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Section 1 Plan Summary



Figure 1.1: Needham, Massachusetts

The Town of Needham, Massachusetts is a suburban community located ten miles southwest of downtown Boston, bordering the cities of Boston, Newton, and the towns of Dover, Dedham and Westwood. The Charles River serves as the border for about three quarters of its perimeter and is served by Route 95/128 and the Massachusetts Bay Transportation Authority's (MBTA) commuter rail.

The residents of Needham have shown their support for Needham's open space and recreation land over the years, through voting for financial support, including the 2004 vote to accept the Community Preservation Act, or through donations of time or personal funds, such as the founding of the registered non-profit 501(c)(3) Needham Land Trust by a group of Needham citizens in 2012. Attachment A in this report outlines the numerous achievements from 2007-2016, but much more must be done that continues to balance the pressure for development with the need to protect our natural resources and to provide recreational opportunities and facilities for people of all ages and abilities. The Town has had many successes implementing past plans, but it will take the concerted effort of volunteers to support Town staff and acquire funding to implement this Open Space and Recreation Plan.

One of Needham's continuing achievements is the large quantity of protected municipal open space throughout the Town. As part of this Open Space and Recreation Plan update, the goal of strategic acquisition of open space will be maintained, but with additional goals focusing on the maintenance and improvement of the numerous existing open space and recreation resources.

Based on the on the 2007 Open Space & Recreation Plan as well as input from Town boards and residents, the following goals have been established:

- *Goal I:* Acquire /Protect Additional Open Space
- *Goal II:* Maintain, Enhance, and Expand Recreational Facilities
- *Goal III:* Expand Access, Promote Awareness, and Support Responsible Stewardship of Needham's Natural Resources
- *Goal IV:* Protect Water Resources

The sequencing of the goals is not intended to reflect priority order as each is considered to be of equal importance.

This Open Space and Recreation Plan provides an updated inventory of open spaces, outlines the needs related to open space and recreation, and sets forth a set of objectives to work towards the achievement of the four major goals.

The overall goal of this plan is to maintain and enhance Needham's open space and recreational resources to preserve their contribution to Needham's community character and quality of life. This Plan is only as good as its implementation. The action plan incorporates public outreach regarding the many resources the Town offers as well as a focus on maintenance and environmental stewardship. Implementation will require a concerted effort among elected officials, Town staff and volunteers. All have a role in improving the future of Needham!

Section 2 Introduction

2.1 Statement of Purpose

When entering the Town of Needham, Massachusetts (the Town), visitors are greeted by nature, whether crossing over the Charles River, passing large tracts of undeveloped land or traveling through a vista of tree coverage. The historic Town Common in Needham's center is a gathering spot and venue for many special events. Maintaining Needham's essentially pleasant, open, and suburban characteristics has long been a primary planning objective of the Town's residents. Creation of parks and conservation of natural areas are among the major means of fulfilling this important goal. These open spaces serve many functions that are essential to the enjoyment of the suburban environment. Parks are not luxuries, but rather necessities that benefit the community. Park, recreation, and conservation land should not be merely what remains after other municipal development has taken the prime land. The 2017 Open Space and Recreation Plan Update is a reaffirmation of the original goals and an attempt to address the issues facing Needham in the 21st century. Support for Needham's open spaces and parks has been reflected through the results of the National Citizens Survey.

The term "open space" refers to conservation land, recreation areas and parks, as well as the broader definition of any lands of conservation interest that are currently undeveloped. In this plan, a joint working group representing the Needham Conservation Commission, Needham Park and Recreation Commission, Needham Board of Selectmen and Needham Planning Board, with the assistance of a cross-section of Needham residents, has made an assessment of the natural resources in the Town, reviewed the previous efforts to protect those resources and provide recreational opportunities, and developed a plan to meet the Town's present and future open space needs.

The objective of the 2017 OSRP Update was to take the existing documents and refine and expand them to reflect the current goals of the Town. The updated plan describes how the quality of life of its citizens and the economic development of the Town have been, and will continue to be, dependent on the natural character of the community. It is also based on inventories of the Town's natural resources including— geology, soils, water resources, wildlife and habitats, agriculture, and scenic and unique resources. It also makes an assessment of environmental concerns or challenges and the importance of open space to the economy of Needham.

It is the purpose of this plan to provide a current and comprehensive understanding of the Town's current natural resources, review the role of those resources in the past, and propose a set of future actions that will protect and enhance opportunities to enjoy the benefits of open space.

2.2 Open Space Planning Process

By 1979, many parcels of desirable open land listed in the 1966 Master Plan had been converted to other uses. These changes provoked the preparation of Needham's first Open Space Master Plan in 1979. The Plan was prepared by the Conservation Commission, a group of interested citizens, a representative from the Park and Recreation Commission, the Planning Director, and Director of Park and Recreation. The

Town Engineering Department prepared the accompanying maps. In 1988 the Open Space Master Plan was updated to affirm and redefine the original goals. The Open Space Master Plan Committee reconvened in 1995 and reviewed the full plan, with special attention given to the goals and objectives of the 1979 and 1988 plans.

The Open Space Master Plan Committee members represented the Conservation Commission, the Park and Recreation Commission, the Planning Board, and the Board of Selectmen. The Committee developed their information through informal input from individuals, neighbors, and volunteer groups and from public meetings.

The Committee discussed progress that had been made, and then modified the objectives and goals accordingly. Individual members prepared new information, and in the winter of 1996, a graduate student from MIT was brought on as a staff-associate to the Committee.



Figure 2.1: Needham Center

In 2002, an intern developed a complete inventory of the Town's lands and open spaces. The management, use, and the level of protection were found for each parcel of open space. All of this information has been entered into the Town's GIS system. The 1998 draft plan was updated following the 1999 Executive Office of Environmental Affairs recommendations. In 2006, with the assistance of Community Preservation funds, the process of updating the plan was undertaken, with community representation.

The 2016-2017 Update process was also funded by the Community Preservation Committee and those funds were used to hire a consulting firm to guide the process. In 2016, the Directors of the Conservation and Park and Recreation Departments collaborated to interview several firms for the purpose of hiring a qualified consultant to lead the Update effort. The firm of Tighe & Bond was selected and began work in May of 2016.

During the summer of 2016, the Town solicited members of the public and representatives of various town boards to serve on the Open Space and Recreation Plan Update Advisory Group. The response to the solicitation was excellent and in September of 2016, the OSRP Update Advisory Group was formed, consisting of approximately forty (40) members.

2.3 Public Participation

The 2017 Open Space and Recreation Plan Update was prepared by the Needham Conservation Commission, the Needham Park & Recreation Commission and the Open Space and Recreation Plan Update Advisory Group with the assistance of Tighe & Bond. Between May 2016 and XXX 2017, numerous public meetings, forums, and surveys were held to seek official and public participation in the preparation of the Update. These included a variety of meetings with interested committees, boards, and departments including:

- Board of Selectmen
- Park and Recreation Commission
- Department of Public Works
- Planning Board
- Open Space & Recreation Plan Update Advisory Group
- Conservation Commission

The following public meetings and outreach efforts were also held:

- Two Public Forums (11/16/2016 and 4/5/2017)
- Online Survey (open from 11/9/2016 to 12/31/2016)
- X###X Open Space and Recreation Plan Advisory Group Meetings
-
- All Boards Meeting (3/28/2017)

The Public Forums and Advisory Group meetings and the Online Survey, were vital resources to the setting of goals and objectives in this document.

The OSRP Update focused the Goals and Objectives established in the previous plans. Town staff provided a summary of accomplishments of the previous Goals and Objectives in order to provide a basis for the updating of these items. The updating process, as guided by the consultant, included an iterative process which involved broad discussions of general open space and recreation topics, to development of the survey, to developing a comprehensive list of goals and objectives, and then distilling the list to the prioritized version included herein. This document, as developed by the wide spectrum of interested citizens, board members, and Town staff, was reviewed in detail by the participating Town boards and **unanimously voted for acceptance** as the future Open Space and Recreation roadmap for The Town of Needham.

Section 3 Community Setting

3.1 Regional Context

The Town of Needham is a suburban community located ten miles southwest of downtown Boston (Figure 3.1). It is bordered by the cities of Newton and Boston on the northeast and the Town of Wellesley on the northwestern side. The southern border abuts the Towns of Dover, Dedham and Westwood. The Charles River serves as the Town border for about three quarters of its perimeter (12.3 out of 17.9 miles). Needham is a member of the Metropolitan Area Planning Council, the regional planning agency for Boston and the surrounding communities. Needham is also one of the 34 communities that comprise the Charles River Watershed (Figure 3.2.)

Needham shares several resources with its neighbors. For example, the Town of Wellesley owns 65 acres in Needham that serve as their water supply land; Cutler Park – owned and managed by the State Department of Conservation and Recreation – spans portions of both Needham and Newton; and the Charles River Corridor is shared with Newton, Dedham, and Dover.

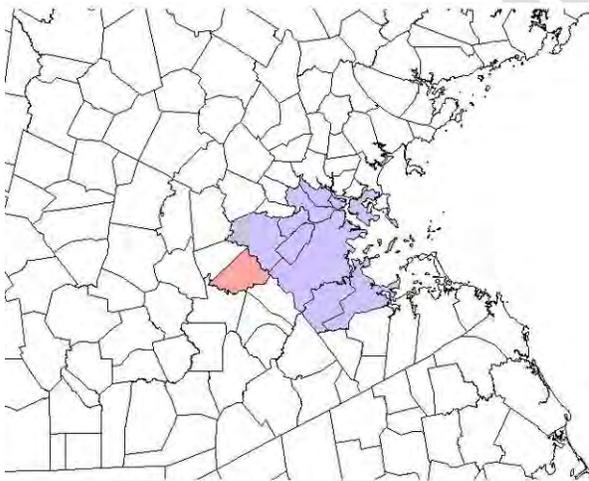


Figure 3.1: Needham in relation to Boston



Figure 3.2: Needham in the Charles River Watershed

3.2 History of the Community

Prior to the arrival of Europeans, the area of present-day Needham lay within the territory of the Massachusett, an Algonkian-speaking tribe related to the Wampanoags on the coast. Artifacts excavated in Needham showed that Native American communities had lived here for nearly 8,000 years. The European settlement of Needham began in the 1640s as a part of the large Dedham Grant. In 1681, the land that would become Needham and Wellesley was purchased from tribal leader William Nehoiden for 10 pounds in cash, 40 acres of land, and 40 shillings' worth of corn.

The early settlers made their living as farmers; producing garden crops and hay and raising cattle. By 1711, settlement of the area had spread far enough to justify the establishment of a new parish and Town government. The Farmers' Petition seeking a new parish was granted by the General Court on November 6, 1711, and the new Town was given the name Needham, after the English village of Needham Market (a neighbor of the English Town of Dedham).

Needham remained a largely agricultural community until the mid-1800s. In 1853, the first rail line was laid, connecting Needham to Boston. Rail access to Needham was extended both for commercial purposes and to accommodate the "Back Bay Fill". Starting in 1859, gravel was transported from Needham to Boston to fill in the Back Bay for residential use. For nearly 15 years, over 1200 freight cars per day were loaded with gravel dug from the area that now forms the Industrial Center and the Route 128 interchange.

Improved rail access precipitated the arrival of wealthy Boston families who began to build "between season" estates along the Charles River. These affluent seasonal residents included William Emerson Baker who used his fortune from a sewing machine company to purchase 800 acres in the southwest corner of Town for a summer estate, Ridge Hill Farms. He transformed it into an amusement park, which embodied his extraordinary passion for social and economic reform, experimental agriculture, bad puns and practical jokes (read "*The Baker Estate, or Ridge Hill Farms of Needham*" by Leslie G. Crumbaker (revised edition, 1999)). The Needham Historical Society also created a film by Derick Risner, "*Beautiful & Bizarre, William Baker's Ridge Hill Farms.*"

Also in the 1850s, Needham began to see the development of industry, especially in Needham Heights. Knitters from the English Midlands, displaced by economic changes in their own country, migrated to Needham and the surrounding towns to reestablish their businesses. The most famous of these was the William Carter Company, which today still produces knitwear (though no longer in Needham). In 1890 there were more than 15 companies manufacturing knitted garments in Needham Heights. By about 1900, the demand for labor in these factories brought an influx of new immigrants to Needham -- not only from England, but also from Ireland, Italy and Poland.



Figure 3.3: Highlandville in 1887

The farming and knitting industries sustained Needham's economy until the middle of the 20th century. By the 1950s, however, both began to decline in favor of new industries and technologies. The construction of Route 128, "America's Technology Highway", carried the intellectual capital of Boston's universities out to the land-rich western suburbs, to create a hub of technological innovation. The Needham Industrial Center, built on the land stripped for the Back Bay Fill, was the first such business/industrial center in the country. It is now known as Needham Crossing, part of the N-Squared Innovation District with Newton. The Franklin W. Olin College of Engineering, America's newest and most innovative engineering school, was built in Needham and dedicated in 2002. Today Needham is primarily a residential suburb of Boston. Ready access to the city and to the western part of the state is a boon to both businesses and residents. The fine schools and the strong sense of community keep the Town vibrant and growing as it embarks into its fourth century of existence.

(Need to reference Needham Historical Society)

3.3 Population Characteristics

Needham's location provides an ideal locus for anyone working in Boston or along the Route 128 corridor. Needham's population includes a variety of cultural and ethnic

backgrounds. The community and schools promote intercultural activities and multicultural awareness for the residents and students.

The Town of Needham has approximately 11,000 total housing units with a median single-family house price of \$848,500 as of the end of 2016. Housing market conditions are very tight with vacancy rates of less than 1% and little or no affordability remaining in the private housing stock. These conditions have been exacerbated by an overall loss of rental units and substantial teardown activity. As a result, greater numbers of residents are spending far too much for their housing and finding it increasingly difficult to remain in the community.

Needham has made significant progress in providing affordable housing however. The Town currently has 1,393 units defined as affordable by the state, representing 12.6% of its housing stock. It is therefore well beyond the 10% state affordability threshold under MGL Chapter 40B and no longer susceptible to what it considers inappropriate comprehensive permit applications where developers can override local zoning if the project includes deed-restricted affordable units and meets other state requirements.

3.3.1 Population Trends

During recent decades, Needham has grown rapidly. From 1950 to 2000 the population almost doubled, growing from 16,313 to 28,911. The most rapid period of growth occurred between 1950 and 1960, when Needham's population grew by 58%. While population levels have stabilized since the 1980s, it is expected to grow to 30,000 people in the near future.

TABLE 3-1
Population Evolution of Needham

Year	Population
1950	16,313
1960	25,793
1980	27,901
1990	27,557
2000	28,911
2010	28,886
2020	29,491
2030	30,746

Source: MAPC Projections

As is true for the country as a whole, Needham's population is aging. According to the U.S. Census, those residents 65 years of age or older comprised 9.3% of the Town's population in 1970. In 1990, 16.8% of the total population of Needham was 65 years or older, and in 2010, 16.3% of the population fell into this category. As the "Baby Boomers" age, Needham will have an increasingly high ratio of senior citizens (providing of course that those residents choose to remain in Needham). In addition, census

trends show that young adults, between the ages of 25 and 34 years old, are leaving the Town, while the number of school age children in Needham is growing. According to the Needham Public Schools, MA Demographic Study (January 2017), total district enrollment is forecasted to increase by 108 students, or 1.9%, between 2016-17 and -22. Total enrollment is forecasted to decline by 138 students, or -2.4%, from 2021-22 to 2026-27. The total enrollment is forecasted to decline by 172 students, or -3.1%, from 2026-27 to 2031-32.

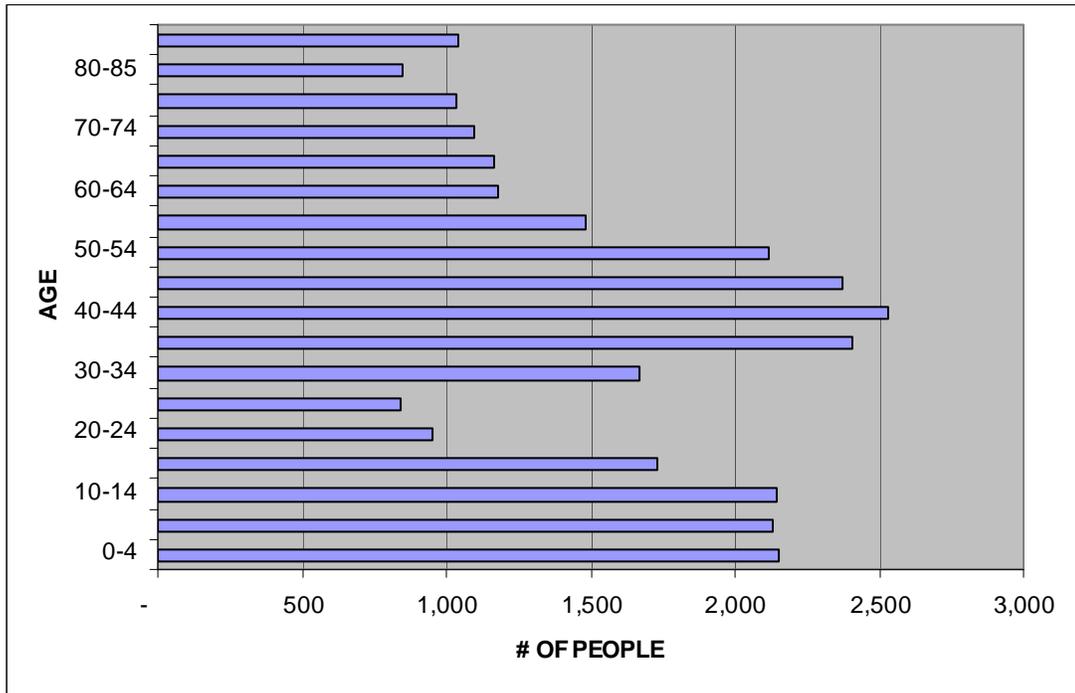


Figure 3.4: Population by Age – MAPC 2000 Population (Town of Needham).

3.3.2 Income

According to the U.S. Census, Needham’s median household income in 1990 was \$79,522, up from \$60,734 in 1980 (in constant dollars). In 2000, median income reached \$88,079. In 2015, the estimated median household income had grown to \$132,237.

3.3.3 Density

Due to current zoning laws, most of the remaining undeveloped land cannot be subdivided into less than an average of one dwelling per acre. Due to historical settlement patterns most of this land is located in the southwestern section of town. The result is that the town’s population is unevenly distributed. In fact, the population density of the southwestern section is only about half that of the northeastern section (U.S. Census tracts 403100, 403200, and 403500). This uneven population distribution is apparent when one compares Census tract 403200 in the northeastern section (roughly the Town Hall, Mitchell School and High School area) and Census tract 403400 in the southwestern section (roughly the Ridge Hill, Babson and Rosemary Lake areas and part of the High Rock School area). Census tract 403200 is almost four times more densely populated than the southwestern tract.

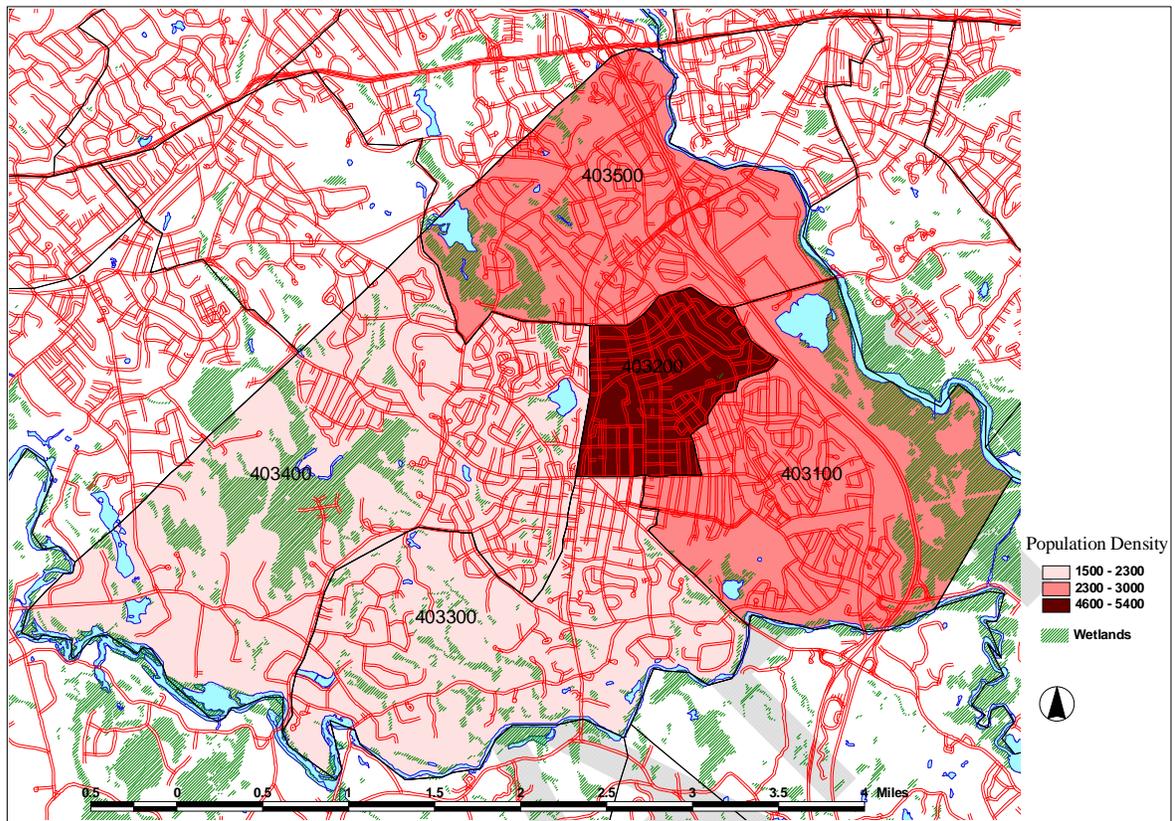


Figure 3.5: Population Density by Census Tract – US Census 2000.

3.4 Infrastructure

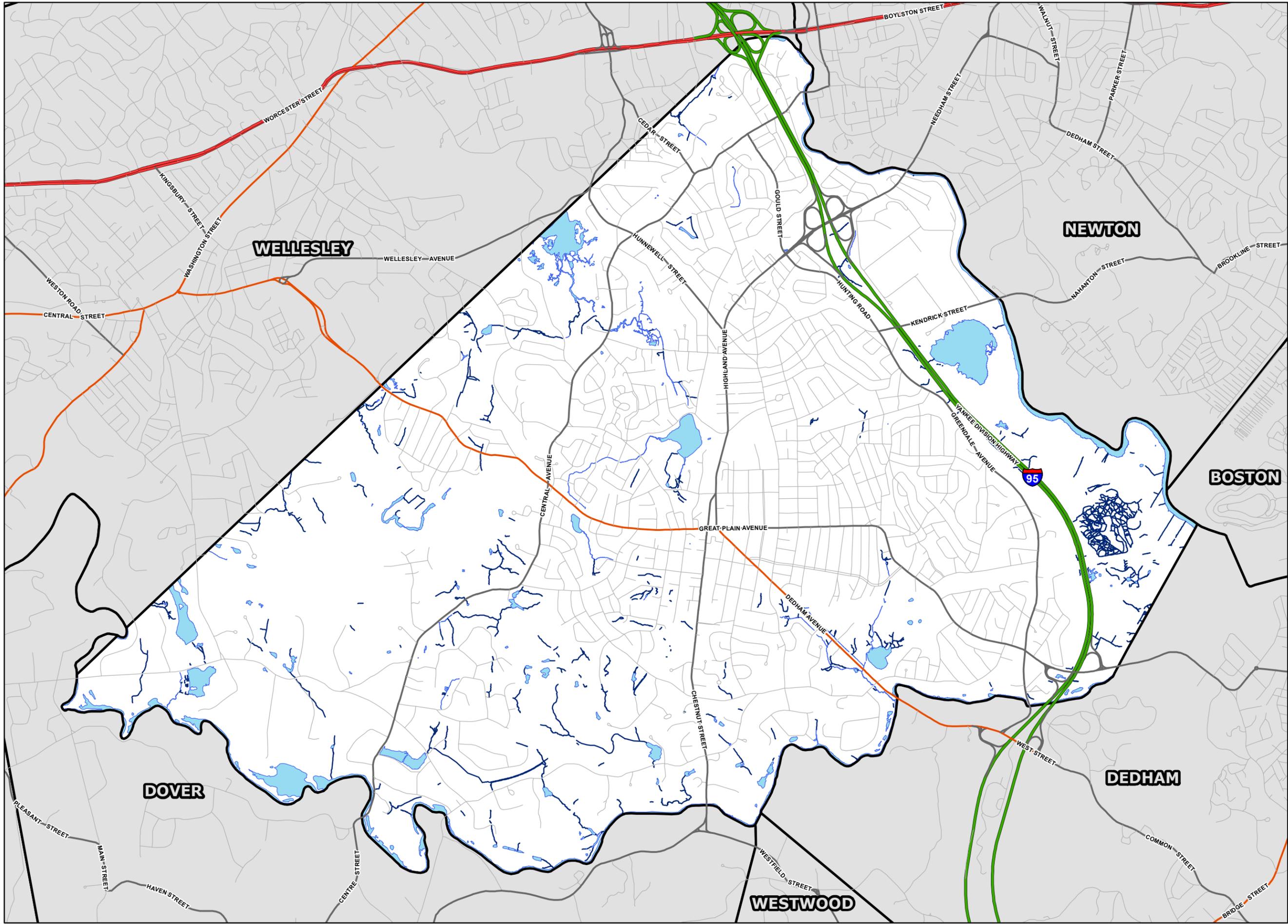
3.4.1 Transportation

Needham is dissected by a heavily traveled section of Route 128 (Interstate 95), the inner highway belt around Boston. Four exits from 128 provide direct access to the northern and eastern parts of Needham. Route 135 enters the town from the Dedham border and crosses through the center of town to Wellesley. Other heavily traveled roads include Highland, Greendale, Central and Great Plain Avenues and Chestnut Street (Figure 3.6).

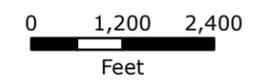
**FIGURE 3.6
EXISTING
INFRASTRUCTURE**

LEGEND

- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road
- Stream
- Waterbodies
- Town Boundary



LOCUS MAP



1:28,800 1 in = 2,400 ft

NOTES

1. Data Provided by the Town of Needham and MassGIS

**Town of Needham
Open Space & Recreation Plan
Needham, Massachusetts**

September 2016

Tighe & Bond
Engineers | Environmental Specialists

Needham is located approximately ten miles southwest of downtown Boston which is easily accessible by car via the Massachusetts Turnpike and Interstate 93. Public transportation to the city is also readily available: MBTA commuter rail service from four stations – Needham Heights, Needham Center and Needham Junction and Hersey – brings travelers from Needham to Boston in an average of 40 minutes. In addition, the MBTA operates inter-city bus service to Newton and Watertown.

3.4.2 Water and Sewer Systems

The residents of Needham obtain their water supply from ground water aquifers. Three wells, located off of Charles River Street between Needham and Dover, provide approximately 4.6 million gallons a day or about 85% of the Town's annual water supply. The area that the Town's wells are located is a no salt area to protect the water supply. The Town is also in the design phase to install a new pump station located at the corner of Winding River Road and Charles River Street. The addition of this pump station will allow the Town to connect the one residence in town that has a septic system in the protected zone for the well fields. This will also allow the elimination of an additional six (6) septic systems outside of the protected zone. The water is treated at the Charles River Water Treatment Facility and then distributed through a 133-mile pipe system. Generally, it is only during peak water usage in the summer that it becomes necessary for the Town to purchase Quabbin Reservoir water from the Massachusetts Water Resources Authority (MWRA).

Needham is connected to the MWRA sewer system. Sewage is piped to the Boston Harbor treatment plant on Deer Island. At present, eight hundred and one houses still have individual septic systems. These houses are located in the southwest part of town where the density is low. Approximately one half of these homes currently have access to the public sanitary sewer system. Per DEP's Title 5 requirements, these homes are connected to the sewer system as needed (generally as a result of a failed septic system).

3.4.3 Solid Waste Management

Needham's sanitary landfill, which opened in the early 1950's, was closed in 1997. In 1980, portions of the land were converted to Municipal Solid Waste (MSW), recyclables and yard waste drop off areas. In 1988, the Town constructed the transfer station. Currently, MSW is transported from the transfer station to the Wheelabrator Waste to Energy facility Millbury, MA and recyclables are transported to Casella Recycling's facility in Auburn, MA for processing. Yard waste is composted and processed on site, then sold under contract to Agresource, Inc. It is also reused in Town projects or sold in small quantities to residents. The former landfill was capped in 1998, and a large portion of the cap (13 acres) is currently utilized for the Town's solar array system. This 3,593-kilowatt system includes 11,780 panels on 12+ acres and annually generates approximately 4,700,000 kWh.



Figure 3.7: Charles River Water Treatment Facility

3.5 Growth and Development Patterns

3.5.1 Commercial Growth and Development Patterns

During the 1950s, Needham experienced rapid industrial growth, which followed the construction of Route 128 and the development of the adjacent Needham Industrial Park. In the winter of 1996, the Needham Industrial Park formally changed its name to the New England Business Center (NEBC). Major companies, including Federal Express, Parametric Technologies Corporation, Duracell, Gillette, Coca Cola, and a Sheraton Hotel, located in the NEBC.

Commercial development is generally constrained to the northeastern portion of the Town (in and around the NEBC); along Highland Avenue, through the Needham Heights and into the Town Center; Gould and Reservoir Streets, and onto portions of Great Plain Avenue, Chestnut and Chapel Streets. Given the continuing development pressures, the Town undertook a study to examine redevelopment options for the NEBC, Mixed Use-128 and Highland Commercial-128 in 2001 with zoning recommendations and then a follow-up study to that in [year]. As a result of these studies, the Town adopted zoning amendments in for those zoning districts (now known collectively as Needham Crossing) that allow for greater density and a mix of uses, including multifamily residences, in Needham Crossing (Figure 3.8). As a result of the changes in implemented in, a total of 2.5 million square feet of development is possible. As of January 2017, over one million square feet of development has been permitted.

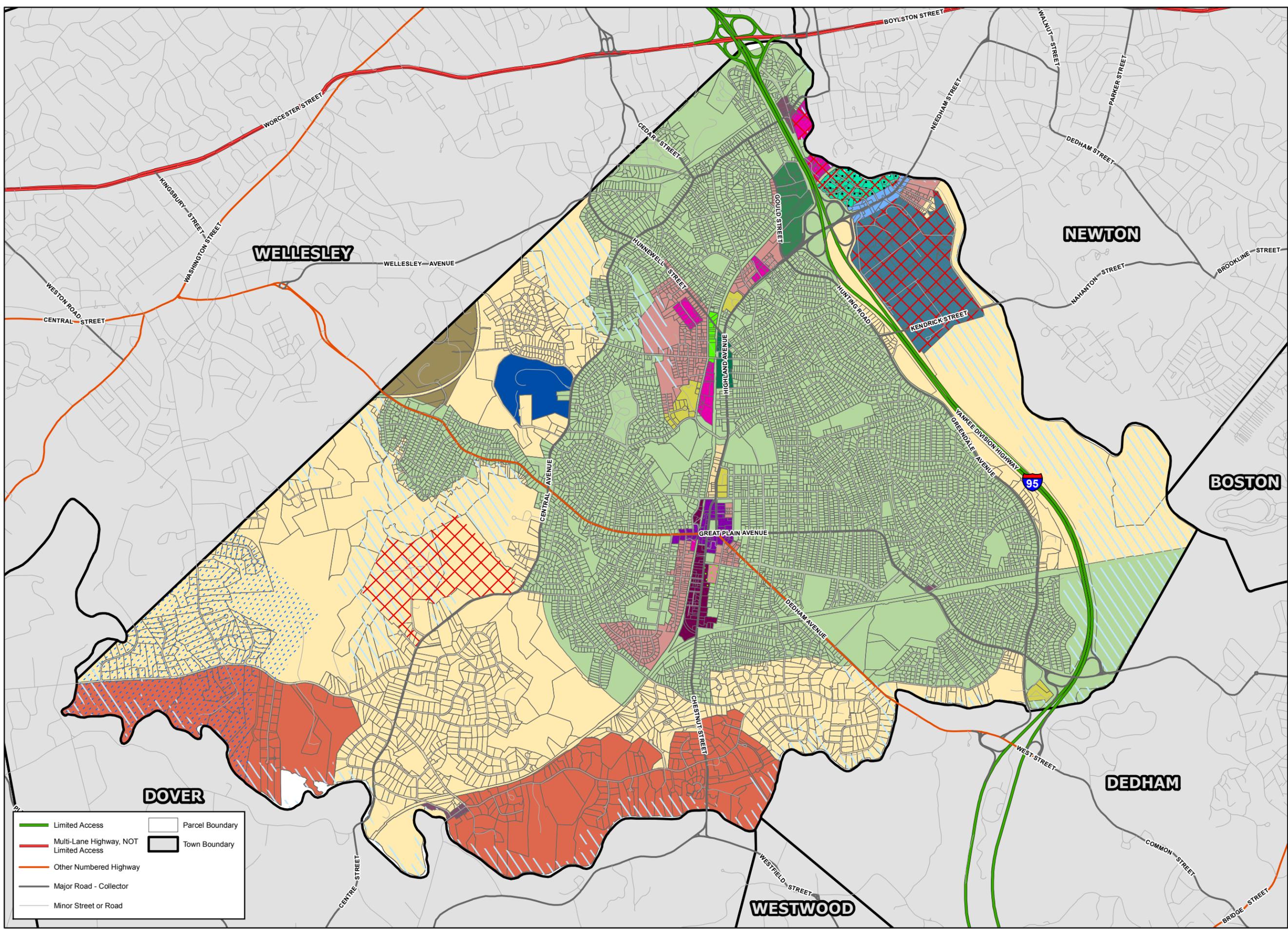
A similar study addressing downtown Needham was initiated in the Fall of 2006 and completed in 2009. Zoning amendments were approved at a subsequent Town Meeting. Since the aforementioned zoning changes, the Town has received applications for developments that take advantage of both of these increased densities. In addition, a study of the industrial districts along Gould and Reservoir Streets has been undertaken by the Council of Economic Advisors with the goal to up-zone these areas along Route 128/95 to realize their economic potential.

The Town hopes to see its business nodes redevelop utilizing the zoning amendments. The future commercial development in Needham Center, industrial districts and Needham Crossing will constitute redevelopment and will not be built on any land that is now open space. It is envisioned that further development of Needham Crossing will include the expansion of the river trails along the Charles River to augment the trail work completed near Charles River Landing all the way to Cutler Lake.

3.5.2 Residential Growth and Development Patterns

Though the Town's population decreased between 1970 and 1980, housing stock increased by 9.4%. Today, after a short decrease in the number of structures built, a new upsurge in construction can be seen. The number of building permits fell from 135 structures/year between 1980-88 to 52 structures/year for 1989 (Census 1990), but is now back up to 130 per year.

**FIGURE 3.8
ZONING (2002)**



LEGEND

Use Districts

- APARTMENT A-1
- APARTMENT A-2
- AVERY SQUARE BUSINESS
- BUSINESS
- CENTER BUSINESS
- CHESTNUT STREET BUSINESS
- GENERAL RESIDENTIAL
- HIGHLAND COMMERCIAL-128
- HILLSIDE AVENUE BUSINESS
- INDUSTRIAL
- INDUSTRIAL-1
- INSTITUTIONAL
- MIXED USE-128
- NEIGHBORHOOD BUSINESS
- NEW ENGLAND BUSINESS CENTER
- RURAL RESIDENCE CONSERVATION
- SINGLE RESIDENCE A
- SINGLE RESIDENCE B

Overlay Districts

- Adult Use
- Aquifer Protection
- Flood Plain
- Medical
- Wireless Communications Facilities Towers



North arrow pointing up.

Scale bar: 0, 1,200, 2,400 Feet

1:28,800 1 in = 2,400 ft

NOTES

1. Data Provided by the Town of Needham and MassGIS

**Town of Needham
Open Space & Recreation Plan
Needham, Massachusetts**

September 2016

Tighe & Bond
Engineers | Environmental Specialists

DOVER

- Limited Access
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road
- Parcel Boundary
- Town Boundary

(Need more recent statistics - # of demos/rebuilds over last 10 years; # of affordable units, info about planned production?)

New Construction:	1/1/07 thru 12/31/16 (10 years)
New Single Family Dwellings	763
New Two Unit Dwellings	94 = 188 Units
Multi Condo Unit Structures	24 = 855 Units- of which 132 are affordable units.
Total New Residential Units	1,806
Residential Demolitions	822

In the spring of 2000, the Metropolitan Area Planning Council (MAPC) performed a study for Needham that analyzed the undeveloped land and the potential for residential development. At that time, the calculated amount of undeveloped land area totaled 48,953,804 square feet and the number of possible new residential lots was 593 with the potential for 606 new dwelling units. The location of the undeveloped land was primarily in the Single Residence A Zoning District (approximately 20,568,120 square feet) and the Rural Residence Conservation Zoning District (approximately 13,061,273 square feet). The majority of the undeveloped land identified can be found in the southwest quadrant of the Town. Since the time of the MAPC study, the Planning Department has processed many Approval Not Required Subdivision Plans (which ranged from not creating any new building lots to creating one, two or three) and several Definitive Subdivision Plans that created new Right of Ways and new Building Lots. Through these processes, the undeveloped land in Town has slowly been reduced.

As development continues, there has been a noticeable change in vegetation and open space resources. Since 1952, the most dramatic changes in vegetative land cover have occurred on the eastern slopes of Birds Hill and Tower Hill; in the Standish and Brewster Roads and Country Way areas; in a portion of the High Rock area; and in the Meadowbrook Road area.

Development of North Hill Senior Living and commercial development on Gould Street and the NEBC across Route 128 have had a visual impact on the Town. Since 1977, development of the Winslow/Fuller Brook area, High Rock Woods, South Street, Grove Street, Cartwright Road, South Street, and Country Way areas has reduced Needham's remaining open space. In recent years, there has been a strong trend toward tearing down the smaller houses built over the past fifty (50) years and replacing them with much larger homes on the existing lots. This has resulted in a general loss of mature tree cover and an increase in stormwater runoff from these lots. At the annual Town Meeting in May of 2017, the town adopted new zoning bylaws that XXXXXXXXXXXXXXXXXXXXXXXXXXXX. The undeveloped land is decreasing more and more over time and the need to protect the last open space has become more obvious.

A built out scenario proposed by EOEa based on a GIS Methodology calculated the number of residential units and total square footage of industrial/commercial building floor area that can be developed. It gives the estimation of the future number of house lots within each zoning district. In this scenario, the Town, under existing constraints, would accept 1,562 additional residents.

Needham's proximity to Boston; the availability of a good public transportation system; the level of public services; and the excellent school systems will contribute to Needham's continued growth.

