LAWRENCE, MA

Spring 2013

Greenway Plan

University of Massachusetts Amherst
Department of Landscape Architecture and Regional Planning

Run Chen, Jay French, Sean Regnier, Steven Sanborn
LA 497C Senior Capstone Studio: Landscape Planning Studio
# Table of Contents

## Analysis & Assessment
- History 2
- Regional Context 4
- Recreation and Protected Open Space 10
- Merrimack River and Manchester Lawrence Corridor 16

## Greenway Design
- Concept 18
- Spicket River 20
- Canal/Island 32
- Rail Trail 37
- Merrimack River 41

## Conclusion
- References 50
The city was settled in 1708 and became a city in 1853. The people of the Essex Company, which used the local rivers to power the mills of the city, built the city. The majority of the production was from the textile mills and those are what employed most of city. The Essex Company is responsible for most of the parks in the city by donating acres of land to be used for parks and public land. The city has been known as the “immigrant city”, during the years of the mills running, jobs were high in demand. With the high number of jobs came a high number of immigrants from across the globe, but mostly an Irish population. The introduction of synthetic fibers moved the mills south and created an immediate decline in jobs in the middle of the 19th century. The population had an extreme drop in numbers, the population drop left much of the mills, business and residential buildings to be abandoned.

But in recent years the city has received new life by the Hispanic people filling much of the city voids. With the new life the city is in demand of making the heavily industrialized city into a green city that displays its rich cultural history. There are some locations throughout the city that can describe the city’s history as well as create a green network. These locations and links can be linked together by proposed and existing trails.

The North Canal mills were built between the years 1845 and 1858. The canal runs along the edge of the Merrimac River and creates an island that is home to the mills. The design was done by Charles Storrow who was the architect and engineer of many of the buildings prior to the North Canal. Part of the construction was to create “The Great Stone Wall Dam” to feed into the canals. The canals run for about a mile and are 100 ft wide and they were used to power the mills on the island. There were twelve lots, each of the lots were given a 3rd of the mills energy for a fee of $300. The properties were auctioned off to the highest bidder. The majority of the investing companies were textile manufacturing companies. But with the introduction to synthetic fibers in the early to mid 20th century the mills were moved to the southeast. With the mills moving to the southeast the jobs left the city. The mills were left to be abandoned but they were put on the National Historic Register in 1975. Today they are now to be used as retail, art studios, and residential buildings.

The Arlington Mills are northwest corner of Lawrence and cross the border into Methuen. The mills were built by the Robert M. Bailey Company in 1865 along the Spicket River. However in 1866 the mills
burnt down and had to be rebuilt in 1867. The Arlington Mills produced cotton goods to make worsted’s and dresses. In the future they started to produce more products such as mohair and alpaca. Again after the growth of the production, more land was added to build more mills. In fact in 1905 the companies spent 1 million dollars to expand, and even more in 1917 with building the Arcadia Mills. However like the North Canal, in the 40s and 50s the mills were closed and much of them took their business south.

In the 1840s the transport of their goods were done by steamboat. But with the creation of “The Great Stone Wall” in 1848 came the decrease of the water level. With the decrease of the water level the boats could not transport large amount of goods on the Merrimack River. The Boston-Maine Railroad then developed the Methuen Railroad line. While that was being built the Manchester, NH-Salem, NH Railroad was being built and the two railroads were connected. But in the late 19th century the New Hampshire lines were connected to the Boston lines, and eventually the Methuen/Lawrence line were lightly used and abandoned.

The North Common is a 17.5 acre common donated by the Essex Company in 1848 for the people of Lawrence, Ma. It was once a sand heap and a swamp that was transformed into a recreational park. But after WWII the park was named for the three Campagnone brothers of Lawrence who gave their lives during World War II. A number of memorials can be found at Campagnone Common. A Civil War memorial, erected in 1881, listing the names of the men from Lawrence who fought for the Union can be found. The common also is the home to memorials from the World War II, the Spanish-American War, the Gulf War, and the Korean War.

