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## SECTION I PLAN SUMMARY

The 2013 Lowell Open Space and Recreation Plan was prepared by City of Lowell Department of Development (DPD) staff. It is a comprehensive update to the 2005 Lowell Open Space and Recreation Plan and represents the changing needs of Lowell residents and a changing environmental and development context. The Open Space and Recreation Plan follows the principles of Sustainable Lowell 2025, an update to the Lowell Comprehensive Master Plan, adopted by the Lowell City Council spring 2013. The Open Space and Recreation Plan reflects the vision and is aligned with the goals established in Sustainable Lowell 2025, which include the following four components:

- ***Livability***  
*Lowell will offer a high quality of life for residents of all backgrounds and stages of life by building upon the strength of its neighborhoods as diverse, accessible communities whose established character is celebrated and preserved, and whose lifestyle amenities are well integrated and readily available.*
- ***Place-Making***  
*Drawing upon its rich and authentic natural, cultural, institutional, and historical resources, Lowell will serve as a local and regional hub for innovation and sustainable economic development with an unmistakable pride of place and a vibrant urban downtown.*
- ***Longevity***  
*By proactively preparing for and adapting to social, economic, and environmental trends at the local, regional, and global level, Lowell will maintain an effective and innovative municipal government, foster an engaged community, support a diversified and sustainable economic base, and preserve its environmental assets, striving to put policies in place that will endure beyond any given set of leaders.*
- ***Responsibility***  
*Through increased accountability, education, civic engagement, and action Lowell will cultivate a community-wide, shared ethic of sustainability whose implications and merits - for both the present and future - are broadly understood.*

The Lowell Open Space and Recreation Plan will guide open space and recreation policy and planning in the City of Lowell over the next five years. The objectives and actions recommended in this document are the result of extensive data collection, and public outreach. They provide a clear action plan that responds to the changing needs of the city based on this outreach and analysis.

The 2013 Open Space and Recreation Plan is designed and formatted according to Massachusetts Division of Conservation Services (DCS) requirements.

## SECTION II INTRODUCTION

### STATEMENT OF PURPOSE

The Lowell Open Space and Recreation Plan establishes a vision for preserving, maintaining, and enhancing existing open spaces, and protecting valuable natural and historic resources. The plan takes a regional perspective recognizing environmental resources are part of larger regional networks that extend well beyond city boundaries. It identifies opportunities to link open space and recreational amenities with neighboring communities to maximize natural resource protection, broaden recreational options, and improve access to recreational activities for Lowell residents.

The plan documents the current demographic, development, socioeconomic conditions and environmental resources for the city. An analysis of the current environmental conditions and inventory of recreational amenities along with an extensive public outreach process was conducted to inform the goals and objectives guiding the implementation. A focus is placed on an interconnected network of open spaces throughout the city and linked to the region beyond to strengthen wildlife habitat, wildlife corridors, and to provide a variety of recreational opportunities within close proximity to all Lowell residents. To supplement the creation of the networked system of "green infrastructure" more natural vegetation and landscaping will be introduced into densely populated areas.

Based on changing demographics and direct feedback offered through public outreach activities the plan emphasizes creation of recreational facilities that meet the varied needs of the public, and seeks to provide ease of access to open spaces for residents throughout the city. It sets a high standard of maintenance of existing open spaces and recreational facilities and to implement reasonable regulations that will protect important natural resources. Information will be readily available and effectively communicated to the public to increase use of open spaces, and appreciation of the value of our natural and historic resources. The City will continue to work with varied stakeholders and build on past successes in preserving the rich historical and cultural heritage of the City. In order to effectively implement the broad set of goals summarized above an action plan was created and will provide an implementation strategy to carry out recommendations over a 5-year period.

There have been a number of improvements made since the prior Lowell Open Space and Recreation Plan was completed and approved in 2005. A preponderance of the work directly reflects the goals and objectives outlined in that plan, significant progress has occurred across various elements of open space planning including parks, recreation, and preservation of open space in the City of Lowell. Major renovations to existing parks and recreational facilities are among the many steps taken since the last plan was approved and include the following:

- The City completed major renovations and upgrades to public parks in various neighborhoods. In 2009, the City completed significant improvements to Shedd Park, including the installation of an aquatic spray park, play structures, a 50 car parking lot with accessible spaces adjacent to the new spray park, upgraded bathroom facilities and drinking fountains, upgraded lighting and site furnishings, and landscape areas designed to provide additional shade.
- At McPherson Park in Centralville, a new playground was constructed in the spring of 2010. Swings, a large net climber, a tree house play structure, a see-saw and other play elements were installed as well as a shade structure, benches, plantings, pavers, fencing, parking lot improvements, and a mural.
- In the summer of 2011 landscaping enhancements including shade trees and a new electric service box was installed in Armory Park in the Lower Highlands for outdoor events and movie viewing.
- Clemente Park also located in the Lower Highlands neighborhood received many additions and upgrades in 2011, including athletic lighting for night volleyball games, a shade structure, a concession stand with public restrooms, plantings, and 20 shade trees.
- Fels Park located in East Pawtucketville was upgraded with new playground equipment in 2010. Additional shade tree plantings and fence improvements are scheduled to be implemented by Fall Of 2014. Design plans have been developed with UMass Lowell for a memorial seating area and plantings.
- The City constructed a new playground in Scullin Park adjacent to the Morey School located in the Highlands neighborhood. This playground will be used by the school children and the neighborhood alike and includes play climbers, swings, shade trees, benches, seat walls, and plantings.
- The City worked with the Coalition for a Better Acre (CBA) to design and construct enhancements to a playground area serving an affordable housing complex owned by the CBA located on Moody Street and serving the Acre neighborhood more broadly. The new playground was constructed during winter 2011 and includes a contemporary climbing play structure to fit in the space adjacent to a basketball court.

The Concord River Greenway (CRG) development, which is well underway, currently consists of 2,700 linear feet of trail and 1.3 acres of open space. Public art and interpretive signage line the multi-modal path, and an online classroom can be utilized by visiting school programs. Completion of the CRG is expected within the next several years, at which time it will connect to the regional and state-wide network of trails. The City has completed the first two phases of the Concord River Greenway. Construction of Phase I for the Concord River Greenway beginning at the Davidson Street lot and heading south was completed in 2008. Phase II of the Greenway, which begins at Lawrence Street and runs along the edge of the Concord River for approximately one third of a mile, was completed in the fall of 2009. Designs for Phase IIIA and IIIB have been completed and the City is working on the needed land acquisitions and funding for construction. When completed the Greenway will link Downtown Lowell and the Riverwalk with the regional Bruce Freeman Trail and serve as a part of the Bay Circuit Trail.

The city has worked collaboratively with the Lowell National Historical Park to secure funding for and manage the development and redevelopment of many canal walkways throughout the

Downtown and Acre neighborhood. Since 2001, 6,662 linear feet of canal walkway have been restored or constructed, and an additional 11,360 linear feet are currently underway. The City worked with the National Park along the Western Canal and Merrimack River to complete the following projects:

- Phase I was the development of a canal walk from the head of the Western Canal on Dutton Street about ¼ mile to Broadway Street along the western bank of the canal. This \$1.4 million project improved pedestrian access to the Acre neighborhood and was the first of three phases of improvements planned for the Western Canalway.
- Phase II of the project, with a cost of over \$1.7 million, refurbished the canal's original Paul Lu landscape design with improved pavements, railings, plantings and site amenities along the canal from Broadway to Moody Street.
- Phase III, Moody Street to Father Morrissette Blvd. was completed by the National Parks Service in 2010.
- Design and construction of Red Cross Reach Park next to the Pawtucket Falls and the historic Spalding House on Pawtucket Street completed in the fall of 2010 and includes fieldstone walls, wildflower plantings, an arbor, and wooden privacy fence. The park provides improved access to the River and historic resources associated with the canal system and provide an opportunity to link with existing pedestrian paths located along the Merrimack River.
- Jackson Street canal walkway was completed in 2011 in conjunction with a series of street improvements including lighting, sidewalks, landscaping, and street parking. The canal walkway provides access to the canal front and links to residential, commercial, and institutional developments, to Downtown Lowell, and to the existing Merrimack Canal walkway.

## **PLANNING PROCESS and PUBLIC PARTICIPATION**

The Lowell Open Space and Recreation Plan was developed by City of Lowell staff with the benefit from insights offered by the Northern Middlesex Council of Governments (NMCOG), Lowell Parks and Conservation Trust and other stakeholders. An internal open space plan working group comprised of DPD staff was created to manage and conduct data collection, perform research and analysis, and author plan elements according to Massachusetts Division of Conservation Services (DCS) guidelines. The planning process began in January 2013 with a review of existing data, and the compiling information to formulate the existing conditions analysis summarized in sections three and four of this document. City departments were consulted in preparing the environmental inventory and analysis element, and asked to provide feedback relative to open space objectives including the Water Utility, Wastewater Utility, and Parks Department. Open space plans completed by neighboring communities. The Massachusetts Division of Conservation Services was also consulted in an effort to introduce a regional perspective to the plan.

A number of activities designed to capture the opinion of Lowell residents relative to open space utilization and needs were applied to inform the goals and objectives of the Lowell Open Space and Recreation Plan. Much of the data collected during the master plan update process was

used to supplement additional data collection conducted for the open space plan as a majority of the feedback received during the public outreach portion of the process was directly related to open space planning and conservation. DPD conducted extensive outreach to formulate a basis for the comprehensive update to the master plan with engagement activities beginning summer 2011. Outreach was designed to include a broad range of participation by residents, business owners, institutional leaders, and other community stakeholders to develop a shared vision for the future. Lowell DPD conducted the following activities to engender the public's participation in the visioning process:

- 800 residents completed a telephone survey conducted in 4 languages
- 175 participants, including 61 teens from 6 local youth organizations, shared over 1,000 comments through an online participatory planning tool, Community PlanIt
- 160 community stakeholders attended 5 visioning sessions on topics ranging from Transportation to Economic Development
- Over 200 people attended educational tours and discussions held during Lowell's 1st Annual Sustainability Week
- 113 photographs were submitted to the Sustainability Snapshots Photography Contest for consideration in the Sustainability Plan

Additional outreach activities were conducted late spring 2013 including a survey focusing entirely on the public's opinion and preferences relative to open space preservation and recreational amenities. Surveys were distributed via email and easily completed online. Paper copies of the survey were also made available at the Library, City Hall information desk, and Lowell Senior Center. Over 1,000 surveys were distributed with nearly 200 responses returned to DPD for analysis. A copy of the survey can be found in Appendix A of this document. A focus group was also conducted by Libran Research and Consulting to drill down into the qualitative aspects of open space and historic preservation in the City of Lowell.

NMCOG began a regional open space planning process in the fall of 2012. The process included the constituent communities of Lowell, Tewksbury, Billerica, Chelmsford, Westford, Pepperell, Dunstable, Tyngsborough, and Dracut. NMCOG has completed an existing conditions analysis with the help of public participation from constituent communities and their residents. Analysis from this process was generously provided by NMCOG to supplement activities undertaken by DPD to help add a regional perspective in the objectives of this open space plan.

#### OPEN SPACE SURVEY

The open space survey was developed by DPD staff by adapting elements from the survey instrument utilized in support of the 2005 open space plan. Questions were updated to reflect current informational needs and to supplement the data collected for the comprehensive master plan update. Specifically the survey sought to understand how residents felt relative to the following:

- How open space, recreation facilities, and conservation of the natural environment may affect their choice of a place to live;
- How frequently open spaces are currently used, which open spaces are most frequently used, and what activities people participate in when utilizing public open spaces;
- How well is the City providing open space and recreational facilities in terms of accessibility, safety, cleanliness and maintenance;
- How resources should be prioritized when considering planning for new, or making enhancement to existing open spaces, parks, and recreational facilities.

The survey instrument was made available through direct emailing utilizing the Constant Contact survey invitation module and distributed to over 900 contacts. The survey was also made available on the DPD web page for download in digital format or direct link to the on-line survey. Hard copy surveys were also made available at the Lowell Public Library, Lowell Senior Center and City Hall help desk. The survey was made available May 10<sup>th</sup> 2013 via email invitation, placed on the City webpage, posted on several City blogs and in hard copy form at the location listed above. Respondents were asked to complete and return the survey by May 27<sup>th</sup>. Nearly 200 surveys were completed and returned to DPD for analysis. Although there were a considerable number of responses to the survey the demographic makeup of the respondents do not represent the demographic makeup of Lowell and therefore should not be considered a comprehensive analysis of all Lowell residents. It should be noted that many of the responses clearly tracked with survey responses provided for the master plan update which was a representative sample of the city population. The Open Space survey responses do provide a strong anecdotal evidence relative the general public's preferences relative to open space and recreation. The City should continue its practice of directly engaging the public when implementing specific open space and recreational projects to ensure facilities are aligned with the needs and preferences of the residents most affected.

#### OPEN SPACE FOCUS GROUP

One focus group was conducted on June 4<sup>th</sup> 2013 by Libran Consulting, a market research consulting firm, with eight (8) Lowell residents participating. The respondents were randomly selected by the consulting firm to represent a mix of age, gender, ethnicity, length of residency and geographic area of residence. Seven of the eight participants reside in an Environmental Justice neighborhood. The focus group was designed to explore in detail the following two key areas:

1. What scenic landscapes, distinctive landforms, and/or environments help shape the unique identity of Lowell?
2. What cultural and historic structures, places and/ or other resources contribute to the unique identity and character of Lowell?

To help build a framework around these central questions the consultant team explored more generally with participants what comes to mind when thinking about open space in the context of Lowell, and what are the benefits of preserving open spaces. Participants were also asked how the City of Lowell should prioritize resources in areas relative to open space and historic preservation in order to make the city a better place to live.

The draft Open Space and Recreation Plan was made available to the public and distributed to the Planning Board, Lowell City Council, Conservation Commission, Board of Health, Zoning Board of Appeals, and NMCOG for comment on July 15, 2013. The plan will also be made available on the City web page to provide additional opportunity for the public to provide direct feedback. Comments and public agencies, officials, and the general public will be compiled and incorporated into a final plan.

## SECTION III COMMUNITY SETTING

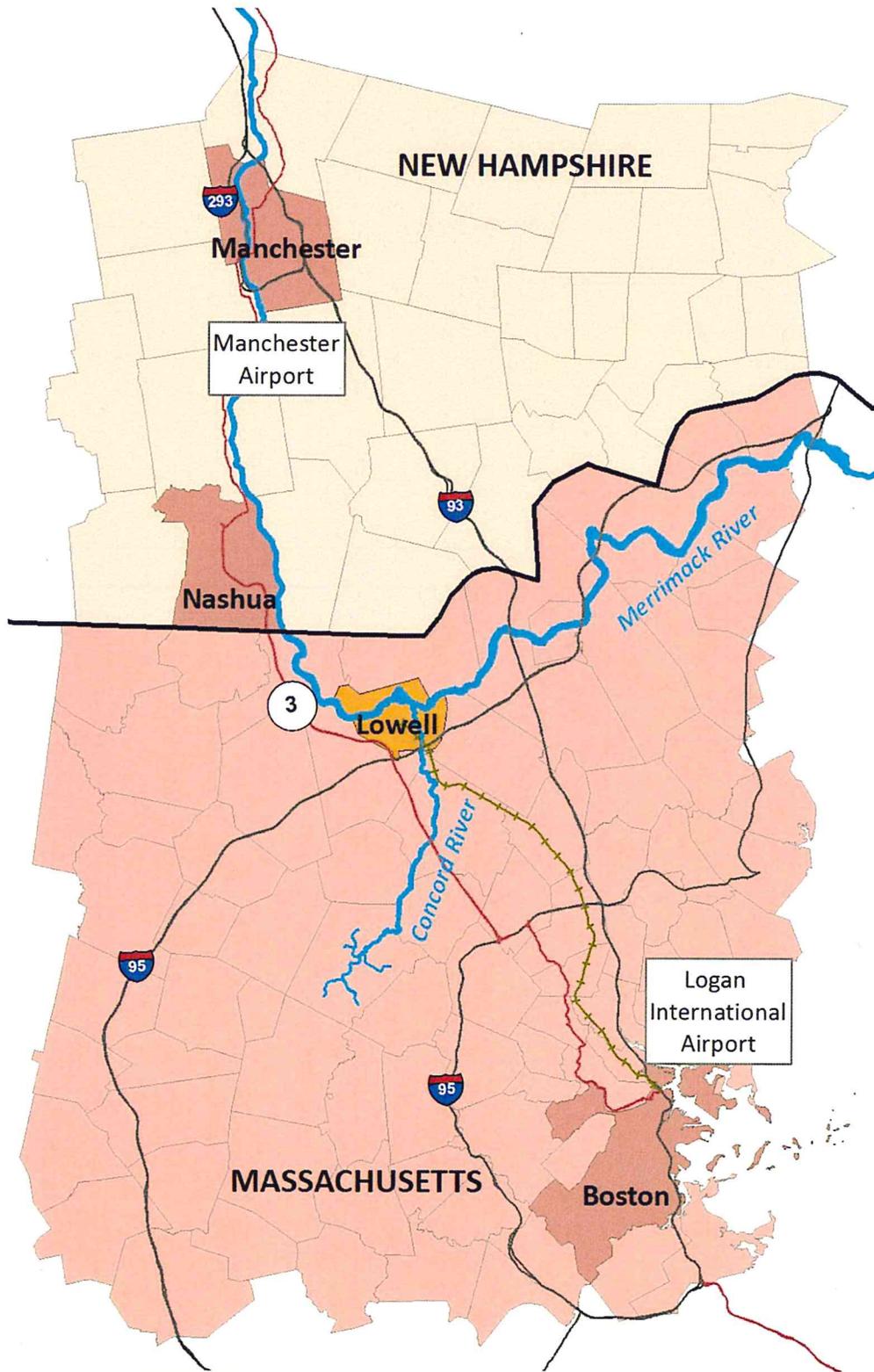
### REGIONAL CONTEXT

Lowell, Massachusetts, the nation's first successfully planned industrial community, is located in northern Middlesex County in the northeastern section of Massachusetts. The City, located approximately 25 miles north of Boston, is bisected by the Merrimack River. Lowell has a land area of 13.38 square miles with the remaining 0.89 square miles covered by surface water. The City has a total area of 14.27 square miles. The major watersheds affecting the city are the Merrimack and Concord Rivers. Both rivers have played a critical role in the development of Lowell over the years, with the canal systems fed by both the Merrimack and Concord Rivers providing the energy needed to catalyze the industrial revolution. These rivers continue to play a critical role in Lowell's development patterns as they offer important amenities to residents and businesses, and offer habitat for a wide spectrum of vegetation and animals, and limit growth in some areas due to wetlands and flood plains.

The city is a diverse urban/suburban community built primarily around the extensive industrial mill complexes along the Merrimack River. The industrial revolution of the 19<sup>th</sup> Century gave the city its economic base, heritage, and character that are still prevalent today. Although the City experienced an extended period of economic decline during the mid to late 20<sup>th</sup> century as the textile industry and supporting sectors migrated south and eventually off shore, the City has experienced a resurging economy over the past 20 years with a diversifying economic base. The city can currently be characterized as a highly urbanized community surrounded by wealthier suburban white-collar communities. A healthy industrial sector remains active in the city, along with growing service based, and research and development sectors now playing a larger role in the region's economy. Most recently University of Massachusetts at Lowell has taken a more active role in economic development, including new development projects providing additional student housing, research facilities and administrative buildings. The City is surrounded by the suburban communities of Tewksbury, Chelmsford, Dracut, and Tyngsborough, communities with extensive open land reflecting their rural character and historical agrarian economy.

The City shares a number of natural resources with the surrounding communities, and the region beyond. The Merrimack River and Concord River are major waterways shared by many northeastern Massachusetts and central and southern New Hampshire communities. The Lowell-Tyngsborough State Forest includes 1,140 total acres of protected land including 180 acres of which is open water or wetlands. The state forest includes 457 acres of land located within Lowell and provides an important environmental and recreational resource to the residents of Lowell as well as the region. Smaller riparian networks are shared among surrounding towns including River Meadow Brook which with headwaters in Westford and runs through Chelmsford before emptying into the Concord River in Lowell. Beaver Brook originates in Londonderry NH, runs through Dracut MA before emptying into the Merrimack River in Lowell. Wetland resources and floodplains associated with these waterways are also shared with neighboring communities in the region.

# Regional Context Map



0 2.5 5 10 15 20 Miles

## LOWELL HISTORY

Lowell was remarkable among 19th century industrial cities for its quick ascent to fame, the symbolic value the city held for America, and the sheer enormity of its industrial processes. The physical remains of Lowell's industrial past, the 5.6 miles of canal ways, lock chambers, mills, boarding houses, bridges, and machinery, are monuments to the American Industrial Revolution.

Lowell was America's first large scale planned industrial community. It was incorporated as a town in 1826 and a city in 1836. By 1840, Lowell had become the principal manufacturing center of the United States and a model for many similar ventures. The transformation from rural community to industrial mecca occurred in less than two decades and was one of the most rapid industrialization processes the country had ever experienced.

Lowell's geographical location at the confluence of the Merrimack and Concord Rivers attracted settlers to its banks for approximately 10,000 years. The site first served as an ideal location for Native American fishing camps and then to early English settlers who made use of the rich farmland along the rivers' floodplains. During the Industrial Revolution, the two rivers provided an abundance of inexpensive yet reliable waterpower for the mills. The level terrain, convenient access to Boston via the Middlesex Canal and to Newburyport via the Pawtucket Canal, and the Merrimack River were also geographical advantages that drew settlers.

In the 19th century, Lowell's city designers designated mill sites and canal routes as their highest priority. To facilitate the use of river power, mill complexes were constructed along the banks of the Merrimack and Concord Rivers, where the force of the watercourses were greatest. As corporations were founded, an intricate system of canals evolved to provide the necessary power. Eventually, 5.6 miles of canals were constructed, cutting up the city into seven islands as they fanned out across the landscape. The rest of the community developed within the confines of the V-shaped wall formed by the mills.

With the expansion of the mills during the 1830s and 1840s, a large middle class grew in three adjoining areas. Chapel Hill was the first neighborhood to develop. Development then spread to the Belvidere section of the City. In 1834, the remaining land above Nesmith Street was annexed to Lowell, which was then sold to developers to build expensive homes during the 1840s. Centralville was settled next and was annexed to Lowell in 1851. The introduction of the streetcar in the 1890's led to the development of Lowell's outlying areas, such as Tyler Park in the Highlands neighborhood. Pawtucketville became a part of the City in 1874.

By the 1860s, Lowell could not keep pace with the very forces of the industrial system it had generated. As the 19th century progressed, conditions in mills and corporate boarding houses became worse as overcrowding became prevalent. Tenement buildings were constructed throughout the city, and the neighborhoods grew to their present size.

Shortly after the turn of the century, Lowell's status diminished when the use of alternate forms of power production became widespread. It was also practical for many aging textile companies

to move south where raw materials and labor were less expensive. For several decades, the City's economy stagnated and the mills and canals fell into disrepair. It would be many decades before efforts were initiated to reuse these impressive facilities.

Lowell has proven that historic preservation and urban economic development can work hand-in-hand to improve a community. Urban disinvestment and decline were a familiar sight in America's older cities in the mid-twentieth century. Lowell was no exception to this phenomenon as the collapse of Lowell's once-thriving textile industry resulted in empty mill buildings and a decaying central business district. During the 1950s and 1960s, federal urban renewal funding became available to Lowell. Unfortunately, these efforts did not stimulate economic renewal and resulted in the demolition of some of the city's most significant mill yards and tore apart several ethnic neighborhoods.

In the early 1970s, planning efforts began to focus on preservation as a core element of the City's revitalization strategy. The City established Lowell's first Historic District Commission and two local design review districts. Much of the downtown, mill yards, and canal system were placed on the National Register of Historic Places. The City invested in pedestrian improvements in the downtown that recreated the 19th century feel and provided design assistance for owners of historic properties. The establishment of the Lowell Heritage State Park in 1974 added credibility to Lowell's efforts to establish a National Park, and eventually lead to the creation of the Lowell National Historical Park (LNHP) in 1978 by federal law. That same law also established the Lowell Historic Preservation Commission (LHPC), which during its existence, assisted with much of the historically sensitive building rehabilitation that took place between 1979 and 1995.

The LNHP and the City have played an important part in fostering many public and private partnerships that are responsible for the rehabilitation of over 250 structures in the downtown, and the creation of extensive public programs to preserve and interpret the city's cultural resources. Several major mill complexes have been successfully renovated into housing and office spaces. Aluminum and stucco facades were removed from downtown buildings to reveal 19th century commercial storefronts. The banks of Lowell's canals have been largely reclaimed, providing areas of recreational enjoyment and interpretation of the city's rich history. Streetscape improvements including brick pavement, granite pavers, period lighting and benches have all been placed downtown to enhance the 19th century urban character of the city.

Strengthening and expanding historic preservation regulation and review in Lowell was a requirement of the federal law that created the LNHP. In 1983, the Massachusetts Legislature established the Lowell Historic Board (LHB) and the Downtown Lowell Historic District (DLHD) to satisfy the federal requirements. As a result of this action LHPC, the original historic district commission was abolished and the two previously-existing design review districts were consolidated and expanded to form the DLHD. The Acre Neighborhood District (AND), a second design review district also overseen by the LHB was created in 1999 to assist in the implementation of the Acre Neighborhood Revitalization & Development Plan. Eight additional design review districts under the purview of the LHB were created in 2005, 4 of which were the

existing National Register neighborhood districts. In 2011 a new design district was created. LHB jurisdiction for the neighborhood districts is limited to demolition of existing structures and new construction.

Within Lowell's neighborhoods, the LHB has established an active historic home marker and brochure program. Other efforts of the LHB have included survey and identification of historic resources and National Register listings as well as technical assistance and outreach to homeowners regarding preservation. Through partnerships with neighborhood groups and various state grant sources, the City has successfully preserved several historic landscapes including Tyler Park and Rogers Fort Hill Park.

For all of its efforts, the City of Lowell was recognized by the National Trust for Historic Preservation with one of its distinguished National Preservation Honor Awards in 2002 as well as one of America's initial Dozen Distinctive Destinations in 2000. In 2004, Lowell was designated a Preserve America community by the White House and Advisory Council on Historic Preservation.

#### HISTORIC RESOURCES

The city's numerous historic districts contain a critical mass of structures from the nineteenth century when Lowell was America's textile capital. Lowell has a total of 13 districts listed on the National Register of Historic Places and 26 individually-listed National Register properties scattered throughout the downtown and neighborhoods (see below). Lowell has the fifth highest number of properties included on the state's inventory of historic resources in Massachusetts. The Lowell Canal System, which provided the framework that shaped the entire development of Lowell, is listed as a National Historic Landmark and is also a designated Civil and Mechanical Engineering Landmark.

#### NATIONAL REGISTER OF HISTORIC PLACES - DISTRICTS

- Andover Street Historic District\*
- Belvidere Hill Historic District\*
- City Hall Historic District
- Locks and Canals Historic District (also a National Historic Landmark)
- Lowell National Historical Park & Preservation District
- Merrimack-Middle Streets Historic District
- Rogers Fort Hill Park Historic District\*
- South Common Historic District\*
- Tyler Park Historic District\*
- Wamesit Canal-Whipple Mills Historic District
- Wannalancit Street Historic District\*
- Washington Square Historic District\*
- Wilder Street Historic District\*

\*These districts have also been designated as Local Historic Districts along with the Acre Neighborhood and Downtown Lowell Historic Districts.