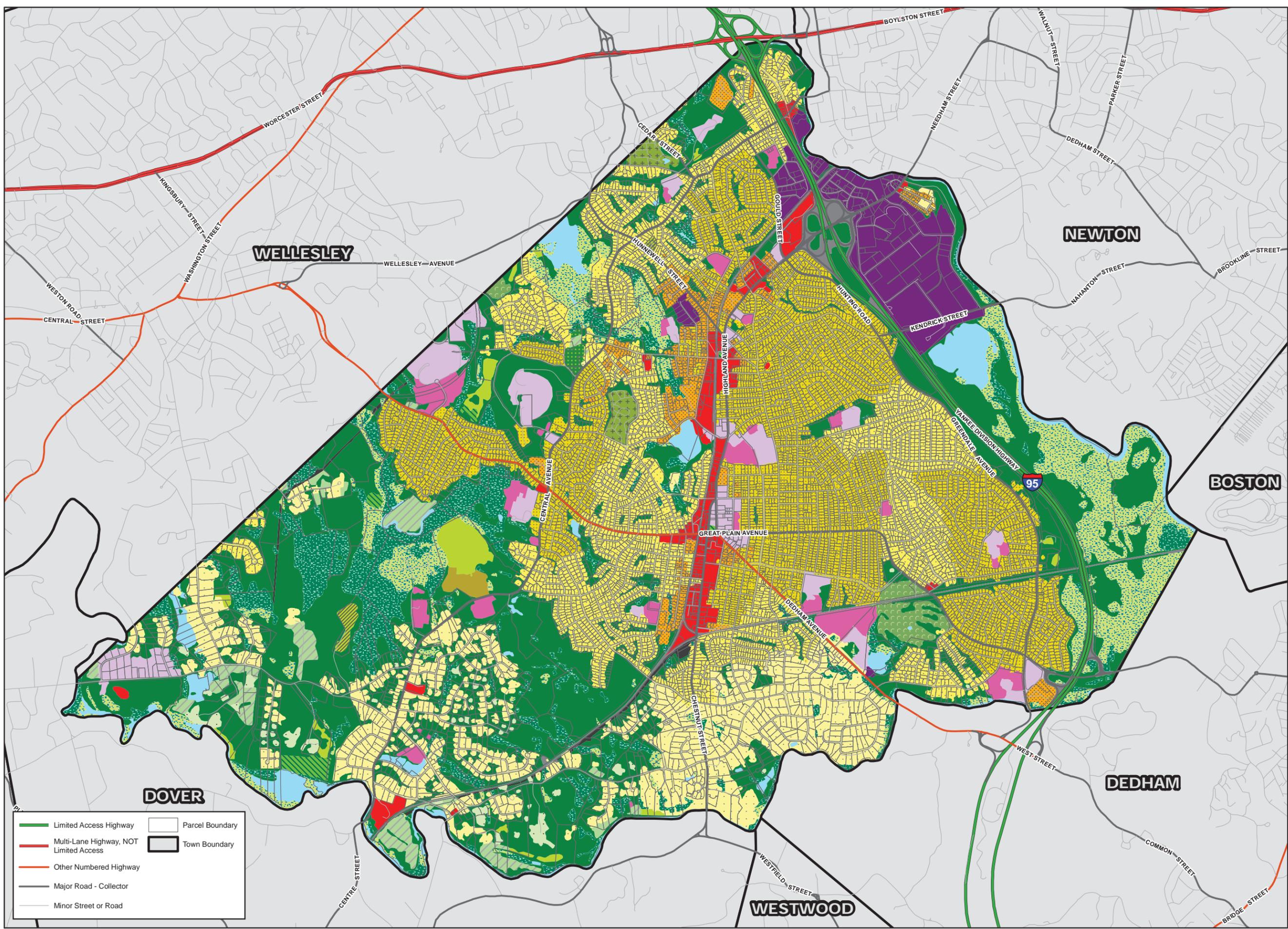
Land use data from 2005 illustrates that Needham is a primarily residential community with an unevenly distributed population.

The following table indicates the amounts of different types of uses, illustrated on Figure 3.9 and a comparison with land uses in 1971.

TABLE 3-2
Needham Land Use

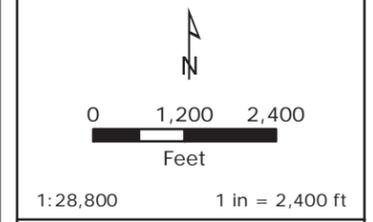
Land Use	1971 Acres	Percent	2005 Acres	Percent
Brushland/Successional			22.0	0.3%
Cemetery			36.0	0.4%
Cropland	190.2	2.3%	93.9	1.2%
Pasture	14.8	0.2%	13.0	0.2%
Transitional			11.3	0.1%
Forest/Forested Wetland	2,226.1	27.3%	2,481.2	26.5%
Non-forested Wetlands	540.3	6.6%	471.0	5.8%
Gravel Pits, Mining	2.9	0.0%	-	0.0%
Open Land (undeveloped)	130.0	1.6%	63.8	0.8%
Participation Recreation/Golf Course	146.3	1.8%	187.2	2.3%
Spectator Recreation	23.2	0.3%	0	0.0%
Multi-family Residential	24.6	0.3%	166.7	2.0%
Residential less than 1/4 acre			1,452.3	17.8%
Residential 1/4 to 1/2 acre	1,189.3	14.6%	1,117.4	13.7%
Residential more than 1/2 acre	978.9	12.0%	882.2	10.8%
Commercial	154.8	1.9%	162.9	2.0%
Industrial	318.0	3.9%	292.4	3.6%
Urban Open / Institutional	187.2	2.3%	225.2	2.8%
Powerline/Utility			19.1	0.2%
Transportation	179.6	2.2%	173.5	2.1%
Waste Disposal	39.6	0.5%	15.8	0.2%
Water	185.6	2.3%	245.8	3.0%
Orchard, Nursery	40.8	0.5%	8.9	0.1%
Total	8,160.7	100.0%	8,142	100.0%

**FIGURE 3.9
LANDUSE (2005)**



LEGEND

Forest	Water-Based Recreation
Brushland/Successional	Marina
Open Land	Multi-Family Residential
Water	High Density Residential
Forested Wetland	Medium Density Residential
Non-Forested Wetland	Low Density Residential
Salt Water Wetland	Very Low Density Residential
Salt Water Sandy Beach	Transitional
Cranberry Bog	Urban Public/Institutional
Orchard	Commercial
Nursery	Industrial
Cropland	Transportation
Pasture	Powerline/Utility
Cemetery	Mining
Golf Course	Waste Disposal
Participation Recreation	Junkyard
Spectator Recreation	



NOTES

1. Data Provided by the Town of Needham and MassGIS

**Town of Needham
Open Space & Recreation Plan
Needham, Massachusetts**

July 2017

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Limited Access Highway	Parcel Boundary
Multi-Lane Highway, NOT Limited Access	Town Boundary
Other Numbered Highway	
Major Road - Collector	
Minor Street or Road	

3.5.3 Industries

At the turn of the 21st century, Needham had about 19,000 jobs located within its borders and about 14,000 persons in its resident labor force, resulting in net in-commuting of about 5,000 workers per day to fill those jobs, a powerful economic standing for a community that is commonly characterized as a residential suburb. The following data further explore that economic status and its potential change over the next twenty years.

Table 3-3 and Figure 3-10 provide an overview of historic and projected changes in jobs in Needham broken down by industrial sector (using the Standard Industrial Classification Codes or the SIC classification system). Jobs in services have steadily grown, while jobs in manufacturing have steadily declined over the 1967-2000 period covered, essentially following regional trends. The forecasts by the MAPC (which start from 2001 in which employment was significantly higher than the 2000 figures in these materials) indicate overall employment decline, most sharply in retailing, and with finance and real estate the only sector forecast for steady growth. Also shown in Table 3-3 are the average annual wages by industrial sector in 2000 (such data by municipality is not available), and the number of establishments in the Town over the historic period. Overall the number of jobs and the number of establishments have grown at similar rates despite the possible impression that businesses are getting bigger.

Table 3-4 lists the twelve largest employers in the Town as of 2003, a list that starts with the Town itself being the largest employer, two of the top 12 being categorized as “residential” land uses, and four of the twelve (including the Town) being involved in education. Less than a quarter of the jobs located in the Town are in the twelve largest establishments, an indicator of the healthy diversification that the Town enjoys.

Table 3-3
Needham Jobs by Industry, 1967-2025

Year	Gov't	Manuf.	Whols., Retail	Fin., insur., real est.	Services	Other	Total Jobs	Number Estmts.
1967	500	5,646	3,311	142	792	909	11,300	607
1970	600	3,323	3,878	236	1,112	1,551	10,700	662
1975	800	3,541	3,995	264	1,761	1,539	11,900	772
1980	1,499	3,016	5,854	447	2,121	1,818	14,775	885
1985	1,450	6,729	5,731	623	3,144	1,993	19,670	1,018
1990	1,292	5,539	4,690	771	4,348	1,809	18,449	1,187
1995	924	3,367	4,601	746	4,524	1,763	15,925	1,263
2000	1,185	2,769	4,306	1,181	6,891	1,971	18,303	1,372
2005	1,149	2,142	3,732	1,250	9,154	2,150	19,577	
2010	1,035	1,446	3,315	1,340	9,821	2,081	19,038	
2015	917	1,284	2,890	1,425	10,004	1,993	18,513	

Year	Gov't	Manuf.	Whols., Retail	Fin., insur., real est.	Services	Other	Total Jobs	Number Estmts.
2020	799	1,389	2,459	1,503	9,955	1,897	18,002	
2025	683	1,332	2,021	1,578	10,089	1,799	17,502	
Wages*	\$39,284	\$57,255	\$30,757	\$78,154	\$43,304	\$43,701	\$44,329	

* Average annual wage in MA in 2000.

Source: History – MA DET, Projection – MAPC.

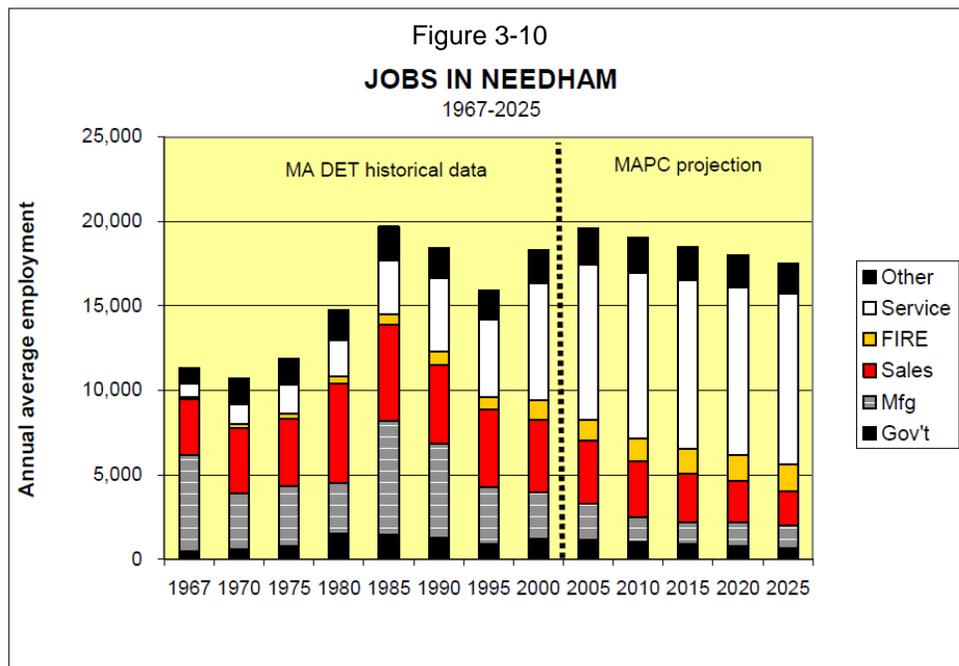


TABLE 3-4
Needham's Largest Employers, 2003

Name	Product/Function	Employees
Town of Needham	Municipal govt. & education	1,175
Parametric Technology	Software development	950
Coca Cola Co. of Boston	Bottling & distribution	637
BI Deaconess/Glover Hospital	Health care	360
North Hill Living Care Center	Retirement center	300
Pearson Education	Publisher	261
Walker Home & School	Education	250
Channel 5	WCVB-TV Channel 5	226
Wingate	Assisted living facility	170
Muzi Ford	Auto dealer	165

Name	Product/Function	Employees
Roche Bros. Supermarket, Inc.	Supermarket	145
Olin College	Engineering School	85
Total in the 12 largest		4,724
Total in all establishments (2001)		20,018

Source: Town of Needham individual contacts.

DRAFT

Section 4

Environmental Inventory and Analysis

4.1 Geology, Topography, and Soils

The geology and topography of Needham help define the landscape as well as the land's ability to support various uses (Figure 4.1). For example, steep slopes can be a limiting factor in developing a parcel of land. Bedrock outcrops or bedrock just beneath the surface can also be a deterrent to development by increasing the potential cost of construction. However, with modern technology, and increased demand for the shrinking supply of undeveloped land, many such areas are now considered buildable.

4.1.1 Geology

Bedrock geology of Needham dates back to the Carboniferous Period or Devonian Period 290-354 million years ago during a time of intense volcanic activity in the region. The predominant types of bedrock – Mattapan volcanics – are a type of igneous rock called andesite, which has a greenish-gray color and crystals that are too small to be seen by the naked eye (what geologists refer to as a fine texture). There are also small sections of conglomerate sediments and a small region of *granodiorite*.

The last major geological event to affect Needham was the Wisconsin Ice Age that ended approximately 12,000 years ago. Tracing a line along Long Island, Martha's Vineyard and Nantucket yields an approximate boundary of the glacier's terminus, though it retreated and remained stationary for several thousand years along the boundary of Rhode Island, the Elizabeth Islands and the southern coastline of the Cape Cod peninsula.

Glaciers were powerful forces of nature that left a lasting impression on the New England landscape. These landscape formations were created during both the advance and retreat of the glacier. The sheer mass of the glacial ice depressed bedrock which took hundreds of years to rebound, often resulting in cracks and fissures in rock formations. Glaciers also shaped the land over which they flowed through a process called plucking and grinding. The movement of the ice mass, albeit at a glacial pace, caused friction and melted ice at the base of the glacier. This thin layer of water then trickled down into cracks and crevices in the underlying rock where continual freezing and thawing action wedged it apart. As the glacier continued to flow, this rock was lifted and incorporated into the glacier. The tops of hills are often dotted with irregular shaped outcrops indicative of this violent action: smooth, gentle faces on the upstream side and steep, jagged faces toward the direction of ice flow. To one observer long ago, these features resemble the backs of sheep lying in a pasture and therefore are referred to as *roche moutonnée*.

Rock within the glacier continued to be eroded, either in the ice itself or by the bedrock over which the glacier passed. Rock protruding from the base of the glacier acted as a scouring agent, eroding the surface beneath sometimes resulting in a fine "glacial polish" or in deep, parallel grooves known as glacial striations. The composition of the rock

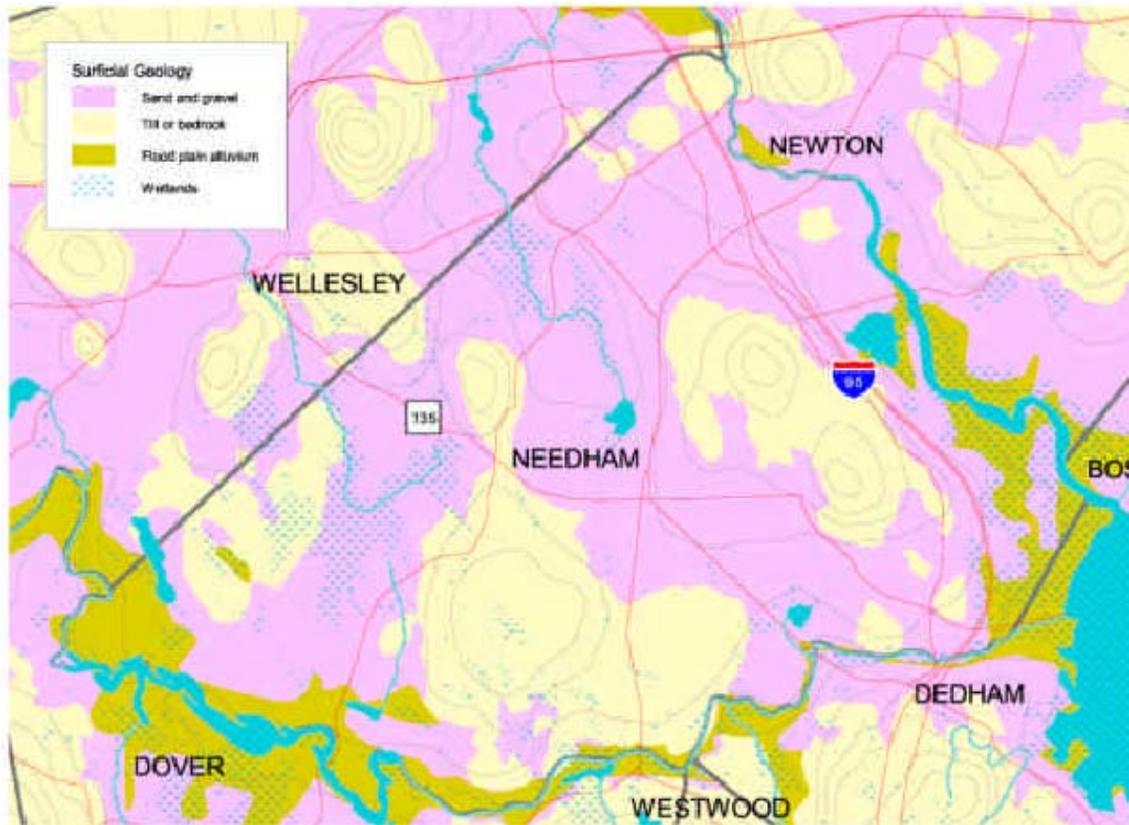


Figure 4.1: Surficial Geology of Needham

incorporated into the glacier, known as glacial till, was as varied as the bedrock over which it flowed and ranged in size from fine silts to large boulders. Glaciers also shaped the landscape again as the ice slowly retreated about 19,000 years ago, depositing the till in various forms. Direct melting of the glacier and depositing of till resulted in a mix of sand and gravel known as glacial outwash which covers most of the Town. Often glacial melt-water sorted the till by particle size. Heavier particles settled out first while smaller particles, carried farther downstream, were deposited on top of the larger particles resulting in stratified drift.

Large boulders deposited by glaciers, either singly or often in jumbled piles, are known as glacial erratics. Because they were carried from so far away, these rock conglomerations are a different composition than the underlying bedrock. Devil's Den (described below) is a textbook example of a glacial erratic.

Melt-water at the base of the glacier sometimes formed streams within the mass of ice. These streams also carried and deposited sediment, but unlike streams in daylight, the depositions were confined by the walls of the glacier, which molded the sediments in the shape of the stream channel. When the glacier receded, sinewy ridges of till, known as eskers remained. These unique geological formations can be observed at Ridge Hill (along the "Esker Trail") and at Valley Road.

Surficial geology is the underlying basis for both natural systems and human use and provides important information about an area's environmental potentials and vulnerabilities. Needham's surficial geology contributes to making many areas prime targets for new development. Conversely, several areas throughout Town are

considered undesirable for development because of constraints caused by the features and soils left behind by the glacier.

4.1.2 Topography

The topography of Needham is generally characterized by highlands in the east and low-lying wetlands in the west (Figure 4.2). Needham Heights is the easternmost upland; North Hill and High Rock are located centrally. The wet nature of low-lying areas constrains development and Ridge Hill Reservation makes up the majority of these lands. Most of Needham's topography owes its existence to the glacial events described above. Much of the terrain, such as the vast sand and gravel plain on either side of Great Plain Avenue, specifically relates to events in the formation of the Charles River.

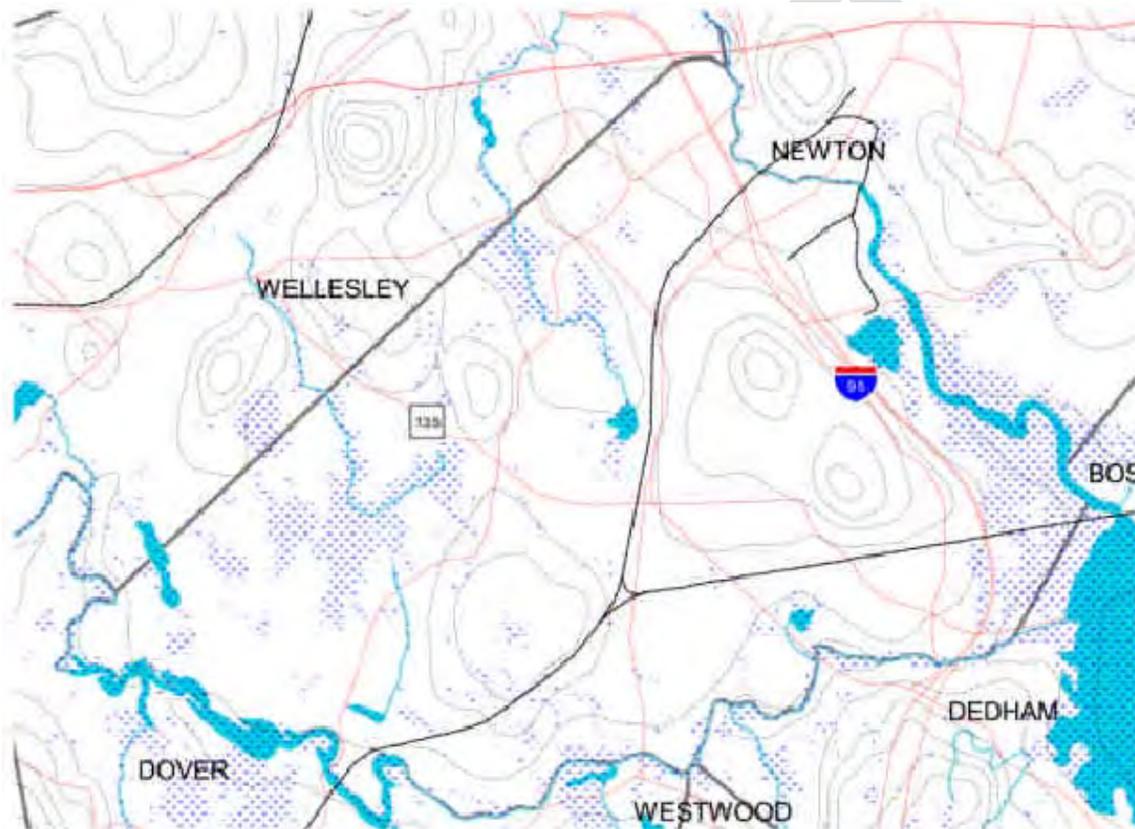
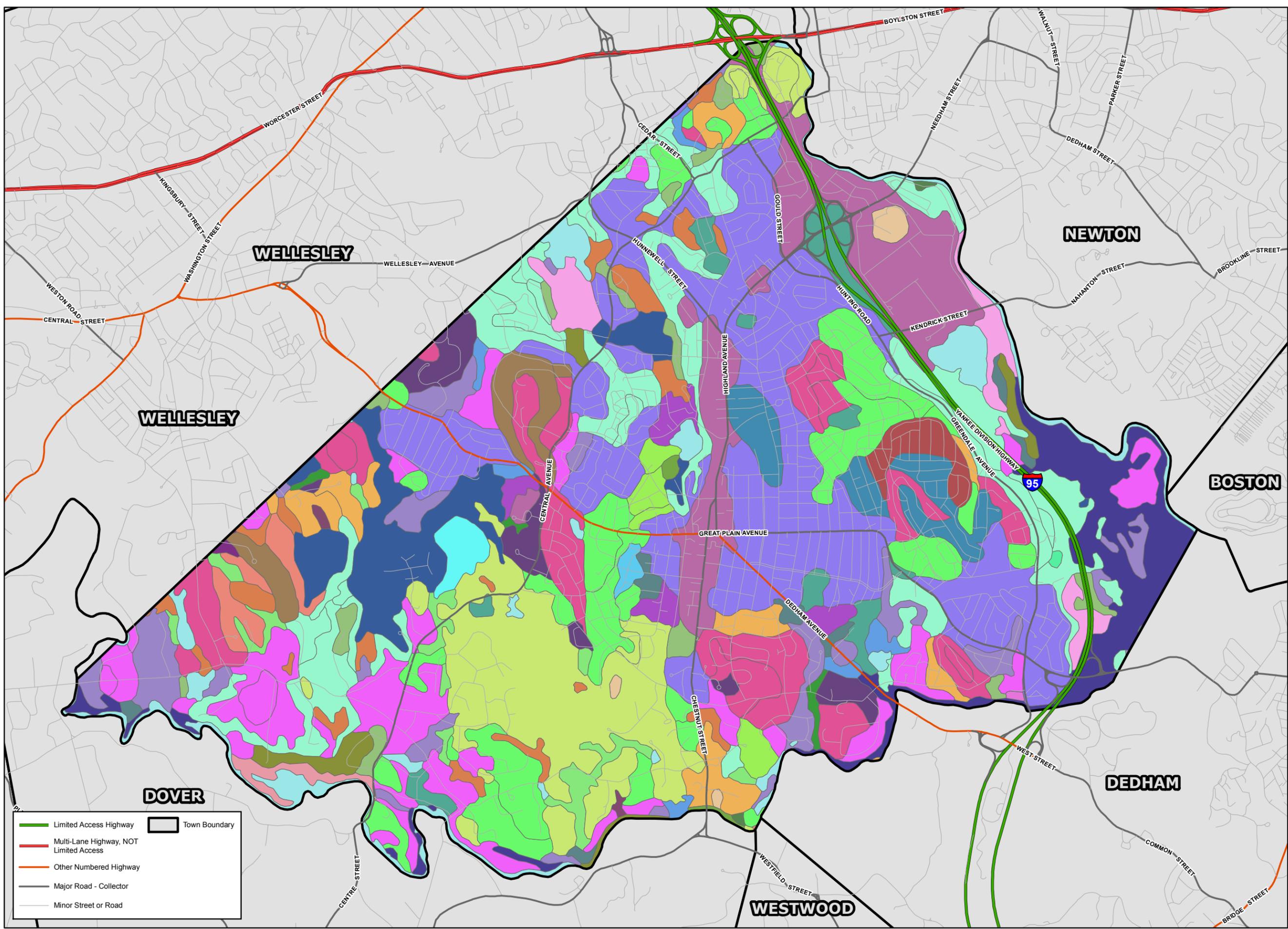


Figure 4.2: Topography of Needham

4.1.3 Soils

Soils play a role as diverse as nourishing our agricultural crops to supporting the buildings that we live and work in. Soils that drain poorly and/or have a high water table may restrict development options of a parcel of land because of an inability to provide on-site sewage disposal or basements, or because of other environmental constraints such as wetlands. Soils will continue to be a development constraint for many areas of Needham. Muck soils are frequently found in wetlands; because of stringent regulation these soils, they are rarely subject to new development. Steep slopes (greater than 15%) or bedrock close to or at the surface may also deter development. Identification and delineation of the soils in the town provide a basis for sound land use planning decisions in the future (Figure 4.3).

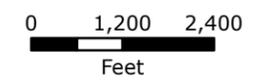
**FIGURE 4.3
NRCs SOILS**



LEGEND

- Canton fine sandy loam
- Canton fine sandy loam, extremely stony
- Canton-Urban land complex
- Charlton-Hollis-Rock outcrop complex
- Charlton-Hollis-Urban land complex
- Deerfield loamy sand
- Freetown muck
- Freetown muck, ponded
- Hinckley loamy sand
- Hollis-Rock outcrop-Charlton complex
- Merrimac fine sandy loam
- Merrimac-Urban land complex
- Paxton fine sandy loam, extremely stony
- Paxton fine sandy loam
- Pits, sand and gravel
- Raynham silt loam
- Ridgebury fine sandy loam
- Ridgebury fine sandy loam, extremely stony
- Rippowam silt loam
- Rock outcrop-Hollis complex
- Saco silt loam
- Scarborough and Birdsall soils
- Scio very fine sandy loam
- Sudbury fine sandy loam
- Swansea muck
- Udortheis, loamy
- Udortheis, refuse substratum
- Udortheis, sandy
- Udortheis, wet substratum
- Urban land
- Urban land, wet substratum
- Walpole sandy loam
- Water
- Whitman fine sandy loam, extremely stony
- Windsor loamy sand
- Woodbridge fine sandy loam, extremely stony
- Woodbridge fine sandy loam
- Woodbridge-Urban land complex

LOCUS MAP



1:28,800 1 in = 2,400 ft

NOTES

1. Data Provided by the Town of Needham, USGS, MassGIS, USDA NRCS

**Town of Needham
Open Space & Recreation Plan
Needham, Massachusetts**

September 2016

Tighe & Bond
Engineers | Environmental Specialists

- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road
- Town Boundary

Physical characteristics and management of soil impact many environmental factors such as wetlands, drainage characteristics, permeability, and depth to water table. Several of these factors have been evaluated for the purpose of identifying limitations for specific uses such as active and passive recreation and urban growth, and for highlighting areas of concern.

Permeability/Drainage Characteristics

All soils have permeability and drainage characteristics that affect their management and potential land use. Permeability is defined as the quality that enables the soil to transmit water or air, and is measured as the speed water moves through the soil (in inches per hour). Soils with slow permeability will have to be modified through artificial drainage when land is used for development. Homes will be adversely affected by water in soils with slow permeability and perched high water tables. Soils with slow permeability rates limit the use of land unless they are modified—a costly option. Where appropriate, these areas should be encouraged for conservation, recreation, or open space.

The permeability of a soil is an important factor in determining the risk of groundwater contamination. The faster water and dissolved pollutants can flow through soil, the higher the risk for groundwater contamination because the pollutants have less time to be filtered out by adhering to soil particles. Soils with the highest permeability in Needham correspond closely to the areas shown on Figure 4.1 as sand and gravel deposits. These soils are also located near aquifer recharge areas and Wellhead Protection Areas (Zone IIs). The protection of land with high permeability, within recharge or well protection areas, is essential to ensure continued high quality drinking water. These soils have a high conservation value and need to be protected as open spaces. Prime farmland soils should be protected for agricultural and open space activities and to preserve a heritage of the town's rural past.

Prime Farmland

There is little that remains of Needham's agricultural past, akin to many towns along the Interstate 95 beltway. Presently, Needham's largest agricultural area is ideally situated on prime agricultural soils, as defined by the U.S. Department of Agriculture. In some towns, offering tax incentives, such as Chapter 61A designations, to local farmers has helped to reduce but not stop the loss of farmland. At least one farm within Needham participates in this program.

4.2 Landscape Character and Scenic Resources

The landscape character of Needham can be generally described as suburban with elements of agricultural past remaining. Natural resources such as the Town Forest, numerous reservations, and the Charles River corridor, provide welcome expanses of open space (Figure 4.4). Scenic resources are not limited to a specific view or location, but may be a combination of features that together create an aesthetically pleasing situation, such as a tree-lined street, a rolling meadow, a hilltop, or an old farmhouse and its outbuildings.

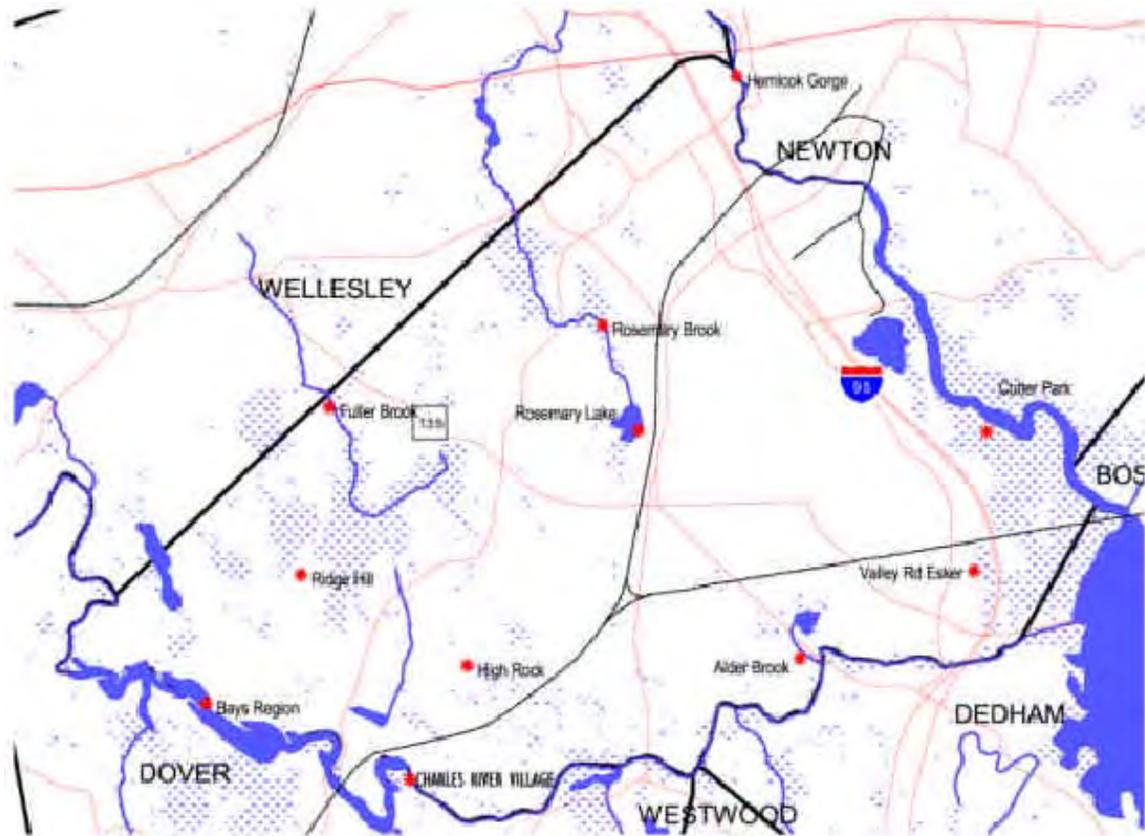


Figure 4.4: Landscape Character and Natural Resources

Without a doubt, The Charles River is the jewel in the crown of Needham's natural resources. Needham has the longest stretch of riverfront of any town on the Charles River, and forms the Town's southern and eastern borders. The Charles is enormously valuable as a scenic corridor and recreational resource and is also a primary source of groundwater recharge for the entire region.

4.2.1 Scenic Roads

The Scenic Roads Act (M.G.L. Chapter 40, section 15C) allows a municipality to designate any non-numbered route or state highway as a "scenic road". Once designated, any proposed repair, maintenance, reconstruction or paving work that involves the cutting of trees or destruction of stonewalls needs prior approval of the Planning Board. Designating a road as scenic will allow for the preservation of existing rural and natural aesthetic qualities, and thereby contribute to the overall rural character of a community. The Town of Needham has designated three roadways as Scenic Roads:

- Charles River Street – 1982 Annual Town Meeting
- South Street – 1982 Annual Town Meeting
- Central Avenue between Nehoiden Street and Marked Tree Road – Special Town Meeting 1989

4.2.2 Geologic Formations

Many of Needham's valuable landscape features are geologic in origin and are either bedrock features created by volcanism or features created by glacial action. These features, described below, add to the character of the Town and should be preserved for future generations.

Kingsbury Ledge - Located near Claxton Field, the Kingsbury Ledge was excavated many years ago to provide crushed rock for Needham. Although the rock within the excavation is of varying color, it remains part of the siliceous Mattapan Volcanic. Some geological studies in this area have revealed differences in the detailed mineral structure. This is an area for continued mineralogical investigation.

High Rock and Council Rock - These imposing outcrops are the best examples of light-colored siliceous Mattapan Volcanic, which make up so much of the bedrock surface in the Town Forest. High Rock is the highest bedrock point in Needham and is a frequent visiting spot for hikers, nature walkers, and budding mountain climbers. It is mentioned as a natural landmark in some of the earliest narratives on Needham.

Council Rock is in the Boy Scouts of America Reservation and forms the backdrop of a natural area. The unique feature of Council Rock is the curved columnar jointing at its southern end. The joint lines, normally straight, are serpentine in this example and are formed as lava flows cool more rapidly than usual.

John Eliot School Rock - This rock, measuring approximately 130 by 90 feet and 10 feet high, is part of the mouth of a volcano that was active about 300 million years ago. A similar piece of rock may be seen in St. Mary's Cemetery (the rock with angels). These two rock outcrops are unique in the greater Boston area. They were formed from molten lava that poured out of the mouth of the nearby volcano, and now appear light purple in color. Imbedded in this purplish rock are numerous jagged-shaped multicolored pieces called breccia that were broken off the throat of the volcano under tremendous force and eventually mixed with the molten material. Sometime later, after the lava and breccia had partially cooled, additional eruptions produced more liquid lava, which flowed like small rivers over previous deposits. These later flows are bright blue in color. Glaciation eroded the rock to its present form with *roche moutonnée* features and glacial striations.

Powder House Ledge - Powder House Ledge is another point of geologic significance that also has historical importance. It is a very good example of andesite, one of the forms of the intermediate Mattapan Volcanics. Some other examples in the Standish Estates area have now been blasted away during home construction.

Nehoiden (Maugus's) Cave - This cave has been known for centuries and was apparently used by the local native tribes before the Europeans arrived. Located in Hemlock Gorge, the cave was probably hollowed out by erosion during the final stages of glacier melting. Thus, it has both historical and geologic significance.

Gatewood Drive - There are two places on Gatewood Drive where the contact between the siliceous and intermediate siliceous forms of Mattapan Volcanics is visible. In addition, there are excellent examples of glacial striations in both places. The first location is in the front yard at 57 Gatewood Drive, where fragments of the siliceous form are mixed into the intermediate form. Deep grooves are cut in the surface by glacial movement. The other location is on the west side of Gatewood Drive near White Pine

Road, where the surface was only recently exposed. Here the contact is more sharply defined between the light-colored siliceous and dark bluish-purple intermediate. The top surface has very fine striations, which have been well-preserved underground. Now that they are exposed, these fine striations will disappear in a few years' time due to natural erosion.

Devil's Den - Devil's Den is a jumbled pile of boulders that form a small cave. These boulders or erratics were either pushed over the edge of a small cliff by the glacier, or were deposited directly by the glacier during melting. The cave has been of considerable interest to cave explorers. It is located on private property at 25 Gatewood Drive.

