
- Lack of emergency operations plan for 55+ community facility.

Housing:

- Isolation of homes when road network is compromised for extended periods.
- Education needs focused on potential for current and future impacts to structures.

Societal Concerns and Challenges

Vulnerable Populations:

- Isolated pockets of residents who live in more rural parts of community.
- Older housing stock including homes without air conditioning.
- Implications on disproportionately disadvantaged populations (i.e. elderly, working poor, etc.) due to flooding, winter storms, and heat waves.
- Need for long-term residents to educate new residents on preparedness.
- Need to update lists of special needs individuals to assist with response during major events.
- Power outages to residential homes and business particularly during the winter months increasing isolation.

Specific Categories of Concerns and Challenges (cont'd)

Environmental Concerns and Challenges

River, Watersheds, Aquifers:

- Lack of understanding of floodplain dynamics among stakeholders - particularly at the Whites Farm Open Space area and other riparian zones within the Coginchaug River Watershed.
- Contamination plume in groundwater from Superfund Site.
- Need to utilize nature-based solutions to reduce risk of flooding to people and property.

Trees and Forests:

- Increasing impacts to tree health from pests and pathogens resulting in dead and standing trees which pose risk to power lines, people, and property if not managed.
- Long-term maintenance of large intact forest blocks that protect drinking water supply for municipality.

Current Strengths and Assets

Because of the recent experiences with extreme weather, the Town of Durham is well acquainted with existing and shared strengths. Reinforcing best practices and enhancing available assets will generate greater benefits to the Town and adjoining communities through increased resiliency to more frequent and intense storms, as well as to long term impacts from increases in temperatures and precipitation.

- Clearly, the responsive and committed leadership exhibited by officials and staff is a very appreciated strength within the Town of Durham. Ongoing collaboration between the Town, adjoining municipalities, Lower Connecticut River Valley Council of Governments, DEMHS Region 2, business community, faith-based organization, and NGOs among others on the priorities identified below will help to advance comprehensive, cost-effective approaches to community resilience building.
- The Town has solid, highly experienced, staff with access to adequate resources for most emergency situations. The coordination amongst various departments including leadership, Police, Fire, and EMS (i.e. Chiefs Council) was cited as an ongoing, and highly valued community strength despite the need to maintain a flow of volunteers over time.
- Ongoing recognition and commitment to replace, repair, or upgrade culverts as the principal vulnerable infrastructure across municipality (i.e. 2 culverts currently being fixed on Picket Lane).
- Adequate and well-positioned fire hydrant and pond suppression supply sources will be in place due to water main extension project.
- Relatively intact forested watershed surrounding ponds and wetlands across Durham coupled with rivers and riparian corridors which provide flood storage, enhance public amenities for recreation and gathering, and increase ecological function and biodiversity.
- Self-reliant and resilient residents that look out for one another and pride themselves on preparedness.
- High quality sheltering facility at Coginchaug Regional High School with back-up generation and ability to handle pets and continue to make available to adjoining municipalities like Middlefield during times of need.
- Fully functioning Emergency Operation Center in Town Hall with back-up power.

- Collaborative partnership between municipalities (Durham, Middlefield) and regional school district facilitated by open and constructive dialogue (i.e. monthly meetings) and considerations of mutually beneficial activities to advance a shared understanding of the needs of the larger community.
- Posted shared Town Planner position between Durham and Middlefield with the potential to broaden consideration of activities that could enhance more local to regional resilience. Planner hired with start date of December 9, 2019.
- Process in place to alert motorists of road segments that flood routinely (i.e. Parmalee Hill Road, Meeting House Hill Road, Higganum Road) with alternative "workarounds" to avoid closure.
- New natural gas line to be connected to Coginchaug Regional High School, other schools, and potentially any buildings along the Route 68 and 17 corridors.
- Maintenance of "Well-Check List" with Social Services Department in coordination with Fire, Police, and EMS coupled to response prior to and after major events.
- The annual Durham Fair which provides a reoccurring opportunity to enhance planning and coordination across departments and organizations within the municipality and therefore a tool for community resilience building.
- Strong network of social support services and organizations such as Durham Health Department, Meals on Wheels, Community Renewal Team, Local Wellness Coalition, Food Pantry (run by municipality at Activity Center), Amazing Grace Food Pantry (Middletown), Thanksgiving/Christmas meal events, Durham Neighbors in Need, and Giving Garden, and Coginchaug Area Transition Team.
- Have used Senior Bus to get people to shelters as needed.

Top Recommendations to Improve Resilience

A common thread throughout the workshop discussions was the recognition that Durham needs to be better prepared through longer term community-based, contingency planning across all areas of concern. This need and additional core highlights surfaced by the Workshop participants are addressed below across Infrastructure, Societal, and Environmental categories.

Infrastructure

- Establish standing Memorandum of Understanding (MOU) or pre-approved release form with private property owner(s) and/or DEEP for natural storm debris management fields for temporary storage after major storm events. Identify multiple fields in strategic locations to increase flexibility and reduce transportation costs and time.
- Advance the ongoing culvert identification and mapping project by including the age and condition of each culvert in the database. Once completed conduct prioritization process and develop plan to comprehensively sequence the replacement, repair, or retrofit of culverts as well as incorporating future storm scenarios into to design.
- Seek ways to encourage local businesses including gas station, pharmacy, and restaurants to secure back-up power generation that will help to ensure continuity of critical services and products during major events.
- Continue to advance discussions on possible microgrid installation given the additional flexibility provided by the new natural gas line along Route 68 and 17.
- Identify areas across municipality where Low Impact Development (LID) practices along with installation of green stormwater infrastructure could help minimize localized flooding and enhance the environment.
- Look to incorporate green stormwater infrastructure where appropriate into upgrades to storm drains, paving, and general maintenance of roads via Capital Improvement Plan budgets.
- Maintain the current process of road closure protocol and utilize Everbridge, when possible.

Community Resilience Building Workshop Recommendations

Infrastructure (cont'd)

(Credit: Jessica LeClair/ISE)

- Review state response plan for bulky waste generated by damage to residential structures during major events with an eye towards better positioning the municipality to manage structural debris including consideration of auxiliary or standing contract(s) with local contractor(s), permitting needed, and record keeping procedures to ensure reimbursement from FEMA.
- Build out the administrative and governance structure surrounding the Durham Water Company that will lead the development of a plan to maximize the potential benefits of the water main project (i.e. repairs, upgrades, etc.).
- Ensure parcel-scale GIS information is updated and available for property owners to accelerate FEMA claim requirements in the aftermath of disasters.
- Review assessment being conducted by the Council of Governments on benefits and costs to Durham of enrolling in FEMA's Community Rating System (CRS).

Societal

- Continue to seek ways to educate residents on the limitations of services provided by the municipality particularly during time of emergencies with an emphasis on a 72-hour, shelter-in-place mentality.
- Enhance communication with residents regarding the decision protocol for opening and closing sheltering, cooling, and heating facilities including the sharing of protocol documents on municipal website, mailers to taxpayers, and other means, as appropriate.
- Strengthen coordination across municipality between groups providing services to at-risk residents including better defining the Well Check List, identifying where the List should be housed and maintained, sharing the availability of the services associated with being on the List with residents, and identifying ways for residents to self-identify and register to be on the List.

Community Resilience Building Workshop Recommendations

Societal (cont'd)

- Explore rejuvenating and rebuilding the Citizen Emergency Response Team (CERT) and developing an action plan to ensure the CERT team(s) are properly trained and engaged during periods without emergencies.
- Maintain "Chiefs Council" to ensure routine and timely information is exchanged across municipal and state departments and to enable more responsive and informed decisions.
- Work to connect active groups and clubs (i.e. 60+ Club, etc.) with resilience-related activities and volunteer needs in the community.
- Look to increase the number volunteers available to staff the emergency shelter.
- Continue to encourage the development of an emergency operations plan for assisted living and 55+ community facilities (i.e. Mauro Meadows).
- Complete the strategic planning exercise for Fire and EMS.
- Look to advance a skills/resource sharing enterprise via the Coginchaug Area Transition Team.
- Maintain communications to residents via Everbridge as a critical source of information during routine and major events.

Environmental

- Continue to develop and generate updated open space acquisition and management plan for Durham (Conservation & Inland Wetlands Commissions) that integrates the identification of parcels that would enhance the overall resilience of the community (i.e. adjoining and within existing riparian corridors subjected to flooding currently).
- Maintain and enhance, where possible, the White Farm Open Space and Riparian Project that balances diverse interests and needs of multiple stakeholders given that the site is in the principal floodplain of the Coginchaug River and will experience ever-increasing levels of flooding over time resulting in temporarily limits to passive recreation.

