

SHREWSBURY OPEN SPACE AND RECREATION PLAN 2020



Town of Shrewsbury
Open Space and Recreation Plan

2020

Prepared For: Town of Shrewsbury
100 Maple Avenue
Shrewsbury, MA 01545

Prepared By: Central Massachusetts Regional Planning Commission
1 Mercantile Street, Suite 529
Worcester, MA 01608

Acknowledgements

The Town of Shrewsbury Open Space and Recreation Committee

Prashanth Ram, At Large Member

Paul Gannon, Jr., At Large Member

Tom Siwek, At Large Member

Martha Gach, Conservation Commission Representative

Peter Collins, Lake Quinsigamond Commission Representative

James Brown, Parks and Cemetery Commission Representative

Joseph Thomas, Planning Board Representative

Susan Colwell, Trails Committee Representative

The following individuals and organizations have also contributed to the development of this Open Space and Recreation Plan for the Town of Shrewsbury:

Bernard Cahill, Town Planner

Kristen Las, Assistant Town Manager/Economic Development Coordinator

Angela Snell, Superintendent of Public Facilities and Parks

Kevin Esposito, Parks and Cemetery Division Manager

Dan McCullen, GIS Coordinator

Brad Stone, Conservation Agent

Mimi Kaplan, Central Massachusetts Regional Planning Commission

Matt Franz, Central Massachusetts Regional Planning Commission

Cover Photo: Melanie Magee



TABLE OF CONTENTS

SECTION 1: PLAN SUMMARY	1
SECTION 2: INTRODUCTION.....	4
A - Statement of Purpose.....	4
B - Planning Process and Public Participation.....	6
SECTION 3 - COMMUNITY SETTING	9
A - Regional Context	9
B - History of Community.....	12
C - Population Characteristics.....	14
D - Growth and Development Patterns	24
SECTION 4: ENVIRONMENTAL INVENTORY AND ANALYSIS	33
A – Geology and Soils.....	33
B – Topography and Landscape Character	35
C - Water Resources.....	37
D - Vegetation	46
E - Fish And Wildlife	48
F - Scenic Resources And Unique Environments.....	52
G - Environmental Challenges.....	63
SECTION 5: INVENTORY OF LANDS OF CONSERVATION & RECREATION INTEREST.....	70
A - Private Parcels	75
B – Public and Non-Profit Parcels	78
SECTION 6: COMMUNITY VISION	86
A - DESCRIPTION OF PROCESS	86
B - STATEMENT OF OPEN SPACE AND RECREATION GOALS.....	88



SECTION 7 - ANALYSIS OF NEEDS.....	90
A - SUMMARY OF RESOURCE PROTECTION NEEDS	90
B – SUMMARY OF COMMUNITY’S NEEDS	92
C - MANAGEMENT NEEDS, POTENTIAL CHANGE OF USE	94
SECTION 8 GOALS AND OBJECTIVES	96
SECTION 9: SEVEN YEAR ACTION PLAN	100
SECTION 10: PUBLIC COMMENTS	118
SECTION 11: REFERENCES.....	119



SECTION 1: PLAN SUMMARY

Shrewsbury is a vibrant community that has changed significantly since the last half of the twentieth century. Starting as a mostly rural and agricultural community with farms and scattered settlements, the Town then experienced phases of growth which first made it a streetcar suburb and a resort community. During the 1950s and 1960s it was transformed into a thriving residential community. Finally, in the latter part of the century, with interstate highway access to the metro Boston area, residential development occurred in nearly all corners of the Town, and the industrial and commercial sectors grew. Open land became a valuable asset. The Town now hosts a healthy and diverse economy near attractive residential settings and open landscapes. Community members value the balance of development and preservation.

The Town contracted with the Central Massachusetts Regional Planning Commission (CMRPC) to assist in the development and submission of an Open Space and Recreation Plan (OSRP) that would meet the requirements of the Commonwealth. In June 2019, the Town of Shrewsbury Board of Selectmen created the Open Space and Recreation Plan Committee (OSRPC), and in July 2019 they appointed three community members. Strong community involvement has been integral to the creation of this plan. Through regular meetings, the survey, and public forum, the OSRP Committee identified many opportunities to improve and enhance the Town's open space and recreation resources. This 2020 Town of Shrewsbury Open Space and Recreation Plan provides substantive updates to the 2012 Shrewsbury Open Space and Recreation Plan. It was completed with guidance from the Division of Conservation Services (DCS) Open Space and Recreation Planner's Workbook in such a way as to satisfy the DCS 2008 Open Space and Recreation Plan Requirements. Once the plan is accepted, the Town will qualify for variety of open space and recreation project funding programs.

This OSRP builds on an understanding of Shrewsbury's current place in the region, its history and character, its demographics, and its growth and development patterns. A thorough review of the geology, landscape, water resources, vegetation, wildlife and fisheries, unique and scenic resources, as well as the environmental challenges was necessary to develop a clear picture of the area's strengths, weaknesses, opportunities and threats. Working with the Town's assessor and others, an inventory of both public and private lands of conservation and recreation interest was compiled. This plan identifies those special places and spaces that town residents enjoy and sets out a strategy for improving open space and recreation opportunities in a manner that is sustainable for future generations. Through the planning process, the community developed a vision and goals to accomplish that vision. In order to achieve the vision, goals, and stated objectives, an analysis of resource protection and community recreation needs was prepared. Finally, a seven (7) year action plan with detailed action steps, time frames, and responsible parties was laid out so Shrewsbury can move forward with accomplishing the goals and objectives.



The overall goals of the Town include preserving the community's character and enhancing open space and recreation resources. This plan provides extensive background information about Shrewsbury, building a foundation and agenda for future action that includes protection of natural resources and improvements to the recreation opportunities. The action plan developed through this process includes many progressive steps to increase community outreach and involvement, to manage community growth with regulatory and non-regulatory mechanisms, to improve recreational opportunities for Shrewsbury's residents and visitors, and to foster economic growth through the responsible promotion of its open space and recreation opportunities among others.

The 2012 Open Space and Recreation Plan (OSRP) established the following five (5) goals.

- GOAL 1: Acquire, through appropriate means, key open space parcels.
- GOAL 2: Plan and develop greenways in the Town.
- GOAL 3: Preserve and enhance the Town's recreational facilities.
- GOAL 4: Protect the Town's potable drinking water sources.
- GOAL 5: Protect surface water resources.

The OSRP Committee carefully considered the continued relevance of and progress toward the goals and objectives from the 2012 Plan, as well as the public's input from the survey and forum, to develop the following open space and recreation goals:

- GOAL 1: Protect and preserve open space parcels, identify opportunities for new open space
- GOAL 2: Protect and enhance habitat
- GOAL 3: Plan and develop greenways in the Town with consideration to appropriate regional connections
- GOAL 4: Maintain and enhance the Town's recreational and park facilities.
- GOAL 5: Protect the Town's potable drinking water sources.
- GOAL 6: Protect surface water resources



DEFINITIONS

The term “*open space*” in this document refers to either public or privately-owned land that is undeveloped. It is land in a predominantly natural state or altered for natural resource-based uses (i.e., farming, orchards, forestry, hunting and fishing, walking-type parks and trails). Examples of privately-owned open space might include farms, forest lands, and passive recreation areas.

The term “*recreational open space*” or “*recreation*” refers to land used for active recreational purposes. Land used for active recreation does not qualify technically as open space because these parcels often have portions covered with paved surfaces such as that for tennis courts, basketball courts and parking lots. In addition, athletic fields require regular fertilizer applications and are usually installed with fencing and outbuildings. Since this plan deals with both open space and recreation, we have presented an approach to obtaining the benefits of maintaining and improving existing recreational facilities, and developing new facilities, without losing scarce valued environmental assets. In addition, grants and partnerships between federal state and local agencies are often based on recommendations the applicant community makes in its OSRP. Thus, we recognize and embrace opportunities for healthy outdoor activities, whether it be hiking along forest trails or a playing with a team on a soccer or football field.



SECTION 2: INTRODUCTION

A - STATEMENT OF PURPOSE

The Shrewsbury 2020 Open Space and Recreation Plan update builds upon the 2012 Open Space and Recreation Plan as well as the 2016 Shrewsbury Master Plan to provide a framework for priority needs and actions. It reflects the long-standing commitment of the Town of Shrewsbury to preserve its community character, and to balance growth and development with protection and enhancement of natural, cultural and recreational resources. The primary purpose of this OSRP are to:

- 1) Inventory existing open space resources and recreation opportunities
- 2) Provide an accurate assessment of open space and recreational needs for Shrewsbury residents, and
- 3) Create an action plan that optimizes those opportunities and satisfies those needs.

As stated in the 2016 Master Plan, “Shrewsbury is a mature suburb that has experienced tremendous growth and development over the past 50 years. As part of the greater Worcester economy, the Town enjoys continued market pressure to grow and develop. For these reasons, it is critical that Shrewsbury is mindful of the natural systems that still play an integral role in the local economy and contribute to overall community health and sustainability.” As part of the master planning process, the Town developed a 20-year vision with community input and identified four key goals focused on land use. These included Goal LU2 - Promote land use patterns that compatible with the Town’s natural environment and existing landscape character. The following policies were developed to support the achievement of Goal LU2, and these policies both inform and intersect with the goals and objectives of the 2020 OSRP:

Policy LU2.1: Guide development and redevelopment into areas that have the physical, environmental, and infrastructure capacity to absorb and reduce impacts.

- a. Reevaluate Shrewsbury’s zoning bylaw to ensure that zoning in each district is compatible with the character of the land.
- b. Review the existing zoning bylaw for needed revisions to strengthen protection of natural resources.

Policy LU2.2: Discourage development in environmentally sensitive areas, including land that provides wildlife habitat or groundwater recharge.

- a. Where feasible, acquire lands that contribute to the quality and diversity of wildlife habitat, or the protection of the Town’s drinking water supply.
- b. Continue to require developers to identify critical environmental, historic and cultural resources on their properties. Develop incentives for their protection if they are outside of environmental protection



or historic districts. Examples to explore include, but are not limited to, Wetlands Bylaw and Demolition Delay Bylaw as well as standards for minimum slopes, stormwater runoff, lot dimensions, and lot coverage. ([Town of Shrewsbury Master Plan, 2016](#))

Open space provides numerous social benefits and ecosystem services for the Town of Shrewsbury. Open spaces provide interaction with nature, peaceful areas, beautiful scenery, habitat for flora and fauna, active and passive recreational opportunities, safety from flooding and groundwater contamination, and healthier air. The Town is committed to ensuring the protection of these features and benefits.

The Town of Shrewsbury has diverse recreation and open spaces that have shaped this wonderful community. Today, Shrewsbury's suburban character, natural beauty, excellent schools, and economic base attract families to live here. Despite extensive growth and development over the past 50 years, open space and recreation are key components of this character. Building upon efforts conducted in 1987, 1999, 2001, 2012, and the 2016 Master Plan, this plan identifies the needs and priorities of the Town in order to ensure that natural and recreational resources will continue to enhance the quality of life in Shrewsbury. The plan will assist the residents and Town officials with future decisions and planning, both short and long term, about natural resource conservation, preservation and open space acquisition, and improvement of recreational opportunities.



Photo Credit: Melanie Magee

This OSRP is based on an understanding of Shrewsbury's current place in the region, its history and character, its demographics, and its growth and development patterns. A thorough review of the geology, landscape, water resources, vegetation, wildlife and fisheries, unique and scenic resources, as well as environmental challenges was necessary to develop a clear picture of the area's strengths, weaknesses, opportunities and threats. Working with the Town's assessor and others, an inventory of both public and private lands of conservation and recreation interest was compiled.

The overall goals of the Town include preserving the community's character and enhancing open space and recreation resources. The objectives and action plan developed through the community engagement process includes many progressive steps: Those to increase community information and involvement, to manage community growth with regulatory and non-regulatory mechanisms, and to improve passive and active recreational opportunities for Shrewsbury's residents and visitors.



B - PLANNING PROCESS AND PUBLIC PARTICIPATION

Strong community involvement has been an integral part of creating this plan. The Open Space and Recreation Plan Committee (OSRPC) was established to steward the preparation of this plan. The committee was appointed by the Board of Selectmen in July 2019 and includes the following:

- Prashanth Ram, At Large Member
- Paul Gannon, Jr., At Large Member
- Tom Siwek, At Large Member
- Martha Gach, Conservation Commission Representative
- Peter Collins, Lake Quinsigamond Commission Representative
- James Brown, Parks and Cemetery Commission Representative
- Joseph Thomas, Planning Board Representative
- Susan Colwell, Trails Committee Representative

In addition, development of the plan has benefited significantly from the active participation of Town Planner Bernard Cahill, Parks and Cemetery Division Manager Kevin Esposito, Recreation Supervisor Gary Grindle, Recreation and Superintendent of Public Facilities and Parks Angela Snell, and Conservation Agent Brad Stone.

The Committee first convened August of 2019 and began working with CMRPC on a town-wide survey to gauge resident sentiments regarding open space and recreation resources within the Town.

The survey was opened up for responses on the Survey Monkey Platform in October 2019 and kept open for approximately two months until mid-December. The survey was linked electronically on the front page of the Town's website as well as on the OSRP page. Hard copies of the survey were made available at various locations around town, including the Municipal Offices, the Town Library, and the Senior Center, and were also distributed at Town youth basketball games. Flyers were also distributed with the link and QR code for the survey. Announcements of the survey were included in multiple list serves, including for the schools and the Parks and Recreation Department. The survey received 858 responses. Despite the distribution of a number of

Shrewsbury
Open Space &
Recreation Plan

Monday, August 31st
6:00 - 7:30 PM

VIRTUAL PUBLIC FORUM
TO DISCUSS SHREWSBURY'S NEXT OPEN SPACE AND
RECREATION PLAN

This public forum will be held using Zoom Video Conferencing. Come share your vision for open space in Shrewsbury! For more information, visit the OSRP website at www.shrewsburyma.gov/OSRP.

Please sign up online or contact the Planning Department to be added to the guest list:
elarson@shrewsburyma.gov
bcahill@shrewsburyma.gov
(508) 841-8512

WE NEED YOUR FEEDBACK!

Figure 1: Virtual Public Forum Flyer



hard copies of the survey, almost all of the responses were online. Summaries of the results of the survey are presented in the appendices of the plan.

The OSRP Committee organized a virtual public forum using the Zoom platform, which was held on August 31, 2020. It was decided that due to Covid-19 and the prohibition on meetings over 25 people that a virtual public forum would be preferable to an in-person meeting for both safety reasons and also to accommodate a larger number of participants. There were 37 attendees, including Town staff. The public forum included a discussion of the draft plan, the draft survey results, draft goals, objectives, and action plan, as well as residents' priorities for open spaces and recreation in Shrewsbury. The meeting was publicized via announcements and an article in the local newspaper, the Community Advocate, flyers that were distributed at the Annual Town Meeting and the farmer's market, announcements on various pages on the Town website, ads on the local cable access bulletin board, and posts on Facebook and Twitter. The flyer was emailed to the Senior Center and the India Society of Worcester, and further distributed to their members, in order to target residents of Shrewsbury's Environmental Justice areas.

The forum began with a PowerPoint presentation on the plan and the process to develop it, the draft goals and objectives and the survey results. The next portion of the forum which took up the majority of the time was the group discussion. Three topics for discussion were introduced: Indoor and outdoor recreational facilities – what is needed or needs to be improved; Open spaces for preservation/conservation, scenic areas and routes – what is needed, and what parcels of land should be protected; and Connectivity and passive recreation – what is needed to improve and expand trails and connectivity. Comments and questions were typed into the chat box, and the discussion was conducted by both speaking and by replies in the chat. Notes were taken and all of the dialogue in the chat, along with the flyer and agenda were saved and are included in Appendix C - Summary of Community Forum and Community Comments. The participant's comments were reviewed and discussed, and incorporated into the plan as appropriate.

Committee members met approximately every two months beginning in August 2019, and provided substantial information and feedback for the plan, including, reviewing and providing constructive feedback on plan drafts, completing the Americans with Disabilities Act (ADA) facility inventory, and stewarding the document through its presentation to the Town Selectmen and submittal to the state.

Shrewsbury has an Environmental Justice (EJ) Population. EJ Populations in Massachusetts are determined by the following criteria:

1. Households earn 65% or less of the statewide household median income; or
2. 25% or more of the residents are minority; or
3. 25% or more of the residents are foreign-born; or
4. 25% or more of the residents are lacking English language proficiency.



Based on the 2010 US Census Block Data, one or more Census blocks or block groups in Shrewsbury meets the Minority criteria and the English Isolation criteria. Based on the 2010 Census information, the environmental justice population is concentrated in a neighborhood located on the western border of Shrewsbury south of Route 9, north of Jordan Pond and east of Worthington Road. **Map 2 – Environmental Justice Map** (Appendix A) shows these locations. Environmental Justice populations require special outreach so that residents of those areas are offered ample opportunity to participate, comment and provide input into OSRP development.

Outreach to solicit community involvement was done broadly through a variety of methods throughout the entire Town. Shrewsbury's Environmental Justice (EJ) community is relatively large and focused in two areas of Town: Much of the southern section below Route 9, and the west side bordering Lake Quinsigamond from Interstate 290 on the north to just south of Route 9. The EJ criteria are met for population of minority English isolation residents. Community input was solicited for this plan via two surveys and a public forum. Both the survey opportunity and the notice of the public forum were broad cast in a multitude of ways that would reach the EJ areas including:

- A “crawl notice” on Shrewsbury Community Access,
- The Shrewsbury Town website
- Promoted in the public schools,
- Promoted in town recreation programs
- Promoted in many public meetings and events
- Targeted outreach to the India Society of Worcester (located in Shrewsbury)

Overall the Committee was satisfied overall with community input on this plan. In particular, the Committee was pleased that a number of participants who attended the public forum were members of the EJ community.



SECTION 3 - COMMUNITY SETTING

A - REGIONAL CONTEXT

Shrewsbury, lying immediately east of New England's second largest city, Worcester, has evolved into a large suburban town. Its proximity to Worcester, places of employment, and major highways has made the Town an ideal location for residential development. The Town has used this to its advantage, creating many pleasant neighborhoods, a large retail shopping district, and an extensive water and sewer system.

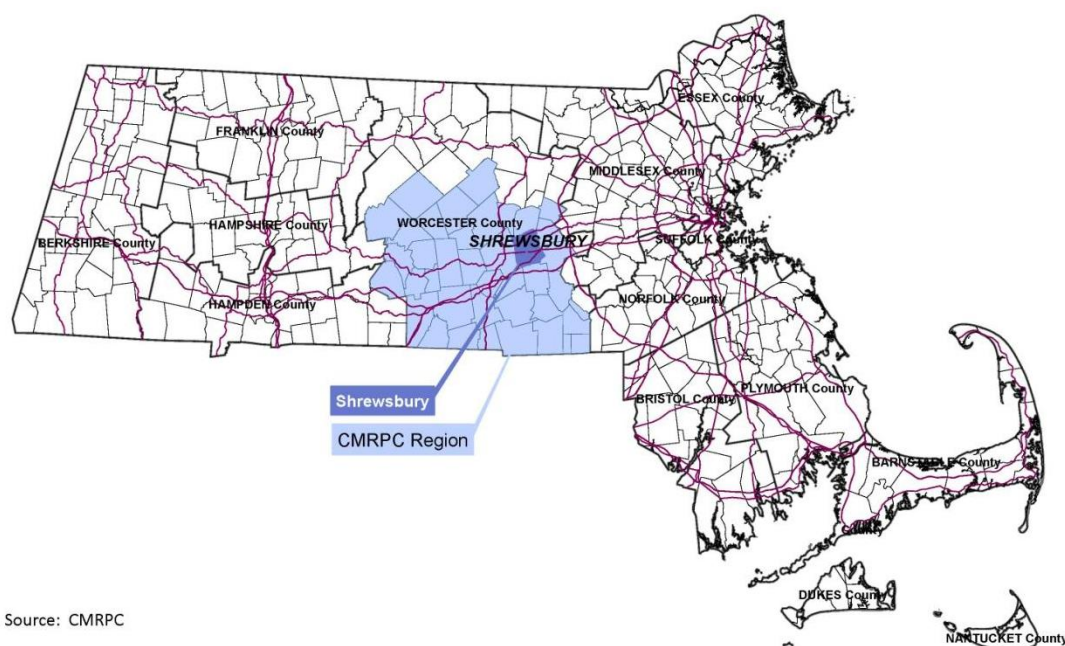
Shrewsbury's neighbors to both the north and south - the Towns of West Boylston, Boylston and Grafton - are comparatively undeveloped. Westborough directly to the east along Route 9, has a similar level of development to Shrewsbury, although there is somewhat less residential development. Northborough also to the east has been a community in transition from relatively rural to more suburban.

In addition to Worcester, the Town is within driving distance of several major metropolitan areas. Shrewsbury is just over 35 miles from Boston, about 190 miles from New York City, about 50 miles from Providence, Rhode Island and 70 miles from Hartford, Connecticut. US Interstate 290 crosses the northern part of town. US Route 20 crosses the southern part of town. Massachusetts Route 9 cuts the Town almost in half through its midsection east west and Massachusetts Route 140 roughly bisects the Town north south. Massachusetts Route 70 cuts across the northwest corner of town. The Town has convenient access to the Massachusetts Turnpike (US 90) and US Interstate 495. **Map 1 - Regional Context Map** (Appendix A) shows Shrewsbury location in proximity to its nearby communities and highways.

Shrewsbury is located within the region serviced by the Central Massachusetts Regional Planning Commission (CMRPC) as shown in Figure 2 - Regional Planning Area (below). CMRPC is the designated regional planning agency (RPA), one of 14 in the Commonwealth, for the Central Massachusetts region, which includes the City of Worcester and the surrounding 39 communities. This region encompasses the southern two-thirds of Worcester County. CMRPC provides municipal and regional planning for Land Use and Transportation, as well as a variety of Community Development services, Transit Planning for the region's transit authority, Geographic Information Services (GIS), staffing for MORE (Municipalities Organized for Regional Effectiveness), and other programs. CMRPC collaborates with local, regional, state and federal officials, as well as with legislators, in order to bring a regional perspective and a coordinated approach to the planning and development that occurs in this region. The ultimate goal of this agency is to improve the quality of life for those who work and live in the Central Massachusetts region.



Figure 2 - Regional Planning Area



Source: CMRPC

The region is also well connected by rail and highway to the ports, airports, and intermodal facilities. Boston Logan International Airport is the closest International airport serving the Town. However national service is also easily obtained via the TF Green Airport in Providence (Warwick), Rhode Island and the Manchester Boston Regional Airport in Manchester, New Hampshire. Worcester Regional Airport, operated by the Massachusetts Port Authority, is about 10 miles from Shrewsbury Town Center. Smaller airports supporting private airplanes are located in Sterling, Marlborough, Spencer, and Hopedale.

The Worcester Regional Transit Authority provides public transportation to the Town primarily via the Route 15 fixed route bus service that connects the Shrewsbury Nursing Home, Southgate retirement community, Shrewsbury Center, Shrewsbury Town Hall and Senior Center, and Fairlawn Shopping Plaza to Union Station in Worcester via Shrewsbury Street and Route 9. The Worcester Regional Transit Authority (WRTA) service area includes over half a million in population and is the second largest regional transit authority in Massachusetts, serving 36 communities. The WRTA maintains a fleet of 52 buses including six (6) electric buses and seventeen (17) diesel-electric hybrid buses for 28 fixed routes in Worcester and 12 of the surrounding communities. The WRTA also provides paratransit service for the elderly and disabled in the region, in addition to a variety of special services for elderly and disabled residents in the entire service area. The Shrewsbury Council on Aging also runs two WRTA vans and two Shrewsbury-owned vans for senior and para-transit clients.

Shrewsbury and its immediate neighbors present sort of a microcosm of the history of development in Massachusetts and other urbanized states. Shrewsbury's first big development stage was as a bedroom



community to the city directly to its west. Meanwhile most of its immediate neighbors maintained their small-town character. With the completion of the interstates and the trend to development along them, neighbors like Westborough and to a lesser extent Grafton and Northborough began to become less rural. Another burst of residential development, this one starting in the 1980's and continuing to the present, has Shrewsbury focused more towards the east and away from Worcester. This is evidenced by the increased residential development occurring in the northern part of town near the I-290 interchanges.

Shrewsbury's natural resources have always played a part in its development. Four (4) are particularly significant in a regional context. The most obvious is *Lake Quinsigamond*. Historically this has been a defining feature, acting first as an impediment to westward travel and then as a popular area for summer homes. The lake has for a number of years served as a recreational resource for Worcester, Shrewsbury and to some extent the central Massachusetts region. Directly north of the lake is a large and productive *aquifer* that stretches from the northwestern part of Shrewsbury into Boylston. Shrewsbury gets the majority of its drinking water from this aquifer.



Photo Credit: Town of Shrewsbury

On the east side of the community is a low but distinct ridge running almost north-south, called the *Shrewsbury Ridge*. This area coincidentally forms the border between Shrewsbury and the neighboring towns of Northborough and Westborough. Its use as a recreational resource is exemplified by the Ward Hill Ski Area located within the Town on the border with Northborough. This area is also an important watershed containing some of the upper tributaries to the Assabet and Sudbury Rivers (SUASCO Watershed). Both the state and the Town of Northborough hold land protecting these water resources.

In a regional context, then, Shrewsbury has many forces pulling at it. First and most significant, is its suburban development pattern. Second is its self-contained ground water supply, fairly unique for a town of 35,600. Finally, are the remaining areas of town which are still relatively undeveloped despite residential and retail development activity a short distance away.