## NATIONAL REGISTER OF HISTORIC PLACES – INDIVIDUAL LISTINGS

- Allen House (57 Rolfe Street)
- Jerathmell Bowers House (150 Wood Street)
- Jonathan Bowers/Round House (58 Wannalancit Street)
- Brown-Maynard House (84 Tenth Street)
- Butler School (812 Gorham Street; demolished 2013)
- Chelmsford Glass Works Long House (139-41 Baldwin Street)
- Colburn School (136 Lawrence Street)
- Flagg-Coburn House (722 East Merrimack Street)
- Fox Building (190 Middlesex Street)
- Grace Universalist Church (44 Princeton Boulevard)
- Holy Trinity Greek Orthodox Church (62 Lewis Street)
- Howe Building (208 Middlesex Street)
- Hoyt-Shedd Estate (386/396 Andover Street and 569/579 East Merrimack Street)
- Lowell Cemetery (Lawrence Street)
- Middlesex Canal
- Monarch/Owl Diner (244 Appleton Street)
- Musketaquid Mill (131 Davidson Street)
- Old Lowell Post Office (89 Appleton Street)
- Pawtucket Congregational Church (15 Mammoth Road)
- St. George Antiochian Orthodox Church (61 Bowers Street)
- St. Joseph's Convent & School (517 Moody Street)
- St. Joseph's Roman Catholic College for Boys (760 Merrimack Street)
- St. Patrick's Church (284 Suffolk Street)
- Varnum Building (401 Bridge Street; fire and demolished 2010)
- Varnum School (103 Sixth Street)
- Worcester House (658 Andover Street)

## ARCHEOLOGICAL RESOURCES

The area known today as Lowell was populated well before the Industrial Revolution. This region was popular with Native Americans and early settlers because of its water resources. The two rivers and the Pawtucket Falls proved to be valuable natural resources for hunting, fishing, and transporting goods to and from various markets. While much of this earlier history is overshadowed and forgotten due to the booming Industrial Revolution that occurred centuries later, archeological remains have been found in the region that describe life in Lowell in Pre-Industrial times. The Algonquin-speaking Pennacook Indians came to the Pawtucket Falls regularly to take fish from the Merrimack River. Numerous remains from these fishing and gathering sites have been found along the river.

## POPULATION CHARACTERISTICS

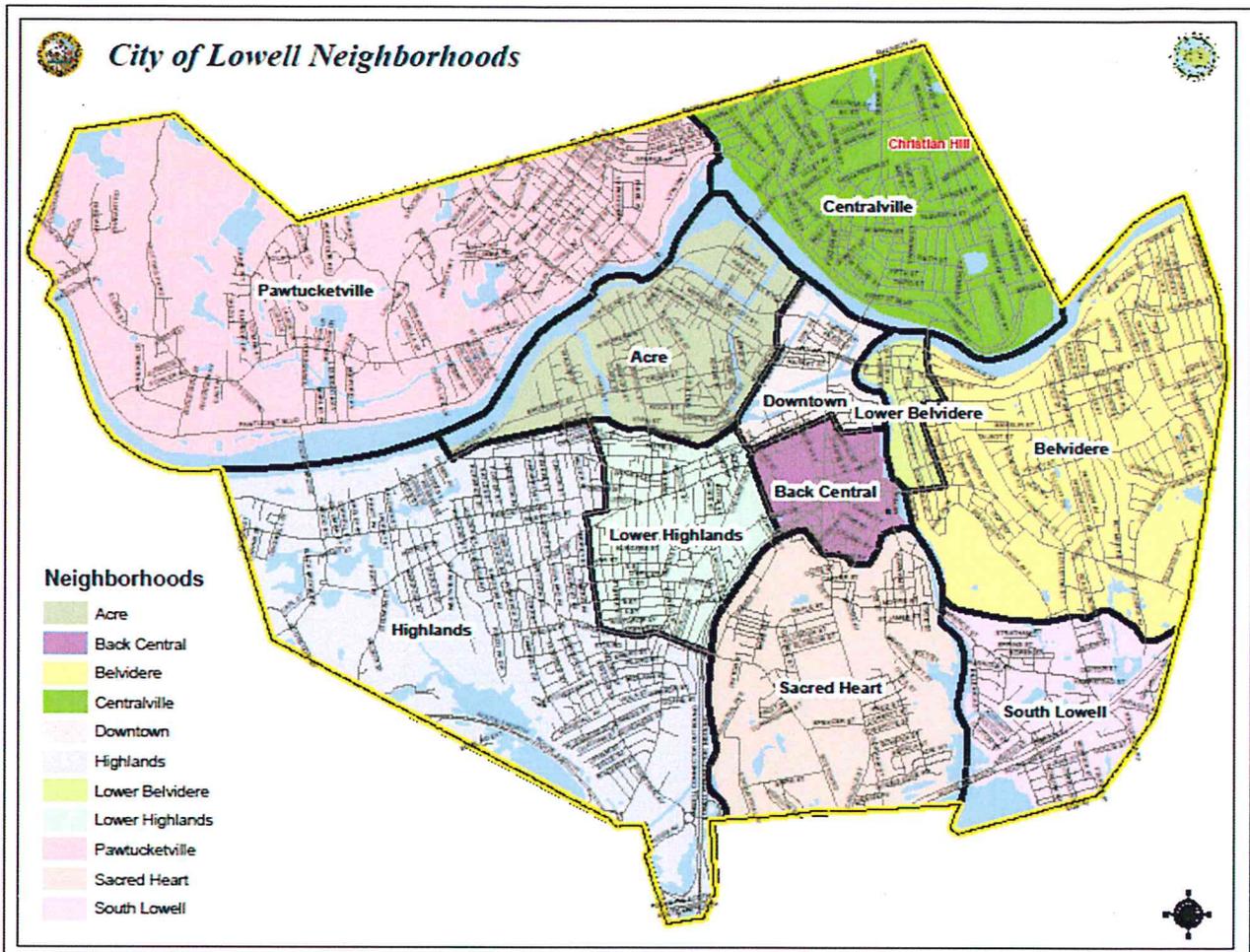
According to the 2010 US Census, the City of Lowell had a population of 106,419 and a population density of 12.1 persons per acre (p/a). The growth in total population has slowed in the past two decades with a modest 1.3% increase from the 2000 census and a 3% increase from the 1990 Census. However there has been significant growth overall since 1980, where the population has increased by 15.3%.

Table 1: Population Trends 1880 to 2010

Year	Population	% Change
1880	59,475	
1890	77,695	+30.6
1900	94,969	+22.2
1910	106,294	+11.9
1920	112,759	+06.0
1930	100,234	-11.1
1940	101,389	+01.1
1950	97,249	-04.1
1960	92,107	-05.3
1970	94,239	+2.3
1980	92,418	-01.9
1990	103,439	+10.7
2000	105,167	+ 1.7
2010	106,519	+1.3

The largest percentage of the population lives in the Highlands neighborhood (17.2%). However the population density (10.8 p/a) in the neighborhood is just below the City's average. The greatest population densities can be found in the neighborhoods of Back Central (26.6 p/a), the Lower Highlands (25.5 p/a), and a portion of the Acre (30 p/a). The lowest population densities are located in South Lowell (6.1 p/a) and Pawtucketville (7.4 p/a). Since 1970, Downtown and a portion of Pawtucketville have experienced the biggest increases in density, with Downtown increasing by 512% and Pawtucketville by 63%. Overall, neighborhoods physically portray their density levels, with more two-family and multi-family homes in highly dense areas and predominantly single-family homes on larger lots in lower density areas.

The most significant changes within the city have occurred with the redevelopment of Downtown. As of 2010, the population and density of Downtown has increased by more than five times what it was in 1970. Since 2000, the addition of 2,202 market-rate units and 1,356 subsidized units has contributed to a 36% increase of the population in this census tract. The creation of these market-rate units has substantially contributed to the de-concentration of low-income populations in this neighborhood without displacing a single affordable unit. Through a number of aggressive development policies the City has successfully encouraged redevelopment of the area with the increase of residential use. Continuing residential development within Downtown will help to relieve growth pressures in other neighborhoods and ensure a vibrant center.



### AGE

While no age group dominates the population of Lowell, over the past 20 years, the most notable change in the age of the population of the City has occurred with those between the ages of 50-69. While this cohort represented 14.3% of the population in 1990, it has grown to 19.4% by 2010. Other significant patterns since 1990 include a 10% decrease in the population of persons under the age of 15 and a 15% decrease in the population over the age of 70.

### ETHNICITY

Lowell has a long history as a gateway city for immigrants and home to an ethnically diverse population, this is a trend that has been amplified in recent years. The most predominant demographic change has occurred with the City's ethnic population, which has doubled in the span of just two decades. In 1990, Lowell's ethnic population consisted of 23.5% of the total population increasing to 47.2% by 2010. All races have experienced substantial growth in the past twenty years except the White population, which decreased by just under 20,000, from 81.1% of the total population in 1990 to 52.8% in 2010. The Asian population has experienced the largest growth (82%) change since 1990. The Hispanic population has also grown substantially, increasing 70% since 1990. The African American population increased along with

other ethnic groups although growing at a slower pace of 6.8%. Growth of ethnic populations has concentrated in the Acre, Lower Highlands, Back Central, Lower Highlands, and Centralville neighborhoods.

#### INCOME TRENDS

In the 1970's, citywide median household incomes declined in every neighborhood with most severe cases in portions of the Acre (-54.9%), Lower Belvidere (-42.7%), and Centralville (-37.3%). Between 1970 and 1980 the City's overall median household income fell from \$44,627 to \$36,038 (in 1999 dollars). Only one area in the Highlands had a slight increase of 3.7%.

In the 1980's, median incomes varied throughout the neighborhoods and the city's overall adjusted median income increased by 5.9% (\$38,156). Neighborhoods that continued to experience declining incomes included the Acre, the Lower Highlands, and Back Central. Centralville experienced the biggest increase in median household income by roughly 35%, along with neighboring Christian Hill (+17.9%). Other areas to progress include South Lowell and Sacred Heart.

During the 1990's median incomes once again varied throughout the neighborhoods. By 2000, the city's overall adjusted median income increased by 2.7% to \$39,192. Census tracts with the largest increase in median household income during this decade were located in the Lower Highlands (+72%) and the Acre (+36%). Census Tracts with the largest decrease in median household income were located in Centralville (-16%) and Back Central (-15%).

The Census Bureau has changed the way it collects income data, beginning with the 2010 Census, will no longer be releasing this information with the 10-year Census counts. The American Community Survey (ACS) provides annual estimates of the population for the nation, states and counties and cities of 50,000 people or more. The ACS one-year estimates for Lowell in 2010 indicate that median household income is \$49,698 in 2010 inflation-adjusted dollars. This figure represents a 26.8% increase in median household income since 1999. However, it is important to note that the American Community Survey only represents a small survey of the population and should therefore not be used for direct comparison purposes to previous 10-year Census counts. Despite the limitations of this data, it does provide an accurate picture of the overall growth in median household income. It is believed that the largest percent in median household income during the 2000s occurred in the Downtown census tract with the addition of over 2,200 new market-rate housing units.



## EMPLOYMENT TRENDS

Over the course of the past decade, Lowell and the surrounding Merrimack Valley region have been impacted by shifts in the nation's economy. In spite of a national recession which prompted a rise in unemployment rates, Lowell has fared well in comparison to other gateway cities, and has continued to make strides in growing a healthy and sustainable local economy.

Employment in the city has increased and the city's unemployment rate has fallen as the recession has waned. The unemployment rate remains higher than the state and national averages, however it has steadily declined from a high in 2009 of 11.2% to 9.8% in 2011. In comparison with other gateway cities, Lowell lags behind Haverhill and Worcester, but fared better than Brockton, Springfield, Lawrence and Fall River.

Significant redevelopment has occurred Downtown and within the Hamilton Canal District, bringing new residents with disposable income to support the growing number of Downtown restaurants and retail shops. Lowell has diversified its economic base from its traditional manufacturing roots to more knowledge based industries, including technology, health care, education and service sectors. Amongst the City's leading employers are local hospitals, institutions of higher education, and high tech companies. The growth of UMass Lowell's student population in particular has contributed to a greater sense of vibrancy throughout the City and to an emerging identity of Lowell as a college town.

## GROWTH and DEVELOPMENT PATTERNS

### PATTERNS AND TRENDS

Development in Lowell is unique in that the city is mostly built-out (a build-out analysis suggests over 95%), with new development mostly taking the form of redeveloped on underutilized or vacant parcels as opposed to previously undeveloped land. New development has been concentrated in the downtown and urban renewal districts, and is expected to continue as remaining mill buildings are repurposed and the Hamilton Canal District continues to move forward. There are a limited number of large parcels that offer a development opportunity for on open land located in the Pawtucketville neighborhood, and it is expected small scale development will occur going forward. There are also areas of infill opportunity throughout the city, however recent zoning amendments increasing minimum frontage requirements will further limit the magnitude of this development in the future. Most recently the University of Massachusetts at Lowell has begun an aggressive expansion of its physical plant including administrative, research and development facilities, and student housing. These developments are taking place on or near each of the campus areas.

## INFRASTRUCTURE

### TRANSPORTATION

The Lowell community is well served by a clean and modern public transportation system and regional highway system that provides direct access to the Boston metropolitan area. The transportation system includes local and regional bus routes, passenger commuter trains, inter-city bus shuttles, airport limousine service and a modern multi-modal transportation facility at the Gallagher Terminal. Commuter trains provide convenient 40-minute travel service between Lowell and Boston's North Station with 22 inbound and 27 outbound trips per day. Free wifi is included to enhance the rider experience. The Lowell Regional Transit Authority (LRTA) operates 16 bus lines that serve Lowell and surrounding communities out of the Gallagher Terminal. In addition, the LRTA operates a 12-minute shuttle that connects the Gallagher Terminal to Downtown Lowell.

The City of Lowell is well served by an excellent regional highway system that provides direct access to the Boston metropolitan area as well as key points to the west and north. The City is positioned at an integral regional transportation hub for New England as it is located at the intersection of Interstate Highways 495, Interstate 93 and Route 3. Lowell has six bridges that carry cars, bikes, and pedestrians across the Merrimack River. These bridges are heavily used by residents, UMass Lowell students and staff, and regional traffic passing through the City.

Improving traffic flow throughout the city and region remains a challenge, as does connecting Lowell's neighborhoods with its Downtown and Gallagher Terminal. To that end, major pedestrian and traffic improvements have been made along Thorndike Street between South Common and the Lord Overpass. Numerous efforts to improve pedestrian infrastructure have been applied in many other locations throughout the city, including the Downtown, Centralville, the Lower Highlands and Back Central. The volume to capacity analysis has found that some streets, such as Thorndike, Dutton, Bridge and School Streets, now have proportionally higher traffic volume/capacity ratios when compared to 2002 traffic volumes. That said the majority of major thoroughfares have volume to capacity ratios that have remained steady or decreased compared to 2002. The city also saw a decrease in traffic accidents between 2001 and 2010. The number fell from 4,247 to 3,494 during that time.

Over the course of the past decade, studies in the city have been undertaken to determine ways of better meeting growing transportation needs using sustainable means. With the expansion of UMass Lowell, the city's second largest employer, there is an increased need for both parking and alternative modes of transport by which to shuttle the thousands of faculty, staff and students throughout the city on a daily basis. UMass has improved their shuttle system and added new routes, in addition to providing more on-campus parking. UMass Lowell is currently undertaking a transportation study to improve shuttle access between campuses and the Downtown, and encourage biking. Other studies, such as the Downtown Evolution Plan, provide a framework for enhanced bike and pedestrian amenities throughout Downtown for all residents and for the re-introduction of the historic trolley to the city. DPD worked with the LRTA

to identify and install new bus shelters throughout the City with the hope of increasing bus ridership over the longer term.

Other improvements to the transportation infrastructure have included enhanced signage for drivers and pedestrians, the use of energy efficient bulbs for all traffic lights and many street lights, the introduction of a new parking kiosk system in the downtown, the addition of bike racks to all LRTA buses, the installation of the city's first electric vehicle charging station, the covering of cobblestone walkways for improved handicap access Downtown, and the construction of the Early Parking Garage in the Jackson/Appleton/Middlesex (JAM) Plan area. This \$22 million garage, which opened in 2009, consists of 940 spaces and 17,000 square feet of commercial space on the ground floor. Security has improved overall in all 5 City owned garages. The construction of the new University Avenue Bridge, equipped with bike lanes on each side, will also improve traffic flow along a heavily utilized city corridor. It is expected that these significant improvements will continue to spur economic growth throughout the city and enhance the quality of life for residents.

#### WATER SUPPLY SYSTEM

The Lowell Water Department was formed in 1872 and relies solely on the Merrimack River for supply. Conventional treatment is used with, sand, dual and carbon media filtration. Approximately 15 million gallons per day (mgd) are pumped with a maximum capacity of 30 mgd. The Lowell Regional Water Utility (LRWU) is responsible for supplying all of Lowell residents with safe potable water. The utility also supplies water to Dracut, Tyngsborough, East Chelmsford on a daily basis, as well as Tewksbury, North Chelmsford and Chelmsford Center on an as needed basis from its facility on Pawtucket Blvd. The other major user of water from the Merrimack is the Enei North America, which withdraws water to generate hydroelectric power. The LRWU system includes two underground storage tanks with a capacity of 11 million gallons which are located on Christian Hill in the Centralville section of the city, the Stackpole, Newbridge, and Tenth Street booster Stations, as well as two freestanding storage tanks located on Wedge St (1 million gallon capacity) in the Highlands section of the city and on Fox St. (.4 million gallon capacity.) located on Christian Hill. There are over 210 miles of water mains consisting mostly of 6-inch cast iron pipe supported by 8, 12 and 24-inch cast iron transmission mains; most of the mains are between 60 and 100 years old. Lowell has 2,200 hydrants and 22,000 house, business and industrial services. The water utility is aggressively replacing service pipes made of lead or galvanized iron which constitute approximately 15% of all service pipes.

The Merrimack River provides ample water for Lowell's existing and future water supply demands. Significant improvements have been made all along the Merrimack River Utility Basin, whereas twenty years ago fish were hard to find along the river, trout, bass and pan fish can be found in abundant supply. Water quality has improved and the river has been designated a class (B) river which means it is safe for fishing, swimming and boating. However, as development continues in the basin, major efforts are needed to manage existing and potential contamination sources.

Much of this cleanup effort gained important significance when in 1988 the Environmental Protection Agency (EPA) established the Merrimack River Initiative. This program coordinates cleanup efforts between New Hampshire and Massachusetts. Since its inception, millions of dollars have been spent to update municipal sewage treatment facilities and to educate the public on the importance of clean water to prevent further degradation of the Merrimack River. This federal effort has trickled down to the local level where various students from area schools have been participating in water quality monitoring programs. Continued cleanup of the Merrimack and Concord Rivers will result in expanding recreational opportunities for area residents and stimulating further economic development.

The Utility is in the midst of a 12.6 million dollar upgrade which will keep in compliance with all present and future regulations as well as completely automate all the operations of the treatment plant.

#### SEWER SERVICE

The Lowell Regional Wastewater Utility (LRWWU) operates the City of Lowell's combined sewer, sanitary wastewater, and storm water collection systems. Approximately 50 percent of Lowell's sewer pipes are combined sewers that convey both storm water and sewerage, and approximately one half of the sewer system is over 100 years old. The other portions of the city's wastewater and stormwater systems are separated systems where the sewer pipes only carry sanitary wastewater (to the downstream treatment facility) and the stormwater pipes carry stormwater that is discharged into the brooks, streams, canals and rivers throughout the city.

The sanitary and combined sewer collection systems are comprised of approximately 230 miles of sewer pipes, ranging in size from 6-inch diameter to 120 inches diameter. Conveyance systems are constructed of clay, reinforced concrete, brick, or PVC (plastic). The stormwater collection system consists of about 70 miles of drainage, with diameters that range from 6-inches to 84-inches in diameter. Manholes and catch basins in city streets provide access to the wastewater and stormwater collection system for maintenance. There are more than 5,000 manholes and catch basins maintained and operated by LRWWU.

LRWWU prepared a Long Term Control Plan (LTCP) in February 2002 that evaluated a range of alternatives to reduce the city's CSO discharges, and since 2001, LRWWU has spent more than \$90 million to implement the Phase 1 of its improvement plan, with program objectives of increasing the capacity of its wastewater collection and treatment systems and improving the ability to treat and store combined sewer flow.

In 2009, LRWWU completed a comprehensive evaluation of its aging wastewater treatment facilities (approximately 30 years old), which resulted in the preparation of a Capital Improvement Program (CIP) for both the treatment facilities and the collection systems. LRWWU is currently implementing the recommendations of the CIP to be done over the next twenty years. LRWWU leveraged available federal and state funding, receiving a grant of \$7 million under the 2009 American Reinvestment and Recovery Act (ARRA). The funding has been used to reduce the cost to sewer users for the CIP improvements, as well as to make green and sustainable

improvements to the wastewater treatment facility (WWTF). LRWWU is installing new energy-efficient turbo blowers for its aeration system, green vegetated roofs on its buildings, photovoltaic arrays to generate power, passive solar walls to supplement heating requirements for two buildings, and storm water controls (pervious pavement and retention/detention ponds) around the WWTF campus. In April of 2011, Lowell was presented with the Mass DEP Clean Water SRF Pisces Award, for these improvements, which are estimated to result in an annual reduction of 400 tons of CO<sub>2</sub> and 90 KW of green power generation.

## LONG TERM DEVELOPMENT PATTERNS

The primary tools available to the City to control future land use and development are the Lowell Zoning Ordinance, Subdivision Regulations, and the site plan review process. In December 2004, the Lowell City Council adopted a comprehensive update to the zoning ordinance and map in order to create land use regulations consistent with the goals and objectives of the Lowell Comprehensive Master Plan adopted in 2003. The amendment established a regulatory framework for implementing the land use objectives, specifically, the goal to promote and protect neighborhood character.

The revised ordinance created new zoning districts based upon neighborhood character addressing the need for new development to reflect the urban, traditional neighborhood, and suburban character of the surrounding neighborhood. Greater restrictions were placed on design and density of multi-housing development, while increasing parking and dimensional requirements, such as building set back requirements. Urban design elements such as building bulk and form, the placement of porches and garages, and location of buildings on a lot were encoded with the ordinance to ensure that new infill projects are in keeping with the surrounding streetscape.

There have been a number of amendments to the zoning ordinance since 2004 to further the goals the comprehensive master plan and adapt to the changing needs of the city. That said, the zoning ordinance continues to follow the basic framework established with the 2004 amendment. Some of the more significant changes include:

- A new section establishing design, development and procedural requirements for large, grid scale, wind energy facilities and smaller accessory wind energy facilities;
- A permitting path and minimum performance standards for privately developed and operated dormitories;
- Creation of the Hamilton Canal District Form-Based zoning district. The Hamilton Canal Form-Based Code is the first manifestation of a pure Form-Based code that emphasizes building form and how it interacts with the public realm rather than regulating new development based on its use. It establishes administrative standards to facilitate timely and comprehensive review of development proposed within the 15 acre Hamilton Canal District.
- Creation of the Downtown Lowell Smart Growth Overlay district encompassing two redevelopment parcels located on Jackson and Bridge Streets. The overlay district has been

adopted according to MGL 40R guidelines and provides an expedited permitting process for mixed-use developments that include commercial and residential components.

- Two areas have been designated priority development sites under MGL 43D. The zoning designation is intended to promote commercial, industrial, and mixed-use economic development projects in previously developed urban areas.
- There have been multiple zoning amendments that have generally affected residential and mixed use zoning districts. In each case they have increased the minimum lot frontage and minimum lot area requirements for residential projects. Property owners or developers may seek a reduction of the frontage requirement by special permit approved by the Planning Board. This essentially sets up a design review process to ensure residential infill development is consistent with the character of the surrounding neighborhood.

The previously described zoning amendments generally emphasize redevelopment of land in existing urbanized areas, while providing additional protection to the traditional and suburban residential zoning districts. Many of the amendments provide an expedited permitting process for projects that meet the objectives of the master plan and district specific redevelopment plans.

The City utilizes a site plan review process with the Planning Board as the permit granting authority for all development projects of a certain size. Site plan review establishes a process whereby DPD, the Engineering Department, Board of Health, Conservation Commission, Fire Department and Water Department review all projects that involve construction of more than 10,000 square feet or exceed three residential dwelling units. This ensures that projects of significance be reviewed holistically by multiple departments and ensure negative impacts are addressed and communicated to Planning Board. This cooperative agreement ensures that all major projects receive the scrutiny necessary to prevent potentially harmful or hazardous projects. In addition to land use controls, the city relies upon FEMA regulations regarding development in flood prone areas particularly around the Concord River and Merrimack River. The overlay flood plain district puts proposed projects within floodplain boundaries (delineated as Zones A and V in Flood Insurance Rate Maps (FIRM)) under closer scrutiny to mitigate loss of flood storage and ensure new construction in the flood plain is built to minimize damage during a flood event.

There has been a significant reduction in the amount of development conducted through the definitive subdivision process since the 2005 Open Space and Recreation Plan. There have been eight subdivisions approved and constructed since 2005 totaling 11.5 acres of land developed. Two of the eight subdivisions account for nearly half of subdivision development over the past seven years with 5.5 acres of total land developed among the two projects. The Subdivision located at 104 West Meadow Road resulted from a City land disposition consisted of 5 residential lots totaling 2.7 acres of land, and preservation of the balance of land totaling 4.4 acres with a conservation restriction. There have been three additional subdivisions of land since 2005 all of which were sought to initiate redevelopment of land for different purposes. Most significantly is the 14.5 acre Hamilton Canal District (HCD) subdivision sought to create the street pattern and parcel layout according to the HCD master urban design plan. The HCD subdivision included land formerly used for manufacturing purposes and included vacant and dilapidated industrial buildings. The subdivision created 13.5 acres of redevelopment land for

mixed residential and commercial development and over an acre of land has been set aside to provide public open space. The slowdown in subdivisions constructed in the City in the past seven years is the product of multiple variables, including the incredible downturn in the housing market beginning in 2008, and more importantly from a long-term development perspective in Lowell, a diminishing amount of land available for subdivision.



