

City of Lowell



Open Space and Recreation Plan

2019-2023

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SECTION I

PLAN SUMMARY

The 2018 Lowell Open Space and Recreation Plan was prepared by City of Lowell Department of Planning and Development (DPD) staff, this plan is an update to the 2013 Lowell Open Space and Recreation Plan. The 2018 plan is a vision for the City's parks, open spaces and recreational programming for the next five years. This plan represents the changing needs of Lowell residents and sets out a course to respond to those needs. As a largely built-out city Lowell must always try and think creatively about our available resources and how our community is responding to the needs of our diverse community.

Similar to the 2013 Open Space and Recreation Plan, this new plan follows the principles of Sustainable Lowell 2025, the City of Lowell's Comprehensive Master Plan. Creating a community that responds to the needs of our residents, and is willing to adapt to changes in our environment is important for the long term sustainability of our community. The Open Space and Recreation Plan reflects the vision of, and is aligned with, the goals established in Sustainable Lowell 2025, which include *livability, place-making, longevity, and responsibility*.

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.

The following goals will help us provide the spaces and amenities our residents expect from their community.

1. Improve pedestrian connections and experience throughout all neighborhoods to provide residents safer access to parks, open spaces and the opportunity to walk as a form of exercise or for leisure
2. Improve cycling infrastructure across the city; prioritize non-vehicular modes of travel and recreational opportunities for residents.
3. Increase and improve the availability of water-based recreational opportunities for residents of Lowell.
4. Prioritize improved maintenance, security and preservation of parks and open spaces across the city and provide amenities residents have expressed an interest in seeing available to them.
5. Improve communication to the public regarding parks, open spaces, available amenities, and events occurring showcasing these spaces across the community.
6. Increase recreational opportunities and improve existing parks and open spaces for the enjoyment of all residents of the community regardless of age, ability and neighborhood of residence.

The 2018 Open Space and Recreation Plan is designed and formatted according to Massachusetts Division of Conservation Services (DCS) requirements.

SECTION II

INTRODUCTION

2. A. – STATEMENT OF PURPOSE

The Lowell Open Space and Recreation Plan establishes a vision for preserving, maintaining, and enhancing existing open spaces that represent the needs and desire of community residents. The goals and action items set forth in this plan will enhance the quality of our open spaces, and help the City prioritize necessary improvements to our infrastructure. We all want Lowell to be a community where everyone, regardless of the neighborhood they reside in, has access to recreational activities they enjoy. We want to protect our natural and historic resources, and provide equal access to all residents to enjoy them.

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. Throughout the public process several common themes began to emerge. This showed that although our community is very diverse there were common themes and priorities shared across our community. Based on direct feedback offered through public outreach activities the 2018 Open Space and Recreation Plan emphasizes the following general themes:

Connections: people want to utilize their neighborhood parks but also want to be able to access other open spaces across the city in more convenient ways that are not always car dependent.

Cycling: Residents want to make Lowell a more bike friendly community and a place where residents can use cycling as a means to exercise and as an accessible mode of transportation.

Water: With two major rivers running through the city and miles of canals throughout our downtown, Lowell has an abundance of water in the community, but residents are looking for more opportunities to interact with our water resources and want more accessibility to water within the city.

Maintenance & amenities: Residents want to ensure sound capital planning, adequate funding, and staffing is available within the city to create and maintain the parks, open spaces and recreational programming they want to see provided in the community.

Information: Residents want to understand the volume of information that is available to them about recreational opportunities and are looking to the city to streamline the information and present it in accessible ways within the community.

Access: Lowell is a diverse community, and residents are looking for parks, open spaces, and recreational programming that is accessible for everyone in the community regardless of age, ability and neighborhood of residence.

As the City works to implement the goals and action items in this plan we will rely on cross departmental collaborations and work closely with institutional partners, and community stewards and resident leaders.

There have been a number of improvements made since the prior Lowell Open Space and Recreation Plan was completed and approved in 2013. Major renovations to existing parks and recreational facilities are among the many steps taken since the last plan was approved and include the following:

- Major renovations to Mulligan Park in partnership with the Lowell Housing Authority were completed. A new splash pad was installed to replace a closed pool, a brand new playground replaced an existing dated playground, off street parking was improved, the existing basketball courts were renovated, and the city's first whiffle ball field was installed.
- With support from DCR and MassDOT the city completed Phase I of park improvement to South Common. Park improvements created a fully accessible multi-modal path through the park and significantly improved walkway lighting through the park, added new park furnishings and planted trees.
- The City substantially improved Campbell Park with a new playground, installation of a shade structure in the playground area, and safety improvements to the parking area.
- The city has expanded its Community Garden Program to 8 sites across the city. In 2014 the City signed a lease agreement with Mill City Grows on a seven acre parcel of land for use as an active farm.
- The City of Lowell and the Lowell Heritage Partnership announced a new initiative in 2016: the Lowell Waterways Vitality Initiative. The mission of the Lowell Waterways Vitality Initiative is to enhance the everyday experience of people in Lowell by making the city's historic waterways more accessible, active, and vibrant.

The Concord River Greenway (CRG) development remains a priority project for the City. On behalf of the City, the Executive Office of Energy and Environmental Affairs (EOEEA) will manage design and construction of the final phases of the CRG—Phase IIIA and Phase IIIB. Design for two additional sections of the CRG is complete, pending any changes necessitated by future easements required for construction. Since the last OSRP update the City completed a portion of Phase IIIA in 2015. This new stretch of the greenway involved extensive clean-up of debris on the river bank and the building of a coffer dam. The new portion of the Greenway

connects Jolene Dubner Park with Centennial Island. 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. 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. Construction of the final phases will link together all previously developed sections of the trail, completing a critical urban connection to the regional trail networks. The city is working in partnership with the Lowell Parks and Conservation Trust on this project.

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, 18,022 linear feet of canal walkway have been restored, constructed, or are currently underway.

2. B. – PLANNING PROCESS and PUBLIC PARTICIPATION

The Lowell Open Space and Recreation Plan was developed in-house by City of Lowell staff. 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 September 2017 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. DPD staff met with stakeholders such as the Lowell National Historical Park, University of Massachusetts Lowell, Lowell Parks and Conservation Trust and the Massachusetts Department of Conservation and Recreation to discuss their priorities over the next five years.

DPD staff led a robust outreach effort to gather feedback from residents, the goal during this process was to reach as many people as possible through multiple channels of communication. The 2013 Open Space and Recreation Plan benefitted from the fact that the city was undertaking an update of its comprehensive master plan, this time, the outreach focused specifically on open space and recreation. Lowell DPD conducted the following activities to encourage the public's participation in the visioning process:

- 250+ community stakeholders attended 3 public meetings
- 230 survey responses were submitted
- DPD staff attended neighborhood meeting, to gather neighborhood specific feedback on open space needs

- DPD staff held focus groups with 2 youth organizations and City of Lowell Disability Commission
- Staff attended community events to gather feedback in resident input

OPEN SPACE SURVEY

The open space survey was developed by DPD staff by adapting elements from the survey instrument utilized in support of the 2013 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, are used by residents;
- How frequently open spaces are currently used;
- What kind of facilities are most frequently used, and what activities people participate in when utilizing public open spaces;
- How are residents access open space and recreation facilities;
- 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 email, online on the City of Lowell website, and distributed on social media accounts. Hard copy surveys were also made available at City Hall and physically distributed by staff at public events. The survey was made available in March, and responses were requested by August 17, 2018. 230 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. The Open Space survey responses do provide a strong anecdotal evidence relative the general public's preferences relative to open space and recreation and the importance of open space conservation in Lowell. 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.

ENHANCED OUTREACH FOR ENVIRONMENTAL JUSTICE NEIGHBORHOODS

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.

DPD staff recognized the importance of community outreach during the planning process and took several steps to try and make public participation accessible for all residents. Flyers advertising public meetings and the Open Space Survey were made available in English, Spanish and Khmer. Notices about public meetings were forwarded to local newspapers, including a local Khmer newspaper. Translation services were made available in Spanish and Khmer at all public meetings. While childcare was not provided at meetings, DPD staff did bring crayons and coloring sheets to keep children occupied during meetings if they accompanied their caregivers.

DPD staff arranged meetings with all of the city's active neighborhood groups and attended events such as the Working Cities Challenge Lowell monthly CHOP Dinners to meet directly with residents. These monthly dinners are hosted in the Acre neighborhood, historically the city's lowest income neighborhood, and bring together a diverse population of residents from the area monthly. Each month the CHOP dinner table conversations focus on themes residents have identified they want to learn more about.

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SECTION III

COMMUNITY SETTING

3. A. – REGIONAL CONTEXT

Lowell is the nation's first planned industrial community. The City, located approximately 25 miles north of Boston, is in northern Middlesex County and northeastern Massachusetts. Lowell is 14.27 square miles, including 13.38 of land area and 0.89 of surface water. The major watersheds are the Merrimack and Concord Rivers. Both feed a network of canals that delivered the energy needed for the Industrial Revolution. Today, these rivers and canals are ecological, environmental, and recreational assets for residents and businesses. They offer habitat for a wide spectrum of vegetation and animals. Their associated flood plains and wetlands also curb unsustainable development in some areas.

Lowell is an urban and suburban community that sprouted around the extensive industrial mill complexes built along the Merrimack River. The Industrial Revolution of the 19th century gave the City its economic base, heritage, and character that remain significant today. The City experienced an extended period of economic decline during the mid to late 20th century as the textile industry and supporting sectors migrated south and eventually off shore. However, Lowell has experienced a resurging economy over the past 30 years with a diversifying economic base. Today, Lowell is a highly urbanized community surrounded by wealthier suburban white-collar communities. A healthy industrial sector remains active in the City, although service and research and development sectors are now playing a larger role in the region's economy. The suburban communities of Tewksbury, Chelmsford, Dracut, and Tyngsborough surround Lowell. These communities have extensive open land, which reflects their rural character and past agrarian economy.

The City shares many natural resources with the surrounding communities and the wider region. The Merrimack and Concord Rivers are major waterways that flow through many northeastern Massachusetts and central and southern New Hampshire communities. The Lowell-Tyngsborough State Forest includes 1,140 acres of protected land, including 180 acres of open water or wetlands and 457 acres of land in Lowell. The state forest provides an important environmental and recreational resource to the residents and the region. The surrounding towns also share wetland resources, floodplains, and smaller riparian networks, including River Meadow Brook. The Brook has headwaters in Westford and runs through Chelmsford before emptying into the Concord River in Lowell. Beaver Brook originates in Londonderry NH and flows through Dracut MA before emptying into the Merrimack River in Lowell.

3. B. – LOWELL'S 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 scale of its industrialization. Today, the built

environment still records Lowell's industrial past—5.6 miles of canals, lock chambers, mills, boarding houses, bridges, and machinery, which are monuments to the American Industrial Revolution.

Lowell 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.

Located at the confluence of the Merrimack and Concord Rivers, Lowell attracted settlers to its banks for approximately 10,000 years. Native American's selected the area for their fishing camps. Later, English settlers developed 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 1835, the Boston and Lowell Railroad opened as the first major railroad in Massachusetts and one of the earliest in North America. More rail lines soon opened, with lines and spurs connecting the City to Salem, Nashua, Lawrence, Framingham, and beyond. These lines not only provided faster ways for new residents and visitors to arrive in Lowell, but also additional routes for mill owners to receive raw materials and ship finished products to market.

In the 19th century, Lowell's city designers designated mill sites and canal routes as their highest priority. To exploit the tremendous river power, owners constructed mill complexes along the banks of the Merrimack and Concord Rivers, where the force of the watercourses were greatest. New corporations devised an intricate system of canals to provide additional power. Eventually, these canals divided the city into seven islands as they fanned out across the landscape. Initially, the community developed within the confines of the V-shaped wall formed by the mills.

As the mills expanded during the 1830s and 1840s, a large middle class grew in three adjoining areas. Chapel Hill developed first and Belvidere followed. In 1834, the City annexed the remaining land above Nesmith Street, which developers purchased to build inexpensive homes during the 1840s. Next, people settled in Centralville, which Lowell annexed in 1851. In the 1890s, streetcars enabled development in Lowell's outlying areas, such as Tyler Park in the Highlands. Pawtucketville became a part of the City in 1874.

By the 1860s, Lowell could not keep pace with the forces of the industrial system it had unleashed. As the 19th century progressed, conditions in mills and corporate boarding houses became worse and overcrowding prevailed. 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 alternative power generation replaced water power. Many aging textile companies moved south to seek cheaper raw materials and less expensive labor. 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 the 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, but instead prompted the City to demolish significant mill yards and tear 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 to recreate the 19th century feel and provided design assistance for owners of historic properties. In 1974, Massachusetts designated the Lowell Heritage State Park, which became the Lowell National Historical Park (LNHP) four years later. The law creating the national park also established the Lowell Historic Preservation Commission (LHPC). During its existence, the LHPC assisted with much of the historically sensitive building rehabilitation that occurred between 1979 and 1995.

The LNHP and the City have fostered many public and private partnerships that have rehabilitated over 250 structures in the downtown and created extensive public programs to preserve and interpret the City's cultural resources. Several major mill complexes have become housing and office spaces. Aluminum and stucco facades have come down 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. The City has invested in downtown streetscape improvements including brick pavement, granite pavers, period lighting, and benches to enhance the 19th century urban character of the city.

The federal law creating the LNHP required the City to strengthen and expand its historic preservation regulation and review. In 1983, the Massachusetts Legislature established the Lowell Historic Board (LHB) and the Downtown Lowell Historic District (DLHD) to satisfy the federal requirements. The LHB replaced the LHPC and the DLHD replaced and expanded upon two earlier design review districts.

The Acre Neighborhood District (AND), a second design review district also overseen by the LHB was created in 1999 to assist implementing the Acre Neighborhood Revitalization & Development Plan. From 2005-2011, nine more design review districts under the purview of the LHB were created, four of which were National Register neighborhood districts. In neighborhood districts, LHB has jurisdiction over new construction and demolitions.

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 preserved several historic landscapes including Tyler Park and Rogers Fort Hill Park.

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

HISTORIC RESOURCES

The City’s numerous historic districts contain a critical mass of structures from the 19th century when Lowell was America’s textile capital. Lowell has 13 districts on the National Register of Historic Places and 26 individually-listed National Register properties scattered throughout the downtown and neighborhoods (see Tables #-#). In addition, Lowell has the fifth highest number of properties included on the state’s inventory of historic resources in Massachusetts. The Lowell Canal System is a National Historic Landmark and a designated Civil and Mechanical Engineering Landmark.

Table 3.1: National Register of Historic Places – Districts

Historic District
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 are also Local Historic Districts.

Table 3.2: National Register of Historic Places – Individual Listings

Listing Name	Address
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 (demolished 2013)	812 Gorham Street
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 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 (fire and demolished 2010)	401 Bridge Street
Varnum School	103 Sixth Street
Worcester House	658 Andover Street

ARCHEOLOGICAL RESOURCES

Prior to the Industrial Revolution, Native Americans long populated the area known today as Lowell. Native Americans and early settlers came to the region 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 markets. While the Industrial Revolution overshadows much of this earlier history, archeological remains in the region describe life in Lowell in pre-industrial times. For example, Algonquin-speaking Pennacook Indians came to the Pawtucket Falls regularly to take fish from the Merrimack River and numerous remains from these fishing and gathering sites have been found along the river.

3. C. POPULATION CHARACTERISTICS

DENSITY

As of July 2017, Lowell has an estimated population of over 111,000, an increase of 4.5% since the 2010 Census, and making Lowell the 5th-largest city in Massachusetts. This steady population growth means Lowell is nearing its industrial peak from the 1920s. In addition, Lowell has a population density of 12.1 persons per acre (p/a), an increase of 15.3% since 1980. Since 1970, Downtown has seen the greatest increase in density, with an increase of 512%. Other areas with relatively high population densities include Back Central (26.6 p/a), the Lower Highlands (25.5 p/a), and portions of the Acre (30 p/a).

HOUSING

Housing trends in Lowell have tended to mirror those throughout the Commonwealth. While the City saw a significant housing boom in early 2000s, with an increase in home prices and an influx of new residents, the national foreclosure crisis coupled with high unemployment rates has significantly affected the housing market in recent years. In spite of these challenges, Downtown has experienced tremendous growth since 2000 as a result of significant redevelopment efforts, with over 1,500 market rate and 300 subsidized units added to the existing housing stock.

Other neighborhoods experiencing high percentages of new construction include Pawtucketville and the Highlands. With nearly 50% of Lowell's housing stock having been built before 1940, the City recognizes the value of supporting redevelopment projects, particularly in cases where planned improvements result in safer, higher-quality, and more energy efficient homes. Lowell remains one of only a handful of communities that exceeds the State's goal of 10% affordability under MGL Chapter 40B, thereby providing housing to assist low-income residents in need. According to the Department of Housing and Community Development's Subsidized Housing Inventory, Lowell subsidizes 12.5% of all its residential units, which totals 5,253 total units available citywide.

RACE, ETHNICITY, & LANGUAGE

Lowell has a long history as a gateway city for immigrants and a home to an ethnically diverse population. This trend has accelerated in recent years, with a doubling of the City's ethnic minority population in just two decades. In 1990, Lowell's ethnic minority 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 minority groups although at a slower pace of 6.8%.

The growing ethnic populations have concentrated in the Acre, Lower Highlands, Back Central, Lower Highlands, and Centralville neighborhoods. In light of this ethnic diversity, it is not surprising that 43.5% of Lowell residents speak a language other than English at home, which is higher than the national average of 21.1%. The most commonly spoken foreign languages in Lowell are Spanish and Khmer.

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.

ENVIRONMENTAL JUSTICE POPULATIONS

In 2016, the median household income in Lowell was \$46,972, which is significantly lower than the statewide median household income of \$67,846.¹ 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 are 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). These neighborhoods have large foreign born and non-English speaking populations, including many recent immigrants who live in multi-family dwellings. Historically, these neighborhoods have lacked amenities, including open space, and they meet Environmental Justice criteria (i.e., low-income, minority, and foreign-born). The lowest population densities are in South Lowell (6.1 p/a) and Pawtucketville (7.4 p/a).

PERSONS WITH DISABILITIES

According to the U.S. Census Bureau, 9.3% of people 65 years of age and under have a disability in Lowell.² This population has unique issues and challenges and increasingly they have organized to advocate for comprehensive, cohesive, and individualized services. In particular, the City's Commission on Disability advocated for a comprehensive self-evaluation and transition plan and will be contributing \$25,000 towards this planning process. Due to their advocacy efforts, the City Manager has committed a minimum contribution of 5% of the Capital Budget moving forward.