B - HISTORY OF COMMUNITY

Settlers. The Town of Shrewsbury is now a suburban community with an uneven and hilly terrain cut by a number of minor streams providing several small water power sites. Grants of land were made in what would eventually be the Town beginning in 1664, with the 3,200 acre grant called Haynes Farm as the largest. Settlers came primarily from Sudbury and Marlborough, and the first permanent settler was Gersham Wheelock in 1720. (Massachusetts Department of Housing and Community Development, 2000)

The Wheelocks built a dwelling on the north side of Main Street somewhere near the current Town Common in 1717. By 1727 the Town had enough residents to incorporate. The original town boundaries stretched from Lancaster to the north, Sutton to the south, Worcester to the west and Marlborough to the east. By 1768 Shrewsbury had taken on more or less the shape it has today. By this time many large tracts had been annexed to surrounding communities or had themselves become new political entities.

Transportation. Even in these early years, the Town had the advantage of good transportation. What is now Main Street was laid out in 1683 as a path connecting Boston to the Connecticut River towns. The current Holden Street was used even before the Revolution and served as a county road connecting with Northampton. This road was part of the route from Boston to Vermont for many years. (Shrewsbury Open Space Planning Committee, 1999) The Boston Turnpike (now Route 9) was finished in 1808 and originally crossed Lake Quinsigamond on a floating bridge. There was also “a road of considerable travel from the northward, directly through Shrewsbury to Providence.” (Whitney, 1983)

Business. Several historical accounts say the Town had good farmland, though it was difficult to till in some places. Early industries included tanning, with the first known tannery starting in 1762 on Gulf Street. There were also gunsmiths and shoemakers. The first water-driven mill was built on Mill Street by Samuel Wheelock in 1721. The Wyman Grist Mill was built about 1800 and stood downstream from a sawmill. There was also the Slocum Mill north of the Town common, the Fay Mill on Prospect Street, the Davis Saw Mill on Spring Street, the Harlow Mills off Sewall and Holden Streets and another mill at the outlet of Mill Pond.

A leather industry began in 1786 in Shrewsbury and town farmers developed large cattle herds to support the manufacture of boots and shoes. This was followed by the establishment of gunsmithing operations in 1797 which produced rifles, shotguns and pistols and eventually cutlery. Luther Goddard began making brass clocks in 1809 and then established a small watch factory employing a few skilled Swiss and English watchmakers. Lumbering created sawmills and they in turn drew chair and cabinet



Photo credit - Irish Settles



makers, plow and wagon builders. (Massachusetts Department of Housing and Community Development, 2000)

Shay's Rebellion in 1786 sought to close the courts to prevent debt collections and the foreclosure of mortgages. Shrewsbury became a staging area for the rebellion and the encampment of the more than 400 insurgents, before the march on the Worcester Court House. (Massachusetts Department of Housing and Community Development, 2000)

Development patterns. Original development in Shrewsbury was centered in several places. The largest area was around what is still the Town center at Main and Boylston Streets. There were other settlements too around Straw Hollow in the northeast part of town and in the northwest part of town around present day Holden and Sewall Streets. Townspeople created an agricultural economy with apple orchards and by 1750 there were two stores and four taverns as well as several small industries in operation. The rapid fall of prices for agricultural goods, the shortage of hard currency and the general economic depression following the Revolutionary War produced disastrous conditions for colonists. (Massachusetts Department of Housing and Community Development, 2000)

With the introduction of street cars and the extension of lines to outlying areas in the late 19th and early 20th century, Shrewsbury began to evolve from its more agrarian, small town past into a commuter suburb. The Town grew quickly between 1910 and 1930, more than tripling in size from 1,900 to almost 7,000 people. In addition to permanent home settlement, the early 20th century was also a time for resort development around Lake Quinsigamond.

The next major thrust of development occurred in the post war years - the baby boom. This was a time when the Town changed for good into a suburb with an influx of over 10,000 new residents. The automobile had also become firmly entrenched as the preferred means of transportation and the retail development that is now prevalent along Route 9 began in earnest.

The development of streetcar routes in the 19th century spurred the growth of single-family housing in town, and summer resort residents on Lake Quinsigamond became consumers of the market garden produce grown by town farmers. As Shrewsbury's industry was killed off by the lack of large waterpower sites and the tardy arrival of the railroad, its role as a suburb of Worcester grew more important. The Town's population doubled from 1915 to 1940 as continued streetcar suburb growth brought more modern settlers into the community. Other modern developments included an increased number of lakeside cottages, ethnic clubs and recreational areas on the lake. The economy of modern Shrewsbury was described at the time as dependent on agriculture, the resort industry and the provision of recreation and food for the population of Worcester.

In the last thirty years or so, the Town has once again become a hot spot for residential development. Between 1985 and 1995 over 2,500 building permits were issued for new homes. This in turn spurred more retail development, mostly along Route 9. However, industrial development also continued to occur, particularly



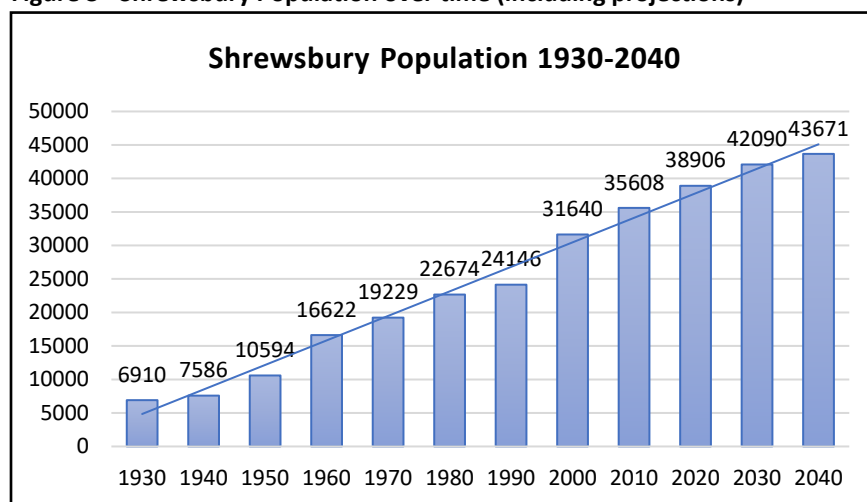
along Route 20. Although some additional commercial and industrial development has occurred in the 2000's, the Town continues to be a primarily residential community.

C - POPULATION CHARACTERISTICS

POPULATION GROWTH

The official 2010 US Census Bureau decennial population count for Shrewsbury was 35,608, and the estimated population for 2017 was 36,973. Population growth in Shrewsbury has fluctuated over the past century, with large increases in the 1950s and the 1990s, and slower growth in the 1930s and the 1980s. Between 1990 and 2000, Shrewsbury's population grew from 24,146 to 31,640, a 31% increase. This growth slowed after 2000, but it has remained steady, and is projected to continue to grow at a steady rate through 2040.

Figure 3 - Shrewsbury Population over time (including projections)



(US Census, CMRPC Population Projections 2017)

According to the CMRPC population projections, Shrewsbury will experience slow and steady growth. By the year 2030, CMRPC projects the population of Shrewsbury will be 42,090, and by 2040 the population will be 43,671. CMRPC regularly publishes population projections for its constituent communities based on U.S. Census estimates. The town level projections were vetted with the communities for transportation planning purposes as part of the 2016 Long Range Transportation Plan. The control totals for the CMRPC region are provided by the Massachusetts Department of Transportation (MassDOT). Town level projections were developed based upon past growth trends, land use and infrastructure capacity, planned future projects, and stakeholder input,



including that of the Central Massachusetts Metropolitan Planning Organization (CMMPO), CMMPO Advisory Committee, and CMRPC Regional Collaboration and Community Planning staff.

REGIONAL GROWTH

Shrewsbury outpaced most of its neighbors with a growth rate of 31% from 1990 to 2000. From 2000 to 2010 its growth rate slowed, but at 13% it was still higher than most neighboring communities and the county, outpaced only by Grafton (19%). This steady population growth indicated that Shrewsbury was a highly desirable residential community. Its location bordering Worcester to the east, with easy access to the Mass Pike and other major routes, no doubt contributed to its desirability and its growth. The growth rate slowed considerably from 2010 until 2018, with only a 4% increase in population between these years. All of the surrounding towns other than Worcester had higher growth rates. This may have been due to the effects of the 2008 recession, with lower home prices in surrounding communities attracting more families and others moving to the region.

Table 3.1 – Shrewsbury And Surrounding Communities Population 2000-2018

Community	2000	2010	2018 – Estimated	Percent Change 2000-2010	Percent Change 2010-2018
Shrewsbury	31,640	35,608	36,973	13%	4%
Boylston	4,008	4,355	4,581	9%	5%
Grafton	14,894	17,765	18,885	19%	6%
Northborough	14,013	14,155	15,101	1%	7%
West Boylston	7,481	7,669	8,215	3%	7%
Westborough	17,997	18,272	19,189	2%	5%
Worcester	172,648	181,045	185,877	5%	3%
Worcester County	750,963	798,552	830,839	6%	4%
Massachusetts	6,349,097	6,547,629	6,902,149	13%	5%

(US Census, 2000, 2010, 2018 estimates)



POPULATION DENSITY

In 2018, with a total land area of approximately 21 square miles and a population of 36,973, the population density of Shrewsbury was 1,761 people per square mile. With the exception of Worcester, Shrewsbury is much more densely populated than its neighbors and the rest of Worcester County. The relatively high rate of population growth and the population density in Shrewsbury has the potential to result in development pressures and a reduction in open space available for protection and recreation.

Table 3.2 - Population Density of Shrewsbury and Surrounding Communities

Community	Land Area (Square Miles)	Density (Persons/ Square Mile)
Shrewsbury	21	1,761
Boylston	16	286
Grafton	23	821
Northborough	19	795
West Boylston	13	632
Westborough	21	914
Worcester	38	4,892

(2018 American Community Survey 5-year estimates)

AGE DISTRIBUTION

As the population of Shrewsbury increased from 2000 to 2010, and continued to increase from 2010 to 2018, almost all of the age groups also increased in population. The only exception was the under 5 age group, which decreased overall by 25% from 2000-2018. The most dramatic population increase was the 60-69 age group, which had 77% growth, and second to that was the 50-59 age group, which increased by 56%. Although these older populations had the largest increases, the 5-19 and 20-29 age groups also increased by a significant amount, at 27% and 37% respectively. The median age reflects the large increases in the population of older residents. The median age of Shrewsbury's population rose from 37.6 to 40.2 from 2000 to 2010, and increased to an estimated median age of 41.6 in 2018. This was about two years older than the median age of the state (39.4) and slightly older than the median age of Worcester County (40.1).



Table 3.3 - Age Distribution of Shrewsbury Residents

Age Distribution of Shrewsbury Residents					
	2000	2010	2018	Change 2000-2018	% Change 2000-2018
<5	2,483	2,051	1,861	-662	-25%
5-19	6,092	7,887	7,765	1,673	27%
20-29	2,897	3,256	3,957	1,060	37%
30-39	3,229	4,512	4,112	883	27%
40-49	5,186	6,426	5,524	338	7%
50-59	3,669	4,888	5,709	2,040	56%
60-69	2,221	3,146	3,927	1,706	77%
70-79	1,949	1,857	2,407	458	23%
80+	1,225	1,585	1,775	550	45%

(US Census 2000, 2010, 2018)

Growth or decline in the population of the various age groups has implications for schools and classroom sizes, recreation facilities, municipal services, housing, and economic development needs for the community. Because Shrewsbury has relatively high percentages in both younger and older age categories, it is important that facilities are available to accommodate for a variety of needs. Younger and school aged residents have a need for more active recreation facilities such as soccer and baseball fields. For middle aged residents, active recreation areas for league sports may be needed as well as passive recreation facilities for activities like hiking and picnicking with the family. For the older generations, passive recreation facilities and special provisions like wheelchair accessibility may be needed.

ECONOMIC CHARACTERISTICS

The American Community Survey (ACS) 2013-2017 estimated 68.6% (Margin of Error 1.9%) of Shrewsbury residents over the age of 16 were active in the labor force. In April of 2019, the unemployment rate for the Town was 2.2%. This is the lowest employment rate for the Town since 2000, when it was also 2.2%, and considerably lower than the unemployment rate of 7.4% in 2010. (Massachusetts Department of Labor and



Workforce Development, 2011) The unemployment rate for Shrewsbury was also slightly lower than the rate for Worcester County (2.8%) and the rate for the state (2.6%). As of the writing of this plan, however, the Covid-19 pandemic in 2020 has caused significant unemployment, the effects of which could last over a period of many months or possibly years.

The industry with the largest number of establishments in Shrewsbury is Service Providing, according to 2019 data from the MA Department of Labor and Workforce Development. As shown in Table 3.4, this is followed by Trade, Transportation and Utilities, and then by Education and Health Services. The industry in Shrewsbury that had the highest numbers of employees was also Service Providing. However, the industries with the highest average weekly wage were Financial Activities and Professional and Technical Services.

Table 3.4 - 2019 Average Employment and Wages by Industry in Shrewsbury

Description	No. of Establishments	Total Wages	Average Monthly Employment	Average Weekly Wages
Total, All Industries	1,006	\$202,491,593	15,031	\$1,036
Service-Providing	893	\$180,322,327	13,757	\$1,008
Trade, Transportation and Utilities	234	\$79,340,987	6,000	\$1,017
Education and Health Services	206	\$60,066,119	4,289	\$1,077
Professional and Business Services	183	\$14,915,058	1,003	\$1,144
Health Care and Social Assistance	179	\$40,775,847	2,883	\$1,088
Retail Trade	129	\$22,608,902	2,236	\$778
Professional and Technical Services	127	\$8,818,565	461	\$1,471
Goods-Producing	113	\$22,169,266	1,274	\$1,339
Social assistance	112	\$2,839,736	410	\$533
Individual and family services	102	\$1,142,536	216	\$407
Other Services, Except Public Administration	95	\$4,201,189	444	\$728



Description	No. of Establishments	Total Wages	Average Monthly Employment	Average Weekly Wages
Construction	91	\$10,848,901	623	\$1,340
Leisure and Hospitality	78	\$7,111,783	1,216	\$450
Financial Activities	73	\$9,404,259	469	\$1,542

Massachusetts Executive Office of Labor and Workforce Development, 2019

According to 2018 data from MA Department of Labor and Workforce Development shown in Table 3.5, the top three employers in Shrewsbury are Metso Flow Control Corporation, University of Massachusetts, and Ventois Inc. Large retail businesses along Route 9 and the public schools are also among the largest employers.

Table 3.5 - Largest 25 Employers in Shrewsbury

Company Name	Address	# Employees	NAICS Code
<u>Metso Flow Control</u>	Bowditch Dr	500-999	5416
<u>University of Massachusetts</u>	South St # 400	250-499	6113
<u>Ventois</u>	Boston Turnpike #201	250-499	3345
<u>A A Transportation Co</u>	Hartford Turnpike	100-249	4852
<u>Christmas Tree Shops</u>	Boston Turnpike # 10	100-249	4529
<u>Ericsson Inc.</u>	Walnut Drive	100-249	5179
<u>Exsel Plastics</u>	Boston Turnpike	100-249	3261
<u>Floral Street School</u>	Floral St	100-249	6111
<u>Golub Corp.</u>	Boston Turnpike	100-249	4511
<u>Hebert Confections Llc</u>	Hartford Turnpike	100-249	3113



Company Name	Address	# Employees	NAICS Code
<u>Home Depot</u>	Boston Turnpike	100-249	4441
<u>JNR Gutters</u>	Boston Turnpike #1	100-249	2381
<u>Oak Middle School</u>	Oak St	100-249	6111
<u>Shaw's Supermarket</u>	Boston Turnpike	100-249	4451
<u>Shrewsbury Nursing Rehab Ctr</u>	Julio Dr	100-249	6231
<u>Shrewsbury Parks Dept</u>	Maple Ave	100-249	7121
<u>Shrewsbury Senior High School</u>	Holden St	100-249	6111
<u>Southgate at Shrewsbury</u>	Julio Drive	100-249	5419
<u>St. John's High School</u>	Main Street	100-249	6111
<u>Tri-State Trucking</u>	Hartford Turnpike	100-249	4231
<u>Whole Foods Market</u>	Boston Tpke #1100	100-249	4451
<u>Amici Trattoria</u>	Main St	50-99	7221
<u>Bed, Bath and Beyond</u>	Boston Turnpike #4	50-99	4422
<u>Benchmark Senior Living</u>	Main Street	50-99	6233

(Employer Information is provided by Info Group of Omaha, NE, Copyright 2020, All Rights Reserved)

In 2018, the median household income was \$105,959, with a per capita income of \$47,316. Median and per capita income have steadily increased since 2010, when the median household income was \$85,697 and the per capita income was \$37,536. This data, along with the low unemployment rate, indicate that there has been substantial economic improvement for Shrewsbury residents since the economic downturn. As of this writing, the economic impacts of the Covid-19 pandemic will likely result in lower median household incomes in Shrewsbury for 2020 and possibly beyond. Businesses closing and large numbers of people losing employment will have substantial economic ramifications for many of the residents of Shrewsbury.



Table 3.6: Regional Median Household Income

Geographic Location	2000 Median Household Income	2010 Median Household Income	2018 Median Household Income
Shrewsbury	\$64,237	\$85,697	\$105,959
Boylston	\$67,703	\$88,214	\$97,074
West Boylston	\$53,777	\$79,906	\$78,313
Northborough	\$79,781	\$102,969	\$113,608
Westborough	\$73,418	\$96,069	\$108,767
Worcester	\$35,623	\$45,036	\$46,407
Worcester County	\$47,874	\$64,152	\$71,895
Massachusetts	\$50,502	\$64,509	\$77,378

Source: US Census 2000 and 2010, and 2018 American Community Survey 5-year estimates

HOUSING

In 2018, the majority of housing types in Shrewsbury were single family or 1-unit homes, at 64% detached and 6% attached. The second most common type of housing type was 20 or more units, at 10%, with smaller percentages of multi-family dwellings with 2 to 19 units. In 2018, 74.4% of the occupied housing units were owner occupied, while 2% were renter occupied. The Shrewsbury Housing Authority administers over 250 units of elderly/disabled and family housing units and 173 Section 8 vouchers. As of January 2019, Shrewsbury had 6.37% of its housing stock qualified as subsidized housing (affordable housing) by the Department of Housing and Community Development. The state goal is for each municipality to have 10% subsidized or affordable housing.

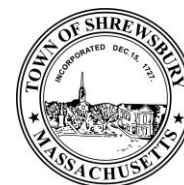
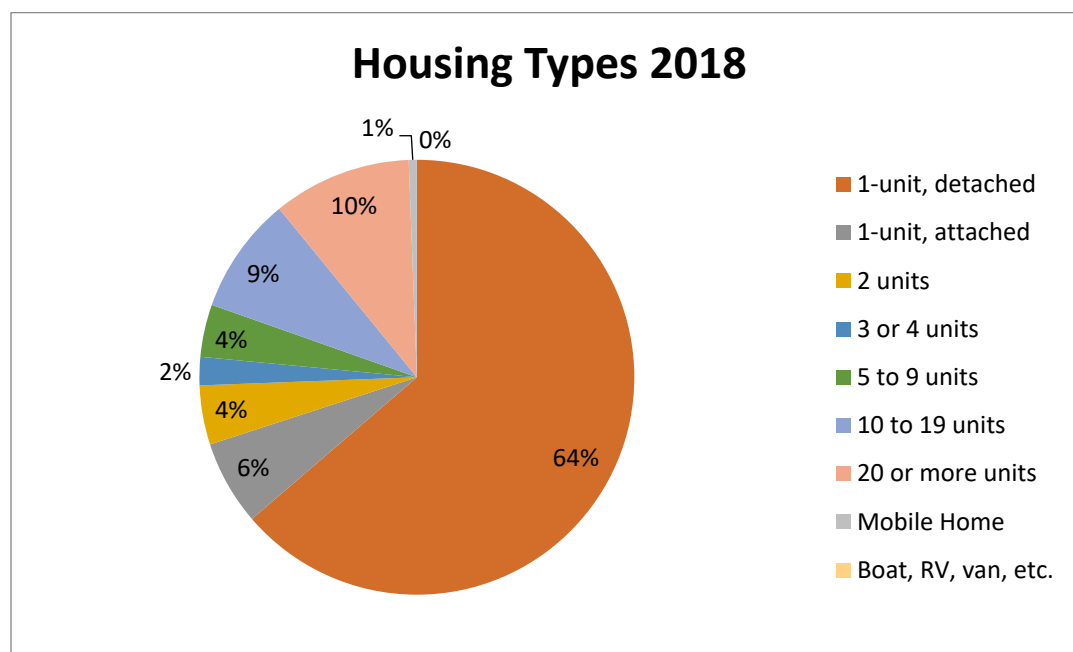


Figure 4 – Housing Types in Shrewsbury, 2018



Source: US Census 2018 American Community Survey 5-year estimates

SOCIAL (DIVERSITY) CHARACTERISTICS

Shrewsbury residents have relatively high levels of educational attainment, and higher than the statewide average. In 2018, of Shrewsbury residents 25 years or older, 95% had a high school degree or greater, and 58.4% had a bachelor's degree or higher. This trend has accelerated since 2000, when 91.7 % had a high school degree or greater, and 46.1% had a bachelor's degree or higher. Enrolled in school in 2018 were 10,200 students over the age of 3 – 1,174 in preschool, nursery school, or kindergarten, 4,372 in elementary school, 2,351 in high school, and 2,303 in college.

Shrewsbury is becoming more diverse. As figures 5 and 6 below show, the percentage of the population that identifies as White has decreased over 15% since 2000, and the percentages of the population that identify as Asian, Black, and Latino have increased. The Asian population has increased by the largest proportion, from 8 to 19%.

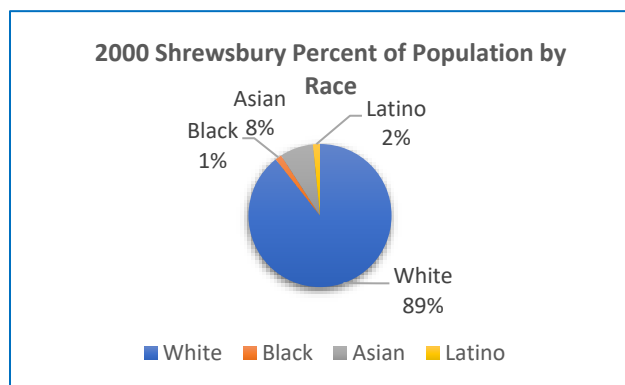


Figure 5: 2000 Shrewsbury Racial Demographics

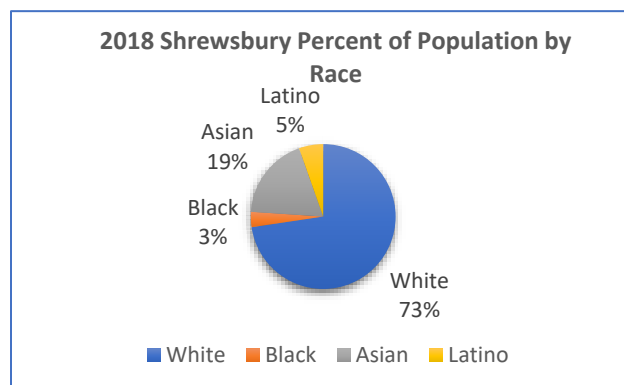


Figure 6: 2018 Shrewsbury Racial Demographics

In 2018, according to the American Community Survey, 71% of 35,176 residents 5 years over spoke English only. Of the residents 5 years or over, 12% spoke English less than “very well”, and 29% spoke a language other than English as their primary language. Spanish was spoken by 4% of the population, 12% spoke other European languages, and 10% spoke South Asian, East Asian, or Pacific Island languages. Special outreach might be needed to reach some of these populations.

ENVIRONMENTAL JUSTICE

Since 2002, the Executive Office of Energy and Environmental Affairs (EOEEA) has been implementing an Environmental Justice Policy to help ensure that all Massachusetts residents experience equal protection and meaningful involvement with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies, and the equitable distribution of environmental benefits. This policy was instituted recognizing that communities across the Commonwealth, particularly those in densely populated urban areas and in or near old industrial areas, face many environmental challenges associated with Massachusetts’ industrial legacy. Residents in these predominantly low-income and minority communities lack open space and recreational opportunities, and often live close to existing large and small sources of pollution which can pose risks to public health and the environment.

Critical to advancing Environmental Justice (EJ) in the Commonwealth is the equitable distribution of environmental assets such as parks, recreation, and open space. Toward this end, and where applicable, municipalities shall identify and prioritize open space sites in the Open Space and Recreation Plans that are socially, environmentally, and ecologically important to EJ populations within the community.

As mentioned in Section 2, the Town of Shrewsbury has a significant Environmental Justice (EJ) Community, which is mapped and shown on **Map 2: Environmental Justice Map** (Appendix A). Based on data from the 2010



Census, a population of 11,670, or 32.8% of the total population, fall into the category of minority residents, the category of residents lacking English proficiency, or both categories. The majority of this population resides south of Route 9, with some EJ populations also residing along the western boundary of the Town, adjacent to Worcester. The entire population that falls into both the minority and English isolation groups resides in the triangular geographical area bounded by Route 9 on the north, Memorial Drive on the west, and Route 20 on the south and east.

D - GROWTH AND DEVELOPMENT PATTERNS

PATTERNS AND TRENDS

Like many towns, Shrewsbury's past was more rural. Although the Town has grown significantly, it is still possible to see its agricultural roots. In the early 18th century, much of Shrewsbury's land was used for growing crops. Fruit orchards were plentiful as were other types of produce and livestock. Driving down many of Shrewsbury's streets it is still possible to experience a flavor of this history. There are many narrow, winding, tree-lined ways that stand in contrast to busy Route 9 and some of the other, more modern roads that cross the Town. The Town is home to a few remaining agricultural operations.