Ridge Hill - Ridge Hill is recognized as a significant geologic feature in Needham and includes an excellent example of an esker. It was identified on early maps and is part of Ridge Hill Reservation. It is approximately 40 feet high and extremely well preserved. There is a rather strange "S" turn in the middle at the beginning of the Timothy Otis Fuller Trail. This twist is thought to have come from what is known to geologists as river piracy, in which one stream intersects another and "steals" its source of water, thus enlarging one stream at the expense of the other. Perhaps there were two parallel ice-channels and a hole occurred in the ice wall separating them. One side took all the flow north of the hole, while the flow switched over to the other side, south of the hole. If one looks carefully at the swamp floor adjacent to Ridge Hill, there appears to be a smaller ridge running parallel for a short distance. This may have been the original streambed before the piracy took place.

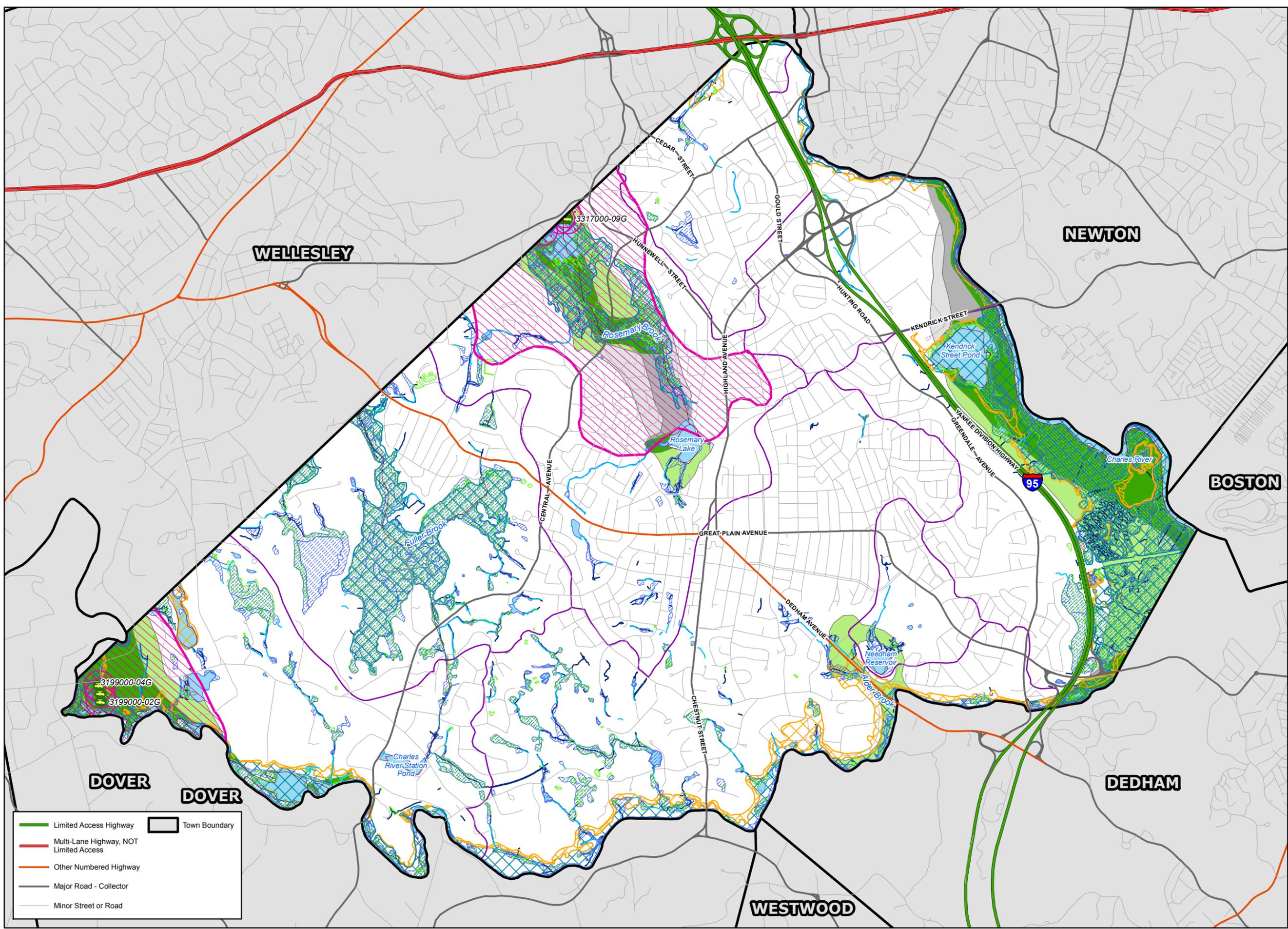
Valley Road Esker - The esker along Valley Road travels behind the houses on the east side of the street, forming an effective sight and sound barrier to Route 128. It is smaller than Ridge Hill, but it is also well preserved and deserves recognition. There are other small eskers in Needham, but none so well defined and easy to observe. Because of its useful function, it is unlikely that this esker will be destroyed.

4.3 Water Resources

In order to appreciate the true value of the Town's water resources they need to be viewed through a regional perspective. Needham is located within the Charles River Drainage Basin. The Town's surface water resources are a combination of rivers, streams and ponds and their associated wetlands (Figure 4.5). Ground water resources are also evident in town at the locations of the town wells and Zone II wellhead protection areas. Recognizing the importance of wetland resource areas, the Massachusetts Wetlands Protect Act protects wetland resource areas and the eight important public interests they serve, including:

- Public and private water supply;
- Ground water supply;
- Flood control;
- Storm damage prevention;
- Prevention of pollution;
- Fisheries; and
- Wildlife habitat.

**FIGURE 4.5
WATER RESOURCES**



	Limited Access Highway		Town Boundary
	Multi-Lane Highway, NOT Limited Access		
	Other Numbered Highway		
	Major Road - Collector		
	Minor Street or Road		

LEGEND

- Community Public Water Supply - Surface Water
- Community Public Water Supply - Groundwater
- Non-Community Non-Transient Public Water Supply
- Non-Community Transient Public Water Supply
- Hydrologic Connections
- Stream
- Public Surface Water Supply Protection Area (Zone A)
- DEP Approved Wellhead Protection Area (Zone I)
- DEP Approved Wellhead Protection Area (Zone II)
- DEP Interim Wellhead Protection Area (WPA)
- Major Drainage Basin
- Sub Drainage Basin
- Wetlands (Needham)
- 100 Year Flood Zone
- 500 Year Flood Zone
- Waterbodies
- Inland Wetlands (MassDEP)
- Non-Potential Drinking Water Source Area - High Yield
- Non-Potential Drinking Water Source Area - Medium Yield
- Potentially Productive Medium Yield
- Potentially Productive High Yield



North arrow pointing up.

Scale bar: 0, 1,200, 2,400 Feet

1:28,800 1 in = 2,400 ft

NOTES

1. Data Provided by the Town of Needham and MassGIS

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Open Space & Recreation Plan
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September 2016

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In addition, these areas also provide open space and passive and active recreation for various public uses such as nature study, photography, boating, and swimming.

Needham is also part of the Army Corps of Engineers flood control project known as the Charles River Natural Valley Storage Area. Controlling the human activities, such as development, within the headwaters of a watershed is often the least costly and most effective way to prevent downstream flooding and preserve water quality. The Corps recognized this fact in the 1970s and purchased or obtained conservation restrictions on much of the Charles River headwaters including approximately 46.5 acres in Needham.

4.3.1 Surface Waters

Surface waters include lakes, ponds, bays, streams, rivers and reservoirs. They cover approximately 16% of Needham and along with wetlands, offer a valuable amount of water storage, flood control during heavy rains, pollutant filtration, and habitat diversity.

A watershed is the area of land that drains all its water to a common point—often a lake, ocean, or larger stream system. Needham is divided into eight watersheds. Identifying the boundaries of watersheds is an important step for securing future water quality. Knowing what areas contribute water to a water body can help identify potential pollution sources. When examining the likelihood of a water body becoming polluted, the land use, soil type, groundwater level, and percolation rate of the watershed should be considered. High ground water and rapid percolation rates are two soil characteristics that affect how fast and how much pollution reaches the water supplies. Current land use should be evaluated as possible pollution sources. Undeveloped land and existing zoning can be used to estimate future land use and to predict future water conditions. Zoning can also be used to protect water supplies by limiting high pollutant risk uses within aquifer recharge areas or other significant watershed areas.

The following table summarizes several landscape conditions that are related to water quality for each sub-basin within the town. Highlighted areas are most likely to face water quality problems. They have a combination of relatively more development, little open space, and highly permeable sandy soils. These watersheds should be high on the list for future open space acquisition.

TABLE 4-1
Needham Sub-Basin Surficial Geology

Sub-basin	Acres	Surficial Geology
Hurd Brook	556	Sand & gravel; till
Cutler Park drainage	468	Sand & gravel, till, alluvium
Alder Brook	357	Till, sand & gravel
Needham Heights drainage	265	Sand & gravel; till
Ridge Hill drainage	252	Sand & gravel; till; alluvium
Fuller Brook	232	Sand & gravel; till
Rosemary Brook	230	Sand & gravel; till
Needham Reservoir	20	Sand & gravel; till

Of the eight sub-basins in Town defined by the Commonwealth's Department of Environmental Management, Rosemary Brook, Hurd Brook and Fuller Brook are the largest in surface area, though they are not fully contained within Town borders. Rosemary Brook begins near Needham Junction, and flows diagonally northward through Sportsmen's Pond to Rosemary Lake, it then winds through large wetlands before entering Wellesley and eventually the Charles River. In the late 18th and early 19th century, a gristmill, saw mill, and blacksmith's shop operated on waterpower from Rosemary Brook. A portion of Rosemary Brook was impounded in 1830 to form Rosemary Lake, thereby providing waterpower for manufacturing. Part of the Town of Wellesley's water supply is furnished by wells that are adjacent to Rosemary Brook at its crossing over the Wellesley border. Wellesley owns title to Needham wetlands and the impoundment upstream of their wells is desirable as a water supply protection and augmentation measure. Fuller Brook originates in Needham's large Pine Swamp to the east of Ridge Hill and also flows to the Charles River through Wellesley. Hurd Brook drains the small northeast corner of Needham before it enters Wellesley and reaches the Charles River. The Hurd Brook basin covers five towns including Needham and though it only drains a small portion of Needham, it is the Town's largest tributary to the Charles.

The Charles River is the most significant water resource in Town and arguably the Town's greatest natural resource. For the natives and early settlers, the river provided fish, transportation, and fertile lands for growing crops. For later settlers, it also provided waterpower for running mills and other early industries. As the population grew and the Charles River became a convenient disposal facility for human waste, the water quality was degraded. Nevertheless, the Charles River lured many residents to enjoy its excellent boating and scenic beauty. At one time, boat rental facilities at Red Wing Bay and many other launching sites provided access to the river for recreation. New opportunities for renting boats are located in Newton and Boston, and the opposite shore lines of the Charles River.

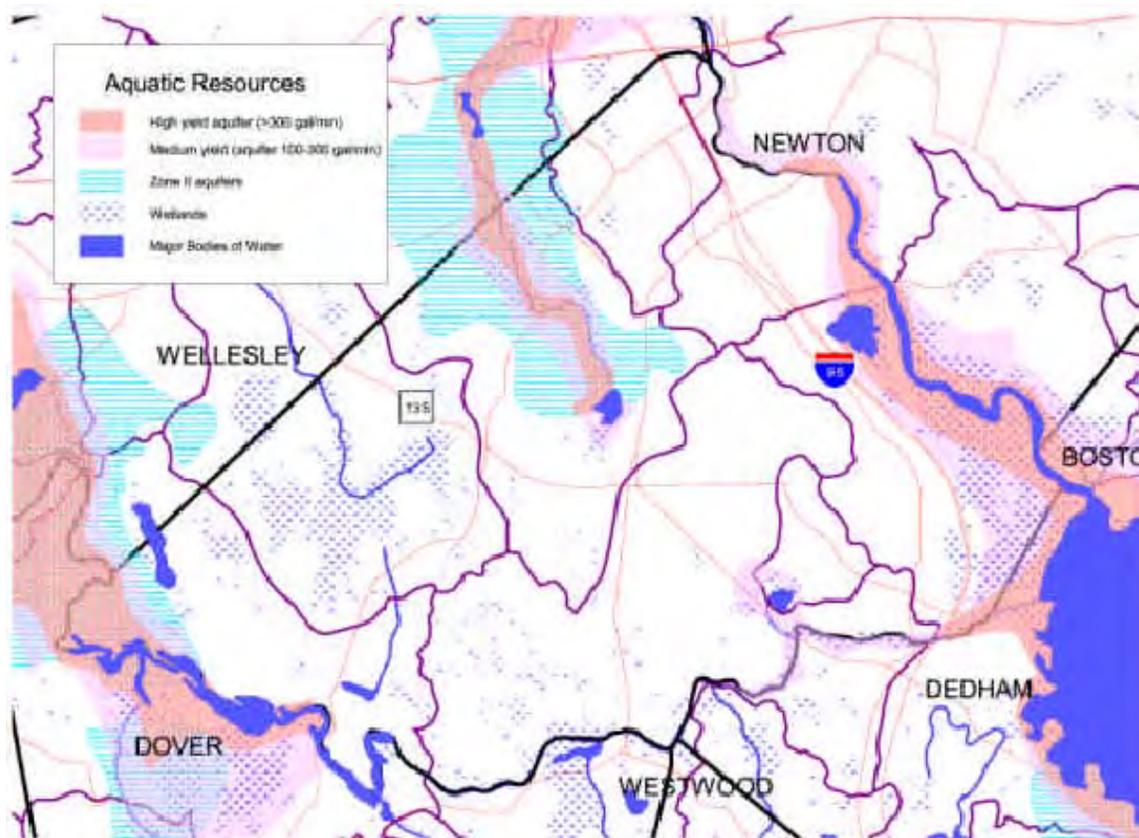


Figure 3.6: Aquatic Resources of Needham

Public and private organizations have committed a great deal of effort to restoring the river's clean waters. The section of the Charles River passing by Needham has a classification goal of "B" meaning it is acceptable for swimming, fishing, and visual qualities (<https://www.epa.gov/charlesriver/charles-river-initiative>). To attain this goal, upstream municipal and state sewage facilities, industrial discharges, landfill leachate, failing septic systems, and all piped and non-piped urban and general storm water runoff will have to be controlled. For Needham, this may mean less fertilizer and road salt use and better street cleaning and better inventory of potential illicit connection to the storm water drainage system.

The Town of Needham has signed a Memorandum of Understanding with the Environmental Protection Agency committing to the development and implementation of a comprehensive storm water management program for the Charles River Watershed. A draft of the Storm Water Master Plan has been available since March 2002. The recommendations are:

1. To eliminate the illicit discharge with an increase in inspection programs,
2. To improve the hydraulic capacity based on flooding problems identified in the town, and
3. To improve water quality by increasing controls, modifying the existing storm water drainage/detention system, and by installing new systems.

To achieve this, the plan outlines measures to protect water supply resources from various pollutants (pesticides, fertilizers, salt, litter, debris and sediment) that wash into waterways during rain events. The plan also addresses sewers connected to storm water systems that can introduce bacteria and other pollutants into waterways.

The urban nature of the eastern portion of Needham meets federal Phase II National Pollutant Discharge Elimination System (NPDES), while the entire Town is in compliance with state Department of Environmental Protection storm water policies to protect drinking water supplies. The storm water plan is multifaceted and includes public education including classroom education, community education, and media outreach. Additional measures include the review and scheduling of "Best Management Practices", which detail pollution preventing measures such as street cleaning, catch basin monitoring, and pipe outfall testing. The plan also calls for the implementation of an "Integrated Pest Management" program to reduce the use of pesticides and herbicides on parks and landscapes. This is achieved through intensive monitoring and the strategic application of products tailored to particular sites and targeted pests.

The Town of Needham has developed an integrated pest management (IPM) policy to assure that all Town departments, boards and commissions with oversight of buildings, parks and fields adhere to IPM principals and use, only if necessary, the smallest amount of the least toxic chemical to control pests and weeds. Still, the greatest environmental source of pesticides contamination and exposure to children in Needham may be from residents own yards and lawns and the runoff from excessive or inappropriate use. The Needham Health Department urges residents to ask about alternative safer products and to ask their lawn specialists about the products they are currently using and whether safer alternatives are available.

The Charles River Corridor Plan (1982) set forth four recommended protection mechanisms for Needham through Conservation Restrictions, Cluster Zoning, a setback by-law, extension of flood plain zoning, modification to comprehensive conservancy district, and scenic roads designations. This policy, along with both state and federal storm water programs was intended to help contribute to the Environmental Protection Agency's goal of restoring fishable and swim able conditions in the lower Charles River by Earth Day, 2005. Though the Town has since adopted all of these recommendations in some form, more extensive use of conservation restrictions and other land protection strategies may be desirable.

Additional surface water resources include large water bodies include Rosemary Lake, Cutler Pond, Sabrina Lake, Walker Pond, and the Old Reservoir near the Public Works building. Numerous smaller water bodies include Farley's Pond, Baldwin Pond, Forbes Pond and Sportsmen's Pond. There is year-round public access to all but Sportsmen's Pond, where public access is limited to the winter months. The lakes provide valuable places for fishing, boating, ice-skating, and passive recreation.

A portion of Rosemary Brook was impounded in 1830 to form Rosemary Lake, thereby providing waterpower for manufacturing. It has a surface area of 14 acres. Through the turn of the century and into the 1900s, many different manufacturers used the mill site at the dam. During this time, both Rosemary Lake and Macintosh Pond (now Sportsmen's Pond) furnished the Town's ice supply. In 1933, Rosemary Lake became the Town's public swimming facility. Prior to this, the Town had maintained a supervised facility on the Charles River near the intersection of South Street and Dedham Avenue. By June of 1970, excess nutrients entering the Lake resulted in algal growth substantial enough to impede visibility, and the lake was closed to swimming. The Town conducted

detailed bacterial, algal, and nutrient studies in searching for the best solution for the reclamation of Rosemary Lake. In the past it has identified dredging, storm water bypass, and other lake management techniques as possible solutions. In addition, public education efforts were implemented to help reduce or eliminate the fertilizer, motor oils, detergents, pet droppings, garden wastes, and other nutrients and pollutants that find their way into Rosemary Lake.

The Park and Recreation Commission built a swimming pool within the lake to separate the swimming facility from the lake water, as a temporary measure while searching for a solution and funding source for reclaiming the lake. The walls of the swimming pool were a cofferdam that isolates the water in the pool from the lake and its contaminants. The lake needed to be drained to keep the walls from collapsing when the pool was drained for maintenance and the water level in the pool and lake needed to be maintained at nearly the same level. Rosemary Pool closed in August 2016 after 45 years of service. The Town has gone through a multi-year study and design process to replace the pool, construction funding is in place, and construction of two pools and an office building has commenced. The lake, and adjacent camp property, are utilized for outdoor recreation opportunities, including trails, boating and fishing.

4.3.2 Aquifer Recharge Areas

Nearly a million gallons of rainwater falls per year on each acre of Needham. This water then enters ground or surface waters, evaporates, or is transpired through vegetation. Beneath Needham's surface are many groundwater aquifers water-bearing strata of permeable rock, sand and/or gravel, which give flow to the Town's streams and the Charles River and provide 85% of the Town's annual water supply. Needham has three aquifers, two related to the Charles River and one to Rosemary Brook. The Rosemary Brook Aquifer also contributes to the water supply in nearby Wellesley.

Needham's public water supply includes both the Town's own well field off Charles River Street, and supplemental water purchased under contract during peak periods and as needed from the Massachusetts Water Resources Authority (MWRA). All three Charles River Wells are currently in service in conjunction with the Town's Water Treatment Facility.

Groundwater quantity can be maintained by providing large open space land for rainwater recharge areas and by limiting displacement of water out of the basin through conservation of water usage. The Wellhead Protection Areas (Zone II) are designed to protect these aquifers. A Zone II aquifer is an area that contributes water to a well under the most severe pumping and recharge conditions anticipated (180 days of pumping at safe yield, with no recharge from precipitation). The Zone II is very important for protecting the recharge area around public water supply wells. In this area, a pest management program controls the use of any product. The current delineation of Zone II aquifers in Needham is sufficient to meet the town's needs. Results from pumping tests conducted by the water department show that water levels in the Charles River are not affected by pumping from the well field and that the two water bodies, the river basin and the well field, appear to be at least partially confined.

Threats to water supply include increased development. As areas with permeable soil (e.g., sand and gravel deposits) are developed, infiltration water is channeled directly to culverts and streams, thereby decreasing soil absorption and groundwater quality. The other potential danger to the groundwater quality is the transportation of groundwater to Boston Harbor as a result of leaks in the sewerage system, instead of replenishing the

local watershed supply. The DPW has a program to repair sewer lines and prevent this depletion of groundwater.

The closure of the landfill has reduced the threat of future groundwater contamination adjacent to the disposal site. Problems of pollution still exist from the failure of private septic systems or the public sewer system. But, it is anticipated that septic systems will be improved over time through the federal and state regulations and sewer pipes will be replaced on an ongoing program across the town.

4.3.3 Flood Hazards

The Town's Flood Plain Zoning By-Law, adopted in 1961 (Section 3.3), protects Needham's wetlands from most activities. Structures, hazardous materials, and landfill are restricted within the 100-year flood plain, as defined by the Federal Emergency Management Agency (FEMA). Not only does this by-law protect the waterways and their adjoining lands, but it also protects both individuals and the community from the potential damages of flood obstructions and assures the continuation of the floodplain's water retention ability (see Figure 4.5, Water Resources).

The U.S. Army Corps of Engineers' Natural Valley Storage (NVS) project described earlier also provides the Town of Needham with flood control protection. The guiding principle of NVS is that the most effective and least costly method of avoiding flood damage is preserving land subject with the capacity to hold water in time of flooding. Needham lands included in NVS are in the Cutler Park and Fuller Brook areas. The Army Corps of Engineers has either purchased parcels of land in fee, or obtained flowage easements, thus permanently securing the land for flood management. The threat of flooding remains and both the state and Town must remain vigilant to safeguard the remaining wetlands.

4.3.4 Wetlands

In addition to the bodies of open water, Needham has approximately 1,200 acres of wetlands (see Figure 4.5, Water Resources) consisting of a wide variety of ecological cover types. The largest wetland areas in Town are the roughly 517 acres of wetland within Needham's share of the Department of Conservation and Recreation's (DCR) Cutler Park and 284 acres along Fuller Brook in Pine Swamp.

Wetlands have a great capacity for water retention, providing valuable flood protection and, by the slow release of water during summer months, stream-flow augmentation. Wetlands also provide fish and wildlife habitat, oxygen production, and groundwater recharge. The presence of denitrifying bacteria helps reduce the large volume of nitrogen compounds, such as fertilizers, in soil that humans contribute to the environment. In addition, wetlands provide valuable open space with educational, aesthetic, passive recreational, and other values. Many state, local, and federal laws are in place which regulate and protect wetland resources.

Two state wetland regulations apply in Needham. Under the Massachusetts Wetlands Restriction Act (M.G.L. Ch. 131, S40A) the State Department Environmental Protection is authorized to delineate wetlands and restrict development within their boundaries. There are 48 state-restricted areas totaling 792 acres in Needham recorded in the Registry of Deeds.

A second wetland law is the Wetland Protection Act, M.G.L. c. 131, Section 40, (WPA) which is administered at the local level by Conservation Commissions. It requires all

individuals proposing a project in a wetland area to file with the Commission a Notice of Intent, after which the Commission holds public hearings and issues Orders of Conditions. The Conditions attempt to minimize the impact upon nine statutory wetland interests designated in the law: groundwater, water supply, flood control, pollution prevention, storm damage prevention, shellfish, fisheries, and wildlife habitat. The Act further grants jurisdiction to the Conservation Commission over lands within 100 feet of a stream or wetland, thereby controlling certain activities not in wetlands but capable of impacting them. In 1996, the WPA was amended and expanded to regulate lands within 200 feet of rivers and perennial streams (known as Riverfront Area).

In 1989, Needham Town Meeting passed a General Wetlands By-Law (Article 6, Appendix C Wetland by-law). This by-law and regulations, also administered by the Conservation Commission, affords greater protection to wetlands than is available through the Wetlands Protection Act, particularly in the "buffer zones" adjacent to wetlands and which are presumed significant to the interests protected by the Act.

4.4 Vegetation

Plant life in Needham is typical of the Northeastern Coastal Zone Boston Basin subunit and the eastern part of Massachusetts (Figure 4.7). It encompasses a wide range of trees, such as pine, maple, birch, cedar, oak, and elm, and many species of wildflowers, dominated by low rolling topography, acidic soils, and suburban land uses. Plant inventories are available for some of Needham's conservation areas at the Conservation Commission office. Vegetation cover in Needham falls into five broad categories: forest, field, wetland, open water and urban open land.

4.4.1 Forests

Woodlands have many benefits. In addition to providing a habitat for a variety of plants and animals, the Town's forests also provide a natural method of absorbing, storing, and gradually releasing fallen precipitation.. Forests also act to provide shade and natural "air-conditioning" as well as visual relief and aesthetic values. Mature trees are highly valued in residential areas and new trees planted in the downtown business district have added to its appearance. Needham's woodland areas include many noteworthy plants such as stands of wild orchids and a significant stand of hemlocks on conservation land on the Ridge Hill extension to the Charles River. The largest forests in Needham are: the Town Forest, Ridge Hill Reservation, and Cutler Park. In 1952, much of the undeveloped land in Needham was wooded. An aerial survey done in 1952 classified 3,600 acres as woodlands. By 1977, one-fifth of that area had trees removed to the extent that the land is now classified urban. In the last twenty years, significant additional woodlands have been lost to development. Needham still has a rural quality with 24.4% forested (Based on 2005 MassGIS land use data)

In addition to these relatively large forested areas Needham has been honored for the twenty-four years as a "Tree City USA". This designation by the National Arbor Day Foundation recognizes communities that meet four standards: having a tree board or tree department, enforcing laws that protect public trees, spending at least \$2 per capita on urban forestry, and holding an Arbor Day celebration. Many visitors to Needham comment on the trees along streets, in parks, and in neighborhoods that give the Town much of its character.

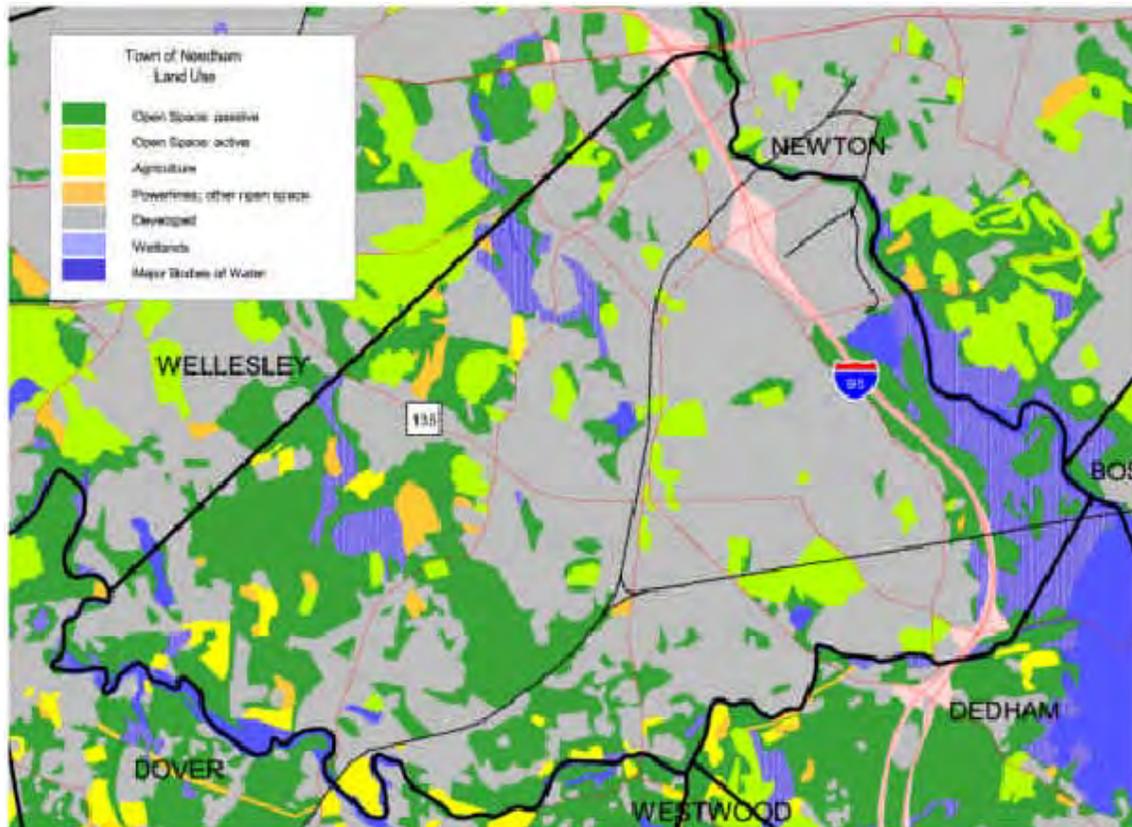


Figure 4.7: Vegetation and Land Use Character in Needham

4.4.2 Meadows and Fields

Needham's meadows and pasturelands once supported flourishing nursery and dairying enterprises. However, over two-thirds of this land type had been developed by 1977. By 1999, only 1.5% of Needham's land was classified as "agricultural" (MassGIS, 1999). MassGIS 2005 data indicates that 1.3% of Needham's land is considered cropland/pasture. Most of the tillable cropland is gone. The presence of these open meadows and fields not only added variety and interest to the landscape, but they also provided important ecological communities; the edges between fields and woods support a great diversity of plant and animal species. Open fields in a natural state may also offer the opportunity to observe the natural succession of development in a plant community.

4.4.3 Wetlands

The fourth major type of ecosystem found in Needham is wetlands. Some wooded areas are very wet and support red maples, while others thin out toward the wet marsh, which supports alders, buttonbush, cattails, and pickerelweed, among many others. These wet meadows and woods provide opportunities for environmental interpretation and education, and also retain and slow down rainfall runoff. The vegetation and soil soaks up large volumes of water and additional quantities are stored as shallow surface flooding. Such wet areas provide the expanse of land necessary to protect and stabilize stream flow from higher areas. Wetland resources are protected under federal, state, and local laws. However, vigilance is necessary to ensure that wetlands are not altered

intentionally or unintentionally by actions of careless landowners through dumping and illegal fill, removal of vegetation, and alteration of hydrology.

100 Years of Change

Fieldwork on Needham's plant life by a resident botanist, Lisa Standley, PhD, focused on changes in floristic biodiversity over a 122-year period. Results from her study conducted from 2000 to 2002 were compared to work contained in an unpublished manuscript written by local naturalist T.O. Fuller that documented the flora of Needham from the period of 1880-1885. The comparison yields interesting results in the changes in biodiversity of native, introduced and rare species, as well as changes among taxonomic groups and loss of specific habitat types.

The two surveys yielded a total of 914 species of plants. Four hundred and five (59%) of the 691 species found in 1885 were still present in 2000-2002. This change reflects a shift in floristic biodiversity:

- 245 native species have been lost
- 107 native species have been gained
- 42 non-native species have been lost
- 115 non-native species have been gained.

Overall, of the 691 species found in 1885, 128 (19%) were introduced. That compares to the 628 species found in 2000-2002, of which 201 species (32%) were introduced. In total, 12 taxonomic families and 73 genera of plants were lost during the years between the two studies. Many losses at the genus level are due to the loss of a single species, however losses of two or more species per genera did occur. Ferns and orchids suffered the greatest misfortune with 21 and 11 rare species once found in Needham no longer occurring. Though losses did occur in all habitats, grasslands and rich mesic woods (which are no longer to be found in Needham) had the greatest loss of species.

Community types are not the only natural element lost from Needham's biological diversity: thirty-three plant species found in 1885 no longer occur in Needham and are now considered rare and endangered by the state's Natural Heritage and Endangered Species Program. The loss of these species is most likely due to habitat loss at the hand of development. Other factors contributing to the loss of floristic biodiversity are from loss of agricultural land use and as a result of changes in plant community composition due to natural succession. Disease, random stochastic events (such as extreme weather, wild fires, or floods) and invasive species also threaten floristic biodiversity.

Fewer native species and a greater number of introduced species occur in Needham today. Though many remaining undeveloped lands in Needham are permanently protected, some town owned land that is currently open space could be converted to other uses placing Needham's floristic biodiversity at continuing risk.

Standley, Lisa A. Flora of Needham, Massachusetts – 100 Years of Floristic Change. *Rhodora*, Vol. 105, No. 924, pp. 354-378, 2003.

4.4.4 Open Water

Open Water Communities in Needham occur in the shallow ponds and Charles River. Characteristic species of the Charles River impoundments include spatterdock, water lily, water meal, various pondweeds, Eurasian milfoil, water smartweed, and water clover. Large-flowered bladderwort occurs in a few locations. Water willow, arrow arum, pickerelweed, and bur-reed on the river shores. Water levels in these impoundments do not fluctuate greatly, and there are no seasonally exposed mud banks that would provide habitat for annual species. Ponds include numerous submerged and floating aquatics. Both Sabrina Lake and Walker Pond have been treated with aquatic herbicides to reduce the growth of floating and submerged aquatics in an attempt to maintain these ponds for swimming and boating, and to retard eutrophication. In 2017, Town Meeting authorized funding for a study of Walker Pond to determine inputs that may be accelerating eutrophication in order to develop long-term solutions for the pond's maintenance and protection.

4.4.5 Urban Open Land

This area includes school grounds, the golf course, parks, and other maintained areas. While these areas are generally accessible to the public, they typically offer limited value as wildlife habitat.

4.4.6 Natural Community Types

A finer-scale analysis of vegetative characteristics yields natural community types. Natural communities are defined as a group of organisms of different species that occur in the same habitat, interact with each other and are subject to the natural processes. In Needham, these include rock outcrops, hemlock ravine, various oak-dominated forests, red maple swamp, and several wetland types. The Massachusetts Natural Heritage and Endangered Species Program classifies 105 natural communities in the commonwealth, 14 of which occur in Needham and are described below.

Acidic Rock Outcrop – This is an open community of exposed acid bedrock dominated by mosses and lichens, with herbaceous and woody vegetation in soil pockets, crevices, or around the margins of the outcrop. Characteristic species include white pine, red oak, scrub oak, huckleberry, lowbush blueberry, little bluestem, Pennsylvania sedge, and pink corydalis. Examples occur at High Rock Town Forest.

Circumneutral Rock Outcrop – Like the Acidic Rock Outcrop, this open community of exposed circumneutral bedrock is often dominated by mosses and lichens, with herbaceous and woody vegetation in crevices. Characteristic species include red cedar, hickories, Pennsylvania sedge, poverty grass, pink corydalis, and panic grasses. This community type is found in the Town Forest and the Hemlock Gorge Reservation. They typically support small populations of pink corydalis, ebony spleenwort, marginal shieldfern, panic grasses, and scrub oak.

Cultural Grassland – Grassland communities occur in former pastures dominated by native graminoids (Pennsylvania sedge, poverty grass and little bluestem) or by introduced grasses (sweet vernalgrass, orchard grass, fescue grasses, timothy, and bluegrasses) depending on moisture regime, soil fertility, and past agricultural practices. Forbs such as common milkweed, hawkweeds, blue toadflax, blackberries, and goldenrods also are frequent in this community. Cultural grassland occurs in the

Trustees of Reservations Peninsula Reservation along the Charles River, the only large and diverse grassland area remaining in Needham. Other areas of cultural grassland occur in the Needham Cemetery, mowed areas along a gas pipeline, and in small fields at Olin College.

White Pine-Oak Forest – These forests of mixed dominance on moderately dry moraine or till deposits are dominated by white pine and species of oaks, also including black birch, sassafras, hickories, American chestnut, lowbush blueberry, huckleberry, and maple-leaf viburnum. Characteristic herbaceous species include Canada mayflower, pink lady's slipper, cow wheat, whorled loosestrife, wintergreen, hay-scented fern, and bracken fern. This is one of Needham's most common community types and good examples can be found at the Ridge Hill Reservation.

Successional White Pine Forest – This is a transitional community of old fields and pastures, dominated by white pine with scattered oaks and red maples. Exotic or weedy shrub and vine species such as glossy buckthorn, honeysuckles, multiflora rose, oriental bittersweet, and poison ivy are common. The herbaceous layer is often dominated by Canada mayflower and tree clubmoss. This is the dominant forest community throughout Needham, found in small woodlots as well as the large tracts of forest in Cutler Park Reservation, Ridge Hill Reservation and adjacent lands, Town Forest, and Farley Pond Reservation.

Oak Forests – Oak forests occupy a broad ecological continuum across a range of mesic to xeric soils. Depending on slope, soil type, fire frequency, and other disturbance factors, these forests may be classified as Mixed Oak Forest; Black Oak-Scarlet Oak Forest, or Oak-Hickory Forest. These communities have canopies dominated by white oak, scarlet oak, red oak, and black oak, with hickories, black birch, red maple, sassafras, and white ash. The understory and shrub layers are typically dominated by hop hornbeam, American chestnut, witch hazel, flowering dogwood, hazelnut, maple-leaf viburnum, lowbush blueberry, and huckleberry. The generally sparse herbaceous layer includes hay-scented fern, Canada mayflower, Pennsylvania sedge, Swan's sedge, poverty grass, tree clubmoss, and pink lady's slipper. Oak forests occur on the dry ridgetops in the Town Forest, where there are occasional unauthorized fires, and on the esker in Ridge Hill Reservation.

Hemlock Ravine Community – A hemlock ravine community occurs in Hemlock Gorge, on the rim and north-facing steep slopes and cliffs of the ravine. The community is dominated by eastern hemlock with some patches of beech. There is little or no shrub or herbaceous layer, although beech-drops (a parasitic plant) are common under the beech trees and marginal shield fern on rock outcrops. Threats to Hemlock Ravines include the wooly adelgid.

Red Maple Swamp – These forested wetland communities are dominated by red maple in the canopy, with occasional tupelo and swamp white oak. The dense shrub layer contains sweet pepperbush, highbush blueberry, swamp azalea, winterberry, and arrowwood. The herbaceous layer characteristically contains skunk cabbage, cinnamon fern, royal fern, marsh fern, dewberry, tussock-sedge, and manna grass. Red maple swamps are the dominant wetland type in the Fuller Brook watershed, which includes areas within the Town Forest, Ridge Hill Reservation, and other lands west of the Newman School.

Deep Emergent Marsh – This is a community dominated by herbaceous species that occurs in shallow permanent water in broad flat areas adjacent to ponds and the Charles

River. Characteristic species include cattails, common reed, wool grass, tussock-sedge, Canada bluejoint, and purple loosestrife, with water willow, arrowhead, and arrow arum along the edge of open water. Large expanses of deep emergent marsh dominated by either cattails or common reed occur along the Charles River in the MDC Cutler Park Reservation, visible from Route 128 or the MBTA railroad. Deep emergent marsh also occurs in the inundated portion of Rosemary Brook at the Wellesley town line, known as Rosemary Meadow.