EMPLOYMENT AND INDUSTRY TRENDS

The financial crisis affected Lowell and the surrounding Merrimack Valley region, but Massachusetts' economy is robust and unemployment rates have plunged in recent years. Lowell

¹ www.factfinder.census.gov

² <https://www.census.gov/quickfacts/lowellicitymassachusetts>

has kept pace with the State’s and region’s unemployment trends, faring well compared to other gateway cities (e.g., Brockton, New Bedford, Lawrence, and Springfield). For example, employment has increased and the City’s unemployment rate has fallen to a record low of 4.2% in September 2017. While this rate is higher than the state (3.5%), it has steadily declined from a 2009 high of 11.2%.

Significant redevelopment has occurred Downtown and within the Hamilton Canal District, bringing new residents with disposable income to support the growing number of restaurants and shops. Citywide, Lowell has diversified its economic base from its traditional manufacturing roots to more knowledge based industries, including technology, health care, education, and service sectors. Among the City’s leading employers are local hospitals, institutions of higher education, and high tech companies. Since 2015 the City attracted several major employers that plan to create or retain more than 2,400 jobs in Lowell (see Table #). The companies will invest a combined \$280 million in real estate and equipment to generate over \$15.7 million in new tax revenue.

Table 3.3: Major employers that have opened offices in the City since 2015

Company Name	Address	Type	Jobs Retained/Created
Kronos	900 Chelmsford St.	Software	1,706
MACOM	100 Chelmsford St.	Electronics	420
Metrigraphics	1001 Pawtucket St.	Optics R&D	105
Markley Group	2 Prince Ave.	Data Center	100
Somerset Industries	137 Phoenix Ave.	Manufacturing	58
Plenus Group	101 Phoenix Ave.	Manufacturing	30
TOTAL			2,419

3. D. – GROWTH AND DEVELOPMENT PATTERNS

PATTERNS AND TRENDS

Lowell is mostly built-out (an analysis suggests over 95%), with activity largely focused on redeveloping underutilized or vacant parcels. New development has concentrated in the downtown and urban renewal districts, a trend that the City expects to continue as builders repurpose the remaining former mill buildings and plans for the Hamilton Canal District move forward. A few large parcels offer a development opportunity in the Pawtucketville neighborhood. Otherwise, small scale development will likely prevail. Infill opportunities exist throughout the City, but recent zoning amendments that increase minimum frontage restricts this type of development. Recently, the University of Massachusetts Lowell (UMass Lowell) has begun expanding its physical plant including administration, student housing, and research and development. This construction is occurring on or near to each of the campuses.

Transportation

Lowell has a clean and modern public transportation and regional highway system that provides direct access to the Boston metropolitan area. The transportation system includes local and regional bus routes, passenger trains, inter-city bus shuttles, airport limousine service, and a modern multi-modal transportation facility at the Gallagher Terminal. Trains provide convenient travel between Gallagher Terminal and Boston's North Station with 25 inbound and 25 outbound trips per day (averaging 45-minutes). Free Wi-Fi at Gallagher and onboard the trains enhance the rider experience.

The Lowell Regional Transit Authority (LRTA) operates 18 bus routes that serve Lowell and surrounding communities out of the Gallagher Terminal, including a frequent downtown shuttle with 15-minute headways. The LRTA has added an app with a live bus tracker and an interactive GPS Map with live departure times on its website, www.lrta.com. The Merrimack Valley Regional Transit Authority (MVRTA) also serves the Gallagher Terminal, providing bus connections to Lawrence, Haverhill, and the rest of the MVRTA service area.

The regional highway system provides direct access to the Boston metropolitan area and key points to the west and north. The City is at a regional transportation hub for New England as it is located at the intersection of Interstate Highways 495, Interstate 93, and Route 3. Within the City, Lowell has six bridges that carry cars, bikes, and pedestrians across the Merrimack River. Residents, UMass Lowell students and staff, and regional traffic passing through the City use these bridges heavily. Plans are underway to begin the design and environmental permitting process to replace the Rourke Bridge that connects the Pawtucketville and Highlands neighborhoods. In addition, MassDOT will begin replacing bridges on I-495, improving the roadway and signals on Route 38, and modifying the signals at various intersections.

Improving pedestrian access, bicycle infrastructure, and 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, the City has adopted a Complete Streets ordinance and policy:

To create a multi-modal transportation system designed to provide improved mobility and accessibility opportunities for all users regardless of their age, income or ability. Multi-modal, within the context of this policy, includes automobiles, pedestrians, passenger buses, the trolley system, cyclists, and freight modes of transportation

As part of the Complete Streets policy, the City recognizes that each neighborhood deserves context sensitive solutions that preserve and enhance their character. Under the policy, the City has advanced several pedestrian and bike-friendly improvements. Recently, the City completed a project in South Common that added 1,500 feet of 10-foot wide handicap accessible multi-use shared paths. The shared paths connect the Gallagher Terminal, the Rogers School STEM

Academy, and the Markham Village apartments. In addition, a new multi-use trail path runs parallel to Thorndike Street from the Highland Street intersection to the Gallagher Terminal and another one is between the school and the tennis courts.

The City has also implemented projects to improve walkability in Cupples Square and the Bridge Street corridor. Further, the City has installed better pedestrian infrastructure in many locations throughout the city, including the Downtown, Centralville, the Lower Highlands, and Back Central. Other changes include new signage for drivers and pedestrians, using energy efficient bulbs for all traffic lights and many street lights, implementing a parking kiosk system in the downtown, including bike racks on all LRTA buses, installing electric vehicle charging stations in downtown, and covering cobblestone walkways to increase access for people with disabilities.

Over the next five years, the City will undertake numerous transportation projects. The Thorndike Widening project is under construction and will provide additional turning capacity along the corridor. Construction of the Lord Overpass redesign project will begin in spring of 2019. The project will result in a multi-modal boulevard that will have dedicated bus lanes, separated 11-foot wide multi-use paths, and ADA accessible sidewalks and crosswalks. The City is replacing and/or repairing five bridges over various canals via a Federal TIGER grant. All of the new bridges will have protected sidewalks and/or multi-use paths. In addition, the City is constructing Streets F & G in the Hamilton Canal Innovation District, which will include a new signature bridge and will improve pedestrian access from the NPS Visitor Center and Swamp Locks.

Over the past decade, the City has undertaken studies to determine ways to meet growing transportation needs using sustainable means. UMass Lowell, the city's second largest employer, is expanding and increasing demand for parking and alternative modes of transportation for thousands of faculty, staff, and students. UMass has improved their shuttle system and added new routes, including providing more on-campus parking lots. UMass Lowell is also updating their Transportation Master Plan, with an overarching goal of reducing the negative effects that students and faculty have on the City's transportation system. The University already offers subsidized MBTA passes to students and faculty, provides a free bikeshare system on campus, and is encouraging resident students to leave their cars at home. The plan explores dynamic parking pricing to encourage carpooling and parking at distant lots, a cycle track along Pawtucket Street to connect the separate campuses, increased regional bus service to/from campus, and pick-up/drop-off zones for rideshare services in prime locations.

In 2019, the City will partner with a private entity to roll out a pilot program for a dockless bike share. The system will enable residents and visitors to access bicycles, electric bicycles, and three-wheeled vehicles, including individuals with mobility and balance issues. This system and the complete range of planned transportation investments will spur economic growth throughout the city and enhance the quality of life for residents.

Lowell's Water Transport and Treatment Systems

The City operates and maintains two water transport and treatment systems. Each system has a large treatment facility along the bank of the Merrimack River. The drinking water system withdraws raw water from an upstream reach of the river, treats the water so that it is potable (drinkable), and distributes finished water throughout the city and neighboring towns. The sewerage system collects wastewater (sewage and stormwater) from Lowell and four surrounding towns, treats the water so that it is clean (safe for the environment), and discharges the clean water into a downstream reach of the river.

The drinking water facility is near to Pawtucket Boulevard and Old Ferry Road ("Ferry Crossing") and the clean water facility is located near to Hunts Falls ("Duck Island"). Both facilities are mechanically complex and energy intensive, creating substantial demands for energy and equipment. Each facility connects to a vast network of pipes and pump stations that transport water, serving approximately 200,000 residents in Lowell and its surrounding towns.

The reliable delivery of safe and secure drinking water and clean water services to these Greater Lowell communities requires the daily operation and maintenance of the two treatment facilities, more than 400 miles of water mains and sewer lines, and nearly three dozen pump stations. In total, these facilities represent more than \$1 billion in financial assets for the City of Lowell. This infrastructure is critical for public health and environmental protection.

Many of the mechanical systems, buildings, and underground structures are reaching the end of their useful lives. Much of this infrastructure has been in continuous service for more than 50 years; some of the buried water and sewer lines for more than 100 years. The combination of criticality (to the community and the environment) and condition (excessive age and wear) calls for a comprehensive long-term capital investment plan to prevent catastrophic failures and avoid community and environmental crises.

Drinking Water Treatment and Distribution System

In 1872, the Lowell Water Department formed, drawing its water supply from well fields and local streams. Today, the Lowell Water Utility obtains its drinking water supply solely from the Merrimack River, a reliable source of "raw water" even during severe droughts. Lowell's Raw Water Intake Station is on the North Bank of the Merrimack River, on the upstream end of the Lowell reach, near the Tyngsborough town line. The Lowell Drinking Water Treatment Facility, which is on Pawtucket Boulevard at Old Ferry Road, treats an average of 12 Million Gallons per Day (MGD).

The drinking water treatment facility, originally built in 1960, transforms raw water into high-quality potable water that is suitable for a variety of uses, most importantly as a safe and reliable source of public drinking water and community fire-fighting water supply. Multiple physical and chemical water-treatment processes, including sedimentation, chlorination, and fluoridation,

produce a maximum of 30 MGD of treated drinking water. In recent years, the City has upgraded the treatment processes and modernized the facility, including installing a 600-KW solar power (photovoltaic) farm on the facility's grounds.

Finished drinking water is distributed throughout the City and its surrounding communities (Lowell is a secondary water supply for these towns). Three water pumping stations pressurize 200 miles of force mains to convey drinking water supply. Four large tanks hold a reserve of approximately 11 million gallons. The water storage system consists of two large underground storage tanks on top of Christian Hill as well as three above-ground storage tanks on Wedge Street, Newbridge Street, and Tenth Street.

The distribution system consists mostly of cast-iron pipes ranging in diameter from 6 inches to 24 inches. Approximately 2,200 hydrants are in Lowell's distribution system and 22,000 drinking water services are within the City. To ensure a safe drinking water supply, Lowell is planning to replace water service pipes constructed of lead or galvanized iron.

In addition to providing finished drinking water to residents and businesses in Lowell, the water utility also supplies finished water to Dracut, Tyngsborough, and East Chelmsford on a daily basis, as well as Tewksbury and Chelmsford on an as-needed basis (back-up supply).

Wastewater Collection and Treatment System

The Lowell Wastewater Utility manages a regional system that transports wastewater from the City and four surrounding towns to the Duck Island Clean Water Facility before discharging clean water into the Merrimack River.

Lowell constructed a significant portion of its original wastewater collection system in the late 1800s and early 1900s; much of the original system still exists today as a combined sewage/stormwater system. The sewerage system includes pipes and structures that vary greatly in size, complexity, and age. Particularly challenging are the aging sewer lines, with many pipes more than 100 years old and some as old as 150 years. Within the City, the wastewater utility operates and maintains more than 300 miles of sewerage and stormwater drainage, two dozen pumping stations, and a 32-MGD clean-water discharge facility at Duck Island.

The sewerage system in Lowell includes approximately 60% combined sewer lines, which transport both sewage and stormwater to Duck Island. The other portions of the City's wastewater and stormwater systems are separated. In separated systems, sewer pipes only carry sanitary sewage (to Duck Island) and the stormwater pipes carry stormwater to discharge into the brooks, streams, canals, and rivers. The combined system presents a significant operational challenge to manage large fluctuations in flow rates into the system. The utility must maximize wet-weather flows while avoiding combined sewer system surcharges into adjacent properties and minimizing combined sewer system overflows into local waterways.

The sanitary and combined sewer collection systems include approximately 300 miles of sewer pipes, ranging in size from 6-inch diameter to 120 inches diameter. Conveyance systems are made 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 provide access to the wastewater and stormwater collection system for maintenance. The Lowell Regional Wastewater Utility maintains and operates more than 5,000 manholes and catch basins.

The Duck Island clean-water discharge facility is nearly forty years old, having first treated domestic, commercial, and industrial wastewater in May 1980. Prior to discharge into the Merrimack River, incoming wastewater receives extensive treatment. Physical, chemical, and biological processes convert this wastewater into valuable resources: bio solids and clean water. Duck Island discharge excess stormwater into local streams (the Merrimack and Concord rivers) as combined sewer overflows.

The City has made remarkable progress in reducing combined sewer outflows into local streams, having retrofitted a complex hydraulic system that was designed to overflow. This progress is the result of a multi-year capital investment program that has improved the quality of life in the Greater Lowell community by enhancing the health of the Merrimack River.

Lowell is developing a long-term plan to reinvest in its entire water infrastructure. The plan will balance the community's need for a safe water supply and reliable transport and treatment systems with environmental safeguards.

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, with amendments through 2017, the Lowell City Council adopted a comprehensive update to the zoning ordinance and map to create land use regulations consistent with the goals and objectives of the comprehensive Master Plan, Sustainable Lowell 2025. The zoning ordinance amendments established a regulatory framework for implementing the land use objectives, specifically, the goal to promote and protect neighborhood character.

The Lowell Zoning Ordinance consists of zoning districts based on neighborhood character. These districts address the need for new development to reflect the urban, traditional, and suburban character of the surrounding neighborhood. Each district has dimensional requirements that restrict the design and density of multi-housing development, while increasing parking and dimensional requirements, such as building set back requirements.

The ordinance encodes urban design elements such as building bulk and form, the placement of porches and garages, and location of buildings on a lot to ensure that new infill projects match the surrounding streetscape. In general, the zoning amendments emphasize redeveloping land in

existing urbanized areas, while providing additional protections 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. Multiple zoning amendments also affect residential and mixed use zoning districts. In each case, these amendments have increased the minimum lot frontage and minimum lot area requirements for residential projects.

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, Division of Development Services, the Engineering Department, Board of Health, Conservation Commission, Fire Department, Wastewater Utility, and Water Department review all projects that involve constructing more than 10,000 square feet or exceed three residential dwelling units. This process ensures that multiple departments can review significant projects to address and communicate potential negative effects to the Planning Board.

In addition to land use controls, Lowell relies upon FEMA regulations and the Wetlands Protection Act regarding development in flood prone areas particularly around the Concord and Merrimack Rivers. The City is a dense with a high percentage of impermeable surfaces and deals with a lot of problems caused by stormwater runoff. These problems are becoming more urgent as the frequency of intense storm increases due to Climate Change. The project review process allows City staff to identify and minimize stormwater runoff with redevelopment projects.

Since the 2013 Open Space and Recreation Plan, the number of projects proceeding through the definitive subdivision process has declined. The Planning Board has approved four subdivisions since 2013 totaling four acres of newly developed land and nine new single-family dwellings. The City adopted rules and regulations governing the Subdivision of Land in Lowell on December 2, 1959 with amendments through December 12, 1983. On February 19, 2009, the Lowell Planning Board adopted Appendix A: Subdivision Rules and Regulations for the Hamilton Canal District. The 14.5 acre Hamilton Canal Innovation District (HCID) subdivision created the street pattern and parcel layout according to the HCID master urban design plan. The HCID subdivision included land formerly used for manufacturing purposes and vacant and dilapidated industrial buildings. The subdivision designated 13.5 acres for mixed residential and commercial development, with over an acre reserved for public open space.

The slowdown in new subdivisions during the past five years is because little open land remains available. A standard build-out analysis indicates that the City is almost at capacity due to the small number of singular vacant parcels. A small number of property owners in Lowell can use innovative approaches to create developable land, such as petitioning the Planning Board for a Special Permit for frontage reduction. This reality suggests that the long-term development trend will focus on redeveloping and reusing existing buildings. However, to enable these types of projects the City would need to relax some of its permitting requirements in certain zoning districts to allow for denser development.

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, 2,202 new market-rate units and 1,356 subsidized units have contributed to a 36% increase of the population in this census tract. These market-rate units have contributed substantially 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.

DRAFT

SECTION IV: ENVIRONMENTAL INVENTORY AND ANALYSIS

4. A – GEOLOGY, SOILS, AND TOPOGRAPHY

The City of Lowell is 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 a low point of 50 feet above mean sea level (msl) at Duck Island along the Merrimack River. Higher elevations concentrate in the eastern portion of the City. Among prominent topographic features are Fort Hill and Christian Hill.

Fort Hill is to the south of the Merrimack River and just to the east of the Concord River. It rises over 250 feet above msl. Christian Hill is just to north of the Merrimack River and rises to 300 feet above msl. It includes the McDermott Reservoir at its summit. Although no longer a source of potable water for Lowell residents, the reservoir provides a pleasant passive recreation space and an excellent vista of Downtown Lowell. Fort Hill includes a scenic park that also offers spectacular views of Lowell, particularly of the Concord River valley as it flows towards its confluence with the Merrimack River. To the northeast of Fort Hill Park is a residential part of the Belvidere neighborhood that reaches 260 feet above msl. This site once contained a fire suppression reservoir, which the proprietors of the locks and canals constructed to protect the mills. Most of the rest of the City generally ranges from 100 to 250 feet above msl.

Lowell is at the confluence of the Merrimack and Concord Rivers. These rivers are major features that 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. A three-mile stretch that includes the Pawtucket Falls accounts for 30 feet of the elevation drop.

The Concord River flows northerly through Billerica and enters the Merrimack River near the Cox Bridge, northeast of Downtown Lowell. The elevation of the Concord River is largely constant over most of its length from Concord to Billerica and its floodplain tends to be broad. However, the Concord River drops markedly in Lowell, most notably over the course of three sets of waterfalls.

The soils of Lowell include deposits of stratified sands and small amounts of silt, mud, and gravel along the watercourses. Bordering these deposits and comprising the greatest extent of superficial material are ice-contact deposits. These deposits 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 almost exclusively contain glacial till. Till is a conglomeration of un-stratified clay, sand, silt, gravel, and boulders that overlie the bedrock throughout the region.

4. B. – LANDSCAPE CHARACTER

Lowell is an urban setting by and large built out with several geological features that lend to its attractiveness. 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 are staples in the City. 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, textile production would not have occurred in Lowell and the history of the area would have differed drastically. Today, in addition to energy, the rivers and canals provide both drinking water and recreation. Examples include boat tours on National Park's canals and strolls on the Riverwalk that stretches from LeLacheur Park to beyond the Tsongas Center. Outreach conducted for this 2018 plan concluded that residents continue to prioritize developing trails and pathways for recreation.