Community Resilience Building Workshop Recommendations

Environmental

- Continuously review and refer to the Coginchaug River Watershed Plan for recommendation and best practices to maintain and enhance the ecological, societal, and economic benefits of natural resources that can improve resilience in Durham.
- Maintain large forest blocks that protect drinking water supply for the municipality and the region.
- Conduct inventory of dead and dying standing trees of concern and prioritize removal given available budget and in consultation with municipal insurance carrier.
- Encourage collaboration between the Conservation, Inland Wetlands, and Agriculture Commission to determine how municipal-owned properties are managed today and into the future.
- Continue to monitor the extent of beaver activity across municipality and be prepared to implement control measures if activity begins to cause harm to roadways and property (e.g. James Road area).
- Investigate tree ordinance for residential property owners to reduce future tree issues in the public right-of-way.
- Look to Middletown staff and organizations to see what support and education opportunities are available to help with tree issues as part of Middletown's Tree City designation.
- Monitor the level of risk for the municipality due to wildfire given increased intensity of drought conditions in the future.
- Catalogue the location and extent of vernal pools across municipality to ensure they are properly considered in proposed development reviews.
- Communicate with existing farmers regarding runoff of chemicals from agricultural lands into riparian areas.

CRB Workshop Participants: Department/Organization

Town of Durham - First Selectmen's Office
Town of Durham - Emergency Management Department
Town of Durham - Public Works
Town of Durham - Health Department
Town of Durham - Board of Education
Town of Durham - Sustainable Durham
Town of Durham - Residents
Coginchaug Area Transition
Lower Connecticut River Valley Council of Governments

CRB Workshop Project Team: Organization and Role

Durham Core Team

Laura Francis - Town of Durham

Workshop Facilitation Team

The Nature Conservancy – Adam Whelchel, Ph.D. (Lead Facilitator)
Institute of Sustainable Energy - Jessica LeClair (Support Lead)

Recommended Citation

Town of Durham (2019). Community Resilience Building Workshop Summary of Findings. Town of Durham, Sustainable CT, The Nature Conservancy. Durham, Connecticut.

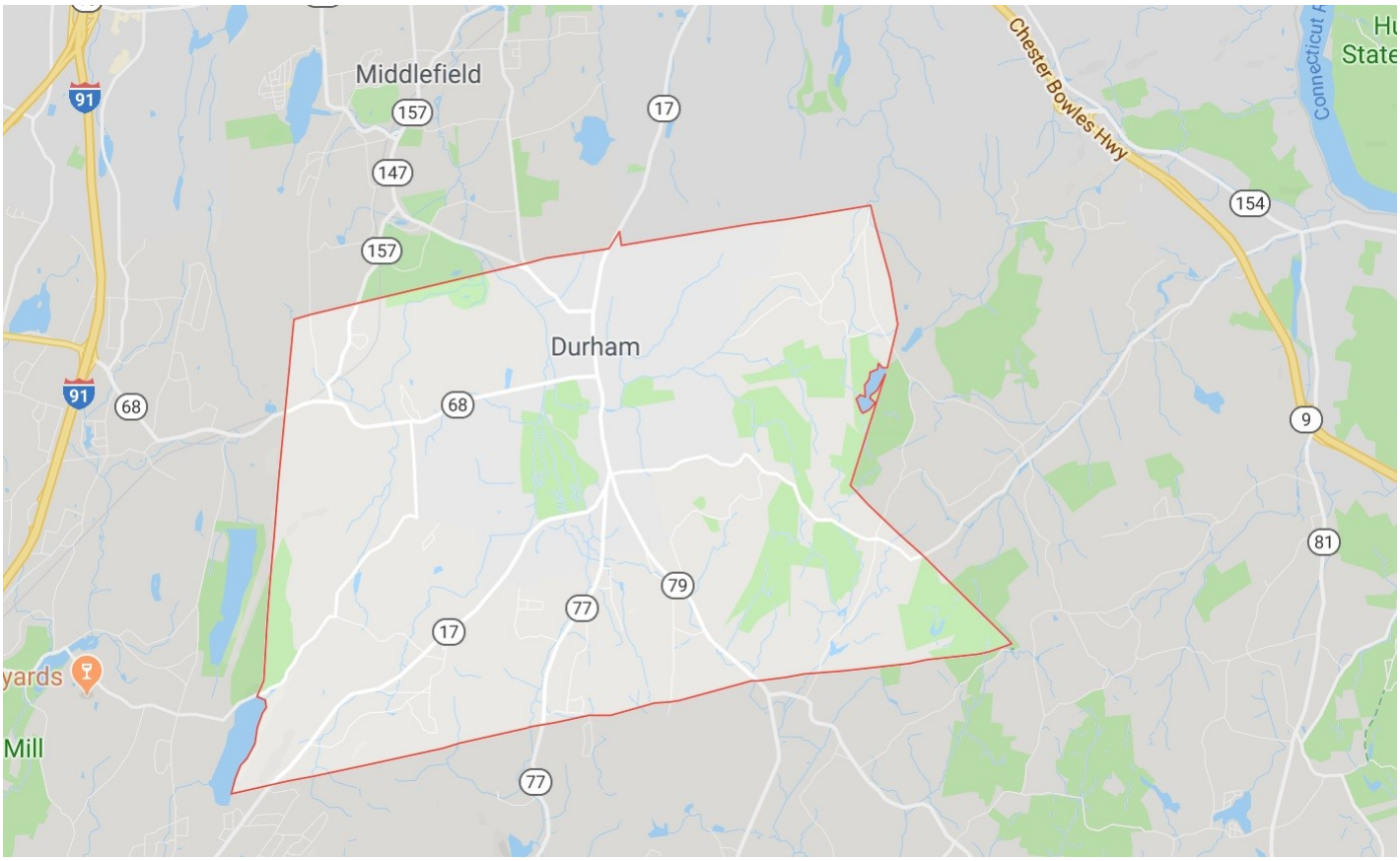
Acknowledgements

Special thanks to the Town of Durham First Selectman, staff, and community members for their willingness to embrace this process in hopes of a more resilient future for Durham. Thank you to Sustainable CT and a Durham resident for providing refreshments and food. Finally, thanks to the scribes that recorded the workshop dialogue.

This project was made possible in part through the generous contribution of The Nature Conservancy and Sustainable CT who conducted Durham's Community Resilience Building Workshop in close partnership with the Town's Core Team.

Appendix

Base Map


Middlefield
Durham
Chester Bowles Hwy
91
157
147
17
154
68
9
81
79
77
Mill

Resources and Maps Used During Workshop

MULTI-JURISDICTIONAL
NATURAL HAZARD MITIGATION PLAN

Lower Connecticut River Valley Council of Governments
Towns of
Cromwell, Durham, East Haddam, East Hampton,
Haddam, Middlefield, Middletown and Portland

Project Funded by:	U.S. Department of Homeland Security Federal Emergency Management Agency
Administrated by:	Connecticut Department of Energy and Environmental Protection
Prepared by:	Midstate Regional Planning Agency and the Lower Connecticut River Valley Council of Governments