CITY OF  
LOWELL  
MASSACHUSETTS  
DIVISION OF PLANNING  
AND DEVELOPMENT  
ACCEPTED BY THE CITY COUNCIL  
DECEMBER 2004

The City of  
**LOWELL**  
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<http://www.lowellma.gov>



**APPROVED  
AMENDMENTS**

- 1141 Orange Street
- 1297 B. Street
- 1300 B. Street
- 1301 B. Street
- 1302 B. Street
- 1303 B. Street
- 1304 B. Street
- 1305 B. Street
- 1306 B. Street
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- 1400 B. Street

- Zoning Districts**
- USF
  - HCD-A to HCD-G (see Detail A)
  - INST
  - NB
  - RR
  - LI
  - GI
  - OP
  - HRC
  - SMU
  - UMU
  - PDMU
  - SSF
  - TSF
  - SMF
  - TTF
  - TMF
  - UMF
  - DMU
  - TMU
  - Artist Overlay District
  - Smart Growth District
  - Priority Development Sites
  - Parcels

- SUBURBAN DISTRICTS**
- SUB-R: SUBURBAN SINGLE-FAMILY
  - SUB-T: SUBURBAN TWO-FAMILY
  - RE: REGIONAL RETAIL DISTRICT
- TRADITIONAL, NEIGHBORHOOD DISTRICTS
- TRF: TRADITIONAL, NEIGHBORHOOD SINGLE-FAMILY
- TRM: TRADITIONAL, NEIGHBORHOOD MEDIUM-DENSITY
- TRU: TRADITIONAL, NEIGHBORHOOD SINGLE-FAMILY
- TRB: TRADITIONAL BUSINESS DISTRICT
- TRC: TRADITIONAL COMMERCIAL DISTRICT
- TRD: TRADITIONAL DOWNTOWN DISTRICT
- TRF: TRADITIONAL, NEIGHBORHOOD SINGLE-FAMILY
- TRM: TRADITIONAL, NEIGHBORHOOD MEDIUM-DENSITY
- TRU: TRADITIONAL, NEIGHBORHOOD SINGLE-FAMILY
- TRB: TRADITIONAL BUSINESS DISTRICT
- TRC: TRADITIONAL COMMERCIAL DISTRICT
- TRD: TRADITIONAL DOWNTOWN DISTRICT

**URBAN DISTRICTS**

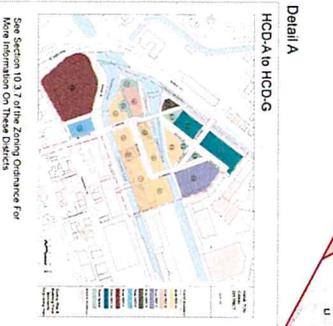
  - URF: URBAN SINGLE-FAMILY
  - URM: URBAN MEDIUM-DENSITY
  - URU: URBAN HIGH-DENSITY
  - URB: URBAN BUSINESS DISTRICT
  - URC: URBAN COMMERCIAL DISTRICT
  - URD: URBAN DOWNTOWN DISTRICT

**SPECIAL PURPOSE DISTRICTS**

  - SPF: SPECIAL PURPOSE DISTRICT
  - SPM: SPECIAL PURPOSE MEDIUM-DENSITY
  - SPU: SPECIAL PURPOSE URBAN DISTRICT
  - SPB: SPECIAL PURPOSE BUSINESS DISTRICT
  - SPC: SPECIAL PURPOSE COMMERCIAL DISTRICT
  - SPD: SPECIAL PURPOSE DOWNTOWN DISTRICT
  - SPF: SPECIAL PURPOSE DISTRICT
  - SPM: SPECIAL PURPOSE MEDIUM-DENSITY
  - SPU: SPECIAL PURPOSE URBAN DISTRICT
  - SPB: SPECIAL PURPOSE BUSINESS DISTRICT
  - SPC: SPECIAL PURPOSE COMMERCIAL DISTRICT
  - SPD: SPECIAL PURPOSE DOWNTOWN DISTRICT

**INDUSTRIAL DISTRICTS**

  - I: LIGHT INDUSTRIAL, MANUFACTURING, & STORAGE
  - IC: INDUSTRIAL COMMERCIAL
  - ICD: INDUSTRIAL COMMERCIAL DISTRICT
  - ICD: INDUSTRIAL COMMERCIAL DISTRICT
  - ICD: INDUSTRIAL COMMERCIAL DISTRICT**



Map Updated January 19, 2011

1 inch = 1,200 feet

**NOTES:**

1. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ZONING DISTRICTS ARE SUBJECT TO CHANGE WITHOUT NOTICE. THE CITY OF LOWELL PLANNING AND DEVELOPMENT DIVISION IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS ON THIS MAP. THE CITY OF LOWELL PLANNING AND DEVELOPMENT DIVISION IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS ON THIS MAP.



The build-out analysis completed for the 2011 update to the City of Lowell Master Plan utilizes an alternative methodology than is typically applied for land use planning purposes. Specifically, a “standard” build-out analysis for the City of Lowell would indicate the City is almost at capacity due to the small number of singular vacant parcels. However, experience dictates that property owners in Lowell can utilize innovative approaches to create developable land. To that end, a multitude of approaches have been contemplated to determine the true build out capacity in the City to include potential redevelopment of existing underutilized properties, urban infill, as well as greenfield development. The 2011 build out analysis projects the potential for 5,715 housing units and 12,364 additional residents. It is significant to note that only 710 of the total projected housing units result from subdivision of large contiguous parcels of land, less than 13% of total new residential development. This reflects diminishing availability of undeveloped land and suggests the long term development trend will be focused on redevelopment and reuse of existing buildings. Total expected increases in the number of residential units, population and resultant impact on municipal services are outlined in the following table shown by development type.

Table 2: Lowell Build-Out Analysis

Development Type	Potential Dwelling Units	Additional Residents	Additional Water Demand gal/day	Additional Non-Recyclable Solid Waste tons/yr	Additional Recyclable Solid Waste tons/yr	Additional Vehicle Trips/Day
Adaptive Reuse: Churches, Mills, etc.	1,849	3,532	254,274	2,219	314	16,641
Large Contiguous Land for Subdivisions	710	1,896	136,490	852	121	6,390
Planned Development in Renewal Districts	1,060	2,025	145,771	1,272	180	9,540
Vacant Land in Urban Areas	237	633	45,561	284	40	2,133
ANR Potential Addition Lots (Pre-Frontage Increase)	959	2,561	184,358	1,151	163	8,631
Vacant building space: Downtown Mixed-Use district	900	1,719	123,768	1,080	153	8,100
<b>Total</b>	<b>5,715</b>	<b>12,364</b>	<b>890,223</b>	<b>6,858</b>	<b>972</b>	<b>51,435</b>

## SECTION IV: ENVIRONMENTAL INVENTORY AND ANALYSIS

### GEOLOGY, SOILS and TOPOGRAPHY

The City of Lowell is located at 42°38'22"N 71°18'53"W /42.63944°N 71.31472°W and has a total area of approximately 14.5 square miles. Lowell is a city of hills and valleys with the low point of 50 feet above mean sea level (msl) at Duck Island along the Merrimack River. Higher elevations are concentrated in the eastern portion of the City. Among prominent topographic features is Christian Hill just north of the Merrimack river rising to 300 feet above msl and Fort Hill south of the Merrimack and just east of the Concord River rises over 250 feet above msl. Christian Hill includes the McDermott Reservoir at its summit. Although no longer a source of potable water for Lowell residents the reservoir continues to provide a pleasant passive recreational space and provides perhaps the best vista for viewing Downtown Lowell. Fort Hill includes a scenic park that also offers spectacular views of the Lowell, particularly the Concord River valley as it flows towards downtown and confluence with the Merrimack River. To the northeast of Fort Hill Park is a residential area in the neighborhood of Belvidere, which reaches 260 feet above msl. This site once contained a fire suppression reservoir, which was constructed by the proprietors of the locks and canals to protect the mills. The remainder of the City generally consists of elevations of 100-250 feet above msl.

Lowell sits at the confluence of the Merrimack and Concord Rivers. These rivers are considered major features which define the City's landscape. The Merrimack River flows easterly through the northern portion of Lowell and drops approximately 60 feet in its eight-mile course through the city. The three-mile stretch of the Pawtucket Falls accounts for 30 feet in elevation drop for the river.

The Concord River flows northerly through Billerica and enters the Merrimack River near the Cox Bridge, northeast of Downtown Lowell. The Concord River's elevation drops very little over most of its length from Concord to Billerica and the floodplain tends to be broad. However, the Concord River drops markedly in Lowell as is evidenced by the three sets of falls.

The soils of Lowell are partially composed of deposits consisting of stratified sands and small amounts of silt, mud and gravel found along the watercourses in Lowell. Bordering these deposits and comprising the greatest extent of superficial material are ice-contact deposits. These consist of stratified sand and gravel with some silt, clay, and a few isolated boulders. The overall stratified material tends to follow the pre-glacial Merrimack River Valley, which extends southeast from the present valley. The ice-contact deposits are over 140 feet thick in places. Higher elevations are almost exclusively composed of glacial till. Till is a conglomeration of unstratified clay, sand, silt, gravel, and boulders that overlie the bedrock found through the region.



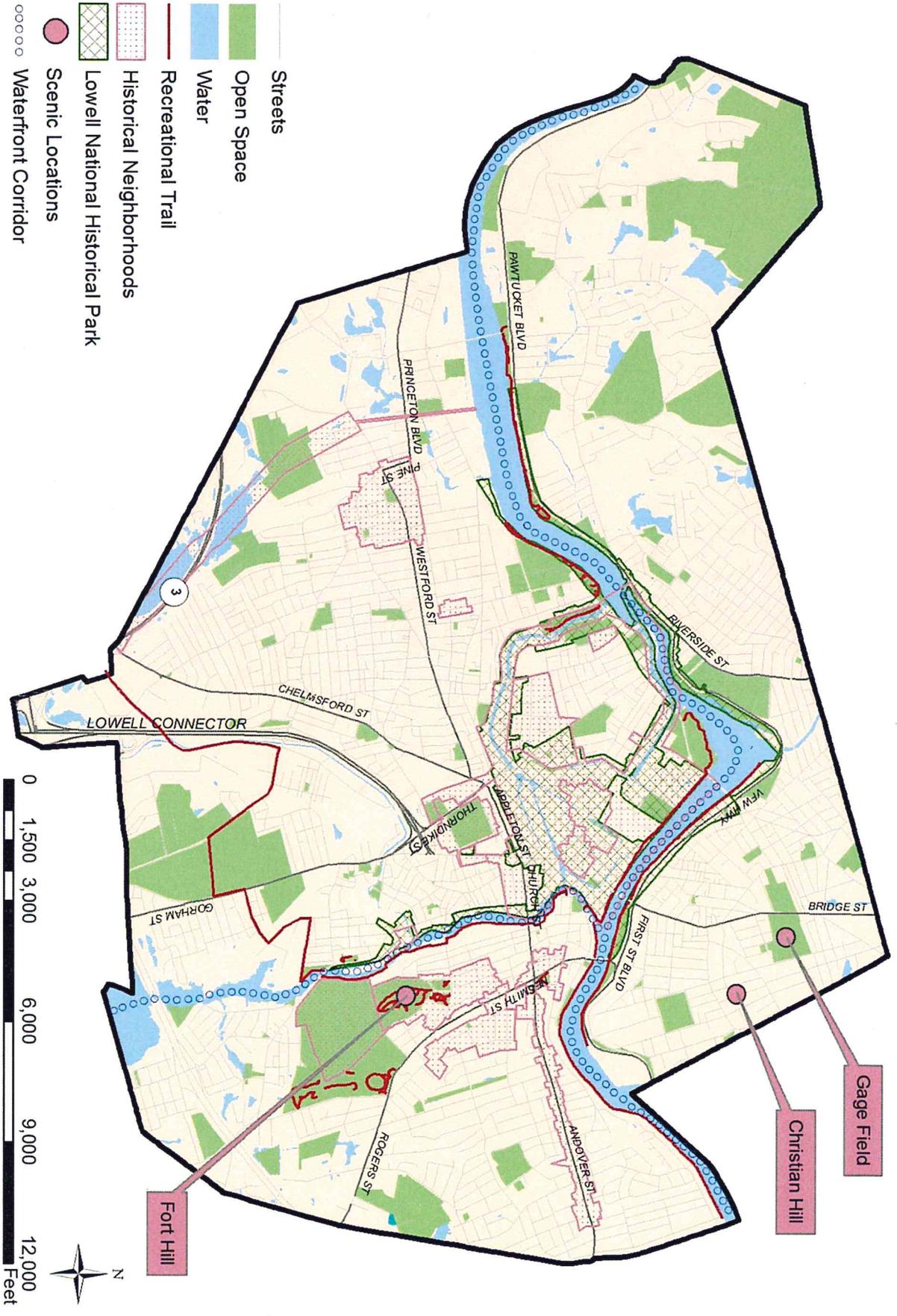


## LANDSCAPE CHARACTER

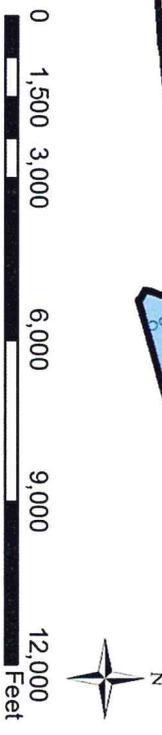
Lowell can be characterized as an urban setting by and large built out with several geological features that lend to its attractiveness. Different elevated vantage points throughout the city allow for appealing views of not only the Merrimack and Concord Rivers, but also some of the historic neighborhoods that have remained staples to the city through its development. Views from elevated portions of the city contrast with the flat relief along the rivers.

The Merrimack and Concord Rivers led to the birth of the city and the Industrial Revolution. In the past, mill owners built dams, ponds and canals to control the flow of water to ensure a continuous source of power. For instance, at Pawtucket Falls, located just above the Merrimack's junction with the Concord, the river drops more than 30 feet in less than one mile. This significant drop in the water level created a continuous surge of power to drive the turbines in the mills. Without the drop in elevation along both the Merrimack and Concord Rivers, there would have been no textile production in Lowell thereby drastically changing the historical narrative and ultimately, the defining character of the city. Today, in addition to energy, the rivers and canals provide necessary drinking water and a multitude of recreational resources such as tours through the National Park and the Riverwalk, stretching by LeLacheur Park and the Tsongas Center. Outreach conducted from the City's recent Master Plan update concluded that development of trails and pathways continues to be seen as a priority for recreational opportunities in the City.

# Unique Features Map



-  Streets
-  Open Space
-  Water
-  Recreational Trail
-  Historical Neighborhoods
-  Lowell National Historical Park
-  Scenic Locations
-  Waterfront Corridor



## WATER RESOURCES

### WATERSHEDS

The City of Lowell is in the Merrimack River Watershed and is also part of the Concord River Watershed. Some of the City's smaller watersheds are around Clay Pit Brook, Beaver Brook, Black Brook, Scarlet Brook, and Humphrey's Brook. The City partners with many groups to protect and maintain its many water resources. It works with the Merrimack River Watershed Council, a group that protects the river and brooks through monitoring and conducting cleanups. The City of Lowell also participates in river cleanups with the Lowell Parks and Conservation Trust, which focuses its programming on the Concord River. In addition, the City has a Local Wetland Ordinance, in addition to the Wetlands Protection Act, to protect the wetlands of the area.

### SURFACE WATER

The Merrimack River is the largest water body found in Lowell. This river is formed at the confluence of the Pemigewasset and Winnepesaukee Rivers in Franklin, New Hampshire. The river flows southward through New Hampshire to Tyngsborough, Massachusetts, and then turns northeastward when it reaches Lowell. It flows easterly through the northern portion of Lowell and drops approximately 60 feet in its eight-mile course through the city. The three-mile stretch of the Pawtucket Falls accounts for 30 feet of the elevation drop for the river. The river empties into the Atlantic Ocean at Newburyport after flowing through Lowell, Lawrence and Haverhill.

The river falls more than 90 feet during its 116-mile flow through Massachusetts. The river drains a land area of 5,010 square miles, of which 1,210 square miles is located in Massachusetts. The water contributed by this vast drainage area is recorded by the United States Geological Survey (USGS) by means of a flow gage just above the Hunts Falls Bridge. The gage location also allows it to account for water received by the Merrimack's largest tributary in Lowell, the Concord River. Average flow at this site is 7,610 cubic feet per second (cfs).

The Merrimack River in Lowell has three access points for recreational boating. There is a private boat ramp at the Bellegarde Boathouse used by a sailing program and the UMass Lowell crew team. There is another boat ramp adjacent to the Vandenberg Esplanade for public use. A third boat ramp has recently been constructed at the Lowell Heritage State Park on Pawtucket Boulevard west of the Rourke Bridge. During the summer, numerous boats will access the river through this ramp for the purposes of fishing, water-skiing, tubing, or taking a leisurely ride up the river.

The Concord River originates at the confluence of the Sudbury and Assabet Rivers. It flows approximately 16 miles through Concord, Carlisle, Bedford and Billerica before it enters the Merrimack River in Lowell. The river drops 12 feet in the first 15 miles, and then falls 50 feet in the final mile as it goes through Lowell over the three sets of falls. The drainage area for the Concord River basin is 62 square miles. The Old North Bridge, of Revolutionary War fame, is situated over this river in Concord. The federally designated Great Meadows National Wildlife Refuge, a vast land area in the towns of Sudbury, Wayland, Lincoln, and Concord, is also along

this river. A USGS gauging station located near the confluence of River Meadow Brook and the Concord River records its flow. The average discharge over a 53-year record period was 640 cfs.

The Concord River is the site of some of the best white water rafting in New England. Every spring, the Lowell Parks and Conservation Trust runs white water rafting trips down the Concord River. The season is usually sold out before it even begins. This area has hosted several white water kayaking competitions. The City is moving ahead to capitalize on the interest created by the Concord River to preserve its banks for boat launches and parks. The Concord River Greenway development, which is well underway, will enhance access to the river and connect to the Bruce Freeman Trail in Chelmsford as well as the larger Bay Circuit Trail. The City, in a joint effort with the Public Access Board, created a canoe ramp on Billerica Street in Muldoon Park, which allows boaters to paddle on calmer waters away from the rapids. Local residents have used this site for many years, but the new ramp will make it more accessible to the public. In addition, the history of land use along the Concord River is being investigated through a joint partnership by the Lowell Parks and Conservation Trust and UMass Lowell.

The second major tributary to the Merrimack River in Lowell is Beaver Brook. The brook originates in New Hampshire and meanders southward through Dracut before flowing into the Merrimack River just east of Pawtucket Falls. Additional tributaries of importance are located in the western part of Lowell. Black Brook begins in a wetland area in North Chelmsford. The brook flows northward, passing through the Middlesex Village area of Lowell before entering the Merrimack River. Clay Pit Brook originates from a vast wetland in the Dracut portion of the Lowell-Dracut-Tyngsborough State Forest, and initially flows southward. After turning eastward, the brook expands into a small pond before continuing as an outlet stream, which flows into the Merrimack River west of Pawtucket Dam. Scarlet Brook is a small tributary that originates in Tyngsborough and flows southward along a portion of the Tyngsborough-Lowell border before entering the river. Flagg Meadow Brook, which originates in the Lowell-Dracut-Tyngsborough State Forest, is also a small tributary of the Merrimack River.

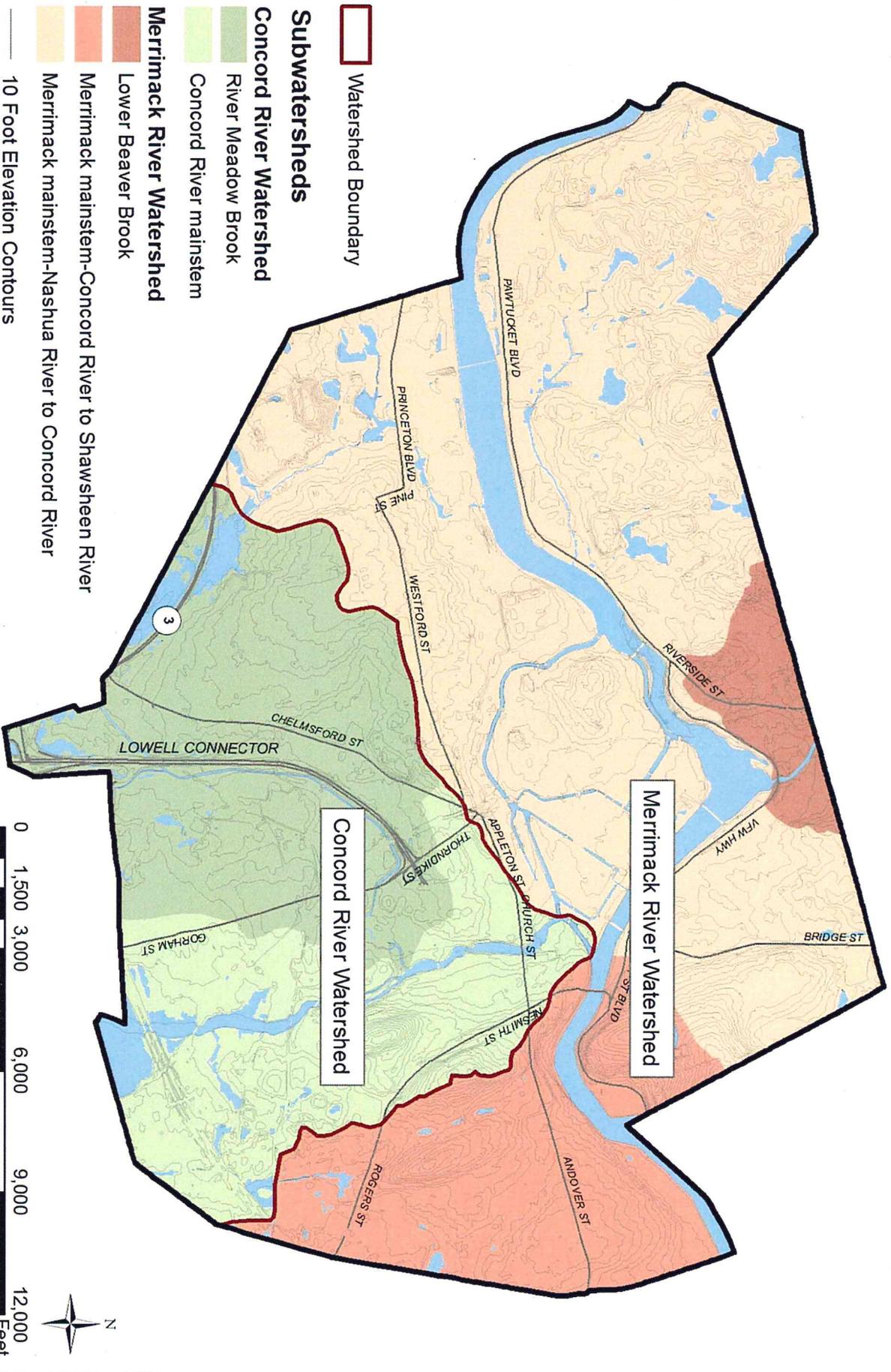
River Meadow Brook is the main tributary to the Concord River in Lowell. It begins in a vast wetland region located southwest of Chelmsford Center in the Town of Westford and receives a large amount of water from another wetland body, Hales Brook, located east of Route 3 and north of Route 129. It flows into the Concord River near Rogers Street.

In addition to the two rivers and several brooks, Lowell is interlaced with man-made waterways, the canals that have been in existence since the Industrial Revolution. All of the canals, the Eastern Canal, Pawtucket Canal, Northern Canal, Western Canal and the Hamilton Canal are fed by the Merrimack River. The Pawtucket Canal was originally constructed as a transportation route around the Pawtucket Dam. The other canals were later constructed as branches of the Pawtucket Canal to feed the additional mill complexes for the purpose of creating waterpower. Power was generated through the controlled release of water through a series of dams along the canals. Today, Lowell's canals have the capacity to generate 22 megawatts of hydroelectricity, which is enough energy to power 22,000 homes. Renewed interest in the canal system for recreational purposes has been prompted by the state acquisition of the land along the canal system and by public/private ventures working together to clean and restore these

historic transportation networks. The Lowell National Historical Park currently operates tour barges along the canal as part of their programs. Better maintenance and cleaning of the canals will enhance the experience for park visitors and allow for their further enjoyment of the legacy left behind by the Industrial Revolution.

Many recreational activities are dependent upon clean water such as swimming, sailing, fishing, rowing, and canoeing. The Vandenberg Esplanade Boathouse, in the Lowell Heritage State Park, is a major recreational resource along the river. Whitewater rafting, which has become a popular springtime activity on the Concord River, is also only possible with clean water. The City's canal system is a major tourist attraction for visitors of the Lowell National Historical Park. With barge tours being a primary component of the experience, water quality is of utmost concern and attention should be focused in this area. The recreational economy of Lowell depends heavily upon clean water.

# Watershed Boundary Map



## AQUIFER RECHARGE AREAS

Recharge is the only natural means of replenishing groundwater supplies, and the water table will drop if the amount of water withdrawn exceeds the amount recharged. This is not a common problem in the Northeast except during drought periods. Recharge water generally moves downward through the soil until it reaches the water table, then travels in a more horizontal direction, following the contours of the aquifer. Eventually groundwater resurfaces, producing springs or feeding water into streams, wetlands, or other surface water bodies.

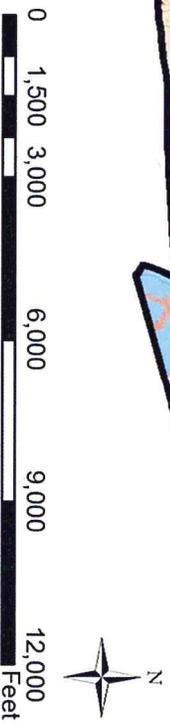
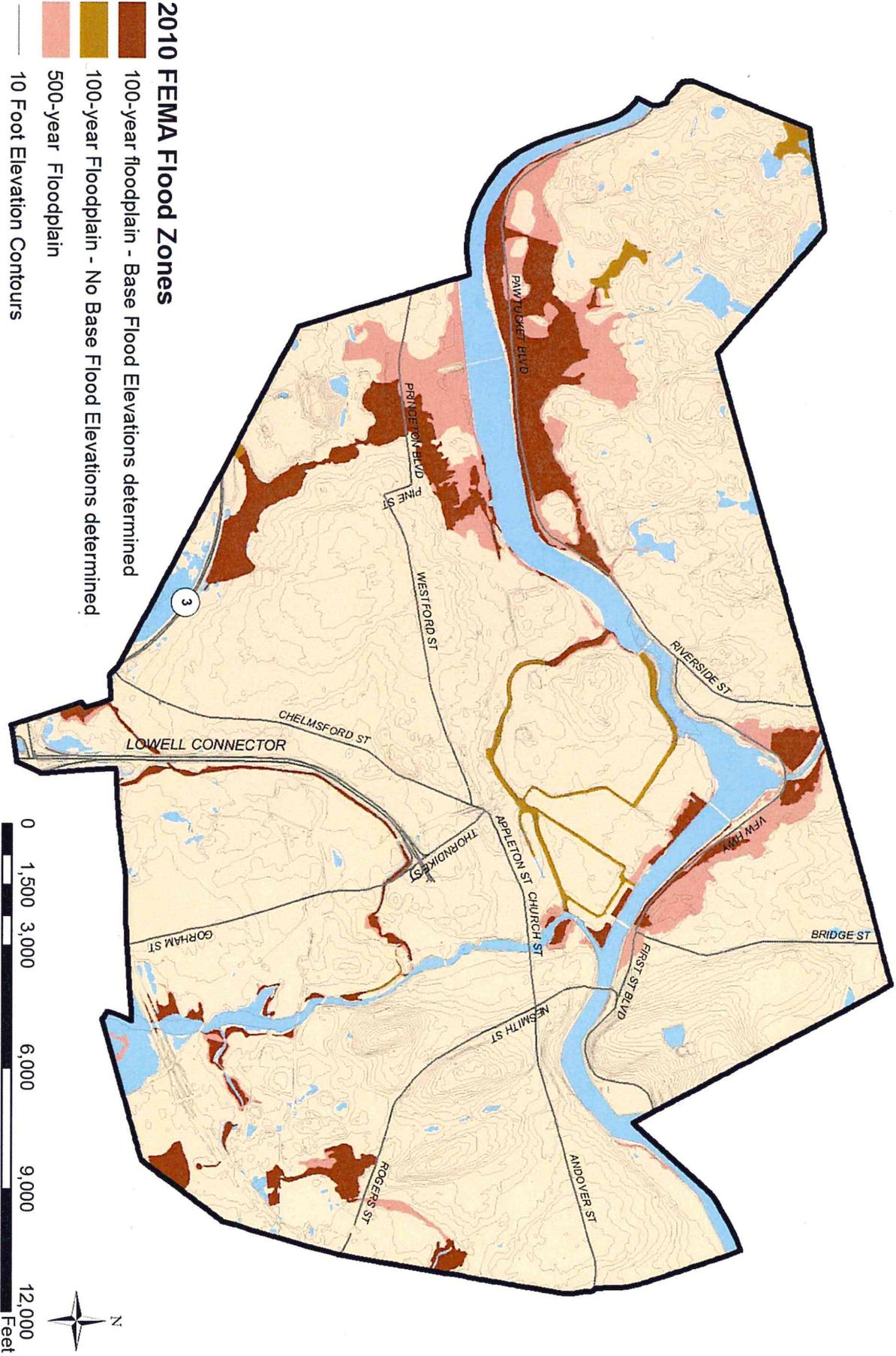
Since the residents of Lowell primarily rely on the Merrimack River for drinking water, the City does not have any specific areas for ground or surface water recharge. While the City does not depend upon ground water supplies, neighboring towns in the region do depend on them. Some water from the wetlands recharge the Stony Brook aquifer and other designated aquifers in the region. Several public wells in neighboring communities rely on recharge areas contained in wetlands found in Lowell. Two public wells in Chelmsford have designated Zone II's that lie within Lowell's borders. Zone II is the aquifer area that contributes water to a well under the most severe pumping and recharge (180 days of pumping at approved yield, with no recharge from precipitation). The wetland bodies located near Route 3 collect water for underground storage areas. Even though Lowell residents do not rely on these various wetland bodies for water supply, efforts should be made to protect and buffer them from harmful encroachment.