4. C. – WATER RESOURCES

WATERSHEDS

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

SURFACE WATER

The Merrimack River is the largest waterbody in Lowell. This river forms at the confluence of the Pemigewasset and Winnepesaukee Rivers in Franklin, NH. The Merrimack flows south through New Hampshire to Tyngsborough, MA, 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 are in Massachusetts. The United States Geological Survey (USGS) records the water contributed by this vast drainage area at a flow gage just above the Hunts Falls Bridge. The gage location also accounts 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).

In Lowell, the Merrimack River has three access points for recreational boating. The Bellegarde Boathouse is a private boat ramp that the UMass Lowell sailing program and crew team use. A second boat ramp is adjacent to the Vandenberg Esplanade and is open to the public. The final boat ramp is newer. This ramp is within the Lowell Heritage State Park on Pawtucket Boulevard west of the Rourke Bridge. During the summer, numerous boaters will access the river via this ramp to fish, water-ski, tube, or go on 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 joins 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 waterfalls. The drainage area for the Concord River basin is 62 square miles. The Old North Bridge, of Revolutionary War fame, spans 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 period was 640 cfs.

The Concord River boasts some of the best white water rafting in New England. Every spring, the Lowell Parks and Conservation Trust runs white water rafting trips. This popular public offering often sells out before rafting starts, and the river also hosts white water kayaking competitions. The City is capitalizing on the value created by the Concord River to preserve its banks for boat launches and parks. The Concord River Greenway project, 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. Residents have used this site for many years, but the new ramp is more accessible to the public. In addition, a joint partnership of UMass Lowell and the Lowell Parks and Conservation Trust has prepared a history of land use along the Concord River.

Several other tributaries feed the Merrimack River in Lowell. After the Concord River, Beaver Brook is the second major tributary. The brook originates in New Hampshire and meanders south through Dracut before flowing into the Merrimack River just east of Pawtucket Falls. Additional tributaries are 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 first flows south. After turning east, the brook expands into a small pond before continuing as an outlet stream, which flows into the Merrimack River west of the Pawtucket Dam. Scarlet Brook is a small tributary that originates in Tyngsborough and flows south 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 to the southwest of Chelmsford Center in the Town of Westford. The brook 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. Recently, the Lowell Parks and Conservation Trust completed a land use history, eco-inventory, and recreational access study for this corridor.

Canals contribute another network of waterways to the City. The Merrimack River feeds these canals built during the Industrial Revolution, including Eastern Canal, Pawtucket Canal, Northern Canal, Western Canal, and the Hamilton Canal. First, the Pawtucket Canal served as a transportation route around the Pawtucket Dam. The other canals opened as branches of the Pawtucket Canal to provide waterpower to the burgeoning mills. Power came from 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 followed state acquisition of the land along the canal system and public/private ventures to clean and restore these historic transportation networks. The Lowell National Historical Park 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 depend on 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 on 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. Barge tours are central to the experience, so water quality is of utmost concern and deserves sustained attention.

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 condition 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 waterbodies.

Since the residents of Lowell 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 Lowell wetlands. Two public wells in Chelmsford have designated Zone II area's that lie within Lowell's borders. Zone II is an 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, protecting and buffering them from harmful encroachment is important.

FLOOD HAZARD AREAS

Flooding is an acute problem in some places near the Merrimack River. This condition prevails 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 has also occurred in past years.

Flooding often occurs in Lowell during the spring because of the snowmelt in headwaters and higher elevations or following 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 are valuable water storage areas for impervious surface runoff. When these river and stream channels cannot accommodate excess discharge, water flows across the flat valley floors or "floodplain" adjacent to rivers, streams, and other surface waterbodies.

A floodplain is a type of wetland resource area that floods following storms, prolonged rainfall, or snowmelt. Two types of floodplain resource areas are 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 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 restrict plans for new buildings and repairs and expansions of existing buildings in floodplains.

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. This rate of flow contributes to erosion and enables water to collect hazardous contaminants during the course of flow. The City enforces the Massachusetts Wetlands Protection Act and Lowell Wetlands Ordinance 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 are even more important today as climate change will increase the frequency and strength of storm events, which will contribute to more frequent flooding in and adjacent to floodplains.

WETLANDS

Many types of wetlands exist, such as marshes, wet meadows, ponds, bogs, wooded swamps, and other water-dominated areas. Wetlands are valuable because they help to maintain water supplies, purify polluted waters, limit the destructive power of flood and storm water, shelter diverse wildlife, and provide numerous recreational opportunities.

Most wetlands in Lowell provide significant benefits by preventing or reducing pollution through their great absorptive capacity. Wetland basins first store and retain water and then release it gradually into the groundwater. The wetland vegetation also 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 environments further enhance the environment by reducing biological oxygen demand levels, and lowering nitrate and phosphate levels. Several 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 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 an urbanized environment, they are also necessary breeding and hunting grounds for plant and animal life. Many bird and mammals rely on wetlands and adjacent vegetative habitats for food, shelter, and reproductive purposes.

The value of a wetland as a wildlife habitat depends on its size, vegetation composition and structure, and hydrologic relationship. These habitats also provide recreational opportunities for hunters, fishermen, bird watchers, and boaters as well as hikers, photographers, and environmental educators. Many of our outdoor recreational opportunities would 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 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 are near to Cross Point Towers, Wood Street, Westford Street, several locations along I-495, and near Cawley Stadium. Several other smaller wetlands exist throughout the city.

4.D. – VEGETATION

GENERAL INVENTORY

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

Hardwood species dominate upland communities, with 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 dominate the Lowell-Dracut-Tyngsborough State Forest. The white pine predominates in sandy soils while hardwood and hemlock species are 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 ecologically valuable habitats, they promote passive recreational opportunities and vary the landscape.

Many invasive species are widespread in the natural communities of Lowell and pose a threat to the native species. The most common invasive species include leafy spurge, spotted knapweed, phragmites, purple loosestrife, multiflora rose, Morrow's honeysuckle shrubs, winged euonymus, glossy buckthorn, tree of heaven, and oriental bittersweet. However, all new plant installations have to avoid the species listed on the Massachusetts Department of Agricultural Resources Prohibited Plant List. A more proactive approach to eliminate growing invasive plant species is necessary to counter 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. Detailed information on the vegetation along the Concord is 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 led to 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 dominate and surround the Lowell-Dracut-Tyngsborough State Forest. The State Forest is over 1,000 acres, of which 548 acres is in Lowell. Mixed hardwoods and softwoods exist south of this area in the region of two additional state forestlands. The western portion of the City has relatively dense, forested areas along the banks of the Merrimack River.

PUBLIC SHADE TREES

Lowell has an estimated 16,000 publicly-owned shade trees, including hardwood species in the Lowell-Dracut-Tyngsborough State Forest. The white pine predominates in sandy soils while hardwood and hemlock species are 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

One parcel in the city has Chapter 61A protection. This Massachusetts law allows a farmer to pay a lower property tax on active farmland. Communities assess the tax based on the land's present use versus a more valuable potential use for residential or commercial developments. A landowner must have at least five acres of contiguous property in order to qualify. The Chapter 61A landowner in the City uses his property to produce and sell Christmas trees. Other parcels in the City once had Chapter 61A protection, but have since been withdrawn to allow for residential development. It is unlikely that any other parcels will receive this designation. Preserving land for agriculture is difficult in Lowell as the alternative is too profitable other parcels are too small for Chapter 61A.

WETLAND VEGETATION

Wetland vegetation provides important stormwater management benefits for the urbanized environment. They are also breeding and hunting grounds for many animal species. Marshes and swamps are land areas, which are continually inundated with water, or which continually have groundwater levels at the ground surface. Unlike swamps, marshes do not have trees or shrubs. Instead marshes have 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 have both 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, have adapted to their periodic wet existence. For example, floodplain trees such as black willow, cottonwood, and silver maple can withstand flooding. Marshes, swamps, and floodplains are terrestrial ecosystems that are particularly sensitive to environmental changes.

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 endangered, and the Indian paintbrush is historical. The MNHESP has no record of any rare plant species currently existing in Lowell. The MNHESP recommends further study to identify more occurrences of rare plants or animals in Lowell.

Some sections of Lowell-Dracut-Tyngsborough State Forest have unique plant environments and warrant further research. The Natural Heritage Program has identified a priority habitat that may contain state listed rare species. Further research would determine which rare plant or animal species (if any) exist in this environment.

4.E. – FISHERIES AND WILDLIFE

GENERAL INVENTORY

Despite Lowell's limited open space, the landscape, particularly along the Concord and Merrimack Rivers, provides 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 now visit the waterway yearly, especially during the fall migration period. As Bald Eagles

are abundant in the river’s estuary, building nesting sites along the Merrimack would be beneficial. 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 this infrastructure.

The State Forest, also a protected priority habitat of rare species, supports squirrels, cottontail rabbits, red foxes, 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 pressures to build in and near them have increased.

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. Table 3 lists the 16 vernal pools in the city:

Table 4.1: List of certified vernal pools

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

CORRIDORS

The narrow links, or corridors, between large habitat areas are critical to habitat survival. Strips of undeveloped land provide essential connections for animals and birds to move from one feeding or nesting spot to another. Uninterrupted open space also allows wildlife to move about and reach other habitats. When new development cuts off this link, animals face extinction as their habitat dwindles. Maintaining and protecting the vegetative corridors along the Merrimack

River and tributaries provides wildlife with access to the broader undeveloped tracts located outside the region.

The Concord River, thickly vegetated on both banks, is another important wildlife corridor used by birds and animals that should be maintained and protected. Building the Concord River Greenway exemplifies actions that can preserve important wildlife corridors, linking larger habitats (e.g., Shedd Park, Rogers Fort Hill Park, and several large cemeteries), and offering recreational facilities for residents. These corridors also provide excellent spots for Lowell residents to enjoy nature.

The Merrimack and Concord Rivers provide significant regional connections and habitat for wildlife. Smaller riparian corridors also connect larger habitat areas. For instance, the Clay Pit Brook and Flagg Meadow Brook serve as a wildlife corridor between the Lowell-Dracut-Tyngsborough State Forest and the Merrimack River. Other important wildlife corridors include the Black Brook, Beaver Brook, and River Meadow Brook.

Waterways are also corridors 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 eight rare and endangered animal species are in Lowell (see: Table 4). Maintaining and creating connectivity between open spaces in the City will protect thoroughfares for wildlife to access larger open spaces and ensure a resilient ecosystem.

Table 4.2: Rare and endanger animal species in Lowell

Scientific Name	Common Name	MESA Status	Most Recent Observation
<i>Cicinnusmelsheimeri</i>	Melsheimer's Sack Bearer	Threatened	Historic
<i>Deschampsiaespitosa ssp. Glauca</i>	Tufted Hairgrass	Endangered	1882
<i>Elymusvillosus</i>	Hairy Wild Rye	Endangered	1882
<i>Emydoideablandingii</i>	Blanding's Turtle	Threatened	2007
<i>Falco peregrinus</i>	Peregrine Falcon	Threatened	2017
<i>Gomphusvastus</i>	Cobra Clubtail	Special Concern	2004
<i>Liatrix scariosa var. novae-angliae</i>	New England Blazing Star	Special Concern	1882
<i>Neurocorduliaobsoleta</i>	Umber Shadowdragon	Special Concern	2004

4. F. – 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, gives the City a general feeling of openness, and is 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, while 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 to view the City as is the Christian Hill Reservoir. Fall foliage enhances each of these views.

Cemeteries and burial grounds also serve as habitats for animal and plant life. The Lowell Cemetery, designed after Mt. Auburn Cemetery in Watertown, has 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 work with Tewksbury to add 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 where it joins the Merrimack River. In this area, the water level drops almost 50 feet providing excellent conditions for rafting and canoeing. Unfortunately, access problems prevent residents from interacting with the river, thereby limiting their exposure to its positive aspects. Lowell could capitalize on the attractiveness of the river and gain regional and national recognition for its excellent white water on the Concord River by completing the Concord River Greenway. The Greenway would protect the banks of the rivers, develop access points, and encourage associated programming to celebrate the river and ensure 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 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 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. Lowell also has numerous neighborhoods on the National Register of Historic Places. These districts contain the tangible reminders of Lowell's history: 19th century residences, industrial structures, parks and landscapes, a rural cemetery, and civic and community buildings.

Lowell also contains many areas of archeological interest. The City 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 recognition and protection. The City could collaborate with neighboring communities to create a cultural heritage corridor.

Historic burial grounds and their gravestones are "above-ground" archeological elements of a community. For example, the Hunt-Clark Cemetery in a residential neighborhood of Belvidere,

dates to the late 17th century and was a family burial ground through the mid-20th century. Abandoned in the 1950s after a string of vandalism, the untended burial ground is now home to various tree and wildlife species and serves as a wildlife corridor. Landscape inventories often overlook these types of sites, but they contribute 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, two burial grounds are abandoned.

As of January 2018, only one cemetery, the private Lowell Cemetery, is 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, including maintenance of the landscapes. The City should protect these historic burial sites by nominating them for the National Register of Historic Places and use grants to restore and maintain the sites.

Druid Hill is a unique feature in Pawtucketville. This standing stone cluster on a mound is near to 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 and several standing late 18th/early 19th century homes.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN

Lowell does not have any designated Areas of Critical Environmental Concern (ACEC). The City has explored the steps to apply for ACEC designation and determined that sufficient resources are not available at this time. However, the absence of ACECs does not mean that certain areas in the community are not worthy of further protection. The City is aware of the essential benefits provided by the rivers and streams to residents, visitors, businesses, wildlife, and the natural ecosystem. The Merrimack and Concord Rivers, as well as the several brooks forming tributaries to them, are all important assets. Existing regulations offer some protection and they may benefit from further strategies, such as conservation, fee ownership, or other appropriate restrictions.

4.G. – ENVIRONMENTAL CHALLENGES

HAZARDOUS WASTE AND BROWNFIELD SITES

Lowell has a history of leveraging many Federal- and state-funded grant programs to remediate contaminated properties. The City's Brownfields Program, administered through the Department of Planning and Development (DPD), has been active since 1996 when the City earned one of the U.S. Environmental Protection Agency's (EPA) demonstration pilot grants. Since that time,

Lowell has received over \$4 million in assessment, clean-up, and planning grants from the EPA. In addition, MassDevelopment has awarded the City over \$200,000 in assessment and clean-up funding. Federal and state funds have assisted in the assessment of more than 70 properties and 75 acres of Lowell land. Brownfields sites in Lowell vary in size and use and can include:

- Current and former auto service and gas stations
- Former dry cleaners
- Historic mills
- Abandoned railroads
- Former landfills

According to the Massachusetts Department of Environmental Protection (MassDEP) Searchable Sites List, 565 reported releases have occurred in Lowell from 1985 through 2018. Currently, approximately 65 releases are in various stages of open investigation and/or remediation.

Lowell also has one of the most environmentally contaminated sites in New England—the Silresim Superfund Site. The former Silresim Chemical Corporation property covers just over four acres of land on Tanner Street and has been under government control since the company declared bankruptcy and ceased operations in 1977. Over 30,000 drums of hazardous chemicals remained on site following the company’s closure. Since 1982, the U.S. Environmental Protection Agency (EPA) and MassDEP have operated an on-site groundwater treatment system to contain contaminants and remediate the site.

The Lowell Brownfields Program deploys innovative strategies to assess and remediate both publically-owned and privately-owned Brownfields sites. These efforts have led to new housing and commercial space; but more importantly, a number of new parks and recreational spaces. These new spaces include the Edwards Soccer Field, Utopia Park, and various sections of public walkways and greenways. Through the Lowell Brownfields Program, the City will continue to use site remediation to provide viable and engaging recreational spaces for the community.

LANDFILLS

Lowell does not have any active landfills. The former Westford Street Landfill, located at 1020 Westford Street, served as the City’s primary solid waste disposal facility from 1947 to 1992. Today, the landfill is approximately 200 feet high and occupies about 56 acres. Historical records indicate that the facility accepted domestic, industrial, municipal, and hazardous wastes. Waste included asbestos, organic lead stabilizers, metal plating waste, sewage and industrial sludge, and volatile organic compounds.

Through a directive by MassDEP, the City has capped the landfill with 18 inches of clay and a top layer of soil and grass. Initially, ventilation systems trapped and released methane gas generated by decomposing trash. Subsequently, the City entered into an agreement to install, operate, and maintain a gas-to-energy system at the landfill, the contract for which expired at the

end of 2016. Gas recovery wells used for the gas-to-energy system have since converted back to passive ventilation wells and are monitored for their effectiveness.

In 2014, the City installed and began operating a solar array at the landfill. The site has approximately 6,000 solar panels that produce 1.5 megawatts of electricity. Combined with other solar projects completed across the City, the solar panels supply approximately six percent of the City's electricity usage for which half comes from the landfill.

Following the solar installation work, environmental monitoring requirements for groundwater, surface water, and methane gas have been revised. The City is in the process of completing an ongoing monitoring program in coordination with the Massachusetts Department of Environmental Protection.

EROSION

Wide-spread erosion is not apparent in Lowell given the lack of steep slopes and exposed land surfaces. Localized erosion occurs in the area immediately downstream of the Pawtucket Falls because 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.

CHRONIC FLOODING

Areas of chronic flooding in the City are along waterways such as Marginal Brook, River Meadow Brook, Beaver Brook, Black Brook, and Clay Pit Brook. These areas are within the 100-year floodplain and have suffered from historic development practices where adequate floodwater storage was not provided and appropriate stormwater management practices were not implemented.

The Massachusetts Wetlands Protection Act and the City's wetlands ordinance regulate these areas. Future development at or near these waterbodies is subject to the review of the Lowell Conservation Commission. The Commission reviews all plans for building within the flood plain, uses criteria set up in the Act to determine if development will have a negative effect, and develops appropriate mitigation requirements to address those effects.

SEDIMENTATION

Sedimentation accumulation has not been a problem for the City. Common sources of sedimentation in waterways include combined sewer overflows (CSOs) and stormwater runoff. Substantial reductions in CSO volume and frequency have mitigated the effects of this source. City policies are addressing local stormwater runoff concerns related to stormwater management practices.

NEW DEVELOPMENT

The City expects new development to occur in Urban Renewal Areas such as the ACRE Plan area in the Acre Neighborhood and the JAM Plan area in the Downtown. The City also anticipates development in the Ayer's City Industrial Park area, which is in the Sacred Heart Neighborhood. The City expects this area to become the newest Urban Renewal Area. By focusing growth in redevelopment areas, Lowell is creating opportunities for environmentally-friendly redevelopment projects and 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 brownfield sites and the implementation of targeted stormwater management practices.