Shrewsbury and its immediate neighbors present sort of a microcosm of the history of development in Massachusetts and other urbanized states. Shrewsbury's first big development stage was as a bedroom community to the City of Worcester directly to its west. Meanwhile most of its immediate neighbors maintained their small-town character. With the completion of the interstates and the trend to development along them, neighbors like Westborough and to a lesser extent Grafton and Northborough became less rural. Here though the orientation was away from Worcester and towards the interstate highways. With the burst of residential development in the 1980's, growth in Shrewsbury began focusing more toward the east and away from Worcester, and this has continued until the present day. This is evidenced by the heavy residential development occurring in the northern part of town near the I-290 interchanges.

According to the 2020 edition of Massachusetts Audubon's "Losing Ground", the Town of Shrewsbury has the eighteenth highest rate of development in the State (standardized by town size) with 6.8 acres per square mile developed between 2012 and 2017. However, this rate of growth has decreased from the early 2000's, when 14.8 acres per square mile were being developed. It is part of a significant cluster of high growth communities in the Blackstone River Watershed and is part of what Massachusetts Audubon and others refer to as the Sprawl Frontier. According to "Losing Ground," Shrewsbury ranks very low among all municipalities for permanently conserved land, ranked at 295 (out of 351 cities and towns) for total acres of permanently conserved land, and 335 for percent of land permanently conserved (6% of the total area).



INFRASTRUCTURE

Streets: The number of roadway miles in Shrewsbury has not changed significantly in the last 10-15 years, with a total of 186.51 roadway miles in 2019, and 185.54 roadway miles in 2007. The number of miles of subdivision and private roads has decreased slightly, and the number of miles of Town roads has increased slightly. As reported in the Town of Shrewsbury's Annual Town Reports, the table below summarizes road miles from 2007 to 2019.

Table 3.7 - Summary of Roadway Miles

Roads	2007	2008	2009	2010	2019
State Roads (miles)	18.41	18.41	18.41	18.41	18.41
Town Roads (miles)	148.54	148.65	149.07	150.47	153.61
Private Roads (miles)	13.07	13.07	13.07	13.07	12.48
Subdivision Roads (miles)	5.52	5.51	6.07	4.77	2.01
Total	185.54	185.64	186.62	186.72	186.51

(Town of Shrewsbury, 2007, 2008, 2009, 2010, and 2019)

The Highway Division maintains the more than 153 miles of Town roadway, along with more than 100 miles of sidewalks. The sidewalks are primarily in and around the Town Center, with some sections along major roadways in other areas of Town. There is a need for additional sidewalks in many residential areas, as well as for improvements to sidewalks that are in poor condition. The Town has completed Tiers I and II of the Complete Streets Program. The [Prioritization Plan](#) includes 34 proposed projects, including Dean Park Sidewalk and Ramp Repairs, North Quinsigamond Ave Sidewalk Extension, Lake Street Sidewalk Construction, and MA-140 (Memorial Drive) Bicycle Facility.

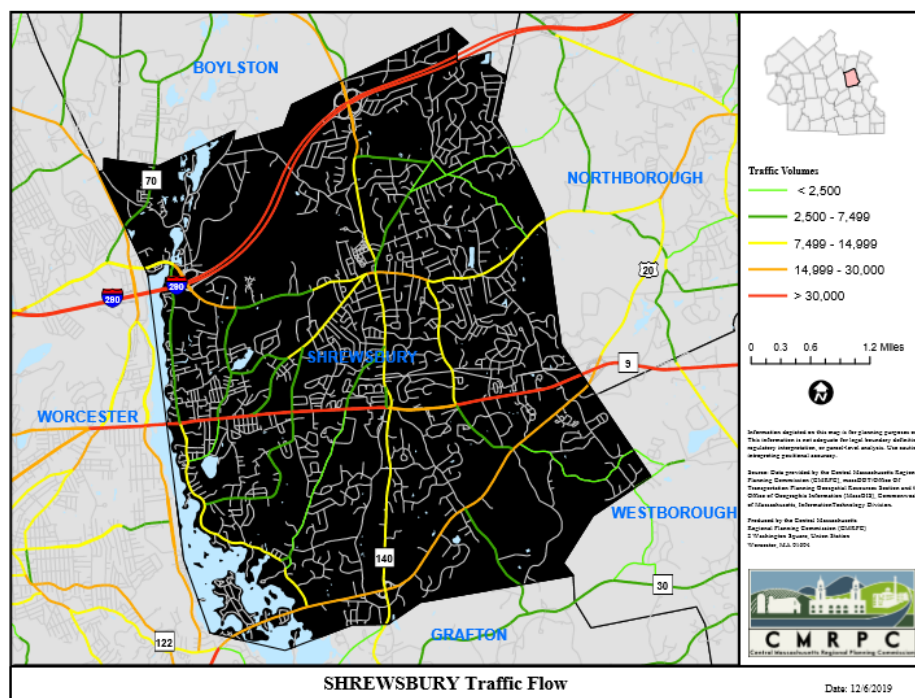
One indication of growth is traffic. Central Massachusetts Regional Planning Commission (CMRPC) collects traffic data along the primary routes in the Town, and traffic volumes along these roadways are shown in the figure below. The highest traffic volumes (red) are on I-290 and Route 9, followed by Route 20 (orange), and the section of Main Street between Route 140 and South Street.

The 2010-2018 American Community Survey estimated that the average commute in 2018 was 30.2 minutes (MOE 1.4), only a slight increase from the average commute time in 2010 of 27.3 minutes. The slightly increased commuting time might be a result of a number of factors including an increase in population and residents



commuting to work, an increase in employment opportunities further from Shrewsbury, or decreased employment opportunities locally.

Figure 7 - Shrewsbury Traffic Volumes



(CMRPC, 2019)

Water and Sewer Systems: The Shrewsbury Water Department was started in 1905. It is municipally owned by the Town of Shrewsbury. All of the water supply is derived from a series of gravel packed wells. These wells are primarily located in the northwest quadrant of our community. The Home Farm and Sewall Street well, are the most productive, but the Town has two other less productive sources in the Lambert and South Street sites. A large and very productive aquifer is located to the north and east of Lake Quinsigamond, and it is this aquifer that provides a majority of the Town's water. According to the engineering department there are few remaining opportunities for the Town to develop new wells. According to the Water and Sewer Department Annual Town Report from 2018, the Water Department supplied 11,551 total connections, with 41 new connections added in 2018. As of 2018, there was a total of 207.43 miles of water main. Few residents and businesses depend on their own private wells.





On an average day, the Department pumps about 3.3 million gallons per day from eight active wells. Fifteen hundred fire hydrants are serviced by the department. Water is treated for volatile organic compound (VOC) removal, corrosion control and manganese sequestering. Fluoridation and chlorination is also added to the water supply. The new Water Treatment Plant, which started construction in July, 2017, became fully operational in early October of 2018. The project involved the building of a new plant using a biological filter treatment system for manganese removal along with chemical addition process controls. Shrewsbury is currently piloting programs for the removal of low levels of hexavalent chromium and PFAs.

Outside watering restrictions and/or restrictions on non-essential water use are implemented yearly between May and October in compliance with the Town's Water Management Act Permit. Water restrictions may be instituted if drier conditions warrant, as was the case in the drought of 2010.

The Sewer Department started as a separate department in 1963. Wastewater is treated with primary and secondary treatment at the regional Westborough Wastewater Treatment Plant. The department maintains over 9,849 sewer connections, adding 61 new connections in 2016 and 56 in 2017. After treatment water is discharged into the Assabet River. The Department operates and maintains approximately 40 pump stations and 170 miles of sewer main.

Upgrades are underway at the Westborough Treatment Plant as a result of a mandate by the US Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (DEP). Agencies issued a directive to reduce the amount of phosphorus discharged as part of the requirements for the renewal of the plant's operating permit. Because of the plant's age, other repairs and upgrades are also being undertaken. The cost of this upgrade is budgeted at \$57 million, with Shrewsbury paying 57 - 61% of the cost. It is expected that the Federal government will provide approximately \$5 million in stimulus funds from the American Recovery and Reinvestment Act to offset the cost of this project.

LONG TERM DEVELOPMENT PATTERNS

Zoning: The Town adopted zoning regulations to begin managing its growth in 1967. The last amendment to the Zoning Map was approved at the Annual Town meeting in August 2020. Shrewsbury is divided into 18 districts with several overlay districts. Map 3 - Zoning Map shows Shrewsbury's complex array of zoning districts. The intents of the various districts are described below:

1. The Rural AA District is intended as a residential district for detached single family homes and open space, recreation and conservation areas in addition to planned residential development.
 - 1a. The Rural A District is intended as a residential district for typical rural uses with which one-family homes are compatible.



2. The Rural B District is intended as a district for low density uses with which one-family homes are compatible.

3-5. The Residence A, B-1, and B-2 Districts are intended as districts for rural, residential and noncommercial uses.

6-6a. The Multi-Family MF-1 and MF-2 Residential Districts are intended for low density multi-family residential uses.

7. The Apartment District is intended for high density multi-family residential uses.

8. The Limited Business (LB) District is intended to provide consumer goods and services.

9. The Commercial-Business (CB) District is intended to provide goods and services for transients or tourists and non-consumer goods and services.

9a. The Limited Commercial-Business (LCB) District is intended to provide goods and services for residents, transients and/or tourists as well as office uses.

10. The Limited Industrial (LI) District is intended for use by research laboratories, office buildings and light industries.

11. The Neighborhood Business District is intended to provide consumer goods and services under highly controlled conditions so as not to be disruptive to adjacent residential properties.

12. Town Center is intended to foster a pattern of land use and site development that creates a walkable mixed-use Town Center reinforcing the traditional New England character already in place.

13. The Office-Research District is intended for use by research laboratories and office buildings which would be compatible with rural residential neighborhoods.

13a. The Limited Office-Research District is intended for use by specialized biomedical, pharmaceutical, research and development, and production facilities.

Table 3.8 - Zoning District Descriptions

District	Minimum Lot Area (square feet)	Minimum Lot Frontage (feet)	Raw Acres	Percentage of Town
Total			13,923.53	100.0
1. Rural A	20,000 – 40,000	125-150	1,759.13	12.6
1a. Rural AA	45,000	150	68.42	0.5



District	Minimum Lot Area (square feet)	Minimum Lot Frontage (feet)	Raw Acres	Percentage of Town
2. Rural B	20,000 – 40,000	125-150	2751.76	19.8
3. Residence A	20,000 – 40,000	125-150	2362.55	17.0
4. Residence B-1	12,500 - 40,000	100-150	2666.26	19.2
5. Residence B-2	12,500 - 40,000	100-150	1563.18	11.2
6. Multi-Family - 1	12,500 - 16,000	50-125	156.45	1.1
6a. Multi-Family -2	12,500 - 160,000	50-125	127.30	0.9
7. Apartment	12,500 - 20,000	100-150	74.81	0.5
8. Limited Business	12,500	100	66	0.5
9. Commercial-Business	40,000	150	739.33	5.3
10. Limited Commercial Business	40,000	150	156.15	1.1
11. Limited Industrial	80,000	50	1006.14	7.23
12. Neighborhood Business	25,000	150	2.73	0.02
13. Town Center District	5,000	50	53.11	.38
14. Office-Research	80,000	100	296.31	2.1
13a. Limited Office-Research	80,000	200	73.87	0.5
Aquifer Protection Overlay	Underlying district	Underlying district		
Lakeway Overlay	Underlying district	Underlying district		
Edgemere Overlay	Underlying district	Underlying district		
Route 20 Overlay	Underlying district	Underlying district		
Flexible Development Overlay A & B	Underlying district	Underlying district		

(Town of Shrewsbury Zoning Bylaw Amendments through August 2020)



Shrewsbury has an Aquifer Protection Overlay District (Section VI. Subsection D of the Town Zoning Bylaw). The purpose of the Aquifer Protection Overlay District is to promote and protect the public health, safety and welfare by protecting aquifers and recharge areas serving an existing or potential public water supply from contamination. In addition, Shrewsbury has four (4) special development overlay districts (Zoning Bylaw Section VII Subsections M, N, O, P) – The Lakeway Overlay District, the Route 20 Overlay District, the Edgemere Village Overlay District, the Flexible Development Overlay District. These overlay districts allow development compatible with the Town vision and that provide benefits such as desired residential design, economic development, compact development and walkability. Maps of the overlay districts are present within the Zoning Bylaws.

The Flood Plains Bylaw (Zoning Bylaw Section VII, Subsection I) uses the Flood Insurance Rate Maps (FIRM) to delineate areas subject to season or periodic flooding and controls development of these areas. The revised Flood Insurance Rate Maps (FIRM) dated July 16, 2014 were adopted by the Town in May 2014.

The Cluster Development Bylaw (Zoning Bylaw Section VII, Subsection L) is intended to provide for the public interest by the preservation of open space and natural landscape features in perpetuity and to encourage development designed to accommodate a sites physical characteristics such as topography, vegetation, water bodies, wetlands, open spaces such as farmlands and meadows, major scenic views and wildlife habitats. The bylaws require that development of this type designate at least 40% of the total area as common land not to be covered by buildings, roads, driveways or parking areas.

The Town of Shrewsbury has a Stormwater Management Bylaw (Town General Bylaws, Article 21) which was enacted in order to regulate discharges to the municipal separate storm sewer system (“MS4) for the following purposes: To safeguard the public health, safety and welfare; improve stream health and environmental conditions; protect the Town of Shrewsbury’s water bodies and groundwater from further negative impacts of stormwater runoff; reduce contamination of stormwater runoff; protect aquatic and wildlife habitat; comply with federal and State regulatory mandates of the National Pollutant Discharge Elimination System Program; and to reduce flooding.

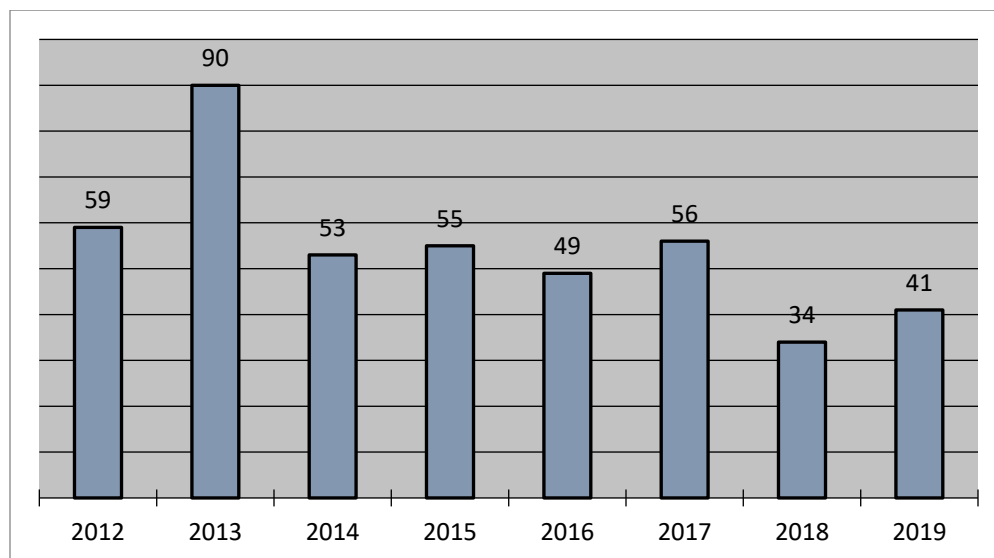
In 2019, the Town also adopted Stormwater Management Rules and Regulations and a stormwater enterprise fund to administer the stormwater management program. This is funded by revenue from a Stormwater Utility Fee and Stormwater Application Review and Inspection Fee.



RESIDENTIAL DEVELOPMENT

Figure 8 below shows the building permits issued for housing units in Shrewsbury between 2012 and 2019. The graph demonstrates a steady pattern of residential development although there was less resident development in 2019 compared to previous years, though there has been an increase since the previous year.

Figure 8 – Residential Building Permits Issued for Shrewsbury, 2012-2019



(Town of Shrewsbury, MA Annual Reports, 2012-2019)

For the last twenty years, the communities in the 495/MetroWest region of Massachusetts have undergone significant growth in employment and population. Looking forward, the region's public and private sector leaders recognize the need for collaborative approaches to infrastructure and land use to ensure the vitality of the region's economy and quality of life. In 2003 a group of regional leaders formed the 495/MetroWest Partnership, a public-private association, in order to address economic development, housing, transportation, workforce development, and natural resource conservation in the region.

In 2012, the 495/MetroWest Development Compact was developed to guide and inform land use decisions in 37 communities in the MetroWest region. The plan outlines strategies for identifying and enabling priority development and addressing infrastructure needs while also protecting areas identified for preservation. In 2017, the Central Massachusetts Regional Planning Commission worked with the 495/MetroWest Corridor Partnership to gather information on the Priority Development Areas of seven towns, including Shrewsbury. This was updated for the purposes of the OSRP in fall of 2020. Table 3.9 lists the areas identified for priority development and preservation in the Town of Shrewsbury.



Table 3.9 - Locally-identified Shrewsbury Priorities - 495/MetroWest Development Compact

Location/Site Name	Priority Type	Current Status (Developed or No Change)
Route 140/I-290 Land 409 Boylston Street	Development	No Change – Vacant Greenfield
Edgemere Drive-in Site, Edgemere Overlay District 180-228 Hartford Turnpike	Development	Mixed Use Development (Under Construction)
Glavin Property 214 Lake Street	Preservation/Development	Purchased by the Town and Shrewsbury Youth Soccer in 2019. New Beal School, Soccer Fields, Agriculture.
Worcester Sand and Gravel 160 Holden Street	Development	Purchased by GFI early 2020, Zoning Change to Limited Industrial 2020 ATM
Route 9 – Bldg 19/Spags – Now Lakeway Commons	Development	Developed Mixed Use
Old Canada Dry Bottling Plant 335 Maple Avenue	Development	No Change - Vacant
Cen-Tech North 384-386 South Street	Development	Definitive Subdivision Road Approved in 2019
Bull Farm 609 Hartford Turnpike and 263 Cherry Street	Development	Developed – Solar Farm
Cen-Tech East Fortune Boulevard	Development	Developed
Worcester Foundation Property 200 – 222 Maple Avenue	Development	No Change – Use by UMass
White City Re-investment Opportunity 20 – 120 Boston Turnpike	Development	Developed – Shopping Plaza
Postal Service Site 192 Main Street	Development	No Change – USPS Distribution Facility

(Massachusetts Executive Office of Housing and Economic Development, 495/Metrowest Development Compact Regional Study, 2017. Updated in 2020 for purposes of the OSRP.)

The Town's prosperity, true to its history, rises and falls with the national and regional economy, but is buoyed by its regional location and many assets. The Town demonstrates a resilience and steadiness of character that make it attractive for residents and visitors alike.



SECTION 4: ENVIRONMENTAL INVENTORY AND ANALYSIS

A – GEOLOGY AND SOILS

Geology affects topography by creating the varying elevations seen in Town. It affects soils by providing some of the parent materials with their different fertility and drainage characteristics. These same characteristics of soils affect the type of vegetation supported and the type of development that can occur. Geology, topography and soils all affect surface and groundwater hydrology, which are important to both the natural and created environments. The underlying geology of Shrewsbury has given rise to the Town's two major defining landscape features - Lake Quinsigamond in the west and the Shrewsbury Ridge to the east.



Photo Credit: Trish Settles

The *bedrock geology* of Shrewsbury consists of five (5) dominant rock types typically with a northeast southwest orientation. One of the largest units found in Shrewsbury are bands of the Nashoba Formation (nu). Bands of this formation can be found generally through the center of Shrewsbury including in the vicinity of Ward, Golden, Temple, Union, Prospect and Tomblin Hills, but also near Route 290 including the area of Slocum Meadow and Rawson Hill. It is described as light to gray rocks composed chiefly of muscovite biotite-oligoclase-quartz gneiss with a few lenses of marble. Cutting through the

Nashoba Formation is the Tadmuck Brook Schist (tb). Areas around Prospect Park in the central part of town are largely comprised of the Tadmuck Brook Schist, a metasedimentary rock that lies south of the Clinton Newbury Fault. Small areas in the northeast part of town contain amuscovite and quartz monzonite (mqm) and metasiltstone-phyllite (msp), both found proximal to the Tadmuck Brook Schist. Finally the eastern portion of town is dominated by the Andover Granite (ag), a light to medium gray quartz monzonite (an igneous rock). One significant northeast southwest oriented fault has helped created the juxtaposition of these rock formations, the Spencer Brook Fault, west of Temple Hill. (Barosh, 1978)

The surficial geology of Central Massachusetts was largely influenced by glacial advance and retreat.



The most recent, the Wisconsin glacier, at times two miles thick, rode over the area creating and redistributing glacial till, forming drumlins and outwash plains. Oak Hill in Littleton is the northern tip of a long ridge of hills called Shrewsbury Ridge by geologists. In glacial times, the ridge acted as the eastern shore of a vast glacial lake, Lake Nashua. Its northern shore was the face of the melting glacier.

In more rural and agricultural communities *soil types and characteristics* are of critical importance for development. In Shrewsbury, where large portions of the Town are served by central water and sewer systems, and there are few agricultural operations, soil constraints play a relatively minor role in development. As with slopes, confined areas of poor soils, like those with high water tables or that are very rocky, do pose some development constraints. Again, on a town wide basis, these constraints are generally not a hindrance.

The US Department of Agriculture has produced a soil survey for the Town. It found that Shrewsbury is covered by five general soil groups. The approximate percent of land area for each is found in Table 4.1.

Table 4.1 – Shrewsbury Soils

General Soil Group	Approximate % of Land Area
Winooski-Limerick-Saco	3%
Hinckley-Merrimac-Windsor	17%
Paxton-Woodbridge-Canton	61%
Chatfield-Hollis	8%
Urban Land-Hinckley	6%
Water	5%
<i>(USDA, Soil Survey of Worcester County, 1997)</i>	

To make soils information easier to understand on a town-wide or regional basis, the USDA creates these generalized groupings. However, in practice there are dozens of distinct soil types that cover the Town. Soil scientists determine a number of variables for these types including depth to bedrock, height of the water table, suitability for in ground septic systems, and ability to support agricultural uses. While this plan will not go into the details of this data, it is important to note that even though Shrewsbury's central sewer and water systems diminish the importance of specific soil characteristics, they still impact development on a location-specific basis. Shallow soils may cause the need for blasting and

thus add to expense. Other types that are relatively unstable may necessitate special berms or embankments.



Within the five major soil groups the Hinckley-Merrimac-Windsor soils are the best suited for development (though this generalization is very broad). Chatfield-Hollis soils on the other hand generally have more severe limitations than the other soil groups. Shrewsbury's most extensive soil group, Paxton-Woodbridge-Canton, moderately limits development. A high-water table and the

potential for frost action are particular problems. With respect to recreational development, the soil survey observes that in the Paxton-Woodbridge-Canton soil group playgrounds are difficult to create because of the proliferation of rocks and stones. Other recreational uses including trails and picnic areas are less severely impacted. Soil types are one factor to consider in development decisions, however, in Shrewsbury other factors will play a more significant role.

Map 4 – Soil Map (Appendix A) shows the soils based on the dominant drainage class as well as the locations of prime farmland soils.

B – TOPOGRAPHY AND LANDSCAPE CHARACTER

TOPOGRAPHY

It would be difficult to paint Shrewsbury's landscape in one broad brush. Shrewsbury's landscape is variable, with elevations ranging from 755 feet at Rawson Hill to approximately 350 feet in the Edgemere section. Relatively small pockets of steeply sloping land are scattered throughout the Town, though there are no large contiguous areas. Steeply sloping land on individual parcels, particularly areas over 25%, present problems for development. However, on a town-wide basis, since these areas are relatively limited, they do not pose a major constraint. The 2012 Open Space Plan recognized four areas of particular note with respect to steep slopes: 1) in the northwest, east of Sewall Hill, 2) toward the southwest near the Grafton town line, 3) in the northeast along Union Hill and, 4) in the northeast along Rawson Hill.



Photo Credit: Trish Settles

Shrewsbury's two major defining landscape features are Lake Quinsigamond in the west and the Shrewsbury Ridge to the east. Views of the lake are afforded particularly from the Town's major east-west roadway corridors. Coming west on Interstate 290 the driver is given a rather sweeping view of a well-defined valley with relatively high and steep embankments on the western (Worcester) shore. From Route 9 heading toward the lake, a few blinks and the observer might miss it amongst all the retail development on both sides. From Route 20 to the south, the lake is visible in various places, but in that

location as more of a swamp than a deep finger lake. Otherwise there are few if any extended views of the lake from major public places.

Rawson Hill in the northeast part of town, near Interstate 290, is the Town's highest point at 755 feet above sea level. While a subdivision flanks it to the north, the hill itself is partially owned by the Town's Conservation Commission. The Shrewsbury Sportsmen's Club owns a small piece of land at the western foot of the hill and the state owns an area to the south as part of the Sudbury Assabet Concord (SUASCO) watershed. Additional wetlands, some owned by the Conservation Commission, and the Northborough Reservoir lie just to the east. Together these properties and features create a landscape with a great deal of diversity. More prominent access could make this into an interesting and well used passive recreation area. There may be a potential for development of new trails or enhancement of and connection to existing trails on this property and nearby by properties.

Another important landscape feature is the Slocum Meadow. This over 300-acre wetland/floodplain complex covers a large portion of the northwestern part of town, straddling Interstate 290. Limited views are available from Gulf Street. Some of the land is in public ownership, but much of it is in private hands. The Town might consider working more actively with the various owners to make this a more widely used area for passive recreation and education. New England Forestry Foundation owns approximately 75 acres on Gulf Street, which is open to the public and posted. This property connects to town land. Some portions north of Route 290 are accessible from Cypress Avenue. St. John's High School and City of Worcester still own about 135 acres as well.