## FLOOD HAZARD AREAS

Flooding in Lowell is an acute problem in some areas near the Merrimack River. This is especially true along the northern bank near the Rourke Bridge. Lands near the Concord River also suffer from severe flooding. Many areas along Black Brook, near its confluence with the Merrimack River, have experienced flooding and erosion problems on an annual basis. Flooding along Clay Pit Brook and Marshall Brook have also been problems in past years.

Flooding often occurs in Lowell during the spring because of the snowmelt in headwaters and higher elevations and intense seasonal rain showers. Due to over-development and construction with substandard flood mitigation from historical periods, many important flood storage areas have been filled and developed in Lowell and upriver. Wetland bodies become valuable water storage areas for impervious surface runoff. When these river and stream channels cannot accommodate excess discharge, water is carried on the flat valley floors or "floodplain" adjacent to rivers, streams and other surface water bodies. A floodplain is a type of wetland resource area that floods following storms, prolonged rainfall or snowmelt. There are two types of floodplain resource areas present in Lowell: areas bordering rivers and streams, and low lying areas that flood at least once a year. The area of a floodplain that has a 1% chance of flooding in any year is often called the 100-year flood plain. Lowell experienced two significant floods in 2006 and 2007, each reaching the 100-year flood elevation. FEMA has mapped the limits of flood hazard areas in Flood Insurance Rate Map (FIRM). The 100-year flood elevations and flood depths shown on FIRMs are the basis regulatory elevations for the design and construction of new buildings, the improvement and repair of existing buildings, and additions to existing buildings located on floodplains.

# Flood Hazard Zone Map



Certain types of development in a watershed change the watershed's response to precipitation. The most noticeable effect is the significantly higher rate of runoff that results from an increase in building and parking lots. Whereas natural lands can readily absorb water and transmit it to a water table, impervious surfaces direct the flow of water, channeling it to receiving sites. The problem arises from the rate of flow contributing to erosion and the water collecting hazardous contaminants during the course of flow. The City enforces the Massachusetts Wetlands Protection Act and Lowell Wetlands Ordinance regulations to preserve the benefits floodplains provide our community and to protect public safety by reducing threats to personal safety, mitigate property damage, prevent the occurrence of emergencies resulting from water contamination and pollution, and reduce cost incurred from clean up response to flood events. These regulations have become all the more important as the frequency and strength of storm events are expected to increase due to climate change and therefore the city can expect more frequent flooding in and adjacent to floodplains.

## WETLANDS

There are many types of wetland environments such as marshes, wet meadows, ponds, bogs, wooded swamps and other water-dominated areas. Wetlands should be preserved because they help to maintain water supplies, purify polluted waters, check the destructive power of flood and storm water, shelter diverse wildlife and provide numerous recreational opportunities.

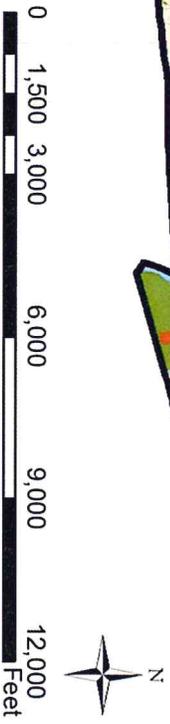
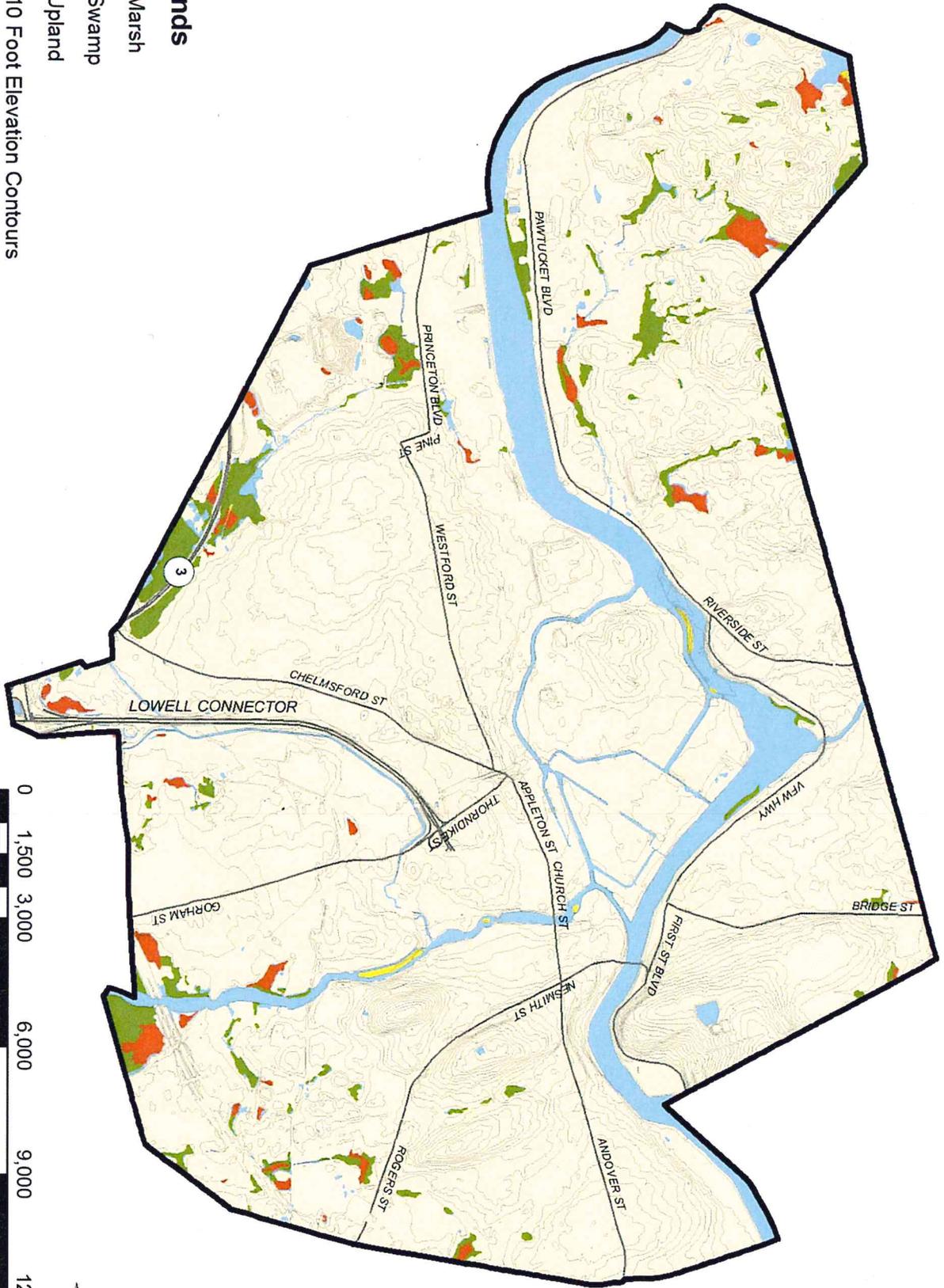
Most wetlands found in our urbanized area provide significant benefits by preventing or reducing pollution in a variety of ways. Many of these ways are related to the great absorptive capacity of the wetlands. Water is stored and retained in wetland basins and is released gradually into our groundwater. The wetland vegetation filters and traps sediments and heavy metals. By trapping these nutrients and minerals, wetlands purify the water and provide healthier environments for fish and plant life. Wetland plants that thrive in these wet environments further enhance the environment by reducing biological oxygen demand levels, and lowering nitrate and phosphate levels. A number of factors influence the degree to which wetlands function in pollution prevention or reduction. These factors include wetland type, vegetative density, size, and gradient.

The water storage capability of wetlands is important for their role in flood control and storm damage prevention. Wetlands can reduce the force and speed of floodwaters, which could cause serious property damage. In this way, wetlands provide a secondary function by reducing the intensity of floodwaters, thereby reducing erosion. This factor is particularly important in highly urbanized areas such as Lowell where impervious surfaces intensify water runoff. Not only do wetlands provide important benefits for the urbanized environment, they are also necessary breeding and hunting grounds for plant and animal life. Many bird and mammals rely almost solely on wetlands and adjacent vegetative habitats for food, shelter, and reproductive purposes. The importance of wildlife habitats provided by the wetlands has recently become a greater issue for determining wetland value. The actual value of a wetland as a wildlife habitat depends on its size, vegetation composition and structure, and hydrologic relationship. In addition, these habitats provide important recreational opportunities for hunters, fishermen, bird watchers and boaters as well as hikers, photographers and environmental educators. Many of

our recreational opportunities would quickly disappear if we do not provide better protection for these wetlands and open spaces.

In Lowell, wetlands are generally shrub swamps or areas forested with hard wood species. Most of the larger wetland areas, approximately 10 to 25 acres, are present in the Lowell-Dracut-Tyngsborough State Forest as well as along the old Middlesex Canal, Black Brook and portions of the Merrimack and Concord Rivers' floodplains. Other minor wetlands can be found near Cross Point Towers, Wood Street and Westford Street, several locations along I-495 and near Cawley Stadium. There are several other smaller wetland locations dispersed throughout the city.

# Wetlands Map



## VEGETATION

### GENERAL INVENTORY

The natural communities in Lowell are dominated by flora species over fauna species owing to the predominant urban character. Massachusetts Natural Heritage and Endangered Species Program data shows that the plant communities occurred in terrestrial and palustrine settings, primarily as linear landscape along the water resource corridors owing to dense alteration and development of the natural environment.

Upland communities are dominated by hardwood species like white pine, maple, oak, hickory, birch, beech, and ash on rich, moist soils. Dry, well-drained sandy soils are predominated by pitch pine, white pine, gray birch, and white and scrub oak. Understory vegetation of the hardwood forest include tree saplings and shrubs such as blueberry, mountain and sheep laurel, maple leaf viburnum, and smooth arrow-wood. Hardwood species are dominant in the Lowell-Dracut-Tyngsborough State Forest. The white pine predominates in sandy soils while hardwood and hemlock species are found in looms and fine sandy looms. Dominant hardwood species include red and sugar maple; red, white, black and scarlet oak; white, black and gray birch, white ash, beech, butternut, sweet pignut and shagbark hickory, and American elm.

Herbaceous vegetation dominates the meadow communities with shrubs and trees confined mostly to the margins. Areas of open fields with level terrain and dry, well-drained soils are dominated by grasses such as foxtail, broom bear, redtop, fescue, orchard, Kentucky blues, and timothy. Herbaceous and woody field species include red field clover, wild carrot, meadowsweet, yarrow, goldenrod, hairy vetch, lady's sorrel, asters, cinquefoil, sweet fern, pigweed, dandelion, and ragweed. This community provides successional habitat that is generally in decline throughout northeast region. In addition to being habitats that offer ecological value, they promote passive recreational opportunities and diversity in the landscape.

Many invasive species are already widespread and common in the natural communities of Lowell, posing a threat to dispose the native species. Most common invasive species found locally include leafy spurge, spotted knapweed, phragmites, purple loosestrife, multiflora rose, Morrow's honeysuckle shrubs, winged euonymus, glossy buckthorn, tree of heaven, and oriental bittersweet. There are no current programs in place for the eradication of these invasive species. However, all new plant installations have to avoid the species listed on the Massachusetts Department of Agricultural Resources Prohibited Plant List. It is recommended that a more proactive approach to eliminating growing invasive plant species considering the rapidity at which they spread and inhibit native species.

In 2002, the Lowell Parks and Conservation Trust and the Mass Audubon Ecological Extension Service conducted an ecological inventory of the lands adjacent to the Concord River, and detailed information regarding vegetation along the Concord may be found in this report. In 2012, the Mass Audubon Ecological Extension Service prepared a Natural Resource Inventory for River Meadow Brook in Lowell to assess the effects of a proposed recreational trail on natural

resources present along River Meadow Brook, and to provide recommendations in developing plans for the construction of a recreational trail within the wetland corridor.

#### FOREST LAND

The urbanization of Lowell over the past century has resulted in a significant loss of vegetation. According to the 2005 Massachusetts Land Use Map (updated through 2009), the western portion of the city contains well-forested areas. Hardwood species are dominant in and surrounding the Lowell-Dracut-Tyngsborough State Forest. The State Forest is over 1,000 acres in area, of which 548 acres is located in the city. Mixed hardwoods and softwoods exist south of this area in the region of two additional state forestlands. In the western portion of the city, there are relatively dense, forested areas along the banks of the Merrimack River.

#### PUBLIC SHADE TREES

Lowell has approximately an estimated 16,000 publicly owned shade trees. Hardwood species are dominant in the Lowell-Dracut-Tyngsborough State Forest. The white pine predominates in sandy soils while hardwood and hemlock species are found in looms and fine sandy looms. Dominant hardwood species include red and sugar maple, red, white, black and scarlet oak; white black and gray birch; white ash; beech; butternut; sweet pignut and shagbark hickory; and American elm.

On upland sites with rich, moist soils, white pine, maple, oak, hickory, birch, beech, and ash are common. Dry, well-drained sandy soils are predominated by pitch pine, white pine, gray birch, and white and scrub oak.

#### AGRICULTURAL LAND

There is one parcel in the city that is protected under Chapter 61A regulations. This Massachusetts law allows a landowner that farms his land to pay a lower property tax. The tax is based on the land's present use as opposed to its often more valuable potential use such as residential or commercial. A landowner must have at least 5 acres of contiguous property in order to qualify. The Chapter 61A landowner in the City uses his property for the production and sale of Christmas trees. Other parcels in the city were once protected under Chapter 61A, but have since been withdrawn to allow for residential development. It is unlikely that any other parcels will be designated as agriculture. Preserving land for agriculture is difficult in Lowell as the alternative is too profitable and predominately consists of small fragmented parcels of land not large enough to take advantage of the tax benefits under Chapter 61A.

#### WETLAND VEGETATION

Wetland vegetation provides important stormwater management benefits for the urbanized environment in Lowell. They are also necessary breeding and hunting grounds for many animal species. Marshes, unlike swamps, do not have trees or shrubs and are characterized by grasses and sedges such as cattail, pickerel weed, arrowhead, spike rush, bulrush, umbrella sedge, reed, reed canary grass, smartweeds, swamp milkweed, and water plantain. Swamps are dominated by wetland trees (red maple, black gum, black willow, and black oak) and shrubs (speckled alder, pussy willow, skunk cabbage, sweet pepperbush, water hemlock, elderberry, jewelweed, silky dogwood, violets, and water pennywort). Floodplains, which may include swamps,

marshes, and water-tolerant forests, are adapted for their periodic wet existence. Floodplain trees such as black willow, cottonwood, and silver maple are particularly adapted to withstand flooding. Marshes, swamps, and floodplains are terrestrial ecosystems that are particularly sensitive to environmental changes and thus may be severely impacted. Marshes and swamps are land areas, which are continually inundated with water, or which continually have groundwater levels at the ground surface.

#### RARE, THREATENED AND ENDANGERED SPECIES

The Massachusetts Natural Heritage and Endangered Species Program (MNHESP), which maintains records of the State's rare and most vulnerable natural features, has records of six historical rare plant species that existed in Lowell. These species, shore sedge (*Carex lenticularis*), Indian paintbrush (*Castilleja coccinea*), arethusa (*Arethusa bulbosa*), Melscheimer's sack bearer (*Cicinnus melsheimeri*), tufted hairgrass (*Deschampsia cespitosa* SSP *glauca*), and hardy wild rice (*Elymus villosus*) were last seen over 100 years ago. The arethusa, shore sedge, Melscheimer's sack bearer, and hardy wild rice are all on the threatened list, while tufted hairgrass is listed as endangered, and the Indian paintbrush is listed as historical. The MNHESP has no record of any rare plant species currently existing in Lowell. The MNHESP recommends that further study be completed in Lowell to identify more occurrences of rare plants or animals.

Some sections of Lowell-Dracut-Tyngsborough State Forest should be noted for their unique plant environments and warrant further research. The Natural Heritage Program has identified a priority habitat that may possibly contain state listed rare species. Further research work is needed to determine what species actually exist in this unique environment. Efforts should be undertaken to identify any rare plant or animal species residing in this section of the State Forest.

#### FISHERIES AND WILDLIFE

##### GENERAL INVENTORY

Despite Lowell's limited amount of open space, the landscape, particularly along the Concord and Merrimack Rivers, provide a varied wildlife population. The Merrimack River also receives added protection as a priority habitat of rare species defined by the Natural Heritage and Endangered Species program run by the Massachusetts Division of Fisheries and Wildlife; bald eagles are now sighted yearly along the waterway, especially during the fall migration period. As Bald Eagles are abundant in the river's estuary, nesting sites should be built along the Merrimack River. Belted kingfishers, black crowned night herons, great blue heron, and green herons are also common bird species sighted during the summer months. Discarded utility poles provide excellent nesting platforms for birds of prey and provide a way to recycle a necessary infrastructure component.

The State Forest, also a protected priority habitat of rare species, contains a diverse habitat that supports squirrels, cottontail rabbits, red fox, various songbirds and fishers. Tributaries to the Merrimack River have been home to beaver for a number of years as well as several types of waterfowl. The importance of wildlife habitat provided by wetlands has recently become a

greater issue for determining wetland value as private development projects located in said areas have become more prevalent.

#### VERNAL POOLS

In recent years, a number of vernal pools have been certified within the City, all of which are located in the Lowell-Dracut-Tyngsborough State Forest. The following represents the 16 certified vernal pools in the City.

TABLE 3: LIST OF CERTIFIED VERNAL POOLS

Vernal Pool #	Criteria	Date Certified	Parcel Address
4954	Fairy Shrimp	2008-09-17	361 Trotting Park
5204	Obligate Species	2009-07-21	395 Trotting Park
4953	Obligate Species, Facultative Species	2008-09-17	56 Gumpus Rd
4955	Obligate Species	2008-09-17	361 Trotting Park
5203	Obligate Species	2009-07-21	361 Trotting Park
5205	Obligate Species	2009-07-21	370 Trotting Park
5202	Fairy Shrimp	2009-07-21	351 Trotting Park
5201	Obligate Species	2009-07-21	351 Trotting Park
5210	Obligate Species	2009-07-21	348 Trotting Park
5208	Obligate Species, Fairy Shrimp	2009-07-21	251-271 Trotting Park
4952	Obligate Species	2008-09-17	1531 Varnum Ave
4956	Obligate Species	2008-09-17	251 Trotting Park
5207	Obligate Species, Fairy Shrimp	2009-07-21	191 Trotting Park
5209	Fairy Shrimp	2009-07-21	191 Trotting Park
5206	Obligate Species	2009-07-21	47 Charant Rd
3285	Obligate Species, Fairy Shrimp	2003-06-25	31 Elene St

#### CORRIDORS

A critical element to habitat survival is the narrow links, or corridors, between large habitat areas. Strips of undeveloped land provide essential connections for animals and birds to move from one feeding or nesting spot to another and uninterrupted open space allows wildlife to move about and reach other necessary habitats. As new development cuts off this link, animals ultimately face extinction as their habitat dwindles. Maintaining and protecting the vegetative corridors along the Merrimack River and tributaries can provide wildlife with access to the broader undeveloped tracts located outside the region.

The Concord River, thickly vegetated on both banks of the river, is another important wildlife corridor used by birds and animals that should be maintained and protected. The Concord River Greenway exemplifies actions that can preserve important wildlife corridors, linking larger habitats (in this case linking some of the City's largest open spaces including Shedd Park, Rogers Fort Hill Park, and several large cemeteries), and offering recreational facilities for residents.

These corridors can provide excellent spots for Lowell residents to view nature in a highly urbanized setting.

The Merrimack and Concord Rivers provide significant regional connections, and provide habitat for various wildlife, however smaller riparian corridors also play an important role in providing links among larger habitat areas. For instance the Clay Pit Brook and Flaggy Meadow Brook serve as a wildlife corridor between the Lowell-Dracut-Tyngsborough State Forest and the Merrimack River. Other important wildlife corridors to consider include the Black Brook, Beaver Brook, and River Meadow Brook.

Corridors are also important in the waterways for fish. A salmon restoration project completed by the State has provided a fish ladder at the Pawtucket Dam on the Merrimack River and a fish elevation at the hydroelectric station. This lift and ladder system allows fish to continue their journey upriver to their spawning grounds in New Hampshire.

#### RARE, THREATENED, AND ENDANGERED SPECIES

The Natural Heritage and Endangered Species Program have determined that there are six rare and endangered animal species in Lowell (see following table). Maintaining and, in appropriate circumstances, creating connectivity between open spaces in the city must continue to be an ongoing priority to protect thoroughfares for wildlife gaining access to larger open spaces and maintaining a resilient ecosystem for species survival.

TABLE 4: RARE AND ENDANGER ANIMAL SPECIES IN LOWELL

Scientific Name	Common Name	MESA Status	Most Recent Observation
<i>Falco peregrinus</i>	Peregrine Falcon	Endangered	2010
<i>Cicinnusmelsheimeri</i>	Melsheimer's Sack Bearer	Threatened	Historic
<i>Gomphusvastus</i>	Cobra Cluvtail	Special Concern	2004
<i>Neurocorduliaobsoleta</i>	Umber Shadowdragon	Special Concern	2004
<i>Emydoideablandingii</i>	Blanding's Turtle	Threatened	2007
<i>Deschampsiacespitosa ssp. glauca</i>	Tufted Hairgrass	Endangered	1882
<i>Elymusvillosus</i>	Hairy Wild Rye	Endangered	1882
<i>Liatris scariosa var. novae-angliae</i>	New England Blazing Star	Special Concern	1882

#### SCENIC RESOURCES AND UNIQUE ENVIRONMENTS

## SCENIC LANDSCAPES

The City's most distinctive features are the Merrimack and Concord Rivers. The wide Merrimack River offers a dramatic view and gives the City a general feeling of openness. The Merrimack River is classified as a Massachusetts Scenic River. The Pawtucket Falls, where the Merrimack plunges over the dam, is also a location of special interest. The more intimate Concord River, though heavily developed over much of its length in Lowell, provides many locations of natural beauty and historic interest.

Other scenic landscapes include annual fall foliage and two large marshes located in the Lowell-Dracut-Tyngsborough State Forest that span approximately 30 acres. Lowell's topography also affords many scenic overlooks of the City. The summit of Fort Hill, at over 250 feet, offers beautiful views of the Concord River and Downtown Lowell. Gage Field in Centralville is a good location for viewing over the city as is the Christian Hill Reservoir where there are views of Belvidere and the Merrimack River. Again, all these views are enhanced during the fall foliage.

Cemeteries and burial grounds can also serve as habitats for animal and plant life. The Lowell Cemetery, designed after Mt. Auburn Cemetery in Watertown, is known for its distinctive plantings and tombstones. Smaller untended graveyards are now a home to various tree and wildlife species.

Scenic landscapes include Clark Road, a street that runs from Andover Street (Rt. 133) through the Town of Tewksbury and retains several landscape features that relate to its use by local troops at the start of the Revolutionary War. Features include a burial ground, a large oak tree, and several standing late 18th/early 19th century homes. While the Lowell Historic Board is in the preliminary stages of placing the area on the National Register of Historic Places, Lowell could consider working with the Town of Tewksbury to work on historic markers and materials that highlight the history of the area.

## MAJOR CHARACTERISTIC FEATURES

An important area for recreational use and a unique environment for the region are the white water sections of the Concord River near its intersection with the Merrimack River. In this area, the water level drops almost 50 feet providing excellent conditions for rafting and canoeing. Several competitions have already been hosted as a result. Residents' perceptions regarding the positive aspects of the river are limited as access problems prevent close interaction with the river. Lowell could capitalize on the attractiveness of the river and gain regional and national recognition for its excellent white water found on the Concord River by completing the Concord River Greenway thereby protecting the banks of the rivers, developing access points, and developing associated programming to celebrate the river and develop a greater appreciation of this natural resource.

## CULTURAL and HISTORIC AREAS

Extensive public programming, interpretive and educational programs, waysides, and public art add to the vibrancy of the city and reinforce Lowell's history and culture. Wayside exhibits and public art help to weave together the significant areas, vistas, and structures along the canalways and throughout the Downtown Lowell Historic District. Cultural events such as Doors Open Lowell, the Lowell Folk Festival, Lowell Summer Music Series, and Winterfest help to encourage the community to celebrate its rich heritage while participating both as actors and audience in the midst of Lowell's historic buildings and sites.

Many historic and cultural resources are located along the rivers and canal system in Downtown Lowell where industry once harnessed the power of the Merrimack and Concord Rivers. Canal boat tours conducted by the Lowell National Historical Park enable visitors to experience the technological marvels of the 19th century. As mentioned earlier, Lowell also has numerous sections in the city that are listed on the National Register of Historic Places. These districts contain the tangible reminders of Lowell's history in the form of 19th century residences, industrial structures, parks and landscapes, a rural cemetery, and civic and community buildings.

Lowell also contains many areas of archeological interest. Lowell increased its size between 1832 and 1906 by annexing land from adjacent communities. These lands had a rich history of settlement starting with the Native Americans and early settlers of the Merrimack Valley. The pre-industrial historic resources of Lowell deserve to be recognized and protected as part of Lowell's overall history. In a cooperative effort with neighboring communities the City could help create a cultural heritage corridor and share grants and other incentives.

Historic burial grounds and their gravestones are considered "above-ground" archeological elements of a community. Cemeteries and burial grounds can also serve as habitats for animal and plant life. For example, the Hunt-Clark Cemetery, located in a residential neighborhood of Belvidere, dates back the late 17th century and was used as a family burial ground through the mid-20th century. Abandoned in the 1950s after a string of vandalism; the untended burial ground is now a home to various tree and wildlife species and serves as a wildlife corridor. These sites are unique landscapes that are often overlooked in landscape inventories and should be considered as a contributing landscape to the broader open space network. The City of Lowell has six municipally owned cemeteries, including three historic burial grounds that are closed to new burials. In addition to many private cemeteries, there are also two burial grounds that are classified as abandoned.