GROUND AND SURFACE WATER POLLUTION

The Merrimack River provides ample water for Lowell's existing and future water supply demands. Surface water is withdrawn from the impoundment upstream of Lowell for drinking water treatment and distribution. Used water is collected and conveyed to the Lowell Regional Wastewater Utility's Duck Island Clean Water Facility, which treats the used water and discharges clean water to the river downstream of Lowell at the border of Dracut. Several towns draw from the Merrimack River for drinking water supply in this downstream impoundment.

The other major user of water from the Merrimack is the hydropower company Enel North America. The company operates historic dams that impound the river for several miles (providing increased drinking water supply) both upstream and downstream of Lowell, and withdraws water from these impoundments to generate hydroelectric power through Lowell's historic system of canals.

Significant improvements have been made all along the Merrimack River Basin: whereas 20 years ago fish were hard to find along the river, trout, bass, and pan fish are now abundant. Water quality has improved dramatically and the river is now a class (B) river, which means it is safe for drinking water supply, fishing, swimming, and boating.

Much of this cleanup effort gained important in 1988 when the Environmental Protection Agency (EPA) partnered with state and local governments, as well as non-governmental organizations, to establish the Merrimack River Initiative. This program coordinated cleanup efforts between New Hampshire and Massachusetts. Since its inception, hundreds of millions of dollars have been spent to update municipal sewage treatment facilities and to educate the public on the importance of clean water to restore the Merrimack River to good health. This interagency effort has trickled down to some local schools. Students have the opportunity to participate in water quality monitoring programs.

As development continues in the basin, major efforts are needed to manage existing and potential contamination sources. Lowell has a legacy combined sewer and stormwater system built in the late 1800s that can become overwhelmed during periods of heavy rain. Combined sewers and both public and private stormwater systems are discharged to the Merrimack River and its tributaries during periods of heavy rainfall. These discharges increase the transfer of nutrients, sediments, bacteria, and other trace chemical pollutants in runoff to the City's waterbodies, which may at times contribute to degradation of water quality in Lowell and downstream communities. The Utility is permitted to operate nine CSO structures, eight of which remain active and are used to maximize in-line storage and regulate flows to the treatment plant to allow for maximum high-flow treatment volumes. During intense rainfall, excess storm flows are directed into the Merrimack River, the Concord River, and Beaver Brook. Eight industrial outfalls discharge into the Merrimack River, the Pawtucket Canal, the Lower Locks Canal, and the River Meadow Brook.

The Lowell Regional Wastewater Utility (LRWWU) has completed sewer separation efforts in several areas of the City. In the next three to five years the LRWWU anticipates conducting additional combined sewer control activities to address ongoing CSO problems.

The City has a Phase II NPDES General Stormwater Permit for its Municipal Separate Stormwater System (MS4). LRWWU has conducted mapping and field inspections to identify approximately 300 municipal stormwater outfalls. Lowell discharges stormwater into these waterbodies:

- 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 effects 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 and the Massachusetts Stormwater Management Standards, ensure that any new construction or redevelopment does not harm surface waterbodies. 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 Act and implementing the Massachusetts Stormwater Management Standards.

To increase confidence in the efficacy of potential future pollution control strategies and to prioritize such projects, the LRWWU is implementing a long-term water-quality monitoring and modeling program, the Clean Stream Initiative. The initiative aims to characterize and assess control strategies to optimize and/or renew existing infrastructure. In doing so, the initiative will reduce overall water-quality degradation from these numerous point and diffuse sources in Lowell.

Continued cleanup of the Merrimack and Concord Rivers will result in expanding recreational opportunities for area residents and stimulating further economic development.

IMPAIRED WATERBODIES

Per Section 303(d) of the Clean Water Act, MassDEP maintains a list of impaired waterbodies. Rivers, streams, lakes, and ponds are impaired if a prior designation has not been proven resolved or if there is insufficient monitoring evidence to suggest that a previously unimpaired waterway no longer meets water-quality standards for its designated uses. MassDEP's Consolidated Assessment and Listing Methodology (CALM) sets the evidence base, which includes: dissolved oxygen, temperature, pH, fecal coliform bacteria, solids, color, turbidity, oil, grease, taste, and odor.

In Lowell, these waterbodies are 303(d) impaired:

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

Bacteria and nutrients from CSOs, stormwater runoff, and municipal NPDES discharges are the primary causes of these impairments. The City is working to reduce harms to these waterbodies through new policies related to stormwater management and CSO control efforts. Lowell also maintains an extensive street cleaning program. Other sources of waterbody 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 waterbody, respectively.

INVASIVE SPECIES

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

The City does not have a program for removing invasive species. However, the LRWWU manages a contract for vegetation control and removal from 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.

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. The City has discussed a possible greenway, and it is likely that cleanup efforts will be made to the area surrounding the brook.

ENVIRONMENTAL EQUITY

As designated by the Massachusetts Executive Office of Energy and Environmental Affairs, Lowell is an Environmental Justice Community. Per the 2010 U.S. Census, 87.6 percent of Lowell's population lives in an environmental justice block group where:

- Annual median household income is equal to or less than 65 percent of the statewide median (\$62,072 in 2010);
- 25% or more of the residents identify as a race other than white; or
- 25% or more of households have no one over the age of 14 who speaks English only or very well

Access to municipal recreational and open space, as well as regional recreational and open space amenities is a significant concern for Environmental Justice communities. As part of the City's comprehensive master plan update, Sustainable Lowell 2025, and through an extensive public outreach effort for this document, residents of all backgrounds and income levels provided input on future open space and recreational planning. Five goals emerged from outreach process:

- 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;

- Expanding 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;
- Identifying parcels of land to protect permanently.

DRAFT

SECTION V

INVENTORY OF LANDS OF CONSERVATION AND RECREATION INTEREST

Lowell's open spaces vary in size, purpose, and setting. These spaces include trails, parks, plazas, squares, cemeteries, golf courses, playgrounds, natural areas, community gardens, active playing fields, and public school grounds. The City's public spaces foster neighborhood vitality, a sense of community, recreational opportunities, environmental health, arts and cultural programming, economic development, and local mobility.

Despite the value of the City's open spaces, challenges persist in securing maintenance funds, developing connections between open spaces, and unveiling new programming to meet changing demands. For example, many residents want greater access to swimming pools, community gardens distributed throughout the City, and playgrounds closer to home. Meeting these demands will require new resources. However, preserving, developing, and connecting open spaces is integral to improving the health and wellbeing of Lowell's residents, visitors, and ecology. Further, a walkable, bikeable, and accessible network of open spaces is both invaluable and necessary to achieving an equitable, healthy, and vibrant Lowell.

In general, open space is largely free of structures and impervious surface, serves as valuable wildlife habitat, helps to protect water and air quality, and provides flood storage. In addition to the natural and environmental benefits, open spaces offer scenic vistas, recreational opportunities, and enhance neighboring properties. This section profiles lands with conservation and recreational value, as well as properties that have the potential for greater conservation and recreational opportunities. Refer to Appendix B for the complete list of properties with existing or potential open space value.

5.A. – PRIVATE PARCELS

AGRICULTURAL LAND

Preserving agricultural land is difficult. The City does not have a zoning designation for agricultural land or open space, alternative uses are often more profitable, and many undeveloped parcels are small and fragmented.

In Lowell, only one parcel has protection under Chapter 61A regulations, a state law that allows a farmer to pay a lower property tax on active farmland. The tax derives from the land's present use (i.e., agriculture and/or horticultural) rather than a future use with a higher tax assessment (e.g., a residential or commercial project). To qualify, a landowner must have at least five contiguous acres. The sole remaining 61A parcel has 10 acres and is on Varnum Avenue in Pawtucketville. The landowner uses this property to grow and sell Christmas trees, but the City's zoning ordinance allows him (or a new owner) to convert the property into a subdivision of single-family homes.

Other 61A parcels once existed, but the landowners have since sold their properties to home builders. Remaining large tracts of land will likely not become agricultural. However, interest in urban agriculture—which enables farming on a smaller, local scale—is growing. Accordingly, the City should evaluate regulatory changes that would allow agricultural uses in certain zoning districts and enable urban agriculture.

FOREST LANDS

In Lowell, no forested land qualifies for Chapter 61 protection. This designation has similar requirements as Chapter 61A. Property owners who own more than 10 acres of contiguous land used for forest production can petition the State for Chapter 61 designation. However, the only significant block of woodland in the City is in the Lowell-Dracut-Tyngsborough state forest. Limited blocks of trees are in private parcels adjacent to the state forest and along the Merrimack River, but none of these parcels have Chapter 61 protection. Most other blocks of forested land were cleared over a century ago for farming.

LESS-THAN-FEE-INTEREST

No parcels have protection under these types of development restrictions. Typically, a landowner grants these easements for the public to access a recreational resource. In general, these easements state that the landowner will not alter the land in a way that impairs its recreation or open space value.

PRIVATE RECREATIONAL LANDS

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

ESTATES

Lowell has no large properties classified as estates.

MAJOR INSTITUTIONAL HOLDINGS

Several private and non-profit institutions occupy large parcels throughout the city. Many of these parcels have recreational facilities on their premises that could serve residents. The City

has prioritized working with these landowners to open their facilities to the general public. In particular, the Greater Lowell YMCA owns five acres, the Lowell Girls Club owns several acres, and the Lowell Boys Club owns two acres with active recreational space for school age children.

The region has multiple healthcare facilities that provide extensive medical care. These facilities cover large tracts of open space. Lowell General Hospital has two campuses totaling 72 acres, 64 of which are in Pawtucketville and 8 are along the Merrimack River east of Downtown. In addition, the Sisters of Charity of Ottawa provide senior care services on a 76-acre complex in Pawtucketville. Other large institutional landholders include churches, private parochial schools, and several non-profit groups.

5.B. – PUBLIC AND NONPROFIT PARCELS

CITY PROPERTIES

The City holds an extensive number of properties for a variety of public purposes. Several City authorities manage these properties:

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

Table 5.1 lists City-owned or managed open spaces and parks. This table is not a complete inventory of city-owned land.

Table 5.1: City parks and open spaces

Site Name	Acres	Recreation		Funding
		<i>Current</i>	<i>Potential</i>	
Armory Park	1.26	Passive-playground	Add play equipment for older children, shade structure	CDBG
Bourgeois Park	0.20	Active-basketball	None	CDBG
Callery Park	5.50	Active-baseball & playground	None	State Earmarks
Campbell Park	4.07	Active-baseball & playground	None	City
Carter St Park	0.50	Active-basketball	Neighborhood playground	City

Site Name	Acres	Recreation		Funding
		Current	Potential	
Cawley Stadium Sports Complex & practice fields	31.81	Active-football, track & field, soccer, softball, & baseball	None	City, CDBG, Urban Self Help Grant, Federal, City bond funds, SBAP
Centerville Memorial Park	0.13	Passive	None	City, CDBG, State Earmark
Circuit Ave Park	0.58	Passive	Picnic area	City
Clemente Park	3.02	Active-volleyball, playground, skate park, & bocce court	None	City, CDBG, State Earmark
Coburn Park	0.25	Passive	None	City, Private Foundation (LPCT)
Concord River Greenway	1.30 (3,500 linear feet)	Passive, multiuse trail and greenspace	None	City, State-Urban Trails, Federal
Creegan Park	0.47	Passive	None	City
Crowley Park	0.50	Passive	None	City, State Earmark
Derby Park	0.09	Passive	None	City, Private
Doane St. Park	1.40	Active-basketball	Dog Park, pickleball	City, CDBG, LHA Partnership
Donahoe Park	13.04	Active-basketball & playground	None	City, CDBG
Dubner Park	0.23	Passive	None	CDBG, Private LPCT
Ducharme Park	0.50	Active-basketball & playground	None	City, CDBG, State Earmark
Durkin Park	2.76	Active-baseball, basketball, & playground	Amphitheater, improved play area	City, CDBG, State SBAP (School)
Edwards Soccer Fields	8.79	Active-soccer	Lacrosse	City, CDBG, State Earmark, LPCT, Brownfields
Father Grillo Park	0.10	Passive	None	City, CDBG
Fayette St. Park	0.30	Active-basketball & playground	None	City, CDBG

Site Name	Acres	Recreation		Funding
		<i>Current</i>	<i>Potential</i>	
Fels Playground	0.64	Passive-greenspace & playground	None	City, CDBG
Ferry Landing Park	0.15	Passive	None	Partnership with Private “Curbs and Cobbles”, City, Veterans
Finneral Park	0.03	Passive	None	City
First St. Park	2.67	Passive-dog park	None—will return to Water Dept. uses	City
Fort Hill Park	34.51	Passive	None	City, CDBG, DEM-Historic Landscape Preservation Grant
Franklin Street Garden	0.14	Community garden	None	City, CDBG, Private
Franklin Street Park	0.10	Passive-pollinator garden, musical equipment, & seating	None	City of Lowell, Habitat for Humanity
Fr. Kirwin Park	1.54	Active-basketball/playground	None	City, CDBG
Fr. Maguire Park	4.59	Active-basketball, baseball, softball, playgrounds, tennis, & garden beds	None	City, CDBG, State SBAP (School)
Gage Field	21.87	Active-basketball, soccer, baseball, tennis, & playground	None	City, CDBG, State Earmark
Hadley Park	5.88	Active-volleyball, baseball, stake park, & playground	None	City, CDBG, State Earmark
Harmony Park	0.20	Passive	Neighborhood playground	City, CDBG
Highland Park	19.97	Active-basketball, handball, baseball, & playground	None	City, CDBG, State Earmark
Hovey Field	8.54	Active-soccer & playground	Fully accessible Playground	City, CDBG, State Earmark

Site Name	Acres	Recreation		Funding
		Current	Potential	
Kerouac Park	1.02	Passive-memorial	Venue space, stage, play equipment, concession area	City, CDBG
Kittredge Park	1.80	Passive-playground	None	City, Tsongas Foundation, CDBG, Private Funding
Knott Park	1.17	Passive	Veteran's Memorial Park	City
Koumantzellis Park	9.33	Active-baseball, skate park, & playground	None—same uses, improved infrastructure	City, CDBG, State Earmark
Lawrence Mills Park	4.93	Passive	None	State
Lincoln Square Park	0.50	Passive	None	City, CDBG, Lowell Heritage Partnership Fund
Lowell Memorial Auditorium Greenspace	2.22	Passive	None	City
Lucy Larcom Park	1.27	Passive	None	City, Federal National Park
John & Priscilla Maher Park	0.35	Active-playground	Picnic area	City, CDBG, State Earmark
Manning Field	11.00	Active-baseball	Expanded multiuse fields	City
Martin Portuguese Park	0.10	Passive	None	City, CDBG
McDermott Reservoir	14.96	Passive	Accessible walking paths	City, CDBG, State Earmark
McPherson Park	10.55	Active-pool, softball, tennis, basketball, & playground	None	City, CDBG, Private
Muldoon Park	0.55	Passive-boat launch access	None	State Earmark
Monsignor Keenan	1.02	Active-basketball, playground, & community garden	Splashpad	City, CDBG

Site Name	Acres	Recreation		Funding
		Current	Potential	
Moody St. Playground	0.40	Active-basketball & playground	Improved playground	City, CDBG
Mulligan Park	2.78	Active-splashpad, basketball, wiffle ball, & playground	None	City, CDBG, State “Our Common Backyards Grant”, LHA partnership
Olga Nieves Playground	0.23	Active-playground	Picnic area	City, CDBG
Noonan Family Park	0.03	Passive	None	City
North Common	7.69	Active-pool, basketball, softball, stage, playground, community garden, & amphitheater	None	CDBG, State Earmark, State (Pool), Urban Self Help Grant
O'Donnell Park	15.29	Active-splashpad, basketball, tennis, & baseball	Pickleball	City, CDBG, State
Oliveria Park	1.83	Active-baseball & softball	Skate park, picnic areas, orchard	City, CDBG
Pawtucket Memorial Park/LeBlanc Field	61.20	Active-baseball, softball, soccer & playground	None	City, CDBG, State SBAP (School)
Perry Playground	0.41	Active-basketball & playground	Picnic area	City, CDBG
Reilly School Community Playground	3.17	Active-basketball & playground	None	City
Rotary Club Park	0.86	Active-skate park & community garden	None	City, CDBG, Private-Rotary Club, Mill City Grows
Rynne Beach	0.25	Active-swimming	None	DCR, City (summer staffing)
Scullin Park (Morey School Playground)	1.20	Passive-playground	Picnic area	City, CDBG, State SBAP (School)
Shedd Park	53.83	Active-splashpad, basketball, tennis, playground, & baseball	None	City, CDBG, Urban Self Help Grant, Private “Friends of Shedd Park”

Site Name	Acres	Recreation		Funding
		Current	Potential	
Sheehy Park	5.33	Passive	Outdoor exercise equipment	City, CDBG
Sheehy Park Extension	5.48	Passive	Outdoor exercise equipment	City, CDBG
Smith Street Community Garden	0.16	Community Garden	None	City, CDBG, Private
South Common	20.31	Active-pool, soccer, multimodal path, & playground	Full renovation-soccer, pool, basketball, tennis, splashpad	City, CDBG, Gateway Park Grant, Federal
Spaulding House Park	0.42	Passive	None	Federal-National Park Service
St Louis Playground	6.38	Active-baseball, softball, basketball, & playground	None	City, CDBG
Stocklosa School Park	1.50	Active-basketball, open space, & school garden	None	City, CDBG, State SBAP (School)
Suffolk St. Park	1.20	Passive	None	City, CDBG
Sweeney Park	2.72	Passive	Walking trail	City
Tenth St. Reservoir	1.33	Passive	None	Water Dept., City
Thomas L Crowley Park	0.61	Passive-playground	None	City, State Earmark
Tyler Park	2.00	Passive	None	City, CDBG, DEM-Historic Landscape Preservation Grant
UMass Lowell Boathouse	0.24	Active-boating	None	UMass Lowell
Utopia Park	0.29	Passive	Large sculpture installation: <i>Hydro</i>	City of Lowell CASE office, CDBG, Nancy & Richard Donohue Fdn., Parker Fdn., Fund for the Arts, New England Fdn. for the Arts, National Endowment for the Arts

Site Name	Acres	Recreation		Funding
		<i>Current</i>	<i>Potential</i>	
Varnum (Mt. Vernon) Park	0.58	Passive	None	City, State Earmark
Veterans Memorial Park	0.28	Passive	None	City, CDBG, State Earmark
Victorian Garden	0.10	Passive-garden	None	State DEP property, maintained by City
Victory Park	0.06	Passive	None	City
Walter J Lemieux Park	0.13	Passive	None	City, CDBG
Wang Soccer Fields	20.00	Active-soccer	Lacrosse, field hockey	City
Wannalancit Park	2.00	Passive	None	City
West 3rd Street Community Garden	0.06	Community Garden	None	City, CDBG, Private
Western Canal Park	4.00	Passive	None	Federal-National Park Service
Whiting Street Community Garden	0.06	Community Garden	None	City, CDBG, Private
Total Acres	462.81			
Linear sq. ft.	3,500.00			

The open space managed by the City and dedicated to active and passive recreational purposes provides approximately 4 acres of open space per 1,000 residents. However, this figure does not include the Lowell-Dracut-Tyngsborough State Forest, which alone accounts for an additional 1,015 acres of open space.