Shallow Emergent Marsh – This community is similar to the deep emergent marsh, but with water depths only seasonally above the surface. Dominant species include tussock-sedge, Canada bluejoint, reed canary grass, and purple loosestrife. The diverse community often also includes other sedges, rushes, ferns, and herbaceous species. Shallow emergent marshes occur in extensive areas along the Charles River, where they are dominated by reed canary grass, silky dogwood, common nettle, red maple, swamp mallow, and buttonbush occur in higher hummocks within this marsh system.

Wet Meadow – Wet meadow communities are similar to the shallow emergent marsh, but soils are seasonally saturated and rarely inundated. Dominant species include a wide range of sedges, Canada bluejoint, wool grass, knotweeds, soft rush, manna grass, fowl meadow-grass, meadow rue, joe pye-weed, sensitive fern, and flattopped aster. Wet meadows also occur along the Charles River, primarily in the Cutler Park Reservation, along the inlet of the Needham Reservoir, in Ridge Hill Reservation along the gas pipeline, and in low areas in the Trustees of Reservations Peninsula Reservation.

Shrub Swamp – These are communities of permanently or seasonally saturated soils, often at the transition between emergent marshes and swamp forests, and are likely a successional stage in the transition from wet meadow to forested wetland. Shrub swamps are dominated by alder, silky dogwood, winterberry, willows, meadowsweet, steplebush, highbush blueberry, arrowwood, and red maple saplings. Herbaceous species typical of swamps or wet meadows may also occur. Shrub swamps occur along the Fuller Brook and Rosemary Brook drainages.

Acidic Graminoid Fen – An acidic peat-land community dominated by sedges and sphagnum, including bottlebrush sedge, beakrush, twig rush, cranberry, and a sparse shrub and tree community including red maple, poison sumac, swamp azalea, and highbush blueberry. Spatterdock and fragrant water lily occur in deeper pools. This fen community occurs in several locations in the Ridge Hill Reservation, where the Town's only population of sundew occurs. Acidic fens also occur in the Cutler Park Reservation, in shallow depressions between the forested upland and the river marshes.

Acidic Shrub Fen – This community is similar to the graminoid fen, but dominated by shrubs and sphagnum. Dominant species include water willow, leatherleaf, steplebush, swamp St. John's wort, and Virginia chain fern. Good examples of this habitat type occur in small kettle-holes in the High Rock Town Forest.

An additional community type not recognized by the Massachusetts Natural Heritage and Endangered Species Program occurs in a few locations in Needham. This is a community of dry, sandy or gravelly disturbed sites that occurs along railroad embankments, old railroad yards, and the former Nike missile site. This community characteristically is dominated by grasses, including cheat grass and purple love-grass, sedges, and some characteristic forbs (orange grass, blue toadflax, pinweed, and bracted plantain). Sweet fern is the most frequent shrub species.

4.5 Rare Species

The Natural Heritage and Endangered Species Program (NHESP) define two habitats of rare species in Needham in Ridge Hill Reservation and in Cutler Park (3% of the territory) (Figure 4.8). The Massachusetts Division of Fisheries and Wildlife maintain this program, which is responsible for the conservation of 175 species animals and 250 species of native plants that are endangered. Table 4.2 lists 8 animal and 19 vascular plant species that are state-listed that have occurred in Needham.

TABLE 4-2
State-Listed Rare Species in Needham

Taxonomic Group	Scientific Name	Common Name	State Rank	Most Recent Observation
Amphibian	<i>Ambystoma laterale</i>	Blue-spotted Salamander	SC	2014
Bird	<i>Vermivora chrysoptera</i>	Golden-winged Warbler	E	1928
Dragonfly/Damselfly	<i>Neurocordulia obsoleta</i>	Umber Shadowdragon	SC	2007
Mammal	<i>Myotis lucifugus</i>	Little Brown Bat	E	2011
Mammal	<i>Myotis septentrionalis</i>	Northern Long-eared Bat	E	2011
Mammal	<i>Perimyotis subflavus</i>	Tricolored Bat	E	2011
Mussel	<i>Ligumia nasuta</i>	Eastern Pondmussel	SC	1962
Reptile	<i>Terrapene Carolina</i>	Eastern Box Turtle	SC	2015
Vascular Plant	<i>Aristida purpurascens</i>	Purple Needlegrass	T	1883
Vascular Plant	<i>Asclepias purpurascens</i>	Purple Milkweed	E	1887
Vascular Plant	<i>Cardamine longii</i>	Long's Bitter-cress	E	1919
Vascular Plant	<i>Carex oligosperma</i>	Few-seeded Sedge	E	1912
Vascular Plant	<i>Conioselinum chinense</i>	Hemlock Parsley	SC	1883
Vascular Plant	<i>Desmodium cuspidatum</i>	Large-bracted Tick-trefoil	T	1886
Vascular Plant	<i>Galium boreale</i>	Northern Bedstraw	E	1881
Vascular Plant	<i>Gentiana andrewsii</i>	Andrews' Bottle Gentian	E	1890
Vascular Plant	<i>Houstonia longifolia</i> var. <i>longifolia</i>	Long-leaved Bluet	E	1919
Vascular Plant	<i>Liatris scariosa</i> var. <i>novae-angliae</i>	New England Blazing Star	SC	1883
Vascular Plant	<i>Nabalus serpentarius</i>	Lion's Foot	E	1894
Vascular Plant	<i>Ophioglossum pusillum</i>	Adder's-tongue Fern	T	1890
Vascular Plant	<i>Platanthera flava</i> var. <i>herbiola</i>	Pale Green Orchis	T	1891
Vascular Plant	<i>Scirpus longii</i>	Long's Bulrush	T	2011
Vascular Plant	<i>Sphenopholis nitida</i>	Shining Wedgegrass	T	1884

Taxonomic Group	Scientific Name	Common Name	State Rank	Most Recent Observation
Vascular Plant	<i>Sphenopholis pennsylvanica</i>	Swamp Oats	T	1887
Vascular Plant	<i>Spiranthes vernalis</i>	Grass-leaved Ladies'-tresses	T	1985
Vascular Plant	<i>Trisetum triflorum ssp. Molle</i>	Spiked False Oats	E	1889
Vascular Plant	<i>Viola brittoniana</i>	Britton's Violet	T	2012

Source: NHESP, 2006, <http://www.state.ma.us/dfwele/dfw/nhesp>

None of the endangered species were located during an intensive 2000-2002 survey (see insert on page 4-16). Five Watch List species were documented to occur in Needham, one introduced (*Sporobolus compositus* (Poiret) Merrell), and four native (*Carex haydenii* Dewey, *Salix pedicellaris* L., *Utricularia minor* L, and *Wolffia brasiliensis*). A solitary box turtle was observed in the area of Ridge Hill in June of 2015. A rare species observation record was subsequently submitted to NHESP.

**FIGURE 4.8
PLANT & WILDLIFE
HABITAT**

LEGEND

-  NHESP Certified Vernal Pools
-  NHESP Potential Vernal Pools
-  BioMap2 Core Habitat
-  BioMap2 Critical Natural Landscape
-  NHESP Priority Habitats for Rare Species
-  NHESP Estimated Habitats for Rare Wildlife

LOCUS MAP



0 1,200 2,400
Feet

1:28,800 1 in = 2,400 ft

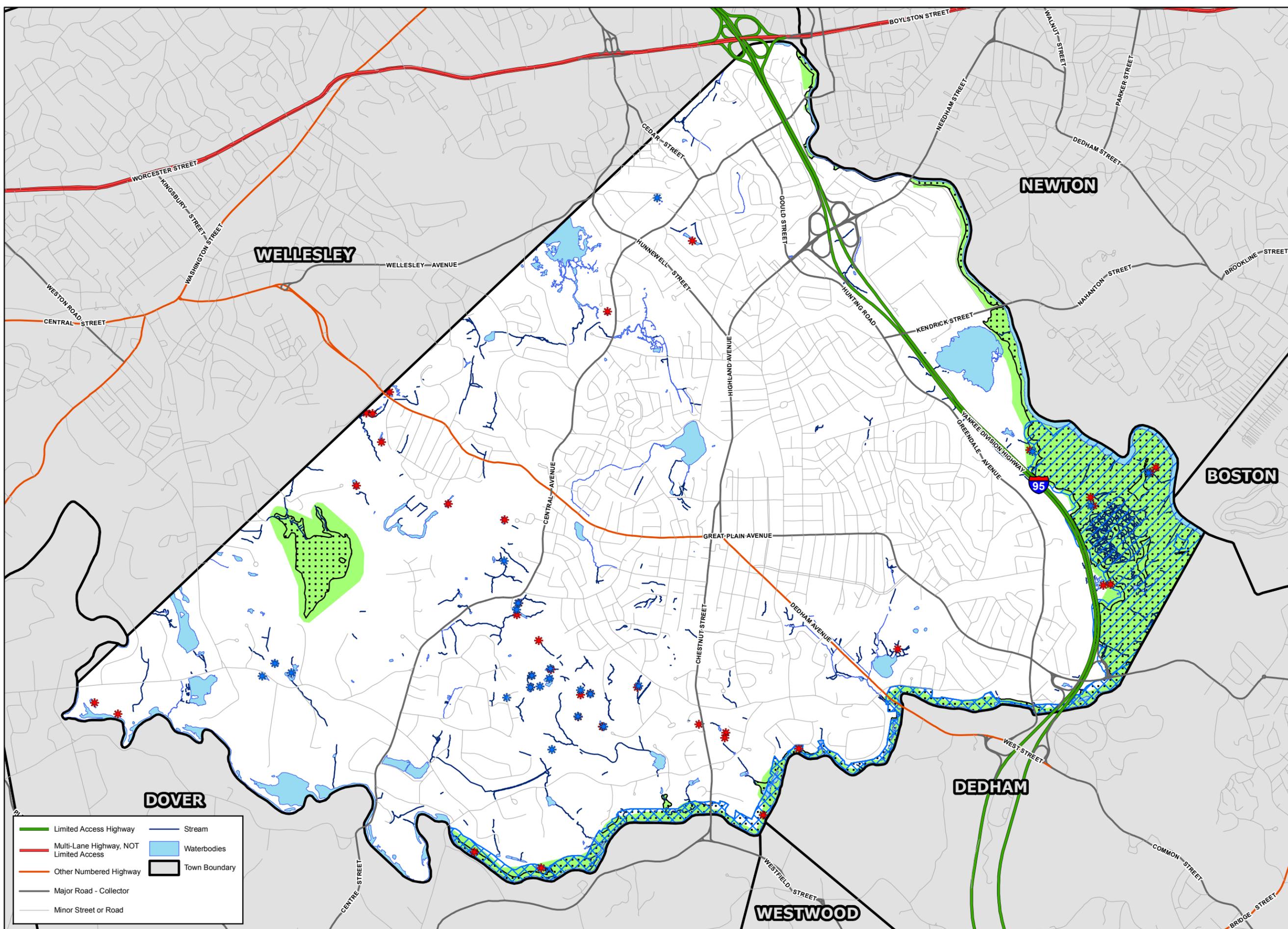
NOTES

1. Data Provided by the Town of Needham and MassGIS

**Town of Needham
Open Space & Recreation Plan
Needham, Massachusetts**

September 2016

Tighe & Bond
Engineers | Environmental Specialists



-  Limited Access Highway
-  Multi-Lane Highway, NOT Limited Access
-  Other Numbered Highway
-  Major Road - Collector
-  Minor Street or Road
-  Stream
-  Waterbodies
-  Town Boundary

4.5.1 Fisheries and Wildlife

Needham supports a diversity of wildlife adapted to both suburban areas and coexistence with humans and yet also able to thrive in the larger undisturbed spaces that have a more rural character. Larger vertebrates include white-tailed deer, coyote, red and gray fox, muskrat, skunk, raccoon, and opossum. Otters and beaver are observed along the Charles River. Gray squirrels, eastern cottontail rabbits, and white-footed deer mice are common throughout town.

Wetlands such as marshes, streams, rivers, and ponds, are home to an extensive collection of wildlife, and include rare birds such as pileated woodpeckers, bluebirds, and wood duck. Several species of reptiles can be found, including turtles and snakes. Amphibian life consists of various frogs, toads, and salamanders. Insect species are extremely diverse and include dragonflies, butterflies, crickets, grasshoppers, praying mantises, and mosquitoes. Fish found in the Town's lakes, ponds, and the Charles River include bass, carp, bullheads, perch, and white suckers.

Bird species in Needham include typical suburban resident species (Canada goose, mallard, American crow, blue jay, black-capped chickadee, tufted titmouse, American robin, northern cardinal, downy woodpecker, red-bellied woodpecker, Carolina wren, house sparrow, European starling, house finch, white-breasted nuthatch, red-tailed hawk, sharp-shinned hawk, great horned owl, screech owl) and neotropical migrants of forest and wetland habitats (catbird, grackle, red-winged blackbird, eastern towhee, tree swallow, northern oriole, yellow warbler, northern yellowthroat, ovenbird, hermit thrush, wood thrush, eastern wood peewee, eastern phoebe, northern flicker, song sparrow, great blue heron, belted kingfisher, and black-crowned night heron). Numerous other bird species pass through Needham during spring and fall migrations. Hooded and common mergansers are frequently seen on the Charles River and on smaller water bodies (Rosemary Lake and Farley Pond) in spring and late fall. As with the mammals, the large natural habitat complexes centered on the Ridge Hill Reservation, Town Forest/Farley Pond, and Cutler Park are the most important habitat areas for birds.

The large forested areas of the Ridge Hill Reservation in combination with the Wiswall parcel, the Nike Site, the Mackintosh/Stare parcels, the Jacobs Sanctuary, the Newman School/Eastman Conservation Area, and the Corps of Engineers Natural Valley Storage lands in the Fuller Brook wetlands is the largest contiguous area of wildlife habitat and provides an array of upland and wetland habitat types capable of supporting a diverse wildlife community. The Town Forest and the conservation lands adjacent to Farley Pond form a second important wildlife habitat area, which connects to the Charles River corridor via privately owned undeveloped lands. There is an important, although interrupted, wildlife corridor along the Charles River. It includes the Town Forest (along the Charles River between the river and Charles River Street), privately owned but undeveloped lands along the river (some of which are under conservation easement or restriction), a portion of the Ridge Hill Reservation, the Trustees of Reservation's Charles River Peninsula property, and Cutler Park and Charles River Reservation.

Needham is home to an especially interesting wildlife habitat—vernal pools. These are usually small, temporary bodies of fresh water that provide critical habitat for many vertebrate and invertebrates. Many fill with spring rains and snowmelt before spring leaf-out when the ground is still frozen. A typical vernal pool dries in the hot summer months, though some do remain full all year and others fill again in the fall. Many

vernal pools provide breeding habitat for a suite of species that have adapted to breeding only in vernal pools. These are called obligate species and include wood frog, spotted salamander, blue-spotted salamander and a minute crustacean called a fairy shrimp, all of which are found in Needham. Several obligate vernal pool species, including the blue-spotted salamander, are state-listed rare species. Therefore, protecting vernal pools and the surrounding habitat is important.

In the spring of 2001, the Natural Heritage and Endangered Species Program published the results of remote sensing techniques used to identify areas that potentially function as vernal pool habitat. Needham has thirty-seven of these PVPs, as they are known. If any of these areas are confirmed as vernal pools the Natural Heritage and Endangered Species Program will certify them and they will become Certified Vernal Pools, or CVPs. Certified Vernal Pools receive protection under the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00), Massachusetts Surface Water Quality Standards (314 CMR 4.00), Title 5 (310 CMR 15.00) and Forest Cutting Practices Act Regulations (3.04 CMR 11.00). Needham affords CVPs additional protection under Town bylaws that protect areas subject to flooding or inundation (including vernal pools) and land within 100 feet of these areas. Currently, there are twenty-three (23) CVPs in Needham, many documented by private citizens.

4.5.2 BioMap and Living Waters Projects

The Natural Heritage and Endangered Species Program developed two special projects called BioMap and Living Waters to identify the areas most in need of efforts to protect the native biodiversity of the Commonwealth. The goal of the BioMap, completed in 2001, is to promote strategic land protection by showing areas, that if protected, would provide suitable habitat over the long-term for the maximum number of Massachusetts' terrestrial and wetland plant and animal species and natural communities. The goal of the Living Waters project, completed in 2003, was to identify and delineate the rivers, streams, lakes, and ponds that are important for freshwater biodiversity in the Commonwealth. Both BioMap and Living Waters delineate Core Habitats that identify the most critical sites for biodiversity conservation across the state. Core Habitats represent habitat for the state's most viable rare plant and animal populations and include exemplary natural communities and aquatic habitats. To further ensure the protection of Core Habitats and Massachusetts' biodiversity in the long-term, the BioMap and Living Waters projects identify two additional areas that help support Core Habitats—Supporting Natural Landscapes, and Critical Supporting Watersheds. Needham has two core habitats identified by the BioMap and Living Waters projects as shown on Figure 4.8. For further information, please consult the appendices at the end of this document.

4.5.3 Invasive Non-Native Species

Invasive exotic species now recognized as significant threats to native communities have been introduced after 1885. Norway maple, sycamore maple, Japanese barberry, garlic mustard, Japanese honeysuckle, oriental bittersweet, several euonymus species, Russian olive, Eurasian milfoil, yellow iris, black swallow-wort, purple loosestrife, canary reed grass, giant reed grass, multiflora rose, tree of heaven, and glossy buckthorn. Norway maple, honeysuckles, bittersweet, winged euonymus, multiflora rose and glossy buckthorn are present at virtually all sites regardless of the apparent level of disturbance. Kudzu, an especially aggressive invasive vine, has been identified sporadically in Needham. When found, the Massachusetts Department of Agricultural Resources (MDAR) has responded to aggressively treat the infestation to prevent further spread. Some other exotic species well established in Needham are not currently

recognized as invasives, but are dominant in some communities or are present in virtually all communities, these include savoy hawkweed and wych elm.

4.6 Scenic and Historic Resources and Unique Environments

Visual and cultural values consist of an array of interrelated, intangible values that benefit the public, but are often very difficult to measure. These include aesthetic, recreational, educational and other heritage values. The term "heritage value" is used to define special uses or meanings that individuals have attached to a particular area because of personal or cultural interactions with that area. Marshes and other wetlands, for example, contribute directly to the scenic value of landscapes and add to landscape diversity. This value of aesthetics is achieved through direct recreational usage as well as from distance viewing. The recreational values vary greatly according to user and landform type. Recreational activities may range from bird watching and picnicking to walking, canoeing, hunting and fishing. Many scenic areas may also serve as areas of scientific research and as outdoor educational exhibits to demonstrate the dynamics of ecological relationships or the natural or manmade history of a culture, landform, town, or entire region.

The protection of historic resources can be a way to protect open spaces. The scenic effect of historic resources is associated with a protected environment.

Needham has long had an Historical Commission, and active non-profit organization support through the Needham Historical Society. Needham currently has two historic districts, the McIntosh Corner Historic District and the Town Hall Historic District. Needham's historical heritage, however, extends throughout the Town and includes eighteen properties recorded in the Massachusetts Register of Historic Places as well as a number of older established neighborhoods that reflect the history and pattern of development of the town. The eighteen listed properties in Town are:

TABLE 4-3

Properties Recorded in the Massachusetts Register of Historic Places

Property Name	Address
Echo Bridge	Newton/Needham – Crossing, Charles River and Ellis Street
Amos Fuller House	220 Nehoiden Street
Robert Fuller House	3 Burrill Lane
Emery Grover Building	1330 Highland Avenue
Joseph Hagar House	1227 South Street
Kingsbury – Whitaker House	53 Glendon Road
Joshua Lewis House	178 South Street
McIntosh Corner Historic District	Great Plain and Central Avenues (roughly)
Davis Mills House	945 Central Avenue
Needham Street Bridge Crossing	Charles River at Needham Street, Newton and Highland Avenue, Needham
Needham Town Hall Historic District	Great Plain Avenue

Newton Multiple Resource Area	Includes two (2) bridges crossing between Needham and Newton
Newton Upper Falls Historic District	Portion in Needham
James Smith House	706 Great Plain Avenue
Sudbury Aqueduct	Linear District Portion in Needham
Tolman – Gay House	1196 Central Avenue
Rev. Jonathan Townsend House	980 Central Avenue
Water Supply System of Metropolitan Boston	Portion in Needham
Israel Whitney House	963 Central Avenue

Source: *Town of Needham Community Preservation Plan, 2005*

Note: Properties in **Bold** are listed on the National Register of Historic Places.

In addition to these state and federally listed sites there are 146 additional structures, areas, burial grounds, and objects listed in the Massachusetts Cultural Resource Information System (MACRIS) for Needham (<http://mhc-macris.net/index.htm>). Of these 146 structures, seventeen (17) have been demolished since their listing, although they are still listed in the MACRIS database. There are an additional fifty (50) resources in the process of survey for future addition to the Needham inventory.

4.6.1 Charles River

Needham lies entirely within the Charles River Watershed and is bordered on three sides by the Charles River, Massachusetts' largest intrastate waterway. This river frontage totals 12.3 miles, or approximately 15% of the total river length. Large private riverfront estates along South and Charles River Streets were established early in the Town's history, many serving as summer homes for wealthy Bostonians. This land today remains as one of Needham's largest stretches of woods and other open space. However, the Charles River Corridor Plan states: "4.8 miles of Needham's 12.3 miles of River frontage, or about 40%, is unprotected, other than by flood plain zoning, and the uplands are even less well protected. (Charles River Watershed Association; 1982.)"

4.6.2 Ridge Hill Reservation

This open space reservation, the "jewel" of publicly owned open space in Needham, encompasses over 300 acres of beautiful wetlands, fields, woodlands and forest. The Reservation offers extensive hiking trails, scenic vistas and an historic mansion that is currently closed and used for storage.

4.6.3 Needham Town Forest

This expansive open space and forestland located southwest of Needham Center may be entered from Horsford Pond parking area, near the intersection of Marked Tree Road and Central Avenue. Historic cart paths and fire access lanes offer the walker miles of trails in the municipal forest land of Needham. Orienteering markers are also established in the forest. There is limited use by cross-country skiers and mountain bikers, as well as numerous geocaches. The former Bay Colony Rail Line has been converted into a 1.7 mile pedestrian path, accessible from the Town Forest, and creating a link to the Charles River.

4.6.4 Lakes and Ponds

Several of Needham's water bodies provide vital resources including swimming, fishing and open space including Rosemary Lake, Cutler Pond, Sabrina Lake and Walker Pond.

4.6.5 Cutler Park

This park is a Wetlands Preserve, and is the largest remaining fresh water marsh in the middle of the Charles River. The river is extremely wide at this point which makes it a great spot for canoeists. It also provides excellent bird watching with over 100 species, and pleasant paths for walking and hiking.

4.6.6 Hemlock Gorge

This beautiful site includes steep canyon walls, a waterfall, and the aqueduct arches. It is surrounded by large stands of hemlock evergreens, which preserve its tranquility, and shelter it from surrounding urban activity. Wildlife can be seen from hiking trails along the 23 acres of the banks of the Charles. History is evident here with traces of activity from centuries ago. There is an access point at Hamilton Place to launch canoes for paddling upstream.

4.6.7 Bays Region

The Bays Region stretches 3.5 miles, from Charles River Street to the Cochrane Dam. Over time, the river has altered its course and left its mark on the valley floor. Abandoned channels, called bays, remain where current no longer flows. Redwing Bay is rich in plant and bird life, and provides open space for passive recreation.

4.6.8 Charles River Village

This area was a large 19th century industrial center. The mills still exist along the river at Cochrane Dam. Just downstream from the dam is Dover Gage, a United States Geological Survey (USGS) gaging station. There are Class II rapids just below the Cochrane Dam, offering a place to practice white water kayaking techniques. There is a slalom kayak course set up with wires stretching above the river with pairs of white poles suspended to form gates that paddlers must navigate.

4.7 Environmental Challenges

Ongoing development poses the biggest challenge for Needham. Competition for limited land and water resources will increase as the Town continues to grow. While population is expected to stabilize at around 30,000 people, land for new larger homes, businesses, and open space will continue to be in limited supply.

4.7.1 Impaired Waterbodies

Surface water quality standards are provided by the MA Department of Environmental Protection in accordance with the Federal Clean Water Act and are determined for a waterbodies designated use. There are five categories used to classify state waterbodies. A Category 1 waterbody is unimpaired and not threatened for all designated uses. In contrast, a Category 5 waterbody is impaired or threatened for one or more uses and requires not only implementation of technology based controls to achieve required water quality standards but Total Maximum Daily Loads establishment. There are six (6) designated impaired waterbodies in Needham as provided below.

TABLE 4-4

MA DEP Designated Category 5 Impaired Waterbodies in Needham

NAME	SEGMENT ID	SIZE	POLLUTANTS
Alder Brook	MA72-22	0.28 miles	Nutrient/Eutrophication Biological Indicators, Aquatic Macroinvertebrate Bioassessments
Charles River	MA72-06	8.4 miles	DDT, Eurasian water milfoil (<i>Myriophyllum spicatum</i>), Excess Algal Growth, Fish Bioassessments, Nutrient/Eutrophication Biological Indicators, Phosphorus, PCB in Fish Tissue
Charles River	MA72-07	24.8 miles	DDT, Escherichia coli, Fish Bioassessments, Nutrient/Eutrophication Biological Indicators, Phosphorus, PCB in Fish Tissue
Fuller Brook	MA72-18	4.3 miles	Escherichia coli, Nutrient/Eutrophication Biological Indicators, Sedimentation/Siltation
Kendrick Street Pond	MA72-055	39.3 acres	Turbidity
Rosemary Brook	MA72-25	3.3 miles	Dissolved Oxygen, Phosphorus

Source: MA DEP Proposed Massachusetts Year 2014 Integrated List of Waters

The Town is working diligently through its NPDES Phase II Stormwater Permit Program to help improve the impaired waterbodies by implementing Best Management Practices including public education.

4.7.2 Ground and Surface Water Pollution

The Town of Needham's environmental problems include over 28 sites that the Massachusetts Department of Environmental Protection has declared as Chapter 21E disposal sites (Figure 4.9). These properties have contaminated soil and groundwater resources. Fuel oil, contaminated soil and groundwater, and other contaminants affect many industrial and residential sites.

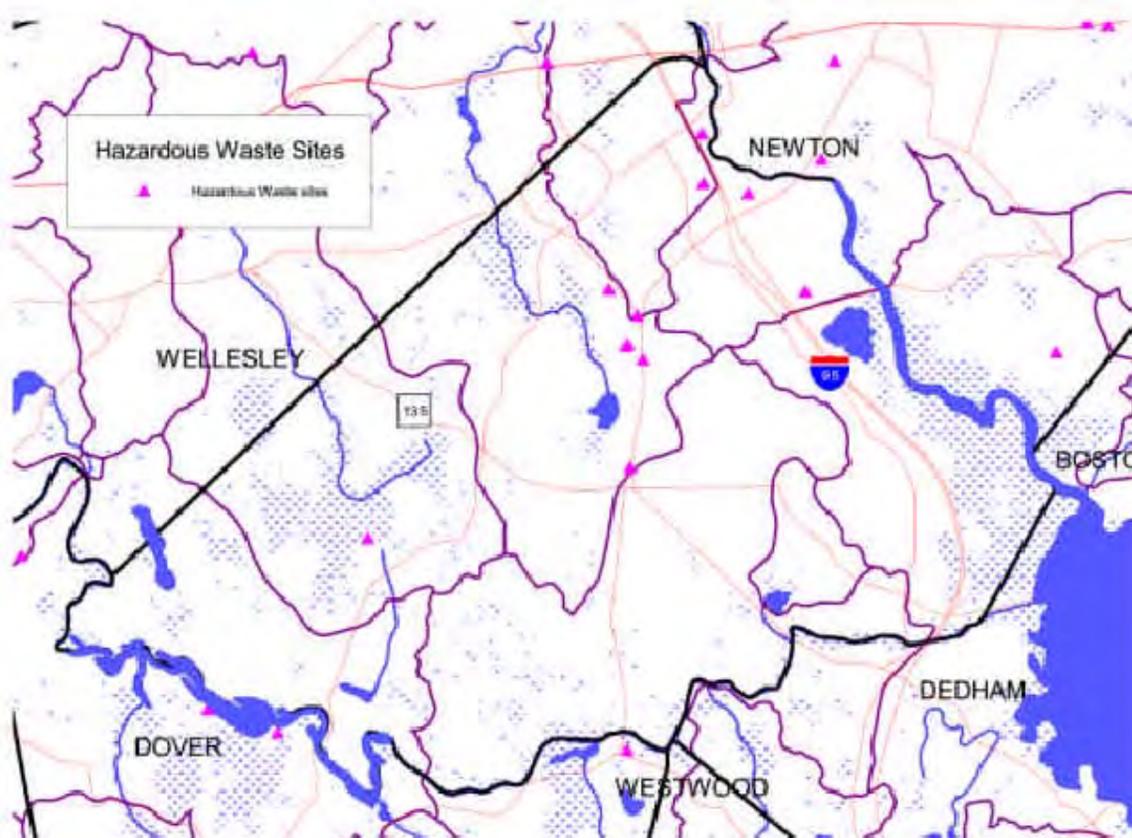


Figure 4.9: Hazardous Waste Sites in Needham (MassGIS)

The Town has approximately 800 homes that discharge sewage through septic systems. Title 5 regulations govern these systems and are designed to prevent adverse impacts on groundwater. Buffer areas have been defined and represent the setback requirements for the installation of septic system near specific natural resources and water features. Older systems are “grandfathered” until a system fails or the property is sold or a major renovation is planned. Some older private septic systems could be a source of pollution and a potential threat to groundwater.

Other environmental issues include the landfill/disposal area. Under a consent agreement with the Massachusetts Department of Environmental Protection, the Town landfill was closed in 1997. The landfill and its perimeter have been tested through monitoring wells, identifying levels of groundwater contamination above drinking water standards for some parameters (Needham Dept. Public Works).

Section 5

Inventory of Lands of Conservation and Recreation Interest

5.1 Introduction

Open space protection has many public benefits and values ultimately contributing to a better quality of life for Needham residents by protecting aesthetics, scenic treasures, recreational opportunities, important natural resources, wildlife habitat, water quality, historic sites, cultural landscapes, and property values. Open space generally includes land protected from development and managed by the Conservation Commission; town-owned parcels not intended for sale or development but managed by an organization other than the Conservation Commission, such as Water Department lands under the Board of Selectmen, Park and Recreation lands, and School Committee property; parcels owned as open space by the State or Federal government; non-profit conservation land, and some private land (not necessarily protected). Not all open space provides public access. The following inventory describes the ownership, condition, management responsibility, current use, public access, zoning, and degree of protection for Town, State, and Federally-owned open spaces in Needham.

Perhaps one of the most important considerations for the future viability of the Town's natural resources is the degree of protection from degradation or loss of conservation and recreation land. Strategies to protect natural resources include:

- Private lands can be protected in perpetuity through deed restrictions, or conservation easements. Some easements used to run for 30 years and then needed to be re-recorded. These old easements did not offer permanent protection. In 1969 the state passed legislation that allowed conservation restrictions (CRs) to be permanent without the requirement to be re-recorded.
- Lands under special taxation programs, such as Chapter 61, have private owners that are actively managing them for forestry, agricultural, horticultural or recreational use. The Town has the right-of-first-refusal should the landowner decide to sell and change the use of the land, therefore, it is important to prioritize these lands and consider steps the community should take if it wants them to be permanently protected. Currently, there are a handful of Chapter 61 parcels in Needham.
- Lands acquired for watershed and aquifer protection are generally permanently protected open space.
- Public recreation and conservation lands may be permanently protected open space, provided that they have been dedicated to such uses as conservation or recreation use by deed. Town-owned parcels may be protected as permanent open space by a vote at Town Meeting when they are acquired or at a later date.
- Certain public and non-profit conservation and recreation lands are protected under Article 97 of the Articles of Amendment to the State Constitution that requires a process, including a two-thirds vote of the legislature, to change their use.

Of the 8,160 acres in Needham, approximately 1,800 acres (or 22%) are classified as permanently protected open space or recreation land (source: Town of Needham GIS,

MassGIS). Another 536.5 acres have a limited or unknown degree of protection. This area includes undeveloped school land and some park and recreation lands that could become developed with more intensive facilities. There are several privately owned parcels, totaling about 95 acres, with permanent conservation restrictions. A summary of open space land in Needham is provided in Table 5-1 and on Figure 5.1, which summarize Needham's open space and recreation lands by its ownership or management responsibility. Some of the recreation and private lands classified as permanently protected may be subject to intensified uses that could impact their values for conservation and wildlife habitat in the future.

Needham has protected much of its open space in a time of increasing pressure for development. Private landowners have donated land for conservation and many of the Park and Recreation facilities have been improved and expanded. However, loss to development of key parcels has been keenly felt by the residents and raised the awareness that not all open land is protected from development.

TABLE 5-1
Existing Open Space Ownership in Needham

Owner/Manager	Acres	Percent of Town
Conservation Commission	494.7	6.1%
Parks & Recreation Commission ²	356.9	4.4%
Trustees of Memorial Park	12.5	0.2%
School Department ²	152.9	1.9%
Federal Government	46.5	0.6%
State Government	586.8	7.2%
Private (Conservation Restrictions)	95.0	1.2%
Non-profit Conservation	34.9	0.5%
Other Private (Babson College, BSA, etc.) ²	322.6	4.0%
Wellesley Water/Conservation Lands	77.5	1.0%
Board of Selectmen ^{1,2}	243.2	3.0%
Chapter 61A and 61B Lands	61.2	0.8%
TOTAL	2,484.7	30.4%

Source: *MassGIS and TownGIS*

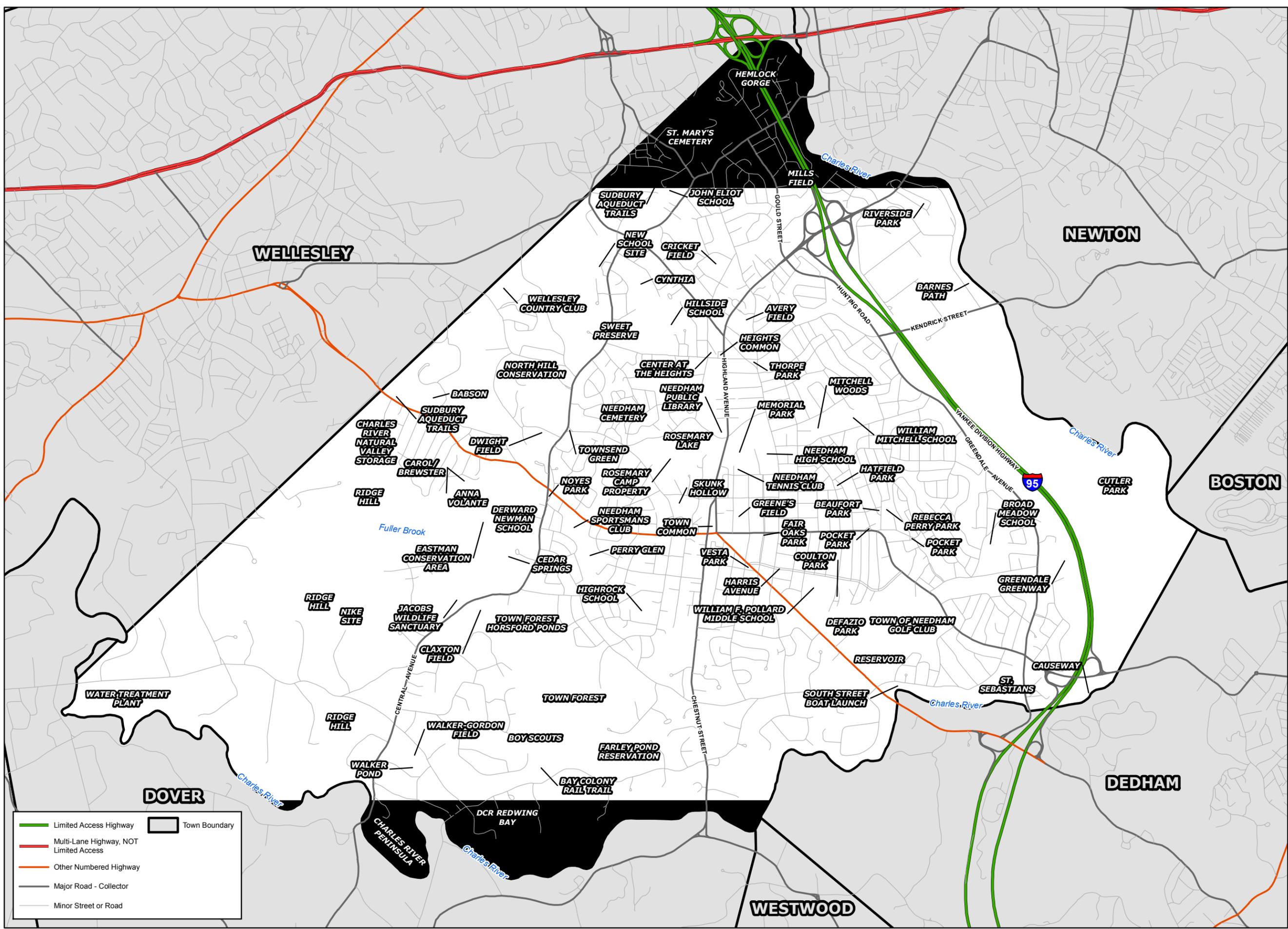
¹ Includes some Water Lands.

² May not all be permanently protected.

**FIGURE 5.1
OPEN SPACE
INVENTORY BY
OWNER TYPE**

LEGEND

- Open Space Owner Type**
- Federal
 - Municipal: Needham
 - Municipal: Wellesley
 - Private
 - State
 - Town Boundary



- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road
- Town Boundary

LOCUS MAP



NOTES

1. Data Provided by the Town of Needham and MassGIS.
2. Based on 2013 MassGIS Color Orthophoto.

**Town of Needham
Open Space & Recreation Plan
Needham, Massachusetts**

April 2017

Tighe & Bond
Engineers | Environmental Specialists

5.1.1 Private Lands

Many privately-owned parcels, including land owned by institutions, contribute to the Town's sense of open space. Some private owners have taken steps (Conservation Restrictions and gifts) to assure that their land is protected from future development and will forever be open space. Remaining large unprotected privately-owned parcels are likely candidates for future development. Recent development of private tracts of land have created a sense of loss of key features of Needham's natural environment, including trees and natural buffers.