August 2013

Received: July 21, 2016
2:32 pm
Office of the Town Clerk

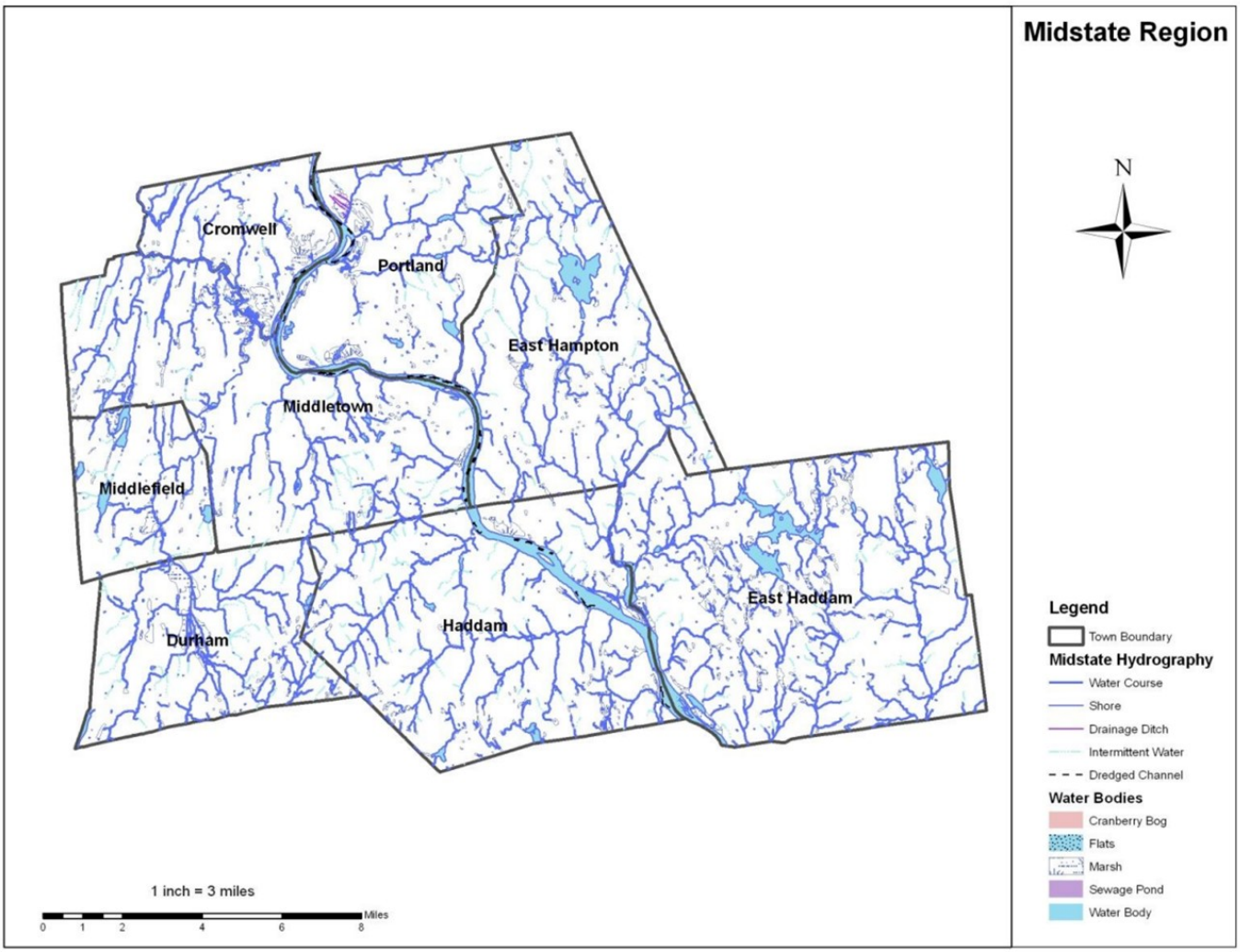
PLAN OF CONSERVATION AND DEVELOPMENT

TOWN OF DURHAM
SEAL
1708
CONNECTICUT

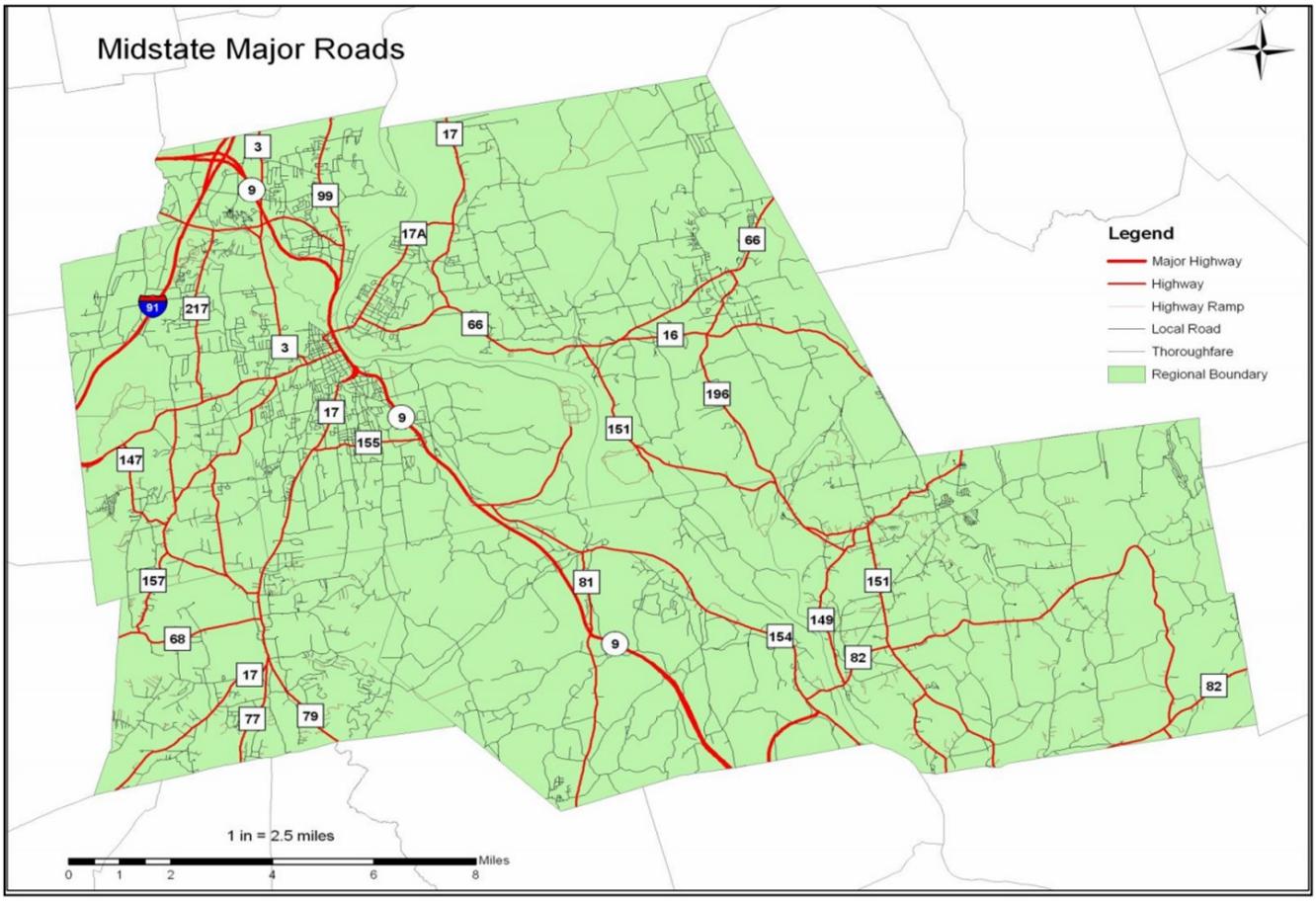
EFFECTIVE DATE: AUGUST 1, 2016

Page 1 of 123

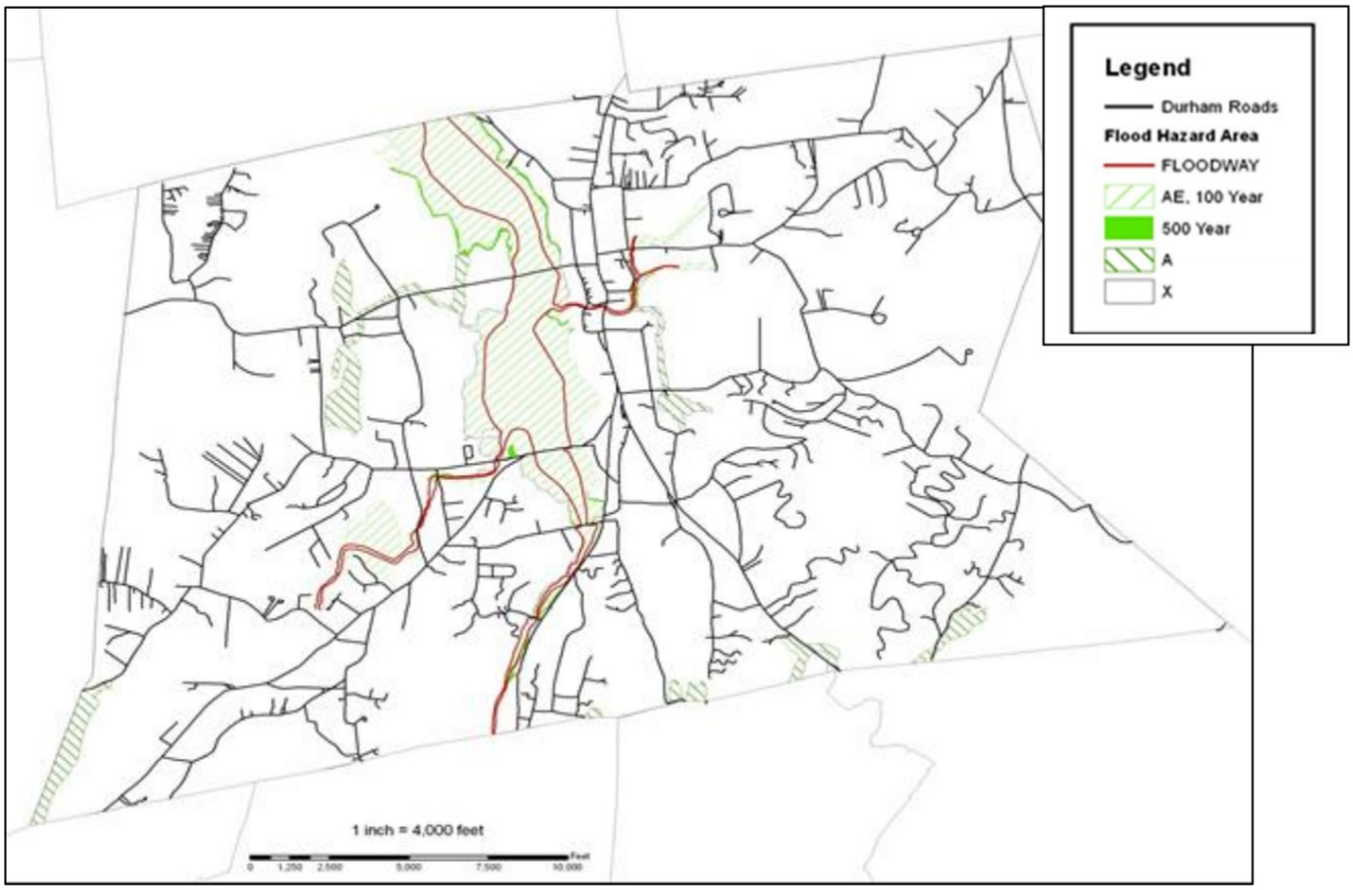
Photo 5: Durham, Main Street looking north in the aftermath of the Hurricane of 1938.
Source: Russell Library