As of January 2013 only one cemetery, the private Lowell Cemetery, is listed on the National Register of Historic Places. The various public and private burial grounds are important cultural resources that serve as a reminder of the early history of the area as well as a place of passive recreation for many residents of the City. These sites should have comprehensive master plans that address short and long term goals that include maintenance of the landscapes. The City of Lowell should place better protections on its historic burial sites by nominating the sites for the National Register of Historic Places and utilizing grants that can help restore the sites and maintain their landscapes.

Druid Hill is a unique landscape feature found in Pawtucketville. This standing stone cluster on a mound is located near an area that was once an isolation hospital. While the origin of this feature is unclear, it is nevertheless an important part of the history of the neighborhood. Another unique cultural landscape includes Clark Road, which runs from Andover Street through the Town of Tewksbury. Clark Road retains several landscape features that relate to its use by local troops at the start of the Revolutionary War with features that include a burial ground, a large oak tree, and several standing late 18th/early 19th century homes. While the Lowell Historic Board is in the preliminary stages of placing the area on the National Register of Historic Places, Lowell could be working with the Town of Tewksbury to work on historic markers and materials that highlight the history of the area.

#### AREAS OF CRITICAL ENVIRONMENTAL CONCERN

There are no designated Areas of Critical Environmental Concern (ACEC) in Lowell. The City has examined the necessary steps to apply for an ACEC designation but felt that sufficient resources were not available to warrant this type of protection. However, this does not mean that certain areas around the city are not worthy of further protection. The city needs to be aware of the value provided by the rivers and streams of Lowell to residents, plant life, wildlife and industry. The Merrimack and Concord Rivers, and the several brooks that feed into these locations are all very important to Lowell and should be protected through regulation, conservation restriction or fee ownership, where most appropriate.

#### ENVIRONMENTAL CHALLENGES

##### HAZARDOUS WASTE and BROWNFIELD SITES

Lowell has a history of successfully utilizing many federal and state funded grant programs to address issues on contaminated properties. The City of Lowell's Brownfields Program has been active since 1996, when the City was selected to be one of the U.S. Environmental Protection Agency's (EPA) demonstration pilots. Since that time, Lowell has been awarded over \$4 million in assessment, cleanup and planning grants from the EPA. Additionally, the City has been awarded over \$200,000 in assessment and cleanup funding from MassDevelopment. Federal and State funds have assisted in the investigation of over 70 properties on over 75 acres of land.

According to the Massachusetts Department of Environmental Protection (MassDEP), there have been 489 reported releases in Lowell from the years of 1985 through 2013. Currently, there are approximately 60 releases that are in various stages of investigation and/or remediation in the City.

Hazardous Waste Sites can vary in size and use, however; commonly known sites in Lowell include, but are not limited to:

- Current and former service/gas stations,
- Former dry cleaners,
- Historic mills,

- Abandoned railroads, and;
- Former landfills.

Lowell is also home of one of the most environmentally contaminated sites in New England - the Silresim Superfund Site. Formerly home to the Silresim Chemical Corporation, this site of just over four acres on Tanner Street has been under government control since the company declared bankruptcy and ceased operations in 1977, leaving behind over 30,000 drums of chemicals. Since 1982, the U.S. Environmental Protection Agency (EPA) and MassDEP have operated on-site groundwater treatment.

## LANDFILLS

The Lowell Landfill, located at 1290 Westford Street, served as the City's primary solid waste disposal facility from 1947 to 1992. Today, the dump stands at approximately 200 feet high and occupies 56 acres. Historical records indicate that domestic, industrial, municipal, and hazardous wastes were disposed of at the facility and included asbestos, organic lead stabilizers, plating, bath sludge and volatile organic compounds.

Through a directive by MassDEP, the landfill has been properly capped with 18 inches of clay and a top layer of soil and grass. Initially, ventilation systems were installed to trap and release methane gas generated by decomposing trash. The City of Lowell later entered into an agreement to install, operate, and maintain a gas-to-energy system at the landfill.

Lowell is currently working to complete the installation of a photovoltaic array at the landfill. As part of that work, environmental monitoring requirements for groundwater, surface water, and methane gas are being revised and repairs to the landfill area are being made.

## EROSION

Wide-spread erosion is not apparent in Lowell given the lack of steep slopes and exposed land surfaces. However, localized erosion can be seen in the area immediately downstream of the Pawtucket Falls as a result of frequent dam activity. When the water level is raised and lowered at the dam, the stream banks downstream of the dam experience erosion due to sudden surges of water when the water level is changed.

## CHRONIC FLOODING

Areas of chronic flooding in the City are located along waterways such as Marginal Brook, River Meadow Brook, Beaver Brook, Black Brook, and Clay Pit Brook. These areas are located within the 100-year floodplain and suffer from past development where adequate flood storage was not provided and appropriate stormwater management practices were not utilized. Recently updated FEMA flood insurance rate maps have better defined these areas. City policies related to stormwater management practices are expected to result in a mitigation of flooding problems in the future.

Many of the areas subject to chronic flooding are also regulated under the Massachusetts Wetlands Protection Act. As such, future development of these areas is subject to the review of the Lowell Conservation Commission. The Lowell Conservation Commission reviews all plans for building within the flood plain, uses criteria set up in the Massachusetts Wetlands Protection Act

to determine if development will have a negative impact, and develops appropriate mitigation requirements to address those impacts.

#### SEDIMENTATION

Sedimentation has not been problematic for the City of Lowell. Common sources of sedimentation in waterways include combined sewer overflow (CSO) and stormwater runoff. Both of these issues are being addressed through new City policies, stormwater management practices, and sewer separation efforts.

#### NEW DEVELOPMENT

New development is expected to occur in the City's Urban Renewal Areas such as the ACRE Plan area in the Acre Neighborhood and the JAM Plan area in the Downtown Neighborhood. The City also anticipates development in the Ayer's City Industrial Park area, which is located in the Sacred Heart Neighborhood and is expected to become the City's newest Urban Renewal Area. By focusing growth in redevelopment areas the City is relieving development pressure on existing unprotected open spaces in the city.

These Urban Renewal Plans include the development of new open space and recreational opportunities. New development of former industrial sites can provide environmental benefits to these neighborhoods with the assessment and clean-up of brownfields sites and the implementation of stormwater management practices.

#### GROUND and SURFACE WATER POLLUTION

Combined sewer and stormwater discharged to the Merrimack River and its tributaries from both public and private sources contributes to reducing water quality in Lowell. These discharges can result in the introduction of excess nutrients, sediments, bacteria, and chemical pollutants to the City's water bodies.

Lowell has a combined sewer and stormwater system that can become overwhelmed during periods of heavy rain. In addition to the discharge point at the Lowell Regional Wastewater Treatment Plant at Duck Island, there are nine (9) CSO structures which regulate flows to the treatment plant and discharge excess storm flows directly into the Merrimack River, the Concord River, and Beaver Brook. There are eight (8) industrial outfalls discharging into the Merrimack River, the Pawtucket Canal, the Lower Locks Canal, and the River Meadow Brook.

The LRWWU has completed sewer separation efforts in several areas of the City. In the next three to five years the LRWWU anticipates conducting additional sewer separation activities to address ongoing CSO problems.

The City currently holds a Phase II NPDES General Stormwater Permit for its Municipal Separate Stormwater System (MS4). Based on mapping and field inspections performed by the Lowell Regional Wastewater Utility, approximately 300 municipal stormwater outfalls have been identified. Lowell discharges stormwater to the following water bodies:

- Merrimack River (303(d) listed)
- Concord River (303(d) listed)
- River Meadow Brook (303(d) listed)
- Beaver Brook (303(d) listed)
- Black Brook (303(d) listed)
- Marginal Brook
- Hamilton Canal
- Merrimack Canal
- Western Canal
- Pawtucket Canal
- Clay Pit Brook
- Flagg Meadow Brook
- Middlesex Brook
- Middlesex Canal

As part of the Phase II General Stormwater Permit, the City has identified and follows Best Management Practices (BMPs) to help mitigate negative impacts to surface waters caused by the MS4. BMPs include street sweeping, catch basin cleaning, hosting household hazardous waste collection days, storm drain cleaning, enforcing illegal dumping ordinances, and catch basin stenciling. Lowell requires that all new catch basins contain four foot sumps and hooded outlets to help contain any sediments or solids at the point of entry into the MS4.

In addition to these BMPs, regulatory structures, such as the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131 §40) (WPA) and the Massachusetts Stormwater Management Standards, are in place to ensure that any new construction or redevelopment does not negatively impact surface water bodies. Construction projects located in the 100-year flood plain, the Riverfront Area, and within 100 feet of a wetland are subject to the review of the Lowell Conservation Commission which is responsible for administering the WPA and implementing the Massachusetts Stormwater Management Standards, where applicable.

#### IMPAIRED WATERBODIES

MassDEP maintains a list of impaired water bodies as per the requirements of Section 303(d) of the Clean Water Act. Streams, lakes and ponds are identified as impaired if there is a significant presence of pollutants or if the waterway does not meet water quality standards for dissolved oxygen, temperature, pH, fecal coliform bacteria, solids, color and turbidity, oil and grease, or taste and odor. In Lowell, the following water bodies are listed as 303(d) impaired water bodies:

- Beaver Brook
- Black Brook
- River Meadow Brook
- Lowell Canals
- Merrimack River
- Concord River

The causes of these impairments are primarily attributed to combined sewer overflow, municipal NPDES discharges, and stormwater runoff. The City is working to reduce impacts to these water bodies through new policies related to stormwater management and sewer separation efforts. Lowell also maintains an extensive street cleaning program. Other sources of water body impairment specific to River Meadow Brook and the Concord River include non-native/invasive aquatic plant species and the proximity of a Superfund Site to a water body, respectively.

#### INVASIVE SPECIES

Invasive plant species are found in and around Lowell and pose a threat to outgrow local native species. The most common invasive species found include Leafy Spurge, Spotted Knapweed, Phragmites, Purple Loosestrife, Multiflora Rose, Morrow's Honeysuckle shrubs, Winged Euonymus, Glossy Buckthorn, Tree of Heaven, and Oriental Bittersweet.

While there is no official program in the City that deals with the removal of invasive species, the Lowell Regional Wastewater Utility manages a contract for vegetation control and removal in many locations throughout the City including bridges, the sewer interceptor line, and the levee. A more proactive approach to invasive species should be explored and implemented to eliminate the further expansion of these species.

As noted previously, non-native/invasive aquatic plant species serve as a source of impairment specifically for the River Meadow Brook. As part of the planning efforts for the Ayer's City Industrial Park, the City highlighted the River Meadow Brook as an amenity to the surrounding area. Plans for a greenway have been discussed as part of this work, and it is likely that cleanup efforts will be made to the area surrounding the brook.

#### ENVIRONMENTAL EQUITY

Lowell is an environmental justice (EJ) community as designated by the Massachusetts Executive Office of Energy and Environmental Affairs. Environmental justice is based on the principal that all people have the right to live in and enjoy a safe and healthy environment.

As part of the City's comprehensive master plan update, Sustainable Lowell 2025, and through an extensive public outreach effort, residents of all backgrounds and income levels were able to provide input on future open space and recreational planning. Important key goals that came out of the outreach process include:

- Ensuring that every resident in the City is within walking distance to a park,
- Identifying and employing a sustainable funding strategy for open space and recreational needs,
- Conducting regular audits and inventories of parks, playground equipment and other recreational resources,
- Expand the network of active and passive recreational spaces and forests throughout the City and the region, and improve the networks and connections between existing spaces, and;
- Identify parcels of land to permanently protect.

Accessibility to City recreational and open space, as well as regional recreational and open space amenities is a significant concern for EJ communities. Lowell has an extensive network of canal walkways, greenways, and recreational trails that are accessible to all populations in locations across the City. Plans to expand this network include creating connections from the downtown area to the Bruce Freeman Rail Trail along the Concord River Greenway, completing additional sections of the canal walkway network, and creating a walkable connection along the Merrimack River to the Department of Conservation and Recreation's Esplanade.

Because of the nature of Lowell's industrial history, the creation of many new open and recreational spaces may be hindered by perceived or known contamination. The City continues to seek funding for its brownfields program in an effort to ensure that new public open and recreational space can be created and that environmental concerns are alleviated.

## SECTION V

### INVENTORY OF LANDS of CONSERVATION and RECREATION INTEREST

Open space is generally land that is predominately free of structures and impervious surface, provides valuable habitat for wildlife, plays an important role in protecting water and air quality, and provide flood storage. In addition to the natural and environmental benefits, open spaces offer scenic vistas and recreational opportunities to the public and can increase the value of surrounding properties. This section includes lands within the City of Lowell that currently provide conservation and recreational value, as well as properties that offer the potential for additional conservation and recreational opportunities to the residents of Lowell. Please see Appendix B for a table with a complete list of properties with current or potential open space value.

#### PRIVATE PARCELS

##### AGRICULTURAL LANDS

Preserving land for agriculture is difficult in Lowell as the alternative is too profitable and is characterized by small fragmented parcels of land, furthermore the City does not have a zoning designation for agricultural land or open space. There is one parcel of land in the City that is protected under Chapter 61A regulations, a state law that allows a landowner that farms the land to pay a lower property tax. The tax is based on the land's present use (agriculture and/or horticultural) rather than a more valuable future use such as residential or commercial uses. A landowner must have at least 5 acres of contiguous property in order to qualify. The 61A parcel contains 10 acres and is located on Varnum Avenue in the Pawtucketville neighborhood. The landowner uses his property for the production and sale of Christmas trees, but the zoning code permits single-family residential construction on that lot. Other parcels in the City were once protected under Chapter 61A but have since given way to residential development. It is unlikely that many any other large tracts of land will be used for agriculture in Lowell in the future; however there is a growing interest in urban agriculture where farming can take place on a smaller, local scale. Although large scale agricultural use on open land is not likely to be in high demand the City should take steps to simplify the regulatory framework to allow agricultural uses in certain zoning districts and encourage urban agriculture ventures where appropriate.

##### FOREST LANDS

There are no forest land properties within the City of Lowell that qualify for Chapter 61 protection. Property owners who own more than 10 acres of contiguous land used for forest production can petition the State for Chapter 61 designation. The forest land designation has similar requirements as Chapter 61A. The only significant block of woodland found in the City is in the Lowell-Dracut-Tyngsborough state forest. There are limited blocks of trees covering the state forest and along the Merrimack River located on private parcels. However, none of these properties are protected under Chapter 61 regulations. Much of the larger blocks of forest land were cleared over a century ago to allow for agricultural development.

#### LESS-THAN-FEE-INTEREST

There are no parcels of land found in the City of Lowell that are protected under these various development restrictions. These easements are typically granted by a landowner for the benefit of the public good to provide access to a valuable recreational resource. They generally state that the landowner will not alter the land in a way that negatively impacts its recreation or open space value.

#### PRIVATE RECREATIONAL LANDS

Owners of recreational land are also eligible for taxpayer relief under state regulation. Chapter 61B applies to land not less than 5 acres that is maintained in its natural state. Allowed uses on the property include hiking, camping, nature study, boating, golfing, horseback riding, hunting, fishing, skiing, swimming, hang gliding, archery, and target shooting. In the City of Lowell, two properties are protected under Chapter 61B designation. One parcel is a private country club, the 18-hole Mt. Pleasant Golf Course, which has over 50 acres and is located in the western part of the city near the Chelmsford line. The second property, the United States Bunting Club, is located on Boylston Street near the Billerica town line and has approximately 11.5 acres. There is another private recreational golf club located on the Lowell-Tewksbury town line. Access to the site is through Lowell, but the majority of the property is located in Tewksbury.

#### ESTATES

There are no large properties in Lowell that are classified as estates.

#### MAJOR INSTITUTIONAL HOLDINGS

Several private and non-profit institutions occupy large parcels of land throughout the city. Many of these parcels have recreational facilities on their premises that could be used by residents. A priority is to work with these landowners to open up these facilities to the general public. The Greater Lowell YMCA owns 5 acres of land. The Lowell Boys Club owns 2 acres of land that contains recreational space for sporting activities for school age children. The Lowell Girls Club also owns several acres of land. The region is fortunate to have multiple healthcare facilities that provide extensive medical care. These facilities also occupy large tracts of open space. Lowell General Hospital recently merged with Saints Medical Center and owns 72 acres of land 64 of which is located in the Pawtucketville neighborhood, and 8 acres along the Merrimack River east of Downtown. The Sisters of Charity of Ottawa operate a large sprawling complex providing senior care services in the Pawtucketville neighborhood with 76 acres of land. Other large institutional landholders in the City include churches, private parochial schools and several non-profit groups.

# Lowell Open Space: Levels of Protection



**PUBLIC and NONPROFIT PARCELS**

**CITY PROPERTIES**

City of Lowell holds and extensive number of properties throughout the city used for a variety of public purposes. City properties are under the management by the following City authorities:

- Public School Department
- Parks and Recreation Department
- Fire Department
- Water Utility Department
- Public Works Department
- Wastewater Department
- Inspectional Services Department
- Cemeteries

The following table lists city owned and managed open spaces and parks. This is not a complete inventory of city owned land.

**TABLE 5: CITY PARKS AND OPEN SPACES**

SITE NAME	ACRES	RECREATION	FUNDING
Alumni Field	5.48	Active-baseball	City Bonded Funds
Armory Park	1.25	Passive-playground	CDBG
Bourgeois Park	0.19	Active-basketball	CDBG
Callery Park	5.50	Active-baseball/playground	State Earmarks
Campbell Park	2.53	Active-baseball /playground	City
Carter St Park	0.41	Active-basketball	City
Cawley Stadium Complex	26.01	Active-football/track & field	State, CDBG, Federal, City
Centerville Memorial Park	0.13	Passive	CDBG, City, State Earmark
Circuit Av Park	0.58	Passive	City
Clemente Park	3.02	Active-volleyball /playground/skate park	CDBG, City, Earmark
Coburn Park	0.25	Passive	Private Foundation (LPCT), City
Doane St Park	1.29	Active	City, CDBG, LHA Partnership
Donahoe Park	13.04	Active-basketball /playground	CDBG, City
Dubner Park	0.18	Passive	CDBG, Private LPCT
Ducharme Park	0.51	Active-basketball /playground	CDBG, City, State Earmark
Durkin Park	3.76	Active-baseball /basketball	CDBG, State SBAP (School), City
Edwards St Park	8.79	Active-soccer	CDBG, Brownfields, LPCT,

			City, State Earmark
Father Grillo Park	0.10	Passive	CDBG, City
Fayette St Park	0.17	Active-basketball /playground	CDBG, City
Fels Playground	0.64	Passive-playground	CDBG, City
Ferry Landing Park	0.15	Passive-dog park	City
Finneral Park	0.03	Passive	City
First St Park	2.67	Passive	Partnership with Private "Curbs and Cobble", Veterans, and City,
Fort Hill Park	34.51	Passive	CDBG, MHC, DEM/DCR, City
Fr Kirwin Park	1.48	Active-basketball /playground	City, CDBG
Fr Maguire Park	4.59	Active-basketball/ baseball/tennis/playground	CDBG, State SBAP (School), City
Gage Field	21.87	Active-basketball/soccer baseball/tennis/playground	State Earmark, CDBG, City
Hadley Park	5.75	Active-volleyball/ baseball/ playground/skate park	CDBG, State Earmark, City
Harmony Park	0.19	Passive	CDBG, City
Highland Park	19.71	Active-basketball/handball /baseball/playground	CDBG, State Earmark, City
Hovey Field	7.42	Active-soccer/playground	CDBG, State Earmark, City
Kerouac Park	0.97	Passive	CDBG, City
Kittredge Park	1.63	Passive-playground	Tsongas Foundation, CDBG, City, Private Funding
Knott Park	1.12	Passive	City
Koumantzellis Park	12.75	Active-baseball /skate park/playground	CDBG, State Earmark, City
LHS Practice Fields	4.55	Active-soccer/football	City
LHS Varsity Soccer Field	2.26	Active-soccer	City, CDBG, State Earmark
Lincoln Square Park	0.37	Passive	CDBG, City, Lowell Heritage Partnership Fund
Lowell Memorial Auditorium Greenspace	2.22	Passive	City
Lucy Larcom Park	0.71	Passive	Federal National Park, City
John & Priscilla Maher Park	0.35	Active-playground	CDBG, State Earmark, City
Manning Field	6.15	Active-baseball	City
Martin Portuguese Park	0.08	Passive	CDBG, City
Martin Softball Field	10.12	Active-softball	CDBG, State SBAP (School), City
McDermott Reservoir	14.87	Passive	CDBG, City, State Earmark
McPherson Park	10.55	Active-pool/basketball/ tennis/playground/ softball	CDBG, City, Private
Monsignor Keenan	0.62	Active-playground	CDBG, City
Moody St Playground	0.40	Active-basketball/ playground	CDBG, City
Mulligan Park	1.99	Active-splash park*/ basketball/playground	State "Our Common Backyards Grant", LHA partnership, CDBG, City

Nieves, Olga Playground	0.23	Active-playground	CDBG, City
Noonan Family Park	0.03	Passive	City
North Common	9.84	Active-pool/basketball/ softball/playground	CDBG, State Earmark, State (Pool)
O'Donnell Park	15.29	Active-splash park*/ basketball/tennis/baseball	State, City, CDBG
Oliveria Park	1.81	Active-baseball/softball	CDBG, City
Pawtucket Memorial Park	58.22	Active-baseball/softball/ soccer/playground	CDBG, City, State SBAP (School)
Perry Playground	0.41	Active-basketball/ playground	CDBG, City
Reilly School Community Playground	13.98	Active-basketball/ playground	City, Private
Rotary Club Park	0.85	Active-skate park/ community garden	CDBG, Private- Rotary Club, City, Mill City Grows
Rynne Beach	0.25	Active-swimming	State, City (summer staffing)
Scullin Park	1.19	Passive-playground	Also called Morey School Playground, CDBG, State SBAP (School), City
Shedd Park	52.89	Active-splash park/ basketball/tennis/ playground/baseball	CDBG, State, Private "Friends of Shedd Park", City
Sheehy Park	5.42	Passive	CDBG, City
Sheehy Park Extension	5.48	Passive	CDBG, City
South Common	20.11	Active-pool/soccer/ playground	CDBG, State, City, Federal
St Louis Playground	6.38	Active-baseball/softball/ basketball/playground	CDBG, City
Suffolk St Park	1.20	Passive	CDBG, City
Tenth St Reservoir	1.23	Passive	State (Water Dept), City
Thomas L Crowley Park	0.61	Passive-playground	City , State Earmark
Tyler Park	1.81	Passive	CDBG, City
UMass Lowell Boathouse	0.24	Active-boating	State, City
Varnum (Mt. Vernon) Park	0.58	Passive	State Earmark, City
Veterans Memorial Park	0.28	Passive	CDBG, City, State Earmark
Victory Park	0.06	Passive	City
Walter J Lemieux Park	0.13	Passive	CDBG, City
Wang Soccer Field	17.32	Active-soccer	City
Wannalancit Park	0.05	Passive	City
<b>TOTAL ACRES</b>	<b>459.80</b>		

Although 459.80 acres may seem like a lot of open space, it should be noted that the portion of the Lowell-Dracut-Tyngsboro State Forest located in Lowell is approximately two thirds of the total acreage listed above. The total area of open space managed by the City dedicated to active and passive recreational purposes provides approximately 4 acres per 1000 resident of open space. Although not the primary purpose of cemeteries, they do provide the public passive recreational opportunities, such as walking paths, in a tranquil setting while introducing relatively large areas of landscaping into the neighborhood. The following table shows that there are a number of cemeteries in the city contributing greatly to other open space opportunities throughout the city.

TABLE 6: LOWELL CEMETERIES

<b>CEMETERY SITE</b>	<b>ACRES</b>
Edson Cemetery	39.6
Hamblet Cemetery	0.54
Hildreth Family Cemetery	2.25
Lowell Cemetery	84.43
Old Cemetery	0.53
School Street Cemetery	1.09
St. Patrick's Cemetery	38.24
St. Peter's Cemetery	23.19
Westlawn Cemetery	31.9
Woodbine Cemetery	0.76
<b>TOTAL ACRES</b>	<b>222.53</b>

Over the past five years, significant progress has occurred within the realm of parks, recreation, and open space in the City of Lowell. Major projects have included the development of the first two phases of the Concord River Greenway, improvements and extensions to canal and river walkways, new parks and recreational facilities, and the enhancement of existing open space across all neighborhoods.

The Concord River Greenway development, which is well underway, currently consists of 2,700 linear feet of trail and 1.3 acres of open space. Public art and interpretive signage line the multi-modal path, and an online classroom can be utilized by visiting school programs. Completion of the CRG is expected within the next several years, at which time it will connect to the regional and state-wide network of trails.

The city has worked collaboratively with the Lowell National Historical Park to secure funding for and manage the development and redevelopment of many canal walkways throughout the Downtown and Acre neighborhood. Since 2001, 6,662 linear feet of canal walkway have been restored or constructed, and an additional 11,360 linear feet are currently underway.

Through the City Manager's Neighborhood Initiative and other various planning processes, the city has worked closely with community stakeholders to best determine open space needs and address the changing demographics of Lowell's most urban neighborhoods. Improvements to athletic facilities and amenities have been made in McPherson, Clemente, Rotary, and Armory Parks, among many others. In addition to refurbishing dozens of parks across all neighborhoods, nearly 10 new parks have been established throughout the city, including Jollene Dubner, Muldoon, and Olga Nieves. Through the various initiatives there has been an increased publicly owned public space by 13.32 acres since 2001.

#### STATE and FEDERALLY OWNED LANDS

A vital asset to Lowell and the towns of Dracut and Tyngsborough is the presence of the 1,015-acre Lowell-Dracut-Tyngsborough State Forest located in the northwest portion of Lowell. This major resource provides a variety of recreational opportunities such as biking and mountain biking, hiking, nature walking, picnicking, fishing, birding, field sports and winter sports such as ice skating, sledding, and cross-country skiing.

State lands are predominately under the administration and management of the Massachusetts Department of Conservation and Recreation, University of Massachusetts Lowell, and the Department of Public Works (DPW). DCR properties include much of the Locks and Canal areas and the state parks. DCR maintains and operates the 1,015-acre Lowell-Dracut-Tyngsborough state forest as well as the 83-acre Lowell Heritage State Park. These two open spaces offer a wide variety of active and passive recreational activities for all ages and abilities. The Massachusetts DPW maintains and operates Festival Field, also known as the, Ann Dean Welcome Regatta Field, along the Boulevard in the city's Pawtucketville neighborhood.

The Lowell Department of Planning and Development is petitioning the state to transfer the title of several parcels of land along the Merrimack River to DCR. This will enable DCR to complete the construction of a path that will begin near the Duck Island Treatment Plant and end near the Tyngsborough town line. This recreational link will greatly enhance opportunities for residents north of the Merrimack River. It will provide a nearly continuous park along the bank of the river, and will provide a site for walking, running, and picnicking. Federal properties consist primarily of United States Government buildings including the Courthouse, Postal Facility, and National Park Service property. The National Park contributes substantially to the open space and recreational amenities Downtown, including the Boarding House Park, canalwalks, and the canal boat interpretive cruises. The City should continue to work with the National Park in seeking funds to complete the Pawtucket Canal pathway.