Boston Hill and Green Hill in the southeastern parts of town also represent important landscape features, with views to them from neighboring towns. These two features are also located in the largest remaining undeveloped area in Shrewsbury. Generally, the area is bounded by Route 20 to the north,



Centennial Drive on the west and the Town line elsewhere. Appreciable development has occurred along Arch Street in the far southeastern part of town, but otherwise development is sparse with large tracts of intact forest. In 2018 the Town acquired several large parcels of land that were formerly part of the Grafton State Hospital. This land is relatively undeveloped and will be used for agricultural preservation, open space, and active and passive recreation.

Thus, while the motorist passing through town on Route 9 may suspect there are not many natural areas left in Shrewsbury, the truth is that the Town has a number of important and beautiful landscapes that are meaningful amenities and worthy of preservation. Preservation by itself is an important goal, but raising public awareness and providing good access will make these areas an even more valuable part of Shrewsbury.

C - WATER RESOURCES

WATERSHEDS AND DRAINAGE

A drainage network can be divided into drainage basins. Often called watersheds, drainage basins are land areas which collect the water from precipitation and replenish waterways. Streams and brooks are, in turn, fed by smaller sub-watersheds that comprise a large drainage basin.

Shrewsbury is divided by the watersheds of two major rivers, the Blackstone and Concord (including the Sudbury and Assabet). The Blackstone watershed covers approximately the western two-thirds of the Town, while the Concord covers the remaining areas in the east. However, because of Shrewsbury's relatively high elevation, no major rivers pass through the Town. The most significant named stream in the Blackstone watershed is the Big Bummet Brook which flows due south into Grafton. Streams and brooks are important natural resource corridors. They contain the habitats of many plants and animals. They also channel runoff into water bodies like Lake Quinsigamond. In many ways the health of streams and brooks dictates the quality of water in these larger water bodies.



Photo Credit: Angela Snell

A total of 13.7 square miles of Shrewsbury lie within the Blackstone Watershed Basin and 8.0 square miles of Town lie within the Concord Watershed Basin. The Town is contained in the Headwaters of the Assabet River Sub watershed which is 103.5 square miles and also includes parts of Northborough and



Westborough. The other sub watershed that includes parts of Shrewsbury is the Quinsigamond River Subwatershed which is 98.2 square miles and also includes parts of Worcester, Grafton and Boylston. All rain and snow that falls in Town will drain to these two (2) sub watersheds of the Blackstone and Concord Watershed Basins. Water Resources Map 1 (Map 5, Appendix A) shows the location of the major aquifers, watersheds, sub watersheds, and wetlands in Shrewsbury and surrounding towns.

FLOOD PLAIN AND WETLANDS

A wetland is an area of land whose soil is saturated with moisture either permanently or seasonally. Such areas may also be covered partially or completely by shallow pools of water. Wetlands include swamps, marshes, and bogs, among others and tend to occur in areas where, because of underlying geology, the water table intersects with the ground surface or where slowly permeating soils prevent drainage. Wetlands slow floodwaters, protect uplands from erosion, increase water quality, provide setting for recreation and study, support a diversity of wildlife across the landscape, moderate local climate, recharge groundwater, produce products such as timber, peat, fish, rice, cranberries, blueberries, and hay for livestock.

The total size of wetlands (DEP Wetlands layer) in Shrewsbury is 877.41 acres. Slocum Meadow, located in the vicinity of I-290 midway between the Route 140 interchange and the city of Worcester, is the largest. This area is comprised of wetland soils, an open stream (West Brook) and associated floodplains covering over 300 acres. The Meadow is almost entirely undeveloped with the exception of a few trails. Several other large wetland areas are spread around town including some in the northeast owned by the state as part of the Sudbury Assabet Concord (SUASCO) watershed, another area due south of Dean Park not far from Main Street and another area around and to the west of the New England Power Company transmission lines northeast of Flint Pond. There are numerous smaller wetland areas throughout the Town. These are important places for resource protection because they provide many benefits to the Town including: flood control, recharge of the groundwater supply, protection of public water supply, prevention of pollution, and protection of wildlife habitat. Wetlands are shown on Map 5.

The total size of wetlands (DEP Wetlands layer) within a 100-year flood zone (DFIRM layer) in Shrewsbury is 446.01 acres. The 100-year flood plain areas are located in the lower lying elevations of many lakes, ponds, streams and their tributaries, and is calculated to be the level of flood water expected to be equaled or exceeded every 100 years on average. While the Federal Emergency Management Agency (FEMA) now uses "1% Annual Chance Flood Boundary", the 100-year flood plain (previously used) is still a great indicator of the area potentially affected by rising flood waters. The 100-year flood area is shown on Map 6.



GROUNDWATER RESOURCES

Most importantly perhaps are the Town's *groundwater resources*. A large and very productive aquifer is located in the northwestern area of town. It runs from Boylston southerly into Shrewsbury through the area of Newton Pond and down toward Lake Quinsigamond. This aquifer is where the Town's most productive wells are located: The Home Farm and Sewall Street wells. Shrewsbury has an inter-municipal agreement with the city of Worcester to allocate ground water resources in the Lake Quinsigamond aquifer. The Town received a new Water Withdrawal Permit from MA DEP in 2015 that allows a maximum total pumping volume from all of Shrewsbury's sources of 7.8 million gallons, with the maximum authorized annual average withdrawal of 4.35 million gallons per day. This is also an area where sand and gravel mining has removed much of the soil covering thereby greatly diminishing natural recharge capacity. In addition, nearly all the homes and businesses in the area have on-site septic systems versus municipal sewer connections. Another more minor aquifer is located off South Street in the vicinity of Floral Street. For the most part, the Town has utilized most of the usable capacity of these aquifers. As such there are few opportunities left for the Town to develop additional sources for municipal groundwater supplies.

Protection of these resources is absolutely essential to the long-term health of the community. There are no other major aquifers in the Town and the remaining areas that have not been tapped are nowhere near as productive. Pollution of any of these aquifers could mean a crisis of major proportions, and thus the Town has adopted strict aquifer protection regulations. However, as discussed above there are existing land uses both inside and outside aquifer protection zones that pose a potential threat to the Town's drinking water. The Shrewsbury Water Department has long recognized the susceptibility of these groundwater resources, and has worked to maximize their protection, including acquiring land within the primary recharge areas of the wells.

SOURCE PROTECTION AREAS

The Town's water supply comes entirely from a series of eight (8) active gravel packed groundwater supply wells, located in the northwest quadrant of Town. The eight wells are pumped to the Home Farm Water Treatment Plant facility for treatment before entering the distribution system. The three remaining wells South St., Sewall St. #5 and Oak St are presently not in use because their rated daily capacities have been transferred to the Home Farm Wells. This site has higher yield capacity and better pumping efficiency for the Town.

Mineral deposits of iron and/or manganese, which occur naturally in the water and soil of the Northeast, are present in these wells and can have health effects on residents. Despite the use of a sequestering agent and other approaches to keep the manganese in solution, over time the mineral has



accumulated in the water distribution system. In order to remove the manganese, the Town completed the construction of a Biological Treatment Facility, the Home Farm Water Treatment Plant, in 2018. The Town also developed a flushing project to address the minerals that have already accumulated in the water system that cannot be removed by the treatment facility. The Town is currently pilot testing for hexavalent chromium as well as an emerging contaminant known as PFAS (Per- and Polyfluoroalkyl Substances). PFAS has been detected at low levels, well below the established thresholds, allowing the Town to be proactive in taking the necessary actions to best manage this new challenge.

Wellhead protection areas are important for protecting the recharge area around public water supply (PWS) groundwater sources. A Zone II is a wellhead protection area that has been determined by hydro-geologic modeling and approved by the Department of Environmental Protection's (DEP) Drinking Water Program (DWP). In cases where hydro-geologic modeling studies have not been performed and there is no approved Zone II, an Interim Wellhead Protection Area (IWPA) maybe established based on DEP DWP well pumping rates or default values. Certain land uses may be either prohibited or restricted in both approved (Zone II) and interim (IWPA) wellhead protection areas. The minimum IWPA radius is 400 feet and the maximum radius is 0.5 miles. The Zone II area for each well is the primary recharge area for the aquifer. Each of the wells has a protected area known as Zone I which is the 400-foot radius proportional to the well's pumping rate. The Town owns or controls by easement these protected Zone I areas. ([Town of Shrewsbury Water and Sewer Division 2019 Annual Drinking Water Quality Report](#)).

The Source Protection areas for Shrewsbury are all located in the northwest corner of the Town in the vicinity of Lake Quinsigamond. Two interim wellhead protection areas (IWPA's) encompass the Town's wells. Approved Wellhead Protection Areas (Zone IIs) generally overlap the IWPA's and extend from just south of Route 290 up to the northern extent of Lake Quinsigamond. The Town has 6 community ground water wells, no transient non-community wells, no community surface water sources, and no emergency surface water sources. The Town of Northborough reservoir is located in the upper northeast corner of town but is not used for drinking water. There are no Surface Water Protection Areas (Zone A, B, or C).

The Source Water Assessment and Protection (SWAP) program assesses the susceptibility of public water supplies to potential sources of contamination. The Department of Environmental Protection (Mass DEP) completed its assessment on each of the Zone II's for Town of Shrewsbury's Wells in 2003. The 2003 Source Water Assessment and Protection Report stated that:

"The wells for the Shrewsbury Water Department are located in two (2) Zone II and an IWPA. The GP #1 South Street Well (01G) is currently inactive and located within Zone II #578 in the northwest of Shrewsbury. The Zone II (#577) for the other wells extends in to the City of



Worcester and the Town of Boylston, with a small section in the Town of West Boylston. The system also has an emergency source, well 2271000-03G, which is not assessed in this report. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration.”¹

In 2003 the Zone II land uses for Shrewsbury were a mixture of residential, commercial, and light industrial land uses. Some of the 2003 land uses and activities are or were potential sources of contamination. Key Land Uses and Protection Issues included:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system in 2003 was high, based on the presence of at least one high threat land use within the water supply protection areas. The 2003 SWAP Recommendations are listed below, and those that have been implemented are noted. Actions have been taken to address many of these recommendations. The Town should review these again to see if further or additional actions can be taken to reduce the susceptibility even more.

- Zone I Recommendations:
- To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP’s Zone I requirements.
- Use Best Management Practices (BMPs) for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- Do not use or store pesticides, fertilizers or road salt within the Zone I.
- Keep any new non-water supply activities out of the Zone I.

¹ Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well’s pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP.

IWPA: Interim Wellhead Protection Areas



Residential Land Use Recommendations:

- Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet which provides BMPs for common residential issues. *(Implemented)*
- Work with planners to control new residential developments in the water supply protection areas.
- Promote BMPs for stormwater management and pollution controls. *(Implemented)*

Transportation Corridor Recommendations:

- Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II. *(Partially implemented)*
- Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff. *(Town implemented, unsure about State program frequency)*
- Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options. *(Mapping ongoing. Outfalls are mapped and currently working on other components. Maps are digital and we started using a new program this summer)*

Hazardous Materials Storage and Use Recommendations:

- Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" which provides BMP's for common business issues.
- Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- Educate local businesses on Massachusetts floor drain requirements.

Oil or Hazardous Material Contamination Sites Recommendation:

- Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

Protection Planning Recommendations:

- Develop a Wellhead Protection Plan. Establish a protection team.



- Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2).
- If local controls do not regulate floor drains, be sure to include floor drain controls that meet 310 CMR 22.21(2).
- Work with town boards to review and provide recommendations on proposed development within your water supply protection areas.

Source Protection Recommendations (To better protect the sources for the future):

- Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- Educate residents on ways they can help you to protect drinking water sources.
- Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- Develop and implement a Wellhead Protection Plan.

SURFACE WATER

About one square mile, or less than 5%, of Shrewsbury's total surface area is comprised of open water in ponds or lakes. In addition to Lake Quinsigamond, which is partially located in Worcester, other surface water bodies include Jordan Pond, Mill Pond, Newton Pond, and a portion of the Northborough Reservoir. There are no large rivers to speak of in Shrewsbury, but there are abundant ponds and streams. In addition to many others, the following 19 named ponds and streams are located in town

- | | |
|-----------------------|--------------------------------------|
| • Newton Pond | • Northborough Reservoir (in a part) |
| • Flint Pond | • Poor Farm Brook |
| • Shirley Street Pond | • West Brook |
| • City Farm Pond | • Hop Brook |
| • Mud Pond | • Straw Hollow Brook |
| • Eaton Pond | • Ransom Brook |
| • Mill Pond | • Little Bummet Brook |
| • Hill Farm Pond | • Big Bummet Brook |
| • Windle Pond | • Meadow Brook |
| • Jordan Pond | • Dean Park Pond |



It is an ongoing challenge for Shrewsbury and Worcester to preserve the environmental quality of Lake Quinsigamond in particular, within its heavily developed watershed. However, all of the water bodies in Shrewsbury face some level of pollution threats. Old, on-site waste disposal systems, runoff from roads, and storm sewers all contribute to diminished water quality. Efforts are on-going to slow down water quality degradation, but to date pollution remains a serious threat to the health of these water bodies.

The Massachusetts Department of Environmental Protection (DEP) is responsible for monitoring the waters of the Commonwealth, identifying those waters that are impaired, and developing a plan to bring them back into compliance with the Massachusetts Water Quality Standards. The list of impaired waters, better known as the “303d list” identifies river, lake, and coastal waters and the reason for impairment. Once a water body is identified as impaired, DEP is required by the Federal Clean Water Act to essentially develop a “pollution budget” designed to restore the health of the impaired body of water. The process of developing this budget, generally referred to as a Total Maximum Daily Load (TMDL), includes identifying the source(s) of the pollutant from direct discharges (point sources) and indirect discharges (non-point sources), determining the maximum amount of the pollutant that can be discharged to a specific water body to meet water quality standards, and developing a plan to meet that goal. The Shrewsbury water bodies that were incorporated in the 2016 “303D” integrated list are shown in the table below:

Table 4.1 - Shrewsbury Water Bodies on the "303 integrated list" 2016

Water Body	Size	Cause	Category
Brooklawn Parkway Pond	2.3 acres	Not applicable	Category 3 “No uses assessed”
Dean Park Pond	7 acres	Harmful algal blooms	Category 5 “Waters requiring a TMDL”
Flint Pond (North Basin)	92 acres	(Eurasian Water Milfoil, <i>Myriophyllum spicatum</i>), (Non-Native Aquatic Plants), Aquatic Plants (Macrophytes), Turbidity	Category 4a “TMDL is Completed”
Flint Pond (South Basin)	173 acres	(Eurasian Water Milfoil, <i>Myriophyllum spicatum</i>), (Non-Native Aquatic Plants), Aquatic Plants (Macrophytes)	Category 4a “TMDL is Completed”



Water Body	Size	Cause	Category
Jordan Pond	18.0 acres	Turbidity	Category 4a "TMDL is Completed"
Lake Quinsigamond	471 acres	Excess Algal Growth (Non-Native Aquatic Plants)	Category 4a "TMDL is Completed"
Newton Pond	54	Non-native Aquatic Plants, Aquatic Plants (Macrophytes)	Category 4a "TMDL is Completed"
Poor Farm Brook	3.6 miles	Sedimentation/Siltation (Aquatic Plants (Macrophytes)	Category 5 "Waters requiring a TMDL"
Shirley Street Pond	19.5 acres	Aquatic Plants (Macrophytes)	Category 4a "TMDL is Completed"
Windle Pond	3.7 acres	Not applicable	Category 3 "No uses assessed"

Massachusetts Department of Environmental Protection, 2016



D - VEGETATION

The vegetation of Shrewsbury, like every community, is determined by land use, climate, elevation, topography, aspect, and soils/geology. Vegetation serves as an anchor to topsoil helping control erosion. It also provides shade, animal habitat and aesthetic beauty. Traditionally timber harvesting has played an important part in New England's economy. Many years ago this was true of Shrewsbury as well. Minimal, if any, harvesting still goes on in the Town, it is of only minor significance.

Where trees have not been cleared the remaining specimens are mostly second (or even third) growth. The original forest was extensively cleared to make way for agriculture. Even so the Town still has a good variety of hardwood, mixed hardwood and softwood forest. Heights of mature vegetation range from 20 feet to over 50 feet. Species are those commonly found in southern New England. Common deciduous trees include birch, oak (red, white, and pin), Norway maple, spruce, ash, black locust, shag bark hickory, hop-hornbeam, young chestnut, and staghorn sumac. Coniferous trees are dominated by pine (white and pitch) and hemlock. In the southeastern part of town where the least amount of development has occurred, a beautiful mixed forest of birch, hemlock and oak covers much of the area. The understory is typically dominated by witch hazel, black huckleberry, and Pennsylvania sedge.

In forested wetlands, overstory vegetation is dominated by red maples, with green ash, American elm, ironwood, and dogwoods. The canopy in such swamps often reaches 30 to 40 feet in height. The shrub level generally consists of highbush blueberry, arrowwood, alder, holly, witch hazel, winterberry, spicebush, shadbush, and sweet pepperbush. The ground layer is composed of cinnamon fern, dewberry, sphagnum mosses, and hydrophytic grasses.



Photo Credit: Trish Settles

Wet meadows are dominated by cinnamon and sensitive fern, tussock sedge, reed canary grass, and sphagnum moss. It is also not uncommon for this type to be dominated by purple loosestrife, an invasive and opportunistic species. Intermittent stream bank wetlands are vegetated by species such as red maple and arrowwood. Few fields remain from Shrewsbury's agrarian past, with a few notable exceptions, such as Broken Creek Vineyard on South Street, farmland on Lake Street that was is part of the former Glavin Center property, and farmland on Route 140 south of the center of Town, which provides a pleasant vista of the Shrewsbury Ridge to the east.



According to the *Areas of Critical Environmental Concern (ACEC) Nomination Form* for the "Lake Quinsigamond Aquifer Resource Area" (1992), Flint Pond, the basin at the southern end of Lake Quinsigamond, is much shallower than the main body of water and supports diverse wetland habitats. Large shallow bays and wetlands support populations of emergent vegetation including broad-leaf cattail, purple loosestrife, pickerelweed, swamp willow, arrowhead, and burrweed. At the fringes are such woody riparian species as silky dogwood, speckled alder and red maple. White water lily and other aquatic macrophytes are also present in shallow water areas. The resultant vegetative mix creates a wealth of edge habitat for wildlife, while providing significant pollutant attenuation and sediment removal capabilities. The report indicates there are 533 wetland acres associated with this system, enough to support diverse, naturally-functioning wildlife populations.

The following rare vegetation species were listed in the Town of Shrewsbury. These data were extracted from the database of the Natural Heritage and Endangered Species Program in July 2019. None of these species have federal status. Philadelphia panic grass and Houghton's flatsedge are species found in dry, sandy ground, while black cohosh is a species of dry or moist soil.

Table 4.3 – Rare Plant Species in Shrewsbury

Taxonomic Group	Scientific Name	Common Name	MESA Status	Most Recent Observation
Vascular Plant	<i>Actaea racemosa</i>	Black Cohosh	E	1937
Vascular Plant	<i>Cyperus houghtonii</i>	Houghton's Flatsedge	E	1945
Vascular Plant	<i>Panicum philadelphicum</i> ssp. <i>philadelphicum</i>	Philadelphia Panic-grass	SC	1929
Vascular Plant	<i>Potamogeton vaseyi</i>	Vasey's Pondweed	E	2015

Massachusetts Department of Conservation and Recreation, 2019

E = Endangered; SC = Special Concern

Public shade trees are located throughout Shrewsbury, including the Town Common, Town right of ways, other Town parks, and in the Town cemetery. The Department of Public Works (DPW) and Parks and Cemetery Commission typically monitor and maintain these trees. Each year, some of these trees become damaged to a point where they may represent a hazard. At that point working with the Town's Tree Warden and following due process, the DPW may remove the "hazard tree". The Town of



Shrewsbury seeks to replace trees as soon as possible in a location nearby. Trees and other forms of vegetation provide important resources for a community. Open space planning should protect the volume and diversity of vegetation for a multitude of reasons.

E - FISH AND WILDLIFE

WILDLIFE

As a result of the rapid development in Shrewsbury within the last several decades, the number and diversity of mammal and bird species has declined. The disappearance of wetlands, wooded areas, and open fields has resulted in a decrease in habitat and thus a loss of animals that were once commonly seen in town. Several large more or less unbroken tracts of land can still be found in isolated sections and thus provide the best places for animal habitat. Slocum Meadow, a large upland wetland remains mostly intact and supports a variety of species common to this type of habitat. The southeastern area of town around Centennial Drive and Green streets provides relatively continuous forest cover coupled with areas in northern Grafton and western Westborough. Here typical forest animals may find a home. In most of the rest of the Town, the landscape is much more divided and the quality of wildlife habitat has diminished.

Approximately 200 species of birds either inhabit Shrewsbury year-round or have been observed in town during periods of migration. Year-round inhabitants are typical of birds found in suburban communities in central Massachusetts and include: chickadees, finches, starlings, sparrows, cardinals, heron, woodpeckers, red-winged blackbirds, ruffed grouse, and red-tailed hawks. Lake Quinsigamond provides a place for wintering birds such as geese, ducks, and grebes. Since 2017, bald eagles have nested on or near Drake Island in Lake Quinsigamond.



Photo credit – Angela Snell

As noted in the *ACEC Nomination Form*, during 1991 a total of 244 bird species were recorded in Worcester County by the Forbush Bird Club. Many of the waterfowl species recorded in the list commonly utilize or frequent the open habitat of Lake Quinsigamond while others depend on the associated wetlands and upland communities in the area for cover, breeding habitat, and food sources. These include, or may potentially include, ducks, herons, gulls, and loons. As the Town continues its conversion to developed land uses, alteration of wildlife habitat will have a direct impact on birds. Changes in habitat will encourage such species as bluebird, tree swallow, robin, house wren and house finch to utilize wood edges and/or feed in open

areas, while discouraging habitat utilization of deep wood bird species such as towhee, wood thrush, vireos, and pileated woodpecker. Mammals that typically live in suburban central Massachusetts communities include gray squirrels, eastern cottontail rabbits, woodchucks, muskrats, raccoons, opossums, bats, deer, red foxes, and shrews. Wetlands provide habitat for a variety of amphibians and reptiles, including spring peepers, green frogs, spotted salamanders, American toads, wood and spotted turtles, and several varieties of snakes.

The following rare animal species were listed in the Town of Shrewsbury. These data were extracted from the database of the Natural Heritage and Endangered Species Program in July 2019. None of these species have federal status.

Table 4.4 - Rare Animal Species in Shrewsbury

Taxonomic Group	Scientific Name	Common Name	MESA Status	Most recent observation
Amphibian	<i>Ambystoma laterale</i>	Blue-spotted Salamander	SC	2006
Butterfly/Moth	<i>Rhodoecia aurantiago</i>	Orange Sallow Moth	T	2010
Bird	<i>Haliaeetus leucocephalus</i>	Bald Eagle	T	2020
Reptile	<i>Glyptemys insculpta</i>	Wood Turtle	SC	2007
Mammal	<i>Myotis lucifugus</i>	Little Brown Bat	E	2019

(Massachusetts Department of Conservation and Recreation, 2019)



Wood turtle (*Clemmys insculpta*) habitats can be found around Straw Hollow Brook and along West Brook in Slocum Meadow. Wood turtles have not been verified since 1987. The Wood Turtle is still listed as species of "special concern". Such a designation by the MNHESP indicates that a species is suffering a decline that could threaten its viability in the state, or which occurs in such small numbers or with restricted wildlife habitat that the species could become easily threatened. The Massachusetts Department of Fish and Game (MDFG) runs a special program to study turtle populations and encourages local involvement as a way to insure the preservation of the species.

FISHERIES

Lake Quinsigamond is one of the region's most important fishery resources. The lake attracts anglers for its challenges in landing valued warm-water species as northern pike, chain pickerel, common carp, white perch, and largemouth bass. The Massachusetts Department of Fish and Game (MDFG) regularly stock Lake Quinsigamond, Mill Pond, and Jordan Pond with brook, rainbow and brown trout. Some years, Atlantic salmon brood stock (i.e. large adult fish maintained at hatcheries for spawning purposes), Northern Pike and Tiger Muskellunge have also been introduced into Lake Quinsigamond producing an adjunct fishery that has attracted anglers from throughout New England. The lake has also been the site of the many national bass fishing tournaments. There are as many as fifteen tournaments or fishing events each year.

Many of the species noted above are found in Shrewsbury's other ponds, and provide an important recreational resource for local residents, particularly Jordan and Newton Ponds. In the past, MDFG have also stocked trout in Big Bummit Brook in southern Shrewsbury.

WILDLIFE CORRIDORS

Throughout the Commonwealth, the Division of Fisheries and Wildlife (MassWildlife) owns over 100 Wildlife Management Areas (WMAs) and 13 wildlife sanctuaries with care and control of over 160,000 acres of lands and waters. All WMAs are open to hunting, fishing, trapping and other outdoor recreation activities. Sanctuaries are more restrictive—i.e., camping, hunting, fishing and trapping are prohibited. There are no WMAs or Sanctuaries located in Shrewsbury. The nearest Wildlife Management Areas are the Westborough WMA in Westborough and Northborough (428 acres), and the Martha B. Deering WMA (182 acres) in Grafton and Millbury. Regulations are in place for hunting, fishing and other uses of these areas. In addition, the Broad Meadow Brook Wildlife Sanctuary, owned by the Massachusetts Audubon Society, is located in Worcester.