The Town's focus on private lands is on protection and strategic acquisitions with consideration of specific values:

- **Agriculture:** Very little of Needham's farmland remains as many of the parcels that once included active farmland are now primarily residences or estates. MassGIS and Town land use data from aerial photos indicate that there were 156 acres of land in agricultural use in Needham in 1991. In 1971 there were more than 250 acres of farmland in Needham. MassGIS land use data from 2005 shows that the total area of cropland, pasture, and orchards/nurseries is now approximately 116 acres. Many of the larger unprotected parcels have fields and forests that contribute to the Town's character and provide wildlife habitat.
- **Forest:** Almost one quarter (1,988 acres) of Needham was forested according to the 2005 MassGIS land use data. A good portion of the Town's forested land is already protected by conservation ownership by the Town, Army Corps of Engineers, or non-profit conservation organizations, but much of the forested lands is privately owned and subject to future development.
- **Habitat:** The Massachusetts Natural Heritage Program BioMap Project has mapped two BioMap Core Habitat areas and one Living Water Core Habitat within Needham. While a good portion of the Town's prime wildlife habitat is already protected by conservation ownership by the Town, Army Corps of Engineers, and non-profit conservation organizations, these important wildlife habitat areas should be prioritized for protection.
- **Water resources:** There are two major aquifer recharge areas (Zone IIs) contributing to water supply wells for Needham and Wellesley. Needham's three wells are all located along the Charles River. The Rosemary Brook aquifer contributes to the Wellesley water supply and is considered one of the Town's most important wildlife areas. Assuring future water supply is a major goal of protecting open space. Needham has protected land in proximity to its water supply wells. Location within the Zone II recharge area of a drinking water supply is an important consideration in future land protection efforts. The Town also has an important surface water resource in the Charles River. It has been identified as a key asset and a strong public desire for additional access has been voiced.
- **Proximity to existing resources:** Expanding and improving connectivity between existing open space resources should remain a priority.

Small lots in densely developed areas: pocket parks and commons improve the quality of life in residential areas, and have been identified as a priority for acquisition.

5.2 Protected Lands

5.2.1 Less-than-Fee Interests

Many private owners have had the foresight to protect their land from future development. They have agreed to some form of “less-than-fee” interests or rights that have been transferred to the Town, another governmental body, or by a non-profit organization. In these cases, the private owner, or a prior owner, has given or sold some portion of their ownership rights to an owner with conservation as a purpose. These transferred rights may limit future development or “restrict” the use of the land. Conservation Restrictions are one form of a less-than-fee ownership.

The following table shows privately owned land with some form of less-than-fee interests held by another owner.

TABLE 5-2
Less Than Fee Interests

Assessors Map/Lot	Address	Restriction Type	Restriction Owner	Public Access	Level of Protection	Acres
305/0023	Charles River Street	CR	TTOR	No	Permanent	39.9
209/0011	100 Wilson Lane	CR	TTOR	unknown	Permanent	9.7
222/0008	600 Charles River St	CR	TTOR	No	Permanent	8.7
222/0007	634 Charles River St	CR	TTOR	No	Permanent	6.4
205/0016	47 Southwood Lane	CR	Town	unknown	Permanent	>4.0
221/0004	54 Pheasant Landing	CR	unknown	unknown	Permanent	3.2
083/0004*	St Mary Street	CR	Town	unknown	Permanent	2.4
209/0003	Wilson Lane	CR	unknown	No	Permanent	2.1
209/0025	Wilson Lane	CR	TTOR	No (along river only)	Permanent	0.2
043/0014	60 Lantern Lane	CR	unknown	unknown	Permanent	1.8
221/0023	49 Pheasant Landing	CR	Town	unknown	Permanent	1.6
215/0003	7 Pine Street	CR	Town	unknown	Permanent	>1.4
221/0019	91 Pheasant Landing	CR	Town	unknown	Permanent	1.2
220/0017	74 Beard Way	CR	Town	unknown	Permanent	>1.2
221/0017	Pheasant Landing	CR	Town	unknown	Permanent	1.0
221/0022	61 Pheasant Landing	CR	Town	unknown	Permanent	1.0
221/0015	46 Pheasant	CR	Town	unknown	Permanent	1.0

	Landing						
221/0014	36 Pheasant Landing	CR	Town	unknown	Permanent	1.0	
212/0066	68 Bridle Trail Road	CR	Town	unknown	Permanent	>1.0	
212/0016	117 Bridle Trail Road	CR	Town	unknown	Permanent	>1.1	
043/0010	41 High Rock Street	CR	Town	unknown	Permanent	>1.3	
042/0048-1	429 Warren Street	CR	Town	unknown	Permanent	>1.0	
221/0020	87 Pheasant Landing	CR	Town	unknown	Permanent	0.9	
213/0050	10 Moseley Avenue	CR	Town	unknown	Permanent	>0.4	
							95.0

Source: Needham GIS, MassGIS, Needham Board of Assessors, and Needham Conservation Commission

5.2.2 Public and Non-Profit Lands

Properties protected from development include those owned by the Town’s Conservation Commission, Park and Recreation or held for water supply purposes, properties for which the Town has received state or federal funds for purchase or improvement, state and federal conservation agencies, nonprofit land trusts, or private lands which have a permanent conservation restriction (CR).

This section provides information about land available for conservation and passive recreation managed by the Conservation Commission and by other Town organizations and other land available for active or passive recreation. Tables include parcel identification, owner, management agency, lot size, and significant details about particular parcels. All the parcels identified in this Section are protected from private development.

5.2.3 Public Conservation and Recreation Areas

5.2.3.1 Federal Lands

The Army Corps of Engineers (ACOE) owns 46.5 acres as part of the Charles River Natural Valley Storage project. The following table identifies the properties owned by the Army Corps.

TABLE: 5-3:
Army Corps of Engineers Land

Assessors Map/Lot	Address Site Name	Manager	Description	Public Access	Acres
215/0009	Off Pine Street	ACOE	Wetlands	Unknown	10.3
216/0015	Off Great Plain Ave.	ACOE	Fuller Brook/Wetlands	Unknown	1.2
216/0019	Off Great Plain Ave.	ACOE	Fuller Brook/Wetlands	Unknown	3.9
217/0006	Off Great Plain Ave.	ACOE	Fuller Brook/Wetlands	Unknown	2.4

217/0010	Off Alden Road	ACOE	Fuller Brook/Wetlands	Unknown	13.3
218/0012	Off Powder House Rd.	ACOE	Fuller Brook/Wetlands	Unknown	4.8
218/0021-41	Off Mary Chilton Rd.	ACOE	Fuller Brook/Wetlands	Unknown	10.6
					46.5

Source: Needham GIS

5.2.3.2 State Lands

The Commonwealth of Massachusetts owns a considerable portion of the open space in Needham. The Massachusetts Department of Conservation and Recreation (DCR) Is the primary state landholder in Needham. The following table identifies the properties owned by state agencies in Needham..

TABLE 5-4:
State Lands

Assessors Map/Lot	Address Site Name	Manager	Description	Public Access	Acres
081/0001	0 Central Ave	DCR	Hemlock Gorge Reservation	Yes	11.4
081/0033	0 Reservoir Rd	MDC/Water Division	Sudbury Aqueduct	Yes	25.4
209/0001+	0 South St	DCR	Red Wing Bay	Yes	3.3
210/0030	58 Fisher St	DCR	Red Wing Bay	Yes	3.3
300/0021	0 Highland Ave	DCR	Charles River Reservation/Barnes Path	Yes	23.9
301/0001	0 Great Plain Ave	DCR	Cutler Park Reservation	Yes	2.7
301/0002	0 Kendrick St	DCR	Cutler Park Reservation	Yes	439.5
301/0003+	0 Kendrick St	DCR	Cutler Park Reservation	Yes	76.8
301/0004	0 Great Plain Ave	DCR	Cutler Park Reservation	Yes	0.5
					586.8

Source: Needham GIS and MassGIS

5.2.3.3 Town Lands

The Town owns over 130 parcels with open space and recreation value in Needham, comprising approximately 1,262 acres. Town-owned lands include property operated for conservation, open space, recreation, schools, and municipal facilities. Not all of the Town-owned lands are permanently protected open space. Figure 5.2 shows municipal open space by ownership.

The following table identifies Town-owned land, the ownership, condition, management responsibility, current use, public access, zoning, and degree of protection.

*Numbered labels correspond to "Needham Open Space: Maybe" Parcels in OBJ_ID_OST column in OpenSpace_TBversion Table.
 *See OpenSpace_TBversion table for address, and Owner Information.

**FIGURE 5.2
 OPEN SPACE
 INVENTORY**

LEGEND

- Needham: Maybes
- Needham: Group**
- Unknown
- Board of Selectmen
- Board of Selectmen?
- Conservation Commission
- Conservation Commission / Board of Selectman
- Conservation Commission?
- Park & Recreation
- Park & Recreation / Conservation
- Schools
- Trustees of Memorial Park
- Parcel Boundary
- Town Boundary

LOCUS MAP



0 1,200 2,400
 Feet

1:28,800 1 in = 2,400 ft

NOTES

1. Data Provided by the Town of Needham and MassGIS

**Town of Needham
 Open Space & Recreation Plan
 Needham, Massachusetts**

April 2017

Tighe & Bond
 Engineers | Environmental Specialists

- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road
- Town Boundary

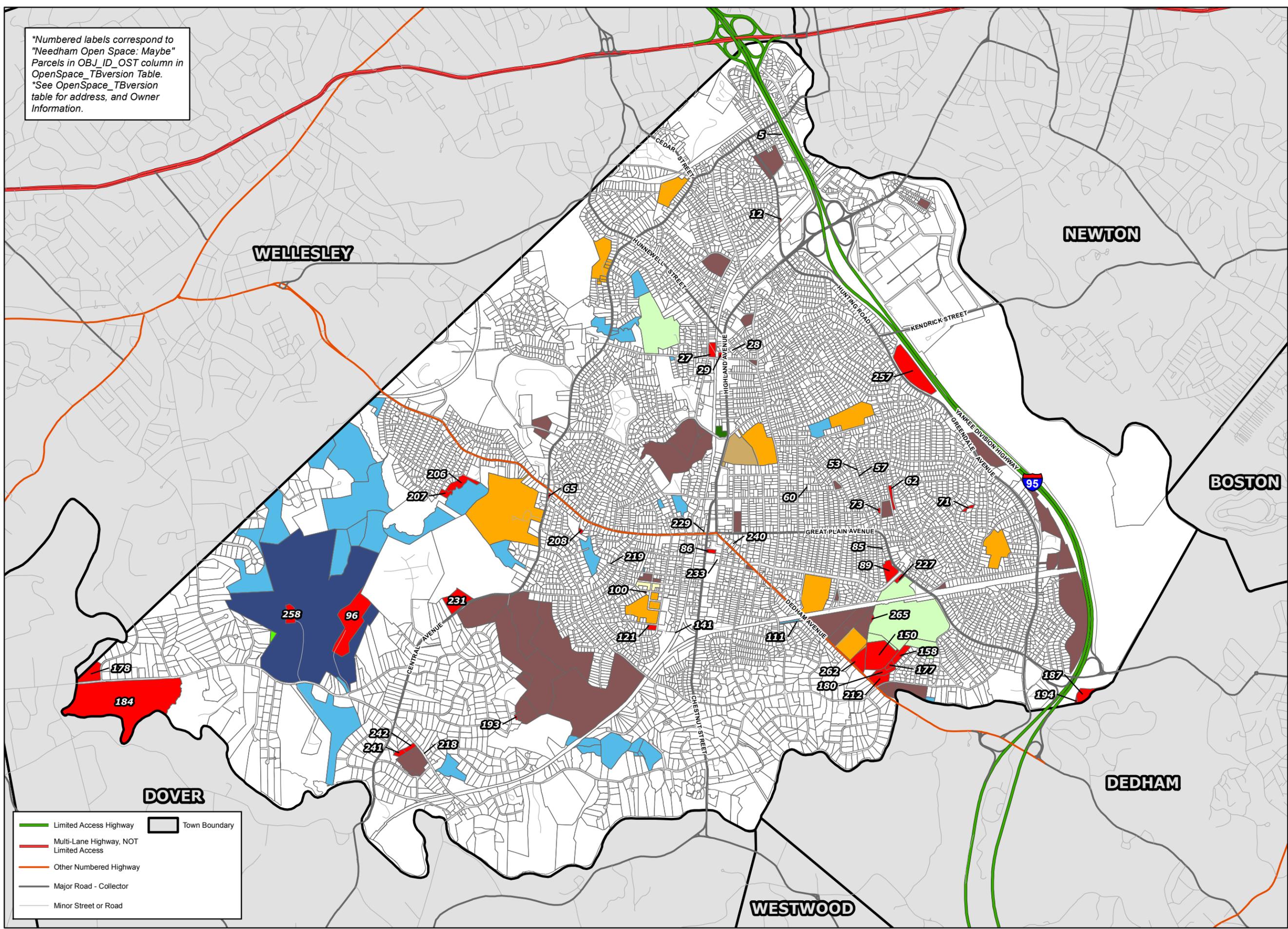


TABLE 5-5: Town Conservation and Recreation Lands

Map/Lot	Address	Site Name	Alternate Name	Acres	Public Access	Management Agency	Degree of Protection	Condition	Zoning	Current Use
302/0003	500 Dedham Ave	Public Service Administration Building		2.67		BoS/ DPW	Unknown	Excellent	SRB	Adminstrative Building
045/0013	0 Maple St	Near Housing Authority		0.02		BoS?			GR	
133/0025	0 Linden St	Near High Rock School		0.02	Yes	P&R / CC			SRB	Conservation
070/0028	0 Webster St	Avery Field		1.81	Yes	P&R	None	Good	SRB	Athletic field
120/0023-2	0 Dwight Rd	Dwight Field		4.71	Yes	P&R	None	Poor	SRA	Athletic field
133/0041	77 Sylvan Rd	High Rock School		10.88	Yes	Schools	None	Good	SRB	Athletic field
035/0001	200 Harris Ave	Pollard Middle School		15.44	Yes	Schools	None	Good	SRB	Athletic field
213/0065	0 Charles River St	Walker-Gordon		0.01	Yes	P&R		Excellent	SRA	Athletic field
214/0001	174 Charles River St	Walker-Gordon Field		0.85	Yes	P&R		Excellent	SRA	Athletic field
214/0061	0 Charles River St	Walker-Gordon Field		0.91	Yes	P&R		Excellent	SRA	Athletic field
226/0010	609 Webster St	Needham High School		14.46	Yes	Schools	None	Excellent	SRB	Athletic field Tennis courts
022/0049	0 Beaufort Ave	Beaufort Park		0.22	Yes	BoS		Good	SRB	Commons/Pocket Park
032/0026	0 Coulton Pk	Coulton Park		0.45	Yes	P&R		Good	SRB	Commons/Pocket Park
030/0079	0 Melrose Ave	Hatfield Park		0.66	Yes	P&R		Good	SRB	Commons/Pocket Park
069/0070	0 Highland Ave	Heights Common		0.35	Yes	BoS		Good	ASB	Commons/Pocket Park
216/0038	0 Noyes Park	Noyes Park A		0.20	Yes	BoS		Good	SRB	Commons/Pocket Park
216/0038	0 Noyes Park	Noyes Park B		0.20	Yes	BoS		Good	SRB	Commons/Pocket Park
063/0048	0 Webster St	Thorpe Park		0.40	Yes	P&R		Good	SRB	Commons/Pocket Park
040/0046	0 Dedham Ave	Vesta Park		0.31	Yes	P&R		Good	SRB	Commons/Pocket Park
217/0008	0 Brewster Dr	Anna Volante Conservation Area		13.59	Yes	CC	Permanent	Good	SRA	Conservation
217/0011	0 Standish Rd	Carol/Brewster		1.14	Yes	BoS	Permanent	Good	SRB, SRA	Conservation
217/0012	0 Standish Rd	Carol/Brewster		3.45	Yes	BoS	Permanent	Good	SRB, SRA	Conservation
216/0040	0 Cedar Springs Ln	Cedar Springs Area	Cedar Springs Open Space	7.21	Yes	CC	Permanent	Good	SRA	Conservation
217/0009	0 Standish Rd	Anna Volante Conservation Area		12.42	Yes	CC	Permanent	Good	SRA	Conservation
220/0004	0 Grove St	Conservation Near Ridge Hill		19.21		CC	Permanent	Good	SRA	Conservation
104/0050	0 Cynthia Rd	Cynthia - Adjacent To Hillside School	Cynthia Road Wetland	4.89	Yes	CC	Permanent	Good	SRB	Conservation
015/0004	0 Greendale Ave	Former Gravel Pit	Greendale Ave Beltway	2.95	Yes	P&R	Permanent	Good	SRB, SRA	Conservation
308/0003	0 Central Ave	Jacobs Wildlife Sanctuary		6.26	Yes	BoS	Unknown	Good	SRA	Conservation
132/0101	0 Linden St	Near High Rock School		0.69	Yes	P&R / CC		Good	SRB	Conservation
139/0088	0 Willow St	Near High Rock School		1.16	Yes	P&R / CC		Good	SRB	Conservation
141/0002	0 Perry Dr	Perry Glen		0.08	Yes			Good	SRB	Conservation
140/0001	0 Great Plain Ave	Perry Glen		6.25	Yes	CC		Good	SRB	Conservation
051/0085	0 May St	Skunk Hollow	Nehoiden Glen	3.27	Yes	CC	Permanent	Good	SRB	Conservation
103/0029	0 Central Ave	Sweet Preserve		0.31	Yes	CC	Permanent	Good	SRB	Conservation
103/0028	0 Central Ave	Sweet Preserve		0.46	Yes	CC	Permanent	Good	SRB	Conservation
103/0039	0 Glover Rd	Sweet Preserve		1.97	Yes	CC	Permanent	Good	SRB	Conservation
109/0004	0 Central Ave	Sweet Preserve	Central Ave	3.77	Yes	CC	Permanent	Good	SRB, SRA	Conservation
103/0027	0 Central Ave	Sweet Preserve	Central Ave Wildlife Refuge	3.97	Yes	CC	Permanent	Good	SRB	Conservation
051/0056	0 Brentwood Cir	Wetlands		0.73		CC			SRB	Conservation
211/0017	0 Charles River St	Wetlands Adjacent To Walker-Gordon	Charles River St	6.21	Yes	CC	Permanent		SRA	Conservation
139/0064	0 Willow St	Near High Rock School	Willow St	1.36	Yes	P&R	Permanent		SRB	Open Space
302/0016	0 Green St	Needham Golf Club		1.36	Yes	BoS	Limited	Excellent	SRB	Golf Club
302/0009	0 Dedham Ave	Needham Golf Club		2.59	Yes	BoS	Limited	Excellent	SRB	Golf Club
302/0014	49 Green St	Needham Golf Club		3.97	Yes	BoS	Limited	Excellent	SRB	Golf Club

TABLE 5-5: Town Conservation and Recreation Lands

Map/Lot	Address	Site Name	Alternate Name	Acres	Public Access	Management Agency	Degree of Protection	Condition	Zoning	Current Use
302/0022	0 Great Plain Ave	Needham Golf Club		8.59	Yes	BoS	Limited	Excellent	SRB	Golf Club
302/0018	25 Green St	Needham Golf Club		46.27	Yes	BoS	Limited	Excellent	SRB	Golf Club
226/0055	1139 Highland Ave	Needham Public Library		1.55	Yes	BoS	None	Excellent	SRB	Library
301/0005	0 Great Plain Ave	Causeway	Open space	4.85	Yes	BoS	Unknown		SRB	Open Space
302/0005	380 Dedham Ave	DeFazio Park	Open space	0.28	Yes	BoS/ DPW		Excellent	SRB	Open Space
302/0005	380 Dedham Ave	DeFazio Park	Open space	3.54	Yes	BoS/ DPW		Excellent	SRB	Open Space
226/0030	1154 Highland Ave	Memorial Park		12.28	Yes	Trustees of Memorial Park	Permanent	Excellent	SRB	Pedestrian path Athletic field
013/0003	120 Broad Meadow Rd	Broadmeadow School		11.07	Yes	Schools	None	Good	SRB	Playground Athletic field
303/0001	1380 Central Ave	Claxton Field		17.31	Yes	P&R	None	Good	SRA	Playground Athletic field
094/0012	65 Hillside Ave	Cricket Field		6.60	Yes	P&R	None	Excellent	SRB	Playground Athletic field
302/0005	380 Dedham Ave	DeFazio Park		4.71	Yes	P&R	None	Excellent	SRB	Playground Athletic field
050/0031-2	0 Pickering St	Greene's Field		2.49	Yes	P&R	None	Excellent	SRB	Playground Athletic field
102/0001	28 Glen Gary Rd	Hillside School		27.39	Yes	BoS	None	Good	SRB, GR	Playground Athletic field
091/0019	135 Wellesley Ave	John Eliot School		8.28	Yes	Schools	None	Good	SRB	Playground Athletic field
056/0001	187 Brookline St	Mitchell School		12.52	Yes	Schools	None	Good	SRB	Playground Athletic field
023/0001	0 Beaufort Ave	Rebecca Perry Park		2.46	Yes	P&R	Permanent	Good	SRB	Playground Athletic field
073/0030	0 Highland Terr	Riverside Park	Hood Park Riverside Park	1.31	Yes	P&R	Permanent	Good	GR, SRA	Playground Athletic field
085/0003	0 Hampton Ave	Chester R. Mills Playground	Mills Field	6.41	Yes	P&R	Permanent	Good	SRB	Playground Athletic field Tennis courts
302/0007	380 Dedham Ave	DeFazio Park		0.28	Yes	P&R	None	Excellent	SRB	Playground Athletic field Track
302/0007	380 Dedham Ave	DeFazio Park		7.81	Yes	P&R	None	Excellent	SRB	Playground Athletic field Track
302/0007	380 Dedham Ave	DeFazio Park		10.67	Yes	P&R	None	Excellent	SRB	Playground Athletic field Track
140/0065	0 Great Plain Ave	Adjacent To Sportsman Pond		0.31	Yes			Good	SRB	Ponds/Lakes/Rivers
225/0031	0 Rosemary St	Bath House	Rosemary Lake	1.19	Yes	P&R	Permanent	Good	SRB	Ponds/Lakes/Rivers
200/0028	0 South St	Charles River Park		0.56		CC		Good	SRA	Ponds/Lakes/Rivers
302/0002	0 Dedham Ave	Charles River Park	Charles River Park Canoe Launch	3.48	Yes	P&R	Permanent	Good	SRA	Ponds/Lakes/Rivers
206/0067	0 South St	Farley Pond Reservation		2.93	Yes	CC	Permanent	Good	RRC	Ponds/Lakes/Rivers
303/0008	0 South St	Farley Pond Reservation	Town Forest	3.74	Yes	CC	Permanent	Good	SRA, RRC	Ponds/Lakes/Rivers
302/0012	0 Dedham Ave	Reservoir		0.83	Yes	BoS/ DPW	Permanent	Good	SRB	Ponds/Lakes/Rivers
302/0011	0 Dedham Ave	Reservoir		1.75	Yes	BoS/ DPW	Permanent	Good	SRB	Ponds/Lakes/Rivers
302/0013	0 Dedham Ave	Reservoir		2.15	Yes	BoS/ DPW	Permanent	Good	SRB	Ponds/Lakes/Rivers
225/0002	0 Rosemary St	Rosemary Lake	Rosemary Lake Pool	11.87	Yes	P&R	Permanent	Good	SRB	Ponds/Lakes/Rivers
225/0003	0 Rosemary St	Rosemary Lake Parking Chambers Cove		0.32	Yes	P&R	None	Good	SRB	Ponds/Lakes/Rivers
302/0001	0 South St	South Street Boat Launch	Charles River Park	4.93	Yes	P&R	Permanent	Good	SRA	Ponds/Lakes/Rivers

TABLE 5-5: Town Conservation and Recreation Lands

Map/Lot	Address	Site Name	Alternate Name	Acres	Public Access	Management Agency	Degree of Protection	Condition	Zoning	Current Use
303/0004	0 Central Ave	Town Forest Horsford Ponds	High Rock Town Forest	22.28	Yes	P&R	Permanent	Good	SRA	Ponds/Lakes/Rivers
210/0036	0 Walker Ln	Walker Pond		0.49	Yes	P&R		Good	SRA	Ponds/Lakes/Rivers
210/0023	0 Charles River St	Walker-Gordon Field	Walker Gordon Pond	8.62	Yes	P&R	Permanent	Excellent	SRA	Ponds/Lakes/Rivers Athletic field
099/0014	300 Hillside Ave	Center At The Heights		1.68	Yes	Council on Aging		Excellent	HAB	Senior Center
206/0069	0 Richardson Dr	Farley Pond Reservation		0.03	Yes	CC		Good	SRA	Trails
206/0019	0 South St	Farley Pond Reservation		0.24	Yes	CC	Permanent	Good	RRC	Trails
206/0016	0 South St	Farley Pond Reservation		0.36	Yes	CC	Permanent	Good	RRC	Trails
206/0015	0 Richardson Dr	Farley Pond Reservation		2.16	Yes	CC	Permanent	Good	RRC	Trails
206/0013	0 South St	Farley Pond Reservation		5.80	Yes	CC	Permanent	Good	RRC	Trails
206/0026	0 Richardson Dr	Farley Pond Reservation		11.71	Yes	CC	Permanent	Good	RRC	Trails
057/0001	0 Cheney St	Greendale Greenway	Greendale Trails	51.42	Yes	P&R	Permanent	Good	SRB, SRA	Trails
055/0001	0 Brookline St	Mitchell Woods		4.53	Yes	CC	Permanent	Good	SRB	Trails
225/0001	0 Rosemary St	Rosemary Camp Property	Rosemary Lake	23.80	Yes	P&R	Permanent	Good	SRB	Trails
303/0012	0 Gateway Dr	Town Forest		0.18	Yes	P&R		Good	SRA	Trails
212/0042	0 Horsford Rd	Town Forest	Town Forest/Tocci Land	1.22	Yes	P&R	Permanent	Good	SRA	Trails
212/0043	0 Horsford Rd	Town Forest	Town Forest/Tocci Land	1.28	Yes	P&R	Permanent	Good	SRA	Trails
303/0011	0 South St	Town Forest	High Rock Town Forest	6.75	Yes	P&R	Permanent	Good	SRA	Trails
303/0005	0 Frances St	Town Forest	High Rock Town Forest	32.41	Yes	P&R	Permanent	Good	SRB, SRA	Trails
303/0003	0 Central Ave	Town Forest	High Rock Town Forest	43.61	Yes	P&R	Permanent	Good	SRA	Trails
303/0007	0 High Rock St	Town Forest	High Rock Town Forest	64.09	Yes	P&R	Permanent	Good	SRB, SRA	Trails
216/0021	1155 Central Ave	Derwood Newman School / Eastman Conservation Area		60.63	Yes	Schools	None	Excellent	SRB, SRA	Trails Athletic field Conservation Playground Pedestrian Path Tennis Courts
306/0011	0 Pine St	Nike Site	Former Nike Site	18.11	Yes	BoS	None	Good	SRA	Trails Community Farm Dog Park
306/0009	149 Pine St	Ridge Hill		0.88	Yes	CC		Good	SRA	Trails Conservation
306/0013	0 Cartwright Rd	Ridge Hill	Hueg	11.34	Yes	CC	Permanent	Good	SRA	Trails Conservation
219/0001	0 Cartwright Rd	Ridge Hill	Wiswall	15.87	Yes	CC	Permanent	Good	SRA	Trails Conservation
218/0009	0 Powder House Rd	Ridge Hill	McIntosh	27.97	Yes	CC	Permanent	Good	SRA	Trails Conservation
304/0006	0 Charles River St	Ridge Hill	Charles River Park	31.35	Yes	CC	Permanent	Good	RRC	Trails Conservation
218/0004	0 Cartwright Rd	Ridge Hill		45.25	Yes	CC	Permanent	Good	SRA	Trails Conservation
306/0001	463 Charles River St	Ridge Hill		223.06	Yes	CC / BoS		Good	SRA	Trails Conservation
302/0010	0 Dedham Ave	Reservoir		11.81	Yes	BoS/ DPW	Permanent	Good	SRB	Trails Ponds/Lakes/Rivers
031/0069	0 Harris Ave	Across From Golf Course	Water Dept. Land	3.28	Yes	BoS			SRB	Water Dept. Land
224/0026	0 Charles River St	Water Dept. Lands & Sub Station		4.93	No	BoS/ DPW			SRA	Water Dept. Land
222/0001	914 Charles River St	Water Treatment Plant	Well fields	65.65	No	BoS/ DPW	Permanent		RRC	Well Fields
134/0039	0 Sylvan Rd	Across From High Rock School		0.72	Yes				SRB	
085/0002	0 Gould St	Across From Mills	Adjacent to C.R. Mills	1.67	Yes	P&R	Permanent		SRB	
302/0023	0 Great Plain Ave	Adjacent Golf Club		0.65	Yes	BoS			SRB	

TABLE 5-5: Town Conservation and Recreation Lands

Map/Lot	Address	Site Name	Alternate Name	Acres	Public Access	Management Agency	Degree of Protection	Condition	Zoning	Current Use
226/0029	0 Oakland Ave	Adjacent Memorial Park		0.24	Yes	Trustees of Memorial Park	Permanent		SRB	
036/0058	0 Dedham Ave	Adjacent Railroad Tracks		0.27		BoS			SRB	
301/0006	0 Great Plain Ave	Adjacent To Causeway		0.24		BoS			SRB	
023/0031	0 Wyoming Ave	Adjacent To Perry Park		0.96	Yes	BoS			SRB	
100/0059	0 Birch St	Adjacent To Petrini Apartments		0.29		CC			GR	
047/0057	66 Chestnut St	Adjacent To Police & Fire		0.57	Yes	BoS	none		CB	Parking
144/0004	0 Mary Chilton Rd	Adjacent To Sudbury Aquaduct Trail	Mary Chilton Drive	2.72	Yes	CC	Permanent		SRB, SRA	
306/0014	0 Charles River St	Contiguous With Standish Road	Ridge Hill/McIntosh	6.03	Yes	CC	Permanent		SRA	
306/0015	0 Charles River St	Contiguous With Standish Road	Ridge Hill Pine Swamp	12.93	Yes	CC	Permanent		SRA	
302/0005	380 Dedham Ave	DeFazio Park		9.35	Yes	Schools	None	Excellent	SRB	
011/0070	0 Broad Meadow Rd	Great Plain Avenue Corner		0.51	Yes	P&R			SRB	
057/0001	0 Cheney St	Greendale Greenway	Parcel 74	12.93	Yes	BoS		Good	SRA	Trails
139/0060	0 Oak St	Near High Rock School		0.10	Yes	CC			SRB	
132/0100	0 Cypress St	Near High Rock School		0.47	Yes	P&R			SRB	
221/0025	Off Pheasant Lndg Rd	Near Ridge Hill		0.69		CC			SRA	
108/0027	45 Sunset Rd	New School Site		0.23	Yes	Schools	None		SRB	
108/0005, 6, 7, 9, 10	559 Central Ave	New School Site		1.51	Yes	Schools	None		SRB	
310/0003	585 Central Ave	New School Site		8.57	Yes	Schools	None		SRB, SRA	
		Ridge Hill Special Lease Area Designated 2007		3.05		BoS	Limited		SRA	

legend
name from 2007 OSRP
need confirmation
missing info

Zoning Codes

- ASB = Avery Square Business
- CB = Center Business
- GR = General Residence
- HAB = Highland Avenue Business
- IND-1 = Industrial-1
- RRC = Rural Residence - Conservation
- SRA = Single Residence A
- SRB = Single Residence B

TABLE 5-6
Wellesley Land

Assessors Map/Lot	Address or Site Name	Manager	Description	LOP	Public Access	Acres
310/0001	Rosemary Meadow	Wellesley Board of Public Works (WBPW)	Water Supply Lands	P	No	65.3
223/0010	Locust Lane	Wellesley Conservation Commission	Wetlands/Pond	P	Yes	8.4
219/0004	Cartwright Road	WBPW	Water Supply Land	P	No	0.8
219/0005	Cartwright Road	WBPW	Wetlands	P	Yes	3.0
Wellesley Total						77.5

5.2.3.4 Recreation Resources

The Town's recreation resources include the 357.8 acres managed by the Park and Recreation Commission, many of the athletic fields on School Department land; the Massachusetts Department of Conservation and Recreation's Cutler Park, private recreation facilities that may be available for public use; approximately 150 acres of land managed by the Board of Selectmen, including the Needham Golf Course (58.5 acres); Memorial Park; and the Town's numerous conservation areas that are suitable and prepared for passive recreation. The following table lists the Town's major recreation facilities:

TABLE 5-7
Recreation Facilities

Fields	
Avery Field	youth diamond
Broadmeadow School	2 youth diamonds; basketball; playground; parking lot
Claxton Field	2 adult softball 60' diamonds (one lighted); playground; picnic area with grills; restrooms
Cricket Field	2 multi-purpose fields; small playground; ½ basketball court; storage building with restrooms
DeFazio Park	4 multi-purpose fields; 1 60' diamonds; 2 90' diamonds; track; tot lot; public restrooms; picnic area with grills; parking lot
Dwight Field	youth diamond; parking lot
Eliot School	youth diamond; basketball; playground; parking lot
Greene's Field	youth diamond; small multi-purpose field; large playground structure; basketball court; picnic area

TABLE 5-7
Recreation Facilities

Fields	
High Rock School	youth diamond; multi-purpose field; parking lot
High School	4 tennis courts, small multi-purpose field
Hillside School	youth diamond; multi-purpose field; playground; parking lot
Memorial Park	90' diamond; 60' diamond; football field; multipurpose field; track; gazebo; memorials; storage/meeting building; restrooms; parking lot; garden
Mills Field	youth diamond; 4 tennis courts; playground; picnic area with grills; basketball court; restroom
Mitchell School	2 youth diamonds; basketball; playground; parking lot
Newman School	3 youth diamonds; 4 tennis courts; basketball; playground; parking lot; walking path
Perry Park	youth diamond; playground; basketball court
Pollard Middle School	youth diamond; multi-purpose field; paved area for in-line skates; parking lot
Riverside Park	small multi-purpose field; small playground; restroom
Rosemary Pool	two pools and an office building are under construction and expect to be completed June 2018
Walker-Gordon Field	90' diamond; small playground; ½ basketball court; fishing in pond; parking lot
Playground Structures	
Broadmeadow School	ages 3-5; ages 5-12
Claxton Field	ages 3-5; ages 5-8
Cricket Field	ages 3-5
DeFazio Park	ages 3-5; ages 5-12
Eliot School	ages 3-5; ages 5-12
Greene's Field	ages 3-5; ages 5-8
Hillside School	ages 3-6; ages 5-12
Mills Field	ages 3-6
Mitchell School	ages 5-12
Newman School	ages 3-6; ages 5-12
Perry Park	ages 3-6
Riverside Park	ages 3-6
Walker-Gordon	ages 3-6

In addition to these facilities the Park and Recreation Department runs many of its programs in school classrooms, gyms, the Public Library, Center at the Heights, and other indoor facilities around Town.

The Department of Public Works maintains many of the Town’s open space and recreation facilities. Refer to Appendix C for maps of the different open space and recreational facilities by Type in the Town of Needham.

5.2.4 Non-Profit Land

The Trustees of Reservations own 34.9 acres on the Charles River at Fisher Street known as the Charles River Peninsula. It is the only nonprofit conservation land in Needham. The Trustees have also protected lands in Needham through deeded development restrictions.

5.3 Unprotected Open Space Land

5.3.1 Chapter Lands

Chapter 61, 61A and 61B provide an option for tax abatements for private properties that are used for forestry, agriculture or recreation uses. These programs provide the Town with the right of first refusal to acquire the property should the owner seek to sell it. These lands provide open space values, but could be developed if the land owner is ready to sell the property and the Town does not choose to exercise its right to acquire. Chapter lands are described below.

Chapter 61 forest lands require a minimum of ten contiguous acres under a minimum 10-year management plan certified by the State Forester. Properties under the Chapter 61 designation are granted tax abatements for remaining under forestry use. The Town has the right of first refusal should the properties be put on the market for another use. There are no Chapter 61 parcels in Needham.

Chapter 61A agriculture lands require a minimum of five contiguous acres to be “actively devoted” to agriculture or horticultural use. To qualify as “actively devoted,” a minimum of \$500 in gross sales income during the prior two year period is required. Properties under the Chapter 61A program are granted tax abatements for remaining in agricultural use. The Town has the right of first refusal should the properties be put on the market for another use.

Chapter 61B recreation lands require a minimum of five contiguous acres that is left wild and /or maintained for wildlife habitat or used for recreational purposes by the public or by private non-profit groups. Properties under Chapter 61B are granted tax abatements for remaining in this use. The Town has the right of first refusal should the properties be put on the market for another use.

Following is a list of Chapter parcels in Needham.

TABLE 5-8
Parcels Under Chapter 61A and 61B

Assessors Map/Lot	Address Site Name	Property Owner	Chapter Status	Zoning	Access	Acres
113/0029	0 Forest St	Wellesley Country Club	61B		Unknown	11
208/0007	0 South St	Payne, Douglas D. and	61B		Unknown	9.4

TABLE 5-8
Parcels Under Chapter 61A and 61B

Assessors Map/Lot	Address Site Name	Property Owner	Chapter Status	Zoning	Access	Acres
		Geraldine R.				
217/0004	0 Standish Rd	Standish Farm Realty, LLC	61A		Unknown	22.2
302/0016	0 Green St	Needham Golf Club	61B		Unknown	0.2
302/0022	0 Great Plain Ave.	Needham Golf Club	61B		Unknown	8.6
305/0029	0 Charles River St	Greenway, H.D.S. & Joy B., Tr.	61A		Unknown	9.8
						61.2

Source: MassGIS and Needham GIS

5.3.2 Private Recreational Properties

There are key recreational properties in Needham that are privately held, and have limited public access. The private Needham Golf Club operates a nine-hole course on land leased from the town. The course was built in 1923. There is also a private Racquet Club on Kingsbury Street and a private pool and tennis club is located at 1545 Central Avenue. Several private schools in town also have recreation facilities

5.3.3 Major Institutional Holdings

There are approximately 323 acres owned by institutions in Needham. The institutions include private schools, churches, and charitable organizations. The following table shows the major holdings of these private institutions.

TABLE 5-9
Institutional Holdings

Assessors Map/Lot	Use	Address	Level of Protection	Public Access	Acres
309/11,16,17,19,21,22,23,25,26,27 114/01,10,11,12	Babson College	46 Burrhill Ln	None	Yes	138.4
227/0001	Radio/TV Tower	350 Cedar St	None	No	45.1
303/0010	Boy Scout Camp	0 High Rock Woods	None	Yes	34.2
124/0001	Cemetery	128 Nehoiden St	Cemetery	Yes	21.7
091/0024	Cemetery	Wellesley Ave	Cemetery	Yes	19.7
200/0016	St. Sebastian's Country Day School	1119 Greendale Ave.	None	Limited	16.5
309/20	Olin College	1000 Olin Way	None	Yes	34.9

TABLE 5-9
Institutional Holdings

Assessors Map/Lot	Use	Address	Level of Protection	Public Access	Acres
214/0053	Walker School	1968 Central Ave.	None	Limited	8.4
142/0073	Sportsman's Club	1346 Great Plain Rd.	None	Limited	3.7
					322.6

Source: Needham GIS

5.4 Implications

Approximately 22% of Needham’s land mass is conserved through Town, State, Federal and non-profit ownership. As Table 5-1 shows, State and Federal holdings comprise approximately 8% of the land within Needham. The Federal lands are focused in the Charles River Natural Valley Storage Area in the western part of Town, while the State lands are focused in the Barnes Path and Cutler Park along the eastern side of Needham. The Town maintains large swaths of conservation land including Ridge Hill Reservation, the Town Forest, and water supply lands in the western part of Town. Many smaller Town-owned recreational and conservation lands are distributed throughout Needham.