#### NON-PROFIT LANDS

The Lowell Parks and Conservation Trust and the Friends of the Forest are the two most active land trusts currently operating in the City. The Lowell Parks and Conservation Trust (LPCT) has actively pursued expanding the portfolio of properties that they and maintain over the past five years. Most significantly the LPCT has acquired a conservation restriction in partnership with the Trustees of Reservations on a four acre property at 426 Varnum Ave. called Hawk Valley Farm. LPCT has also taken a regional approach recently purchasing a conservation restriction on property in Westford that encompasses the headwaters of the River Meadow Brook. LPCT also supports urban forestry by providing trees for planting throughout the city, and offering technical assistance to property owners planting new trees to ensure their survival. The Friends of the Forest owns and manages a six acre parcel adjacent to the Lowell-Dracut-Tyngsborough State Forest off of Charant Road. The following table depicts properties owned or controlled through a conservation restriction by land trusts.

TABLE 7: LAND TRUST PROPERTIES

Organization	Property	Area (Acres)
Lowell Parks & Conservation Trust	181 West Meadow Rd.	3.62
Lowell Parks & Conservation Trust	36 Merrill St.	0.06
Lowell Parks & Conservation Trust	383 Pawtucket St.	0.14
Lowell Parks & Conservation Trust	48 Tottman St.	1.52
Lowell Parks & Conservation Trust	16 Nicole Dr.	2.00
Lowell Parks & Conservation Trust	520 Varnum St.	4.54
Lowell Parks & Conservation Trust	95 Fairmount	0.17
Friends of the Forest	47 Charant Rd.	6.85
<b>TOTAL AREA</b>		<b>18.90</b>

#### OTHER PUBLIC UNPROTECTED LANDS

The University of Massachusetts-Lowell is a major landholder in the city. The State University occupies over 155 acres of land that it uses for academic, housing, university support and recreational facilities. The university is currently engaged in a program of facility growth and renewal to address increases in enrollment, planned growth in funded research, increased demand for on-campus undergraduate housing and a need for better academic community gathering spaces. The university has increased the amount of property it owns by 640,000 square feet since 2008, having acquired the Downtown Inn and Conference Center in 2009, the Tsongas Center in 2010, and the former St. Joseph’s Hospital at 220 Pawtucket Street (University Crossing) in 2011. Construction has begun on University Crossing and will provide 230,000 square feet of administrative and student services, and will include a retail component. University Crossing centrally located building that has the potential to knit together the three UML campuses, as well as to provide increased travel between the campus and Downtown Lowell’s shops, restaurants and other attractions.

Construction of a student housing facility including with 472 beds of suite-style housing on East Campus was completed and open for students fall 2013. A new parking garage on North

campus was completed summer of 2013 displacing tennis courts utilized by University students and faculty. Another parking garage is also being planned for South Campus. As the university grows, it continues to focus on sustainability in its capital and operating programs. Further, a comprehensive campus transportation planning effort, now underway, will provide recommendations on ways to increase walking and bicycling, improve mobility to and between campuses, and to Downtown Lowell. Recreational facilities are located at both north and south campus, with a student recreational center on east campus across from Lelacheur Park. Of particular note is a four-acre parcel along the north side of the river that currently houses a soccer field, which sees heavy use by an area soccer league.

## SECTION VI: COMMUNITY VISION

### DESCRIPTION OF PROCESS

A number of activities designed to capture the opinion of Lowell residents relative to open space utilization and needs were used to inform the Lowell Open Space and Recreation Plan. Extensive outreach was conducted by DPD to inform the update of the Lowell Comprehensive Master Plan beginning early 2011. To ensure broad participation representing residents, business owners, institutional leaders, and other community stakeholders in developing a shared vision for the future Lowell DPD conducted the following activities to encourage the public's participation in the visioning process:

- 800 residents completed a telephone survey conducted in 4 languages
- 175 participants, including 61 teens from 6 local youth organizations, shared over 1,000 comments through an online participatory planning tool, Community PlanIt
- 160 community stakeholders attended 5 visioning sessions on topics ranging from Transportation to Economic Development
- Over 200 attended educational tours and discussions held during Lowell's 1<sup>st</sup> Annual Sustainability Week
- 113 photographs were submitted to the Sustainability Snapshots Photography Contest for consideration in the Sustainability Plan

Additional outreach activities were conducted late spring 2013 including a survey focusing entirely on issues related to open space and recreational facilities and programming. A focus group was also conducted by Libran Research and Consulting to drill down into the qualitative aspects of open space, natural resource, and historic preservation in the City of Lowell.

The Northern Middlesex Council of Governments (NMCOG) began a regional open space planning process in the fall of 2012. The process included the constituent communities of Lowell, Tewksbury, Billerica, Chelmsford, Westford, Pepperell, Dunstable, Tyngsborough, and Dracut. NMCOG has completed an existing conditions analysis and public participation with stakeholder communities and their residents. Analysis from this process has been generously provided to supplement activities undertaken by DPD to engender a regional perspective in the goals and objectives of this open space plan.

### OPEN SPACE SURVEY

The open space survey was developed by DPD staff by adapting elements from the survey instrument utilized in support of the 2005 open space plan. Questions were updated to reflect current informational needs and to supplement the data collected for the comprehensive master plan update. Specifically the survey sought to understand how residents felt relative to the following:

- How open space, recreation facilities, and conservation of the natural environment may affect their choice of a place to live;

- How frequently open spaces are currently used, which open spaces are most frequently used, and what activities people participate in when utilizing public open spaces;
- How well is the City providing open space and recreational facilities in terms of accessibility, safety, cleanliness and maintenance;
- How resources should be prioritized when considering planning for new, or making enhancement to existing open spaces, parks, and recreational facilities.

The survey instrument was made available through direct emailing utilizing the Constant Contact survey invitation module and distributed to over 900 contacts. The survey was also made available on the DPD web page for download in digital format or direct link to the on-line survey. Hard copy surveys were also made available at the Lowell Public Library, Lowell Senior Center and City Hall help desk. DPD staff connected via telephone and electronically with local organizations such as the Boys and Girls Club of Greater Lowell, Cambodian Mutual Assistance Association (CMAA) and the Massachusetts Association of Portuguese Speakers (MAPS) and distributed hard copy surveys to each location for further distribution.

The survey was made available May 10<sup>th</sup> 2013 via email invitation, placed on the City webpage, posted on several City blogs and in hard copy form at the location listed above. Respondents were asked to complete and return the survey by May 27<sup>th</sup>. Nearly 200 surveys were completed and returned to DPD for analysis. Although there were a considerable number of responses to the survey the demographic makeup of the respondents do not represent the demographic makeup of Lowell and therefore should not be considered a comprehensive analysis of all Lowell residents. It should be noted that many of the responses clearly tracked with survey responses provided for the master plan update which was a representative sample of the city population. The Open Space survey responses do provide a strong anecdotal evidence relative the general public's preferences relative to open space and recreation. The City should continue its practice of directly engaging the public when implementing specific open space and recreational projects to ensure facilities are aligned with the needs and preferences of the residents most affected.

#### OPEN SPACE FOCUS GROUP

One focus group was conducted on June 4<sup>th</sup> 2013 by Libran Consulting, a market research consulting firm, with eight (8) Lowell residents participating. The respondents were randomly selected by the consulting firm to represent a mix of age, gender, ethnicity, length of residency and geographic area of residence. Seven of the eight participants reside in an Environmental Justice neighborhood. The focus group was designed to explore in detail the following two key areas:

3. What scenic landscapes, distinctive landforms, and/or environments help shape the unique identity of Lowell?
4. What cultural and historic structures, places and/ or other resources contribute to the unique identity and character of Lowell?

To help build a framework around these central questions the consultant team explored more generally with participants what comes to mind when thinking about open space in the context of Lowell, and what are the benefits of preserving open spaces. Participants were also asked

how the City of Lowell should prioritize resources in areas relative to open space and historic preservation in order to make the city a better place to live.

#### REGIONAL PLANNING PROCESS

NMCOG staff gathered and analyzed information through a variety of activities to inform the development of a regional opens space plan including:

- Compiled and reviewed existing municipal Open Space and Recreation Plans of member communities;
- Reviewed other regional plans, such as the Regional Transportation Plan, Hazard Mitigation Plan, and the Regional Strategic Plan;
- Interviewed municipal staff of member communities, non-profit organizations, and other stakeholders; and
- Conducted a Public Visioning Session and engaging in public outreach.

NMCOG staff conducted a public visioning session on November 15, 2012 at the UMass Lowell Inn and Conference Center to gather input from residents and other stakeholders. Participants were asked to consider and discuss a number of topics related to open space and environmental conservation including:

- What are the most important open spaces, scenic areas, and critical environmental resources in the region?
- What resources or areas are the most threatened or at risk, and what/ where are the most serious open space deficiencies?
- What resources or areas should be prioritized for protection or preservation, and what can be done to better manage the open space areas and resources that are already protected?

Participants were also asked to explore potential public policy changes at the state and local level that could better advance the preservation or protection of open spaces, and environmental resources. Approaches to improve coordination among municipalities in the region were also explored throughout the visioning process.

#### STATEMENT of OPEN SPACE and RECREATION GOALS

1. Ensure open space preservation recognizes and maintains important natural resources to support biodiversity and implement land management policies that result in a healthy environment;
2. Create an interconnected network of open spaces throughout the city that are linked with the region by integrating activities to preserve natural resources and provide recreational facilities;
3. Introduce more open space, natural vegetation and landscape into the more densely populated areas of the city and other areas lacking these types of public amenities;
4. Ensure information is readily available and effectively communicated to the public relative to open space and recreational amenities and public events showcasing these spaces;

5. Maintain and enhance existing parks and open spaces to meet the varied needs of the public;
6. Preserve, maintain, and make accessible the city's historic resources thereby celebrating Lowell's unique and rich cultural heritage.

## SECTION VII

### ANALYSIS of NEEDS

#### SUMMARY OF RESOURCE PROTECTION NEEDS

Resource protection is based on the need to balance activities that protect existing natural and historical resources with land and economic development objectives. Open spaces and natural resources such as wetlands, waterways, floodplains, forested areas, and scenic views offer a number of benefits to the community in terms of active and passive recreation. These places also offer opportunities for the public to directly experience wildlife in their everyday lives, and are critical elements of well-functioning environmental systems. These natural resources along with historic resources offer important amenities to Lowell residents that when well-balanced improve quality of life. When strategically preserved and maintained open spaces can provide a number of benefits including<sup>1</sup>:

- Ecological benefit: Open space provides natural water filtration, drinking water protection, flood and erosion control, wildlife habitat, migration stopovers, and conservation of biodiversity and ecosystems.
- Social benefits: Open space contributes to community and individual quality of life by providing opportunities for recreational, civic, social, and educational interactions. It can contribute to community identity and sense of place by connecting residents to their natural and cultural heritage and by linking neighborhoods to the larger community.
- Economic benefits: Open space is often important for attracting and maintaining businesses in a community and region. Proximity to open space often increased land values, and recreation and leisure activities can make significant economic contributions. Natural processes, such as water filtration, are much less expensive for communities than engineered alternatives, such as water treatment plants.
- Health benefits: Access to parks, greenways, and trails creates recreational opportunities and encourages a physically active lifestyle. Open space helps ensure clean and safe water supplies and food production resources. It also mitigates air, water and noise pollution.

A majority of land in Lowell is urban with few large open areas available for open space preservation and environmental conservation. A complicating factor in the Lowell context is that property ownership is largely disjointed and characterized by relatively small parcels of land. Therefore it is difficult to preserve large swaths of land with one single action. Open space preservation in this context needs to prioritize preserving high value natural resources, maintaining and strengthening where possible existing open spaces and using corridors and greenways to establish a networked system of "green infrastructure". Combining access to

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<sup>1</sup> American Planning Association, "Seven Principles of Green Infrastructure", December 2002

compatible recreational amenities with environmental conservation when preserving open space should be prioritized to maximize community benefits. River corridors offer a particularly relevant example as preservation of land along rivers provide habitat and migration routes for a variety of wildlife, helps reduce water pollution, mitigates impacts from flood events and erosion, while providing opportunities for active recreation such as walking, running or biking and the opportunity to interact with the natural environment.

Although Lowell is a predominately urbanized there is a significant network of wetlands and waterways that provide significant ecological benefits to the community. Activities to enhance land conservation should be focused on these networks as links among larger natural resources areas such as the Lowell-Tyngsborough-Dracut State forest and Fort Hill Park/ Shedd Park. Opportunities for protecting land and improving habitat, and linking larger regional open spaces should be the focus along the Merrimack and Concord rivers. Completing the Concord River Greenway, extending the River Walk greenway on the north bank of the Merrimack west of the Aiken St. Bridge, and extending the Riverwalk along the southern bank of the Merrimack to connect with the Bay Circuit Trail all serve to strengthen the river ecosystems while providing links in the open space network.

Secondary waterways should also be considered such as the River Meadow Brook, Clay Pit Brook, and Black Brook, as well as the canal system. Each of these waterways and associated wetlands provide important habitat and wildlife corridors within the City of Lowell and can serve to meet the four benefits of open space preservation enumerated above. Completing the Pawtucket Canal shared path system, and connecting the Bruce Freeman Trail with the Concord River Greenway via the River Meadow Brook are important opportunities for completing an interconnected system of greenways within the city and regionally.

There is a smaller yet environmentally significant network of wetlands that remain in the City. Development over the course of Lowell's history has encroached and degraded the full extent of wetlands. Strong protection measures should be instituted to prevent further degradation. Current regulations such as the Wetlands Protection Act and Lowell Wetlands Ordinance protect wetlands from encroachment to an extent. However properties containing wetlands and lands directly adjacent to wetlands should be considered for permanent protection through conservation restrictions along with other legal mechanisms to ensure the wetland environments are well maintained. Although some of Lowell's wetlands are on city or state-owned properties, this does not guarantee that they are fully protected from encroachment. Wetland networks of particular interest include those associated with the Concord River, Black Brook, Clay Pit Brook, and Flagg Meadow Brook.

Drinking water supplied by the Merrimack River is distributed to all users in the City as well as users in other towns. Surface water from the Merrimack River as well as the Concord River is also an important recreational resource. Therefore, maintaining a high water quality standard is vital and is a priority of this plan. Water quality has been a particular problem in the past as upstream discharges and users in the City have contributed to its poor quality. However, local, regional, state, and Federal efforts to clean up the Merrimack River and the positive impact of the wastewater treatment plants in Nashua and Manchester, NH have helped to greatly improve

the City's water quality. The Concord River also has a history of pollution due to municipal and industrial waste discharges. Lowell not only needs to concern itself with discharges in its own boundaries but also those from surrounding communities. Since the quality of Lowell's surface water depends significantly on upstream activities, the City should establish a system to monitor pollution, and strive to establish appropriate controls on upstream polluters. Such measures will help maintain water quality and allow continued use of the river by all users.

Periodic flooding in Lowell has been known to cause severe and expensive property damage. As in many urban areas, Lowell's floodplains have also given way to developmental pressures. Flooding problems have increased even further as wetlands, which provide valuable flood storage, have been filled to allow for more development. The Black Brook, and Clay Pit Brook, watersheds, all experience acute flooding problems, are telling examples of improper development of a floodplain area. Lowell needs to develop stricter regulatory controls over development in the floodplains to maintain riverfront open space and reduce damages caused by flooding.

#### HISTORIC RESOURCES & VIEWS

Historical and scenic locations are resources that shape Lowell's character and promote residents' interest and pride in their surroundings. However, pleasant landscapes and historic areas are easily destroyed when their values are not recognized and actions are not taken to protect them.

Lowell is a national model of how a community can preserve and protect its historic and cultural resources. A national and state park, as well as local historic districts, have been created to recognize, preserve, and protect Lowell's varied historic resources. The community has a total of 13 districts listed on the National Register of Historic Places and 26 individually-listed National Register properties scattered throughout the downtown and neighborhoods. The Lowell Historic Board oversees 11 historic and neighborhood design review districts. Efforts should continue to update and expand the community's historic resource survey as well as identify and designate additional properties and districts for listing on the National Register of Historic Places. Where appropriate, additional review districts should be considered to protect historic resources in coordination with neighborhood residents, partners, and other interests.

Several Lowell parks are also significant historic and cultural resources with some listed on the National Register of Historic Places such as the South Common, Tyler Park, Rogers Fort Hill Park, Kittredge Park, and Lucy Larcom Park. Early parks such as the North and South Commons (1845) were created by the City and still provide important open space and recreational needs for the community today. The Northern Canal Walkway was designed and built by Locks and Canals chief engineer James B. Francis in the late 1840s to provide pedestrian access along that canal and an escape from the downtown mill district. Later 19<sup>th</sup> and early 20<sup>th</sup> century parks such as Lucy Larcom Park, Shedd Park, and Rogers Fort Hill Park continue to serve similar functions today. The famous Olmsted landscape architecture firm also had a hand in designing new parks or updating several existing parks in Lowell including Tyler Park, Rogers Fort Hill Park, the North and South Commons, and Pawtucket Boulevard.

Smaller historic parks and landscaped areas including Monument Square, location of the Ladd & Whitney monument and burial site of the first two Union soldiers to perish in the Civil War, as well as the recently refurbished Cardinal O'Connell Parkway are important urban greenspaces adjacent to City Hall. Other similar, smaller parks and squares exist throughout Lowell's neighborhoods with many containing commemorative monuments and memorials significant to those particular sites including the recently restored Abraham Lincoln monument in Lincoln Square. Efforts to maintain and restore similar landscapes and monuments should continue.

Cemeteries are also significant open and historic spaces in the city. The privately owned and managed Lowell Cemetery (1841) is an important, early example of the rural or garden cemetery movement of the mid-19<sup>th</sup> century, was the fourth of its kind in the United States, and is listed on the National Register of Historic Places. Early cemeteries such as the Clay Pit, Hunt-Clark, and School Street have seen renewed interest through seasonal clean ups and preservation efforts in coordination with several community partners, efforts that should continue and be expanded upon in order to secure their long-term preservation.

Lowell's rivers, streams, and canals are among the city's most significant scenic features. They should be protected and enhanced through the establishment of easements and land acquisition programs as well as long-term maintenance solutions. Along the Merrimack River, one can find the Vandenberg Esplanade as well as the Riverwalk that both provide access to Lowell's waterfront while the Concord River Greenway provides similar access along that river. The Lowell National Historical Park's Canalway system provides access along much of the 5.6 mile power canal system located downtown. Efforts to support the completion of remaining Riverwalk, Canalway, and Concord River Greenway sections should continue. The Lowell Heritage Partnership has created an endowment fund specifically for Canalway and Riverwalk maintenance through the Greater Lowell Community Foundation that will assist in funding resource needs for these two areas as the fund grows and matures. Efforts by the Lowell Canalwaters Cleaners and Merrimack River Clean River Project should continue to be encouraged and supported.

## **SUMMARY OF COMMUNITY NEEDS**

### **PUBLIC OPINION and OUTREACH**

#### **TELEPHONE SURVEY**

A Telephone survey was conducted in spring 2011 to collect public sentiment regarding issues broadly affecting the City of Lowell, with particular attention paid to issues relating to social, economic, and environmental sustainability. The survey was part of a larger information gathering campaign to inform the Sustainable Lowell 2025, the comprehensive update to the city's master plan. A number of issues raised in the survey are directly relevant to open space planning and are summarized below.

Through the survey, Lowell residents were asked the importance of fourteen characteristics when choosing a community. The majority of residents surveyed in 2011 felt that all aspects

questioned were important. However, over 75% of participants agreed that the following six were of high importance when choosing a community:

- *Police and Safety*
- *Cost of Living*
- *City Services*
- *Neighborhood Character*
- *Schools*
- *Environmental Quality*

Those items of least importance to survey participants in 2011 were *Community Pride* and *Recreational Opportunities*. This list is fairly similar to the one generated from the 2002 survey results, with the exception of *Community Pride*, which decreased significantly in importance from 2002, and *Stores and Businesses, Roads, Transportation and Parking, and City Services*, which rose significantly in importance from the original survey. The increased importance placed on *City Services* is understandable given the recent reductions in State and Federal aid that have led to cuts in local government operations. However, the simultaneously high prioritization of *Cost of Living* and *City Services* poses a challenge for Lowell at a time when municipal resources are diminishing, as it is difficult to deliver public services at a high quality without sufficient tax revenue. For purposes of informing the Open Space and Recreational Plan it is important to note that "Recreational Opportunities" was the least important factor in guiding respondents' location choices.

#### Stated Quality of Life Improvements

In addition to ranking a list of items by importance, survey participants were provided with an opportunity to generate their own list of three items that, if improved, would positively impact their quality of life. Issues were consolidated into broader categories. For instance, many participants mentioned sidewalk repairs, whereas others mentioned potholes or bridges. All these issues were combined under "Public Infrastructure". The issues mentioned most frequently stated were *Public Safety, Public Infrastructure, Schools, City Services, and Lowering Taxes* each ranked highly in terms of their importance in 2011. Other items mentioned that were not among the top fifteen items expected to improve quality of life include *Snow removal, Parking, Protecting the environment, Availability of housing, Improved water quality, Public health improvements, and Improved lighting*. Interestingly "Parks & recreation" was ranked number six as a responded quality of life improvement with 97 of 800 respondents identifying better parks and recreational as an avenue to improving the quality of life. To some degree this contradicts the response found from the question relative to location choice which rates *Recreational Opportunities* the lowest compared to other community characteristics.

#### Lowell's Performance

Survey participants were asked to rate the city's performance on a series of forty different civic items, twenty-nine of which were reassigned from the original survey conducted in 2002. In order to ensure that the concept of sustainability was fully addressed through the 2011 survey instrument, 11 additional items, including *Incentives for Energy efficiency, Flood management, and Air quality*, were also incorporated.

While there was quite a range in the ratings, at least 50% of survey participants in 2011 ranked 18 (nearly half) of the items very highly (an 8, 9 or 10 on a 10-point scale), and at least 70% of residents felt the city was performing exceptionally well on *A city that preserves its historic places*, *Good trash removal*, and *Plenty of public events and festivals*. Among other items of high ranking were *Good recycling program*, and *Plenty of cultural activities*.

Items that were ranked favorably by fewer than one third of participants in 2011 included *Traffic that moves freely through town*, *Lots of job opportunities in the city*, *Well-maintained roads and sidewalks*, *Stores in my neighborhood that meet my basic needs*, *Streets and Walkways designed to keep accidents from happening*, *Reasonable property taxes*, and *Convenient pathways for pedestrians and bicycles*.

### Bicycle and Pedestrian Infrastructure

Across the board, residents felt the city's performance on creating pathways for bicycles and pedestrians was low. Those earning over \$100,000 were least satisfied (5.2 on a scale of 1 to 10, 10 being most satisfied), whereas those earning under \$30,000 and between \$50,000 – 74,999 were most satisfied (6.5). There was little difference in terms of ratings by age. Those aged 50-69 (6.1) were at the lower end of the spectrum, where as those 70 and over were at the higher end (6.6). Asians (6.0) rated bike and pedestrian amenities least favorably whereas Latinos rated it most favorably (6.5).

### Public Parks

In analyzing the performance ratings of other types of recreational opportunities, such as public parks, there was somewhat greater variation in responses. Those over the age of 70 (8.2) rated this item most highly, where as those under 30 rated it least highly of all age groups (5.9). Latino residents rated parks least favorably of all ethnicities (6.9), whereas Caucasians rated them most favorably (7.3). While Belvidere residents rated this item a 7.8, on average, those living in Back Central and the Acre each rated the city's performance on parks as a 6.7. Residents without children (7.2) rated this item more favorably than those with children (6.9).

### Resource Trade-Offs

In the survey, interviewers explained how "a city often needs to choose how it spends its resources on issues for its citizens". Given this introduction, residents reported what trade-offs they were willing to make on development issues in Lowell. When asked whether they would rather "Increase housing options by building more housing, but with more people in each neighborhood" or "Encouraging more open space in neighborhoods, but reducing housing options", 63% chose encouraging more open space in the neighborhoods over housing choice. On the whole, residents seem to feel more of their housing needs are met than residents did in a similar survey conducted in 2002. Having more housing options was less of a priority in Back Central than in any other neighborhood (26%). On average, renters (52%) were significantly more likely than home-owners to want more housing options (25%). Of all ethnic groups, Africans and African Americans (61%) were most likely to desire an increase in housing options. Caucasians were least likely (29%) of all groups. As income increased, the desire for housing options decreased.

Participants were asked to choose between three different types of enhancements made to recreational facilities. Most of the respondents indicated that they wished to see more open space for trails, natural areas, and conservation land (40%). The second type of enhancement was the creation of “more athletic fields such as basketball and volleyball courts” at 31%, followed by “swing sets and play equipment in parks for younger children at 26%.

Asians (46%) and Caucasians (45%) residents were most likely of all ethnic groups to prioritize open space and trails. Of all groups, Africans and African Americans (48%) were most in favor of athletic fields and courts. Latinos (35%) most wanted to see play equipment for younger children. Several neighborhoods, including Back Central, Centralville, Downtown, Pawtucketville, and South Lowell all prioritized open space and trails over the other options. Downtown (67%) prioritized open space more than any other neighborhood. Of all neighborhoods, Belvidere (35%) was most likely to prioritize play equipment for younger children, though many other neighborhoods ranked close behind. The Sacred Heart residents (44%) were most apt to favor athletic fields of all neighborhoods. All age groups prioritized open space over athletic courts and play equipment, though residents under 30 years of age reported the least variability in their choices. 37% of residents under 30 favored open space, where as 32% favored athletic fields and 30% favored play equipment. Those with children (66%) were more likely to want athletic fields than those without (33%). Those without children (39%) were more likely to want open space and trails than those with them (20%).

A final trade-off question explored the extent to which residents prioritized the protection of our physical environment, an extremely pertinent issue given the city’s focus on sustainability. Residents overwhelmingly favored protecting the physical environment over making policy decisions which could potentially harm it, even at a short-term cost. Respondents were specifically asked if they would prefer the City “Pursue policies that protect the environment for long-term benefit even when there is an added short-term cost” of which 81% of the respondents chose over “Prioritize policies based on the short-term cost even if they are not good for the environment and may not work in the long-term” (14%). While all ethnic groups were in favor of prioritizing policies that would protect the environment, Caucasians (89%) prioritized these policies most highly of all ethnic groups. Those participants with a college degree or more (88%) were also more likely to prioritize these types of policies than were those with fewer academic credentials (84%). Participants with incomes of \$75,000 - \$100,000 (91%) were most apt of all residents to advocate for environmental protection.

## VISIONING SESSIONS

Public visioning sessions help establish an on-going dialogue between city officials and community stakeholders, and are therefore an integral component of a long-range planning process. Through the city’s sustainability planning process, 20 officials from numerous city departments served as presenters, facilitators, and note-takers at five public visioning sessions. Transportation and translation services (Spanish, Portuguese and Khmer) were made available upon request. All meetings were held at the Lowell Senior Center, which was selected for its centralized location, proximity to public transportation, and abundance of free parking.