A wildlife corridor is an area of habitat connecting wildlife populations separated by human activities (such as roads, development, or logging). This allows an exchange of individuals between populations, which may help prevent the negative effects of inbreeding and reduced genetic diversity (via genetic drift) that often occur within isolated populations. Corridors may also help facilitate the re-establishment of populations that have been reduced or eliminated due to random events (such as fires or disease). This may potentially moderate some of the worst effects of habitat fragmentation.

Wildlife corridors are apparent throughout the Shrewsbury and surrounding towns, particularly where large tracts of open space and undeveloped land connect. Wildlife routinely travel the trails and paths of the protected forests to and from water bodies and feeding areas. Farmland and pastures also provide invaluable wildlife corridors between open spaces and other forested land and habitat areas.



Photo Credit: Trish Settles

With its north-south orientation along the eastern edge of the Worcester metropolitan area, Lake Quinsigamond has special significance as a regionally important wildlife migratory corridor. Due to the extent and intensity of surrounding development on the Worcester side, the large expanse of open water around the lake attracts and supports many species which do not typically occur in such urban settings. Northerly of Lake Quinsigamond in Boylston lies the Wachusett Reservoir, while to the south, following the Quinsigamond River, lies Fisherville Pond in Grafton and its associated wetland areas. These large water bodies help define the migratory routes for birds wintering in warmer climates, such as Canada geese, mallards, black ducks, and herring gulls.

According to MassWildlife, the main basin of Lake Quinsigamond is available to migratory waterfowl, but it does not appear to function as a primary resource area for them due to its great depth and the limited occurrence of aquatic vegetation along the lakeshore. Flint Pond, with its shallower depth and large emergent wetland areas, offers more suitable habitat. MassWildlife reports that the lake environment provides breeding areas for mallards, black ducks, Canada geese, spotted sandpipers, and possibly the green-backed heron. The Lake's ecosystems also provide an important overwintering area for many species of birds because of the quality of the inland water bodies and fisheries habitat.



F - SCENIC RESOURCES AND UNIQUE ENVIRONMENTS

UNIQUE ENVIRONMENTS

Shrewsbury is located in the Southern New England Coastal Plains and Hill Ecosystem Subregion. Shrewsbury contains several areas with rare species habitats as designated by the State's Natural Heritage and Endangered Species Program (NHESP). The Natural Heritage and Endangered Species Program (NHESP) has identified two (2) areas of Priority Habitat of Rare Species in Shrewsbury. Priority Habitat is based on the known geographical extent of habitat for all state-listed rare species, both plants and animals, and is codified under Massachusetts Endangered Species Act. The Priority and Estimated Habitat Maps are updated every four years. There are no Estimated Habitats of Rare Species or Natural Communities currently identified in Shrewsbury. The current map was released in 2017. (Natural Heritage & Endangered Species Program, 2020).

1. **NHESP Priority Habitats of Rare Species PH 1279** is in the northwest corner of town where Shrewsbury abuts Boylston, West Boylston and Worcester, near Clinton Street (previously listed as PH 516)
2. **NHESP Priority Habitats of Rare Species PH 1177** is located at the lower end of Lake Quinsigamond near South Quinsigamond Avenue and Edgemere (previously listed as PH 1303)

By disseminating information on locations where such species occur, the NHESP and the Town can encourage residents and developers to protect their unique habitat requirements in order to allow the species to naturally sustain a healthy, growing population. Such areas enjoy special protection when developments are proposed near-by which may threaten the habitat with disruption. If at all possible, Shrewsbury should seek to acquire such habitat by donation or purchase, or work with private landowners on alternative preservation techniques such as conservation restrictions and habitat management.

The State of Massachusetts has developed BioMap2, which is designed to guide strategic biodiversity conservation in Massachusetts over the next decade by focusing land protection and stewardship on the areas that are most critical for ensuring the long-term persistence of rare and other native species and their habitats, exemplary natural communities, and a diversity of ecosystems. BioMap2 is also designed to include the habitats and species of conservation concern identified in the State Wildlife Action Plan. The BioMap2 2012 Report for Shrewsbury can be found in Appendix F.

Core Habitat and Critical Natural Landscape often overlap. Core Habitat includes:



- Habitats for rare, vulnerable, or uncommon mammal, bird, reptile, amphibian, fish, invertebrate, and plant species
- Priority Natural Communities
- High quality wetland, vernal pool, aquatic, and coastal habitats
- Intact forest ecosystems

Critical Natural Landscape includes:

- The largest Landscape Blocks in each of 8 ecoregions
- Adjacent uplands that buffer wetland, aquatic, and coastal habitats

Map 9 – Habitat Map (Appendix A) shows the BioMap 2 Core Habitats, Critical Natural Landscapes, Living Water Core Habitats and Living Water Critical Supporting Watersheds. These areas largely coincide with the areas described about as Priority Habitat of Rare Species Estimated Habitat of Rare Wildlife Specied. This map also shows the locations of certified and potential vernal pools and wetlands. Most of Shrewsbury's BioMap2 Habitats Core areas fall within the Aquatic Core in and around lower Lake Quinsigamond. Species of Conservation Concern are found in the northwest corner, the southeast corner and lower Lake Quinsigamond. The Critical Natural Landscapes generally overlap the core habitats around lower Lake Quinsigamond and the area that shares a border with Westborough.

Vernal pools are unique wildlife habitats best known for the amphibians and invertebrate animals that use them to breed. Vernal pools, also known as ephemeral pools, autumnal pools, and temporary woodland ponds, typically fill with water in the autumn or winter due to rising ground water and rainfall and remain ponded through the spring and into summer. Vernal pools dry completely by the middle or end of summer each year, or at least every few years. Occasional drying prevents fish from establishing permanent populations. Many amphibian and invertebrate species rely on breeding habitat that is free of fish predators. Some vernal pools are protected in Massachusetts under the Wetlands Protection Act regulations, as well as several other federal and state regulations, and local bylaws.

The Natural Heritage and Endangered Species Program (NHESP) serves the important role of officially "certifying" vernal pools that are documented by citizens. As of May 2020, the (NHESP reported that the Town of Shrewsbury had four (4) Certified Vernal Pools. Aerial photos have helped in the identification of potential vernal pools. While Shrewsbury has only four (4) certified vernal pools, there are 75 potential vernal pools. Survey teams might be dispatched to the sites of potential vernal pools to explore the possibility of certification. Guidelines are available from Massachusetts Division of Fisheries and Wildlife for Certification of Vernal Pool Habitat.



Areas of Critical Environmental Concern (ACECs) are places in Massachusetts that receive special recognition because of the quality, uniqueness and significance of their natural and cultural resources. These areas are identified and nominated at the community level and are reviewed and designated by the state’s Secretary of Energy and Environmental Affairs. ACEC designation creates a framework for local and regional stewardship of critical resources and ecosystems. There are no parts of the Town of Shrewsbury currently designated as an ACEC. A nomination may be made for future designation if an appropriate area is identified. As indicated above and Nomination form was completed in 1992, but no designation was received.

According to Mass Audubon’s 2020 Losing Ground Report, the Town of Shrewsbury has 883 acres of permanently conserved land, which is six (6) percent of 13,930 total acres. This puts Shrewsbury at 295 out of 351 municipalities in Massachusetts for total area of permanently conserved land, and at 335 out of 351 for overall percent of permanently conserved land. These are low rankings which indicate that the Town has substantial room for improvement in conserving and protecting land. The Town has made progress in conserving land since the previous OSRP. Between 2012 and 2019, the Town conserved 383 acres of land that is part of a Green Infrastructure Network. However, the Town did not protect any additional ecologically valuable land such as BioMap2 Core Habitat or Critical Natural Landscape during that time period.

Table 4.5 - Shrewsbury's Conservation Acreage

Conserved Land	Value	State rank Total Acres in Area (out of 351)
Total area permanently conserved land	883 acres	295
Overall percent permanently conserved land	6%	335
Total area newly conserved land 2012-2019	383 acres	182
Total area newly conserved BioMap2 Core Habitat	0 acres	338
Total area newly conserved BioMap2 CNL	0	325
Total area newly conserved TNC Resilient Land (acres)	5 acres	227
Total area newly conserved Green Infrastructure Network (GIN)	383 acres	182
Size of Town	13,930 acres	163

(Massachusetts Audubon, *Losing Ground*, 2020)



SCENIC AND CULTURAL RESOURCES

Unique cultural and historic resources, vistas and landscapes, special open spaces and recreational resources make Shrewsbury a special place for its residents and a destination for many visitors. The Scenic Features Map is attached and includes many of the features listed below, including cemeteries, cultural centers, farms, and historic sites.

Noteworthy Landscape: The Shrewsbury Ridge as runs along the eastern border of the Town. It is a long low rise which stretches from Littleton in the north to Shrewsbury. It is described above in Section 4B Topography and Landscapes.

As already discussed, Lake Quinsigamond is perhaps the most defining single natural feature the Town has. It is a “finger lake” which forms the border between Worcester and Shrewsbury (though a majority of its waters are in Shrewsbury). The lake has been actively used for years, first as a home and hunting ground for the native people of the area and later as a resort area for the region’s modern inhabitants. It also has a history as a prize fishing ground. Fishing tournaments and rowing races add to the picturesque activities that take place on the lake. Over the years however, its deep waters have been slowly polluted by surrounding development to the point now where it is sometimes closed for swimming in summer months, though water quality has improved somewhat since its nadir in the 1980s.

Scenic Vistas: Some of Shrewsbury’s roads are winding lanes with woods, fields, stone walls, ponds, scenic views and clapboard houses that capture uniquely preserved images of rural New England. Scenic areas of Shrewsbury include summits of the Town’s multiple hills- Ward Hill, Tomblin Hill, Green Hill, Boston Hill, the shoreline of Lake Quinsigamond and the other multiple ponds, down town Shrewsbury, as well as the height of land on Route 9 looking toward Lake Quinsigamond.



Photo Credit: Angela Snell



Trails: There are a number of both paved and unpaved trails in Shrewsbury that are available for public use. A Trails Committee formed in 2012 at the recommendation of the Open Space and Recreation Plan, and it has been actively supporting and promoting knowledge and use of the trails. The primary trails are:

- Dean Park – 1.8+ miles of interconnecting trails through woods and by a pond
- Jordan Pond – 1.2 miles of a paved path running along the pond on one side, and a dirt path running along the other side
- Lake Street Park – 1.3+ miles of a paved path and additional dirt paths winding through woods, a meadow, and along a wetland.
- Prospect Park – 2.3+ miles of interconnecting paved walks and trails through wooded areas and along remains of formal gardens on the former Whittall Mansion and estate.
- Camp Wunnegan – 1.7+ miles of interconnecting trails through mature forest and rocky outcrops. This is a former Girl Scout camp.
- Carlstrom Forest and Shrewsbury Town Land – 2+ miles of interconnecting trails through mature forest and along stone walls and streams. It is owned by the New England Forestry Foundation, and the trails connect to Town land trails



Photo Credit: Trish Settles

Street, Walnut Street and Bumblebee Circle. (Central Massachusetts Regional Planning Commission, 2000)

The Northeast Subregion Inter-Community Trail Connection Feasibility Study indicated that the Town has explored an off-road hiking trail using the power line right of way that extends through Town in a north south direction. The Right of Way is owned by New England Power Company and further research must be conducted to advance this possibility. Development of an off-road bike path through the Slocum Meadow Nature Preserve has also been discussed. There are also several on road bicycle routes through the Town that include segments of North and South Quinsigamond Avenue Route 140, Main Street, Maple Avenue, Grove Street, Floral

Archeological, Historical and Cultural Resources: No specific pre-colonial archeological sites have been identified in the Town of Shrewsbury.



State Historic Register: The Shrewsbury Historic District listed with the State Register consists of ten (10) properties on Church Road, Main Street, Prospect Street, Boylston Street, and Grafton Street and was accepted onto the National Register in 1976. The district surrounds the Town common on Main, Prospect, Boylston and Grafton Streets as well as Church Road. Aside from the common itself, structures on the register include the First Congregational Church, the Brick School House, the Public Library, and the Jonas Sloan House as well as several homes. The Artemas Ward Homestead was also accepted onto the National Register in 1976 and is located across from Dean Park on Main Street. Most recently, the District #5 Schoolhouse on Old Mill Road was accepted to the National Register in 2013. The Town of Shrewsbury has the following sites also listed in the 2020 State Register of Historic Places:



Photo credit – Angela Snell

1. The Grafton State Hospital (12 properties)
 2. The Grafton State Hospital Ice Pond Complex (One (1) property)
 3. The Green Hill Find Spot 3 (One (1) property)
 4. Green Hill Shelter Boulder Site (One (1) property)
 5. Green Street Culvert (One (1) property)
 6. Milestone, 1767 on West Main Street (One (1) property)
 7. Milestone 1767 on Boston Post Road at Dean Park (One (1) property)
 8. The General Artemas Ward Homestead, 788 Main Street (Four (4) properties)
- (Massachusetts Historical Commission, 2020)*

Cemeteries: The following four (4) cemeteries add to the history of Shrewsbury.

1. Mountain View Cemetery, located on Boylston Street is owned and maintained by the City as of service for town residents. (DesTroismaisons, Mountain View Cemetery, 2004)
2. Hillcrest Cemetery, located on Green Street contains the graves of over 1,000 patients from the Grafton State Hospital. Though there is now a sign, this cemetery may be hard to find. (Santore, 2011)
3. St. Anne's Church Yard Cemetery, located on the Boston Worcester Turnpike. (DesTroismaisons, 2011)

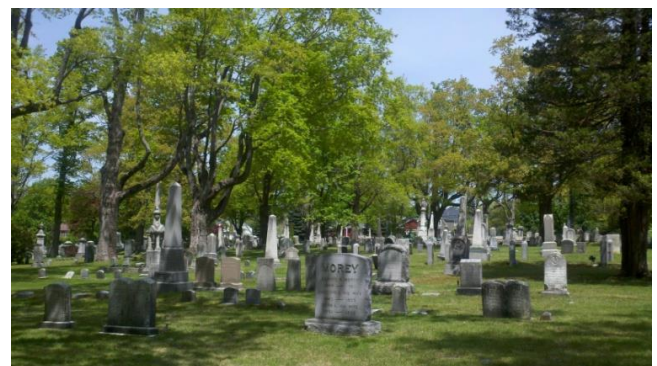


Photo credit – Angela Snell



4. Hillside Cemetery located between Sheryl Drive and Lake Street on the grounds of the Glavin Regional Center. Hillside Cemetery contains the graves of over 1,600 patients who died while residents of the Worcester State Hospital. The graves on one side are all marked with matching flat stones, inscribed with a name, birthdate, and date of death. The graves on the other side are unmarked. The cemetery is very well maintained. (Santore, Beth, 2011)

Other Landmarks: Other cultural or historic landmarks highlighted during the planning process include the following:

1. 1830 Schoolhouse
2. #5 Schoolhouse
3. The First Congregational Church
4. The Public Library
5. Jonas Sloan House
6. Numerous mills

Eighty-five (85) sites including homes, schools, and institutions are listed on the Massachusetts Cultural Resources Information System (MACRIS) database for the Town of Shrewsbury. The search results for the town are shown in Appendix E.

Scenic Roads: Though many town roadways provide travelers with attractive landscapes, the Town of Shrewsbury has not designated any Scenic Roads. Scenic Road designation (per MGL Chapter 40, Section 15c) usually carries with it certain restrictions and protections for features such as rock walls and tree lined edges. Roads or section of roads that might warrant such designation or treatment might include Lake Street and Green Street south of Route 9.

Table 4.7 below lists Shrewsbury's scenic features. **Map 5 – Unique Features** (Appendix A) shows the Town common historic district, the many points and areas of historical, cultural, scenic, recreation or conservation interest, the Shrewsbury Ridge, and the extent of the Floral Street Trail.



Table 4.6 - Shrewsbury's Scenic Features

Map Number	Site Name	Location	Relevance
Relevance - H= Historical; O= Open Space; R= Recreation Space; L= Landscape; S= School; C= Cultural; V=View			
1	Town Common	Intersection of Main St. & Rte 140	C H O
2	Passionist Fathers Retreat Home / Veteran's Inc.	48-acre on South Street, known as Golden Hill.	C H
3	Senior Center	98 Maple Ave.	C R
4	#5 Schoolhouse	2 Old Mill Rd.	H
5	1830 Schoolhouse	15 Church Rd.	H
6	First Congregational Church	19 Church Rd.	H
7	General Artemas Ward Homestead	788 Main St.	H
8	Grafton State Hospital	8 Pine Street	H
9	Grafton State Hospital Ice Pond Complex		H
10	Green Hill Find Spot 3		H
11	Green Hill Shelter Boulder Site		H
12	Green Street Culvert	Green St.	H
13	Hillcrest Cemetery	Green St.	H
14	Hillside Cemetery	Sheryl Dr. & Lake St. on the grounds of the Glavin Regional Center.	H
15	Howe Memorial Library	609 Main St.	H
16	Jonas Stone House	4 Prospect St.	H



Map Number	Site Name	Location	Relevance
17	Milestone, 1767	West Main St.	H
18	Milestone, 1767	Boston Post Rd. at Dean Park	H
19	Mountain View Cemetery	Boylston St.	H
20	Private Family Cemetery	Main St.	H
21	South Cemetery	Grove St.	H
22	St. Anne's Church Yard Cemetery	Boston Worcester Turnpike	H
23	Town Common Historic District	Surrounds the Town Common on Main, Prospect, Boylston & Grafton Sts. as well as Church Rd.	H
24	Shrewsbury Ridge		L
25	Lake Quinsigamond		L O
26	Former Camp Wunnegan	Old Grafton St., parallel to Rte. 140, just south of Rte 9.	O
27	Carlstrom Memorial Forest (NEFF)	Gulf St.	O
28	Corazzini Memorial Boat Ramp (State)	N. Quinsigamond Ave.	O
29	Gauch Park	Corner of N. Quinsigamond Ave. & Main St.	O
30	Melody Lane Park	Melody Lane, Off Route 140 South	O
31	Oak Island Boat Ramp (State)	Route 20, across from Edgemere Blvd.	O
32	Prospect Park	Prospect St. (Former Masonic Property)	O



Map Number	Site Name	Location	Relevance
33	Dean Park	Main St.	O R
34	Donahue Rowing Center	No. Quinsigamond Ave.	O R
35	Floral Street Rail Trail	Floral St.	O R
36	Greylock Park	Off N. Quinsigamond Ave. to Phillips Ave. to Avon Ave.	O R
37	Hills Farm Pond	Stoney Hill Rd., off Route 20	O R
38	Jordan Pond	Florence St, behind Coolidge School	O R
39	Lake Street Recreation Area	Lake St.	O R
40	Maple Avenue Recreation Fields	Maple Avenue	O R
41	Rotary Park	Pond View Dr. Off Old Mill Rd.	O R
42	Ski Ward	1000 Main St.	O R
43	Coolidge School	1 Florence St.	O R S
44	Oak Middle School	45 Oak St.	O R S
45	St. Johns Preparatory School & Athletic Fields	378 Main St.	O R S
46	Arrowwood Park	Arrowwood Ave., Off S. Quinsigamond Ave.	R
47	Edgemere Park	Edgemere Blvd., Off Rte. 20	R
48	Hillando Park	Hillando Dr., off Walnut St.	R
49	Hills Farm Playground and Field	Corner of Stoney Hill and Deer Run	R



Map Number	Site Name	Location	Relevance
50	Ireta Road Playground	Ireta Rd., Off West Main St.	R
51	North Shore Fields	Parker Rd., off N. Quinsigamond Ave.	R
52	Ternberry	Audubon, off Old Mill Rd.	R
53	Toblin Hills Park	Toblin Hill, off Walnut St.	R
54	Floral Street School	57 Floral St.	R S
55	Municipal Fields near Paton School	Municipal Dr., Near Paton School	R S
56	Paton School	58 Grafton St.	R S
57	Sherwood Middle School	30 Sherwood Ave.	R S
58	Shrewsbury High	64 Holden St.	R S
59	Spring Street School	123 Spring St.	R S
60	St. Mary's School	16 Summer St.	R S
61	Al-Hamra Academy	435 South St.	S

H= Historical; O= Open Space; R= Recreation Space; L= Landscape; S= School; C= Cultural; V=View
(Shrewsbury Parks Recreation and Cemetery Department, 2020)



G - ENVIRONMENTAL CHALLENGES

SOLID WASTE PROGRAM

Trash is picked up weekly and recyclables biweekly by private contractors working for the Town. The Town has instituted a Pay As You Throw (PAYT) Rubbish Disposal Program. Only trash in town approved trash Pay As You Throw bags and bulky items with special Bulky Waste Stickers attached will be picked up for disposal. Recycling is collected for no charge with this program. Residents may use trash barrels up to 32 gallons in volume, but first all rubbish must be put in a PAYT bag. Items weighing 20 pounds or less that do not fit in a bag will be collected if a small bag is tied to them; i.e.: a beach chair, storm or interior door, ladder, toy, stroller, lamp, taped mirror, tire, small table/chair, etc.



Photo credit – Town of Shrewsbury website

The Shrewsbury Health Department supports backyard composting as a clean and simple way to get rid of leaves and grass clippings. The Massachusetts Department of Environmental Protection banned the disposal of leaves, yard waste and grass clippings at landfills or incinerators because these materials are easily converted into compost, a usable and beneficial product, and the disposal capacity we have in this state is needed for handling other waste which cannot be composted. Leaves, grass and yard waste are picked up at every residence three times in the spring and four times in the fall. A drop-off site for yard waste is open at the Municipal Garage one Saturday a month. Residents are reminded that it is against state law to burn leaves or to dump yard waste into wetlands, streams, ponds or other open space areas. Two major landfills are located in town, one inactive, the other active. The former town landfill is located on the east side of North Quinsigamond Avenue about 1/2 mile south of Main Street. It was closed in 1976 and has not been reused. No major pollution problems have been reported since the closure.

Central Massachusetts' regional ash disposal landfill is located on the south side of Route 20 between Cherry and Green Streets. Wheelabrator's Shrewsbury Landfill is a 8.4 million cubic yard landfill primarily located to dispose of ash from Wheelabrator's nearby waste-to-energy facility in Millbury. The Shrewsbury Landfill was first developed by the Town of Shrewsbury to dispose of solid waste generated by the municipality. In the early 1970's, the Town of Shrewsbury acquired the individual properties that now form much of the site. Municipal engineers segregated the site into five phases of landfill development. The first two landfill phases were operated by the Town of Shrewsbury from 1973 through the late 1980's for the disposal of solid waste. Located on land leased from the Town of Shrewsbury, one of the original community customers of the Wheelabrator Millbury facility, this landfill has provided over 25 years of reliable ash disposal to the Millbury project. The approximately 200-acre site contains several lined ash disposal cells totaling more than 36 acres. The remainder of the site is comprised of natural buffers, an administration office, access roadways, a municipal leaf and yard waste composting area, and other supporting facilities. A solar array was constructed on a portion of the landfill



in 2018. A comprehensive environmental monitoring program is performed to insure continuous compliance with environmental permits. This program includes regular groundwater and surface water sampling. All monitoring results are provided to the MassDEP and the Town of Shrewsbury and available for review by the public.

FORESTRY ISSUES



Photo Credit: Trish Settles

Trimming and removal of shade trees is carried out throughout the year by the Town's Highway Division under the guidance of the Forestry Commission. Branches that have been weakened by storms are removed, and trees considered a hazard along the roadside are removed. This work is performed by a contractor and some of the work is done by utilizing Highway Division personnel and equipment.

The tree industry changed when the Asian Longhorned Beetle (ALB) was found in Worcester, Shrewsbury and other nearby towns. All of Shrewsbury is in the quarantine zone which means all tree removal, trimming of host trees and

composting performed in the quarantined zones must be in compliance with Asian Long Horn Beetle regulations.

EXISTING WATER QUALITY PROBLEMS

As discussed in subsection C above, the Town has already experienced contamination of its groundwater resources from industrial sources. In addition, the Town's surface waterbodies, particularly Lake Quinsigamond, are experiencing pollution problems. Pollution at Lake Quinsigamond and other surface water bodies, wetland and aquifer results mainly from non-point sources. Many known point sources have been identified and are now remediated or undergoing remediation.

The Town Department of Public Works performs regular roadway maintenance to control drainage and to remedy wash out areas. Sedimentation is caused by erosion of lands where the vegetative cover has been removed. Sediments transported from building sites, farm activities, Town DPW road maintenance and construction, and other common activities continue to harm Town water resources by filling up streams, ponds and reservoirs. These sediments also add nutrients that accelerate growth of algae and aquatic weeds, which usually diminish the recreational use of local waters.



The location, intensity of development, and land use has a large impact on water quality protection. State regulations such as the Watershed Protection Act, Rivers Protection Act, and Wetlands Protection Act all play important roles in protection of water resources. However, many sensitive areas remain unprotected and should be addressed using development regulation or land conservation tools.

CLIMATE CHANGE

Climate change is already impacting New England through warmer temperatures and more extreme precipitation, and the natural environment in Shrewsbury will be impacted by these changes as they continue over the coming decades. Higher temperatures overall, warmer winters, and a longer frost-free period may impact plant vulnerabilities to cold snaps and frost, increase insect populations, particularly invasive species, and affect bird migrations and animal hibernation periods. Higher temperatures and changes in precipitation may also lead to loss of cold-water habitats, and impacts to aquatic invertebrates, fish and amphibians. Reduced precipitation in warmer months could also impact drinking water supplies. More extreme precipitation events, particularly in winter and spring, will likely impact water quality from increased runoff and erosion. ([NOAA 4th National Climate Assessment](#)).