The acreage of land in Needham classified as Chapter 61A or 61B is approximately 0.8% of the overall land mass. These lands comprise open fields, green forests and recreation lands that townspeople associate with Needham’s community character. As property owners’ needs change, and as the market for developable land strengthens, townspeople must be aware that large blocks could be placed on the market for development. There may be other lands that the community wishes to maintain as open space and/or recreational sites. Chapter lands provide a window of opportunity for the Town to exercise its right of first refusal to purchase property being removed from Chapter status. This window is brief, however, so the community needs to be clear about its priorities for acquisition of open lands and to be ready, including having funds or access to funds, to move quickly when opportunities arise.

Needham has many existing protected open spaces and many forest, water resource, and wildlife habitat areas that are worthy of consideration for protection. In addition, there are many parcels that are adjacent to already protected conservation or recreation areas that could increase the future value of these open space resources. Parcels that have multiple open space values (such as in a Zone II, in a watershed protection area, in a priority wildlife habitat area, and adjacent to existing recreation and open space parcels) should be a priority for future protection. There are also many opportunities to create connections, greenways and wildlife corridors that could be the basis of a town-wide greenway and trail system.

Section 6

Community Vision and Goals

6.1 Description of Vision and Goals Process

The process used to develop the vision and goals for the Open Space and Recreation Plan was based on participatory processes with input from the Advisory Group, feedback from the public survey, and the first public forum. The vision and goals were examined and expanded at a series of meetings with the Advisory Group. Public input was solicited through the survey and public forum. The information generated at these sources was compiled and incorporated into a revised vision statement and a revised set of goals that are set forth below.

Vision Statement

Needham has long recognized the importance of open space for conservation and recreation purposes. While the Town is a largely developed metropolitan suburb, Needham's municipal officials and residents are committed to balancing continued pressure for development with the need to protect our natural resources and to provide recreational opportunities and facilities for people of all ages and abilities. Careful planning and stewardship, along with cooperation between Town Departments and coordination with other towns and agencies, are critical to achieving an appropriate balance between competing priorities. Needham will continue to rely on these practices as it works towards a future in which:

- *The Town remains an attractive residential community with a broad mix of permanently protected open spaces that support a diversity of wildlife, protect our water supply, and provide opportunities for passive recreation.*
- *Open space and recreational opportunities exist throughout Town in every major neighborhood.*
- *Residents enjoy active recreation at a set of diverse facilities including outdoor fields and courts, indoor facilities, and well-maintained parks.*
- *Recreational resources – including playgrounds and playing fields – are maintained and expanded in a manner that is consistent with the needs and interests of the community.*
- *A well-documented, interconnected network of trails is available.*
- *The Charles River is recognized as a unique natural and recreational resource and is widely accessible for both walking and boating.*

Achieving this vision will take a concerted effort over a long period of time, but there will be many benefits:

- Generations of families will continue to enjoy the natural forests, meadows, ponds, and wetlands that help define the character of Needham.
- Residents will be able to walk or bike to commercial centers, schools, conservation lands, and recreational facilities on a network of safe and attractive trails and walkways.
- Individuals will be able to enjoy the *re-creation* of the spirit obtained from quiet contemplation and enjoyment of quality environments.
- Residents of all ages will derive both physical and mental health benefits from being able to walk, run, ski, bike, swim, and play sports.
- Seniors will choose to stay in Town because of these facilities, walking opportunities, and programs catering to their interests.
- The future supply and quality of drinking water will be protected.

Perhaps one of the most universally held visions throughout the public process was that Needham retains, maintains and cares for its natural and recreational areas—those already protected and those that may be in jeopardy.

6.2 Statement of Open Space and Recreation Goals

The following four goals, along with the supporting narratives, reveal the broad ambitions of the community with respect to the provision of open space and recreation opportunities. *The sequencing of the goals is not intended to reflect priority order as each is considered to be of equal importance.*

Goal I: Acquire / Protect Additional Open Space

Goal Amplification:

Previously approved Plans, along with input provided by the Open Space & Recreation Advisory Group and the public at large, confirm a broad-based commitment to permanently protecting strategic open space. This protection can be achieved through various avenues. For instance, while the price of land in Needham is extremely high, certain parcels will likely warrant consideration for outright purchase, while less-than-fee interests may be appropriate for protection of other properties. In addition, subdivision control under the Planning Board and permit review by the Conservation Commission can result in the permanent protection of sensitive parcels through conservation restrictions and/or easements. Both Boards have used their permitting authority in the past to protect significant amounts of open space, and these approaches should continue to be utilized and refined to protect natural areas. On another front, efforts to solicit voluntary donations of land, conservation restrictions and/or conservation easements could be intensified. In order to make such donations more attractive to property owners, the possibility of granting tax incentives for such donations could be explored. In addition, coordination with private land trusts, such as The Trustees of Reservations or Needham Land Trust, could help protect parcels of land that have a short window of opportunity to act.

Prioritization of properties for potential acquisition or protection is critical to achieving the stated goal. Previously, the Board of Selectmen articulated the need to actively seek out and protect land in the more developed areas of Town, in order that all Needham residents will have access to the benefits and quality of life improvements that open space affords. In addition to this more recent policy, the Town has historically sought to protect land that abuts existing open space holdings, including, but not limited to, Ridge Hill, Town Forest, and the Eastman Reservation. This approach contributes to several Town priorities, such as developing a trail network, protecting water resources, and maintaining a diversity of wildlife habitat, and should continue to be a dominant principle when assessing the protection of various parcels. Beyond proximity to large tracts of protected land, emphasis should be placed on protecting those parcels with multiple conservation values and those parcels that have unique features regardless of their location. Some unique features identified through this process include Echo Bridge, the Sudbury Aqueduct and the Ridge Hill House. Finally, promoting public access and knowledge about open space and its benefits is critical to building the public support for land protection that will be needed when a specific project relating to land acquisition and/or protection is proposed. Consequently, efforts to promote public awareness of existing open space and the values it provides should be an integral component of any land protection strategy.

Goal II: Maintain, Enhance and Expand Recreational Facilities

Goal Amplification:

Needham has a long-standing tradition of providing a range of “active” recreational opportunities including soccer, baseball, football, lacrosse, tennis, and swimming. The high rate of participation in these sports and the potential for overuse of the existing fields and facilities can significantly affect the condition of these resources. Recognizing the safety and other issues associated with stressed fields, the Town undertook a Field Study in the winter of 2005 and has implemented many of the recommendations generated by the Field Study. In recent years, the management and maintenance of the fields has been a priority and Needham now has some of the best maintained fields in the area. This goal was modified from previous goals to acknowledge the importance of continued maintenance of Needham’s recreational assets. Furthermore, as high levels of involvement in organized sports continues, the Town should seek innovative ways to meet the growing demand for fields and facilities including exploring options for reconfiguring underutilized areas.

Beyond the need to accommodate organized sports, the various Boards, Committees and officials within the Town of Needham understand and appreciate that theirs is a community comprised of young families, single professionals, baby-boomers, senior citizens and every demographic in between. They are also sensitive to the fact that some areas of Town enjoy greater public amenities than others, and that many of the existing facilities are difficult to reach and enjoy for those with physical limitations. Providing safe, well-maintained and accessible fields, playgrounds, open space, and parks throughout the Town – and increasing these opportunities in the more developed portions of Needham – will therefore continue to be a high priority.

Of special note, a 58.5 acre tract of Town-owned land is currently leased to the private, non-profit Needham Golf Club for use as a 9-hole golf course. The land was originally acquired by the Town for water protection purposes, but has been used as a golf course for many years. It is certainly desirable to maintain this property for open

space/recreational use. The current lease is set to expire in 2028. As the termination of the lease approaches, this plan recommends an evaluation of options for future open space use of this valuable Town-owned property.

Goal III: Expand Access, Promote Awareness and Support Responsible Stewardship of Needham's Natural Resources

Goal Amplification:

A recurring theme throughout the public meetings and advisory group sessions held in conjunction with the preparation of this OSRP Update has been improving accessibility to Needham's considerable array of natural resources. Of particular interest in this regard is enhancing access to the Charles River that runs along Needham's border for a total of 13.4 miles. The Town should explore opportunities to either increase the portion of the riverfront that is publicly owned (currently 5.8 miles) or to pursue public access through other means such as easements and/or conservation restrictions. Included in this goal should be efforts to increase the amount of riverfront trails and walking paths (presently about 3 miles); to improve existing access for small boats and canoes; and to identify additional locations for providing scenic overlooks and or boat launching facilities.

Enhancement and promotion of existing passive recreational opportunities throughout Town should remain a high priority. Though used by those living in the neighborhood, trail access around Rosemary Lake should create more opportunities for visits by residents. Heading towards the west side of Town, opportunities for walking, birding, cross-country skiing, and other such pursuits abound at both Ridge Hill and the Town Forest. While the Town offers trail maps for these areas, public knowledge of these resources is still limited. Moreover, the trail networks in many areas are inadequately marked and some are in need of maintenance. The Town took a major step towards resolving the issue of access and awareness when it funded, through Community Preservation Act dollars – a Comprehensive Trails Master Plan. The Trails Plan offers a comprehensive list of existing and proposed new trails and proposed trail connections (linkages). The Trails Plan provides guidance on trail-related needs such as trail maintenance, signage, and opportunities for nature interpretation. A number of the Trails Plan recommendations have already been implemented. Action items in this OSRP have incorporated some key action items from the Trails Plan. These two documents should be considered as complementary and supportive of overlapping goals.

The importance of marketing and promoting the open space resources, including their values and threats, was also stressed by the Advisory Group and public-at-large. Offering fun and interesting venues to encourage the public to use and better understand the value of open space in the Needham will help with future protection and enhancement of these resources.

Effective land management requires an understanding of both the ecological value of a property and the human uses it supports. Therefore, responsible stewardship should start with the development of management plans, at least for the major open space land areas. Once a management plan is defined, the volunteer possibilities proliferate: trails require ongoing monitoring and maintenance; habitat value can be enhanced with plantings or by removing invasive vegetation; interpretive signs can be designed and installed to call out interesting or unique natural features, and the list goes on...

Goal IV: Protect Water Resources**Goal Amplification:**

Water is a critical natural resource. The Town of Needham derives most of its water supply from groundwater sources within the Town boundaries. The Town has taken several precautions to protect both the quality and quantity of the water supply, including the adoption and implementation of an Integrated Pest Management Policy for Town-managed lands and the implementation of policies that promote groundwater recharge. Furthermore, the Town developed a Watershed Management/Forestry Plan for the well-field land on Charles River Street to improve conditions in that area.

The Town has taken measures to incorporate environmentally sensitive practices in municipal operations (such as limiting the application of pesticides, herbicides and fertilizer to those situations when their application is deemed critically necessary). This OSRP Update recognizes that residents also have a great impact on the environment. Public education of the impact of private property owners and landscapers on the environment is of great importance. Educating the public and landscaping service companies about the benefits of xeriscape, limiting use of synthetic products, and options of better managing stormwater is the next major step towards protecting water resources. Along with an education and outreach campaign, expanded regulatory measures such as incorporation of stormwater Best Management Practices, heightening recharge requirements and limiting impervious surfaces within aquifer recharge areas and Zone IIs could be explored. Furthermore, consideration of climate resiliency and potential for better management of stormwater and provision of flood storage should be considered in land development and open space protection decisions.

Finally, the water resource protection value of remaining unprotected open space, noted in Goal I, should figure prominently in decisions regarding land protection or acquisition. The Town as a whole must continue to seek an appropriate balance among use of water for aesthetic and recreational purposes, protection of water resources and consideration of climate resiliency.

6.3 Achievements

Needham has a record of many achievements based on goals and objectives articulated in prior Open Space and Recreation Plans. Since the 2007 OSRP, Carol/Brewster Conservation Area was acquired and key municipal properties were assigned to the Conservation Commission and Park and Recreation Commission thereby offering them further protection from future development. A list of achievements is included in Appendix A.

Section 7

Analysis of Need

This section summarizes Needham's needs for natural resource protection, community recreational facilities, and management. Information pertaining to these needs was collected through a public participation process involving meetings with the Open Space and Recreation Plan Advisory Group, two public forums and the public survey. The Advisory Group also conducted site visits to various facilities and conservation lands to conduct the ADA survey and identify potential needs. The Open Space and Recreation Plan Advisory Group also discussed needs and management issues throughout the OSRP Update process.

Feedback from the meetings, public forum and survey yielded the following list of needs:

- Increase access to existing open spaces
- Create linkages between existing open spaces
- Improve maintenance
- Develop a plan for the Nike site/Ridge Hill area
- Acquire key land for open space and recreation
- Provide new recreational opportunities
- Educate the public on their role in environment conditions and what they can do to minimize their impact
- Leverage public/private partnerships

The public process also resulted in the following more specific list of priorities:

- Create connections to Cutler Park
- Create trails along Charles River
- Improve trail network/greenway connections
- Market existing open spaces using a variety of methods such as social media, signage and QR codes to inform the public of existing information including maps, interpretation, and special programs
- Involve volunteers in maintenance
- Explore opportunities to expand bike paths and bike lanes
- Provide more open space in densely developed neighborhoods
- Increase Community involvement

7.1 Summary of Resource Protection Needs

There are many valuable land and water resources in Needham that require protection or careful management to ensure their long-term preservation. Section 4 identified the impacts of future development and potential threats to water resources as the biggest environmental challenges for the future of the Town. The best strategy to avert or

manage these impacts is concerted efforts to protect existing water resources, natural areas, woodlands, wetlands, and the Town's few remaining agricultural areas.

7.1.1 Water Resources

Wetland and other water resource areas are important for the protection of water supplies, for flood control, and for wildlife protection. These are reasons why it is important to protect the aquifer recharge areas, wetlands, waterways and water bodies from the adverse effects of human activities and future development. Section 4 described the Town's water resources and their threats. Section 5 identifies consideration of land within Zone II watershed protection areas for future protection, and Section 6 indicated that protection of the Town's surface and groundwater resources remains an important open space goal. Protection of the undeveloped parcels in the Zone I and II areas is one important strategy for meeting this need. The other strategies are regulation, management, and education.

- **Regulation.** Since the last Open Space Plan Update the Town Board of Health passed developed Aquifer Protection District Regulations that regulate potential pollutants and prohibit floor drains in the Zone IIs. The Town is considering the implementation of a Stormwater Bylaw and working on a draft bylaw for consideration at a future Town Meeting.
- **Management.** Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials are also needed. BMPs can be structural, such as water quality basins, and nonstructural, such as street sweeping practices that reduce pollutants from entering downstream water bodies and control the quantity of storm-water runoff and infiltration on a developed site. The Town can also identify future sources of water and acquire lands around the sources now, before they are developed.
- **Education.** Education of residents and businesses is another important need. Residents of Needham need information on their potential impact to the environment, and what they can do to minimize their impact. Education ranges from water conservation methods, to proper disposal of household hazardous waste, to techniques to minimize impact from stormwater runoff. Businesses, industries and residents need to control the use and disposal of hazardous materials to protect Needham's natural environment.

Needham's water resources also include the Charles River and several ponds and lakes, including Cutler Pond, the Needham Reservoir, Rosemary Lake, Farley Pond, Walker Pond, Forbes Pond, and Sabrina Lake. All of these areas provide aesthetic views and some provide recreational opportunities for swimming, canoeing, fishing and skating. Many of these areas and their associated wetlands also provide greenways or wildlife corridors. On-going efforts to improve facilities and increase access to some of these areas are needed and have been noted as a major goal.

Like many other water bodies in Eastern Massachusetts, all of these positive values come together with concerns about the potential for contamination from storm-water runoff, exotic pondweeds, and chemicals. An Aquatic Resources Management Plan may be needed for some of these areas, as has been prepared for Rosemary Lake. Such a plan defines the potential sources of pollution and other threats and explores alternative methods of control of exotics and other management needs. It defines a program to

maintain and improve the quality of these major Town assets. In an effort to enhance existing water resources, the Town is currently undertaking a study of Walker Pond to determine how the pond can be protected and kept in good health for current and future generations.

The Charles River is a special feature of Needham. It played a major role in the Town's past and today is one of its most important assets. The public meetings have emphasized the importance of making more of the river accessible.

7.1.2 Land Resources

Protecting land as permanent open space has been identified as an important goal for the Town. A diversity of vegetation, which is largely determined by underlying soils and land use history, provides the visual backdrop and much of the character of the Town, while also providing wildlife habitat and scenic hiking and picnicking areas. Providing opportunities for bird watching, wildlife viewing and fishing are important to the community. Maintaining ecological diversity is a major need.

Section 4, the Environmental Inventory and Analysis, describes the Town's landscape character, scenic resources, forests, fields, and open lands. Section 5, the Inventory of Lands of Conservation and Recreation Interest, identifies agricultural lands, forestlands, aquifer areas, important wildlife habitat areas, and land adjacent to existing protected open spaces and the Charles River as key features for future protection.

The little remaining agricultural land is a special concern. It provides important habitat and once was a major feature of Needham's landscape character. One way of encouraging its preservation is special consideration in taxation. Another method is to allow the owners of agricultural land to sell their development rights or to transfer them to another site. The Town needs to examine innovative methods and develop policies that will encourage the preservation of areas that represent this once important activity if it wishes to maintain this aspect of its character.

A significant threat to natural communities and biodiversity in Massachusetts and much of the rest of New England is the fragmentation of large expanses of uninterrupted forest habitats. Several species of birds are particularly threatened by forest fragmentation including, scarlet tanager, ovenbird, brown creeper, barred owl, and wood thrush. Many wildlife species, like these, depend on the interior of forests, areas far from an edge, for a significant portion of their life cycle and many biologists agree that the loss of large uninterrupted tracts of forest is contributing to the decline of many species of birds and mammals. As a result, the remaining uninterrupted forests in Needham and surrounding towns are particularly valuable for a broad diversity of wildlife.

Needham has protected much of its "green infrastructure," large protected areas linked by riparian and upland corridors, which help maintain much of the Town's ecological heritage. Acquisition of key parcels adjacent to existing open space or that provide linkages between protected open space parcels remains an important goal to protect the diversity of natural areas. Furthermore, active management of certain protected areas, particularly grassland/meadow habitat, is necessary to preserve that diversity.

7.1.2.1 Corridors / Connections

Additions to areas along the connecting corridors strengthen connections between the larger core habitat areas and help assure their ecological health. These corridors include

the 100-foot buffer along wetlands and streams and the 200-foot buffer along the Charles River—areas that are protected by local and state laws. The corridors or greenways along streams and their associated wetlands are also important for protection of water resources. In addition, some make connections to open space in surrounding communities and help create a regional network. Many of these greenways could also be suitable for trails.

7.1.2.2 Wetland Areas

Wetland resources are protected under federal, state, and local laws. However, vigilance is necessary to ensure that wetlands are not altered intentionally or unintentionally by actions of careless landowners through dumping and illegal fill, removal of vegetation, and alteration of hydrology.

7.1.3 Summary of Community's Needs

Conservation lands are recognized for their contribution to the Town's character and protection of important natural resources, as recreation is increasingly recognized as an important factor, not only in childhood development but also for maintaining health in people of all ages and abilities. Increased development encroaches on lands once valued as resources for wildlife habitat and for passive recreation. These factors emphasize the need for conservation lands and recreation facilities sufficient to satisfy Needham's present and future demands.

Key needs for resource protection include:

- Incorporation of climate resiliency into new developments and in consideration of land acquisition;
- Incorporation of Low Impact Development techniques and best management practices to minimize impact of new developments;
- Encourage maintaining existing trees in new developments, or requiring mitigation of plant new trees to replace those lost;
- Increased public education and outreach regarding environmental concerns and individual best management practices that can be incorporated by homeowners;
- Marketing of existing resources, such as trail locations, and the important features that can be found along trails;
- Continued maintenance and improvements of existing trails;
- Management of key conservation areas to maintain important wildlife habitat functions; and
- Continue to pursue links between trails and other open space and recreational resources.

7.1.4 Ridge Hill Reservation/Nike Site

The majority of Ridge Hill Reservation is protected for conservation and passive recreation uses, while a portion in the center of Ridge Hill Reservation is under the control of the Board of Selectmen. The adjacent Nike Site is also under the control of the Board of Selectmen for other municipal uses and is currently being used as a dog park.

Discussion at public meetings highlighted some of the competing concerns to maintain protection of an important habitat area and to provide the best options for active municipal use on the areas controlled by the Board of Selectmen. Additional data gathering and stakeholder discussion is necessary to determine the proper balance between protection of ecological values for which the property was protected and optimization of future passive and/or active recreational use of the Board of Selectmen lands.

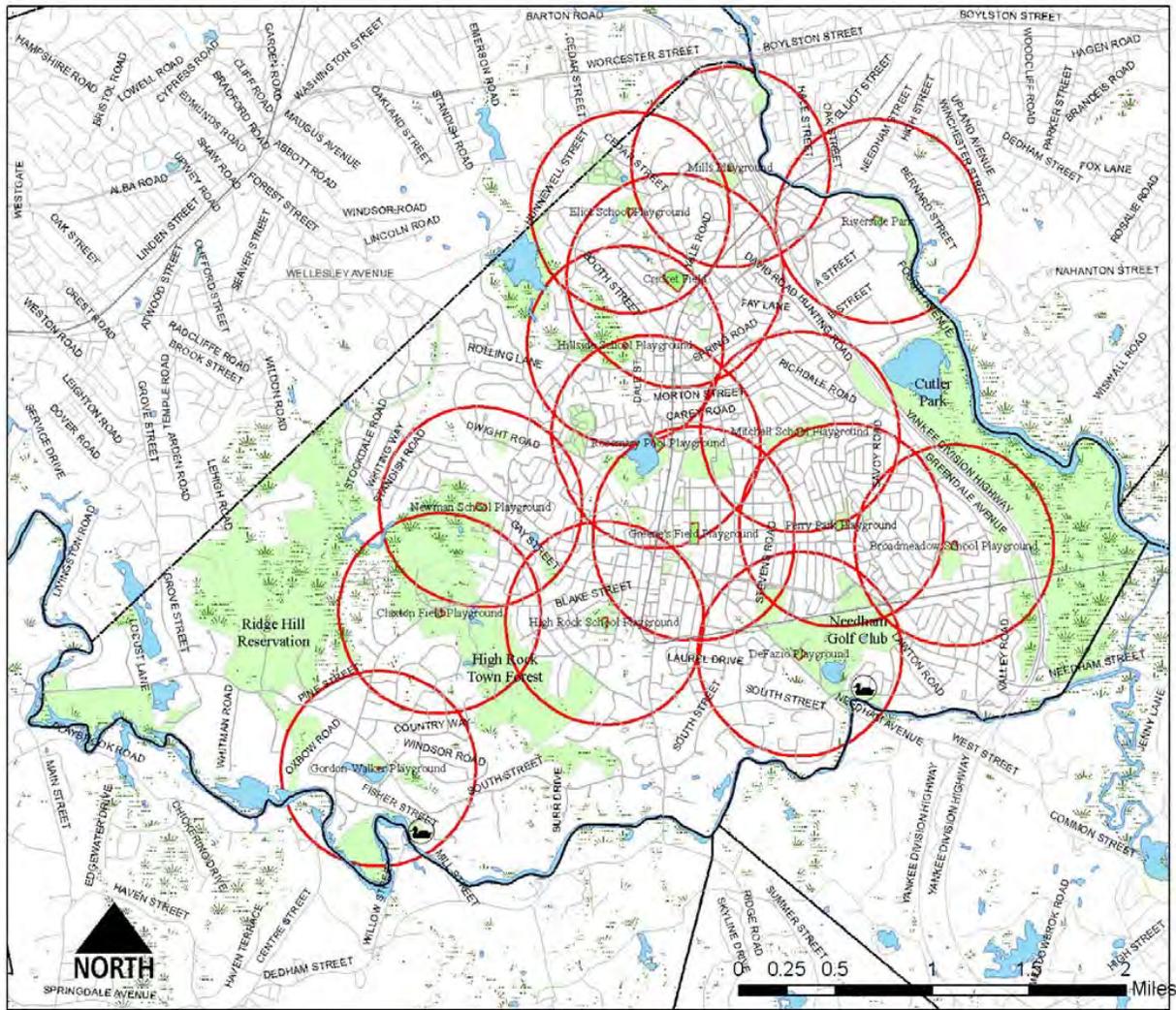
7.2 Summary of Recreation Needs

A community's recreation facilities can be places to gather and share—a critical part of community life. Enjoying sports and open space is also being recognized as an important factor in maintaining good health. People participate in recreation activities to enjoy and experience nature, do something as a family, exercise, share knowledge or skills, and meet people with similar interests. Needham's active recreation facilities are generally located around the schools and in parks scattered in the various neighborhoods. Please refer to the maps in Appendix C for additional information.

7.2.1 Existing Recreation Resources

The active recreation facilities include athletic fields, track, tennis courts, basketball courts and playgrounds. Needham has one outdoor public swimming pool, and there is no single facility for recreation programs. Facilities within school buildings are used for programs offered by Park and Recreation, Needham Public School's Community Education, and a variety of non-profit organizations.

Residents have voiced strong support for additional athletic facilities, especially more neighborhood parks and hiking paths and designated bike paths. The circles on the following map illustrate a ½ mile radius around major facilities.



Needham, MA

Figure 7.1. Circles indicate 1/2 mile radius around existing recreation facilities.

TABLE 7-1
Existing Active Recreation Facilities

Site Name	Location	Facilities	Acres
Avery Field	Webster Street/ Highland Avenue	Youth diamond	1.8
Broadmeadow School	Broadmeadow Road/ Grosvenor Road	2 youth diamonds Basketball courts Playground (3-5) Playground (5-12)	11.1
Claxton Field	Central Avenue/ Marked Tree Road	2 softball diamonds Playground (3-5) Playground (5-8) Picnic/Grills Public Restrooms	17.3

TABLE 7-1
Existing Active Recreation Facilities

Site Name	Location	Facilities	Acres
Cricket Field	Hillside Avenue/ Sunnyside Road	2 multi-purpose fields Playground (3-5) ½ Basketball Court Storage building with restrooms	6.6
DeFazio Park	Dedham Avenue/ South Street	4 multi-purpose fields 2 youth (60') diamonds 2 90' diamonds Track Playground (3-5) Playground (5-12) Picnic/Grills Public Restrooms	36.7
Dwight Field	Dwight Road/ Central Avenue	Youth diamond	3.1
Eliot School	Wellesley Avenue/ Central Avenue	Youth diamond Playground (3-5) Playground (5-12) Basketball Court	8.3
Greene's Field	Pickering Street/ Great Plain Avenue	Youth diamond Multi-purpose field Basketball court Playground (3-5) Playground (5-8) Picnic	2.5
High Rock School	Sylvan Road/ Linden Street	Youth diamond Multi-purpose field	9.6
High School	Kingsbury Street/ Highland Avenue	4 tennis courts Small multi-purpose field	14.4
Hillside School	Glen Gary Road/ West Street	Youth diamond Multi-purpose field Playground (3-6) Playground (5-12)	27.8
Memorial Park	Highland Avenue/ Rosemary Street	Track Multi-purpose fields 90' diamond 60' diamond Football field Gazebo Storage/meeting building Public Restrooms Garden	12.5
Mills Field	Gould Street/ Central Avenue	4 tennis courts Youth diamond Basketball Court Playground (3-6) Picnic/Grills Public restrooms	6.4
Mitchell School	Brookline Avenue/ Tower Avenue	2 youth diamonds Playground (5-12) Basketball Court	16.1

TABLE 7-1
Existing Active Recreation Facilities

Site Name	Location	Facilities	Acres
Newman School	Central Avenue/ Great Plain Avenue	3 youth diamonds 4 tennis courts Walking path Playground (3-6) Playground (5-12)	64.4
Pollard Middle School	Bradford Street/ Harris Avenue	Youth diamond Multi-purpose field Multi-use paved area	15.6
Rebecca Perry Park	Beaufort Avenue/ Great Plain Avenue	Youth diamond Playground (3-6) Basketball court	2.5
Riverside Park	Riverside Street/ Highland Terrace	Multi-purpose field Playground (3-6) Public restrooms	1.3
Rosemary Pool	Rosemary Lake/ Rosemary Street	Two outdoor swimming pools Office building (under construction)	11.9
Walker-Gordon Field	Charles River Street/Walker Lane	90' diamond Playground (3-5) ½ basketball court Fishing in pond	8.8

TABLE 7-2
Other Recreation Facilities in Needham

Site Name	Location	Facilities	Acres
Charles River	South Street/ Dedham Avenue	Canoe Access Picnic	3.5
Ridge Hill Reservation	Charles River Street/ Pine Street	Walking Trails Picnic Event Building	355.8
Town Forest	Central Avenue/ Marked Tree Road	Walking Trails	169.8
Town Common	Great Plain Avenue/ Highland Avenue	Park Special Events	1.3
Cutler Park (DCR)	Kendrick Street/ 3 rd Avenue	Walking Trails	533.9
Red Wing Bay (DCR)	South Street/ Charles River Street	Canoe Access	3.3

7.2.2 Athletic Fields

Since 2007, Needham has addressed some key issues related to the Town's athletic fields, including improved maintenance of the fields and installing synthetic fields with outdoor lighting at Defazio and Memorial Parks. Maintenance is an on-going need to ensure that Needham's athletic fields remain in good conditions in years to come. Additional improvements are needed at key locations including at Hillside and Cricket Field.

7.2.3 Additional Recreational Needs

Through the public process, additional recreational needs were raised for consideration. These recreational needs include:

- Additional tennis courts
- Indoor pool
- Skate park
- Bike paths/bike lanes
- Improved sidewalks
- Improved accessibility to playgrounds and athletic fields

7.2.4 The Statewide Comprehensive Outdoor Recreation Plan

The 2012 Massachusetts Statewide Comprehensive Outdoor Recreation Plan (SCORP) identifies the recreational resources and the needs in the state and identifies the gaps in order to better focus recreational funding. Surveys included a web-based survey, a phone survey and a survey targeted to select middle and high school students (including students in Needham). The goals and objectives of the SCORP are:

- Increase the availability of all types of trails for recreation.
- Increase the availability of water-based recreation.
- Invest in recreation and conservation areas that are close to home for short visits.
- Invest in racially, economically, and age diverse neighborhoods given their projected increase in participation in outdoor recreation.

The specific needs identified in Needham are consistent with the needs outlined in the SCORP, especially with regard to increasing the availability of all types of recreational trails, increasing the availability of water-based recreation and increasing recreational and open space opportunities close to home.

7.2.5 Special Needs

Special needs of Needham residents also need to be considered. Many of Needham's parks are not accessible. Generally, hard-packed paths with railings and signage are lacking. Some handicapped parking is available at Needham's various parks. The Park and Recreation Department is installing handicapped accessible water fountains at fields and playgrounds as funds allow, and all playground structures installed since the mid-1990s have met minimum standards for accessibility. The Needham Accessible Reservoir Trail, a handicapped accessible trail and fishing "pier" at the Reservoir, are currently under construction and will be open in the Fall of 2017.

7.3 Summary of Management Needs and Potential Changes of Use

Good management is critical to maintaining the ecological significance and recreational potential of the Town's land. One overriding consideration about management is that the Town has limited capabilities to add staff, so recommendations need to be workable with existing staff resources and tap into volunteer resources where appropriate.

7.3.1 Management Needs

Residents expect well-maintained facilities. In addition to staff resources, the Town should pursue the ability to create and tap into volunteer resources.

Work through the Trails Committee highlighted the need for more and/or improved communication between the Town boards with jurisdiction over the properties, including Conservation Commission, Park and Recreation Commission, Board of Selectmen and School Committee. Shared goals and the tasks of trail development and maintenance need to be well coordinated, with possible consolidated decision-making. These boards have been involved in the review of this OSRP update, including the action plan.

7.3.2 Potential Changes of Use or Management

The Town undertook a comprehensive study of open space parcels and potential change of use in 2003. The Town Administrator, Planning Director, Park and Recreation Director, School Superintendent and representatives of the Board of Selectmen, Planning Board, Conservation Commission, Park and Recreation Commission, School Committee, Finance Committee, and Housing Authority Board were part of the Open Space Study Working Group that looked at all town-owned parcels to determine if they should remain under current use and management. Copies of the Working Group recommendations were submitted to all affected Town Boards for review and comment. The draft Working Group report was then revised to reflect a consensus of individual Board recommendations. The final report received the formal endorsement of the Board of Selectmen, Conservation Commission, Housing Authority, Park and Recreation Commission, Planning Board, and School Committee. As a result of this report many properties were reassigned to improve their protection as open space and recreational resources. Through this OSRP Update process, a detailed list of municipal lands was developed. For some properties, the municipal jurisdiction is still unknown. There is an opportunity for continued coordination among municipal departments, commissions, and boards to assign jurisdiction for these additional properties.

Needham continues to face pressures for developing new public resources on limited public lands. A recent development resulted in a land swap among multiple municipal entities to meet the Town's needs and maintain open space and recreational lands. As new municipal development projects arise, the Town will need to consider the importance of protecting open space and recreational resources as they evaluate their options.

Section 8

Goals and Objectives

In Section 6, the community goals and guiding principles pertaining to the provision and protection of open space and recreation areas and opportunities were discussed. The following list of succinct objectives relating to those broad goals is based on the 2007 Open Space & Recreation Plan as well as input from Town boards and residents gathered at a series of subcommittee meetings and public forums. The objectives identify more focused goals, and serve as the basis for more specific recommendations in the Action Plan. *It should be noted that order of the following goals and objectives is not intended to reflect any prioritization.*

Goal I: Acquire / Protect Additional Open Space

Objectives

- I-A. Acquire/Protect Open Space with Multiple Conservation Values
- I-B. Acquire/Protect Open Space in the More Densely Developed Residential Areas of Town
- I-C. Explore All Approaches to Protecting, and Providing Linkages and Access to, Open Space
- I-D. Preserve Unique Features

Goal II: Maintain, Enhance and Expand Recreational Facilities

Objectives

- II-A. Preserve, Maintain and Improve Existing Athletic Fields and Facilities
- II-B. Expand "Active" Recreational Resources to Meet Residents' Needs
- II-C. Improve Handicap Accessibility

Goal III: Expand Access, Promote Awareness, and Support Responsible Stewardship of Needham's Natural Resources

Objectives

- III-A. Expand Access To and Along the Charles River
- III-B. Provide and Maintain Linkages To and Between Open Space and Recreation Areas and with Points of Interest such as Schools, Town Center, etc.
- III-C. Improve and Expand "Passive" Recreational Opportunities
- III-D. Market to, Educate and Inform the Public About Existing Open Space and Natural Resources, Including Their Value and Threats

III-E. Promote Volunteer Groups to Assist in the Management and Protection of Needham's Open Spaces

III-F. Understand and Appropriately Manage Large Tracts of Open Space for Environmental Protection and Wildlife Habitat

Goal IV: Protect Water Resources

Objectives

IV-A. Minimize Contamination of Ground and Surface Waters

IV-B. Educate the Public on Their Impact on the Environment and on Environmentally Sensitive Ways to Manage Their Properties

IV-C. Discourage Use of Synthetic Fertilizers and Pesticides

IV-D. Encourage Water Conservation

IV-E. Promote BMPs under the Municipal Separate Storm Sewer System (MS4) Permit

IV-F. Promote and Incorporate Climate Resiliency into Land Use Design and Decisions

Section 9

Five-Year Action Plan

The Action Plan presented in the following tables represents both short- and long-term strategies for achieving the stated goals (see Section 6) over the period 2018 to 2022. Many of the action items are assigned to the “Plan Sponsors” a group that includes the Board of Selectmen, the Park & Recreation Commission, the Conservation Commission, and the Planning Board. For such action items, the plan sponsors will be asked to designate a representative from their Board to undertake the steps necessary to bring the goal to fruition. In order to centralize the process, actions assigned to “Plan Sponsors” will be coordinated through the office of the Town Manager. Other items have been assigned to the Steering Committee/Plan Sponsors, a group comprised of the Town Manager, Park & Recreation Director, Planning Director, Parks & Forestry Superintendent and Conservation Officer who have been involved in plan update process since its inception. A legend defining each of the boards or committees listed below as well as their membership as of the publication date of this plan can be found in Appendix B.

See Action Plan Map at the end of this section for a summary of the following.