A total of 160 residents, business owners and other community stakeholders attended the five topical sessions to share their views on how the city was performing and on what could be improved upon. At the end of each session, participants were given stickers and asked to vote on the issues that they felt were most important. All voting sheets were made publically available through the city's website after each meeting

While a variety of topics arose throughout the visioning session and online planning processes were raised for discussion, a handful of these topics were most frequently discussed across a variety of public forums. Given their popularity and particular importance to community stakeholders, those topics are summarized below:

- Preservation of Natural Resources - Whether the discussion was centered around the recycling needs of multi-unit residential buildings, the use of municipal solar arrays as "learning laboratories" for school-aged children, the incorporation of rain gardens into parking areas to prevent flooding, the addition of street trees to "cool" the city and improve neighborhood walkability, or the organization of "greener" festivals, preserving Lowell's physical environment was a main priority for stakeholders.
- Bicycle, Bus and Pedestrian Amenities - While bike lanes and walking trails were a natural focus of the *Transportation and Open Space* sessions, these topics also arose during discussions on sidewalk snow removal in *Housing & Public Services*, employee commuter options in *Economic Development, Workforce Investment & Institutional Partnerships*, and the establishment of bike-friendly festivals in *Community Character, Engagement & Identity*. Several participants noted limited hours of service as the primary deterrent to more regular bus system usage.
- Community Character and Pride of Place - The level of pride in Lowell's history and cultural heritage was at the forefront of many conversations with stakeholders. Many felt that the city could better meet resident needs and draw more visitors to the region by further capitalizing on these unique resources. While the preservation of traditional architecture and the local art scene gave residents a sense of pride, neglected buildings and infrastructure, in addition to the perception of Lowell being unsafe, were noted as aspects of the city in need of improvement. Participants hoped to see the quality of life in their neighborhoods enhanced through the collective investment of developers, major institutional stakeholders, and the city itself.

A series of major themes were explored during the public visioning sessions and through the Community PlanIt planning tool with one session devoted to Open Space and Natural Spaces. There were a wide variety of topics raised among participants that are particularly relevant to open space planning, including:

- Introducing more vegetation into the urban context by increasing the amount of public street trees, reducing impervious surfaces, introducing community gardens and pocket parks into neighborhoods. Vegetation should be planted and maintained in a way that is resilient to the urban environment by planting native species and removing invasive species.

- Improve water quality of the waterways by direct intervention such as river and canal clean up programming, and indirectly by reducing the number of combined sewer overflows, and reduce untreated stormwater from being discharged directly into the City's waterways.
- Preserve land along waterways and canals to provide access and preserve the natural environment that can also offer pathways for recreational uses and to provide pedestrian and bicycle connections to public open spaces as well as other public amenities. These pathways should be broadly accessible to the community.
- Public parks and open spaces should offer a greater variety of activities and programming that better reflect the needs and interests of Lowell residents. Recreational activities discussed ranged from more walking and biking paths to skate parks, skating, swimming, kayaking, while introducing more opportunities for interactive fountains and spray parks, and encouraging a greater number of public events.
- Providing improved access to information relative to existing public open spaces so that residents are aware of recreational opportunities, events, and other activities available to them.

#### OPEN SPACE SURVEY

The Department of Planning and Development conducted a survey in May of 2013 to supplement survey data collected for the Master Plan update, specifically addressing open space preservation and recreational needs. Nearly 200 residents responded to the online survey or submitted a response to hard copy versions made available at various locations.

When asked how open space, recreation facilities, and conservation of the natural environment may affect their choice of a place to live a significant majority (91% of respondents) indicated that 'quality, walkability, and appearance of neighborhood streetscapes' are very important. 74% of respondents indicated that 'access to natural areas and scenic landscapes' is very important.

Activities most frequently participated in was walking/ jogging with 90% percent of respondents indicating that they participate in this activity 'Many times a year' (12+ times per year). The second most frequent activity was bicycling with 45% of respondents indicating they participate many times a year, and the third most common activity was picnics and outdoor gatherings with 23% of respondents participate regularly. The most common sport or group athletic activity that respondents or members of their household participated in was football/ soccer, with 16% of respondents indicating that they participated in the activity 'Many times a year'. Baseball/ Softball were the second most common athletic activity with 14%, and basketball the 3<sup>rd</sup> highest response with 12%.

Respondents were asked to rate their opinion relative to availability and access to five different open space types. Playgrounds and play areas for young children was the most highly rated facility with 20% rating it 'very good' and 45% rating it 'fairly good'. Safe and convenient pedestrian and bicycle paths were the lowest rated facility with 13% rating them 'very poor' and

35% rating facilities 'somewhat poor'. When asked to rate the general quality of different open space types the preservation of historic structures and places was the highest rated quality with 36% rating historic preservation at 'very good' and 45% 'fairly good'. Cleanliness and maintenance of fields and parks was the lowest ranked quality with a combined 'poor' rating by 33% of the respondents. Safety in parks and open spaces also appear to be a concern as 34% of respondents were 'neutral' on the subject while a combine 24% of respondents felt safety was 'somewhat poor' or 'very poor'.

When identifying top priorities for new park or open space facilities or improvements to existing facilities the top three facility or open space use types that were identified as a priority on a scale from one to ten were, trails and paths for cycling, running, or walking with 35% of respondents, followed by street trees and sidewalk improvements with 15%, and the third most frequent top priority being conservation of open space/natural areas. Respondents were also asked to rate their highest priorities relative to athletic facilities on a range from one to ten. The top three facilities ranked as the highest priority for respondents were baseball or softball fields (21%), Splash pads and spray parks (18%), and football/ soccer fields and swimming pools tying for third (15%). Respondents were allowed to write in other recreational facilities or open space uses that they felt should be considered for improvements, with the most frequent use written in being community gardens, and bicycle, pedestrian, and jogging paths.

A significant majority of respondents stated that they would support a 1 – 3% increase in property taxes to be used specifically for conservation of open space, park improvements, historic preservation and recreational areas in the City. Of the 189 people responding to the question 71% indicated they supported such an initiative.

#### OPEN SPACE FOCUS GROUP

The resident focus group conducted by Libran Consulting identified a number of insights relative to conservation of open spaces, and historic preservation in Lowell. The primary reasons that attracted participants to Lowell include a high value considering cost of living, reduced crime, access to education, diversity of cultures and cultural activities, and that the city offers a convenient location to live.

Participants demonstrated pride in living in Lowell, with the city's cultural and historic buildings providing the cornerstone for what makes Lowell unique and cherished by its residents. Diversity and celebrations showcasing diverse cultures also play a role in making Lowell a special place. Open space was not seen as a special element helping to create a unique identity for the city, but was considered a vital amenity that can offer respite from building congestion and could help reduce crime.

It was noted that while much has been done to renovate the city and its buildings, restoring neighborhoods and structures to their former grandeur, there remain areas that need attention. These areas should be addressed, whereby open space and historic preservation should play an important role in redeveloping these areas.

A need to develop a more integrated approach for highlighting diverse areas of the city and accentuating the unique cultural aspects within those neighborhoods was identified. Similarly, more communication and access to information relative to open spaces, their amenities, special events and programming that takes place in open spaces is needed. Participants were not broadly aware of the variety of facilities and events available to them and indicated better access to information would greatly benefit Lowell residents and access to public spaces and cultural events.

Infusing more landscape into the neighborhoods such as landscape islands in the public way and street trees were considered an important amenity, however all green spaces need to be regularly maintained to ensure they don't end up presenting a negative impression of the city. Cleanliness and maintenance of open spaces was a need generally voiced among the participants. The Merrimack and Concord rivers, among other waterways, were identified as important natural features. There is an impression that Lowell waterways aren't clean as garbage and refuse and pollutants often end up in the waterways. Attention needs to be paid to the waterways in order to improve their appearance and make safe for swimming, boating and other activities.

#### NATIONAL STANDARDS for RECREATIONAL FACILITIES

In the past, the National Recreation Parks Association (NRPA) guidelines have been followed to determine open space needs by location and population. Traditionally, the NRPA looked at three park systems: mini-park, neighborhood park, and community park; and determined how much acreage should be supplied per 1,000 residents. NRPA designated between 6 and 10 acres per 1,000 residents. Over the past decade, however, the guidelines have shifted and taken on a different focus. Instead of measuring the amount of space in acreage, cultural and social requirements are taken into account. To better accommodate demographic shifts that have occurred over the past decade, the NRPA has changed its guidelines and now uses the following as a means of measurement:

- The need to accommodate different cultures
- The need to include citizen opinion in the process
- The identification of the wellness movement

Since 2003, there have been great strides taken to address all three of these guidelines through the development and refurbishment of open space. This section will outline some of those efforts on a neighborhood level basis.

#### PUBLIC CONSERVATION AND RECREATIONAL RESOURCES BY NEIGHBORHOOD

##### THE ACRE (CENSUS TRACTS 3107, 3108, 3883, 3111, and 3110)

The 2000 Census figures show a population of 12,072 for the Acre, whereas the 2010 figures show an increase in population to 12,271. Since 2001, four new parks and 7.52 acres have been added to the neighborhood: Olga Nieves Park, Sheehy Park, Spaulding House Park, and Stoklosa School Park. The neighborhood had 21.5 acres in 2001 and now has 28.58 Acres.

Adams Park	1.0 Acres
Bartlett Field	4.0 Acres
Harmony Park	0.2 Acres
Moody Street Playground	1.0 Acres
North Common	11.3 Acres
Western Canal	4.0 Acres
Olga Nieves Park	.23 Acres
Sheehy Park	5.33 Acres
Spaulding House Park	.42 Acres
Stoklosa School Park	<u>1.5 Acres</u>
	28.58 Acres

Located in the above mentioned parks are the following passive and active recreational facilities. Since 2001, 2 new playgrounds, 1 skate park, 5 basketball court, and 34 benches have been added to the neighborhood. One set of bleachers and one tennis court have been removed.

- 2 Baseball diamond
- 4 Playgrounds
- 1 Skate Park
- 1 soccer/ football field (lighted)
- 1 tennis courts (lighted)
- 7 Basketball courts (6 lighted)
- 2 Softball diamond

All of these parks are developed and are well distributed throughout the neighborhood. Given the lack of available open space within the neighborhood, any additional facilities would have to be put into the existing parks and playgrounds. The Western Canal walkway improvements have helped provide the neighborhood with much needed open space in addition to provided residents with safer multi-modal transportation routes (walking, biking and jogging). The walkway also provides passive recreation where one can sit or picnic. Sheehy Park and Spaulding House Park have been tremendous additions along the waterfront, allowing for a variety of recreational uses. The Stoklosa School playground has provided much needed basketball courts and open space to the center of the Acre Olga Nieves and park improvements on Moody Street have added 2 new playgrounds. The Latino community, which is the predominant ethnic group in the Acre, has been the greatest proponent of playgrounds of any ethnic group. The adoption of Harmony Park by The Revolving Museum during 2008-2010 resulted in a substantial amount of public art within the neighborhood, including a Cambodian mosaic and a South American totem pole. This art helped celebrate the cultures represented by the neighboring residents.

**BACK CENTRAL (CENSUS TRACTS 3119, 3120)**

The 2000 Census figures show a population of 5,643 for Back Central, whereas the 2010 census shows a population of 5,367. Two new parks and .37 acres have been added to the neighborhood since 2001: Dubner Park and Sweeney Park. The neighborhood currently has 30.88 acres of parks contained in the following parks:

Carter Street Playground	0.50 Acres
Concord Riverbank Park	2.72 Acres

Dubner Park	2.72 Acres
Father Kirwin Park	1.54 Acres
Martin Portuguese Park	.1 Acres
Oliveria Park	1.83 Acres
Rotary Club Park	0.86 Acres
South Common	20.31 Acres
Walter Lemieux Park	.1 Acres
Sweeney Park	<u>.2 Acres</u>
	30.88 Acres

Located in the above parks are the following selective facilities. Since 2001, a skate park, 2 picnic tables, a basketball court, and 20 benches have been added to the neighborhood. One lighted basketball court was removed to create the skate park.

- 1 baseball diamond
- 1 soccer field
- 1 skate park
- 3 basketball courts (2 lighted)
- 2 tennis courts (lighted)
- 1 swimming pool
- 1 running track
- 1 fitness course
- 1 play area
- 1 community garden

While not located directly within the Back Central neighborhood, the Concord River Greenway has enhanced the quality of life for residents by providing a trail system, benches, and other amenities directly across the river, which gives this section of Lowell a fine passive recreational area. The Concord River, in certain sections, drops in elevation providing an excellent area for whitewater rafting and kayaking. This section along with a bike/pedestrian path, once connected to the regional network of trails, will provide a multitude of recreational activities for both local and regional residents. Additionally, two large parks (Fort Hill and Shedd) in neighboring Belvidere provide recreational sites for the residents of Back Central.

#### BELVIDERE / SOUTH LOWELL (CENSUS TRACTS 3123, 3124, 3125)

The 2000 Census shows a population total for these two neighborhoods of 19,380. The 2010 Census, by contrast, shows a population total of 19,951. While there have been many significant improvements to the green spaces in these neighborhoods, the single largest project of note has been the Concord River Greenway expansion, which is currently 2,700 linear feet of trail and 1.3 acres of green space. The neighborhood currently has 121.80 acres of open space contained in the following parks:

Alumni Field	5.50 Acres
Cawley Park	13.92 Acres
Commonwealth Avenue Playground	0.50 Acres
Concord River Greenway	1.30 Acres
Donahue Park (formerly Stratham)	5.00 Acres
Ducharme Park	.51 Acres

Fayette Street Playground	0.70 Acres
Fort Hill Park	34.40 Acres
Kitteridge Park	1.80 Acres
Knott Park	1.17 Acres
Reily School Park	3.17 Acres
Shedd Park	<u>53.83 Acres</u>
	121.80 Acres

Located in the above parks are the following selective facilities. Since 2001, there have been additions of two new playgrounds, one unlit basketball court, a lighted multi-use field, two unlit softball fields, a spray park and water playground, a public fountain, and forty benches. One storage facility has been removed.

- 3 baseball diamonds (2 lighted)
- 4 softball fields (1 lighted)
- 4 multi-purpose playing fields – football/soccer
- 2 football fields (lighted)
- 2 soccer fields (1 lighted)
- 8 tennis courts (6 lighted)
- 6 basketball courts (3 lighted, 3 not lighted)
- 2 ¼ mile running track
- 7 picnic areas
- 8 playgrounds
- 1 spray park and water playground

According to the NRPA standards used in 2001 and earlier, the section of Lowell containing Belvidere and South Lowell has and continues to have a sufficient amount of recreational land. The Concord River Greenway expansion has further contributed to the existing open space available. The spray park and pavilion at Shedd Park has also added tremendously to the neighborhood by allowing for a multitude of recreational uses in a single location. The expansion of athletic field space in these neighborhoods now allows for area teams to play and practice soccer, softball, and other field sports.

#### CENTRALVILLE (CENSUS TRACTS 3102, 3103, 3104)

The 2000 Census figures show a population of 15,808 for Centralville. The 2010 Census show a population of 15,237. The neighborhood currently has 66.53 acres contained in the following parks, which is the same acreage it had in 2001.

Christian Hill Reservoir	14.96 Acres
Centralville Memorial Park	.13 Acres
Dog Park (formerly First Street Park)	1.48 Acres
Ferry Landing Park (Formerly Lyons)	.13 Acres
Gage Field	21.08 Acres
Hovey Field	8.54 Acres
McPhearson Playground	8.57 Acres
Monsignor Keenan Playground	0.33 Acres
St. Louis Playground	9.30 Acres
Tenth Street Reservoir	1.33 Acres

Varnum Park	0.50 Acres
Veterans Memorial Park	<u>0.18 Acres</u>
	66.53 Acres

Since 2001, a multi-use soccer complex, a lighted basketball court, a lighted little league field, a lighted baseball field, a lighted volleyball court, two soccer fields, two new playgrounds, a mural, a shade structure, a refurbished basketball court, and four benches have been added to the existing parks. Two little league baseball diamonds have been removed. At the neighborhood's request, First Street Playground was also transformed into the city's first dog park. The eight parks in this section of Lowell contain the following selective facilities.

- 5 baseball diamonds (3 lighted)
- 3 softball diamonds (1 lighted)
- 3 football/soccer fields
- 1 multi-use soccer complex
- 8 basketball courts (6 lighted)
- 3 tennis courts (3 lighted)
- 1 Volleyball court
- 1 swimming pool/wading pool
- 1 picnic area
- 5 playgrounds
- 1 Dog Park

When examining the facilities available to Centralville residents, it is quite apparent that this particular neighborhood has the most facilities in the City. Gage Field lost approximately 5 acres for a new school to serve the Centralville residents. However, new athletic facilities have been built since that time to make up for this loss. The City Manager's Neighborhood Initiative in Centralville targeted McPherson Playground, and took into account the input from the community when redesigning that space. The reservoir on Christian Hill has been capped. In the winter, this site could be an excellent skating area if the water freezes adequately.

### 8.3.5 DOWNTOWN (CENSUS TRACT 3101)

The 2000 Census figures show a population of 3,881 for Downtown Lowell. The 2010 Census figure show a population of 5,267. Since 2001, one new park and .47 acres were created downtown. The new park was named Creegan Park. This section of the city contains approximately 2.86 acres of open space found at the following locations:

Creegan Park	.47 Acres
Kerouac Park	1.02 Acres
Lucy Larcom Park	1.27 Acres
Victorian garden	<u>.1 Acres</u>
	2.86 Acres

Additional park facilities are needed in this section of Lowell. As it contains much of the central business district, little room is available to install new equipment or acquire open space. The playground at Mack plaza has provided play space for younger children. The downtown area also contains a large elderly population who has different recreational needs. Accordingly, the city needs to properly plan for this segment and provide more passive recreational opportunities

where the elderly can sit and meet with friends. Since 2001, 20 benches, several public art sculptures, a small play area, and 6 new green spaces have been added to the neighborhood.

HIGHLANDS (CENSUS TRACTS 3112, 3113, 3114, 3115, 3116, 3117, 3118)

According to the 2000 Census, the population of the Highlands is 29,631. According to the 2010 Census, the population in this neighborhood is 30,190. The neighborhood currently has 65.31 acres contained in the following parks:

Armory Park	0.75 Acres
Callery Park	5.50 Acres
Clemente Park	3.00 Acres
Colburn Park	0.25 Acres
Crowley Park	0.50 Acres
Daley School Field	12.0 Acres
Doane Street Park	1.40 Acres
Durkin Playground	1.55 Acres
Edwards Soccer Field	8.00 Acres
Finneral Park	.08 Acres
Hadley Field	5.88 Acres
Highland Park	19.6 Acres
Lincoln Square Park	0.50 Acres
Morey Street Playground	1.20 Acres
Mulligan Park (was Avenue A)	2.78 Acres
Perry Playground	0.32 Acres
Tyler Park	<u>2.00 Acres</u>
	65.31 Acres

Most parks in the Highlands neighborhood are well distributed. Since 2001, the following amenities have been added to the existing parks: 4 playgrounds, 1 concession stand, 1 shade shelter, 6 volleyball courts, 1 skate park, 1 basketball court and 48 benches. 1 Tennis court was removed. The city has worked closely with the neighborhood and the Cambodian community in particular to better meet recreational needs in this part of the city. As part of the City Manager's Neighborhood Initiative the volleyball courts at Clemente Park were refurbished and lights were turned on to accommodate night time use. A refreshment stand was also built in an architectural vernacular of the community. Many other park improvements have also been implemented, such as the addition of skate parks to provide this type of recreational option for youth. Located in the parks and playgrounds listed above are the following selective facilities:

- 7 baseball diamonds (4 lighted)
- 1 football/soccer field
- 1 softball diamonds (lighted)
- 6 volleyball court
- 10 basketball courts (5 lighted)
- 5 tennis courts (5 lighted)
- 1 swimming pool (unusable)
- 1 Track
- 9 playgrounds
- 2 skate board parks
- 1 community garden

2 bocce courts

The recreational needs of the Highlands can be provided at existing parks and playgrounds. In addition, Mount Pleasant Golf course provides a large amount of open space that is accessible to the public in the winter for cross country skiing and sledding.

#### PAWTUCKETVILLE (CENSUS TRACT 3105, 3106)

The 2000 Census figures show a population of 14,355 for Pawtucketville. The 2010 Census figures show a population of 15,020. The neighborhood currently has 95.36 acres contained in the following parks:

Bourgeois Park	0.25 Acres
Campbell Park	2.53 Acres
Father McGuire Playground	4.58 Acres
Fells Playground	0.30 Acres
Flaggies Park	4.50 Acres
LeBlanc Park	60.0 Acres
Pawtucket Memorial Park	1.20 Acres
Wang Parcel	20.0 Acres
Wannalancit Park	<u>2.00 Acres</u>
	95.36 Acres

Since 2001, 2 new playgrounds and a little league baseball diamond were built. A baseball field was also upgraded and one swimming pool was removed from this neighborhood. Located in the above parks are the following selective facilities:

- 3 baseball diamonds (2 lighted)
- 2 softball diamond
- 4 basketball courts (lighted)
- 2 tennis courts
- 1 volleyball court
- 1 swimming beach
- 7 playgrounds
- 4 picnic areas
- 2 football/ soccer field
- 1 Multi-Purpose Field

A vital asset to this neighborhood, Lowell and the towns of Dracut and Tyngsborough is the presence of the 1,015-acre Lowell/Dracut/Tyngsborough State Forest located in the northwest portion of Lowell. This major park provides a variety of recreational opportunities such as biking and mountain biking, hiking, nature walking, picnicking, fishing, field sports and winter sports such as ice skating, sledding, cross-country skiing, and birding. The Boulevard also provides an excellent place for walking and jogging, as well as other outdoor community events.

#### SACRED HEART (CENSUS TRACTS 3121, 3122)

In 2000, Sacred Heart contained a population of 7,853. The 2010 Census shows a population of 7,458. Since 2001, one new park has been built in this neighborhood: Muldoon Park. This park

has yielded .55 acres to the neighborhood. The neighborhood currently has 26.46 acres of recreational land contained in the following parks:

Manning Field	11.0 Acres
McInerney Playground	0.35 Acres
Muldoon Park	.55 Acres
O'Donnell Park	<u>14.56 Acres</u>
	26.46 Acres

One new playground has been built in this neighborhood since 2001. Located in the above parks are the following selective facilities:

- 1 baseball diamond
- 2 softball diamond
- 5 basketball courts
- 1 swimming pool
- 1 handball court
- 4 playgrounds
- 3 tennis courts

Park facilities that do exist are well supplied with passive and active recreational facilities; however, more developed parks are needed to serve the entire population. Most of these additional facilities can be provided on existing parks and playgrounds. There are extensive open acres in the form of cemeteries, which compromise much of the land area in the Sacred Heart. These sites can be valuable for passive recreation such as walking, jogging, biking, and cross-country skiing. The development of the CRG will also play an important role in enhancing the quality of life for this neighborhood.

An inventory of public recreational facilities in the City was conducted summer 2013 to gain an updated picture of available facilities to residents. The survey informed totals by neighborhood reported above and is the basis of the following table summarizing the current inventory or recreational facilities in the City.

**Table 8: Inventory of Recreational Facilities in Lowell**

Recreational Activity	Number of Facilities
Basketball Court	41
Handball Court	3
Softball Field	13
Baseball Field	22
Tennis Court	22
Swimming Pools	4
Tracks	3
Volleyball Court	9
Football / Soccer Field	17
Skateboard Park	3
Play Area	38
Spray Park	2
Picnic Area	18
Community Garden	3
Bocce	2
Beach/ Boathouse	1
Multi-Purpose Field	1

The Massachusetts Executive Office of Environmental Affairs, Division of Conservation Services (DCS), developed the Massachusetts Statewide Comprehensive Outdoor Recreation Plan (SCORP) 2012 to assess statewide open space and recreational needs. Extensive outreach through community meetings, and written and telephone surveys was done to gather information about the kinds of recreational activities people participate in, and the kinds of recreational opportunities they would like to see more of in their communities. Overwhelmingly popular activities included walking, jogging and running, while other activities such as hiking, road biking and gardening were also popular. Not surprisingly responses to the SCORP surveys varied by region, for example, more residents in Gateway Cities like Lowell, mentioned recreational team sports as activities they participate in.

The four main goals from the 2012 SCORP plan: increase the availability of all types of trails for recreation, increase the availability of water-based recreation, invest in recreation and conservation areas that are close to home for short visits, and invest in racially, economically, and age diverse neighborhoods given their projected increase in participation in outdoor recreation, align with the Lowell Open Space and Recreation Plan. There is a desire in Lowell for more trails in the city for walking, biking and running. A goal identified in the plan is to complete interconnected shared use path systems along canals and integrate with other city and regional trail systems. The city is very fortunate to have both the Concord and Merrimack Rivers flowing through the city, along with several canalways. Lowell plans to develop trail systems along waterways and work with proprietors of the canal system and the National Park to implement a canal clean-up program to make these waterfront walkways more attractive for

residents and visitors. In addition to the city's natural water resources Lowell residents have expressed a desire to see more splash pads and spray parks within the city.

In an effort to ensure all Lowell residents have access to outdoor public recreational space the Open Space and Recreation Plan includes a goal to introduce more open space into densely populated areas, including the creation of pocket parks throughout the city. The creation of new open space and recreation areas is just one part of the equation; the other is ensuring that city residents are aware of the opportunities available to them. To that end, the city is going to make sure information is readily available and effectively communicated to the public relative to open space and recreational amenities and public events that will further showcase these spaces.

Lowell is a racially, culturally, and economically diverse community. When planning for open spaces the city wants to match the public interest in various recreational activities with appropriate spaces and amenities. A goal of the Lowell Open Space and Recreational Plan is to maintain and enhance existing parks and open spaces to meet the varied needs of the public, and more specifically to broaden the type of recreational amenities available to better reflect the diverse interests of the public.

#### **SUMMARY of MANAGEMENT NEEDS**

Currently, the most significant management need relating to open space and recreation in the City of Lowell is an oversight group that will administer and implement this Open Space and Recreation Plan. Without a permanent Open Space Plan Committee, this document will only remain a document, and very few or none of its recommendations will materialize. Once this Plan is adopted, a committee should be created immediately. This advisory group should be diverse, comprising of residents, community leaders, city workers and officials who are committed to open space and recreation issues. They will be responsible for bringing to life the objectives and action steps outlined here, and for updating this Plan again when the next 5-year mark approaches.

The City of Lowell will rely on its various departments, boards and community partners to oversee and implement the goals of this Open Space and Recreation Plan in addition to a future Committee. In general, a lack of resources and funding in recent years has been a deterrent for these groups in accomplishing their open space and recreation goals. Particularly, the City's Department of Parks and Recreation has seen much of its funding reduced, forcing the department to only maintain the parks and recreational spaces that are in dire need. Thus far, the City has done its best given its budget, however for the future, a reallocation of resources and other sources of funding must be sought.

There is a lack of communication with neighboring communities regarding developments of regional significance. In some cases, a neighboring community might have land zoned for industrial use while the abutting land in the adjacent community is to be preserved for open space. These land uses clearly clash since any by-products of industrial use could negatively

impact the open space. It is important that communities attempt to solve these types of differences so that open space protection does not stop at the town line. Lowell and its neighboring towns should work together on projects that affect the open space goals of different communities in the region.

## SECTION VIII

### GOALS and OBJECTIVES

The City of Lowell has identified the following goals and objectives to provide high quality passive and active recreational opportunities for all residents, support biodiversity, protect important natural resources, and preserve the City's historical resources. Considerable effort has been put into gathering information relative to the public's needs and preferences and is reflected in the following goals and objectives. The City is also directed by the goals set forth in our Master Plan, "Sustainable Lowell 2025" as well as the Massachusetts Statewide Comprehensive Outdoor Recreation Plan (SCORP).