Map 2: Hydrography of the Eight Former Midstate Region Municipalities
Source: RiverCOG

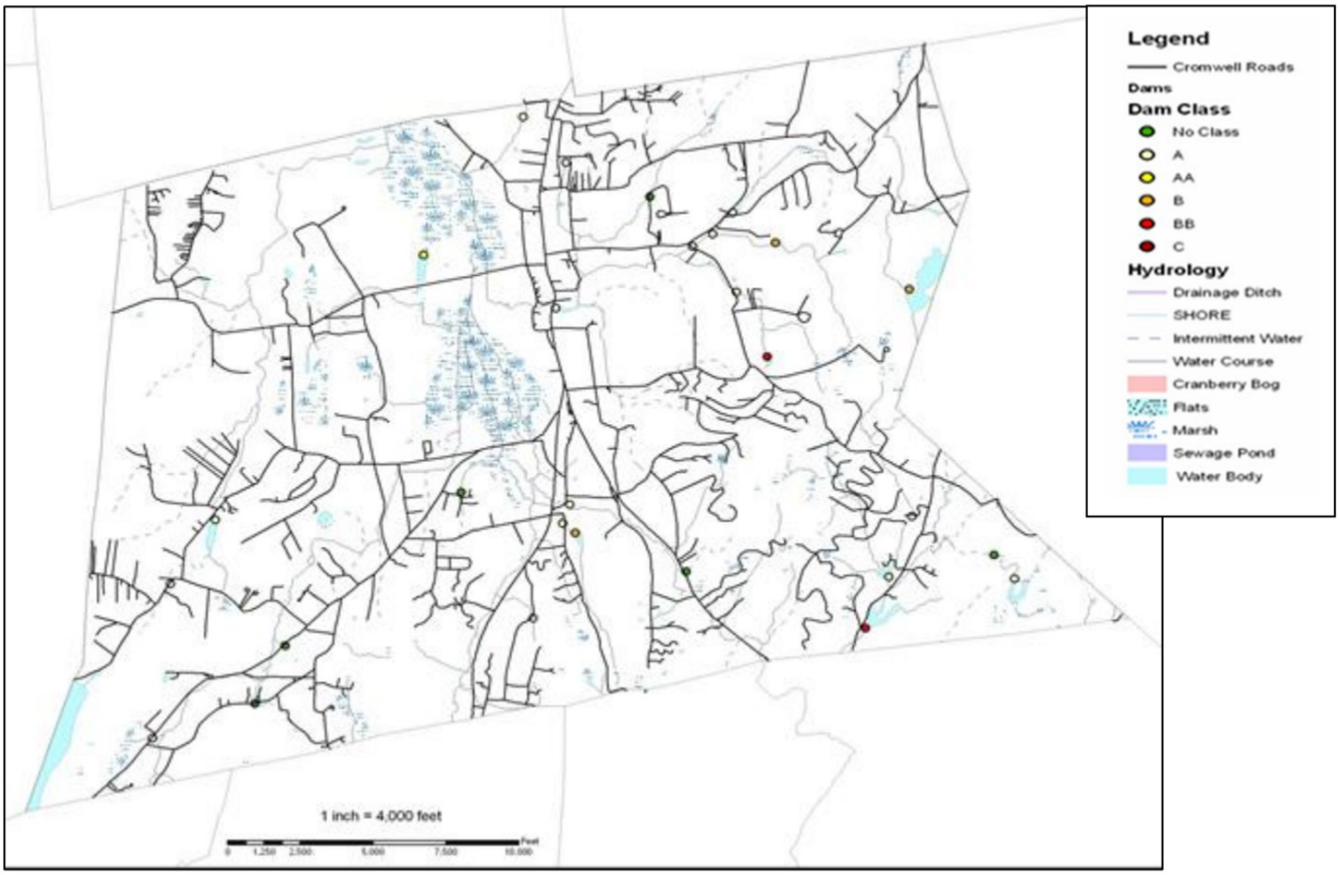


Map 3: Major Roads in the Eight Former Midstate Region Municipalities
Source: RiverCOG