The Town of Shrewsbury was awarded a Municipal Vulnerability Preparedness (MVP) planning grant in 2017, and in 2018 the Town held a Community Resilience Building workshop to identify hazards that Shrewsbury faces that are exacerbated by climate change, and to prioritize actions the Town should take to prepare for these hazards. This workshop was a step towards MVP certification, which would then allow the Town to access additional state funding for projects related to climate change resiliency. Forty-two community members attended part one of the workshop on May 9, 2018, and forty-two attended part two on May 14, 2018, representing a wide cross section of regional, state, and municipal officials, response partners, and other interested parties. Participants in the workshop prioritized a number of action items to strengthen emergency preparedness and response, including assessing the Town's water supplies, evaluating water conservation regulations, and securing alternate sources of water to mitigate water supply impacts. The Plan was accepted by the State in June 2018.

FLOODING, SEDIMENTATION, EROSION

Intense rainfall events or rapid melting of heavy snowpack can create localized flooding in the vicinity of many streams and areas with high water tables. This flooding and the run off often erode roadsides, stream banks and construction sites with exposed soils. As the water levels retreat or dissipate, the remnant gravel, sand, and silt is deposited in roadway and other paved low spots, catch basins, sewer grates, etc and often demands mitigation. Natural sedimentation and erosion within water bodies is not something that is actively monitored. The Town does however monitor construction sites for erosion/sedimentation problems, and require mitigation for any impacts due to construction.



As mentioned in Section 3, the Town has a Stormwater Management Bylaw (Town General Bylaws, Article 21) in place that grants the Town the legal ability to prohibit illicit connections and discharges to the stormwater utilities in accordance with the NPDES permit. Additionally, the by-law regulates development projects that will disturb one acre or more of land. The Town Board of Sewer Commissioners is responsible for enforcing the bylaw and the rules, regulations, and permitting procedures for compliance. In 2019, the Town adopted the Stormwater Management Rules and Regulations and a stormwater enterprise fund to administer the stormwater management program. This is funded by revenue from a Stormwater Utility Fee and Stormwater Application Review and Inspection Fee. The Stormwater Utility Fee (STWF) is assessed on a **quarterly** basis to every residential and non-residential parcel (including municipal, tax-exempt, and vacant properties) based on their impervious area. Impervious area is defined as any material or structure on or above ground that prevents water from infiltrating the underlying soil such as driveways, roofs, parking lots, and any areas of compacted dirt or gravel used for vehicular traffic or parking. However, the Town offers up to a 50% credit against the STWF for property owners who take specific actions to exceed the minimum requirements of any applicable stormwater management guidelines. The Town also provides educational resources to residents, property owners, businesses and institutions on the Town's [Stormwater Management webpage](#).

One water resource management area owned by the state is located in the northeast corner of town, but serves mostly to insure against downstream pollution in the Concord River basin and the Town of Northborough. Otherwise relatively strict subdivision control laws have served to limit the amount of erosion and sedimentation of water resources.

Beaver dams are a problem that can cause excessive erosion, flooding and roadway damage. Beaver populations are on the rise in every community in central Massachusetts. Their activities can be a nuisance to landowners and Public Works employees when they occur near human infrastructure. Beavers are found in many parts of Shrewsbury and throughout central Massachusetts. Historically Shrewsbury has had occasional issues with beavers in tributaries to the larger streams prior to the latest trapping laws. The beaver-related flooding to the knowledge of Town officials has not impacted homes or other structures yet, but the Town has received many calls from concerned residents about nearby floodwaters.

Although beaver activity can cause potential problems for local communities in such areas, beavers provide many benefits that are often overlooked. These include groundwater recharge, flood mitigation, and creation of wetland habitats. Methods for alleviation of the problems caused by beaver activities are prevalent and can be utilized for little or no cost. If consideration of these methods is given, townspeople can learn more about how to live with these interesting and industrious creatures.

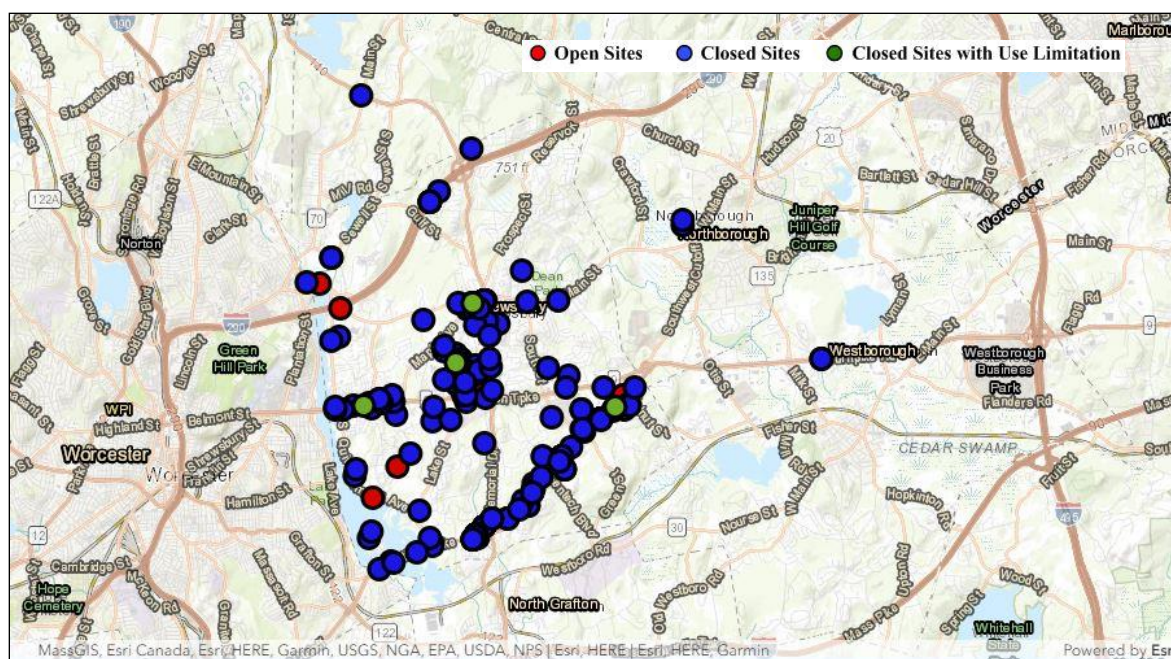


HAZARDOUS WASTE RELEASES

The Massachusetts Department of Environmental Protection (DEP) listed 234 Waste Sites/Reportable Releases in its Database for the Town of Shrewsbury as of April 8, 2020. Several sites have had multiple releases. The earliest reported releases were in 1987 at Worcester Sand and Gravel on Holden Street and Phalo Corporation on Route 9. Response Action Outcome (RAO) Statements have been submitted and accepted for 142 sites. An RAO Statement asserts that response actions were sufficient to achieve a level of no significant risk or at least ensure that all substantial hazards were eliminated. Response Tracking Numbers have been closed on 24 releases and transferred to another primary listing, likely a site listed multiple times for multiple releases. Six (6) sites are Tier classified sites and five (5) have yet to be classified. Tier classification indicates varying levels of DEP or Licensed Site Professional (LSP) investigation, assessment, and remediation oversight. A map of the sites is shown.

While each site has its own particular problems a few general statements apply: 1) most sites are located on the Town's most traveled state highways, Route 9 and Route 20; 2) gas stations, either active or former, make up the many of the sites; 3) as a result, the most common problems are soil and/or ground water releases of petroleum products from leaky underground storage tanks.

Figure 9 - Reportable Releases



(Massachusetts Department of Environmental Protection, 2020)

INVASIVE SPECIES AND OVERGROWTH



Invasive plants, those that grow rapidly and are difficult to remove or control once established, are often threats to forests and wetland areas. When invasive species take over large areas of habitat, ecological processes are changed. Often they force out the native species that provide food and habitat for local species. Plants that have been identified as being a threat to Massachusetts forests include Japanese Barberry (*Berberis thunbergii*), Multiflora Rose (*Rosa multiflora*), Garlic Mustard (*Alliaria petiolata*), and Common Buckthorn (*Rhamnus cathartica*). A number of other species threaten natural wetland, flood plain and streambank communities in Massachusetts. Within wetlands invasive species include Purple Loosestrife (*Lythrum salicaria*), Phragmites or Common Reed (*Phragmites australis*), Shining Buckthorn (*Rhamnus frangula*) and Yellow Iris (*Iris pseudacorus*). Other invasive species threatening floodplains and stream banks include Morrow's Honeysuckle (*Lonicera morrowii*), Japanese Knotweed or Bamboo (*Polygonum cuspidatum*), Goutweed or Bishop's Weed (*Aegopodium podagraria*) and Garlic Mustard (*Alliaria petiolata*). Purple Loosestrife and Phragmites have been documented as threats to Shrewsbury's wetland and water resource areas. Other invasive species that have established themselves in Massachusetts include Hydrilla, Curly-leaved Pondweed, Swollen Bladderwort, Variable Milfoil, and Water Chestnut among others. Identifying and monitoring invasive species is an important first step in controlling or eradicating them. Education campaigns are important to raise awareness. Shrewsbury DPW cut brush along public roads as needed to control vegetation.

Additional species to be on the lookout for that have entered Massachusetts include the Mile a Minute Vine (*Polygonum perfoliatum*, *Persicaria perfoliata*), and Giant Hogweed (*Heracleum mantegazzianum*). Mile-a-minute Vine is a highly invasive annual weed, native to Asia that was first discovered in Massachusetts in 2006. A single vine can grow up to 6 inches per day. Mile-a-minute vine climbs over trees and posts, shading out other plants. It outcompetes and overgrows native species, causing ecological and economic damage. Giant Hogweed is found in disturbed habitats, roadsides, vacant lots, and along streams and rivers.

The *Asian Longhorned Beetles (ALB)* was first detected in 2008 in Worcester, Massachusetts. The Asian Longhorned Beetle (*Anoplophora glabripennis*) is an invasive insect that bores into and kills a variety of tree species, including maple, elm, willow, birch, horsechestnut, London plantree/sycamore, poplar, ash, mimosa (silktree) hackberry and mountain ash.

Since 2008, the USDA and the Commonwealth's Department of Conservation and Recreation (DCR) have been working with local official to eradicate ALB in Worcester and surrounding communities, including Shrewsbury. The entirety Shrewsbury is part of the 110 square mile quarantine zone for ALB that includes six communities. This is a regulated area in which residents and businesses are prohibited from moving or transferring ALB regulated materials including firewood (all hardwood species), live beetles, and wood, logs, stumps, roots, branches, leaves, and green lumber from ALB host trees. Residents are encouraged to report any possible sightings and take all



Asian Longhorn Beetle

Photo Credit - Division of
Conservation and Recreation



appropriate action to prevent the spread of the pest to non-affected areas. Residents may find updated information related to Asian Long Horn Beetle on the Town Website.

Emerald Ash Borer (EAB) was spotted in Worcester in 2015 and was also found in Shrewsbury in 2020. EAB is a small, metallic green beetle, native to Asia, which feeds on ash trees. This pest can kill a tree quickly, within just 3 to 5 years, because it bores directly under the bark and disrupts the tree's conductive system. It has now spread throughout 25 states, killing millions of ash trees and causing billions of dollars in treatment, removal and replacement costs.



SECTION 5: INVENTORY OF LANDS OF CONSERVATION & RECREATION INTEREST

OVERVIEW

Open space makes an important contribution to quality of life. Public recreation areas and open space provide a focus for community life and promote a unique and identifiable community character. Open space can provide opportunities for quiet reflection and connection to the natural world. Open space also has economic benefits. It enhances the property values of nearby land and helps to attract businesses, new residents, and public and private investment. Research on this topic suggests that the proximity to recreation and open space is THE most important factor in choosing the location of a small business, while quality of life ranks as the third most important factor in choosing the location of a large business.

Conservation land also provides environmental functions, providing natural rainwater storage and corridors for wildlife. Even small pockets of green space may serve as critical stopovers for migratory birds and butterflies. Open spaces can absorb floodwaters and reduce runoff, thereby diminishing the frequency and severity of flooding. Wooded open space helps to cool the air and improves air quality.

Lands of conservation and recreation interest in the Town of Shrewsbury include:

1. Properties with permanently protections,
 - a. Publicly owned for purposes of conservation or resource protection
 - b. Land owned by non–profits and land trusts with conservation restrictions or agricultural preservation restrictions
 - c. Privately owned land with conservation restrictions or agricultural preservation restrictions
2. Properties with limited protection
 - a. Public ownership provides only limited protection unless specifically deeded or stipulated as permanently protected, since some properties may be sold or developed as schools or town garages, even town halls. Disposal or sale of these properties usually require a town meeting or other public process.
 - b. Private properties used for forestry, agriculture or recreation in exchange for special tax status
3. Privately owned land with special open space or recreational interest such as a rod and gun club.



Some of these lands may already be protected open space dedicated to conservation or recreation uses and others will be identified for future protection or acquisition.

Map 8 – Open Space Inventory Map (Appendix A) was compiled principally from data reported to MassGIS, the Commonwealth of Massachusetts' Office of Geographic Information, a Statewide Resource for Geospatial Technology and Data. The protected and recreational open space data layer contains the boundaries of conservation lands and outdoor recreational facilities in Massachusetts. The associated database contains relevant information about each parcel, including ownership, level of protection, public accessibility, assessor's map and lot numbers, and related legal interests held on the land, including conservation restrictions. Conservation and outdoor recreational facilities owned by federal, state, county, municipal, and nonprofit enterprises are included in this data layer. Not all lands in this layer are protected in perpetuity, though nearly all have at least some level of protection. Although the initial data collection effort for this data layer has been completed, open



Photo Credit: Melanie Magee

space changes continually and this data layer is therefore considered to be under development. Additionally, due to the collaborative nature of this data collection effort, the accuracy and completeness of open space data varies across the state's municipalities. Attributes, while comprehensive in scope, may be incomplete for many parcels. For the purposes of Map 8, the definitions of "Level of Protection" are as follows:

In Perpetuity (P)- Legally protected in perpetuity and recorded as such in a deed or other official document. Land is considered protected in perpetuity if it is owned by the Town's conservation commission or, sometimes, by the water department; if a town has a conservation restriction on the property in perpetuity; if it is owned by one of the state's conservation agencies (thereby covered by article 97); if it is owned by a non-profit land trust; or if the Town received federal or state assistance for the purchase or improvement of the property. Private land is considered protected if it has a deed restriction in perpetuity, if an Agriculture Preservation Restriction has been placed on it, or a Conservation Restriction has been placed on it.

Limited (L) – These lands include those legally protected for less than perpetuity (e.g. short-term conservation restriction or Chapter 61 lands), or temporarily protected through an existing functional



use. For example, some water district lands are only temporarily protected while water resource protection is their primary use. These lands could be developed for other uses at the end of their temporary protection or when their functional use is no longer necessary. These lands will revert to unprotected status at a given date unless protection status is extended.

Properties with Limited protection are Protected by legal mechanisms other than those above, or protected through functional or traditional use. These lands might be protected by a requirement of a majority municipal vote for any change in status. This designation also includes lands that are likely to remain open space for other reasons (e.g. cemeteries and municipal golf courses).

None (N) - Totally unprotected by any legal or functional means. This land is usually privately owned and could be sold without restriction at any time for another use (e.g. scout camps, private golf course, and private woodland).

PERMANENT PROTECTION

Article 97 of the State Constitution provides permanent protection for certain lands acquired for natural resources purposes, meaning “conservation, development and utilization of the agricultural, mineral, forest, water, air and other natural resources.” Lands of this nature are often owned by the municipal conservation commission, recreation commission, water department, or by a state or federal conservation agency (i.e., the EOEEA or the Division of Fisheries and Wildlife). Private, public and non-profit conservation and recreation lands may also be protected under Article 97. Removing the permanent protection status of such lands is extremely difficult, as is evidenced by the following required steps:

- The municipal Conservation Commission or Parks and Recreation Committee must vote that the land in question is surplus to its needs.
- The removal of permanent protection status must be approved at a Town Meeting/City Council vote and pass by a two-thirds (2/3) vote.
- The municipality must file an Environmental Notification Form with the EOEEA’s Massachusetts Environmental Policy Act (MEPA).
- The removal of permanent protection status must be approved by both the State House of Representatives and the State Senate and pass by a two-thirds (2/3) vote.



- In the case of land either acquired or developed with grant assistance from the EEA's Division of Conservation Services, the converted land must be replaced with land of equal monetary value and recreational or conservation utility.

In other words, it is intentionally difficult to remove a property's permanent protection status so that it may be developed. Article 97 lands are often owned by the municipal conservation commission, parks and recreation commission, the water department or a state conservation agency.

Lands acquired for watershed and aquifer protection, habitat conservation, or state parks are often permanently protected open space. Municipally-owned properties used for cemeteries, public recreation and conservation areas may be permanently protected via a Town Meeting Vote or a City Council Order. Often these lands are placed under the ownership or protection of the Conservation Commission.

Private lands, including those owned by non-profit organizations, can also be protected in perpetuity through deed conservation restrictions, conservation easements, agricultural preservation restrictions, historic preservation restrictions, or wetlands restrictions. Some easements may run for a more limited period (like 30 years) and those are not considered permanently protected. As mentioned above, these lands may also be protected by Article 97.

LIMITED, TEMPORARY, OR NO PROTECTION

Municipal lands under active use (schools, town halls, highway department facilities, police/fire facilities, etc.) are not generally considered permanently protected. For the purposes of this plan, we will consider that those publicly-owned parcels are not permanently protected. A public disposition process however, theoretically insures some level of protection. They cannot be sold without due process.

Private lands that are within the State's special taxation programs (Chapter 61, 61A, and 61B) are actively managed by their owners, but only have limited or temporary protection. Private owners can manage their land for forestry, agriculture, and/or recreation purposes and receive a benefit of reduced property tax under Chapter 61. Chapter 61 is for forested lands, Chapter 61A for agricultural and horticultural lands, and Chapter 61B is for recreational lands. Chapter lands are considered as having limited protection.



OWNERSHIP SUMMARY

As shown in Table 5.1 below, the largest percentage of open space in Shrewsbury is municipally owned (71.06%). That ownership is primarily the Town of Shrewsbury at 99%, with 1% owned by the Town of Northborough. In terms of permanently protected land, the Town of Shrewsbury owns just over 907 acres of cemeteries, parks, wetlands and well protection areas. The Commonwealth of Massachusetts owns 13.6% of the open space in Shrewsbury. Commonwealth of Massachusetts protected properties include lands owned by the Department of Conservation and Recreation and the Department of Fish and Wildlife. These total approximately 175 acres in Shrewsbury. There are no properties owned by an agency of the federal government that have permanent protections in Shrewsbury. The remainder of the open space is owned by either private for-profit, private non-profit entities, or land trusts. Currently the only permanently protected open space owned by a land trust is the 74.95 acres owned by the New England Forestry Foundation. Almost 150 acres are permanently protected by Conservation Restrictions. Chapter lands in 2020 accounted for almost 405 acres.

Table 5.1 Open Space by Ownership

Owner Type	Size (GIS Acres)	% of Total
Land Trust	74.95	5.81%
Municipal	916.40	71.06%
Private for profit	121.89	9.45%
State	175.42	13.60%
Private Non-profit	1.03	0.08%
Grand Total	1,289.69	100.00%

As indicated in Table 5.2 below, the majority of open space in Shrewsbury is protected in perpetuity. The largest permanently protected open space parcel in Shrewsbury is East Slocum Meadow Conservation Area (80.28 acres), followed by Dean Park (79.54 acres) and Rawson Hill Brook Flood Control Site (63.17 acres).



Table 5.2 Open Space by Level of Protection

Level of Protection	Size (GIS Acres)	% of Total
Limited	348.08	26.99%
None	64.55	5.00%
Protected	877.07	68.01%
Grand Total	1,289.69	100.00%

A - PRIVATE PARCELS

Privately-owned parcels described in this subsection include land with agricultural preservation restrictions or conservation restrictions, Chapter 61, 61A, and 61B land, and lands with no protections but of open space or conservation interest. For each parcel, the location, ownership, zoning, land use, land use description, size, grade or condition, management agency, recreation potential, public access, funding, and degree of protection are indicated. The condition of the privately-owned properties is unknown except where the assessor has provided a grade or condition. The management agency is assumed to be the owner or their agent. The future recreational potential on the limited protection parcels is passive such as fishing, hunting, hiking, or natural resource appreciation. Private land is considered protected if it has a deed restriction in perpetuity, or if an agricultural preservation restriction (APR) or conservation restriction (CR) has been placed on the property.

PERMANENT PROTECTION

Of the five (5) conservation restrictions (CRs) in Shrewsbury, there are four (4) CRs that likely resulted from open space set aside as part of planned residential subdivisions. The conservation restriction for 46.68 acres of the Zarette Farm on South Street was granted to Sudbury Valley Trustees in 1999, and is part of a privately-owned farm. No land in Shrewsbury is protected by an agricultural preservation deed restriction.



Table 5.3 - Shrewsbury Conservation Restrictions

APR/CR Status	Size (GIS Acres)	% of Total
Zarette Farm CR	46.68	31.50%
East Slocum Meadow Conservation Area	80.28	54.17%
Brookridge Conservation Area	7.73	5.22%
Dean Estates CR	0.60	0.41%
Shrewsbury Commons CR	12.90	8.70%
Grand Total	148.20	100.00%

CHAPTER LANDS

Land in active and passive use is eligible for a reduced tax rate under Chapters 61, 61A, and 61B of the Massachusetts General Laws (M.G.L.), which are designations for lands that are used for forestry, agriculture, conservation or recreation, respectively. These lands include those legally protected for less than perpetuity (e.g. short-term conservation restriction or Chapter 61 lands), or temporarily protected through an existing functional use. For example, some chapter lands may only be temporarily protected through their forestry use, while residential is their primary use. These lands could be developed for other uses at the end of their temporary protection or when their functional use is no longer necessary. These lands might be protected by a requirement of a majority municipal vote for any change in status. This designation also includes lands that are likely to remain open space for other reasons (e.g. cemeteries and municipal golf courses). The following describes the different Chapter Lands programs:

M.G.L. Chapter 61 is designed to keep forested land under productive forest management. Owners with more than 10 acres of forest are eligible for enrollment. They must submit a DCR-approved forest management plan and a management certificate to the Town assessor before a new tax classification can begin. The assessed value of land classified under Chapter 61 is reduced by 95%. Chapter 61 classifications run for ten-year periods.

M.G.L. Chapter 61A is most commonly applied to agricultural or horticultural land but can be used for the forested portions of a farm, provided a forest management plan is approved by DCR. To qualify for Chapter 61A, a farm owner must have five or more contiguous acres being used for agricultural or horticultural purposes. Property under Chapter 61A is assessed at rates that vary for different agricultural uses. Generally, classification will result in an 80% reduction in assessed value.



M.G.L. Chapter 61B is similar to 61A, but applies to lands designated for recreational use and containing at least five contiguous acres. The land must be retained in a natural state to preserve wildlife and natural resources, must be devoted primarily to recreational use, and must provide a public benefit. Recreational uses may include golfing, hiking, camping, nature study, shooting/target practice, hunting, and skiing. The assessed valuation of Chapter 61B land is reduced by approximately 75%.

Landowners who enroll their land in the program receive property tax reductions in exchange for a lien on their property. The terms of the lien require that enrolled land remain in an undeveloped state and be managed for forest production, agricultural production, or recreation. Furthermore, the lien provides the municipal government of the city/town in which the enrolled property is located a right of first refusal should the landowner put the land up for sale while it is enrolled in the program. The Town has the “right of first refusal” for purchase of the land within 120 days of notification by the property owners of the pending sale. Towns may assign their right of first refusal to a state agency or a nonprofit conservation organization, such as a land trust. Towns often have trouble taking advantage of the right of first refusal because of the rapid timeframe within which the Town must find the money and approve the purchase. Landowners who develop their land while enrolled in the program, or for a period of time after withdrawing from the program, may be required to pay penalties. These lands are considered to have limited or temporary protection because the owner can sell the property or choose to unenroll the property in the special taxation program and thus the open space public benefit goes away.

The Town should inventory and prioritize what limited Chapter land there is and other open space for acquisition or other protection measures. In addition, the Town should insure that notice is given immediately to Conservation and Recreation Commissions if a Notice of Sale of a Chapter property is delivered to the Select Board. A communication system to allow for rapid response should be developed. Working with local non-profits, Mass Audubon and Sudbury Valley Trustees, may help make acquisitions possible, especially with limited municipal staff time and funds.

Table 5.4 – Private Lands with Limited Protection

Chapter Land Type	Size (GIS Acres)	% of Total
Chapter 61	165.80	40.96%
Chapter 61A	219.59	54.25%
Chapter 61B	19.42	4.80%
Grand Total	404.81	100.00%



NO PROTECTION

Appendix D provides information on privately owned parcels of open space or recreation interest that have no protections. These include the following facilities:

- Scandinavian Athletic Club
- Shrewsbury Health and Racquet Club
- Ward Hill Ski Area
- Shrewsbury Sportsmen's Club

The Town of Shrewsbury has many parcels of land characterized in the Town Assessing Database as vacant based on its land use code. Each vacant parcel is described as residential, commercial, or industrial and then also described as developable, potentially developable or undevelopable. These parcels are possibly accessory lots, possibly parking lots or storage lots, or simply undeveloped or undevelopable land. The table below summarizes the privately-owned vacant parcels. The Town should have these parcels mapped and consider if they might be candidates for protection or preservation efforts to augment the Town's open space and recreational resources. The might represent opportunities to add on to protected open space or provide habitat for unique species.

B – PUBLIC AND NON-PROFIT PARCELS

Appendix D provides information on public and non-profit owned lands of open space or recreation significance and contain a listing of the location, ownership, managing agency, zoning, land use code and land use description, level of protection, public access, and acreage. In the case of town-owned conservation and recreation properties, information is provided regarding managing agency, condition, recreation potential and type of grant (if any) used to purchase and/or renovate the property. For many parcels the condition is unknown. A more thorough assessment of condition is suggested as an action step for inclusion in future plans.