Although not the primary purpose of cemeteries, these sites provide passive recreational opportunities, such as walking in a tranquil setting, while also incorporating large landscaped areas in neighborhoods. Table 6 lists 10 cemeteries that contribute to the City's open space assets.

Table 5.2: Lowell cemeteries

Cemetery	Acres
Edson Cemetery	39.60
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	31.90
Woodbine Cemetery	0.76
Total Acres	222.53

Over the past five years, the City and its partners have made significant progress on improving parks, recreation, and open spaces. Major projects include completing the first two phases of the Concord River Greenway, improving and extending the canal and river walkways, building new parks and recreational facilities, and the enhancing existing open spaces across all neighborhoods.

The Concord River Greenway, which is well underway, has 2,700 linear feet of trail and 1.3 acres of open space. Public art and interpretive signs line the multi-modal path, and visiting school programs can use an online classroom module. The City expects to complete the Greenway within the next several years. Once complete, the Greenway will connect to a regional and state-wide network of trails.

The City has also collaborated 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, the partnership has restored or constructed 6,662 linear feet of canal walkway, with work on an additional 11,360 linear feet underway.

Finally, through the City Manager's Neighborhood Initiative and other planning processes, the City has worked with community stakeholders to determine open space needs and address the changing demographics of Lowell's most urban neighborhoods.

STATE AND FEDERALLY OWNED LANDS

In Lowell, the Massachusetts Department of Conservation and Recreation (DCR), University of Massachusetts Lowell, and the Massachusetts Department of Public Works (DPW) administer and manage State lands. DCR maintains and operates the 1,015-acre Lowell-Dracut-Tyngsborough State Forest—a marquee asset. Located in the northwest of Lowell, this major resource provides a variety of recreational opportunities: such as hiking, fishing, cycling, birding, picnicking, nature walking, mountain biking, and playing various field sports. In the winter, people sled, ice skate, and cross-country ski. DCR properties also include the state parks, much

of the locks and canals, and the 83-acre Lowell Heritage State Park. DPW maintains and operates Festival Field (also called, Ann Dean Welcome Regatta Field), along the Boulevard in Pawtucketville.

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 transfer would enable DCR to complete a path beginning near to the Duck Island Treatment Plant and ending near to the Tyngsborough town line. This path would be a nearly continuous park along the river bank and would 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 Boarding House Park, canalwalks, and the canal boat interpretive cruises. The City should continue to work with the National Park to seek and secure funds to complete the Pawtucket Canal pathway.

NON-PROFIT LANDS

The nationally-accredited Lowell Parks and Conservation Trust (active) and the Friends of the Forest (inactive) are the two land trusts in the City. The Lowell Parks and Conservation Trust (LPCT) is expanding the portfolio of properties they maintain. LPCT also supports urban forestry by providing trees for planting throughout the City, and offering technical assistance to property owners to ensure the survival of new trees.

The Friends of the Forest owns a six acre parcel adjacent to the Lowell-Dracut-Tyngsborough State Forest off of Charant Road. Since the group is no longer active, the City should identify an entity to manage this property to prevent encroachment. Table 7 depicts properties owned or controlled through a conservation restriction by the two land trusts.

Table 5.3: Land trust properties

Property	Organization	Acres
47 Charant Rd.	Friends of the Forest	6.85
95 Fairmount	LPCT	0.17
99 Fairmount	LPCT	0.35
36 Merrill St.	LPCT	0.06
16 Nicole Dr.	LPCT	2.00
383 Pawtucket St.	LPCT	0.14
48 Totman St.	LPCT	1.52
520 Varnum St.	LPCT	4.54
181 West Meadow Rd.	LPCT	3.62
Total Acres		19.25

OTHER PUBLIC UNPROTECTED LANDS

The University of Massachusetts Lowell is a major landholder. Over the last decade, the University has transformed from serving commuter students to one with a significant on-campus student population. Since the last plan, the University has increased on-campus student housing by 1,000 beds and now approximately 41% of students live on-campus. The three University campuses—North, South, and East—occupy about 135 acres of land. The campuses have 54 buildings for a total of 3.9 million gross square feet of building space. In addition, the University leases several properties throughout the City for academic, housing, university support, and recreational facilities.

The University has a program of facility growth and renewal to address enrollment increases, planned growth in funded research, increased demand for on-campus undergraduate housing, and a need for better academic community gathering spaces. In the last five years, the University has expanded its campus buildings by 513,000 sq. ft., including a new 472-bed suite-style student housing facility on East Campus. In 2016, the University acquired Perkins Properties, a 271,000 sq. ft. restored mill and parking facility and repurposed the building to accommodate 650 beds of student housing.

Further, a comprehensive campus transportation planning effort, now underway, will provide recommendations on ways to increase sustainable transportation options for students, faculty and staff. The plan proposes investments and incentives to decrease driving alone and increase walking, biking, carpooling, shuttle, and public transit use (i.e., rail and regional buses). One significant proposal is to install a cycle track on Pawtucket Street to connect the separate campuses. If built, the track would provide greater non-vehicular access to the John E Sheehy Memorial Park, Francis Gate Park, and the Lowell Motor Boat Club.

The University also reports that during periods of peak demand, 2,800 parking spaces (40% of all spaces provided) are available. Since the average parking space is 330 sq. ft. (including the drive lane), these unused spaces represent over 21 acres. The University and Sustainable Lowell 2025, the City's masterplan, calls for reforming minimum parking requirements. Doing so may create opportunities to reuse these parking spaces for new facilities or open space. Finally, the University proposes having students work with the City to design and pilot curb extensions, parklets, and bike lanes. These types of temporary installations can provide new pocket parks and recreation opportunities.

Existing recreational facilities are at both north and south campus, with a student recreational center on east campus across from LeLacheur Park. Since the last plan, the University constructed a new outdoor recreation facility at 225 Aiken Street. This 5-acre property is on East Campus and replaced a 67,000 sq. ft., one-story industrial warehouse. The warehouse site included two acres of paved parking lots with no drainage infrastructure. The University redeveloped the site to include two full-size artificial turf athletic fields. This project also

included installing a new on-site stormwater management program. The subject property is within 100-ft. of the Pawtucket Canal and by improving the stormwater mitigation on site, will decrease runoff into the waterbody.

DRAFT

SECTION VI:

COMMUNITY VISION

6.A. – DESCRIPTION OF PROCESS

A Department of Planning and Development (DPD) working group set and managed the planning process for this document, collected data, performed research and analysis, and authored plan elements according to Massachusetts Division of Conservation Services' (DCR's) guidelines.

DPD Staff pursued a number of activities to capture the opinions of Lowell residents, understand how they use the City's open spaces today, and determine which changes they want for the future. The breadth and extent of the outreach compares favorably to the 2013 Open Space and Recreation Plan, which benefited from the simultaneous updating of the City's comprehensive master plan. For this edition, the outreach focused exclusively on open space and recreation. DPD Staff conducted several activities to encourage public participation:

- Hosted 250+ community stakeholders at 3 public meetings;
- Collected 230 survey responses;
- Attended meetings for all 10 neighborhood associations, to gather neighborhood specific feedback on open space needs;
- Held three focus groups with two youth organizations and the City of Lowell Disability Commission;
- Operated a dedicated Facebook page to solicit ideas and advertise events; and
- Attended five community events (e.g., monthly CHOP dinner) to share the survey and gather feedback.

The working group consulted with the Water Utility, Wastewater Utility, Parks, and Recreation Departments. These four Departments commented on the proposed open space objectives and helped to prepare the environmental inventory and analysis elements. In addition, DPD Staff met with key stakeholders, including DCR, the Northern Middlesex Council of Governments, Lowell National Historical Park, University of Massachusetts Lowell (UMass Lowell), and the Lowell Parks and Conservation Trust to discuss their institutional priorities over the next five years.

PUBLIC MEETINGS

Over the course of 2018, DPD Staff hosted three large public visioning sessions at the Lowell Senior Center. The Senior Center was a suitable location for the large public meetings because it is in the center of the city, is ADA accessible, has a big meeting space, provides ample parking, and is served by two LRTA bus lines.

The first public meeting on January 24th included a brief presentation by DPD Staff about the importance of an Open Space and Recreation Plan (OSRP) and a general timeline for the year-

long public planning process. Over 40 residents attended the first meeting. After the staff presentation, these residents engaged in small table conversations focused on two tasks:

- *Answer how they use the City's open spaces and recreation programs today; and*
- *Create a wish list of things they would like the City to have in the future.*

DPD Staff used the information gleaned at the first public meeting to have more direct conversations with residents at the 10 neighborhood meetings. Refer to the **NEIGHBORHOOD MEETINGS** subsection for more information about that part of the process.

Feedback from the neighborhood meetings, initial responses to our survey, and comments from the first meeting set the focus of the second public meeting held on May 17. By this point in the planning process, 10 themes emerged as top priorities for residents. At the second public meeting, DPD Staff asked residents to prioritize these 10 themes by identifying their top four. Upon arrival, DPD Staff directed participants to vote by affixing stickers to poster sheets—one for each theme—that staff had attached to the wall. Once everyone selected their themes, staff tallied the scores to determine the top four:

- 1. Frequent Clean-up & Maintenance**
- 2. Better Sidewalks & Crosswalks**
- 3. Bike lanes**
- 4. Events beyond Downtown**

Next, staff invited residents to sit in groups and chat about these themes. Staff moderated the discussions to encourage residents to identify specific short- and long-term actions the City should take to address each theme. After the discussion period, a representative from each table presented one short- and long-term action item that their group had identified for each topic.

On August 13th DPD Staff welcomed residents to the third public meeting. During the meeting, participants ranked the 10 themes from their highest to lowest priority and returned them to DPD Staff. Residents then sat at tables and collaborated to negotiate and determine the rankings for the entire table. DPD Staff used both ranking approaches to learn how people felt individually and to see whether those priorities shifted after discussions with their table mates. DPD Staff also wanted to help attendees understand the difficulty inherent in translating the many themes into a clear set of priorities.

The activity prompted spirited discussions at each table, and showed the many ways people can negotiate. Some tables ranked items individually again and averaged the results. Other tables had open discussions, with residents advocating for why they preferred to rank items a certain way. DPD Staff did not sit at the tables and instead allowed attendees to moderate their discussions and prioritization. Leaving the residents alone also avoided having staff influence the rankings inadvertently.

After the groups completed their prioritization, DPD Staff shared a sheet with action items for each of the themes. Residents prioritized these action items in the order that they would like to see them accomplished. The City cannot accomplish the many action items identified by the public in one or two years, as such, understanding how residents would like to see the City prioritize this work is important.

By participating in this activity, residents learned a little about the difficulty of writing the OSRP goals and action items for the 2018 plan. DPD Staff must consider City capital planning priorities, available funding, pending projects, and a multitude of competing issues. Given these resource constraints, residents must guide City decision-making when determining which projects to implement. Each public meeting provided an excellent opportunity to learn which issues matter most to residents.

OPEN SPACE SURVEY

DPD Staff developed a new open space survey for the 2018 plan by adapting elements from the survey instrument used for the 2013 iteration. The modified questions reflected current informational needs and supplement the data collected for the comprehensive master plan update. Specifically, the survey solicited feedback on six topics:

- *How residents use open space and recreation facilities;*
- *How frequently residents use open spaces;*
- *What kinds of facilities residents use most frequently, and what activities residents participate in when they visit public open spaces;*
- *How residents access open space and recreation facilities;*
- *How well the City cleans, maintains, and makes accessible its open space and recreational facilities;*
- *How the City should prioritize resources when planning for new or making enhancement to existing open spaces, parks, and recreational facilities.*

To ensure a broad sample of residents received the survey, DPD Staff emailed it to 500 representatives from neighborhood associations, groups, local non-profits, and institutions (e.g., UMass Lowell). The survey was also on the City's website and the City's social media accounts, including the dedicated 2018 Lowell OSRP Update Facebook page. Hard copies of the survey were available at City Hall and staff distributed them during all public meetings, focus groups, neighborhood association meetings, and community events. The survey was available in English, Spanish, and Khmer. In March the survey opened and staff collected responses through August 17, 2018. During that period, residents completed and returned nearly 300 surveys to DPD.

Despite the considerable number of survey responses, the demographic makeup of respondents does not match the City and therefore does not allow for a representative analysis of Lowell residents. Still, the responses provide strong anecdotal evidence for the public's preferences relative to open space and recreation and the importance of open space conservation in Lowell.

NEIGHBORHOOD GROUP MEETINGS

Early in the planning process, DPD Staff decided that large public meetings were not the only way to hear from members of the community. Instead, staff believed attending neighborhood group meetings—where residents were already congregating—would ensure a wider range of input. DPD Staff attended the neighborhood meetings between the first and second public meetings. Staff asked residents to answer two questions:

- *What is missing from your neighborhood today?*
- *In five years, what do you hope Lowell's parks and open spaces will look like?*

To help build a framework around these central questions, staff also asked residents to think more generally about what they believe open space means in Lowell and what benefits they see from preserving open spaces. Their responses to the two questions and their general input on the value of open spaces helped set the style and format of the second public meeting.

While writing this plan, DPD Staff found that the neighborhood meetings validated our efforts to engage the public directly during the planning process. The specific feedback about parks, programs, and open spaces in their neighborhoods also underscores the importance of following-up with residents when the City implements projects in their neighborhoods. Doing so is vital to ensure any new programs and facilities meet the needs and preferences of the residents most affected by them.

FOCUS GROUP

The 2013 plan-making process revealed that some residents are less likely to respond to the survey or attend general meetings. To hear from these residents, DPD Staff conducted three focus groups with groups that have two major users of our parks and recreation programs: the young and people with disabilities.

When selecting the focus groups, DPD Staff also targeted underrepresented voices. Notably, staff discovered during the first focus group discussion that most participants were not familiar with municipal outreach process. Consequently, staff dedicated a time to introduce ourselves, provide background on the process to date, and share information gleaned from previous meetings.

Next, staff kick-started the conversation by asking residents which neighborhoods they call home and had them find their neighborhood on the city map we brought. A majority of participants hailed from an Environmental Justice neighborhood, which are priority communities for outreach about our parks, programs, and open spaces.

DPD Staff then asked participants to answer six questions:

- *What makes Lowell special? Do our parks and open spaces add to this?*
- *What's the first thing that comes to mind when thinking about open space in Lowell?*
- *What's your park of choice? Why that location?*
- *What's missing in Lowell?*

To further understand how the City could better include these groups in future planning process, we asked three follow-up questions:

- *Our survey skews wealthy and Caucasian—what do you recommend we do?*
- *What other ways can we get people involved?*
- *How do you see the feedback loop work after this meeting?*

6.B – STATEMENT OF OPEN SPACE AND RECREATION GOALS

The findings from all of our public outreach informed the OSRP goals for the 2018 plan. Specifically, the City of Lowell recognizes the importance of sustaining and building a system of parks, trails, open spaces, and recreational opportunities that enhance the quality of life of residents, protects our environment, and promotes the economic well-being of our remarkable city on the rivers. Pursuing these six goals will help us provide the spaces and amenities our residents expect from their community:

1. Strengthen pedestrian connections throughout all neighborhoods to provide residents safer access to parks, open spaces, and the opportunity to walk for exercise and leisure.
2. Install cycling infrastructure across the City; prioritize non-vehicular modes of travel and recreational opportunities for residents.
3. Increase the types and availability of water-based recreation opportunities for residents.
4. Prioritize improved maintenance, security, and preservation of parks and open spaces across the City and enhance these spaces with the new amenities requested by residents.
5. Streamline communication to the public about parks, open spaces, amenities, and events to increase knowledge of and access to these offerings.
6. Increase recreational opportunities and modify existing parks and open spaces so that all residents regardless of age, ability, and neighborhood of residence can enjoy them.

SECTION VII

ANALYSIS OF NEEDS

7.A. – SUMMARY OF RESOURCE PROTECTION NEEDS

Resource protection balances 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 many active and passive recreational benefits to the community. These places also provide opportunities for the public to experience wildlife in their everyday lives, and are critical to well-functioning environmental systems. When preserved and maintained strategically, open spaces can provide several benefits³:

- **Ecological:** Open space provides natural water filtration, drinking water protection, flood and erosion control, wildlife habitat, migration stopovers, and conservation of biodiversity and ecosystems.
- **Social:** 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:** Open space is often important for attracting and maintaining businesses in a community and region. Proximity to open space often increases land values, and recreation and leisure activities can make significant economic contributions. Natural processes (e.g., water filtration) are much less expensive for communities than engineered alternatives (e.g., water treatment plants).
- **Health:** Access to parks, greenways, and trails creates recreational opportunities and encourages a physically active lifestyle. Open space helps to ensure clean and safe water supplies and food production resources. It also mitigates air, water, and noise pollution.

Most land in Lowell is urban with few large open areas available for open space preservation and environmental conservation. A complicating factor is that 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. In this context, open space preservation efforts need to prioritize high value natural resources, maintaining and strengthening existing open spaces. Corridors and greenways should also establish a networked system of green infrastructure. When preserving open space, communities should also maximize opportunities to offer sensible recreational amenities in these spaces.

³ American Planning Association, “Seven Principles of Green Infrastructure”, December 2002

Rivers are a particularly salient example. Preserving land along rivers provides habitat and migration routes for a variety of wildlife, helps reduce water pollution, and mitigates flooding and erosion. Further, these corridors provide opportunities for active recreation such as walking, running, or biking and the opportunity to interact with the natural environment.

Lowell has a significant network of wetlands and waterways that provide significant ecological benefits to the community. Activities to enhance land conservation should focus on these networks, especially to build links among larger natural resources areas such as the Lowell-Tyngsborough-Dracut State Forest and Fort Hill Park/Shedd Park. Efforts along the Merrimack and Concord Rivers should focus on protecting land, improving habitat, and linking larger regional open spaces. In particular, the City and its partners should complete the Concord River Greenway (CRG), extend the River Walk greenway on the north bank of the Merrimack west of the Aiken St. Bridge, and extend the Riverwalk along the southern bank of the Merrimack to connect with the Bay Circuit Trail. Each of these efforts would strengthen the river ecosystems while providing links in the open space network.