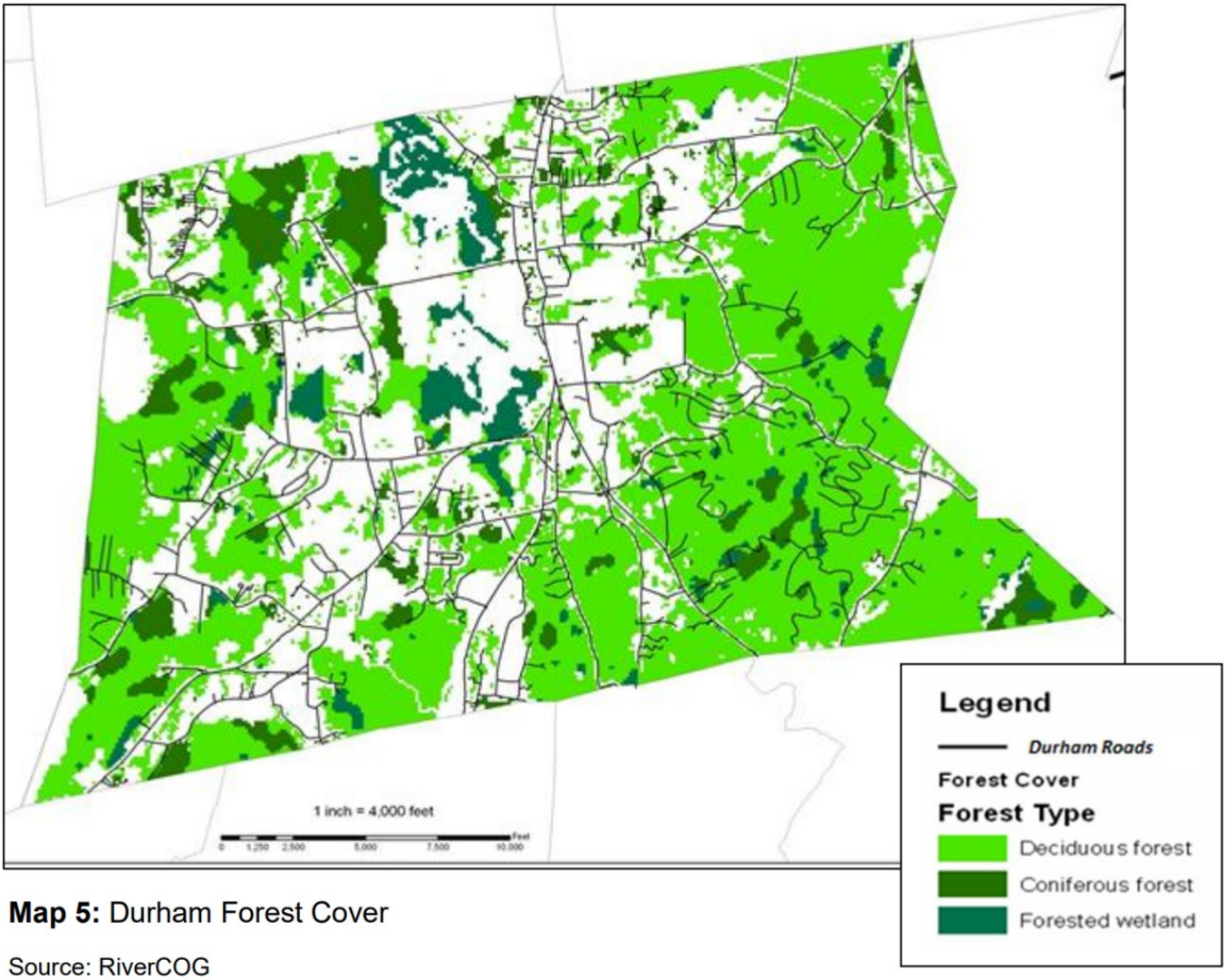
Map 2: Durham Flood Zones

Source: RiverCOG



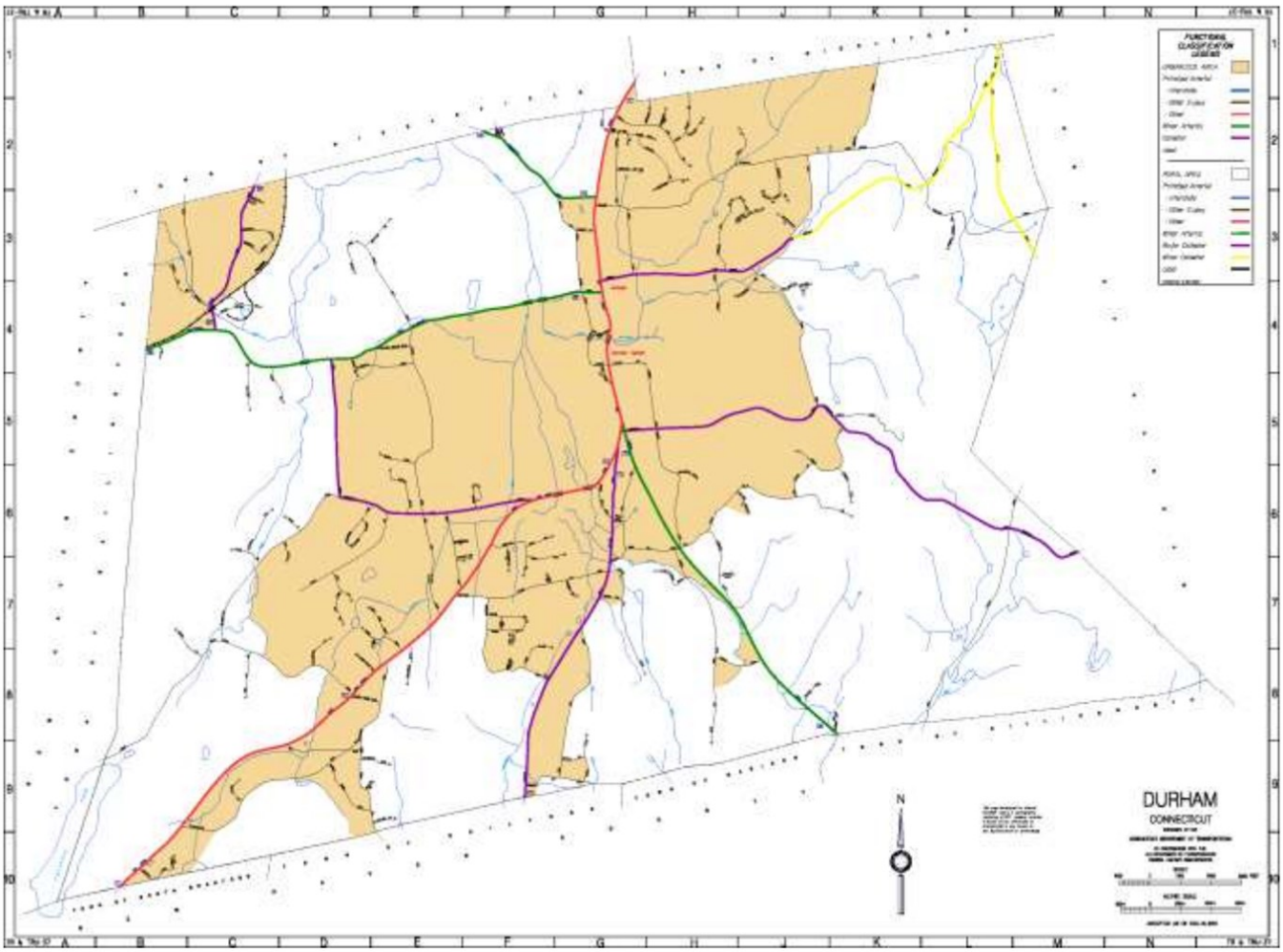
Map 4: Dams in Durham

Source: RiverCOG

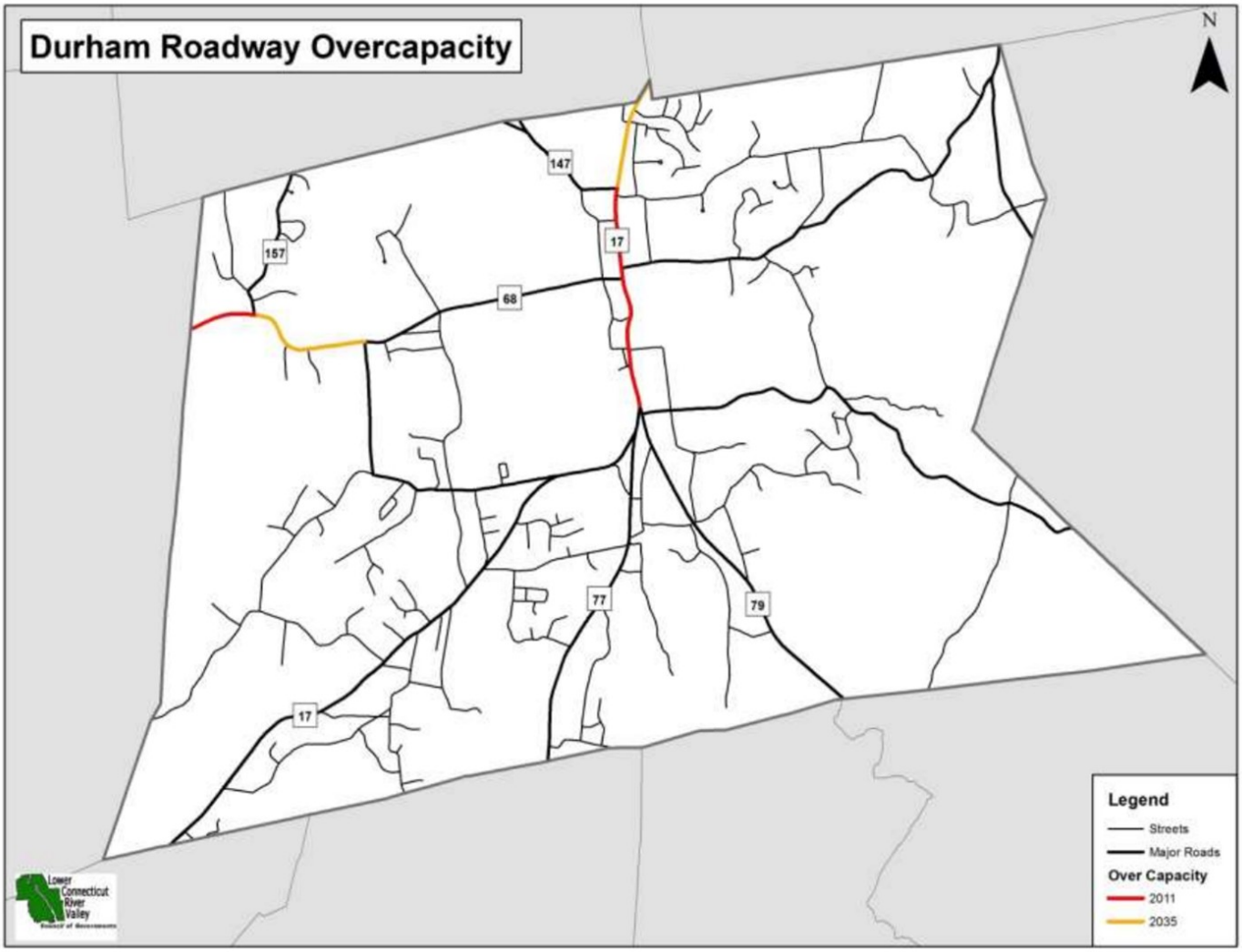


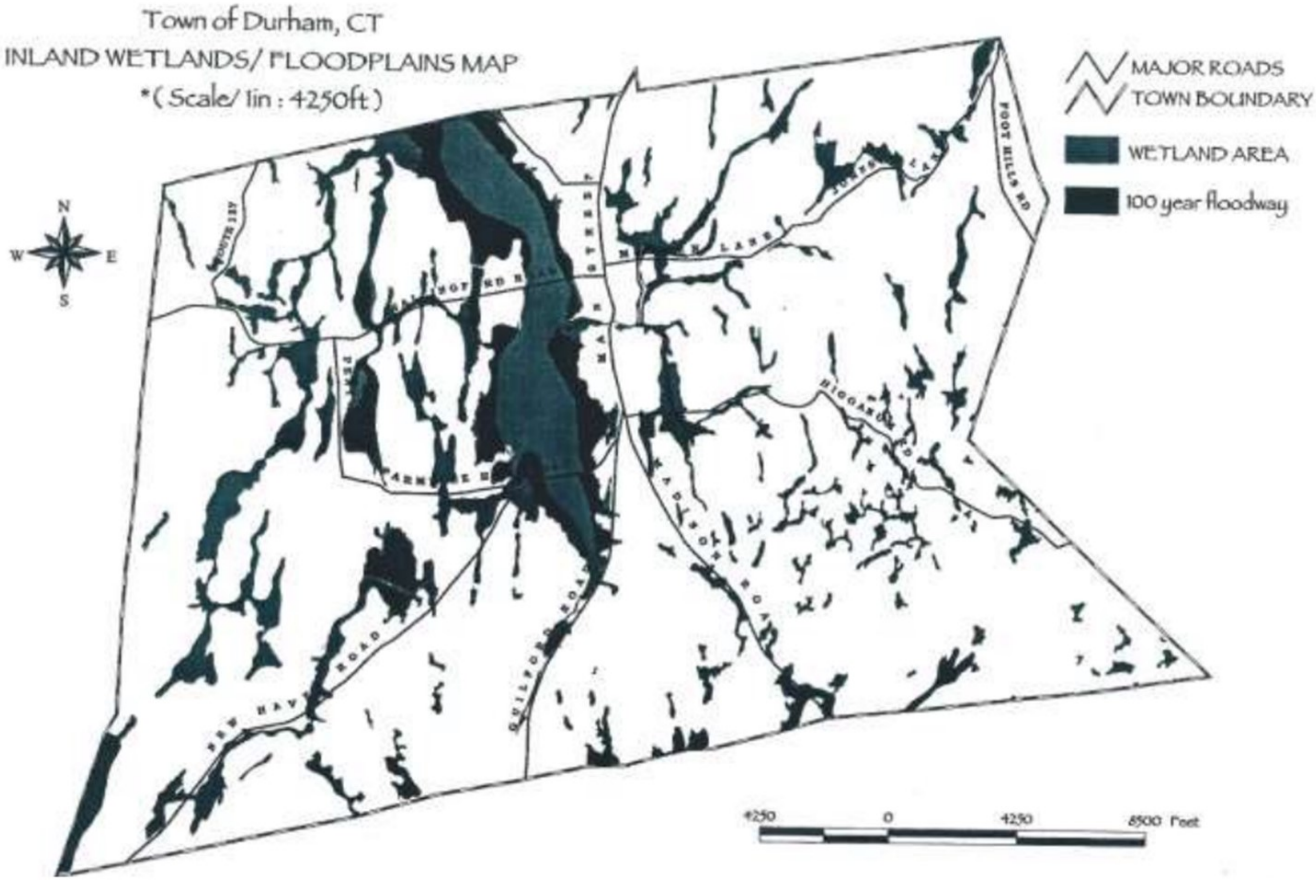
Map 5: Durham Forest Cover