#### Goal 1:

Expand, enhance and maintain existing parks and open spaces to meet the varied needs of the public.

- Broaden the type of recreational amenities and facilities available to better reflect the diverse interests of the public.
- Complete the final phases of the Concord River Greenway.
- Identify underutilized open spaces and parks and implement enhancements to better meet the public's needs.
- Explore new programming opportunities, and design interventions that will increase utilization of underused parks and open spaces, such as splash pads.
- Increase the number of recreational opportunities in the city for low to moderate income families and youth.
- Explore creative solutions for providing park maintenance including, encouraging volunteerism and utilizing landscape designs that require little to no maintenance.
- Improve access to existing parks and open spaces for all residents.
- Improve infrastructure in parks and open spaces, with a focus on storm water infiltration.
- Seek additional funding sources to support maintenance and implement improvements at existing open spaces.
- Promote partnerships with public and private groups to promote and care for parks and open spaces.

#### Goal 2:

Expand, enhance and maintain the interconnected network of recreational trails, walkways, and open spaces throughout the city.

- Identify opportunities to develop trail systems along waterways to link with existing trails within the city and also to link with regional trails.
- Complete the final phases of the Concord River Greenway.
- Complete an interconnected shared use path system along the canals and integrate with other city and regional trail systems.

- Work with neighboring communities, NMCOG, and other regional entities to identify opportunities for developing new regional trail systems.
- Continue to partner with the Lowell National Historical Park on preservation and improvement of path systems along canals and rivers.
- Preserve riparian corridors and associated networks of wetlands and floodplains.
- Seek to integrate compatible recreational amenities with conservation areas along waterways, wetlands, and floodplains.

### Goal 3:

Introduce more green open space, vegetation, and trees into densely populated areas of the city and areas lacking these types of landscape amenities.

- Develop and implement a proactive urban forest policy that includes preservation, maintenance, and a planting plan to increase the tree canopy citywide.
- Focus on introducing vegetation and natural landscapes into more densely populated neighborhoods within the city.
- Build on recent successes with Community Gardens by establishing new gardens in densely populated areas.
- Continue to uphold and expand regulations that encourage improved landscaping practices by the property owners and developers, reducing large expanses of paved surfaces, increasing greenspace, and increasing the shade tree canopy.
- Actively promote Lowell's designation as a Tree City USA, and Massachusetts Green Community.
- Continue to create new pocket parks throughout the City.

### Goal 4:

Preserve natural resources to support biodiversity and implement land management policies that result in a healthy environment;

- Seek to improve the quality of Lowell's water supply for public health and biodiversity of our waterways.
- Work with the proprietors of the canal system, the National Park, and other stakeholders to develop and implement a canal clean-up program.
- Examine wetlands regulations that seek to better protect wetland resources, improve water quality, and protect public health and safety.
- Develop and implement practices for removing invasive species on public lands and identify tools to encourage and simplify removal on private property.
- Establish a program for procuring funds to acquire, protect and improve environmentally sensitive areas.

- Work cooperatively with federal, state and local agencies regarding rules and regulations affecting wildlife habitats and water resources.
- Support local land trusts and nonprofits in acquiring and preserving open space.

#### Goal 5:

Preserve, maintain, and make accessible the city's historic resources thereby celebrating Lowell's unique and rich cultural heritage.

- Preserve and improve historic landscapes, parks, and open spaces.
- Work with the Lowell Historic Board and the Massachusetts Historical Commission to develop programs to preserve historic buildings and structures both within and outside of the Lowell Historic Districts.
- Continue to partner with the Lowell National Historical Park on preservation and improvement projects, including the canalways.
- Recognize the historic value and environmental benefits of cemeteries within the city and actively preserve, maintain, and inform the public of these important resources.
- Seek opportunities to integrate historic preservation with creation of open space and recreational opportunities.

#### Goal 6:

Ensure information is readily available and effectively communicated to the public relative to open space and recreational amenities and public events showcasing these spaces.

- Increase the public's awareness of open spaces, trails, natural resources, and recreational opportunities.
- Increase awareness of and promote education relative to the value of open space preservation and environmental issues.
- Increase awareness of and promote education relative to storm water management.
- Continue to develop wide and diverse programming of special events held in Lowell's public spaces.
- Actively promote Lowell's designation as a Tree City USA, and Massachusetts Green Community.

## **SECTION IX: FIVE-YEAR ACTION PLAN**

The five year action plan outlines a recommended sequence of steps that city officials, community partners, and residents should follow to achieve the goals and objectives of this plan. It should be noted, that the timeline needs to remain flexible for carrying out projects and actions items identified below since resources and other variables may change, accelerating or postponing implementation of any one action.

**Goal 1: Expand, enhance and maintain existing parks and open spaces to meet the varied needs of the public.**

#	Action	Responsible Entity	Possible Funding Sources	Implementation Year				
				1	2	3	4	5
1	Construct new spray park at O'Donnell Park	DPD, Parks Dept.	State, CDBG, City, LHA	X				
2	Construct new spray park and playground at MulliganPark.	DPD, Parks Dept.	State, CDBG, City, LHA	X				
3	Construct new parking lot at MulliganPark.	DPD, Parks Dept.	State, CDBG, City, LHA		X	X		
4	Construct new concession stand at MulliganPark.	DPD, Parks Dept.	State, CDBG, City, LHA				X	X
5	Construct new playground at North Common.	DPD, Parks Dept.	State, CDBG, City	X	X			
6	Construct new Community Garden at North Common.	DPD, Parks Dept.	State, CDBG, City	X				
7	Make improvements to Durkin Park, adding a new playground, murals, etc.	DPD, Parks Dept.	State, CDBG, City	X	X			
8	Implement Phase I of park and recreational improvements of the South Common Master Plan	DPD, Parks Dept.	State, CDBG, City				X	X
9	Create and implement redevelopment of Hovey park to more effectively meet the needs of the neighborhood	DPD, Parks Dept.	State, CDBG, City		X	X	X	

10	Plan and construct the "Greening" of JFK Plaza adjacent to City Hall, incorporating a memorial walk, more green space, trees, and a skating rink in winter.	DPD, Parks Dept.	State, CDBG, City, Private		X	X	X	
11	Add to Clemente Park, new plantings, banners, trash receptacles, and signage. Renovate the underused skat park into a new use.	DPD, Parks Dept.	State, CDBG, City, Private		X	X		
12	Continue to support the local community groups that play volleyball and host events at Clemente Park.	DPD, Parks Dept.	CDBG, City, Private	X	X			
13	Improve playground at Armory Park and continue to assist local community group in hosting movies and events.	DPD, Parks Dept.	CDBG, City, Private	X				
14	Make improvements to Callery Park including renovating three baseball fields and three tennis courts.	DPD, Parks Dept.	CDBG, City, Private	X	X	X		
15	Investigate, plan and construct a new Dog Park in the City of Lowell.	DPD, Parks Dept.	CDBG, City, Private		X	X	X	
16	Finish renovation of Bourgeois Park and basketball court on University Ave, with new benches, kiosk, and lawn. Work with local community groups to maintain flower beds and plantings.	DPD, Parks Dept.	State, CDBG, City, Private	X				
17	Make improvements to Father Maguire Park and	DPD, Parks Dept.	State, CDBG, City	X	X			

	install new playground.							
18	Make improvements to Campbell Park and install new playground, parking area, and renovate playing fields.	DPD, Parks Dept.	State, CDBG, City	X	X			
19	Renovate Gage Park and add new playground.	DPD, Parks Dept.	CDBG, City, Private	X	X			
20	Renovate basketball and tennis at Shedd Park.	DPD, Parks Dept.	CDBG, City, Private	X	X			
21	Renovate the field surface, fence, and parking lot at Alumni Field.	DPD, Parks Dept.	CDBG, City, Private			X	X	X
22	Partner with Umass Lowell to enhance the memorial at Fels Park located on Riverside Ave.	DPD, Parks Dept.	CDBG, City, Private	X	X			
23	Conduct comprehensive analysis of all parks and recreational facilities to determine compliance with ADA regulations	DPD, Parks Dept.	State, CDBG, City	X	X			
24	Implement enhancements identified as a need following analysis of ADA compliance	DPD, Parks Dept.	State, CDBG, City		X	X	X	X
25	Identify and implement enhancements to improve pedestrian accessibility around parks and recreational spaces	DPD, Parks Dept.	State, CDBG, City, Federal	X	X	X	X	X
26	Identify and implement enhancements to bicycle accessibility to parks and recreational facilities, which may include bike racks/ structures and bicycle	DPD, Parks Dept.	State, CDBG, City, Federal	X	X	X	X	X

	pathways							
27	Explore feasibility to located bicycle share facilities within certain parks/ open spaces	DPD, Parks Dept.	State, CDBG, City, Federal		X	X	X	X
28	Improve access to and increase public interest in the State Forest	DPD, Parks Dept.	State, CDBG, City	X	X	X	X	X
29	Develop recreational facilities that encourage year round use of public parks	DPD, Parks Dept.	State, CDBG, City, Private	X	X	X	X	X
30	Explore the potential for establishing additional spray parks and interactive water elements throughout the city, in addition to maintaining public swimming pools.	DPD, Parks Dept.	State, CDBG, City, Private			X	X	
31	Continue to provide seed funding through the Neighborhood Innovation Grant Program and other means, as a way to encourage community ownership over creative improvements to Lowell's public spaces	DPD, Parks Dept.	State, CDBG, City, Private	X	X	X	X	X
32	Design and implement pedestrian improvements along Lucy Larcom Park	DPD, Parks Dept.	State, CDBG, City, Federal		X			
33	Design and implement renovation of existing skate park and basketball courts at Hadley Park	DPD, Parks Dept.	State, CDBG, City	X	X			

34	Design and construct new skate park at St. Louise Park, as requested by local neighborhood group.	DPD, Parks Dept.	State, CDBG, City			X	X	X
<b>Goal 2: Expand, enhance and maintain the interconnected network of recreational trails, walkways, and open spaces throughout the city.</b>								
#	Action	Responsible Entity	Possible Funding Sources	Implementation Year				
				1	2	3	4	5
1	Complete the final phases of the Concord River Greenway.	DPD	State, CDBG	X	X			
2	Complete the Merrimack River Walk extension under the Cox Bridge and terrace to grade with Bridge Street	DPD	State, CDBG	X	X			
3	Work with the National Park, Umass Lowell, and other property owners to create pedestrian and bicycle pathways between the Riverwalk and Downtown Lowell	DPD, Umass Lowell, NPS	State, CDBG, Federal	X	X	X	X	X
4	Extend the Merrimack River Walk around the end of the Mass Mills complex connecting to the Lowell Memorial Auditorium open space	DPD, NPS	State, CDBG, Federal			X	X	X
5	Explore opportunities to connect the Merrimack Riverwalk with the Merrimack Interceptor Trail and Concord River Greenway	DPD	State, CDBG, Federal			X	X	X

6	Explore opportunities and plan walking trails to link to existing recreation paths in Lowell and the region as part of the Ayer City/ Tanner Street plan.	DPD	State, CDBG, Federal	X	X	X		
7	Identify and begin implementation of route along River Meadow Brook for a shared used path to link the Bruce Freeman Trail and the Concord River Greenway	DPD, Parks Dept.	State, CDBG, Federal		X	X		
8	Work with property owners along River Meadow Brook to allow for public pathway	DPD	State, CDBG, Federal		X	X	X	
9	Identify areas, and implement enhancements to improve public access along the Merrimack River Interceptor Trail	DPD	State, CDBG, Federal			X	X	X
10	Seek funding and other resources to support the implementation of River Meadow Brook trail	DPD	State, CDBG, Federal		X	X	X	X
11	Explore feasibility of extending the Merrimack River pathway on the north bank from the Aiken Street Bridge to the School Street Bridge	DPD	State, CDBG, Federal			X	X	X
12	Work with Town of Dracut and other stakeholders to explore the opportunity to provide a regional pathway along Beaver Brook and connection with open space along the Merrimack River	DPD	State, CDBG, Federal				X	X

13	Support the Lowell National Park in its efforts to complete the Pawtucket Canal shared use pathway	DPD, NPS	State, CDBG, Federal	X	X	X	X	X
14	Explore wetlands protection regulations that will better protect wetland and floodplain corridors	DPD, Conservation Commission	State, CDBG, Federal		X			
15	Protect wildlife corridors through acquisition or easement, focusing on riparian corridors and associated wetlands and floodplains	DPD, Conservation Commission	State, CDBG, Federal	X	X	X	X	X

**Goal 3: Introduce more green open space, vegetation, and trees into densely populated areas of the city and areas lacking these types of landscape amenities.**

#	Action	Responsible Entity	Possible Funding Sources	Implementation Year				
				1	2	3	4	5
1	Acquire parcels from National Grid along the route of the Concord River Greenway.	DPD	State, CDBG, Federal	X	X			
2	Explore the possibility of adding landscaping, green space, and trees along Perry Street, as an extension of the Concord River Greenway.	DPD	State, CDBG, Federal	X	X	X		
3	Plan and construct the "Greening" of JFK Plaza adjacent to City Hall, incorporating a memorial walk, more green space, trees, and a skating rink in	DPD, Parks Dept.	State, CDBG, City, Private		X	X	X	

	winter.							
4	Add additional trees and plantings to the Fay Street parcel.	DPD, Parks Dept.	State, CDBG, City	X	X			
5	Transform under-used City lots into community gardens where appropriate. Continue to support Mill City Grows and other community groups who construct and care for community gardens.	DPD, Parks Dept.	State, CDBG, City, Private		X	X	X	X
6	Revise development regulations to encourage improved landscape practices, and require additional shade tree planting	DPD, Parks Dept.	State, CDBG, City			X	X	X
7	Complete citywide shade tree inventory	DPD, Parks Dept.	State, CDBG, City, Arbor Day Foundation, Federal	X	X	X	X	
8	Develop a shade tree planting plan that includes planting guidelines to ensure long-term viability of planted trees	DPD, Parks Dept.	State, CDBG, City, Arbor Day Foundation, Federal	X	X			
9	Work with community groups, and private property owners to develop an aggressive shade tree planting program of 250 trees per year	DPD, Parks Dept.	State, CDBG, City, Arbor Day Foundation, Federal	X	X	X	X	X

10	Hire a certified arborist/ tree warden to implement the Lowell Tree Ordinance	DPW	State, CDBG, City, Arbor Day Foundation, Federal	X				
11	Explore opportunities to utilize property at 71.1 Fowler Rd. for urban agricultural uses	DPD, Parks Dept.	State, CDBG, City		X	X		
12	Revise current zoning regulations to encourage and incentivize urban agricultural uses as economic development opportunities in appropriate areas of the city	DPD, Parks Dept.	State, CDBG, City			X	X	X
13	Seek funding for the transformation of East Pond into a recreational resource, and for other open space amenities within and around the Ayer City Plan area	DPD, Parks Dept.	State, CDBG, City, Federal			X	X	X
14	Explore creative ways to increase the amount of open and recreational space in Lowell's downtown so as to attract and retain a healthy diversity of residents and visitors	DPD, Parks Dept.	State, CDBG, City, Private	X	X	X		
15	Develop and work with community partners to implement a green alleyway program, with particular focus on overgrown alleyways in the Acre and Back Central in initial years	DPD, DPW, Parks Dept.	State, CDBG, City, Private	X	X	X	X	X

**Goal 4: Preserve natural resources to support biodiversity and implement land management policies that result in a healthy environment.**

#	Action	Responsible Entity	Possible Funding Sources	Implementation Year				
				1	2	3	4	5
1	Explore the feasibility of adopting the Community Preservation Act in Lowell	DPD, Inspectional Services, Conservation Commission	State, CDBG, City, Federal	X	X			
2	Implement policy to allocate a percentage of tax title sales be placed into an open space acquisition fund	DPD, Inspectional Services, Conservation Commission	State, CDBG, City, Federal		X	X	X	
3	Work with local land trusts and large institutional land owners in acquiring or placing conservation restrictions on properties adjacent to the State Forest	DPD, Inspectional Services, Conservation Commission	State, CDBG, City, Federal	X	X	X	X	X
4	Work with the State Department of Transportation to permanently protect the property located at 495.1 Pawtucket Blvd.	DPD, Inspectional Services, Conservation Commission	State, CDBG, City, Federal		X	X	X	
5	Construct multipurpose open space on City owned parcel located along the north bank of the Merrimack at 644 Aiken St.	DPD, Inspectional Services, Conservation Commission	State, CDBG, City, Federal			X	X	
6	Identify management entity for conservation area associated with the Rivers Edge development	DPD	State, CDBG, City, Federal	X				

7	Develop and construct pedestrian path to upland area of the Rivers Edge conservation area.	DPD	State, CDBG, City, Federal		X			
8	Explore changes to development regulations that will reduce the amount of impervious surface throughout the City.	DPD, Waste Water, Engineering Dept.	State, CDBG, City, Federal	X	X	X		
9	Work with developers and property owners to encourage open space preservation as a part of a development proposal	DPD, Inspectional Services, Conservation Commission	State, CDBG, City, Federal	X	X	X	X	X
10	Implement the Long-Term CSO (Combined Sewer Overflows) control plan	DPD, Waste Water, Engineering Dept.	State, CDBG, City, Federal	X	X	X	X	X
11	Develop informational materials about Low Impact Design (LID) stormwater practices in culturally appropriate ways	DPD, Waste Water, Engineering Dept.	State, CDBG, City, Federal	X	X	X	X	X

**Goal 5: Preserve, maintain, and make accessible the city's historic resources thereby celebrating Lowell's unique and rich cultural heritage.**

#	Action	Responsible Entity	Possible Funding Sources	Implementation Year				
				1	2	3	4	5
1	Work with the neighborhood to preserve the vacant water utility building located at 16 Hampshire St. for a public purpose.	DPD	State, CDBG, City, Federal, Private		X	X		

2	Preserve and make accessible to the public remaining stretches of the Old Middlesex Canal	DPD	State, CDBG, City, Federal, Private			X	X	X
3	Place Clark Rd. on the National Register of Historic Places, and work with the Town of Tewksbury to develop historic markers and materials that highlight the history of the area	DPD	State, CDBG, City, Federal, Private	X	X			
4	Efforts to preserve and renew early cemeteries such as Clay Pit, Hunt-Clark and School Street should continue and be expanded upon in order to secure their long-term preservation	DPD	State, CDBG, City, Federal, Private		X	X	X	X
5	Continue to update and expand the community's historic resource survey as well as identify and designate additional properties and districts for listing on the National Register of Historic Places	DPD	State, CDBG, City, Federal, Private	X	X	X	X	X
6	Develop creative and engaging ways of bringing history and historic preservation to life in Lowell's open spaces	DPD	State, CDBG, City, Federal, Private		X	X	X	X

**Goal 6: Ensure information is readily available and effectively communicated to the public relative to open space and recreational amenities and public events showcasing these spaces.**

#	Action	Responsible Entity	Possible Funding Sources	Implementation Year				
				1	2	3	4	5

1	Ensure regional bike trails are visible in the city through proper signage	DPD, GIS Dept, MIS Dept., COOL	State, CDBG, City, Federal	X	X	X	X	X
2	Develop recreational map showing all pedestrian and bicycle pathways throughout the City, and include regional connections	DPD, GIS Dept, MIS Dept., COOL	State, CDBG, City, Federal		X	X	X	
3	Develop brochure identifying all handicap accessible recreational facilities in the City	DPD, GIS Dept, MIS Dept.	State, CDBG, City, Federal		X	X	X	
4	Develop a map illustrating "blue ways", designated routes on city waterways for boaters/ kayakers, that includes places of interest, and places to put into the river, and other information to encourage more boating	DPD, GIS Dept, MIS Dept., NPS	State, CDBG, City, Federal		X	X	X	
5	Publish and distribute multi-lingual literature that identifies the parks and open spaces in Lowell	DPD, GIS Dept, MIS Dept.	State, CDBG, City, Federal	X	X			
6	Add programs and volunteer opportunities to school curriculums to increase students appreciation of open spaces and awareness of ecological issues	DPD, Parks Dept., School Dept.	State, CDBG, City, Federal	X	X			
7	Certify potential vernal pools located in City owned open spaces	DPD, Inspectional Services, Conservation Commission	State, CDBG, City, Federal			X	X	X

8	Encourage use of public open spaces for environmental educational programs	DPD, Parks Dept., School Dept.	State, CDBG, City, Federal	X	X	X	X	X
9	Develop a comprehensive outreach campaign to inform the public of open spaces, recreational amenities, and special events using a variety of media platforms	DPD, GIS Dept, MIS Dept., COOL	State, CDBG, City, Federal	X	X	X	X	X

## SECTION X PUBLIC COMMENTS

### Local Review

Copies of the 2013 Open Space and Recreation Plan were sent to:

- The Lowell Planning Board
- The Lowell Conservation Commission
- The Northern Middlesex Council of Governments
- Lowell City Council

### Open Space Survey & Focus Group

See Appendix A for copy of survey

## SECTION XI REFERENCES

The following references were used to complete the 2013 Lowell Open Space plan

- *Sustainable Lowell 2025*. City of Lowell comprehensive master plan update. Department of Planning and Development 2013.
- *Sustainable Lowell 2025 - Existing Conditions Report*. Department of Planning and Development; December 2011.
- *Sustainable Lowell 2025 – Public Opinion Report*. Department of Planning and Development; December 2011.
- Open Space Plan - Resident Focus Group; Summary Report. Libran Research & Consulting; June 2013.
- Northern Middlesex Council of Governments, 2013. Draft Greater Lowell Regional Open Space Strategy; Analysis and Recommendations.
- Massachusetts Statewide Comprehensive Outdoor Plan (SCORP). Division of Conservation Services. 2006.
- *Open Space and Recreational Planner's Workbook*. Division of Conservation Services. March 2008
- Lowell Open Space and Recreation Plan City of Lowell Division of Planning and Development. 2005.
- MassGIS – Office of Geographic Information. Online at <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/>
- Executive Office of Energy and Environmental Affairs. Online at <http://www.mass.gov/eea/>

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APPENDIX A: OPEN SPACE SURVEY  
LOWELL OPEN SPACE SURVEY

1. Please identify how important each of the following is to you when choosing where to live:

	Very Important	Somewhat Important	Neutral	Not Very Important	Not At All Important
Availability of playgrounds and parks for young children					
Availability of parks, athletic fields, and recreational programs for youth					
Availability of parks and recreational facilities and programs for adults					
Condition/maintenance of parks, playgrounds, and recreational facilities					
Access to natural areas and scenic landscapes					
Quality, walkability, and appearance of neighborhood streetscapes (trees, sidewalks, lighting, etc.)					
Access to open spaces and natural areas					
Preserving environmentally sensitive areas					
Protecting property from natural disasters such as flooding					

2. Please indicate how often you or members of your household use or participate in each recreational activity listed:

Activity	Never	Once a year	Few times a year (2 - 5 times)	Several Times a year (6 - 12)	Many times a year (12+)
Fishing or Boating					
Bicycling					
Walking or jogging					
Special event space					
Picnics/Outdoor gatherings					
Skateboarding					
Community Gardens					
Public Fitness facilities/Equipment					
Recreational Swimming					
Dog park/play area					

3. Please indicate how often you or members of your household participate in each sport or group athletic activity listed:

Activity	Never	Once a year	Few times a year (2 - 5 times)	Several Times a year (6 - 12)	Many times a year (12+)
Crew/Rowing					
Tennis					
Baseball or Softball					
Football or Soccer					
Volleyball					
Lacrosse					
Basketball					
Deck or Street Hockey					
Ice Hockey/Ice skating					
Competitive Swimming					

4. What is your opinion of availability and your access to the following park, recreational facilities, and other open spaces in the City of Lowell?

	Very Good	Fairly Good	Neutral	Somewhat Poor	Very Poor
Playgrounds and other play areas for young children					
Athletic Fields/Courts for team and organized sports					
Recreation programs for youth					
Public recreation programs and facilities for adults					
Safe and convenient pedestrian & bicycle paths					
Places to host/hold cultural events					

5. What is your opinion of the following with respect to parks, recreational facilities, and other open spaces in the City of Lowell?

	Very Good	Fairly Good	Neutral	Somewhat Poor	Very Poor
Conservation of open space land, forest, and natural areas					
Preservation of historic places and structures					
Condition and maintenance of park and playground equipment and structures					
Safety of parks and recreation areas					
Cleanliness and maintenance of fields and parks					
Quality of park equipment and facilities					

6. How frequently do you use public parks and open spaces in Lowell?

- At least weekly   
  Once a month   
  A few times per year   
  Rarely   
  Never

7. If you use parks and open spaces in Lowell, please list up to five parks or facilities you use most frequently (consider neighborhood parks, City-wide parks, stadiums and athletic fields, trails, forests, public pools, and waterfront areas)?

8. The City must decide among many options when planning for new or making improvements to existing open space, parks, and recreational areas, please rank the following park functions in order, identifying your highest priority (1) to lowest priority (10):

- Trails and paths for cycling, running, walking \_\_\_\_\_
- Athletic fields or courts \_\_\_\_\_
- Spaces for gathering, picnics, and events \_\_\_\_\_
- Recreation facilities for youth \_\_\_\_\_
- Playgrounds and play structures \_\_\_\_\_
- Pools and water facilities \_\_\_\_\_
- Conservation of Open Space/Natural Areas \_\_\_\_\_
- Preservation of Historic Structures and Buildings \_\_\_\_\_
- Protection from Flooding \_\_\_\_\_
- Street Trees and Sidewalk Improvements \_\_\_\_\_

9. Please rank the following types of athletic facilities in order, identifying your highest priority (1) to lowest priority (10):

- Tennis courts \_\_\_\_\_
- Baseball or Softball Fields \_\_\_\_\_
- Football/Soccer fields \_\_\_\_\_
- Volleyball Courts \_\_\_\_\_
- Lacrosse Fields \_\_\_\_\_
- Basketball Courts \_\_\_\_\_
- Swimming Pools \_\_\_\_\_
- Dek or Street Hockey Rinks \_\_\_\_\_
- Ice Hockey/Skating Areas \_\_\_\_\_
- Spalsh Pads/Spray Parks \_\_\_\_\_

10. Please identify any other types of open space or recreational activities not listed in question# 8 or question #9 that you consider to be a high priority:

11. Would you support a 1-3% increase in property taxes to be used specifically for the conservation of open space and improvement of parks, historic preservation, and recreational areas in the City?

- Yes
- No

DEMOGRAPHIC DATA

12. How long have you been a resident of Lowell

- Less than 2 years
- 2 to 5 years
- 6 to 10 years
- 11 to 20 years
- over 20 years

13. Which Lowell neighborhood do you live in?

Neighborhood	
The Acre	
Back Central	
Belvidere	
Centralville/Christian Hill	
Downtown	
The Highlands	
Lower Highlands	
Pawtucketville	
South Lowell/Sacred Heart/Riverside	
Don't know	
Other: (Text box)	

14. Are there children under 5-years-old in your household?

- Yes
- No

15. Are there school age children in your household?

- Yes

No

16. Do you own or rent your residence?

Own

Rent

17. Which of the following age categories are you?

Under 18

19 – 44

45 – 65

Over 65

18. Which of the following best describes your race or ethnic background?

African American

Caucasian

Hispanic/ Latino

Asian

Other \_\_\_\_\_

19. Please identify the category that includes your total household income

Under \$25,000

\$25,000 – 49,999

\$50,000 – 74,999

\$75,000 - 99,999

\$100,000 – 124,999

\$125,000 or more

20. What is your gender?

Male

Female