These locations throughout the city of Lawrence can relate to the to the history of the city at all points of time. As well as being a historical representation of the town, it can connect to each other in a spatial way. The spaces defined are key features of the history and it has links to existing neighborhoods, as well as proposed neighborhoods in the old mill factories. These spaces could be linked together in a node and corridor system that have direct connections to neighborhoods, commercial areas, as well as cultural areas along the way. These historical sites can be connected by the existing Spicket River Greenway, as well as the proposed Lawrence-Manchester, NH greenway. Together they can be a green system that represents the strong cultural history of the town, that incorporates all neighborhoods of the town.
Lawrence is a bustling postindustrial city of 76,377 (2010 Census), located in northern Massachusetts near the border of New Hampshire in Essex County. Cities that border Lawrence are: Methuen, Haverhill, Andover, Lowell, Dracut, Tewksbury, and Georgetown. Lawrence is located approximately 28.5 miles north of Boston and 88.6 miles northeast of Amherst. The city was settled in the 1650s and incorporated in 1847, it was roughly half the size that it currently is and only located on the north side of the Merrimack River. The city was founded as a textile manufacturing city oriented around the hydropower provided by the Merrimack River. The area around Lawrence is full of amenities which can be used to provide points of interest in a greenway plan, such are as follows: The Lake Cochichewick Scenic area, a bird sanctuary, Andover Trail, Bay Circuit Trail, Den Rock Park, a wooded conservation district on the southern edge of Lawrence that spans the Lawrence-Andover town line, provides recreation for nature lovers and rock-climbers (Andover Trail Committee), and multiple riverside parks along the Merrimack River.
POPULATION AND DEMOGRAPHICS

According to the 2010 U.S. Census, Lawrence has a population of 76,377, rising 6% from its’ 2000 census of 72,043, with a density of 10,973.7 people per square mile. There are 27,137 households in Lawrence with 25,181 of them occupied. The racial makeup of the city is 42.8% White (20.5% non-Hispanic), 7.6% Black or African American, 2.5% Asian, 1.3% American Indian or Alaskan Native, 0.1% Hawaiian Native or Pacific Islander, 39.3% some other race, 6.5% two or more races, and 73.8% of the population is Hispanic or Latino. The median household income for Lawrence is $31,478 with 28.6% of its population living below the poverty line. Most of the population works outside of the city traveling an average of 23.2 minutes to get to work. The majority of the population lives around the center of Lawrence towards its outskirts.

TRANSPORTATION

Interstate 495, which passes through the eastern portion of Lawrence. There are three exits entirely within the city, though two more provide access from just outside the city limits. Route 28 also passes through from south to north through the city, and Route 110, which passes from east to west through the northern half of the city. Lawrence is the site of four road crossings and a railroad crossing over the Merrimack River, including the O’Leary Bridge a railroad bridge, the Casey Bridge, the Duck Bridge, and the double-decked O’Reilly Bridge. Lawrence is the western hub of the Merrimack Valley Regional Transit Authority’s bus service. It is also home to the Senator Patricia McGovern Transportation Center, home to regional bus service and the Lawrence stop along the Haverhill/Reading Line of the MBTA Commuter Rail system, providing service from Haverhill to Boston’s North Station (MBTA). According to the MBTA’s Ridership and Service Statistics report in 2010, on a typical Boston Bound Weekday there are 780 commuters riding the commuter rail from the Lawrence T stop. Nearby is the Lawrence Municipal Airport, which provides small plane service and is mostly used for commercial means by companies such as New Balance and Raytheon.
<table>
<thead>
<tr>
<th>Lawrence, Massachusetts - Overview</th>
<th>2010 Census</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td>76,377</td>
</tr>
<tr>
<td></td>
<td>100.00%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Population by Race</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian and Alaska native alone</td>
<td>957</td>
</tr>
<tr>
<td>Asian alone</td>
<td>1,895</td>
</tr>
<tr>
<td>Black or African American alone</td>
<td>5,788</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific native alone</td>
<td>57</td>
</tr>
<tr>
<td>Some other race alone</td>
<td>30,018</td>
</tr>
<tr>
<td>Two or more races</td>
<td>4,958</td>
</tr>
<tr>
<td>White alone</td>
<td>32,704</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Population by Hispanic or Latino Origin (of any race)</td>
<td></td>
</tr>
<tr>
<td>Persons of Hispanic or Latino Origin</td>
<td>56,363</td>
</tr>
<tr>
<td>Persons Not of Hispanic or Latino Origin</td>
<td>20,014</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Population by Gender</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>36,774</td>
</tr>
<tr>
<td>Female</td>
<td>39,603</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Population by Age</td>
<td></td>
</tr>
<tr>
<td>Persons 0 to 4 years</td>
<td>6,402</td>
</tr>
<tr>
<td>Persons 5 to 17 years</td>
<td>15,700</td>
</tr>
<tr>
<td>Persons 18 to 64 years</td>
<td>47,638</td>
</tr>
<tr>
<td>Persons 65 years and over</td>
<td>6,557</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>CensusViewer - Graphs &amp; Tables: Hispanic/Latino Origin</td>
<td></td>
</tr>
<tr>
<td>Persons of Hispanic or Latino Origin</td>
<td>56,363</td>
</tr>
<tr>
<td>Persons Not of Hispanic or Latino Origin</td>
<td>20,014</td>
</tr>
</tbody>
</table>