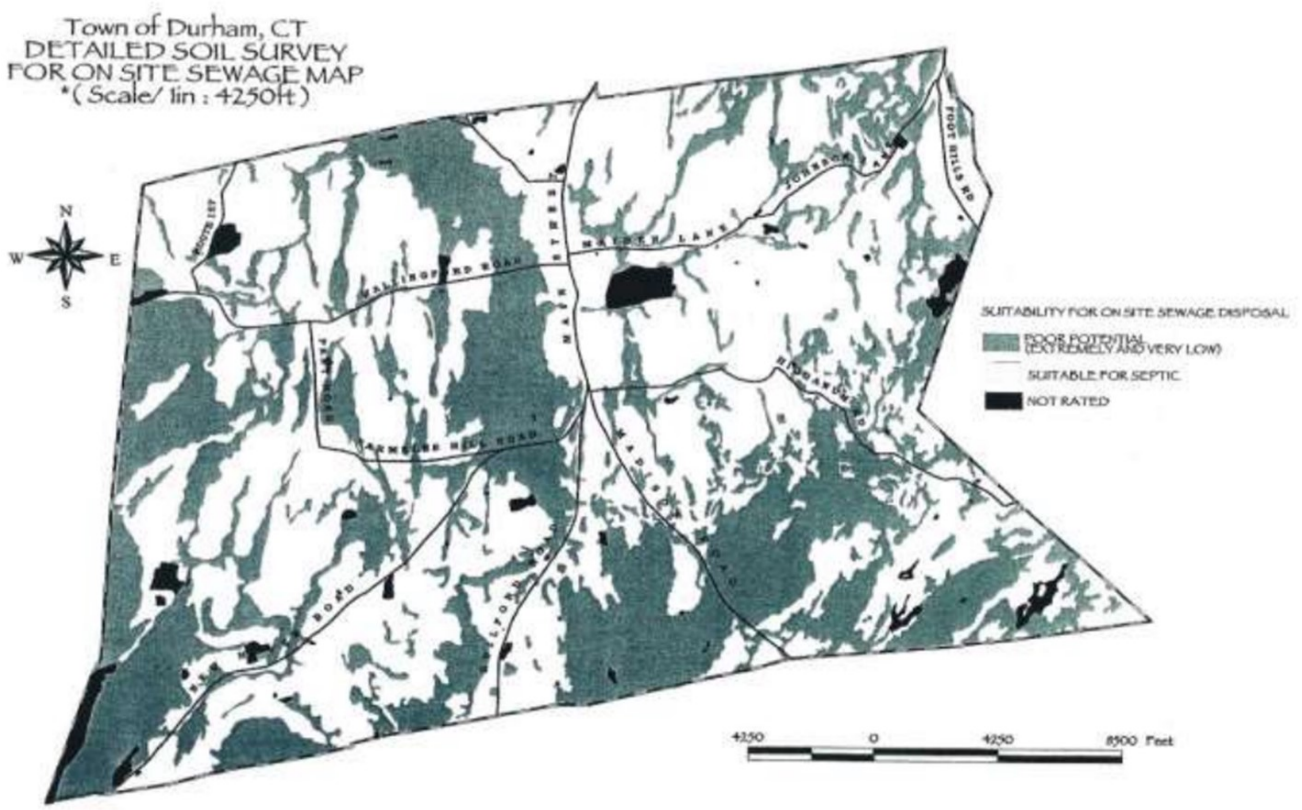
Source: RiverCOG

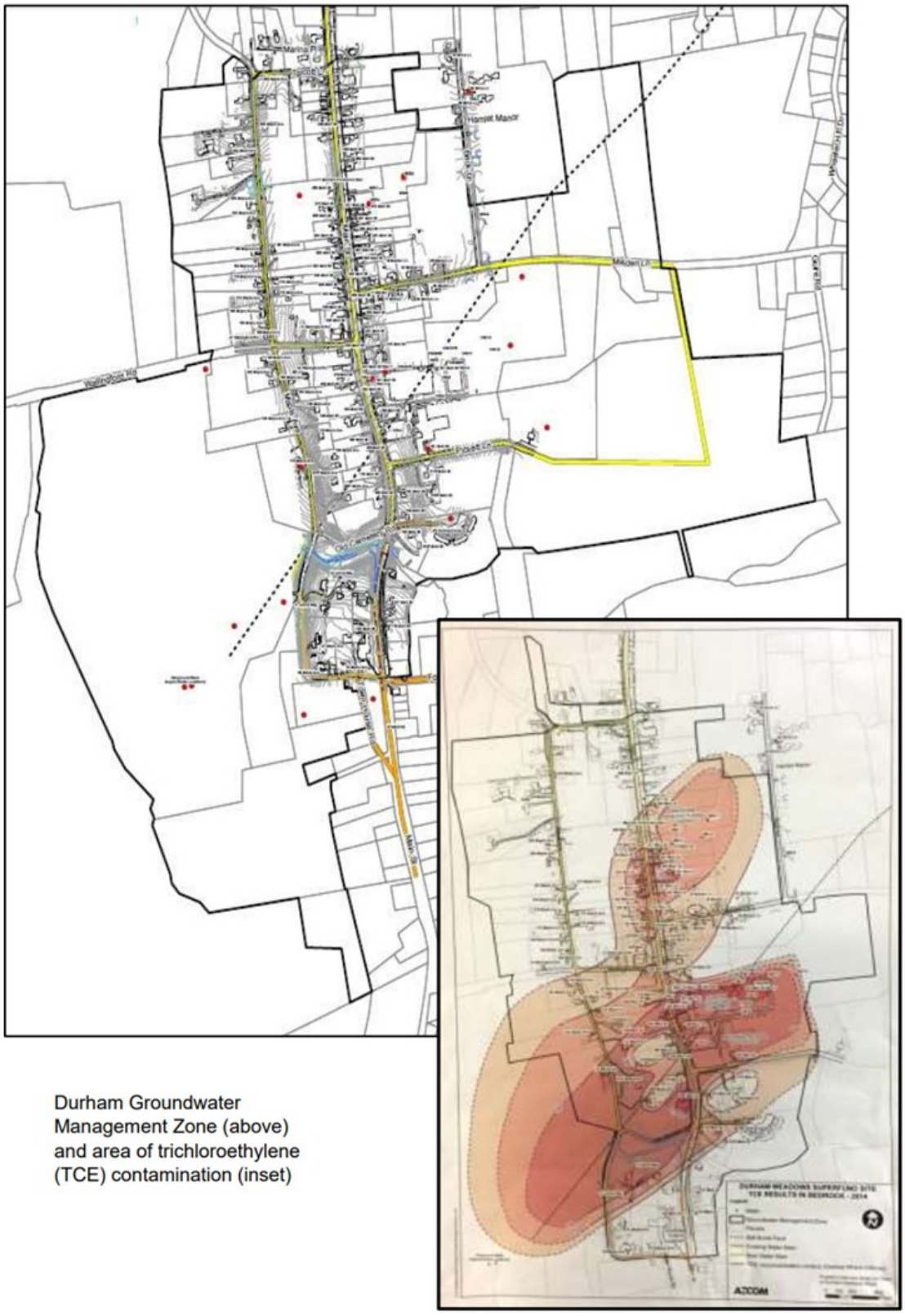


3.3. Travel Patterns to Work


Durham Roadway Overcapacity
N
147
17
157
68
77
79
17
Legend
Streets
Major Roads
Over Capacity
2011
2035
Lower Connecticut River Valley