Efforts should also include secondary waterways, such as the River Meadow Brook, Clay Pit Brook, Black Brook, and the canal system. Each of these waterways and associated wetlands provide important habitat and wildlife corridors within the City and can meet the four benefits of open space preservation listed above. Completing the Pawtucket Canal shared path system, and connecting the Bruce Freeman Trail with the CRG via River Meadow Brook are important opportunities for completing an interconnected system of greenways within the city and regionally.

A smaller yet environmentally significant network of wetlands also exists in the City. Over the course of Lowell's history, development has encroached and degraded the full extent of wetlands. We should implement strong protection measures to prevent further degradation. Current regulations such as the Wetlands Protection Act and Lowell Wetlands Ordinance protect wetlands from encroachment to an extent. However, the City should consider whether properties containing wetlands and lands directly adjacent to wetlands should have permanent protections. Examples include 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 ownership does not guarantee protection from encroachment. Wetland networks of particular interest include those associated with the Concord River, Black Brook, Clay Pit Brook, and Flaggy Meadow Brook.

Drinking water supplied by the Merrimack River goes to everyone in the City as well as people 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 at times poor quality. However, local, regional, state, and Federal efforts to clean up the Merrimack River as well as investments in

wastewater treatment plants in Nashua and Manchester, NH have improved the City's water quality. Like the Merrimack, the Concord River has a history of pollution due to municipal and industrial waste discharges. To ameliorate these issues, Lowell needs to not only concern itself with discharges within its boundaries but also work with surrounding communities to reduce their discharges.

Periodic flooding in Lowell has caused severe and expensive property damage. As in many urban areas, Lowell's floodplains have succumbed 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 experience acute flooding problems and are telling examples of improper development of a floodplain area. Lowell should consider issuing stricter regulatory controls over development in the floodplains to maintain riverfront open space and reduce damages caused by flooding.

HISTORIC RESOURCES & VIEWS

Historic and scenic locations are resources that shape Lowell's character and promote pride in our community. However, pleasant landscapes and historic areas are susceptible to destruction when we do not recognize their value and fail 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, exist to recognize, preserve, and protect Lowell's varied historic resources. The community has 13 districts listed on the National Register of Historic Places and 26 individually-listed National Register properties scattered throughout the downtown and neighborhoods. Further, 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, Lowell should coordinate with neighbors, partners, and other interested parties to consider implementing additional review districts to protect historic resources.

Several Lowell parks are also significant historic and cultural resources with some listed on the National Register of Historic Places. Examples include South Common, Tyler Park, Rogers Fort Hill Park, Kittredge Park, and Lucy Larcom Park. The City created many early parks, such as the North and South Commons (1845), and these parks still provide important open space and recreational amenities for the community today. In the late 1840s, Locks and Canals Chief Engineer James B. Francis designed and built the Northern Canal Walkway to provide pedestrian access and an escape from the downtown mill district. Later 19th and early 20th century parks, such as Lucy Larcom Park, Shedd Park, and Rogers Fort Hill Park, continue to serve similar functions. 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, the 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 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 significant open and historic spaces. The privately owned and managed Lowell Cemetery (1841) is an important, early example of the rural or garden cemetery movement of the mid-19th century, was the fourth of its kind in the United States, and is 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 coordinated by several community partners. These types of efforts should continue and expand to secure their future.

Lowell's rivers, streams, and canals are among the City's most significant scenic features. We should protect and enhance them through establishing easements, land acquisition programs, and developing long-term maintenance plans. Along the Merrimack River are the Vandenberg Esplanade and the Riverwalk. Both resources provide access to Lowell's waterfront while the Concord River Greenway provides similar access along that river. The Lowell National Historical Park's Canalway allows walking along most of the 5.6 mile network in Downtown. Efforts to complete the remaining Riverwalk, Canalway, and CRG 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 should continue to receive support and encouragement.

SUMMARY OF COMMUNITY NEEDS

PUBLIC OPINION AND OUTREACH

Survey

DPD Staff developed the open space survey by adapting elements from the survey instrument deployed during the 2013 plan-making process. The modified questions reflected current informational needs and supplemented the data collected for the comprehensive master plan update, specifically addressing open space preservation and recreational needs. Nearly 300 residents responded to the online survey or submitted a hard copy version made available at various locations.

The demographics of the survey respondents do not represent the demographics of Lowell and therefore are not be representative of all Lowell residents. The Belvidere Neighborhood had the most residents respond to the survey. Citywide, 76.4% of respondents identified as white, with

26% of respondent's indicating they earned \$125,000 or more annually. However, the Open Space survey responses do provide strong anecdotal evidence relative to the general public's preferences that are consistent with what we heard from our additional public outreach efforts. The City should continue its practice of directly engaging the public when implementing specific open space and recreational projects to ensure facilities align with the needs and preferences of the residents most affected.

Overwhelmingly, respondents said that the City and its partners should preserve open space and natural areas (97.7%). Residents identified splash pads and spray stations as the most important recreational amenities. The second most important amenities were baseball and softball fields. The third was basketball courts. These findings are not surprising, as 76.4% of respondents have children under the age of five and 66% have children between the ages of 6-17.

When asked to rank amenities in order of importance, residents overwhelmingly indicated that bins for trash, recyclables, and cigarettes were the most important, followed closely by public restrooms, diaper changing stations, and tables and seating.

Respondents were neutral on the supply of park facilities and structures, canal walks and river walks, and athletic fields and courts. However, respondents said that they were unsatisfied with the playground structures/equipment and pedestrian and bicycle paths. These responses are consistent with when residents were asked to rank the availability of these facilities.

The survey results, while skewed to a white and wealthy population, showed that all neighborhoods recognize the importance of having high-quality facilities. The City should acquire land and create new open space in our Environmental Justice communities to increase access to park land. However, residents also want the City to pay more attention to the operation and maintenance of our existing infrastructure.

Public Meetings

More than 250 residents and community stakeholders attended three public meetings to share their views on how the City was performing and what we could improve. After each public meeting, DPD Staff distributed reports that summarized the discussion topics. All public meeting reports are available through the City's website, DPD Staff emailed them directly to interested parties after each meeting, and staff shared them on the dedicated Facebook page for the OSRP. See Appendix:*

While a variety of topics arose at the public meetings, through the survey, neighborhood meetings, focus groups, Facebook, and the designated OSRP email, ten topics came up frequently:

During the public visioning sessions, residents explored the ten topics and raised many actions:

- Ensure people can access neighborhood parks and other open spaces that are further afield in more convenient ways that are not always car dependent.
- Design parks, open spaces, and recreational programming are accessible for everyone regardless of age, ability and neighborhood of residence.
- Streamline information on existing public open spaces so that residents are aware of recreational opportunities, events, and other activities.
- Make Lowell bike friendly community and a place where residents can use cycling as a means to exercise and as an accessible mode of transportation.
- Invest in green infrastructure, e.g., install rain gardens in parking areas to prevent flooding, plant street trees to cool the city and improve neighborhood walkability, replace impervious surfaces, introduce community gardens, build pocket parks, and organize greener festivals. The City should select native vegetation that is resilient in the urban environment and remove invasive species.
- Increase opportunities to interact with the City's water resources and support greater accessibility to water within the City, especially the major rivers and canals.
- Improve water quality by direct intervention, such as river and canal clean up programming, and by reducing combined sewer overflows and untreated stormwater discharge.
- Preserve land along waterways and canals to provide both better access to them and to preserve the natural environment. The corridors can also serve recreational uses and provide pedestrian and bicycle connections.
- Provide a greater variety of activities and programming that reflect the needs and interests of Lowell residents. Examples include walking and biking paths, skate parks, skating, swimming, and kayaking as well as interactive fountains and spray parks.
- Encourage event sponsors to plan activities in neighborhoods beyond the Downtown.
- Ensure sound capital planning, adequate funding, and staffing is available within the City to create and maintain the parks, open spaces, and recreational programming.
- Preserve Lowell's physical environment, particularly its historic resources. Encourage developers, major institutional stakeholders, and the City to restore neglected buildings and infrastructure to avoid negative perceptions of the City.

Overall, participants are proud of living in Lowell, with the City's cultural and historic buildings providing the cornerstone for what makes it unique and beloved. While participants did not see

open space as a special element helping to create a unique identity for the City, they considered the spaces to be vital amenities that offer respite from hardscapes and could help with community engagement. Residents acknowledged the value of efforts to renovate the Downtown and its buildings—restoring it to its former grandeur, but they said other neighborhoods could benefit from more attention. The City should evaluate opportunities to broaden efforts beyond downtown, targeting places where open space and historic preservation could play an important role in redeveloping these neighborhoods.

Celebrations showcasing diverse cultures also play a role in making Lowell a special place. Residents called for developing a more integrated approach to highlighting culturally diverse areas of the city and accentuating the unique aspects within those neighborhoods. Similarly, residents asked for more communication and access to information relative to open spaces, their amenities, special events, and programming that happens outside of Downtown. Participants were not broadly aware of the variety of facilities and events available to them and said better access to information would benefit Lowell residents and increase access to public spaces and participation in cultural events.

Residents said that infusing more landscaping into the neighborhoods, such as through “islands” in the public way and street trees, is important. Equally important is maintaining greenspaces to avoid presenting a negative impression of the City. In general, all participants said that cleanliness and maintenance of open spaces needs to be a priority. Some residents believed that Lowell waterways are not clean because garbage, refuse, and pollutants often end up in them.

The City and its partners need to pay greater attention to the waterways to improve their appearance and make them safe for swimming, boating, and other activities. Notably, the Lowell Waterways Vitality Initiative released an Action Plan on February 2, 2017. Developed with the City and the Lowell Heritage Partnership, plan aims to enhance the everyday experience of people in Lowell by making the City’s historic waterways more accessible, active, and vibrant.⁴ The objectives identified in this plan are consistent with the recommendations in the Sustainable Lowell 2025 Master Plan.

Public visioning sessions help to establish an on-going dialogue between City officials and community stakeholders, and are therefore an integral component of a long-range planning process. Through this planning process, approximately 15 City officials from numerous departments served as presenters, facilitators, and note-takers at three public meetings. Translation services (Spanish, Portuguese, and Khmer) were available at every meeting. Additional accommodations were also available upon request. While childcare was not provided, staff supplied coloring activities to keep young children entertained. All public meetings were at the Lowell Senior Center, which the plan working group selected for its centralized location, proximity to public transportation, and abundance of free parking.

⁴ <https://drive.google.com/file/d/0B5201MKgbsvgNDIYRFNxQVFya2s/view>

Open Space Focus Groups

Early in this planning process, DPD Staff determined that large public meetings were not the only way to hear from members of the community. After the Kick-off Meeting, we visited neighborhood groups and attended community events to discuss the plan goals, solicit initial feedback, and distribute surveys.

Despite these efforts, two major users of our parks and recreation programs were not well-represented. Consequently, we scheduled three focus-group style conversations with members of the City's Disability Commission and two local youth organizations. We believed that hearing from these two constituencies would enrich this process and lead to a better plan.

Each focus group had a similar structure. First, we introduced ourselves and then provided background information about the process to date, including information gleaned from previous meetings. We continued the conversation with an ice breaker: discussing the neighborhoods people call home. Next, we asked each group how they use parks and open spaces today, the kinds of improvements they would like to see in the future, and whether they know about and participate in the programs offered by the City's Recreation Department.

Several action items in our five-year action plan were a direct result of these three focus groups. The items address improving accessibility across our community for people of all ages and abilities. Those action items are:

1. Purchase water wheelchairs for each city splashpad to provide wheelchair bound residents' access to water recreation in the City.
2. Investigate opportunities to build a fully ADA accessible fishing dock along the river to provide better access for residents to access the water.
3. Provide better restroom facilities at parks, including accessible options.
4. Improve changing room facilities at municipal pools.
5. Work with the Disability Commission to investigate options to provide charging capabilities at inter-connected trail locations for electric wheelchair users.
6. Build additional splashpads in neighborhoods across the City and continue to maintain public pools accessible to residents.
7. Install equipment geared toward older children, teens and adults such as fitness equipment, obstacle courses, and climbing walls.

NATIONAL STANDARDS FOR RECREATIONAL FACILITIES

In the past, the City has followed National Recreation Parks Association (NRPA) guidelines to determine open space needs by location and population. Traditionally, the NRPA looked at three park types: mini, neighborhood, and community. NRPA then determined how much acreage a community should supply per 1,000 residents, designating between 6 and 10 acres per 1,000 residents. Over the past decade, these guidelines have changed. Instead of measuring the amount

of space in acreage, NRPA now accounts for cultural and social requirements. To better accommodate demographic shifts that have occurred over the past decade, the NRPA has changed its guidelines and now uses these three elements:

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

Since our last plan, the City and its partners have made great strides 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 2013, one new park, and three community gardens have been added to the neighborhood: Franklin Street Park, Franklin Court, Whiting Street Gardens, and a community garden at North Common Park. As shown in the table below, the neighborhood now has 41.01 acres of park and open space.

Park	Acres
Koumantzelis Park	9.33
North Common	7.69
Sheehy Park Extension	5.48
Sheehy Park	5.33
Lawrence Mills Park	4.93
Western Canal	4.00
Stoklosa School Park	1.50
Suffolk Street Park	1.20
Spaulding House Park	0.42
Moody Street Playground	0.40
Olga Nieves Park	0.23
Harmony Park	0.20
Franklin Court Garden	0.14
Franklin Street Park	0.10
Whiting Street Garden	0.06
TOTAL	41.01

Since 2013, one new toddler playground and a community garden were added to North Common Park. The City installed new furniture at Sheehy Park and partnered with Habitat for Humanity to create a new neighborhood park on Franklin Street. The parks listed above have 21 active and passive recreational facilities:

- 7 basketball courts (6 lighted)
- 4 playgrounds
- 3 community gardens
- 2 softball diamonds
- 2 baseball diamonds
- 1 skate park
- 1 soccer/football field (lighted)
- 1 tennis court (lighted)

These parks are well-distributed throughout the neighborhood. However, the Acre is dense, so few opportunities exist to expand or create new open space. Additional facilities in the Acre are mostly integrated into existing parks or on parcels owned by the City via tax takings. These properties are either sold through a disposition process or identified from a specific need (e.g., a community garden). The City has plans for extensive field improvements at Koumantzelis Park and North Common; both of these improvement plans are included in the 5-year action plan.

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 small decrease to 5,367. The neighborhood has 28.32 acres of parks and 800 linear feet of multiuse path trails. The table below lists these parks.

Park	Acres
South Common	20.31
Sweeney Park	2.72
Oliveria Park	1.83
Father Kirwin Park	1.54
Rotary Club Park	0.86
Carter Street Playground	0.50
Dubner Park	0.23
Walter Lemieux Park	0.13
Father Grillo Park	0.10
Martin Portuguese Park	0.10
TOTAL*	28.32

**The Concord River Greenway multi-use path has 800 linear feet in Back Central.*

Since 2013, a new 800 foot stretch of the CRG and Phase I of the South Common Master Plan were completed. The work at South Common included a 10-foot wide multi-use path across the park, new tree plantings, and significantly improved lighting. The parks listed in the table above have 15 active and passive recreation facilities:

- 3 basketball courts (2 lighted)
- 2 tennis courts (lighted)

- 2 multiuse paths
- 1 baseball diamond
- 1 soccer field
- 1 skate park
- 1 swimming pool*
- 1 running track
- 1 fitness course
- 1 playground
- 1 community garden

**DCR owned and operated*

The newest portion of the CRG is entirely within the Back Central Neighborhood. The CRG has enhanced the quality of life for residents in the neighborhood by providing a trail system, benches, and 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. In addition, 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 shows a slight increase to 19,951. The neighborhood has 142.01 acres of open space. The total includes Shedd Park, a destination park that attracts residents from across the City. The table below lists the parks within Belvidere/South Lowell:

Park	Acres
Shedd Park	53.83
Fort Hill Park	34.51
Cawley Stadium Sports Complex	31.81
Donahue Park (fmr. Statham)	13.04
Reily School Park	3.17
Kitteridge Park	1.80
Concord River Greenway*	1.30
Knott Park	1.17
Circuit Avenue Park	0.58
Ducharme Park	0.50
Fayette Street Playground	0.30
TOTAL	142.01

**Represents greenspace created along and surrounding the multi-use path. The path is 2,700 linear feet.*

Since 2013, several investments have been made in parks within the neighborhood including field improvements at Alumni Field and renovated basketball courts at Fayette Street and Donahue Parks. Shedd Park underwent several improvements including renovations of the tennis court, field, and the playground in the Shedd Park Picnic Area to now include outdoor fitness equipment. The Pyne Arts Magnet School located in Donahue Park is having a new playground installed to better accommodate children with Autism Spectrum Disorder and other sensory issues. That playground will be installed in October 2018. The parks listed in the table above have 47 active and passive recreational facilities:

- 9 playgrounds
- 8 tennis courts (6 lighted)
- 7 picnic areas
- 6 basketball courts (3 lighted, 3 not lighted)
- 4 softball fields (1 lighted)
- 4 multi-purpose playing fields – football/soccer
- 3 baseball diamonds (2 lighted)
- 2.25 mile running track
- 2 football fields (lighted)
- 2 soccer fields (1 lighted)
- 1 splashpad

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 CRG expansion has further contributed to the existing open space available. The splashpad and pavilion at Shedd Park has 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, while still providing general public access to parks and open space.

Centralville – Census Tracts 3102, 3103, 3104

The 2000 Census figures show a population of 15,808 for Centralville, while the 2010 Census shows a slight decline to 15,237. As shown in the table below, the neighborhood currently has 67.39 acres of parkland:

Park	Acres
Gage Field	21.87
McDermott Reservoir	14.96
McPherson Playground	10.55
Hovey Field	8.54
St. Louis Playground	6.38
Dog Park	1.48
Tenth Street Reservoir	1.33
Monsignor Keenan Playground	1.02
Varnum Park	0.58
Veterans Memorial Park	0.28
Ferry Landing Park	0.15
Centralville Memorial Park	0.13
Victory Park	0.06
W. Third Street Garden	0.06
TOTAL	67.39

Since 2013, Ferry Landing Park was renovated as part of a transportation improvement project at the adjacent intersection. Monsignor Keenan Playground was expanded to include an adjacent property at 16 Hampshire Street, which formerly housed a waterworks building. The building was demolished and the land was converted into a community garden and open greenspace. Years ago, the City of Lowell created a dog park in the neighborhood at the request of residents. At the time the location identified was city property owned by the Water Department, this location was always intended to act as a temporary spot until a more permanent solution could be decided upon. At this time the dog park remains open but the Water Department has notified users that they will require the full use of that property soon. An action item to create a new dog park is part of the five-year plan. The parks in this neighborhood have 35 active and passive recreational facilities:

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

Centralville residents have many diverse recreational opportunities within the neighborhood. Several planned improvements in the five-year action plan will affect this neighborhood (e.g., INSERT). Although the neighborhood will lose the open space available at the existing dog park in the near future, the City hopes to add a new Riverview Park. The City, in collaboration with the Disability Commission is in the early planning stages of renovating the existing and dated playground at Hovey Park into the City’s first fully accessible playground.