GOAL I: ACQUIRE / PROTECT ADDITIONAL OPEN SPACE

Objective I-A. Acquire/Protect Open Space with Multiple Conservation Values				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Seek funding for intern or retain Senior Corps member to update and prioritize private and Town-owned parcels that might be appropriate for conservation and/or recreational purposes.	Department appropriation, Senior Corps funding	Conservation, Plan Sponsors	Ongoing	
Work with property owners to protect priority parcels with multiple conservation values through conservation restrictions, easements, purchase, and other possible options.		Plan Sponsors	Ongoing	
Seek a permanent conservation restriction on property adjacent to Town Forest owned by the Boston Council of the Boy Scouts of America.	CPA, Conservation Fund	Conservation, Parks and Forestry	2020	
Develop and maintain tracking system to follow status of Chapter 61 and 61A lands and other priority parcels.		Assessors	Ongoing	

Objective I-A. Acquire/Protect Open Space with Multiple Conservation Values				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Conduct regular inspections of properties with Conservation Restrictions held by the Town.		Conservation	Ongoing	
Place a permanent conservation restriction on Greendale Greenway.		Conservation	2019	

Objective I-B. Acquire/Protect Open Space in the More Densely Developed Residential Areas of Town				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Identify parcels adjacent to centrally located open space, such as McCracken Camp Property, Sweet Reserve, for potential acquisition/protection.		Conservation, Park & Recreation	Ongoing	
Work with private sector to encourage inclusion of parks, picnic areas, walking opportunities as part of proposed development/redevelopment in densely populated areas, and growing areas (e.g., N2 corridor and Wexford St.) of Town.		Plan Sponsors	Ongoing	
Identify parcels with potential to serve as neighborhood parks, tot-lots, or green spaces and create pocket parks and open spaces in densely developed neighborhoods.	CPA	Park & Recreation	Ongoing	
Review current access to passive recreation areas and trails and propose improvements if appropriate.		Conservation		

Objective I-D. Preserve Unique Features				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Work with City of Newton, MWRA, state agencies and private organizations to rehabilitate Echo Bridge at	CPA	Plan Sponsors	Ongoing	

Objective I-D. Preserve Unique Features				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Hemlock Gorge.				
Establish clear access and develop a maintenance plan for <i>High Rock</i> in the Town Forest.		Park & Recreation	Ongoing	
Create and maintain a list of unique natural features and habitats in the Town.		Conservation	Ongoing	
Identify and certify vernal pools throughout Town.		Conservation	Ongoing	

GOAL II: MAINTAIN, PRESERVE, ENHANCE & EXPAND RECREATIONAL FACILITIES

Objective II-A. Maintain, Preserve and Improve Existing Athletic Fields & Facilities				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Implement Field Study recommendations including investigation of synthetic turf options at Memorial and DeFazio Parks.	Athletic facility improvement fund	Park & Recreation, Selectmen, DPW, Memorial Park Trustees	2018	
Review use of pesticides on fields to address hazardous conditions created by weeds and grubs.		IPM Committee	Bi-annually	
Develop a five year action plan for all recreational facilities, including an inventory of playgrounds, and prioritize improvements. Items for inclusion include playground upgrades at DeFazio Park and Perry Park, field upgrades at Hillside, and improvements at Cricket Field.	Existing capital improvement plan appropriation	Park & Recreation	Ongoing	
Collaborate with community sports associations to leverage funds for athletic field improvements.	Private funding	Park & Recreation	Ongoing	
Replace bleachers at DeFazio Park.	Capital improvement	DPW, Park &	2022	

Objective II-A. Maintain, Preserve and Improve Existing Athletic Fields & Facilities				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
	plan appropriation	Recreation		
Assess the need and feasibility of additional tennis courts.	Capital improvement plan appropriation, grant (ex. Land & Water Conservation Fund)	Park & Recreation, School	2019	
Explore the feasibility of an outdoor basketball court at DeFazio Park.	Department appropriation	Park & Recreation	2022	
Explore the feasibility of additional bathroom facilities at all parks and fields.	Partnerships with Sports Leagues	DPW, Park & Recreation, Sports Leagues	Ongoing	
Improve the parking lot at DeFazio Park.		DPW, Park & Recreation	2018	
Add shade areas at playgrounds.		DPW, Park & Recreation	Ongoing	
Assess and prioritize field upgrades at neighborhood parks such as Broadmeadow, Hillside, and Eliot				

Objective II-B. Expand "Active" Recreational Resources to Meet Residents' Needs				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Explore the feasibility of re-aligning jurisdictional boundaries of Board of Selectmen controlled properties at the Nike Site and Ridge Hill Reservation to balance ecological values and optimize future passive and/or active recreational use of the Board of Selectmen lands. Any changes in land use on Board of Selectmen lands shall be consistent with other adjacent		Selectmen, Conservation	2019	

Objective II-B. Expand "Active" Recreational Resources to Meet Residents' Needs				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
conservation-focused land uses.				
Identify potential funding for replacement of fitness trail at Ridge Hill and/or locate fitness equipment at another park.	Donations	Conservation, Park & Recreation	2018	
Construct two outdoor pools and office building at Rosemary Lake.		Park & Recreation	2018	H
Identify potential private-public partnerships for forming "Friends of" park organizations to coordinate active programming at individual park locations and raising funds to upgrade facilities.		Conservation, Park & Recreation	2020	
Explore possibility of reuse/rehabilitation of existing Ridge Hill buildings for indoor programming space/ranger's office and/or as a setting for events.	CPA	Selectmen	2019	
Explore feasibility of constructing a Skateboard Park.	Donations	Park & Recreation	2020	
Pursue options for possible location and funding for an indoor pool.	Donations	Park & Recreation	2020	
Conduct evaluation of potential for adding basketball court or street hockey court lines to parking lots.		School	2018	
Expand Bay Colony Rail Trail to Chestnut Street.		Selectmen, Park & Recreation, Town Manager	2019	
Create parking for the Bay Colony Rail Trail between Charles River Street and Fisher Street.		Selectmen, Park & Recreation, Town Manager	2018	
Determine the demand, sponsor, and possible location		Park & Recreation	2021	

Objective II-B. Expand "Active" Recreational Resources to Meet Residents' Needs				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
for an indoor skating/hockey facility.				
Research designated parking spaces for Aqueduct Trail		Selectmen, Park & Recreation, Town Manager	2019	
Research options for increasing opportunities for connectivity and signage to close gap in Aqueduct Trails (e.g., providing signage and markings for trail detour around Rt. 95/128; crosswalk at Reservoir St, markings along Reservoir, Central, and St Mary St., crosswalks, sidewalks, pathways from Cedar St to rear of Eliot School).		Selectmen, Park & Recreation, Town Manager	2018	
Create temporary outdoor ice rink(s) at park location(s).		Park & Recreation, DPW	2020	
Create skate park or temporary "pop-up" skate park options.		Park & Recreation	2019	
Study possibility of outdoor ropes course.		Park & Recreation	2020	
Create location for tent camping with facilities.		Park & Recreation, Conservation	2019	

Objective II-C. Improve Handicap Accessibility				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Improve accessible paved pathways for wheelchairs from the paved parking area to the playground structures and the bleachers at the baseball diamonds at Claxton Field.	Donations, Disabilities Commission grant	Park & Recreation	2019	
Improve handicapped access to fields and facilities at recreational properties as	Donations, Capital improvement	Park & Recreation, DPW,	Ongoing	

Objective II-C. Improve Handicap Accessibility				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
necessary.	plan appropriation	Memorial Park Trustees		
Work with Charles River Landing to create handicapped parking and accessible link to the Barnes Path.		Selectmen, Park & Recreation, Town Manager	2019	
Finalize accessible trail at Needham Reservoir.		Park & Recreation	2018	
Create handicapped parking for the Rail Trail.		Selectmen, Park & Recreation, Town Manager	2019	

GOAL III: EXPAND ACCESS, PROMOTE AWARENESS AND SUPPORT RESPONSIBLE STEWARDSHIP OF NEEDHAM'S NATURAL RESOURCES.

Objective III-A. Expand Access To and Along the Charles River				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Identify and evaluate potential walking routes along Charles River.		Conservation, Park & Recreation	Ongoing	
Work with private property owners to expand trail network along Charles River through pedestrian easements, and other options.	CPA, Conservation Fund	Plan Sponsors	Ongoing	
Identify additional public access points and signage along the Charles River for activities such as fishing, canoeing and kayaking.		Conservation, Park & Recreation	Ongoing	
Work with State Department of Conservation and Recreation and The Trustees of Reservations to identify opportunities to provide increased pedestrian access and boating opportunities on the Charles River.		Conservation, Park & Recreation	Ongoing	
Work with project proponent for	Donation	Plan	Ongoing	

Objective III-A. Expand Access To and Along the Charles River				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
the Charles River Landing Complex to develop and implement walking trail along Charles River.		Sponsors		
Provide more information about existing access to Charles River through brochures, web-site, and other opportunities.	Department appropriation	Conservation, Park & Recreation	2008	
Organize community involvement activities that incorporate the river (e.g., adult education, clean-up days, school activities, etc.)		Park & Recreation, Conservation	Ongoing	
Establish annual canoe race.		Park & Recreation	2020	
Reinstall slalom gates on Charles River downstream of Cochrane Dam.		Park & Recreation, Conservation	2022	
Explore system (such as website or kiosk QR code system) to increase public awareness of water quality at Charles River access points.		Conservation, CRWA, Girls Who Code	2020	

Objective III-B. Provide and Maintain Linkages To and Between Open Space and Recreation Areas and with Points of Interest such as Schools, Town Center, etc.				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Develop a Town-wide pathway system including sidewalks and bike lanes that will link neighborhoods to open spaces, recreation facilities, schools, and shopping centers.	Department appropriations	Plan Sponsors	Ongoing	
Cooperate with agencies/organizations in the development of regional bike trails through Needham and pursue funding for same.		Selectmen	Ongoing	
Connect Bay Colony Rail Trail to neighboring communities (in conjunction with multimodal		Selectmen	Ongoing	

Objective III-B. Provide and Maintain Linkages To and Between Open Space and Recreation Areas and with Points of Interest such as Schools, Town Center, etc.				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
pathways as appropriate).				
Work with future project proponents to establish a cross walk and signage for linkage between Cutler Park and Barnes Path.		Park & Recreation, Conservation, Planning	2019	
Establish a sidewalk along Kendrick Street to the Charles River Bridge for linkage between Cutler Park, Barnes Path and the Charles River Path in Newton.		DPW	2022	
Establish a connection between Cutler Park and Greendale Greenway by extending sidewalk/bike path south from Kendrick St./Hunting Rd. intersection to Cheney Street.		DPW	2020	
Provide crosswalk and signage at 4 th Ave to mark trailhead to picnic table and Barnes Dedication Stone on Barnes Path.		DPW	2019	
Extend trail at Ridge Hill to the Charles River.		Conservation	2021	
Improve access to Volante conservation areas from neighboring residential areas.		Conservation	2021	
Improve access to rail trail from High Rock Street.		Conservation	2020	
Implement Sidewalk Master Plan to improve and expand sidewalk systems.		DPW	Ongoing	
Incorporate "Complete Streets" concepts as streets are improved.		DPW	Ongoing	
Create a committee to study options for improving bicycle safety.		DPW	2022	

Objective III- C. Improve and Expand "Passive" Recreational Opportunities				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Implement recommendations from Comprehensive Master Trails Plan.	CPA, department appropriations, seek grants	Conservation, Park & Recreation	Ongoing	
Explore possibility of improving skating conditions at all Town ponds.		Conservation	2021	
Collaborate with private sector to institute "clean-up" days at different areas throughout Town.	Donations, department appropriations	Plan Sponsors	Ongoing	
Hire part-time Trails Coordinator to implement trails projects, work with Trail Stewards.	Department Appropriation	Conservation	2018	
Develop a consolidated list of maintenance and improvement priorities for open space facilities.		Conservation	2018	
Celebrate Arbor Day. Team up schools to promote Arbor Day.		DPW, Schools	Ongoing	
Evaluate feasibility of constructing boardwalks in the Sweet Wildlife Preserve.		Conservation	2022	
Develop a study for a town "Arboretum".		Conservation, DPW	2019	
Construct new walking trail at Nike Site, connecting with Ridge Hill.		Conservation	2020	
Develop the Greendale Greenway into a mountain biking trail loop and organize annual event for its use.		Park & Recreation	2019	
Improve dog park at Nike Site.		Park & Recreation	2018	

Objective III- D. Market to, Educate and Inform the Public About Existing Open Space and Natural Resources, Including Their Value and Threats				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Improve trail maps and lists, make available at highly-trafficked areas such as Library		Park & Recreation,	Ongoing	

Objective III- D. Market to, Educate and Inform the Public About Existing Open Space and Natural Resources, Including Their Value and Threats				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
and Town Hall and on-line.		Conservation		
Collaborate with local newspaper and Needham cable regarding a regular feature highlighting Things to Do in Needham's open spaces and recreational facilities.		Park & Recreation, Conservation	2018	
Coordinate a wildlife photo exhibit for temporary installation at a location in the Town.		Conservation	2018	
Use an app or social media to develop a park passport or scavenger hunt program, to identify activities or sights to encourage use of open space and recreation facilities.		Park & Recreation, Conservation	2019	
Develop a user-friendly interactive on-line map with descriptions for trails using existing apps such as AllTrails.		Park & Recreation, Conservation	2020	
Develop a marketing plan for use of Needham Trails: "Trail Map" booklet, updated kiosks, monthly/weekly activities, school programming, social media marketing.		Conservation	2019	
Work with local businesses to establish themed walks and/or bike rides (e.g., a bike route that shows local attractions).		Park & Recreation, Conservation	2018	

Objective III- E. Promote Volunteer Groups to Assist in the Management and Protection of Needham's Open Spaces				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Make presentation at Rotary, Exchange, and church groups to raise awareness of volunteer and funding opportunities for their constituents and missions		Park & Recreation, Conservation	2018	
Update and continue to implement Trail Steward		Park & Recreation,	Ongoing	

Objective III- E. Promote Volunteer Groups to Assist in the Management and Protection of Needham's Open Spaces				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
program; offer training events for stewards. Consider development of complementary "land steward"/"Friends of" volunteer program for both active and passive recreational areas.		Conservation		
Work with Needham Land Trust to identify and conserve key properties		Park & Recreation, Conservation	Ongoing	
Develop a list of volunteer projects.		Conservation	Ongoing	

Objective III- F. Understand and Appropriately Manage Large Tracts of Open Space for Environmental Protection and Wildlife Habitat				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Continue to work with Scouting Groups to undertake trail and other improvements to Town-owned land.			Ongoing	
Maintain Tree City USA designation.	Department appropriation	DPW	Ongoing	
Complete Forest / Watershed Management Plan.	Department appropriation	DPW	Ongoing	
Implement recommendations from Forest / Watershed Management Plan.	Department appropriation, seek grants	DPW	Ongoing	
Update GIS system with information on trails and wildlife habitat.		Conservation, Technology	Ongoing	
Conduct and maintain a street tree inventory.		DPW	Ongoing	
Maple Syrup Study: Conduct a study to determine if there are adequate "Maple Trees" within the town to create a maple sugaring program. Involving Needham School System, Boy/Girl Scouts/, Local volunteers. In addition, (Cost analysis, study of neighboring		DPW, School	2022	

Objective III- F. Understand and Appropriately Manage Large Tracts of Open Space for Environmental Protection and Wildlife Habitat

Action Item	Funding	Responsible Party	Year (calendar)	Priority
towns who have similar sugaring programming).				
Evaluate town-owned open space for invasive species and undertake control measures as appropriate. Develop volunteer program to remove water chestnut (<i>Trapa natans</i>) from Charles River downriver from Charles River Street.		Conservation	Ongoing	

GOAL IV: PROTECT WATER RESOURCES.**Objective IV-A. Minimize Contamination of Ground and Surface Waters**

Action Item	Funding	Responsible Party	Year (calendar)	Priority
Continue to implement Stormwater Best Management Practices.	Department appropriation, seek grants	DPW	Ongoing	
Strategically identify parts of road network as low- or no-salt areas, and minimize, to the extent practical, the salting of roads.		DPW	Ongoing	
Work with Charles River Watershed Association to identify and remedy "hot spots" and sources of contamination.	Department appropriation	Board of Health	Ongoing	
Continue monitoring stormwater outfalls in accordance with NPDES Phase II requirements.	Department appropriation	DPW	Ongoing	
Label catchbasins throughout Needham – "Do not dump, discharges to Charles River".		DPW, Volunteer Organizations	2022	

Objective IV-B. Educate the Public on Their Impact on the Environment and on Environmentally Sensitive Ways to Manage Their Properties

Action Item	Funding	Responsible Party	Year (calendar)	Priority
Conduct series of education presentations/workshops on xeriscapes, wildlife, invasive		Conservation	Ongoing	

Objective IV-B. Educate the Public on Their Impact on the Environment and on Environmentally Sensitive Ways to Manage Their Properties				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
species management, vector (tick, mosquito) management and habitats including trees.				
Leverage state, local and private organizations to encourage ecologically sound management of privately-held open space.		Conservation	Ongoing	
Enact a tree bylaw to require replacement of trees or contribution to tree fund for trees removed on private property, and to encourage proper stewardship of trees.		DPW	2019	
Educate private property owners on how best to protect conservation lands, open spaces, trees and other sensitive habitats.		DPW, Conservation, Park & Recreation	2020	
Support tree planting by the Town for private citizens.		DPW	Ongoing	

Objective IV-C. Discourage Use of Synthetic Fertilizers and Pesticides				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Continue Integrated Pest Management Program on publicly-owned lands. Pursue effective natural alternatives where practical.		IPM Committee	Ongoing	
Work with large landholders to encourage responsible use of pesticides, herbicides and fertilizer.		Board of Health	Ongoing	
Educate public about impacts of and alternatives to conventional fertilizers, pesticides and herbicides.		Board of Health	2019	

Objective IV-D. Encourage Water Conservation				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Educate residents and the private sector about measures to advance water conservation.		Selectmen, DPW	2020	
Educate local land owners, sprinkler installers, landscapers and contractors on design alternatives to encourage water conservation, including alternatives to traditional lawns and educational materials on installation of rain gardens		DPW	2018	

Objective IV-E. Promote BMPs under the Municipal Separate Storm Sewer System (MS4) Permit				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Enact a stormwater bylaw to address illicit discharges and pre- and post-construction stormwater runoff.		DPW, Planning, Conservation	2019	
Review existing street design and parking lot guidelines and bylaws and assess ability to support low impact design.		DPW, Planning, Conservation	2021	

Objective IV-F. Promote and Incorporate Climate Resiliency into Land Use Design and Decisions				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Plan for future redevelopment of downtown parking lots to plant trees.		DPW	Ongoing	
Track impervious increases/decreases.		Planning, Technology	2022	
Consider stormwater regulations that take climate change conditions, such as flood mitigation and resiliency requirements, into account in design requirements.		DPW, Planning, Conservation	2019	
Consider implementation of strategies from MAPC's Regional Climate Adaptation		DPW, Planning,	2019	

Objective IV-F. Promote and Incorporate Climate Resiliency into Land Use Design and Decisions				
Action Item	Funding	Responsible Party	Year (calendar)	Priority
Change Strategy to address impacts of climate change, such as more frequent or intense precipitation and related flooding impacts.		Conservation		

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APPENDIX A: ACHIEVEMENTS FROM 1979 TO 2007

Acquisition:

- Approximately 30 acres of the Foster Land acquired, providing access to the Charles River. It is located on Charles River Street, across the road from Ridge Hill Reservation.
- Fuller Brook and Cutler Park wetlands acquired by U.S. Army Corps of Engineers as part of the Charles River Natural Valley Storage project.
- Fourteen acre McCracken "Camp Malcolm" Property, adjacent to Rosemary Lake, donated by Mr. James McCracken.
- Three acre parcel purchased from Needham Historical Society at 53 Glendon Road and extending to May Street. This parcel is a primary water source to Rosemary Lake and in an undeveloped state. In addition to its importance to the lake's water quality, the land also contains an area that was once the garden of an old estate.
- "Samuel and Fanny Jacobs Wildlife Sanctuary", a 9.2 acre parcel adjacent to the former landfill, donated to the Town.
- "Sweet Life Preserve", a 4.3 acre property adjacent to Rosemary Brook, donated to the Town.
- Six acres, adjacent to the former landfill, purchased through Town Meeting authorization.
- Triangular parcel of land, adjacent to Ridge Hill Reservation, donated by Woodland Investment Corporation.
- Parcel of land on Oak Street donated to Town by William J. Linse Family.
- Through a successful Proposition 2 ½ override and Town Meeting authorization, three properties adjacent to Ridge Hill Reservation were purchased: (a) six acre McIntosh property that contains the continuation of the Esker Trail; (b) a second parcel of McIntosh property at 28.48 acres, combining wetland, field and woodland, along with Blueberry Hill, on of Needham's major hills; (c) 38.5 Stare property, with combination of forest, fields and wetland, resulting in a continuous band of open space from Charles River Street to the Wellesley border.
- "Anna Volante Wildlife Preserve," a 25 acre parcel, donated by the Volante Family and located adjacent to Volante farmland off Standish Road.
- Eight acre parcel of primarily wetland on Charles River Road donated by Langille Family, and serves as an important wildlife habitat.
- Seven acre parcel, acquired by donation, off Central Avenue, access from the end of the cul-de-sac at Cedar Lane.
- Three and a half acre parcel donated on Mary Chilton Road.

- Two and a half acre parcel acquired on Cranberry Lane, adjacent to Town Forest.
- Beard property parcel, a 19.21 acre parcel adjacent to Ridge Hill Reservation, donated by 290 Grove Street LLC.
- *Wiswall property??*

Protection and Preservation:

- Adoption of an Aquifer Protection Zoning Overlay District in 1981.
- Adoption of a Flexible Development Planned Residential Development Zoning By-Law in 1982, encouraging open space preservation.
- Adoption of a Planned Residential Development and Residential Compound By-Laws in 1985, encouraging open space preservation.
- Instituted Household Hazardous Waste Collection Day, with co-sponsorship by community organizations.
- Establishment of "scenic roadways" on South Street and Charles River Street in 1982 and on Central Avenue, between Nehoiden Street and Marked Tree Road in 1989.
- Passage of the Town of Needham General Wetland By-Law in 1988. Adopted by Town Meeting, the By-Law afforded greater protection to resource areas than those under the Wetlands Protection Act.
- Block-rate billing system instituted by Board of Selectmen in 1996 to encourage water conservation.
- A Perpetual Conservation Restriction was put on 11 acres at the end of Southfield Court by the Southfield Homeowners, assuring that the land will be retained for conservation purposes in an open and natural state in perpetuity.
- A Perpetual Conservation Restriction was placed on 18.71 acres of land located at the end of Burr Drive by Sturdy Oak Construction, Inc.
- Community Preservation Act adopted in 2004.
- Adopted design standards and regulations to promote groundwater recharge.
- Adopted Asbestos Abatement Demolition Policy in 2002.
- Adopted Integrated Pest Management Policy for town-owned properties in 2002.
- Adopted Mercury Disposal Regulations in 2003.
- The Mitchell Woods off James Avenue were moved to the jurisdiction of the Conservation Commission.

- The former gravel pit off Greendale Avenue was moved to the jurisdiction of the Park and Recreation Commission.
- Town-owned buildings, both renovated and newly constructed, are more environmentally friendly. The Needham Public Library, completed in 2006, is expecting to qualify for silver certification under the Leadership in Energy and Environmental Design program. More than 75% of the demolition materials were recycled; construction materials specified 5% recycled content and 20% were manufactured locally; a carbon dioxide monitoring system is in place; building materials used were low-emitting materials; daylight and views are in 75% of the spaces; a water retention system was put in place for the nearby Rosemary Lake; there is water-efficient landscaping with a rainwater recovery irrigation system.
- The Department of Public Works instituted an Inflow/Infiltration program eliminating approximately ½ million gallons of ground water per day that used to flow into the sewer system.

Access:

- Established an agreement with adjacent landowner to maintain the Farley Pond water level for winter skating purposes. Eight pond locations are tested for ice thickness and the results are placed on a recorded information line, so that residents know when 6 inches of black ice has been reached.
- The West Needham Civic Association and the Needham Heights Association began a collaboration to create a walking path throughout Needham, visiting unique features along the way.
- The GFWC Needham Women's Club donated park signs for DeFazio Park and nine other locations, and placed seasonal plantings at the base of each sign.
- An Eagle Scout made improvements to the Dedham Avenue/South Street canoe launch area on the Charles River. The Charles River Watershed is placing marker signs along the Charles River to help boaters identify locations.

Greenbelt and Trails:

- Additional conservation easements secured by Trustees of Reservations on properties along Charles River in an effort to establish a greenbelt.
- Eagle Scouts completed trail projects in the Town Forest, Ridge Hill Reservation and along the Greendale Avenue greenway. GIS maps were created for the Town Forest and Greendale Avenue properties, and signs were located to mark the trails. A signboard was also placed at the entrance to the Town Forest at Horsford to post important information relevant to safe use of the trails, including tick alerts.
- The Exchange Club has performed trail renovation work at the Town Forest.
- An Eagle Scout repaired some trails at the McCracken camp property, and made improvements to the bridges. A Girl Scout Silver Award candidate recently made additional improvements to the trail and the field.

Maintenance and Community Involvement:

- Walker Pond was cleared of the overgrowth of lilies and milfoil, allowing the water to flow naturally through the area, and increasing the amount of fish living in the pond. The pond is inspected each year and treated as needed. Neighbors and abutters have been generous, donating funds to the clean-up projects and keeping the pond clean of clutter.
- At Rosemary Lake, the hillside leading to the pool and lake was reconstructed to prevent run-off from entering the pool and lake, and making the site more accessible to the visitors. Future renovations are planned for the pool that would eliminate the need to drain the lake on a yearly basis for pool pre-season maintenance.
- Following the demolition of the former Harris School, the land became Rebecca H. Perry Park in 1983. This neighborhood park has a softball diamond, basketball court, and a playground for children under the age of 5. Neighbors have contributed to park projects, and Parent Talk provided funding for the most recent renovations to the playground.
- The GFWC Needham Women's Club provided the leadership and fundraising efforts to revitalizing Greene's Field, located near the center of Town. In addition to a large playground and baseball diamond, it also has horseshoe and bocce courts for older residents.
- The Riverside Park neighbors, in collaboration with the Needham Heights Association and Eliot School created a spring garden, with special features for children. Neighbors assist with the maintenance and add new plantings.
- The Coulton Park neighbors planted bulbs and new trees to help revitalize their neighborhood park. In the winter, neighbors built a temporary ice skating rink on the park.
- Through the efforts of parents, the playgrounds at the Broadmeadow School, Eliot School, Hillside School, Mitchell School, Newman School, and the Needham Public Schools' Pre-school were replaced with new playground equipment that meets national codes. The Exchange Club provided the funds and people-power to renovate the DeFazio Tot Lot, and Parent Talk provided the funds and other services to replace the playgrounds at Perry Park and Cricket Field.
- Renovations have been made at various athletic fields providing for safer fields and more efficient maintenance. Donations have been provided by Needham Soccer Club, Needham Little League, Needham Junior Football, Needham Girls' Softball, and Needham Track Club.
- Residents and Town staff created new gardens surrounding the historic Town Hall.
- Town has achieved "Tree City USA" certification for more than ten years.
- Residents have donated memorial trees on Town Common, at Memorial Park, at Hatfield Park, at Perry Park, and along greenway on Harris Avenue.

Education:

- Lisa Standley, current Chairman of Conservation Commission, published *A Checklist of the Plants of Needham, MA and A History of the Flora: 100 Years of Change*.
- Annual Fishing Derby held at the Reservoir, with support of the Commonwealth's Department of Fisheries and Wildlife who stock the pond with trout and work with students from the Pollard Middle School.
- Annual Arbor Day celebrations and tree plantings are held with individual schools or children's groups, and include educational material and free seedlings.

DRAFT

GOAL I: ACQUIRE / PROTECT ADDITIONAL OPEN SPACE

Objective I-A. Acquire/Protect Open Space with Multiple Conservation Values				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Seek funding for intern or retain senior volunteer corps member to research and prioritize parcels with multiple conservation values, identified in section 5, for review by the Plan Sponsors.	Department appropriation, Senior Corps funding	Conservation	2008	None
Work with property owners to protect priority parcels with multiple conservation values through conservation restrictions, easements, purchase, and other possible options.		Plan Sponsors	Ongoing	None
Ask relevant Town Boards to discuss potential policy statement discouraging the conversion of Town-owned land that has conservation or recreation values.		Plan Sponsors	2008	No formal policy statement, but the following properties have been protected: Parcel 74, Cricket Field, Ridge Hill, Greene's Field
Seek a permanent conservation restriction on property adjacent to Town Forest owned by the Boston Council of the Boy Scouts of America.	CPA, Conservation Fund	Conservation	2008	None
Identify and certify vernal pools throughout Town.		Conservation	Ongoing	There are currently 18 certified vernal pools identified in the Town of Needham. Many of these have been certified since 2007.
Develop and maintain tracking system to follow status of Chapter 61 and 61A lands and other priority parcels.		Assessors	2008	Assessor's maintains database of all properties in town that apply for and receive Chapter 61/61A abatements

Objective I-B. Acquire/Protect Open Space in the More Developed Areas of Town				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Identify parcels with potential to serve as neighborhood parks, tot-lots, or green spaces in Needham's more developed areas.		Plan Sponsors	Ongoing	Complete and updated; due for another update
Identify parcels adjacent to centrally located open space, such as McCracken Camp Property, Sweet Wildlife Reserve, for potential acquisition/protection.		Conservation, Park & Recreation	2008	Complete and updated; due for another update
Work with private sector to encourage inclusion of parks, picnic areas, walking opportunities as part of proposed development/ redevelopment in heavily populated areas of Town.		Plan Sponsors	Ongoing	Planning Board and/or Zoning Board of Appeals has required trail easements when development adjacent to public parcels.
Accept May property at 1336 Great Plain Avenue.		Conservation, Selectmen	2008	Complete per Lisa Standley
Accept Schneider property to rear of 159 Marked Tree Road.		Conservation, Selectmen	2008	Complete per Lisa Standley

Objective I-C. Explore All Approaches to Protecting Open Space				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Develop and submit to Town Meeting new zoning regulations that will encourage the protection of natural		Planning Board	2008	No Action to date (per Town Planner); keep goal per Planner

Objective I-C. Explore All Approaches to Protecting Open Space				
Action Item	Funding	Responsible Party	Year (calendar)	Result
areas and expansion of or connections to existing open spaces where appropriate.				
Develop and submit to Town Meeting new zoning regulations that will require a conservation restriction on wetlands and other areas, including portions of buffer zone, as part of subdivision plans.		Planning Board	2008	No action - Would not require a zoning change to require the CR (per Town Planner); Con Com should recommend to PB that CRs be established for subdivisions with wetlands/important habitat (case-by-case basis)
Review the costs and benefits of offering additional tax incentives for conservation restrictions and/or easements.		Town Manager	2009	? (Kate Fitzpatrick)
Explore opportunities to promote the formation of a local land trust to help protect open space.		Steering Committee	2008	Needham Land Trust formed in 2012
Explore the possibility of permanent conservation restrictions or transfer of development rights to protect land in agricultural use.		Conservation	2008	?
Explore possibility of reinstating annual appropriation to Conservation Fund.	CPA	Conservation, Selectmen	2008	Through CPA funds, contributions made in 2008 and 2009. Discussed since that time but not currently supported.
Establish protocol for evaluating/accepting land donations.		Steering Committee	2007	None (may still be warranted – see recent example of abutter interest in Marked Tree Road property)

Objective I-D. Preserve Unique Features				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Work with City of Newton, MWRA, state agencies and private organizations to rehabilitate Echo Bridge at Hemlock Gorge.	CPA	Plan Sponsors	Ongoing	Renewed interest by residents; MWRA updated plan, private fundraising underway, request to Needham CPC for May 2017, request to Newton CPC in Fall 2017.
Pursue a Conservation Restriction on Devil's Den, located on private property on Gatewood Drive.	CPA, Conservation Fund	Conservation	2008	This land is believed to be part of the Boy Scout property, so this item may be duplicative.
Establish clear access and develop a maintenance plan for <i>High Rock</i> in the Town Forest.		Park & Recreation	2009	Discussed but no current workable plan (main issue is graffiti)

GOAL II: PRESERVE, ENHANCE & EXPAND RECREATIONAL FACILITIES

Objective II-A. Preserve and Improve Existing Athletic Fields & Facilities				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Implement Field Study recommendations including the installation of synthetic turf at Memorial and DeFazio Parks.	Private funding, capital improvement plan appropriation	Park & Recreation, Selectmen & Memorial Park Trustees	2007	Complete
Review potential use of herbicides and pesticides on limited number of fields to address hazardous conditions created by weeds and grubs.		IPM Committee	2007	Complete via IPM Committee
Develop a practical strategic plan for improving maintenance of Rosemary Pool/Lake and related facilities.	Existing capital improvement plan appropriation	Park & Recreation	2008	<ul style="list-style-type: none"> • New Pool Complex design • Dredging Plan under design
Collaborate with community sports associations to leverage funds for athletic field improvements.	Private funding	Park & Recreation	Ongoing	Field of Dreams Field Maintenance Fee increased (revolving) Field Administrative Fee (to General Fund) put towards new Athletic Improvement Fund to save for future projects
Continue lease of the current golf course land to a local non-profit entity for use as a golf course under terms favorable to the Town and its residents.	Private funding	Selectmen	2008	Complete
Replace bleachers at Memorial Park.	Capital	DPW, Memorial	2008	Complete

Objective II-A. Preserve and Improve Existing Athletic Fields & Facilities				
Action Item	Funding	Responsible Party	Year (calendar)	Result
	improvement plan appropriation	Park Trustees		
Replace bleachers at DeFazio Park.	Capital improvement plan appropriation	DPW, Park & Recreation	2008	Not complete, but some new bleachers added
Rebuild Tennis Courts at High School and Mills Field.	Capital improvement plan appropriation, grant (ex. Land & Water Conservation Fund)	Park & Recreation	2008	Complete
Restore athletic fields at High School.	Existing capital improvement plan appropriation	Park & Recreation	2008	Complete

Objective II-A. Preserve and Improve Existing Athletic Fields & Facilities (continued)				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Replace playground equipment at Greene's Field.	Donations, department appropriation	Park & Recreation	2009	Complete
Explore the construction of an	Department	Park &	2009	Not complete – parcel under

outdoor basketball court at DeFazio Park.	appropriation	Recreation		several reviews for possible future use
Replace playground equipment at Claxton Field.	Donations, department appropriation	Park & Recreation	2009	Complete; renovated, not replaced
Replace playground equipment at Mills Field.	Donations, department appropriation	Park & Recreation	2009	Complete
Implement stormwater & drainage improvement at DeFazio Park.	Department appropriation	DPW	2010	Complete through Field of Dreams project; more to do
Explore the development of an irrigation plan for the Golf Course and DeFazio Complex using water from the Reservoir on Dedham Avenue.		DPW	2010	Studied and found new well needed; currently under design

Objective II-B. Expand "Active" Recreational Resources to Meet Residents' Needs				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Develop a plan and identify funding opportunities for future active and/or passive recreational use of the Nike Site.		School Committee, Park & Recreation, Selectmen	2008	Ongoing, currently: <ul style="list-style-type: none"> • Dog park • Community farm
Explore potential for "active" recreational uses of Ridge Hill that are consistent with the conservation purposes of the property.		Selectmen, Conservation	2008	Board of Selectmen and Conservation Commission have had limited discussions about future use
Construct a Senior Center in a location that allows for use and enjoyment of natural resources, such as the Morse-Bradley Estate at Ridge Hill.	Capital improvement plan appropriation, donations	Selectmen, Council on Aging, Conservation	2008	Studied, considered, and rejected. Center At The Heights built in Needham Heights
Determine future recreational area needs and acquire land to fulfill these needs.	Donations, department appropriation	Park & Recreation, Selectmen	Ongoing	Accomplishment example: 174 Charles River Street acquisition to complete Walker Pond Field
Develop inventory of undeveloped or partially developed private lands adjacent to existing recreation sites and explore possibility to expand recreation areas.		Park & Recreation	2008	Ongoing
Identify potential private funding for rehabilitation of fitness trail at Ridge Hill and subsequently undertake replacement.	Donations	Conservation, Park & Recreation	2009	A high school student led preliminary evaluation was conducted in 2016; equipment needs replacement, rehabilitation is not feasible

Objective II-B. Expand "Active" Recreational Resources to Meet Residents' Needs (continued)				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Explore interest in and feasibility of constructing a Skateboard Park.	Donations	Park & Recreation	2008	Ongoing; potential for "pop-up park; learn-to-skate programs offered

Objective II-C. Improve Handicap Accessibility				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Pursue funding for handicapped accessible water bubblers at the larger athletic field complexes.	CPA	Park & Recreation	2007	Complete – 10 bubblers funded and ongoing to next generation
Install handicapped accessible playground structures at Greene's Field.	Donations, Disabilities Commission grant	Park & Recreation	2009	Complete
Install handicapped accessible playground structures at Claxton Field.	Donations, Disabilities Commission grant	Park & Recreation	2009	Complete
Install handicapped accessible playground structures at Mills Field.	Donations, Disabilities Commission grant	Park & Recreation	2009	Complete
Install handicapped accessible bleachers at Memorial Park.	Capital improvement plan appropriation	DPW, Memorial Park Trustees	2008	Complete

Objective II-C. Improve Handicap Accessibility				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Improve handicapped access to fields and facilities at DeFazio Park.	Donations, Capital improvement plan appropriation	Park & Recreation, DPW	Ongoing	Complete
Improve handicapped access to fields and facilities at Memorial Park.	Donations, Capital improvement plan appropriation	Park & Recreation, DPW, Memorial Park Trustees	Ongoing	Complete
Identify appropriate areas to install handicapped accessible trails and pursue funding for construction.	Department appropriation, seek grants	Conservation, Park & Recreation	2008	Newman- Eastman Trail accessible system completed in 2015 Needham Accessible Reservoir Trail planned for construction in 2017 (pending funding)

GOAL III: EXPAND ACCESS, PROMOTE AWARENESS AND SUPPORT RESPONSIBLE STEWARDSHIP OF NEEDHAM'S NATURAL RESOURCES.

Objective III-A. Expand Access To and Along the Charles River				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Identify and evaluate potential walking routes along Charles River.		Conservation, Park & Recreation	2009	Barnes Trail upgrades completed in 2016; the Bay Colony Rail Trail provides access to the river
Work with private property owners to expand trail network along Charles River through pedestrian easements, and other options.	CPA, Conservation Fund	Plan Sponsors	Ongoing	check Land Trust to see if this is a goal of theirs; PB looks for opportunities to establish trail easements near the river, where

				feasible – no formal policy; PB can continue to assist, as feasible based on development
Identify additional public access points along the Charles River for activities such as fishing, canoeing and kayaking.		Conservation, Park & Recreation	2009	Design of South Street boat launch improvement project has been funded; design anticipated to occur in 2017
Work with State Department of Conservation and Recreation and The Trustees of Reservations to identify opportunities to provide increased pedestrian access and boating opportunities on the Charles River.		Conservation, Park & Recreation	Ongoing	Nothing in Needham; DCR and Boston Park & Rec have worked in nearby parks, Nahatan Park and Millenium Park
Work with State Department of Conservation and Recreation and The Trustees of Reservations to develop/offer canoeing programs.		Park & Recreation	2009	Nahatan Park (Newton) offers nearby opportunities
Work with project proponent for the Charles River Landing Complex to develop and implement walking trail along Charles River.	Donation	Plan Sponsors	Ongoing	Barnes Trail completed in 2016
Provide more information about existing access to Charles River through brochures, web-site, and other opportunities.	Department appropriation	Conservation, Park & Recreation	2008	Trails information available on town website; Library presentation on the Charles River (since 2014?)

Objective III-B. Provide Linkages				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Develop a plan for the “Rosemary Loop Trail” to connect downtown with	Department	Plan Sponsors	2008	Trail exists; pool project will improve

Rosemary Lake and the Library through Town-owned land and existing easements.	appropriation			connections
Develop inventory of easements that allow access over private property.	CPA	Selectmen, Steering Committee	2008	Draft map available based on research done by DPW
Establish connections between existing conservation land and other open space areas to form loops or greenbelts, some with paths, throughout Town.	Department appropriations	Plan Sponsors	2008	Complete: <ul style="list-style-type: none"> • Bay Colony Rail Trail • Sudbury Aqueduct Trail
Work with Algonquin Gas Transmission to design and construct pathway across Army Corps natural valley storage area, from Ridge Hill to Mary Chilton Road.	Donation	Conservation, Selectmen	2008	None Conservation staff has met with a private landowner about access, but it appears unlikely; other routes may be feasible

Objective III-B. Provide Linkages (continued)				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Develop a Town-wide pathway system that will link neighborhoods to open spaces, recreation facilities, schools, and shopping centers.	Department appropriations	Plan Sponsors	2010	2016 – performed a detailed condition assessment of all existing sidewalk and curb cuts. Data will be analyzed to identify locations where sidewalk could be constructed in order to provide connectivity in the network as well as opportunities to reduce sidewalk on low volume / low traffic areas. The sidewalk information will be used to develop a short and long range priority plan.