Town of Durham, CT
INLAND WETLANDS/ FLOODPLAINS MAP
*(Scale/ 1in : 4250ft)
MAJOR ROADS
TOWN BOUNDARY
WETLAND AREA
100 year floodway
N
W
E
S
4250
0
4250
8500 Feet


Town of Durham, CT
DETAILED SOIL SURVEY
FOR ON SITE SEWAGE MAP
*(Scale/ 1in : 4250ft)
N
W
E
S
SUITABILITY FOR ON SITE SEWAGE DISPOSAL
POOR POTENTIAL (EXTREMELY AND VERY LOW)
SUITABLE FOR SEPTIC
NOT RATED
4250
0
4250
8500 Feet



Durham Groundwater Management Zone (above) and area of trichloroethylene (TCE) contamination (inset)

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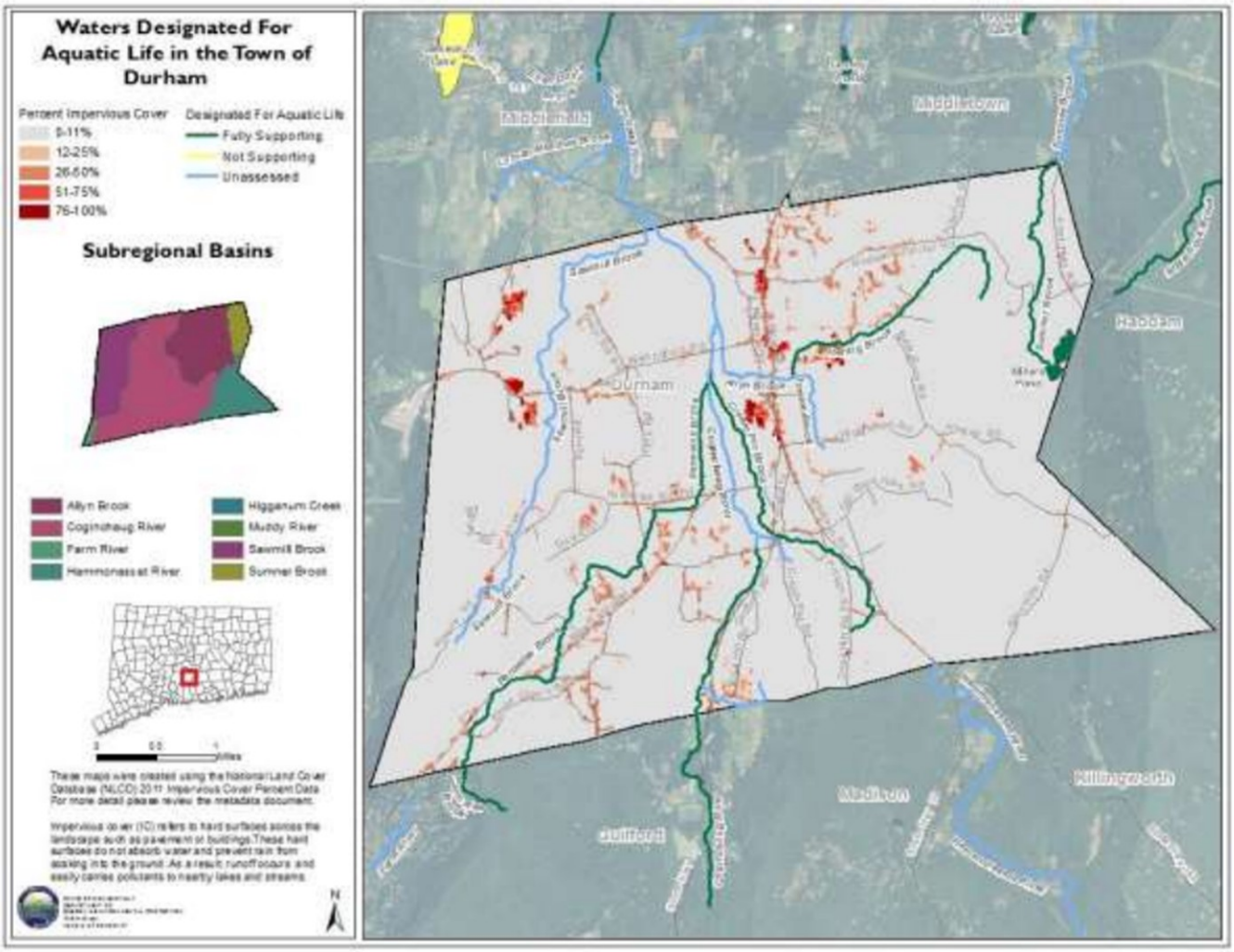
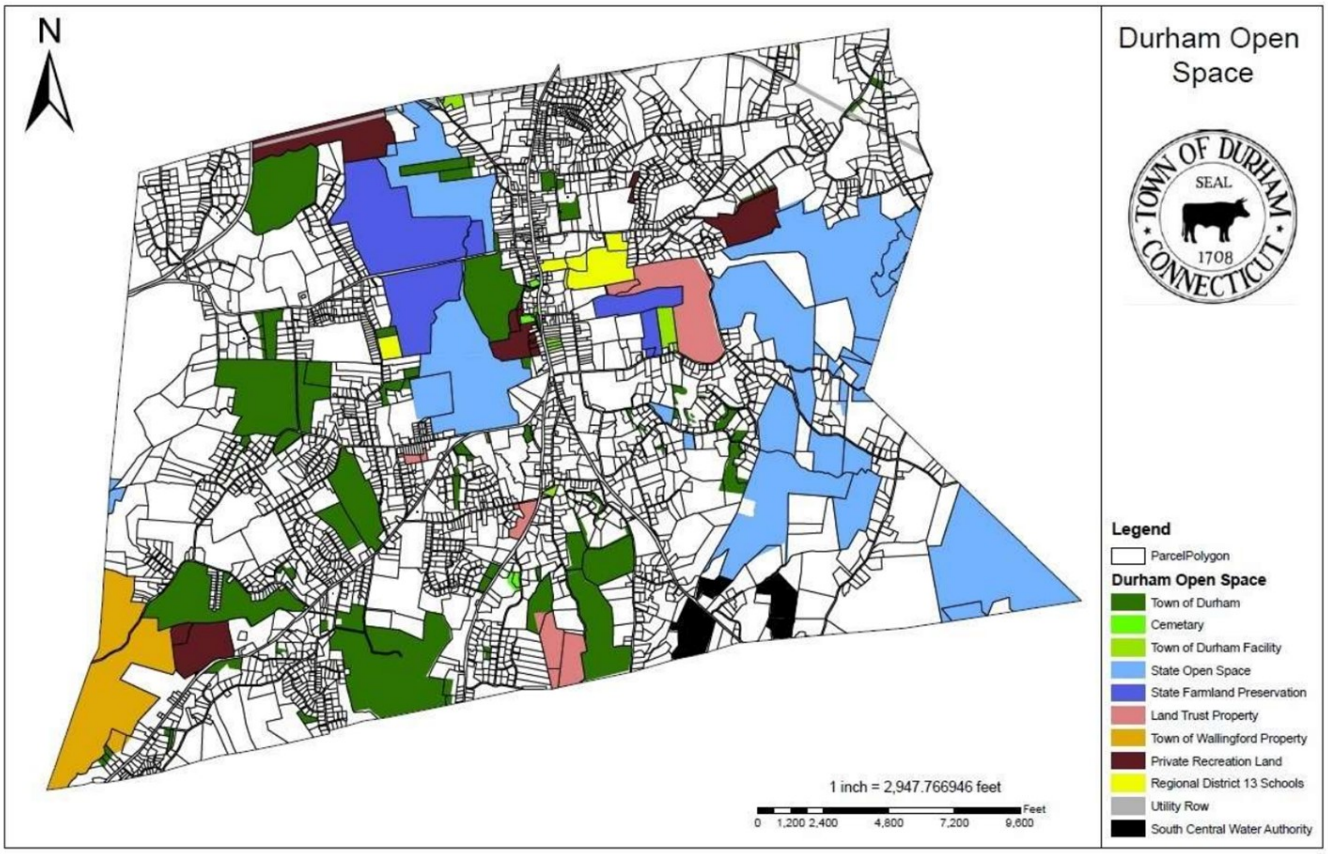
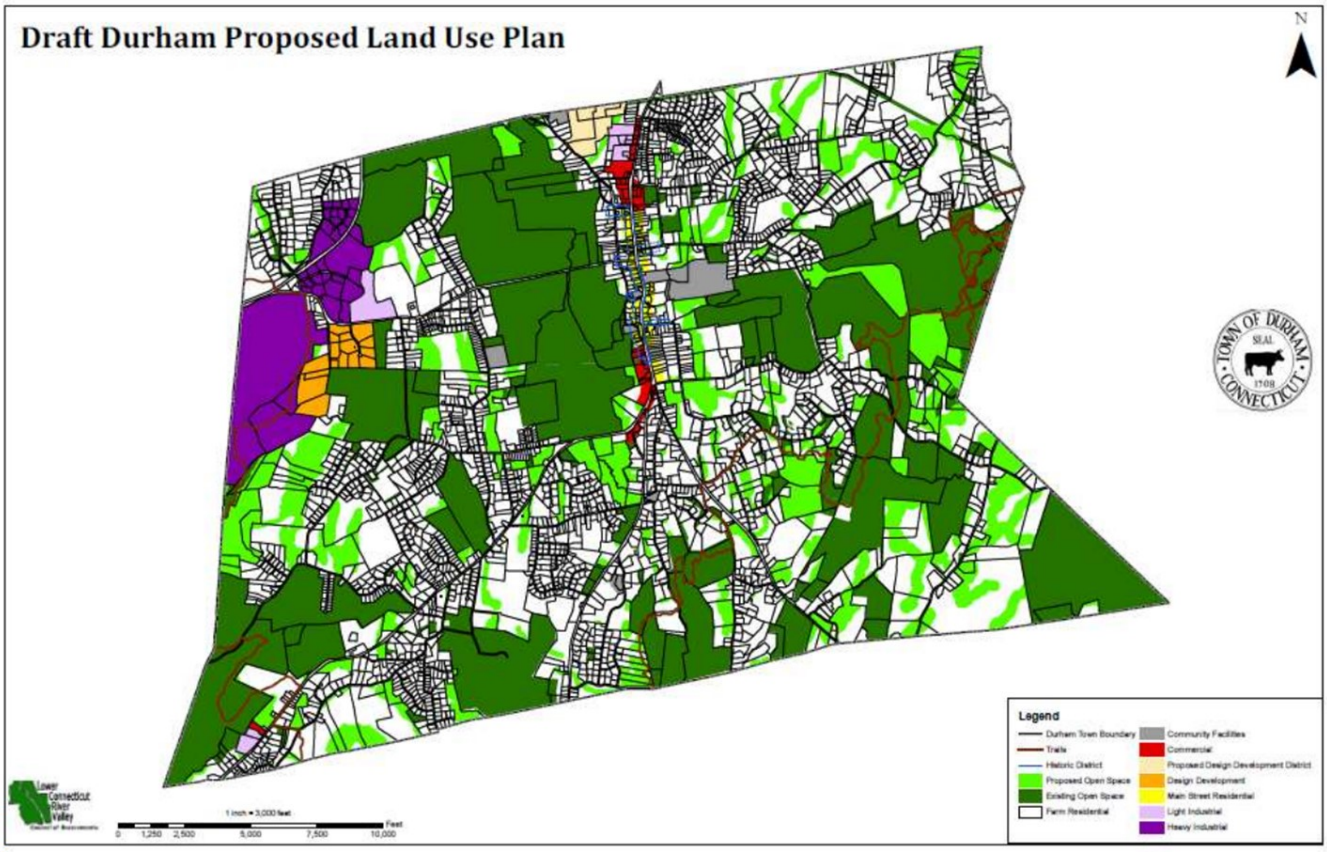
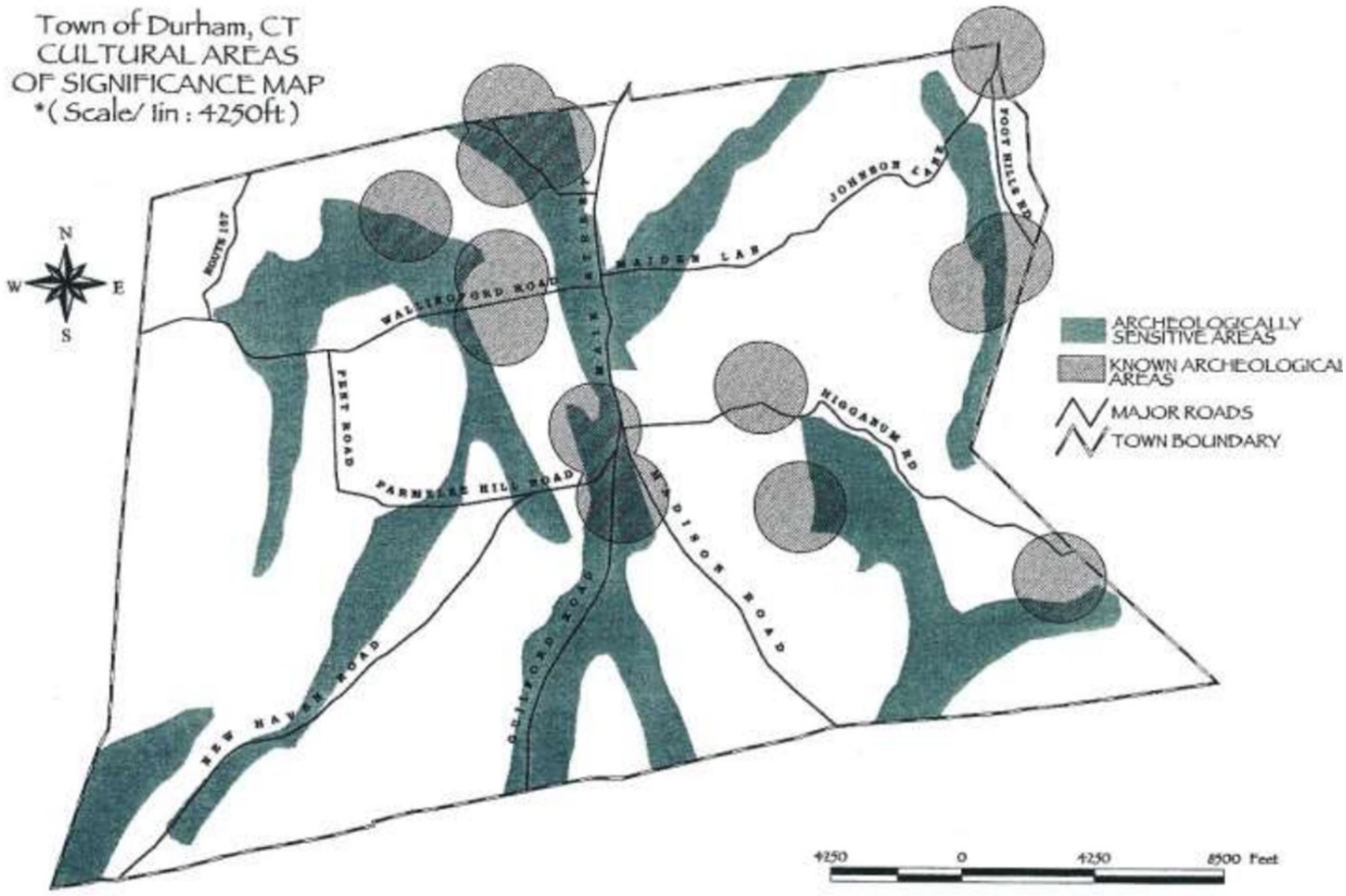