Downtown – Census Tract 3101

The 2000 Census figures show a population of 3,881 for Downtown Lowell. The 2010 Census figure show a large increase to 5,267. Since 2013, one new park and 0.29 acres were created Downtown. The new park, Utopia Park, is in the Hamilton Canal Innovation District. At this time, the park is undergoing a renovation to accommodate a large piece of public art. The sculpture, called *Hydro* was designed by artist Nancy Selvage. Lucy Larcom Park underwent a renovation to improve accessibility with improved walkways. The Merrimack Canal along Lucy Larcom Park also had colorful LED lights installed to add visual interest in the park at the evening. This section of the city contains approximately 5.46 acres of open space found at these locations:

Park	Acres
Lowell Memorial Auditorium Greenspace	2.22
Lucy Larcom Park	1.27
Kerouac Park	1.02
Creegan Park	0.47
Utopia Park	0.29
Victorian Garden	0.10
Derby Park	0.09
TOTAL	5.46

As the Downtown is the central business district and is largely built out, little land is available to create new parks and open spaces. The train at Mack plaza has provided play space for younger children and is the only climbing structure for children in Downtown. Mack Plaza is owned and maintained by DCR. The Downtown has several canal walks within the neighborhood that are owned and managed by the National Park Service, and provide residents and visitors access to passive recreational opportunities along the water.

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 increased to 30,190. The neighborhood currently has 56.60 acres contained in these parks:

Park	Acres
Highland Park	19.97
Edwards Soccer Field	8.79
Hadley Field	5.88
Callery Park	5.50
Clemente Park	3.02
Mulligan Park	2.78
Durkin Playground	2.76
Tyler Park	2.00
Doane Street Park	1.40
Armory Park	1.26
Scullin Park	1.20
Crowley Park	0.61
Lincoln Square Park	0.50
Perry Playground	0.41
Coburn Park	0.25
Smith Street Gardens	0.16
Finneral Park	0.08
Noonan Family Park	0.03
TOTAL	56.60

Most parks in the Highlands neighborhood are well-distributed. Since 2013, several parks in the Highlands underwent renovation including tennis court and field renovations at Callery Park and a total renovation at Mulligan Park in collaboration with the Lowell Housing Authority. In 2015 Mulligan Park had a splashpad installed to replace a closed pool. The playground on site was completely renovated, the basketball courts were resurfaced, and the City's first wiffle ball field was installed. Located in the parks and playgrounds listed above are 47 facilities:

- 10 basketball courts (5 lighted)
- 9 playgrounds
- 7 baseball diamonds (4 lighted)
- 6 volleyball courts
- 5 tennis courts (5 lighted)
- 2 skate parks
- 2 bocce courts
- 1 football/soccer field
- 1 softball diamonds (lighted)
- 1 splashpad
- 1 track
- 1 community garden
- 1 whiffle ball field

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 during 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 shows an increase to 15,020. The neighborhood has 92.70 acres contained in the several parks:

Park	Acres
LeBlanc Park	60.00
Wang Soccer Fields	20.00
Father McGuire Playground	4.59
Campbell Park	4.07
Wannalancit Park	2.00
Pawtucket Memorial Park	1.20
Fells Playground	0.64
Bourgeois Park	0.20
TOTAL	92.70

Since 2013, one new playground was added to Father Maguire Park. The City also updated the playground at Campbell Park, improved circulation and access to the parking areas, and increased pedestrian safety. The Pawtucket Memorial Park also benefited from a field renovation project in 2017. Located in the above parks are 28 facilities:

- 8 playgrounds
- 4 basketball courts (lighted)
- 4 picnic areas
- 3 baseball diamonds (2 lighted)
- 2 softball diamonds
- 2 tennis courts
- 2 football/soccer fields
- 1 volleyball court
- 1 swimming beach*
- 1 multi-purpose field

**DCR property, maintained and staffing by City of Lowell in summer season*

Part of the 1,015-acre Lowell-Dracut-Tyngsborough State Forest is 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, along the Merrimack River also provides an excellent place for walking and jogging, as well as other outdoor

community events, including canoe, kayak and paddleboard rentals from the UMass Lowell-owned and operated Bellegarde Boathouse. Rynne Beach provides residents with a beach and water access on the Merrimack River.

Sacred Heart – Census Tracts 3121, 3122

In 2000, Sacred Heart contained a population of 7,853. The 2010 Census shows a slight decline to 7,458. Since 2013, O’Donnell Park was renovated to remove a pool and replace it with a new splashpad. The neighborhood has 27.19 acres of recreational land contained in four parks.

Park	Acres
O’Donnell Park	15.29
Manning Field	11.00
Muldoon Park	0.55
Maher Park	0.35
TOTAL	27.19

Extensive open acres in the form of cemeteries 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. Located in the above parks are 17 facilities:

- 5 basketball courts
- 4 playgrounds
- 3 tennis courts
- 2 softball diamonds
- 1 baseball diamond
- 1 splashpad
- 1 handball court

The development of the CRG will play an important role in enhancing the quality of life for this neighborhood. This interconnected trail will provide neighborhood residents’ access to the Concord River and an opportunity to access the Back Central, Belvidere, and Downtown neighborhoods via the path.

SUMMARY OF RECREATIONAL FACILITIES

The City inventoried public recreational facilities for the last OSRP. From that data, DPD Staff reviewed and updated the information to include improvements and additions. The information included above and in the Table 8 reflects the City’s inventory in 2018.

Table 7.1: Inventory of Recreational Facilities in Lowell

Recreational Activity	Number of Facilities
Basketball Court	43
Play Area	40
Tennis Court	27
Baseball Field	22
Football/Soccer Field	17
Softball Field	14
Picnic Area	12
Volleyball Court	8
Community Garden	8
Skateboard Park	4
Splashpad	3
Swimming Pools	2
Tracks	2
Bocce	2
Multiuse Path	2
Handball Court	1
Beach/Boathouse	1
Multi-Purpose Field	1
Dog Park	1
Wiffle Ball Field	1
Public Access Beach	1
TOTAL	212

MASSACHUSETTS STATEWIDE COMPREHENSIVE OUTDOOR RECREATION PLAN (SCORP)

The Massachusetts Executive Office of Environmental Affairs, Division of Conservation Services (DCS), developed the Massachusetts Statewide Comprehensive Outdoor Recreation Plan (SCORP) 2017 to assess statewide open space and recreational needs. The Office conducted extensive outreach through community meetings and written and telephone surveys to gather information about the kinds of recreational activities people participate in and would like to see in their communities. Overwhelmingly popular activities included walking, jogging and running, while other activities such as hiking, road biking, and gardening were also popular.

The four main goals from the 2017 SCORP plan align with the 2018 OSRP:

1. Support the statewide trails initiative;
2. Increase the availability of water-based recreation;
3. Support the creation and renovation of neighborhood parks; and
4. Invest in racially, economically, and age diverse neighborhoods given their projected increase in participation in outdoor recreation

Residents want more pedestrian and bicycling access across the city and to connect all our open spaces. Two main goals in the five-year action plan focus on pedestrian and cycling improvements. Action items include expanding interconnected trails (e.g., Concord River Greenway and the Riverwalk) and providing new connections along the City's canal system. Lowell is fortunate to have both the Concord and Merrimack Rivers flowing through the city, along with several canalways. During our public outreach process residents wanted to see our waterways activated more, including in the winter (e.g., ice skating on the canals). Lowell will continue to work on trails along waterways. In addition, the City will 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. Lowell residents also want to see more splashpads, and they would like to see municipal pools maintained, especially since splashpads do not provide the same access to adults.

To ensure all Lowell residents have access to outdoor public recreational space, the 2018 OSRP includes several action items to create better and safer, non-vehicular means of access to parks and open spaces. Parks and open spaces are well-distributed throughout the city, but residents expressed concerns getting to some parks because paths to access them on foot or bike are intimidating. Focusing on pedestrian and biking routes and access will make it easier for residents to get to their neighborhood parks instead of traveling outside their neighborhood or the city. Improved maintenance of our open spaces is also a priority for the City in the next five years. Residents expressed some frustration about the lack of regular maintenance at local parks and pointed to that as a reason they did not go to parks close to their homes.

Creating new open space and recreation areas is just one part of the equation. The other piece is ensuring that residents are aware of the opportunities available to them. To that end, the City is going to ensure information is readily available and communicated to the public. This communication will be done in new ways, such as through a better utilization of municipal social media accounts, and will be prepared in multiple languages to make it more accessible to our non-English speaking residents. Lowell is a racially, culturally, and economically diverse community. Language barriers or confusion about what facilities are available in our community should not stop someone from being fully able to enjoy the many opportunities that are available to all our residents.

SUMMARY OF MANAGEMENT NEEDS

ENVIRONMENTAL JUSTICE

As designated by the Massachusetts Executive Office of Energy and Environmental Affairs, Lowell is an Environmental Justice Community. Per the 2010 U.S. Census, 87.6% of Lowell's population lives in an environmental justice block group where:

- Annual median household income is equal to or less than 65% of the statewide median (\$62,072 in 2010);
- 25% or more of the residents identify as a race other than white; or
- 25% or more of households have no one over the age of 14 who speaks English only or very well - English Isolation

Important goals tied to Environmental Justice came out of the outreach process for this plan:

- 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;
- Expanding 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
- Identifying parcels of land to permanently protect.

The Trust for Public Land has developed a set of tools that helps map and analyze parks. Of particular relevance to Lowell, is "ParkServe" which looks at walking distances to parks. This tool reveals that 91% of the City residents are within a 10 minute walk to a park. This leaves a

population of 9,778 residents that are not within a short walk. This information is vital when planning for renovation and acquisition of recreation space in Lowell.⁵

PLANNING RESOURCES

Planning is about regulating the use of land and resources to meet the future needs of the community. In a city like Lowell, planning can guide the type of development that will occur and how land in the city is developed and/or redeveloped and ensure that all competing interests have the opportunity to be heard on land use projects that may affect them. Planning plays an important role in issues such as:

- Conserving historic landmarks and urban areas;
- Ensuring that developments have pedestrian, vehicle, and transit access;
- Protecting scarce resources;
- Protecting against incompatible land uses;
- Protecting the environment;
- Ensuring public access to State and regional facilities; and
- Safeguarding the safety and security of the community.

Several tools can protect the interests of a community as individual land use decisions are made:

- A guiding document such as a the City's comprehensive master plan, Sustainable Lowell 2025, which spells out community goals and actions based upon a shared vision.
- City of Lowell Zoning Ordinance, which spells out uses, setbacks, landscape requirements, parking requirements, etc. Lowell's Zoning divides the city into districts based upon allowed density and design (urban, traditional neighborhood and suburban districts) and the types of uses allowed (business, single family, multi-family, mixed-use, etc.).
- This document identifies key areas to provide parks, playgrounds, forests, farms, walkways, greenways, bike paths, riverwalks, and other forms of community open space.
- Urban renewal plans (such as Lowell's JAM, Acre, and Ayer's City plans) to address the redevelopment of areas of 'blight' and disinvestment.
- Neighborhood plans identify specific interventions and action steps to help individual neighborhoods and districts.
- Investment in public infrastructure improvements, including transportation improvements, park and playground development, intersection upgrades, traffic calming, and more.

⁵ <https://parkserve.tpl.org/city/id/2537000/>

- Recommendations to appointed or elected bodies on the consistency of individual projects with the planning documents created by the community with the input of the public.

OPEN SPACE PLAN COMMITTEE

The City must continue to evaluate underserved neighborhoods and develop a strategic plan to create more open spaces or recreation opportunities for those residents. The most significant management need relating to open space and recreation in the City is an oversight group that will administer and implement this OSRP. Without a permanent Open Space Plan Committee, this document will only remain a document, and few (if any) of its recommendations will materialize. Once the City adopts this plan, a committee should be created immediately. This advisory group should be representative of the community and include residents, community leaders, city workers and officials who commit to open space and recreation issues. The committee will be responsible for bringing to life the objectives and action steps outlined here, and for updating this Plan again when the next five-year mark approaches.

Creating an Open Space Plan Committee was a goal of the 2013 plan that was unfortunately not acted upon. In between releasing the 2013 draft plan and the final document, the City underwent a change of administration. During this time of transition, and with many other significant municipal projects underway, it was impossible to implement this action item. We have included it again in this plan and have the commitment of the Office of the City Manager to act upon this particular item quickly.

In addition to the future committee, the City will rely on its various departments, boards and community partners to oversee and implement the goals of this plan. The City's Parks and Recreation Departments have seen much of their funding reduced. Thus far, the City has done its best given its budget. However for the future, the City must consider a reallocation of resources, and the Parks and Recreation Departments must pursue significant grant resources and identify private partners that may be able to assist them in meeting their goals.

Limited communication with neighboring communities occurs 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 affect 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. Once created, the Open Space Committee would engage with neighboring communities on ways to collaborate to meet individual goals and improve our region.

The Open Space Committee could address a few items immediately. These items would have long-term significance to the creation and protection of open space in the City. Given the small

amount of land available for development, the City should consider creating opportunities for privately owned public land through zoning provisions, deed restrictions, subdivisions, public-private partnerships, and any other creative methods. These actions would require the City to update its Subdivision Rules and Regulations to accurately reflect development opportunities or update the City's Zoning Ordinance to create agriculture zoning restrictions to protect the larger tract of lands currently used for agriculture purposes in perpetuity. Should the City consider both public and private opportunities for increased open space, residents will be able to enjoy our urban environment for many years to come.

The City's management needs boil down to two objectives:

1. Increase funding and support for City departments that directly oversee open spaces, recreational programming, and property maintenance; and
2. Improve collaboration within the City administration through the creation of the Open Space Implementation group, as well as with residents, major landholders in the city, regional agencies and neighboring communities

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Section VIII

GOALS AND OBJECTIVES

The City of Lowell has identified the following goals and objectives to provide city residents equitable access to recreational opportunities. The following goals and objectives will help guide the City's capital needs improvements and funding requests in the coming years. An extensive community outreach process helped identify these priorities for the community. These goals and objectives are also consistent with the Sustainable Lowell 2025 Master Plan and the Massachusetts Statewide Comprehensive Outdoor Recreation Plan (SCORP).

Goal 1: Improve pedestrian connections and experience throughout all neighborhoods to provide residents safer access to parks, open spaces and the opportunity to walk as a form of exercise or for leisure.

- Continue to implement the City's Complete Streets policy, to create a multi-modal transportation system designed to provide improved mobility and accessibility opportunities for all users regardless of their age, income or ability.
- Rate sidewalk availability and condition across the city to help determine highest and best use of limited municipal funds for improvements.
- Assess all sidewalks for ADA compliance and determine appropriate steps to take to bring all sidewalks into compliance through an ADA transition planning process.
- Ensure all city parks have appropriate pedestrian infrastructure in place to allow residents safe access to available parks.
- Work on improvements to infrastructure that support non-vehicular access to parks and open spaces across the City.
- Continue to work on multi-modal path creation and regional rail trail connections.
- Continue to improve the pedestrian experience by creating a buffer zone on sidewalks with improved landscaping and street furniture zones.
- Activate canal walkways and riverwalks to encourage use and connect residents to City's waterways.

Goal 2: Improve cycling infrastructure across the city; prioritize non-vehicular modes of travel and recreational opportunities for residents.

- Continue to work on multi-modal path creation and regional rail trail connections.
- Continue to implement the City's Complete Streets policy, to create a multi-modal transportation system designed to provide improved mobility and accessibility opportunities for all users regardless of their age, income or ability.
- Work on improvements to infrastructure that support non-vehicular access to parks and open spaces across the City.
- Improve availability of infrastructure to support bike usage across the city.

- Enhance connectivity around the city with improved cycling infrastructure.
- Work with private and institutional partners to create more of a cycling friendly culture in the City.

Goal 3: Increase and improve the availability of water-based recreational opportunities for residents of Lowell.

- Increase access to and utilization of the Concord and Merrimack Rivers for local residents.
- Improve access points to the river for boats, kayaks and canoes.
- Work with appropriate entities to introduce more recreational opportunities on the rivers and canals for City residents.
- Improve safety and maintenance conditions along the river and canals to provide residents safe and clean access points to walkways and riverwalks.
- Continue to provide residents across the city access to water based recreational opportunities during warm weather months.

Goal 4: Prioritize improved maintenance, security and preservation of parks and open spaces across the city and provide amenities residents have expressed an interest in seeing available to them.

- Deploy staff efficiently across the city to clean and maintain parks and open spaces across the city.
- Explore solutions for park maintenance including encouraging volunteerism and public/private partnerships to promote and care for parks and open spaces.
- Identify prospective locations for open space preservation across the city, work with local land trusts and nonprofits to preserve open space and continue to protect, maintain and preserve municipal open spaces.
- Institute standards for lighting quality at all parks and open spaces and consistent rules for lighting installation and operating hours at locations across the city.
- Prepare for continued extreme weather events and establish procedures for tree/limb removal at municipal properties, and residential locations.
- Implement a proactive urban forest policy that includes preservation, maintenance and a planting plan to increase and diversify the City's tree canopy.
- Broaden the type of amenities and facilities available to best reflect the diverse interests of the public.

Goal 5: Improve communication to the public regarding parks, open spaces, available amenities, and events occurring showcasing these spaces across the community.

- Continue to develop and support diverse programming of special events held in Lowell's public spaces, with a focus on the City's many neighborhoods.

- Increase the public’s knowledge of the City’s open spaces, natural resources and many recreational opportunities.
- Utilize a variety of communication tools to outreach to Lowell residents regarding availability of recreational opportunities within the City.
- Seek opportunities to integrate historic preservation and education with the creation and celebration of open spaces throughout the City.
- Improve signage at parks regarding rules and regulations for use of location, litter and hours of operation.

Goal 6: Increase recreational opportunities and improve existing parks and open spaces for the enjoyment of all residents of the community regardless of age, ability and neighborhood of residence.

- Implement universal design standards at new parks and during renovation of existing park locations.
- Seek funding to allow for an expansion of recreational programming offered by the City.
- Plan new parks and open spaces and renovations to spaces with multi-generational uses in mind.
- Improve park access to all City residents in all neighborhoods.