One open space preservation issue facing the Town is the lack of non-profit involvement. These organizations have been very helpful in other communities. Non-profits do not have the same restrictive processes that often slow down or stand in the way of municipal protection efforts. In some cases, they may have cash to use for acquisition, but usually their real value comes in the form of expertise and good relations with individual property owners. In Shrewsbury, the New England Forestry Foundation (NEFF) is the only non-profit entity shown holding land. Several local organizations including



the Sudbury Valley Trustees, The Greater Worcester Land Trust, and the Grafton Forest and Lands Conservation Trust all cover Shrewsbury. Regional organizations such as Massachusetts Audubon and NEFF, and national organizations such as the Trust for Public Land, could all potentially lend assistance to the Town in helping preserve open space.

PERMANENTLY PROTECTED

State Owned - There is no federally owned land of open space or conservation significance in Shrewsbury, although there are state owned parcels. Often the State will own land within a municipality as a State Park or State Forest or as a means to protect valuable or unique water supplies or habitat. Publicly-owned, permanently protected open space and recreation areas in the Town of Shrewsbury include 15.96 acres around Lake Quinsigamond. The Commonwealth of Massachusetts owns three (3) parcels of land for use as a state park or for wildlife management. The Oak Island, North Quinsigamond, and Corizzini Boat Ramps on Lake Quinsigamond are owned by the State, and the Donahue Rowing Center as well as a small area on Lake Avenue are owned by the Town.

Most of Quinsigamond State Park consists of two sites located on Lake Quinsigamond in Worcester: Regatta Point and Lake Park. The 25-acre Regatta Point area offers facilities for swimming, sailing, picnicking and fishing. The area is used extensively for sailing and rowing crew regattas. The 2,000-meter rowing course established on Lake Quinsigamond is internationally recognized as one of the best courses in the world. The Lake Park area provides a number of recreational opportunities including a picnic area, swimming beach and tennis courts.

Land in the vicinity of Boylston Street, Hill Street, Stringer Dam Road, Green Street, and Prospect Street is owned by the Department of Conservation and Recreation Division of Water Supply Protection Office of Water Resources for watershed protection, water supply protection, flood control and/or conservation.

Over 2,000 acres of land are owned by the Massachusetts Department of Fish and Game and managed as Wildlife Management Areas (WMAs). The Town of Shrewsbury has no WMAs within its boundaries. In nearby towns, however are the Westborough WMA in Westborough, the Poutwater Pond WMA in Holden and West Boylston, and the Martha Deering WMA in Grafton and Millbury.



Other Towns - The Town of Northborough and the City of Worcester own land in the Town of Shrewsbury. The Town of Northborough owns 9.27 acres in the vicinity of the Northborough Reservoir in the northeast corner of Town. The city of Worcester owns an almost 75-acre parcel on Main Street.



Photo credit - Trish Settles

Town of Shrewsbury. Six (6) cemeteries including Mountain View are located on 41.57 acres and are considered permanently protected. The 259.25 acres owned by the Shrewsbury Conservation Commission are considered permanently protected. These include what are likely parcels protected as a part of a planned subdivision. This also includes Former Camp Wunnegan and Newton Pond. For the purposes of this plan we have listed parcels managed as

parks or recreation facilities as permanently protected. However, often the deeds to these parcels do not reflect a restriction. Each parcel should be researched to determine the level of protection. 116.51 acres are shown as managed by Parks and Recreation.

The Shrewsbury Water and Sewer Department manage 101.34 acres. All of this land is not used for water supply protection. Some of it houses booster and pumping stations. This land is categorized as permanently protected for the purposes of this report, but each parcel should be researched to determine the level of protection.

Non –profits. The New England Forestry Foundation owns a 74.95-acre parcel on Gulf Street that is permanently protected.

Table 5.5 – Shrewsbury properties with permanent protection

Public Properties with Permanent Protection	Size (GIS Acres)	% of Total
Quinsigamond State Park	2.00	0.23%
George H. Nichols Flood Control Site	1.05	0.12%
Donahue Rowing Center	3.35	0.38%
Rawson Hill Brook Flood Control Site	63.17	7.20%



Public Properties with Permanent Protection	Size (GIS Acres)	% of Total
Lake Quinsigamond Access	6.58	0.75%
Zarette Farm CR	46.68	5.32%
Flint Pond Islands Conservation Area	4.40	0.50%
Edgemere Park	2.28	0.26%
Hunting Avenue Conservation Area	4.34	0.50%
Keywood Manor Conservation Area	2.81	0.32%
Saint James Road Conservation Area	2.54	0.29%
Maple Street Fields	19.99	2.28%
East Slocum Meadow Conservation Area	80.28	9.15%
Worthington Acres Conservation Area	3.39	0.39%
Camp Winnegan Conservation Area	33.70	3.84%
Prospect Hill Conservation Area	36.25	4.13%
Northborough Reservoir	9.27	1.06%
Dean Park	79.54	9.07%
East Avenue Conservation Area	1.11	0.13%
East Avenue Recreational Area	0.51	0.06%
Rawson Hill Conservation Area	55.56	6.34%
Brookridge Conservation Area	7.73	0.88%
Prospect Park	74.05	8.44%
Newton Pond	33.09	3.77%
Brooklawn Park Reservation	5.95	0.68%
Shrewsbury Water Supply Land	1.44	0.16%



Public Properties with Permanent Protection	Size (GIS Acres)	% of Total
Water Supply Land	26.78	3.05%
Slocum Meadow Conservation Area	16.72	1.91%
Carlstrom Memorial Forest	74.95	8.55%
Ternberry Park	3.62	0.41%
Bluegrass Lane Conservation Area	1.92	0.22%
South Meadow Brook Water Supply Land	13.60	1.55%
Oak Street Water Basin Water Supply Land	30.63	3.49%
Lake Street Park	62.27	7.10%
Peat Meadow Conservation Area	9.42	1.07%
Jordan Pond Conservation Area	1.57	0.18%
Lake Quinsigamond Conservation Area	2.64	0.30%
Cedar Road Conservation Area	0.42	0.05%
Boylston Street Conservation Area	0.23	0.03%
Maple Avenue Conservation Area	11.92	1.36%
Arrowwood Park	1.90	0.22%
Gauch Park	0.25	0.03%
Greylock Park	4.13	0.47%
Dean Estates CR	0.60	0.07%
Shrewsbury Commons CR	12.90	1.47%
Oak Island	6.88	0.78%
Oak Island Boat Ramp	6.99	0.80%
Grand Total	877.07	100.00%



LIMITED PROTECTION

Town of Shrewsbury: As mentioned earlier, schools, some parks, and other town-owned parcels are considered limited protection since there is no deed use restriction, but also because any sale of the property would require a public process.

The Shrewsbury Public School System manages, and the town owns, 317.39 acres of property housing classroom buildings, administration offices, utility buildings, recreation fields, playgrounds, and accessory open space. Shrewsbury High School is the largest of these at 194.17 acres.



Photo credit - Trish Settles

Over 300 parcels ranging in size from 0.01 acres to 70.71 acres are listed as vacant with no identified use. These may be part of an existing open space or recreation use, but the nondescript land use makes it difficult to identify which. These may also be parcels the Town holds title to as a result of owners defaulting on property taxes. Tax-title lands have little protection, but may abut conservation and



Photo credit - Trish Settles

recreation areas. These lands could be useful to leverage open space investments by state agencies. An inventory of tax title lands can identify potential conservation and recreation areas for Shrewsbury residents at very low cost. All Town-owned property, especially conservation and recreation lands, should be reviewed to evaluate the actual level of protection, so recommendations can be made to address these management issues. In addition, all Town-owned lands should be reviewed to determine suitability for low-impact recreation activities.

Non-profits: Private schools such as St. John's Preparatory School, St. Mary School, Shrewsbury Montessori School, and Al-Hamra Academy, own land containing buildings, recreation facilities and open space. In addition, several non-profit organizations, churches, hospitals or social service agencies own



property in Shrewsbury. These properties may have open space or recreation value; however, they are not protected.

Table 5.6 – Shrewsbury properties with limited protection

Public Properties with Limited Protection	Size (GIS Acres)	% of Total
Municipal Fields	11.72	3.37%
Dean Park	0.84	0.24%
Spring Street Elementary School Playground	10.78	3.10%
Mountain View Cemetery	33.49	9.62%
Shrewsbury High School Athletic Fields	25.23	7.25%
North Shore School Playground	8.85	2.54%
South Cemetery	0.46	0.13%
Calvin Coolidge Elementary School Playground	4.53	1.30%
Jordan Pond Recreational Area	38.79	11.14%
Former Irving Glavin Center Recreational Area	95.64	27.48%
Sherwood Middle School Athletic Fields	18.93	5.44%
Walter J Paton Elementary School Playground	2.13	0.61%
Eaton Pond Park	43.26	12.43%
Floral Street Elementary School Playground	33.10	9.51%
Hillando Park	1.59	0.46%
Hills Farm Park	7.93	2.28%
Melody Lane Park	6.68	1.92%
Rotary Park	4.13	1.19%
Grand Total	348.08	100.00%



OPEN SPACE EQUITY

Although the Town of Shrewsbury has a large number and good variety of open space and recreation areas throughout the Town, they are not as accessible to all residents as they could be. This is particularly true for those who lack automobile transportation. There are a number of areas of Town where residents cannot access open space or recreational areas by walking or biking, either because of distance or because there are no sidewalks or bike lanes along busy roads. There is also limited bus service to most open space areas.

The Environmental Justice (EJ) populations are concentrated in the southern part of Shrewsbury, south of Route 9, and in the northwestern section of Town between Route 9 and Route 290. These areas have fewer accessible open space and recreation areas than the center and northeast areas of Town. Recreation areas are more concentrated in those areas of town, where the population density is greatest. The Town should prioritize access to open space areas from the EJ neighborhoods, and if new recreation facilities are developed, the focus should be in the southern and western outlying areas.



SECTION 6: COMMUNITY VISION

A - DESCRIPTION OF PROCESS

The current Open Space and Recreation Plan Committee was appointed in July 2019 and first met in August 2019. The Committee met roughly every two months during the plan's development, review and approval. The Committee worked closely with the Central Massachusetts Regional Planning Commission (CMRPC) on the development, distribution and analysis of the survey as well as the organization and facilitation of the community forum.

In October 2019, the Shrewsbury Open Space and Recreation Planning Committee developed and administered a survey to assess the needs and concerns of citizens regarding the Town's open space and recreational resources. The Committee and CMRPC used the 2012 survey and similar OSRP surveys from other towns as a starting point for developing questions. Many questions were revised and new questions were added, based on input from the Committee and Town Administration. The Committee carefully crafted the type of question and wording in order to elicit substantial input from respondents. The survey was conducted online via the Survey Monkey platform, and was linked electronically on the front page of the Town's website. Hard copies of the survey were made available at various locations around town, including the Municipal Offices, the Town Library, and the Senior Center, and were also distributed at Town youth basketball games. Flyers were also distributed in multiple locations with the link and QR code for the survey. Announcements of the survey were included in list serves for the schools and the Parks and Recreation Department. The Town received 858 responses, primarily to the online survey. Tabulated results were then reviewed and discussed by the full Committee, and the resulting information was integrated into the goals, objectives, and action plan for implementation. Survey results can be viewed in Appendix B.



Figure 10 - Survey Cover Page



The Committee initially planned to hold a Public Forum in early May 2020 to discuss the draft plan, the draft survey results, draft goals, objectives, and action plan. However, due to the Covid-19 pandemic, meetings larger than 10 and later 25 individuals were prohibited by Executive Order. When it became clear in July that larger in-person gatherings were unlikely to be feasible in the near future, Town staff made the decision to hold a virtual public forum using the Zoom platform. The virtual public forum was held on August 31, 2020, and there were three main elements of the forum:

1. An introduction from the Town Planner on the purpose of the OSRP and a brief description of the process to date.

2. A slide show presentation on the draft plan and process by Mimi Kaplan of CMRPC – this provided an overview of the OSRP process, a description of the draft goals, a summary of the survey responses, the phases of the plan have been completed thus far and what still remains to be completed. The introduction and presentation together lasted approximately 30 minutes.

3. A group discussion of three topics:

- Indoor and outdoor recreational facilities – what is needed or needs to be improved
- Open spaces for preservation/conservation, scenic areas and routes – what is needed, and what parcels of land should be protected
- Connectivity and passive recreation – what is needed to improve and expand trails and connectivity.



Photo Credit: Melanie Magee

During the discussion, the open space map was shown on the screen so that participants could reference the different conservation and recreation areas and trails. Participants were encouraged to type their questions and comments into the chat, and the facilitators would then read them aloud and they would be open for discussion. Participants could also speak if they preferred to do so. The discussion lasted about 50 minutes, after which there were closing remarks. The entire event lasted about an hour and a half.

There were thirty-seven attendees at the public forum. Town staff, CMRPC, and the Committee publicized the public forum widely. A flyer advertising the forum was posted on numerous pages on the Town's website, and emailed to town residents who subscribed to certain department or committee



email blasts. It was advertised on Shrewsbury Cable Access TV, and posted on social media. Flyers were distributed at both the Annual Town Meeting and the Farmer's Market. An invitation to was sent to the Indian Society of Worcester in order to solicit feedback from the South Indian community, much of which is an Environmental Justice population in Shrewsbury. The participant comments were reviewed by the Committee, and incorporated into this plan. A print-out of the chat and a summary of the comments are attached as part of Appendix C.

B - STATEMENT OF OPEN SPACE AND RECREATION GOALS

This plan is an update from the 2012 OSRP; therefore, the overall goals of this plan are to assess the relevance of and progress toward previous goals, identify new goals, and create a viable plan for the future that will enhance passive and active recreation opportunities, protect vital habitats and water supplies, and improve connectivity of trails and open spaces. These will make Shrewsbury a healthier and more vibrant place to live, work, and play in. Survey respondents and public forum participants would like to make improvements to current facilities and open spaces, and to create new opportunities through existing resources. A strong emphasis was placed on improving the Town's natural conservation areas, water resources, and passive recreation opportunities, as well as on improving connectivity between these.

The themes of the goals and objectives presented in the plan can be grouped into three (3) categories:

1. Protection and preservation of conservation resources
2. Planning, development, maintenance, and improvement of greenways and recreation resources
3. Protection of the Town's water resources.

Based upon public input and feedback as described above, the Committee formulated the following goals for this updated OSRP:

Protection and preservation of conservation resources

- GOAL 1: Protect and preserve open space parcels, identify opportunities for new open space
- GOAL 2: Protect and enhance habitat

Planning, development, maintenance, and improvement of greenways and recreation resources

- GOAL 3: Plan and develop greenways in the Town with consideration to appropriate regional connections
- GOAL 4: Maintain and enhance the Town's recreational and park facilities.



Protection of the Town's precious water resources.

- GOAL 5: Protect the Town's potable drinking water sources.
- GOAL 6: Protect surface water resources

This planning process provides an accurate assessment of open space and recreational opportunities and needs for Shrewsbury residents, and offers a plan of action that optimizes those opportunities and satisfies those needs. The Committee, through this plan, has developed a set of action items aimed at addressing the above goals (see the Action Plan presented in Section 9 of this document).



SECTION 7 - ANALYSIS OF NEEDS

This section presents resource protection needs, community needs, and management needs that were collected through an examination of the data and trends presented in previous sections, the survey, community forum, and input from the Committee and Town staff. The majority of the analysis presented below has been drawn from the public outreach survey distributed from October – December 2019. Additional analysis is also included from feedback shared and insight gained during the Virtual Public Forum held August 31, 2020.

A - SUMMARY OF RESOURCE PROTECTION NEEDS

Resource protection is based upon the need to preserve existing natural and cultural resources that are finite and cannot easily be replaced if damaged or lost. These resources include wetlands, rivers, streams, aquifers, farmland, historical resources and scenic views. These valuable natural systems provide habitat to many wildlife species, some of which may be endangered. Lakes, streams and underground aquifers provide storage capacity for floodwaters and natural purification for drinking water. Preservation of the Town's aquifers provides critical protection of drinking water supply. As climate change continues to impact the local, regional, and global environment, it becomes increasingly important to incorporate resource protection into planning efforts.

Shrewsbury residents have indicated a consistent desire to preserve natural resources, community character, and the quality of life in the Town. When surveyed, 87% reported that it was “very important” to preserve open space and natural areas.

When asked what they would be willing to support or do in order to preserve open space in Shrewsbury, most survey respondents (90%) stated that they would support a requirement for all new residential developments to include conservation/open space areas. A large majority of respondents (87%) stated that they would vote to allocate town funds to acquire or otherwise conserve more open space. Just over half of respondents indicated that they would favor zoning that provides for increases in density in existing developed areas in exchange for open space in less developed or environmentally sensitive areas (55%). Just under half of respondents indicated that they would consider allowing an easement on a portion of their property in order to add to existing open spaces or connect to open spaces (48%). Town officials will be able to use this information to help inform which options would be most viable for preserving additional open space.

Survey respondents were asked to rank their reasons for protecting open space and/or acquiring land for protection. The highest priority respondents indicated for protecting open space was for water supply protection at 90%. Respondents also highly valued protecting open space in order to reduce the



effects of climate change, filtering air and water pollution, providing areas for passive recreation, protecting habitats and preserving scenic areas. A large portion of the land around the Shrewsbury drinking water supply areas remain susceptible to contamination and should have increased protections. Protections may take the form of restrictions on use as well as efforts to minimize negative impacts from point source contamination that may result from use mishandled chemicals, hazardous waste or oil.

A majority of survey respondents were in favor of the Town adopting a wetlands bylaw to limit development activities adjacent to any wetlands resource area. Over three quarters of respondents indicated that they would support a “no disturb zone” of at least 25 feet around wetland resource areas in order to protect critical wetland habitat and water quality. This feedback will be important for both Town planners and the Conservation Agent, as the Town is currently considering options for wetland protection.



Photo Credit: Melanie Magee

Riparian corridors are also important for protection of wildlife habitat and water quality. Riparian corridors and associated habitat areas along brooks and streams are important “buffers” because they protect the stream from nutrient loading, erosion/sedimentation, and temperature increase. Riparian corridors are even more important where they connect other large blocks of protected open space and when adjoining streams contribute to surface water sources. Most wildlife utilize riparian corridors to travel throughout their home territories and to migrate seasonally. Many people also consider brooks and streams to be important components of scenic landscapes. Portions of the West Brook, Straw Hollow Brook, and Big Bummet Brook are examples of riparian corridors that may need further protection. These streams may be vulnerable to the pressures of growth in locations that do not have permanent protection. Protection of groundwater recharge areas along waterways will help to ensure high quality drinking water, as well as to preserve wildlife habitat.

Preservation and promotion of Shrewsbury’s scenic and historic resources was an additional concern of survey respondents. The Town could consider designating local “scenic roads”, as well as developing a walking trail in the historic district of the Town Center. Historic buildings and sites as well as the scenic areas contribute greatly to Shrewsbury’s character, and there is overall support for preserving and enhancing these community resources.



While there are few remaining working farms and agricultural properties remaining in the Town, these are also highly valued by residents and were mentioned as priorities for conservation by survey respondents.

B – SUMMARY OF COMMUNITY'S NEEDS

Shrewsbury residents enjoy their open space and recreation resources. When asked to name their three favorite open spaces or recreational facilities in the Town, they mentioned Dean Park, Prospect Park, and Jordan Pond most often. Also frequently listed were the Town Common, Lake Street Park, and Floral Street Fields and other playing fields. Less frequently listed but also popular were Carlstrom Forest, Camp Wunnegan, the Donahue Rowing Center, Lake Quinsigamond, and Ward Hill Ski Area. These areas and facilities are in general either not as well known or not as accessible as the more frequently mentioned areas. Ward Hill Ski Area is privately owned, and there is limited public access to Lake Quinsigamond. A number of respondents said that they didn't know what other areas or facilities there were in Shrewsbury other than Dean or Prospect Park. This indicates that more publicity and promotion of the Town's open space and recreational resources is necessary.



Photo Credit: Kevin Esposito

Question 9 asked respondents how satisfied they were with the open space and recreation areas, facilities, and programs in the Town. Over half of respondents (58%) were very or somewhat satisfied with the variety and/or number of outdoor recreational facilities, whereas only a quarter of respondents (26%) were very or somewhat satisfied with the variety and/or number of indoor recreational facilities. There was greater satisfaction with existing recreational opportunities for children (57% very or somewhat satisfied) than existing recreational opportunities for adults (40% very or somewhat satisfied). In addition, respondents were

generally unsatisfied with the amount and condition of sidewalks (28% satisfied versus 51% unsatisfied) and the variety and/or amount of bike paths (11% satisfied versus 49% satisfied).

Most survey respondents (79%) felt that it was very or somewhat important to be able to access open space and recreation destinations in Shrewsbury by walking, biking, or bus. This was also mentioned in the public forum. While residents would like to be able to access these areas without a car, driving is currently often necessary and a need for more parking at open space and recreation areas was communicated. Most respondents (86%) felt that additional parking areas were very or somewhat important.



Survey respondents were asked what they considered to be the biggest open space or recreation needs in Shrewsbury. The top response for most needed was water supply protection, followed by additional protection of ecologically valuable habitat, protection of agricultural land, an indoor recreation center, a dog park, and more or improved children's playgrounds. Also mentioned in the comments as well as in the public forum were the need for outdoor or indoor community swimming pools, indoor tennis courts, and more public access to water bodies for swimming.

Question 13 assessed the needs of the community by asking respondents if they regularly traveled to any of six neighboring communities for open space and recreation opportunities, and for which activities. Over half of respondents regularly go to Northborough for open space and recreation opportunities, with about a third of respondents also regularly traveling to Westborough, West Boylston, Worcester, Grafton and Boylston. The most frequently cited activities and facilities that drew respondents to these other towns were hiking and walking on trails (with and without dogs), fishing, swimming, kayaking, dog parks and playgrounds.

The Town will need to prioritize its different open space and recreation needs as well land to acquire or protect. As water supply protection and habitat protection are both high priorities, ideally land that is acquired will fulfill both purposes. Town residents also prioritize more connections between existing open spaces, and the ability to access open spaces and recreational facilities by walking or biking. Acquiring land that connects existing open space areas can increase wildlife corridors as well provide for greater and more accessible passive recreation opportunities. Adding and improving sidewalks in areas that connect residential areas to open spaces and recreation facilities should be a focus for the



Photo Credit: Trish Settles

Town as well. As the survey made clear that many residents are not aware of all of the open space and recreation opportunities in Shrewsbury, publicizing and promoting these should also be a priority.

ACCESSIBILITY

Accessibility is very important not only for the disabled and the elderly, but also for families with children and individuals with other challenges. All of these groups benefit from the accessibility of recreational facilities. People are living longer and staying active to an older age, and as with many towns in the state, the average age of residents in Shrewsbury is increasing. In general, the town needs



to maintain and improve trail access, pathways, safe sidewalks, routes for bikes, feet, and wheels (wheelchairs, strollers, etc.). In particular, accessible routes to the pavilion in Dean Park should be examined to ensure safe passage by a person in a wheelchair or others with disabilities. While some accessible picnic tables have been installed at several parks in recent years, additional picnic tables could still be installed in certain parks around town.

C - MANAGEMENT NEEDS, POTENTIAL CHANGE OF USE

Shrewsbury has limited financial resources, as do all municipalities, which affects the Town's ability to preserve additional open space as well as to develop and maintain open space and recreational facilities. The Covid-19 pandemic has further limited municipal financial resources. The identification of funding sources to meet open space and recreation objectives will be a key element for success, as will working in cooperation with existing groups such as the Sudbury Valley Trustees, the Massachusetts Audubon Society, other non-profit institutions and other private property owners. The passage of the Community Preservation Act (CPA) in November 2020 will also allow the Town to access additional funding. The Town has an abundance of recreational areas, facilities and opportunities. For that reason, the best use of resources may be to invest in and maintain those publicly owned areas currently in use, as well as to increase access to and awareness of these areas. In addition, formal maintenance agreements between the Town and other owners can be put in place for those non-town owned areas in order to ensure public access.

Town-wide adoption of a notification and decision-making process with regard to the disposition of Chapter 61 lands would help reduce the potential for additional loss of valuable open space and habitat. Without a clearly defined and communicated process, the narrow window for town action may close and a rare opportunity may be lost. The first step in this process is typically the prioritization of desirable lands for acquisition and the establishment of partnerships with stakeholder non-profits. As developers approach the Town with proposals for new projects, a clear understanding of land acquisition goals should be in place. When the opportunity arises to protect land as a condition of development approval, then the Town can protect wildlife corridors, habitat, or other priority conservation areas through negotiation.

There are a number of Town boards and committees that may be working independently on many of these issues, for example the Trails Committee, Parks and Cemetery Commission, and the Department of Planning and Economic Development. There are many opportunities for improving communication and unifying the vision between these entities. This will provide for a more streamlined approach for preserving open spaces and enhancing recreation facilities and programs.



The Seven (7) Year Action Plan described in Section 9 of this plan lays out detailed action steps that will increase the protection of the town's resources, enhance the community's recreation resources, and address management including potential change of use. Upon completion of this OSRP and subsequent approval from EEA, the Town will look to apply for a number of grants.



SECTION 8 GOALS AND OBJECTIVES

In developing goals and objectives, the Committee has reviewed the following

- Previous 2012 Open Space and Recreation Plans (OSRPs) prepared by the Town of Shrewsbury,
- The OSRP research data and maps included for this plan;
- The Survey Results and the Public Forum comments;
- The 2016 Shrewsbury Master Plan;
- Other related plans previously produced; and
- OSRPs from other communities.