Graph: Population by Age and Hispanic or Latino Origin, 2010 Census - Lawrence, Massachusetts
LANDUSE

Lawrence has a total area of 7.4 square miles, of which 7 square miles is land and 0.4 is water. More than half of the land use for residential use. At the core of Lawrence along the edges of the Merrimack, is where the majority of the industrial land use occurs from there the commercial areas begins to spread out gradually changing into urban public and institutional. The combination of the commercial, urban public, and the institutional areas forms the downtown area of Lawrence. From this commercial, industrial, and urban public and institutional core the residential areas spread out from there. The new greenway plan seeks to provide a safe and vibrant connection from the residential area, to the downtown area, and also to the river.

WATERSHEDS

The major watershed that encompasses Lawrence is the Merrimack River Watershed and the Shawsheen River sub-watershed. In addition to the Merrimack River bisecting Lawrence, there are two canals, three rivers, Jacque’s Pond, Stevens Pond, and the Reservoir. The Merrimack River is the second largest drinking water source in the state and provides water for over 300,000 people in Lowell, Lawrence, and Methuen.

ECONOMIC DEVELOPMENT

What was once a great industrial mill city, Lawrence had suffered greatly after the decline of domestic manufacturing, the city lost its economic engine and its middle class population that moved to the suburbs. However with the help of several dynamic civil community of nonprofit groups, such as Groundwork Lawrence and Lawrence CommunityWorks have been working to pump life and vibrancy back into the city (cityoflawrence.com). The giant mills that were once abandoned along the Merrimack River are abundant and enormous, taking up about 12 million square feet of space. Groundwork Lawrence and Lawrence CommunityWorks have been working with the city to turn the mill areas into vibrant neighborhoods by converting the abandoned mills into new housing or new businesses. One such example is Union Crossing in the North Canal District, completed in 2007, was one of the first mill redevelopment projects in the area, sparking further mill redevelopment. Union Crossing is a 100 percent affordable housing project that will have 131 housing units, 90,000 square feet of commercial real estate space, and generated roughly 200 new jobs (Smart Growth America).
Analysis & Assessment
RECREATIONAL AND PROTECTED OPEN SPACE

Lawrence is a diverse city with lots of different open space and recreational needs to accommodate its 70,000 diverse inhabitants. The city is largely developed because of its industrial history and rich immigration over the last century and a half which makes open space limited. Although limited the city has many small parks and a few open green spaces along with river front locations and potential for more when vacant lots are taken into consideration. Lawrence also holds potential for a greenway system because of its proximity to the Merrimack River, Spicket River, and Shawsheen River. Another important element that could hold some value for the city is the abandoned rail line that runs north to south in the west part of the city and over the Merrimack River where it turns west and runs into Andover. Lawrence has a rich mill history and a diverse culture, however it has struggled recently because of a tough economic time and depreciation in its industry's.

Some problems that exists in the city regarding the condition of its open spaces is the lack of care of spaces and trash being littered in unused spaces and some spots in its water system. This problem has been identified by Groundworks Lawrence in the Open Space Plan they have put together. Some ways to counter the issues that they are having would be to increase regular maintenance, increase safety through enforcement of illegal activities, encourage public-private partnerships, increase activities and attendance, increase circulation and connectivity, make use of vacant lots, and increase access to the water fronts. These goals would impact the city in the following ways; keep parks and open spaces cleaner, more attractive, and enjoyable to be in, make people feel safer in the areas during all possible hours of recreation or travel to and from places, create jobs through maintenance and upkeep of areas, increase a sense of community through planned activities and events, increase area for passive and active recreation, and increased relationship with the water systems in the city. (Open Space 2009)

One important aspect to note is the large youth population in Lawrence and the fact that almost half its population is under the age of 24. The young population could mean a strong future for Lawrence, however with the current unemployment rate in the city, work could be hard to find for this part of the population about to enter into the work force. Working class jobs could be created within the city because of the improvement need to its infrastructure and open spaces, and educational benefits
could also be made through the cleanup and restoration of the river areas.