Cooperate with agencies/organizations in the development of regional bike trails through Needham and pursue federal funding for same.		Selectmen	Ongoing	Bay Colony Rail Trail "NeedhamBikes" working on advocacy
Work with Babson College and Olin College to formalize access to walking trails through campuses.		Conservation	2008	Completed as part of the Sudbury Aqueduct Trail
Work with Sportsmen's Pond Association to create connection between Great Plain Avenue and High Rock Street, through May/Schneider properties and Rosemary Glen.	Donation	Conservation	2008	Informal investigation completed by Conservation Dept. staff; nothing pending

Objective III- C. Improve and Expand "Passive" Recreational Opportunities				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Hire consultant to develop Comprehensive Master Trails Plan, through CPA funds already awarded.	CPA	Conservation	2007	Complete
Establish Trails Master Plan Committee.		Selectmen	2007	Complete
Implement recommendations from Comprehensive Master Trails Plan.	CPA, department appropriations, seek grants	Conservation, Park & Recreation	2008	See separate document from TRAILS MASTER PLAN
Repair Bridges/Boardwalks along Swamp Trail at Ridge Hill.	CPA	Conservation	2007	Complete
Review current access to Farley Pond Conservation Area and propose alternatives if appropriate.		Conservation, Park & Recreation	2008	Access is now available from the rail trail; parking from South St was investigated and deemed infeasible
Explore possibility of modifying water		Conservation,	2009	None

levels at Farley Pond to improve skating conditions.		Park & Recreation		
Work with the MA Department of Conservation and Recreation and associated organizations such as the <i>Charles River Cutler Park to Commonwealth Avenue Protection Group</i> to identify and provide improved access to Cutler Lake.		Conservation, Park & Recreation	2007	None
Establish a gift fund and solicit donations for maintenance of trails.		Plan Sponsors	2008	None
Collaborate with private sector to institute "clean-up" days at different areas throughout Town.	Donations, department appropriations	Plan Sponsors	Ongoing	Complete; town-wide clean-up days occur twice annually; individual organizations volunteer throughout the year

Objective III- C. Improve and Expand "Passive" Recreational Opportunities (continued)				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Establish a "Land Steward" volunteer program.		Conservation	2008	Trail Steward Program begun in 2008 (needs reinvigoration)
Continue to work with Scouting Groups to undertake trail and other improvements to Town-owned land.	Donations, department appropriations	Plan Sponsors	Ongoing	Ongoing – projects have included construction of bog bridges and kiosks, and removal of invasives; Student Conservation Association brought to town for projects in 2015 & 2016; future years planned
Construct trail and sign system through Ridge Hill / Wiswall /Stare properties, in accordance with recommendations from Trails Plan.	CPA	Conservation	2010	Complete; needs re-do
Evaluate alternative methods for managing invasive species and improving water quality at Walker Pond.		Park & Recreation	Ongoing	Complete and ongoing

Objective III- D. Educate and Inform the Public About Existing Open Space and Natural Resources				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Develop consistent signage to identify Natural Resources.	Department appropriations	Plan Sponsors	2008	None
Work with local civic associations and government agencies to fund the purchase and installation of signs.	Donations	Plan Sponsors	2008	Where complete, town funds or private donations were used

Design and install signs/kiosks at multiple trail heads, including Ridge Hill, Town Forest.	CPA	Plan Sponsors	2008	Partially complete on multiple sites across town
Provide additional information about Needham's Natural Resources on the Town website.		Conservation	2009	Ongoing
Design and distribute, through various resources, brochures and trail maps for Ridge Hill and Town Forest.	Department appropriations	Park & Recreation, Conservation	2009	Maps Complete; on town website, in Park & Rec office; and in kiosks; draft brochures
Organize guided trail walks.		Conservation	2008	Park & Rec offers "Take-A-Hike" program 6-10X/year; Conservation offered guided tours of Ridge Hill in 2014
Collaborate with Science Center to increase public knowledge about trails behind Newman School.		Conservation, School Department	2008	Newman-Eastman trail project completed in 2015

Objective III- E. Understand and Appropriately Manage Large Tracts of Open Space				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Develop ecological inventory and management plans for each of the Town's major natural areas to assure good stewardship of resources.		Conservation	2010	Complete for Ridge Hill; should be updated
Maintain Tree City USA designation.	Department appropriation	DPW	Ongoing	Complete (22nd year in a row) - annual Arbor Day observance with active collaboration between elementary schools and the Forestry Division (including tree planting)

Objective III- E. Understand and Appropriately Manage Large Tracts of Open Space (continued)				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Encourage ecologically sound management of open space by the private sector.		Plan Sponsors	Ongoing	None
Complete Forest / Watershed Management Plan.	Department appropriation	DPW	2007	No Forest Management Plan completed, but it remains a goal of the Parks & Forestry Dept; The Town did perform a tree inventory with a grant a received from the DCR approximately 4 years ago. watershed info - Tony DelGaizo
Implement recommendations from Forest / Watershed Management Plan.	Department appropriation, seek grants	DPW	2008	NA watershed info - Tony DelGaizo
Update GIS system with information on trails and wildlife habitat.		Conservation, Technology	2010	NHESP data layers and trails layers added to town GIS system; needs updates

GOAL IV: PROTECT WATER RESOURCES.

Objective IV-A. Minimize Contamination of Ground and Surface Waters				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Continue to implement Stormwater Best Management Practices.	Department appropriation, seek grants	DPW	Ongoing	Stenciling of catch basins with known issues of illegal dumping (dog waste) Discovery and elimination of illicit connections Inspection of town-installed BMP'S annually (Water Quality tanks, Structures, Detention and Infiltration

Objective IV-A. Minimize Contamination of Ground and Surface Waters				
Action Item	Funding	Responsible Party	Year (calendar)	Result
				Basins) Annual catch basins cleaning Annual TV inspection and cleaning of drain pipes Catch basin repair/replacement initiative
Strategically identify parts of road network as low- or no-salt areas, and minimize, to the extent practical, the salting of roads.		DPW	2008	Rick Merson/Bob Lewis
Continue to work with the MA Highway Department to complete steps necessary to revert control of Chestnut Street to Town, leading towards policy of reduced salting of road.	State funding	Selectmen, DPW	Ongoing	Rick Merson/Bob Lewis
Work with Charles River Watershed Association to identify and remedy "hot spots" and sources of contamination.	Department appropriation	Board of Health	Ongoing	Rick Merson/Bob Lewis
Continue monitoring stormwater outfalls in accordance with NPDES Phase II requirements.	Department appropriation	DPW	Ongoing	Rick Merson/Bob Lewis

Objective IV-B. Discourage Excessive Use of Fertilizers and Pesticides				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Continue Integrated Pest		IPM Committee	Ongoing	Ongoing

Management Program on publicly-owned lands.				
Work with large landholders to encourage conservative use of pesticides, herbicides and fertilizer.		Board of Health	Ongoing	Tim McDonald
Educate public about impacts of and alternatives to conventional fertilizers, pesticides and herbicides.		Board of Health	2009	Tim McDonald

Objective IV-C. Encourage Water Conservation				
Action Item	Funding	Responsible Party	Year (calendar)	Result
Educate residents and the private sector about measures to advance water conservation.		Selectmen	2008	Water Conservation Mailing annually (Jan –Mar) Water Conservation Presentations annually at the Hillside School 3rd and 5th grade classes Annual Touch The Trucks Day with Water Conservation materials Annual BOH press release RTS annual Household Hazardous Waste Day

2007 TRAILS MASTER PLAN GOALS & OBJECTIVES

Goals and Objectives	Result
Goal 1 – Establish a Long-Term Implementation Structure	
1A Prepare proposal for standing Trails Committee	complete
1B Obtain funding for part-time Trails Coordinator	?
1C Establish guidelines for trails volunteers	complete
1D Implement training program for trails volunteers	?
1E Develop list of volunteer projects	started
Goal 2 – Improve Trail Visibility, Access and Use	
2A Create trails webpage	complete
2B Install kiosks at designated trail access points	partially complete
2B-1 Obtain funding for kiosks	partially complete
2B-2 Construct and install kiosks at Ridge Hill	partially complete
2B-3 Construct and install kiosks at Town Forest	partially complete
2B-4 Construct and install kiosks at other locations	partially complete
2C Install trailhead signs on all designated trails	incomplete
2D Create trail descriptions to supplement trail maps	complete (needs update)
2E Improve Farley Pond access	
2E-1 Design and permit new parking area	investigated – not feasible
2E-2 Obtain funding for parking area construction	NA
2E-3 Bid and construct new parking area	NA
Goal 3 – Bring All Existing Trails up to Standards	
3A Obtain generic Order of Conditions (permit) for trail maintenance	complete (Negative Determination)
3B Repair/improve all trails at Rosemary Lake	incomplete
3C Repair/improve all trails at Farley Pond	partially complete
3D Repair/improve all trails at Greendale Avenue	?
3E Repair/improve all trails at Mitchell School	?
3F Repair/improve trails at Newman School	complete
3G Repair/improve all trails at Town Forest	?
3H Repair/improve all trails at Ridge Hill	partially complete
3H-1 Repair trails north of Charles River Street (to end of Esker Trail)	incomplete
3H-2 Repair trails south of Charles River Street	complete (part of Fuller Trail boardwalk contract)
3H-3 Repair trails north of Esker Trail	complete (SCA 2015)
3I Repair/Improve Reservoir Trail	Design complete; funding requested

Goals and Objectives	Result
Goal 4 – Build New Trails on Town Lands	
4A New loop trail at north end of Ridge Hill	complete
4A-1 Design new trail and obtain any needed permits	complete
4A-2 Construct and install signage	needs signage
4B Extend Ridge Hill (south) trail to Charles River	incomplete
4B-1 Design new trail and obtain any needed permits	incomplete
4B-2 Construct and install signage	incomplete
4C New loop trail at Farley Pond	not feasible
4C-1 Design new trail and obtain any needed permits	NA
4C-2 Construct and install signage	NA
4D New loop trail around Nike Site	?
4D-1 Design new trail and obtain any needed permits	?
4D-2 Construct and install signage	?
4E New trail along sewer between Newman School and Carol Road	not started
4E-1 Design new trail and obtain any needed permits	not started
4E-2 Construct and install signage	not started
4F Construct All-Persons accessible trail at Reservoir	partially complete
4F-1 Design new trail and obtain any needed permits	complete
4F-2 Apply for funding for construction	in process
4F-2 Construct and install signage	to be completed 2017 (if funded)
Goal 5 – Build New Trails Connecting Existing Systems	
5A Sign all designated sidewalk trails	incomplete
5B Obtain MWRA approval and sign aqueduct	complete
5C New trail from Ridge Hill to Olin College (Trail 30A)	incomplete
5D New trail from Hillside School to Central Avenue through Sweet Preserve (Trail 18B)	incomplete
5E New trail from Walker Pond to Town Forest	Incomplete
5F New trail from Ridge Hill to Walker Pond	incomplete
5G Investigate Feasibility - New trail from Red Wing Bay to Farley Pond/Chestnut Street (Trail 11)	Incomplete

Goals and Objectives	Result
Goal 6 – Implement and Carry Out Annual Inspections and Maintenance	
6A Perform annual inspections	?
6B Perform annual maintenance	?
6C Update Website with any trails changes	ongoing
6D Update list of volunteer projects	?
6D Update Master Plan	incomplete

APPENDIX B: MEMBERSHIP ON BOARDS – 2017



Xeriscape Garden at Town Hall

Open Space and Recreation Plan Advisory Group

Janet Carter-Bernardo
Cynthia Chaston
Matthew Varrell
Patty Carey
Peter Oehlkers
Michelle Geddes
Moe Handel
Jeanne McKnight
Rick Hardy
Ed Cosgrove
Chris Seariac
Ed Olsen
Kevin Naughton
Greg Smith
Lisa Standley
Gary Crossen
Mark Gluesing
Mark Miskin
Kevin McNamara
Meghan Bourque
Paula Callanan
Axie Breen
Howard Lipton
Michael Kurdziel

Robert Bucelwicz
Roy Cramer
Ross Donald
Prathyusha Gunda
Joanne DiSangro
Dan Tavan
Chip Baker
Kate Carter
Lori Horvat
Trish Cruickshank
Jack Hurley
Kevin Fleming
Meeta Kapadia
Carla Kopikis
Kevin Keane
James Goldstein
Cal Collins
Robin Brodsky
Mike Bolio
Chris Jantzen

Open Space and Recreation Plan Working Group

Patricia Carey, Director of Park and Recreation
Matthew Varrell, Director of Conservation
Janet Carter-Bernardo, Chair Conservation Commission
Cynthia Chaston, Park and Recreation Commission

Conservation Commission

Janet Bernardo, Chair
Sue Barber
Artie Crocker
Stephen Farr
Peter Oehlkers
Alison Richardson
Matthew Varrell, Director

Park and Recreation Commission

Matthew M. Toolan, Chair
Christopher J. Gerstel, Vice Chair
Cynthia J. Chaston
David C. DiCicco
Michelle S. Geddes
Patricia Carey, Director

Board of Selectmen

Marianne Cooley, Chair
Daniel Matthews, Vice Chair
John Bulian, Clerk
Maurice Handel
Matthew Borrelli
Kate Fitzpatrick, Town Manager

Planning Board

Ted Owens, Chair
Paul Albert, Vice Chair
Elizabeth Grimes
Martin Jacobs
Jeanne McKnight
Lee Newman, Director

Trustees of Memorial Park

John Gallelo, Chair
Mark Forbes, Vice Chair
Jim Healy, Clerk
Chuck Mangine
Bill Topham

Board of Health

Edward Cosgrove
Stephen Epstein
Jane Fogg

Board of Assessors

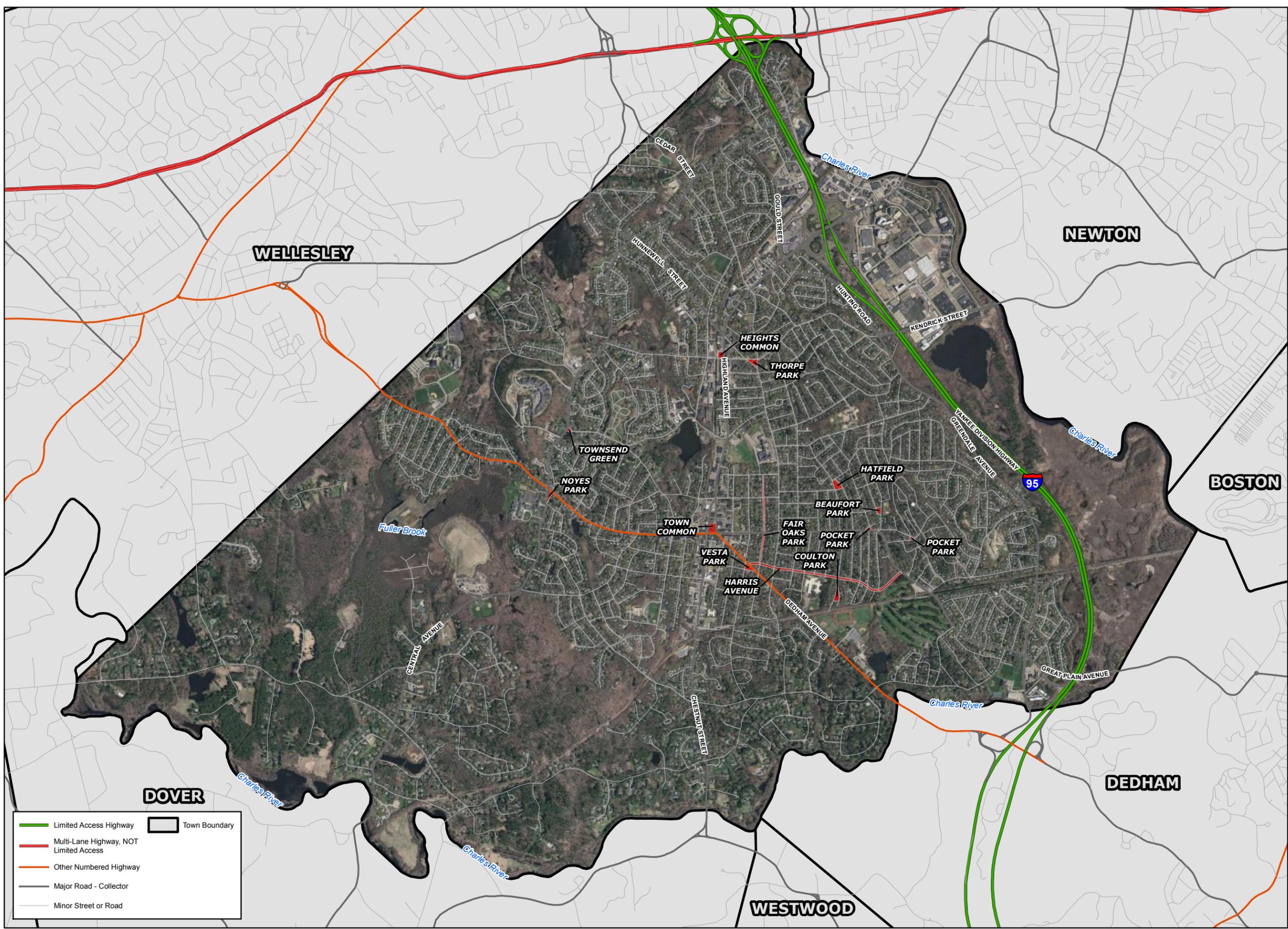
Kurt Ochalla, Chairman
Thomas P. Colarusso, Secretary
Ted Owens, Member

Department of Public Works

Richard Merson, Director
Edward Olsen, Superintendent of Parks & Forestry

Community Preservation Committee

Paul Siegenthaler, Chairman
Janet Bernardo
John Comando
Bruce Eisenhut
Jane Howard
Sheila Pransky
Phil Robey
Ron Ruth
Cary Young



- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road
- Town Boundary

OPEN SPACE INVENTORY

LEGEND

█ Open Space: Commons/ Pocket Parks

DRAFT

LOCUS MAP



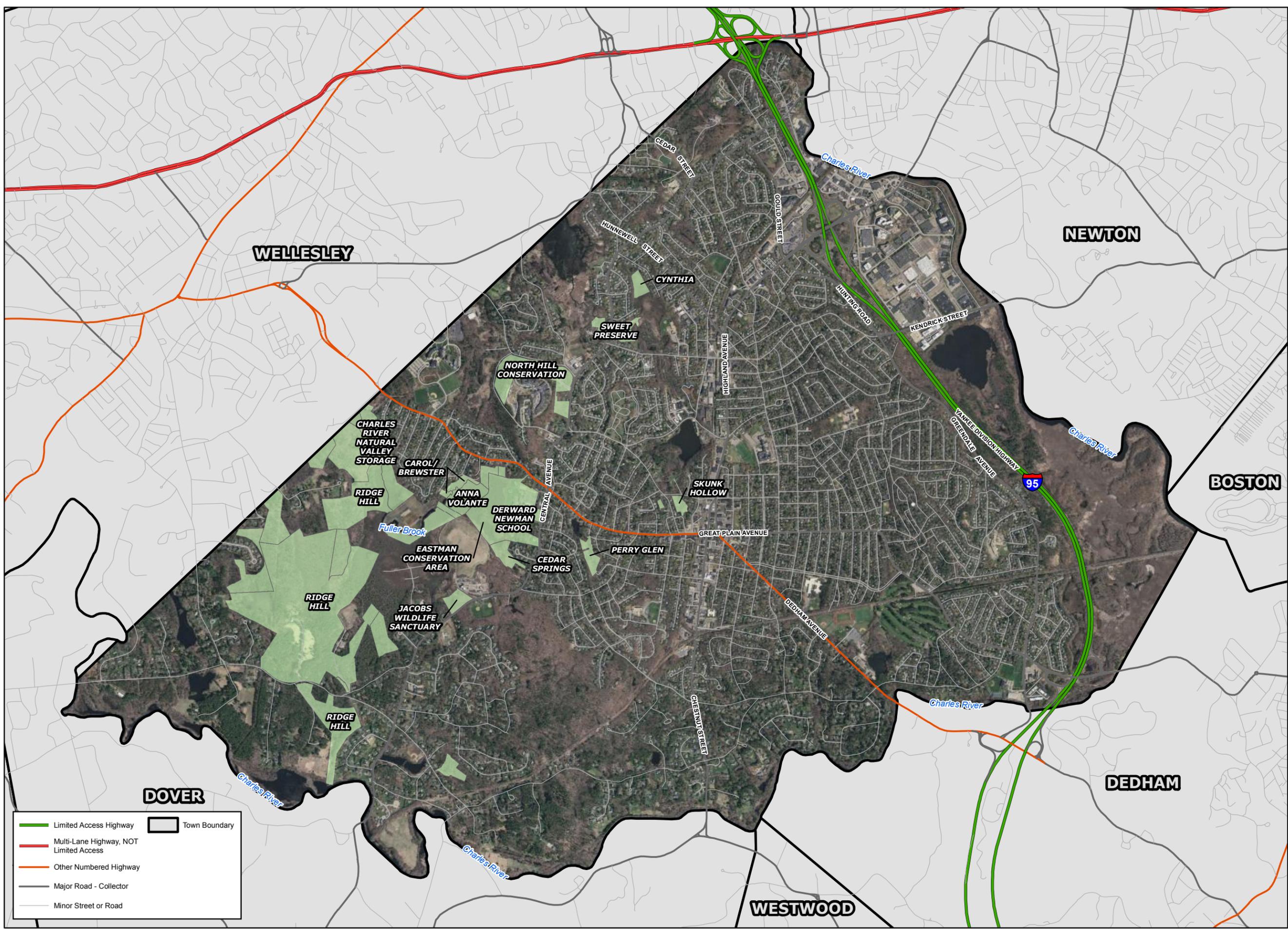
NOTES

1. Data Provided by the Town of Needham and MassGIS.
2. Based on 2013 MassGIS Color Orthophoto.

**Town of Needham
Open Space & Recreation Plan
Needham, Massachusetts**

November 2016

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OPEN SPACE INVENTORY

LEGEND

Open Space: Conservation

DRAFT

LOCUS MAP



NOTES

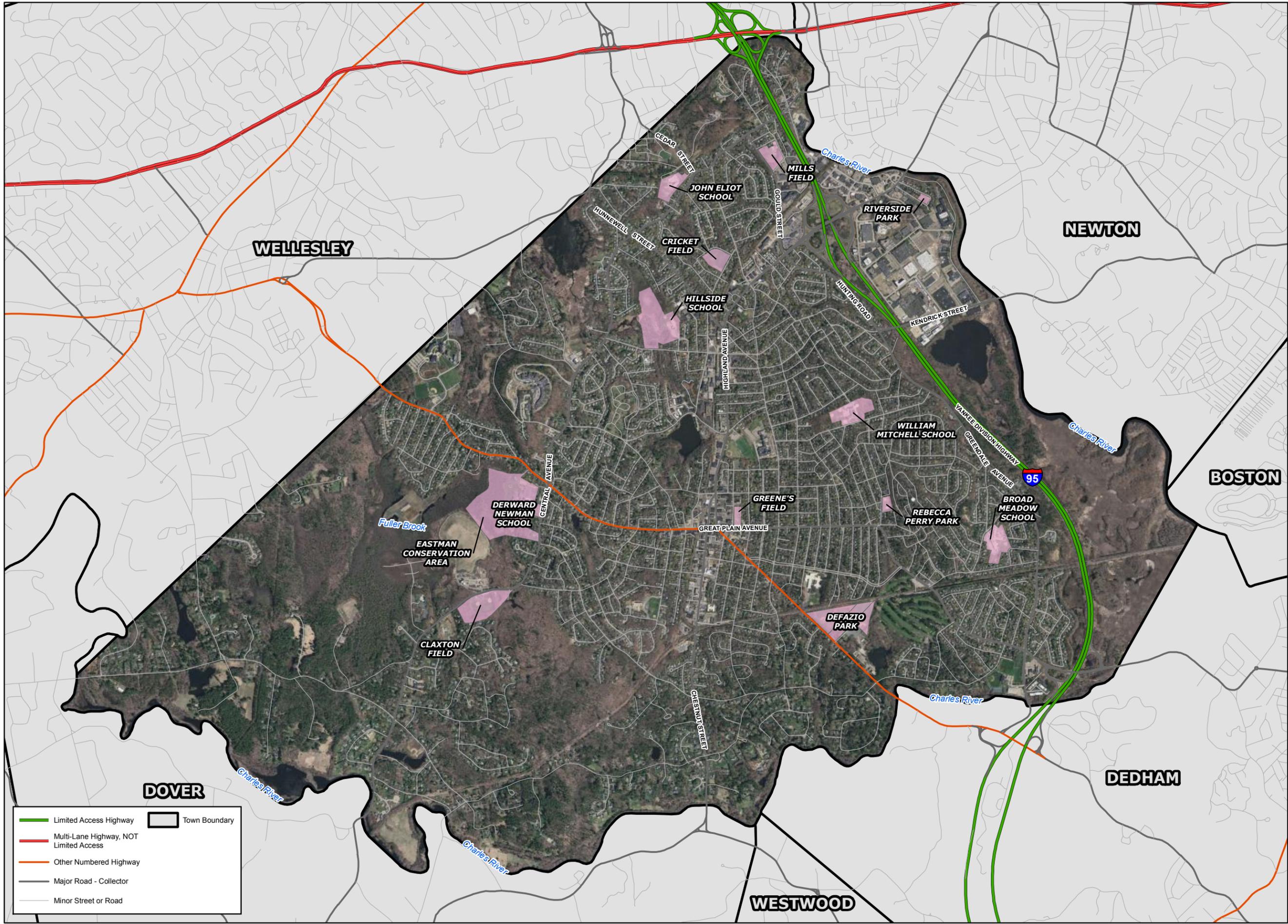
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Open Space & Recreation Plan
Needham, Massachusetts**

November 2016

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Engineers | Environmental Specialists

- Limited Access Highway
- Multi-Lane Highway, NOT Limited Access
- Other Numbered Highway
- Major Road - Collector
- Minor Street or Road
- Town Boundary



OPEN SPACE INVENTORY

LEGEND

 Open Space: Playgrounds

DRAFT

LOCUS MAP



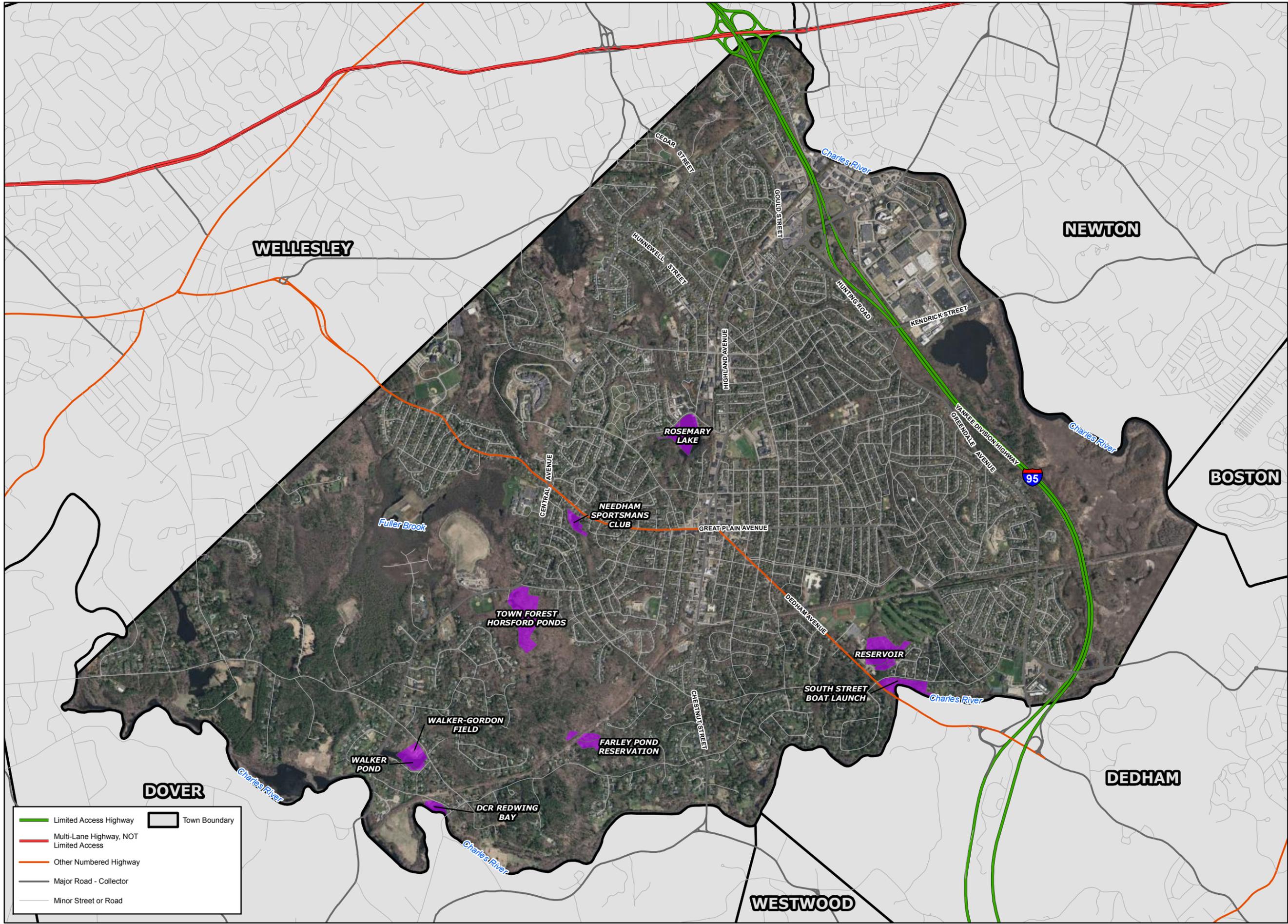
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**Town of Needham
Open Space & Recreation Plan
Needham, Massachusetts**

November 2016

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	Limited Access Highway		Town Boundary
	Multi-Lane Highway, NOT Limited Access		
	Other Numbered Highway		
	Major Road - Collector		
	Minor Street or Road		

OPEN SPACE INVENTORY

LEGEND

Open Space:
Ponds/Lakes/Rivers

DRAFT

LOCUS MAP



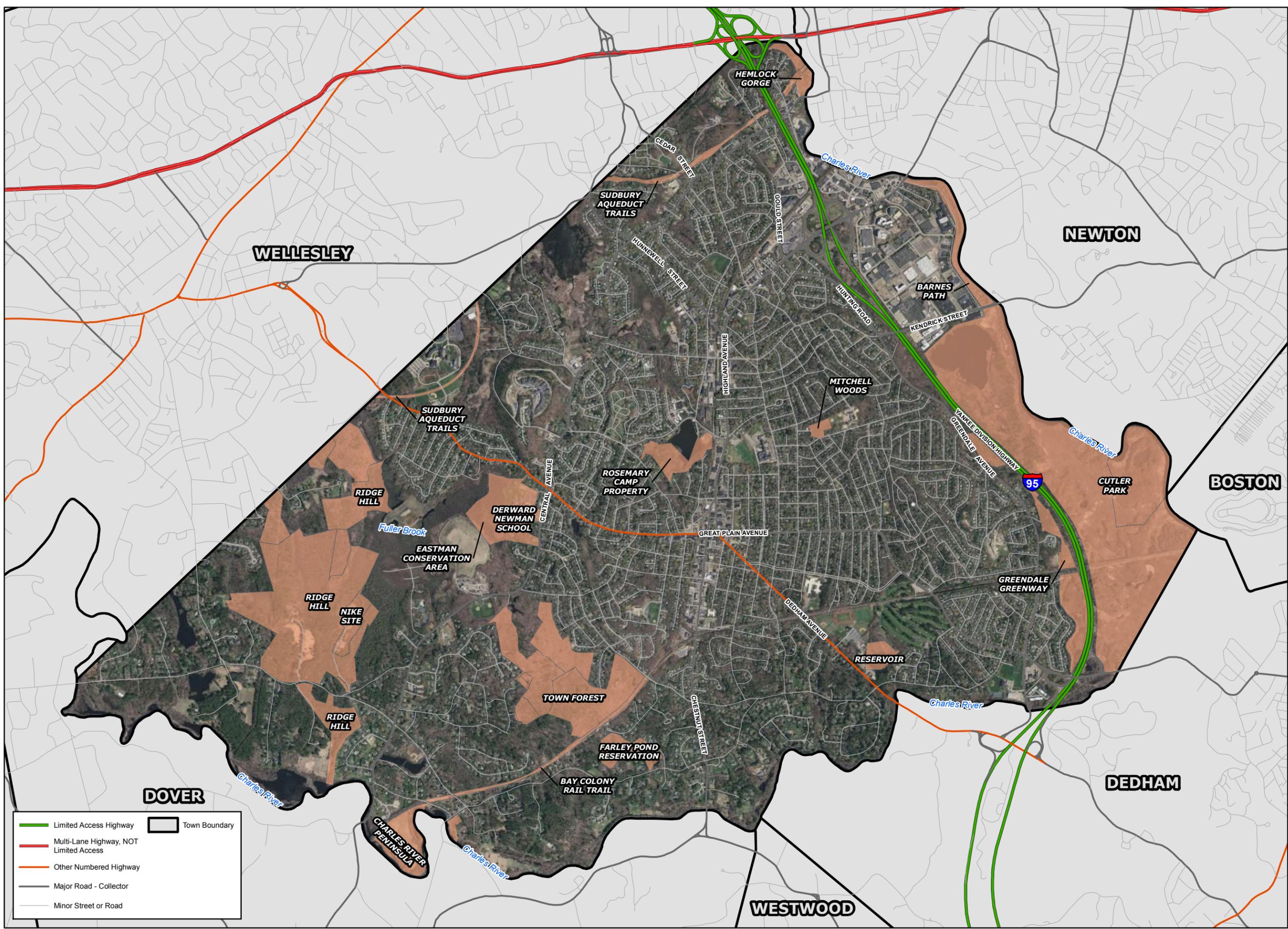
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Needham, Massachusetts**

November 2016

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	Limited Access Highway		Town Boundary
	Multi-Lane Highway, NOT Limited Access		
	Other Numbered Highway		
	Major Road - Collector		
	Minor Street or Road		

OPEN SPACE INVENTORY

LEGEND

Open Space: Trails

DRAFT

LOCUS MAP



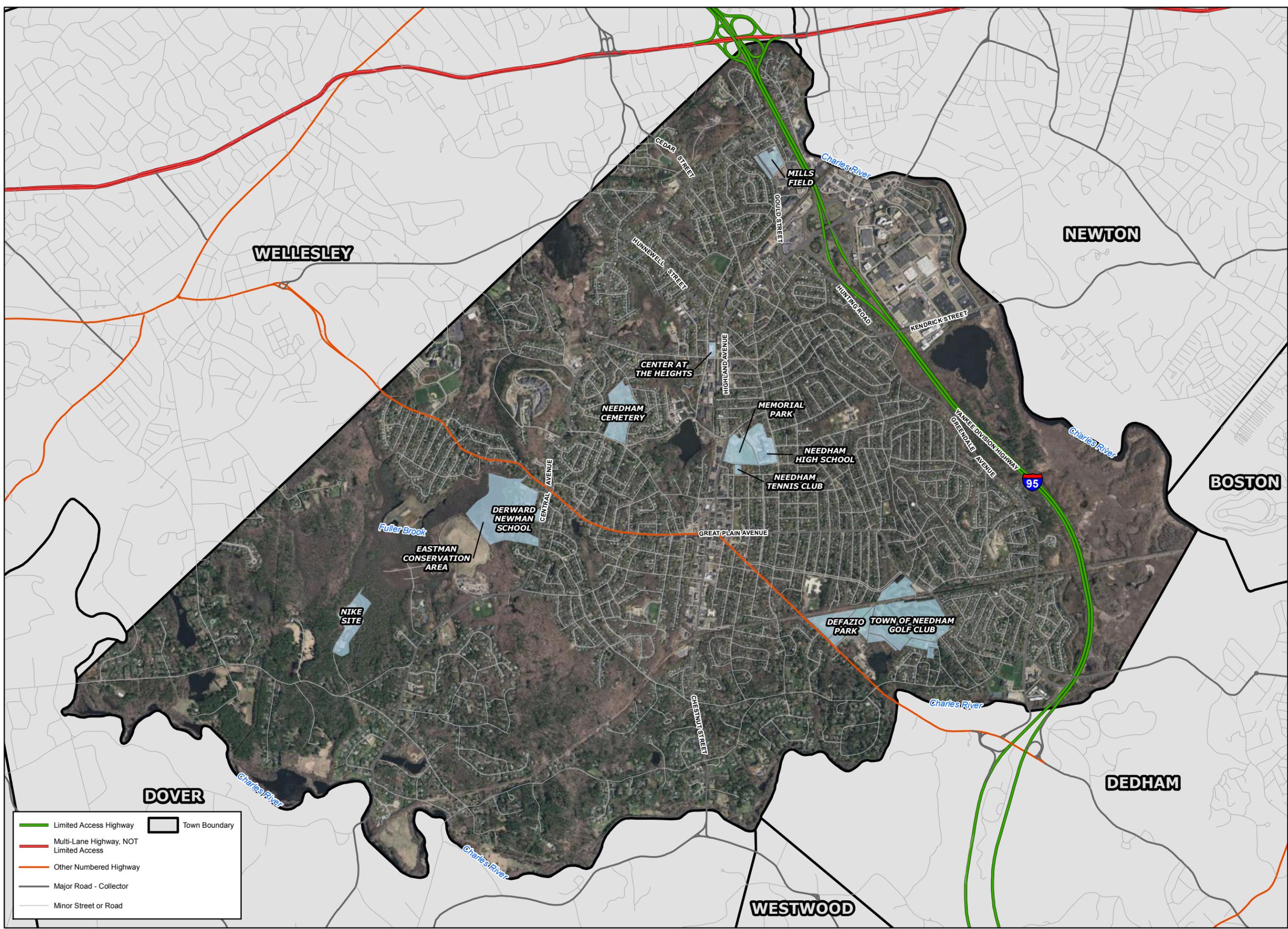
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**Town of Needham
Open Space & Recreation Plan
Needham, Massachusetts**

November 2016

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OPEN SPACE INVENTORY

LEGEND

Open Space: Other

 Limited Access Highway	 Town Boundary
 Multi-Lane Highway, NOT Limited Access	
 Other Numbered Highway	
 Major Road - Collector	
 Minor Street or Road	

LOCUS MAP



NOTES

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**Town of Needham
Open Space & Recreation Plan
Needham, Massachusetts**

April 2017

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