As described in preceding sections, the Town's needs identified by this plan can be characterized into three (3) categories:

1. Protection and preservation of conservation resources
2. Planning, development, maintenance, and improvement of greenways and recreation resources
3. Protection of the Town's water resources.



Photo credit - Trish Settles

As outlined in Section 6 the following six (6) overarching goals were developed for open space and recreation activities in the Town of Shrewsbury. These goals can be described as outcome statements that define what the Town is trying to accomplish both programmatically and organizationally.

- I. Protect and preserve open space parcels, identify opportunities for new open space.
- II. Protect and enhance habitat.
- III. Plan and develop greenways in the Town with consideration to appropriate regional connections.
- IV. Maintain and enhance the Town's recreational and park facilities.
- V. Protect the Town's potable drinking water sources.
- VI. Protect surface water resources.



In comparison, objectives define the actions that must be taken with a time period (the duration of an OSRP) to reach toward the strategic goals. Objectives are more specific than goals and they are measurable. They can be output objectives, or they can be attitudinal or behavioral.

The following objectives defined actions that will help the Town achieve its strategic goals. The objectives listed below are not solely tied to one single goal, but may help move the town toward accomplishing multiple goals. They are listed below with the principle goal that they help advance. While many more objectives and actions can be developed, performed and measured, these objectives will act in part as indicators of successful outcomes. Measurement tools are not discussed in detail here, but typical tools include developing a benchmark and measuring progress against that benchmark. In that vein, some objectives may be first establishing a benchmark.

GOALS AND OBJECTIVES:

Goal I: Protect and preserve open space parcels, identify opportunities for new open space.

- A. Minimize net loss of protected biohabitat.
- B. Minimize net loss of forested acres.
- C. Town and OSRP Implementation Committee, or the town entity assigned to be the OSRPIC, to meet with nonprofit conservation organizations on a regular basis to discuss cooperative efforts related to open space preservation activities.
- D. Identify and prioritize currently unprotected land for potential purchase and/or protection as open space.

Goal II: Protect and enhance habitat.

- A. Educate the public about prudent and best practices with respect to invasive species. Distribute educational material regarding invasive species to schools, developers, and others.
- B. Provide educational material regarding special habitats to schools, developers, and others.
- C. Work with Town to promote and support volunteer or other community building events such as community, field or stream cleanups.
- D. Consider adoption of wetlands bylaw.

Goal III: Plan and develop greenways in the Town with consideration to appropriate regional connections.

- A. Continue mapping paths, trails, bike and pedestrian routes.
- B. Work with Trails Committee to increase the number of paths and trails and work toward getting them officially approved by the Parks and Cemetery Commission.
- C. Identify opportunities to develop greenway connections with neighboring towns, including working with CMRPC.



- D. Perform a Walkable Communities Survey.
- E. Ensure existing and future sidewalk networks connect to open spaces.

Goal IV: Maintain and enhance the Town's recreational and park facilities.

- A. Increase participation in active recreation activities.
- B. Determine current levels of non-municipal open space and recreation funding. Collaborate with Town departments and other community stakeholders to increase the non-municipal funding for open space protection and recreation.
- C. Improve the level of satisfaction with indoor and outdoor recreation facilities to generally “satisfied” or “very satisfied” among all age groups on the next OSRP Update survey.
- D. Improve awareness of open space and recreation facilities among all residents.
- E. Explore opportunities to increase public access to water bodies.
- F. Work with Town departments and staff to increase or introduce new parking, access and accessibility to existing open space.

Goal V: Protect the Town's potable drinking water sources.

- A. Permanently protect additional land area in the Town’s watersheds to protect the surface and ground water supplies.
- B. Educate businesses and developers within wellhead protection areas about low impact development practices and opportunities for watershed land protection.
- C. Align public policy and regulations with low impact development, healthy community and similar approaches.
- D. Protect potable drinking water for and from current and future growth.

Goal VI: Protect surface water resources.

- A. Educate residents, businesses, and institutions relative to nonpoint source pollution issues, such as stormwater.
- B. Encourage private and public entities to reduce discharge of untreated stormwater with best management practices (BMPs) and/or engineered/creative solutions.

General Objective related to each goal

The OSRP Committee recommends that the Board of Selectmen create either an independent OSRP Implementation Committee (OSRPIC) or assign an existing town entity to be the OSRPIC to implement OSRP goals, objectives and action items. The OSRPIC will also include a focus on fundraising, resource development and education campaigns.





SECTION 9: SEVEN YEAR ACTION PLAN

Preserving Shrewsbury's character and enhancing the Town's open space and recreation resources and opportunities requires a community-based approach. Strong support and participation by all interested parties, including those with potentially dissenting opinions, will be the most critical component when pursuing any of this Plan's goals and objectives. By consensus building, most conflict is addressed before it arises *and* the result is usually a better end product that stands the test of time. The Plan's action items advocate for this approach.

The purpose of this section is to establish a year - by -year timetable for specific actions needed to accomplish the goals and objectives listed in Section 8. This section indicates which action steps or recommendations are priorities based on needs and abilities. Each action step or recommended task associated with a goal is assigned a priority level. "High" Priority items will likely take place in the first and second year. "Medium" Priority items will likely take place in the third through fifth year. And "Low" Priority items will likely take place in the sixth and seventh year. The table also lists for each task a responsible party; potential collaborating parties; and, where possible, estimated funding or resources. An Action Map is attached to provide a geographic representation of action plan sites.

Key to Responsible Parties and Collaborators

BG	Business Groups
CMRPC	Central Massachusetts Regional Planning Commission
COA	Shrewsbury Council on Aging
COD	Commission on Disabilities
DAR	Massachusetts Department of Agricultural Resources



DCAM	Massachusetts Department of Capital Assets and Management
DCR	Massachusetts Department of Conservation and Recreation
DEP	Massachusetts Department of Environmental Protection
DFW	Massachusetts Department of Fish and Wildlife
ECD	Shrewsbury Engineering & Conservation Divisions
FHWA	Federal Highway Administration
HS/HC	Shrewsbury Historic Society and/or Historic Commission
IAL	Independent Athletic Leagues/Recreation Groups
LQC	Lake Quinsigamond Commission
MAS	Massachusetts Audubon Society
MDOT	Massachusetts Department of Transportation
MOBD	Massachusetts Office of Business Development
OSRPIC	OSRP Implementation Committee (or town entity assigned to be the OSRPIC)
PED	Planning and Economic Development Department
SAO	Shrewsbury Assessor's Office
SPB	Shrewsbury Planning Board
SBOS	Shrewsbury Board of Selectmen



SCC	Shrewsbury Conservation Commission
SHD	Shrewsbury Highway Division
SPRD/C	Shrewsbury Parks, Recreation, and Cemetery Division/Commission
SPS	Shrewsbury Public Schools
STC	Shrewsbury Trails Committee
SWS	Shrewsbury Water and Sewer
TMgr	Town Manager
TMtg	Town Meeting
Vols	Volunteers
ZBA	Zoning Board of Appeals



Table 0.1 - Seven Year Action Plan (2020-2027)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
I. Protect and preserve open space parcels, identify parcels for new open space.					
	<p>Objectives:</p> <ul style="list-style-type: none"> A. Minimize net loss of protected bio habitat. B. Minimize net loss of forested acres. C. Town and OSRP Implementation Committee, or town entity assigned to be the OSRPIC, to meet with nonprofit conservation organizations on a regular basis to discuss cooperative efforts related to open space preservation activities. D. Identify and prioritize currently unprotected land for potential purchase and/or protection as open space. 				
	a) Apply to state, federal and non-profit programs for funding to preserve, protect, and enhance open space parcels.	High Ongoing Years 1-7	ECD PED	SPRD/C	DCR
	b) Create either an independent OSRP Implementation Committee (OSRPIC) or assign an existing town entity to be the OSRPIC to oversee and ensure the completion of the OSRP Action Plan. The new committee may have subcommittees to tackle specific goals. The committee should report on its activities on a regular basis.	High Year 1	SBOS	PED	Time



Table 0.1 - Seven Year Action Plan (2020-2027)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
	c) Review the Open Space Inventory, and verify and document protections, or lack thereof, on town owned properties.	High, Year 1	OSRPIC	SCC	Legal, Engineering, Time
	d) Maintain relationships with area land trusts and similar organizations including the Sudbury Valley Trustees, New England Forestry Foundation and the Greater Worcester Land Trust.	Medium Ongoing Years 1-7	SCC	ECD PED	Time
	e) Develop criteria for preservation and a system to prioritize investment of resources. Identify priority parcels for preservation.	High Year 2	OSRPIC	ECD, PED, SAO	GIS, Time
	f) Create a database of landowners with key open space parcels who should be contacted by the town on a regular basis to discuss options for preserving their land as open space. Provide information to landowners regarding Chapter 61 tax incentives to preserve forest, agricultural and recreation lands, conservation restriction opportunities and agricultural preservation opportunities.	Medium Years 1-2	OSRPIC	SCC, ECD, PED	Time
	g) Develop, formalize and educate town boards and officials of right of first refusal process with regard to Chapter 61 land. Consider acquiring fee simple or other interest in lands designated under Chapters 61 and 61A when such lands are offered to the town for right-of-first-refusal.	Medium Ongoing Years 1-7	OSRPIC	SCC, ECD, PED	Time



Table 0.1 - Seven Year Action Plan (2020-2027)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
	h) Work with property owners/organizations to insure continuing public use of non-town owned land. Develop clearly documented agreements regarding permitted uses.	High Ongoing Years 1-7	SBOS, ECD, PED	SPRD/C	DCR, DCAM
	i) Consider zoning bylaw amendments that promote and incentivize protection of open space.	Medium Years 1-2	OSRPIC	SPB	CMRPC
II. Protect and enhance habitat					
	<p>Objectives:</p> <ul style="list-style-type: none"> A. Educate the public about prudent and best practices with respect to invasive species. Distribute educational material regarding invasive species to schools, developers and others. B. Provide educational material regarding special habitats to schools, developers and others. C. Work with Town to promote and support volunteer or other community building events such as community, field or stream cleanups. D. Consider adoption of wetlands bylaw. 				



Table 0.1 - Seven Year Action Plan (2020-2027)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
	a) Educate residents about existence of special habitats. Pursue educational opportunities with local school system.	High Ongoing Years 1-7	SCC	SPS	DCR
	b) Document habitats. Investigate potential vernal pools, certify where appropriate.	High Years 2	SCC	SPS	DCR
	c) Establish stream teams to test and track water quality of streams	High Years 2-3	SCC	SPS	DCR
	d) Identify and map wildlife corridors.	Medium Years 2-3	SCC	SPS	DCR
	e) Prevent the spread of invasive plants and animals (including ALB) through education efforts such as increasing distribution of educational material regarding ALB to schools, developers, and others.	High Ongoing Years 1-7	SCC	ECD, SDPW, PED	DCR
	f) Consider zoning bylaw changes that promote and incentivize protection of habitat, such as a wetland protection measures or flood plain controls.	Medium Years 1-2	OSRPIC	SPB	CMRPC



Table 0.1 - Seven Year Action Plan (2020-2027)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
	g) Consider zoning bylaw changes that promote and incentivize protection of habitat. Work with Conservation Commission to draft Wetlands Bylaw or flood plain controls	Medium Years 1-2	OSRPIC	SPB	CMRPC
III. Plan and develop greenways in the town with consideration to appropriate regional connections.					
	<p>Objectives:</p> <ul style="list-style-type: none"> A. Continue mapping paths, trails, bike and pedestrian routes. B. Work with the Trails Committee to increase the number of paths and trails and work toward getting them officially approved by the Parks and Cemetery Commission. C. Identify opportunities to develop greenway connections with neighboring towns, including working with CMRPC. D. Perform a Walkable Communities Survey. E. Ensure that existing and future sidewalk networks safely connect to open spaces. 				
	a) Identify and map potential and existing greenways, open spaces, recreation connections and wildlife corridors.	High Years 1-3	OSRPIC	STC	DCR, MassGIS



Table 0.1 - Seven Year Action Plan (2020-2027)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
	b) During subdivision review, insure that greenway corridors, paths and trails are preserved and that easements are required as a condition of approval.	High Ongoing Years 1-7	PED, ECD, SPB	OSRPIC, STC	Time
	c) Apply to state and federal programs to fund greenway planning, design and acquisition.	Medium Ongoing Years 1-7	ECD, PED	OSRPIC, STC	Time & matching funds
	d) Work with property owners who are interested in taking part in a Town greenway.	Medium Ongoing Years 1-7	ECD, PED	OSRPIC, STC	Time, possibly legal resources
	e) Identify and prioritize potential bicycle paths and routes in Town. Work with relevant Town staff and regional planning staff to develop bicycle paths and routes using local, state or non-governmental funding sources.	Medium Ongoing Years 1-7	OSRPIC, STC	PED, ECD	MassBIKE, NEMBA
	f) Seek funding and begin planning and constructing hiking/walking/cross-country ski trails where appropriate.	High Ongoing Years 1-7	OSRPIC, STC	PED, ECD	BG, Vols



Table 0.1 - Seven Year Action Plan (2020-2027)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
	g) Work with state and federal agencies to identify appropriate trail development and construction standards. Satisfy ADA requirements to the greatest degree that resources will allow.	Medium Ongoing Years 1-7	STC	ECD	Time
	h) Where developments occur adjacent to neighboring Towns, examine those Towns' open space plans to insure interconnection between resources.	Medium Ongoing Years 1-7	OSRPIC, STC	PED	Time
	i) Perform a walkable community assessment and strategy.	Medium Years 1-3	OSRPIC, STC	PED	CMRPC
	j) Work with the Trails Committee to review existing hiking trails and identify needs for additional trails or trail connections.	High Year 1	OSRPIC, STC	PED	CMRPC
IV. Maintain and Enhance the Town's Recreational Facilities.					



Table 0.1 - Seven Year Action Plan (2020-2027)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
	<p>Objectives:</p> <ul style="list-style-type: none"> A. Increase participation in active recreation activities. B. Determine current levels of non-municipal open space and recreation funding. Collaborate with Town departments and other community stakeholders to increase the non-municipal funding for open space protection and recreation. C. Improve the level of satisfaction with recreation facilities to generally “satisfied” or “very satisfied” among all age groups in the next OSRP update. D. Improve the awareness of the open space and recreation facilities among all residents. E. Explore opportunities to increase the public access to water bodies. F. Work with Town departments and staff to increase or introduce new parking, access and accessibility to existing open space. 				
	a) Continue recreation area maintenance and capital improvement. Repair and add fencing, structures, and equipment where needed.	High Year 1-3	SPRD/C	DPW	BG, Vols
	b) Create a procedure and criteria for regular study and evaluation of playfield use by the various recreation programs and leagues to determine needs.	Medium Ongoing Years 1-7	SPRD/C, SPS	IAL, OSRPIC	Time



Table 0.1 - Seven Year Action Plan (2020-2027)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
	c) Develop soccer, baseball, football and other playfields to meet town wide demand. Review agreements for space use at non-town owned recreation areas including UMass South Street fields.	High Years 1-3	SPRD/C, SPS	SBOS	UMass, legal resources
	d) Seek to ensure that open space and/or recreation land created through the subdivision process is maintained by a homeowner's association wherever possible. Evaluate if financial contributions made by developers for open space are being utilized efficiently.	Medium Years 3-5	SEPCD, SPB	OSRPIC, SBOS	Home owner assoc.
	e) Continue to improve access for all ages and abilities at recreation facilities.	Medium Ongoing Years 1-7	SPRD/C STC	COA COD	DPW time
	f) Maintain and improve trail access, pathways, safe sidewalks, routes for cyclists, pedestrians, strollers, and disabled peoples (including wheelchairs and walkers).	Medium Years 3-5	SPRD/C, STC	COA, COD	DPW time
	g) Continue to develop trails, picnic areas and parking facilities on land already owned by the Conservation Commission.	High Ongoing Years 1-7	OSRPIC	SCC STC	DPW time
	h) Establish a regular evaluation protocol for recreation and open space areas and activities.	High Year 1	OSRPIC	ECD	Time



Table 0.1 - Seven Year Action Plan (2020-2027)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
	i) Preserve the open space and recreation resource of Ward Hill.	Medium Years 1-5	OSRPIC	ECD, SPRD/C	DCR
	j) Develop more recreation opportunities on lakes and ponds including Lake Quinsigamond and Jordan Pond, specifically examining the possibility of extending the walking path around Jordan Pond.	High Ongoing Years 1-7	OSRPIC, LQC	SPRD/C	DCR
	k) Preserve the Donahue Rowing Center as a world class rowing facility	High Year 1	OSRPIC, SPRD/C	HS/HC, IAL, SPS LQC	SPRD/C
	l) Consider development for active and passive recreation opportunities for underserved or disadvantaged populations	Medium Ongoing Years 1-7	OSRPIC	SPRD/C	DCR
	m) Identify and obtain funding for open space and recreation programs and maintenance as needed	High Ongoing Years 1-7	OSRPIC	SEPCD, SPRD/C	DCR



Table 0.2 - Seven Year Action Plan (2012 - 2019)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
V. Protect the Town's Potable Drinking Water Sources.					
	<p>Objectives:</p> <ul style="list-style-type: none"> A. Permanently protect more land area in the Town's watersheds to protect the surface and ground water supplies. B. Educate businesses and developers within wellhead protection areas about low impact development practices and opportunities for watershed land protection. C. Align public policy and regulations with low impact development, healthy community and similar approaches. D. Protect potable drinking water for and from current and future growth. 				
	a) Protect land in aquifer recharge areas through outright purchase or easements.	High As opportu nity allows	ECD, SBOS	SWS	DEP
	b) Identify and utilize funding for improvements to septic systems that do not meet current Title 5 standards.	High As opportu nity allows	ECD	SWS	DEP



Table 0.2 - Seven Year Action Plan (2012 - 2019)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
	c) Monitor the land uses and activities in the IWPA's and Zone IIs	High Ongoing Years 1- 7	SWS	ECD	DEP
	d) Continue quality monitoring of municipal water resources.	High Ongoing Years 1- 7	SWS	SEPCD	DEP
	e) Provide readily accessible information to town residents, businesses, etc. regarding the location of town water supply wells and the areas of contribution to those wells. Educate people living in unsewered areas about the proper use and maintenance of septic systems.	High Ongoing Years 1- 7	ECD	SCC OSRPIC	DEP
	f) Reduce or eliminate the use of road salt near well heads and aquifer recharge areas.	High Yeas 1-5	DPW	ECD	Muni time and money



Table 0.2 - Seven Year Action Plan (2012 - 2019)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
	g) Strictly enforce Title 5 regulations in aquifer recharge areas.	High Ongoing Years 1- 7	SCC	ECD	DEP
VI. Protect Surface Water Resources.					
	Objectives: A. Educate residents, businesses, and institutions relative to nonpoint source pollution issues such as stormwater. B. Encourage private and public entities to reduce direct recharge of stormwater with best management practices (BMPs) and/or engineered/creative solutions				
	a) Acquire land and/or easements in the Lake Quinsigamond watershed.	High On-going	OSRPIC, LQC	SBOS, ECD	Muni Time & \$, Legal resources, DCR
	b) Work with the Lake Quinsigamond Commission and Watershed Association on water quality protections and enhancement initiatives. Evaluate the impacts of non-point source stormwater pollution to surface water bodies.	High Ongoing Years 1- 7	OSRPIC, LQC	ECD	Muni Time & money, Legal resources, DCR



Table 0.2 - Seven Year Action Plan (2012 - 2019)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
	c) Protect wetlands and streams that feed into the lake by enforcing wetlands regulations and purchasing land when necessary.	High Ongoing Years 1- 7	SCC	OSRPIC	DCR
	d) Create greenways along tributaries to open water bodies. (related to Goal II).	Medium Years 3- 5	OSRPIC, LQC	PED, ECD	Muni Time & money, Legal resources, DCR
	e) Address septic system problems on properties in the lake watershed that are not connected to town sewers. Coordinate with City of Worcester Sewer Department regarding overflow issues	High Years 1- 3	ECD	SCC	SHD COW Sewer Dept
	h) Use the annual Earth Day and/or Town cleanup as a time to raise awareness about watershed protection and to do cleanups in and around lake and pond watersheds.	High Ongoing Years 1- 7	OSRPIC, LQC	IAL	BG, Vols



Table 0.2 - Seven Year Action Plan (2012 - 2019)

Goals -	Action Steps	Priority/ Timing	Respon- sible Parties	Collabo- rators	Resources
	i) Educate residents and businesses regarding the stormwater bylaws and regulations.	High Ongoing Years 1- 7	ECD	OSRPIC, SBOS	Muni Time & money, Legal resources
	j) Consider adoption of Slope/Driveway Bylaw. Educate the residents of the potential benefits	Medium Years 3- 5	PED, ECD, SPB	OSRPIC, SBOS	Muni Time & money, Legal resources
	k) Educate the impacted property owners of the new FEMA maps and their relevance.	Medium Years 3- 5	ECD	OSRPIC, SCC	FEMA
	General Objective related to each goal Create OSRP Implementation Committee (OSRPIC) or assign a town entity to be the OSRPIC to implement OSRP goals, objectives and action items. OSRPIC will also include a focus on fundraising, resource development and education campaigns.	High Years 1- 7	SBOS	PED	Engineering, Time



SECTION 10: PUBLIC COMMENTS

This Open Space and Recreation Plan has been reviewed and approved by the Shrewsbury Board of Selectmen, the Shrewsbury Planning Board, and Central Massachusetts Regional Planning Commission. Letters of approval from these bodies are included in Appendix H.



SECTION 11: REFERENCES

Barosh, P. (1978). *Reconnaissance bedrock geologic map of Shrewsbury Quadrangle, Massachusetts*. Retrieved January 10, 2012, from US Geological Survey National Geologic Map Database: http://ngmdb.usgs.gov/Prodesc/proddesc_14707.htm

Central Massachusetts Regional Planning District, USDA Soil Conservation Service. (1965). *General Soil Areas Central Massachusetts Regional Planning District*. Worcester, Massachusetts: USDA Soil Conservation Service.

Division of Conservation Services, MA Executive Office of Environmental Affairs. 2001. Open Space and Recreation Plan Requirements. EOEA/DCS, Boston, MA (available online at www.state.ma.us/envir).

Division of Conservation Services, MA Executive Office of Environmental Affairs. 2008. The Open Space Planner's Workbook. EOEA/DCS, Boston, MA.

Labor Market Information Largest Employers By Area. Retrieved June 2020, from EOLWD Data and Statistics: http://lmi2.detma.org/lmi/Largest_employer_index.asp

Massachusetts Department of Environmental Protection. (2016). *Massachusetts Year 2016 Integrated List of Waters: Final Listing of the Condition of Massachusetts Waters Pursuant to Sections 305(B) and 303 (d) of the Clean Water Act*. Worcester, MA: Massachusetts Office of Energy and Environmental Affairs.

Massachusetts Department of Environmental Protection. (2020, April 8). *Reportable Release Lookup*. Retrieved April 8, 2020, from Massachusetts Department of Environmental Protection: <http://db.state.ma.us/dep/cleanup/sites/SearchResults.asp>

Massachusetts Department of Environmental Protection. (2003, April). *Source Water Assessment and Protection (SWAP) Report for Shrewsbury Water Department*. Retrieved January 18, 2012, from Massachusetts Department of Environmental Protection: <http://www.mass.gov/dep/water/drinking/2271000.pdf>



Massachusetts Department of Fish and Game. (2020, May). *Natural Heritage and Endangered Species, Number of Certified Vernal Pools by Town*. Retrieved May 2020, from Massachusetts Division of Fisheries and Wildlife: http://www.mass.gov/dfwele/dfw/nhesp/vernal_pools/vernal_pool_data.htm

Massachusetts Executive Office of Energy and Environmental Affairs. (2017). *Massachusetts Outdoors 2017: Statewide Comprehensive Outdoor Recreation Plan*. Boston, Massachusetts: Commonwealth of Massachusetts.

Massachusetts Executive Office of Housing and Economic Development, 495/Metrowest Development Compact Regional Study - Update, 2017.

Massachusetts Executive Office of Labor and Workforce Development. (2019). *Labor Market Information Municipal Employment Data*. Retrieved June 2019, from EOLWD Data and Statistics: <http://lmi2.detma.org/lmi/Townbox.asp>.

Massachusetts Historical Commission. (2011). *State Register of Historic Places*. Boston, Massachusetts: Secretary of the Commonwealth.

National Cooperative Soil Survey. (1998). *Soil Survey of Worcester County, MA, Northeast Part. Worcester County Conservation District*. Holden, Massachusetts: USDA Natural Resources Conservation Service.

Natural Heritage and Endangered Species Program. 2008. *MA Natural Heritage Atlas: 13th Edition*. MA Division of Fisheries & Wildlife, Westborough, MA.

Natural Heritage and Endangered Species Program. 2017. Natural Heritage Program Web Page (www.state.ma.us/dfwele/dfw/nhesp/nhenviro.htm).

Natural Heritage and Endangered Species Program. 2000. *A Field Guide to the Animals of Vernal Pools*. MA Division of Fisheries & Wildlife, Westborough, MA.

Santore, B. (2011). *Hillcrest Cemetery*. Retrieved August 29, 2012, from Grave Addiction: <http://www.graveaddiction.com/hillcrest.html>

Town of Shrewsbury. (2012- 2019). *Annual Town Report Town of Shrewsbury, years 2012 – 2019*. Town of Shrewsbury, Massachusetts.



US Census Bureau. (2010). 2010 Decennial Census. US Census Bureau.

US Census Bureau. (2018). *2012-2018 American Community Survey*.

Woolsey, H. A. (2011). *BioMap2: Conserving the Biodiversity of Massachusetts in a Changing World*. Department of Fish and Game/Natural Heritage & Endangered Species Program and The Nature Conservancy/Massachusetts Program.