Waters Designated For Aquatic Life in the Town of Durham
Percent Impervious Cover
0-11%
12-25%
26-50%
51-75%
76-100%
Designated For Aquatic Life
Fully Supporting
Not Supporting
Unassessed
Subregional Basins
Allyn Brook
Coginchaug River
Farm River
Hammonasset River
Higganum Creek
Muddy River
Sawmill Brook
Sumner Brook
These maps were created using the National Land Cover Database (NLCD) 2011 Impervious Cover Percent Data. For more detail please review the metadata document.
Impervious cover (IC) refers to hard surfaces across the landscape such as pavement or buildings. These hard surfaces do not absorb water and prevent rain from soaking into the ground. As a result, runoff occurs and easily carries pollutants to nearby lakes and streams.
Middletown
Durham
Haddam
Killingworth
Madison
Guilford


N
Durham Open Space
TOWN OF DURHAM
SEAL
1708
CONNECTICUT
1 inch = 2,947.766946 feet
0 1,200 2,400 4,800 7,200 9,600 Feet
Legend
ParcelPolygon
Durham Open Space
Town of Durham
Cemetary
Town of Durham Facility
State Open Space
State Farmland Preservation
Land Trust Property
Town of Wallingford Property
Private Recreation Land
Regional District 13 Schools
Utility Row
South Central Water Authority


Draft Durham Proposed Land Use Plan
N
Legend
Durham Town Boundary
Trails
Historic District
Proposed Open Space
Existing Open Space
Farm Residential
Community Facilities
Commercial
Proposed Design Development District
Design Development
Main Street Residential
Light Industrial
Heavy Industrial
1 inch = 3,000 feet
0
1,250
2,500
5,000
7,500
10,000
Feet


Town of Durham, CT
CULTURAL AREAS
OF SIGNIFICANCE MAP
*(Scale/ 1in : 4250ft)
N
W
E
S
ROUTE 147
WALLINGFORD ROAD
MAIN STREET
MAIDEN LANE
JOHNSON LANE
FOOT HILLS RD
PENT ROAD
PARMELEE HILL ROAD
HIGGANUM RD
MADISON ROAD
GUILFORD ROAD
NEW HAVEN ROAD
ARCHEOLOGICALLY SENSITIVE AREAS
KNOWN ARCHEOLOGICAL AREAS
MAJOR ROADS
TOWN BOUNDARY
4250
0
4250
8500 Feet