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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 action items identified since resources and other variables may change, accelerating or postponing implementation of any one action.

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Goal 1: Improve pedestrian connections and experience throughout all neighborhoods to provide residents safer access to parks, open spaces and the opportunity to walk as a form of exercise or for leisure.

#	Action	Responsible Entity	Possible funding sources	Implementation year				
				1	2	3	4	5
1	Install appropriate signage, and/or rectangular flashing beacon signs at high traffic crosswalks across the City to alert drivers to pedestrians in crosswalks	City Engineering, DPD, City Electricians	State, City	x	x	x	x	x
2	Enforce ordinances against parking on sidewalks and parking too close to intersections to provide pedestrians full access to sidewalks and give drivers optimal views of pedestrians in crosswalks	Lowell PD	City	x	x	x	x	x
3	Extend the Vandenberg Esplanade to create the Pawtucket Falls Overlook	DPD, LNHP, DCR, MassDOT, NMCOCG	City, State, Federal			x	x	x
4	Continue working to complete phases of the Concord River Greenway	DPD	State, City	x	x	x	x	x
5	Continue supporting advancement of the Bruce Freeman Rail trail Connection in Lowell	Bruce Freeman Rail trail, DPD	State, City	x	x	x	x	x
6	River Meadow Brook Design Planning	DPD	City, State					x
7	Planning and design of the Merrimack Riverwalk-North Bank	DPD, DCR	City, State,	x	x			
8	Build the Merrimack Riverwalk Phase II-Bridge Street Node	DPD, LNHP	State, City	x	x			
9	Continue to research viable solutions to connect Western Avenue Studios to Downtown and Acre neighborhoods.	DPD, Western Ave Artists Association	City	x	x	x	x	x

10	Continue to pursue viable solutions to connect Hawk Valley Farm, Pawtucket Memorial Park and Regatta Field.	DCR, LPCT, DPD	City	x	x	x	x	x
11	Incorporate public art on and along sidewalks throughout the city, including temporary and permanent installations where appropriate.	DPD, Cultural Affairs and Special Events (CASE) Office	Lowell Cultural Council Funds, CDBG			x	x	x
12	Identify and improve intersections and locations utilized regularly by pedestrians where there is currently no appropriate infrastructure in place	Engineering Office, DPW, DPD	City, State, Federal	x	x	x	x	x
13	Ensure right of way is clear and usable for people of all abilities throughout the winter months and enforce strict adherence to standards across the city for private property owners	LPD, DPW, Inspectional Services	City	x	x	x	x	x
14	Implement the Downtown Lowell Pedestrian Improvement Project	DPD, LNHP	CDBG, Federal	x	x			

Goal 2: Improve cycling infrastructure across the city; prioritize non-vehicular modes of travel and recreational opportunities for residents.

#	Action	Responsible Entity	Possible Funding Sources	1	2	3	4	5
1	Undertake an extensive bike master planning process to assess existing conditions, infrastructure, assess routes and identify opportunities to improve connections across the City, and ongoing maintenance needs for infrastructure	DPD	City			x		
2	Ensure that all new bike lane infrastructure is connects to logical, and useful routes for riders	DPD, Engineering, DPW	City	x	x	x	x	x

3	Educate drivers and cyclists about rules of the road and how to peacefully coexist on the City's roadways	DPD, LPD, Mass In Motion, MassBike, Lowell Bicycle Coalition	City, State, Federal	x	x	x	x	x
4	Launch a bike share program throughout the City	Office of the City Manager, DPD, VeoRide	Private	x				
5	Install bike racks throughout neighborhood business districts, all schools and parks	DPD, DPW, Parks, Lowell Public Schools	City, State, CDBG	x	x	x		
6	Identify locations across the City for new bike lane infrastructure, including several design options, such as sharrows, painted lanes, protected lanes, and cycle tracks	DPD, Engineering, Mass in Motion, Lowell Bicycle Coalition	City	x	x	x	x	x
7	Implement a neighborhood/place based color scheme or theme for bike racks to help brand neighborhoods	DPD, Neighborhood Groups	City, CDBG		x	x	x	
8	Make neighborhood connections to regional rail trails more accessible and safe for riders.	DPD, Engineering, DPW	City, State, Federal			x	x	x
9	Map bike routes that are off major roadways to provide riders and opportunity cycle in low speed, low traffic areas	DPD, Engineering, GIS Dept.	City	x	x			
10	Clarify rules and regulations regarding use of bikes on various canal walkways, Riverwalk and other multi use paths	DPD, DCR, Lowell National Historical Park (LNHP)	City	x				
11	Continue working to complete phases of the Concord River Greenway	DPD	State, City	x	x	x	x	x

12	Continue supporting advancement of the Bruce Freeman Rail trail Connection in Lowell	Bruce Freeman Rail trail, DPD	Private, City, State	x	x	x	x	x
13	Install temporary bike lane infrastructure to pilot locations and routes prior to permanent installation	DPD, Engineering, DPW	City, State	x	x	x	x	x

Goal 3: Increase and improve the availability of water-based recreational opportunities for residents of Lowell.

#	Action	Responsible Entity	Possible Funding Source	1	2	3	4	5
1	Build additional splash pads in neighborhoods across the City and continue to maintain public pools accessible to residents	DPD, Parks	City, State, CDBG, Private Foundations	x	x	x	x	x
2	Consider establishing an after-hours splash pad nights specifically for adults, to allow adults equal access to water recreational opportunities	Board of Parks, Parks, Recreation Dept.	City	x				
3	Purchase water wheelchairs for each city splashpad to provide wheelchair bound residents' access to water recreation in the City	DPD, Parks, Disability Commission	City, Disability Commission, Private Foundation	x	x	x		
4	Improve changing room facilities at municipal pools	Parks Dept.	City, CDBG	x	x			
5	Research the possibility of a publically owned boat house for residents and opportunities to provide more classes, rentals, launches and a local rowing club	DPD	City, State, Private Foundations	x	x			
6	Investigate the possibility of dinner boat cruises on the Merrimack River	DPD, Economic Development Office	City		x	x		
7	Continue to support rowing events, regattas, whitewater rafting and festivals that utilize the Concord and Merrimack Rivers	UMass Lowell (UML), CASE, LPCT, DCR, DPW	City, State, Private Foundations	x	x	x	x	x

8	Continue to provide free public access to Rynne Beach along the Merrimack for public swimming opportunities	DCR, Parks, Recreation Dept.	City, State	x	x	x	x	x
9	Activate select canals for activities like ice skating bumper boats, canoeing, and events	DPD, Parks, CASE, LNHP, Enel Corp, Lowell Historic Board, Lowell Waterways Vitality Initiative	City, State, Private Foundations			x	x	x
10	Investigate the opportunities to build a fully ADA accessible fishing dock along the river to provide better access for residents to access the water	DPD, Disability Commission	City, State, Disability Commission			x	x	x
11	Improve boat launch at Muldoon Park to provide more opportunities for use of at events along the Concord River	DPD, LCPT	City, State					x

Goal 4: Prioritize improved maintenance, security and preservation of parks and open spaces across the city and provide amenities residents have expressed an interest in seeing available to them.

#	Action	Responsible Entity	Possible Funding Source	1	2	3	4	5
1	Re-institute Article 97 protections on Cawley Stadium	City Law Dept., DPD	City	x				
2	Conduct a comprehensive study of available maintenance staff time and all facilities currently being maintained seasonally to better inform staff deployment strategies	Parks, DPD, DPW	City	x				
3	Create a preventative maintenance master plan for all parks and open spaces across the city	Parks, DPW, DPD	City	x				

4	Establish an Open Space Committee with municipal staff and members of the public	DPD, Parks, DPW	City	x					
5	Create a How-to/FAQ on website and print with information to organize clean ups and to reserve the City's Community Action Trailer (CAT) Cart with essential clean up supplies to encourage community stewardship	DPW, MIS Dept.	City	x					
6	Create a clear process for private entities interested in volunteering for days of service with the city to connect with appropriate staff and identify priority locations for cleanup	Parks, DPW	City		x				
7	Prepare for continued extreme weather events and edit the existing tree ordinance to establish a process for tree replacement due to storm damage	DPD, Parks, DPW	City, CDBG		x				
8	Continue to support the expansion of the City's Community Gardening Program and improve urban agricultural uses in the City	DPD, DPW, Water Dept.	City, CDBG	x	x	x	x	x	
9	Expand the Adopt an Island program to provide private institutions the opportunity to adopt pocket parks or larger open spaces for maintenance support to supplement municipal work	DPD, Parks	Private		x	x	x	x	
10	Adopt creative ways to introduce more greenery into municipal projects including the installation of green roofs and green/living walls on appropriate municipal projects	DPD, DPW	City, State, Federal	x	x	x	x	x	

11	Increase vegetation and natural landscapes in more densely populated neighborhoods that have limited park spaces	DPD	City, State, CDBG	x	x	x	x	x
12	Create and widely distribute information to residents about ways to communicate directly with the city about maintenance needs at city parks and open spaces	DPW, Parks	City	x	x	x	x	x
13	Create signage with listed fines for littering and not picking up after dogs, etc. and enforce ordinances related to these nuisance issues	DPW, Parks, Inspectional Services, Lowell PD	City	x	x	x	x	x
14	Create a public education campaign to educate the public about the process to have sharps removed from public parks and open spaces	Health Dept., Lowell PD, Inspectional Services	City, State	x	x	x	x	x
15	Work with Health Department and other local health officials to ensure safe and timely removal of sharps disposed of at parks and open spaces	Health Dept., Lowell PD	City	x	x	x	x	x
16	Increase the number of trash cans available at parks and open spaces	Solid Waste & Recycling, DPW	City	x	x	x	x	x
17	Build an improved dog park	DPD	CDBG, Private Foundation			x		
18	Install more picnic tables at select park locations to provide more picnic locations at parks across the City	DPD, Parks	CDBG, City, State			x	x	x
19	Work with small businesses, vendors and food trucks to provide more consistent services at parks throughout the city on a more consistent basis	Economic Dev, Parks, Inspectional Services,	City, Private		x	x	x	x
20	Provide better restroom facilities at parks	DPD, Parks, DPW	City, CDBG, State			x	x	x

21	Install or fix water bubblers at parks and open spaces across the city	DPW, Parks	City, CDBG, State			x	x	x
22	Introduce more interactive public art in parks	DPD, Parks, CASE	City, CDBG, State		x	x	x	x
23	Install electric vehicle charging stations at parks	DPD, DPW, Parks	City, State, Private Foundations				x	x
24	Work with the proprietors of the canal system, the National Park, and other stakeholders to develop and implement a canal clean-up program	DPD, DPW, LNHP, Enel Corp., Canalwater Cleaners	City, Federal, Private	x	x	x	x	x

Goal 5: Improve communication to the public regarding parks, open spaces, available amenities, and events occurring showcasing these spaces across the community.

#	Action	Responsible Entity	Possible Funding Sources	1	2	3	4	5
1	Add signage at parks—explaining the history of location names and background information about the location prior to the park’s creation	DPD, Lowell Historic Board	City			x	x	x
2	Create designated walking tour routes with markers providing historic location information and clearly mapped routes of varying distances	DPD, Lowell Historic Board, LNHP	City, State, Federal					x
3	Streamline the availability of open space and recreation information available online	MIS, Parks Dept., Rec Dept.	City				x	x
4	Utilize social media for outreach and cross promote events with local partner organizations	CASE	City	x	x	x	x	x
5	Install maps at parks that show the locations of other parks and green spaces in the area and routes to follow to get there	DPD, Parks	City				x	x

6	Translate important signage and information about open space and recreational opportunities into other languages	DPD, Parks	City	x	x	x	x	x
7	Increase the clarity and transparency about the process for reserving spaces, including translating information about this process in other languages	Parks Dept., Rec Dept., Board of Parks, DPW	City	x	x	x	x	x
8	Work with event organizers to identify underutilized locations across the City that may be a good fit with new events	CASE, Parks Dept., DPW	City, Private	x	x	x	x	x
9	Work with annual event organizers to assess available locations, confirm venues align with event needs, and assist with relocation if location needs have changed	CASE, Parks Dept., DPW	City, Private	x	x	x	x	x
10	Encourage pop-up events like Parking Day, temporary art installations throughout the city	CASE, Lowell Cultural Council, DPD, Parks, DPW	City, State, Private	x	x	x	x	x
11	Encourage neighborhood block parties, and seasonal events throughout the city to activate locations across the city on a more regular basis	DPW, Neighborhood Associations	Private	x	x	x	x	x
12	Continue to support the work of the Lowell Waterways Vitality Initiative to activate and highlight the City's canals and waterways	DPD, CASE, Lowell Heritage Partnership	City, Private	x	x	x	x	x
13	Organize group hike events in the state forest with educated guides	DPD, LPCT, DCR	City, State, Private			x	x	x
14	Support events like National Night Out to continue family friendly events at neighborhood parks	CASE, Parks Dept., Lowell PD	City, Private	x	x	x	x	x

Goal 6: Increase recreational opportunities, improve existing parks and open spaces, and create new parks for the enjoyment of all residents of the community regardless of age, ability and neighborhood of residence.

#	Action	Responsible Entity	Possible Funding Sources	1	2	3	4	5
1	Work with the Senior Center to identify the recreational interests of clients and seek funding to support expanded programming dedicated to seniors	Senior Center, Rec Dept.	City, Private	x	x	x	x	x
2	Work with the Disability Commission to identify appropriate accommodations to existing recreational programming that may provide more access to city residents with disabilities	DPD, Rec Dept., Parks Dept., Disability Commission	City, State, Private	x	x	x	x	x
3	Install play equipment in Downtown neighborhood	DPD, Parks Dept.	City, State, CDBG		x			
4	Install equipment geared toward older children, teens and adults such as obstacle courses and climbing walls	DPD, Parks Dept.	City, State, CDBG			x	x	x
5	Partner with private entities and other institutional partners to provide passive programming in parks such as organized board game or crafting events	Parks Dept., CASE	City, Private		x	x	x	x
6	Work with the Disability Commission to investigate options to provide charging capabilities at inter-connected trail locations for electric wheelchair users	DPD, Disability Commission	City, State, CDBG				x	x
7	Designate drone use locations	Law Dept.	City	x				
8	Make improvements to Derby Park to more fully activate that location	DPD, Parks Dept., Middlesex Community College	City, State, CDBG			x		

9	Increase public access to Cawley Stadium—provide updated information about times the sites are not reserved for organized sporting events	Parks Dept., Lowell High School Athletics, Board of Parks	City, State	x	x	x	x	x
10	Fence in playground areas at Armory and Callery Parks	DPD, Parks	City, CDBG		x	x		
11	Install a shade structure at Armory Park	DPD, Parks	City, CDBG			x		
12	Assess the need for fences at other playground locations along busier streets	DPD, Parks	City, CDBG	x	x			
13	Install a shade structure over the bocce court, renovate basketball court and skatepark at Clemente Park	DPD, Parks	City, CDBG, State				x	x
14	Pursue potential opportunities to access Western Canal from Clemente Park	DPD	City					x
15	Renovate Clemente Field at Koutmanzelis Park to include improved lighting, concessions, restrooms, and a scoreboard	DPD, Parks	City, CDBG	x	x	x		
16	Pilot a program to designate certain portions of the riverwalk or other locations as designated cross-country skiing/snowshoeing locations	DPD, DPW	City		x			
17	Construct Phase II of the South Common Master Plan	DPD, Parks Dept.	City, CDBG, State	x	x			
18	Renovate Kerouac Park	CASE, DPD, Parks	City, CDBG, Private	x	x			
19	Work with the National Park Service to expand opportunities for canal and river boat tours	CASE, DPD, Parks, LNHP	City, Federal,		x	x	x	x
20	Work with the University of Massachusetts Lowell to more publicly advertise recreational opportunities available in the community to students, faculty and staff	DPD, UML	City, State	x	x	x	x	x

21	Identify locations to create ice skating opportunities in winter months, and pilot a location	DPD, Parks, DPW	City	x	x			
22	Coordinate with environmental remediation efforts and construct Riverview Park along Merrimack River	DPD	City, State				x	x
23	Design and construct Hamilton Canal Innovation District Park	DPD	City, State			x	x	x
24	Continue efforts to increase greenspace and improve accessibility at JFK Civic Center Plaza	DPD, DPW	City, private grants	x	x	x	x	x
25	Renovate ballfields at North Common, Oliveria, Highland, Hadley, Campbell and LeBlanc parks	DPW, Parks	City, CDBG	x	x	x	x	x
26	Renovate Manning Fields	DPW, Parks	City, CDBG					x
27	Resurface & restripe, replace nets at basketball courts at Carter Street, Perry Street and Reily School parks	DPW, Parks	City, CDBG	x	x	x		
28	Renovate playground and ballfield at Donahue Park	DPD, DPW, Parks	City, CDBG					x
29	Renovate playground at Doane Street Park	DPD, DPW, Parks	City, CDBG			x	x	
30	Renovate playground and resurface, restripe basketball court at Durkin Playground	DPW, Parks	City, CDBG			x	x	
31	Restripe, resurface and replace nets, and renovate soccer field at Gage Field	DPW, Parks	City, CDBG				x	x
32	Renovate ballfield, and resurface, restripe and replace nets at McPherson Park	DPW, Parks	City, CDBG				x	x
33	Renovate tennis courts and ballfield at O'Donnell Park	DPD, DPW, Parks	City, private grants, CDBG	x	x			
34	Renovate ballfields and replace spectator seating at St. Louis Park	DPW, Parks	City, CDBG					
35	Renovate Sheehy Park to include fitness equipment, and replace benches & picnic tables	DPD, DPW, Parks, Health Dept	City, CDBG, private grants	x	x			
36	Renovate fieldhouse/pavilion at Shedd Park	DPD, DPW, Parks	City, CDBG, State			x	x	

37	Add lighting to softball field at Father Maguire Park, and add irrigation	DPW, Parks	City, CDBG			x		
38	Restripe select tennis courts to include line markings for Pickleball and purchase appropriate nets	DPW, Parks, DPD, Health Dept	City, CDBG, private grants	x	x	x		
38	Install an accessible playground at Hovey Park	DPD, Parks, DPW	City, State, private grants		x	x		
39	Make landscaping improvements to Kitteridge Park in coordination with Rt38 widening project, and renovate existing playground	DPW, DPD, Parks	City, State	x	x	x	x	x
40	Make improvements at Cawley Stadium including renovating spectator stands, and press box, and replace field turf	DPD, DPW, Parks	City, State		x	x	x	x
41	Make improvements to Alumni and Martin fields including new field netting and a new clubhouse building	DPW, Parks, DPD	City, State				x	x

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