Lawrence has been struggling as a community over the past few decades but has the potential for a rebound. The Open Space Plan proposed by Groundworks Lawrence can help because of its focus on cleaning up the area, enforcing illegal behavior, creating jobs, and making an overall improvement to the wellbeing of the community. While this can help, Lawrence also needs improvements in its educational system along with infrastructure and community building, but if Lawrence takes the right steps to create a framework for overall improvement it could do well as a city in the future.
Lawrence is bisected by the Merrimack River which flows west to east through the city. Both sides of the city have a general downward slope toward the river which is the low point at its most eastern edge. The high point is a little over 200 ft. above the river in the north west part corner of the city where the reservoir is located. The reservoir and the surrounding cemetery comprise the largest open space in Lawrence with many walking paths. The areas surrounding the three rivers in the city are low flood plains that are surrounded by hills that hold most of the residential neighborhoods. (MassGIS)
Soils

Lawrence has a multitude of soils in the city because of the diverse water system that runs through the city. Coarse rocky soils are found in the hilly areas of Lawrence where glacial till deposits occurred. Alluvial flood plain soils are found in the river valleys where silt and clay deposits occurred from river flood processes over long periods of time. Large development in the heart of the city has most likely created a compact urban soil type that isn’t ideal for trees and shrubs. Also the industrial past has left large areas of polluted brown field sites and contaminated areas that need restoration. (MassGIS)
Habitat

The greatest area for habitat in the city is the Merrimack River because of its size. Other parts of Lawrence hold some habitat value as well although they are smaller patches around the cities boundaries and often are shared with the surrounding communities. The other two rivers contain habitat as well; The Shawsheen because of its natural mostly unchanged quality, and the Spicket River that runs through the north half of the city. The restoration of the rivers could bring some ecological improvement back to the area but the developed area of the city lessons ecological condition. (MassGIS)
Hydrology

The city of Lawrence has a complex hydrological system consisting of three rivers; The Merrimack, The Spicket, and The Shawsheen. Together they make a strong system although the water quality has been depredated slightly in some areas along the Merrimack and the Spicket Rivers. Channelization of these two rivers has changed the flood behaviors as well as decreased water quality. The waters in the area are of good quality and remain mostly unpolluted, however trash collects in some areas and some pollution occurs because of the urban environment. (MassGIS)

Flood Plains

![Flood Plains Map]
The city of Lawrence consists of three major water systems, the Spicket River, Shawsheen River, and the Merrimack River. Along with these rivers, there are also two canals, Stevens Pond, Jacque’s Pond, and a Reservoir in Lawrence. The Merrimack River is the state’s second largest drinking water source, which provides water for Lowell, Lawrence, and Methuen (2009 Open Space Plan). The Merrimack River cuts directly through the city creating a Northern and Southern boundaries, while the Spicket River, and Shawsheen River also form boundaries from the surrounding towns. The water systems also serve as recreational purposes and the community has incredible interest in cleaning and embracing the water features of the city. Lawrence in recent years has had several jobs to help clean up the water supply, fix walls the run along the canal, and create walking trails along the rivers with series of public gathering spaces.

**MERRIMACK RIVER**

The Merrimack River is a 117-mile long river that starts in Franklin, New Hampshire all the way to Newburyport where it enters the Atlantic Ocean. Lawrence and the Merrimack River is home of the Great Stone Dam which used to hold the world record for the largest dam. In Lawrence the river is a Class B river which means it’s a fishable, swimmable river, and if the water is treated correctly it can also be used as drinking water (2009 Open Space Plan). With this being said, it doesn’t mean this river is completely clean. Over the years the city has had a continuous problem with illegal dumping, sewage disposal and flooding. In the last ten years there has been a push from the community and the city to clean these active waterways to make them aesthetically more appealing. The architecture surrounding the Merrimack River is full of appealing smoke stacks, bell towers, steeples, and bridges that create unique views of the river.

Groundworks Lawrence is working with the Commonwealth, Department of Conservation and Recreation, along with the City of Lawrence to design and build a 2.6 mile Merrimack Riverwalk (Groundworks Lawrence). Towns along the river already have a town-to-town river walk system set up, for example Newburyport, and Salisbury. This 2.6-mile walk for Lawrence would be great for connecting Methuen and North Andover. Not only will it potentially provide that connection, it will be a great amenity for the city of Lawrence. Along the Merrimack and Canal are abandoned factory buildings that
are slowly getting renovated to residential units, which would be a great asset for the people who would be living in those units. The city is also coming up with an affective maintenance program along with the design, to make sure this large project will not become over grown and fail (Groundworks Lawrence). This is an essential part for the future parks of Lawrence, because the city is lacking greatly for the up kept and maintenance for the parks currently in the city. It will also provide seasonal job opportunities for maintenance of the trail.

The Merrimack River walk will not only be more aesthetically pleasing but it will bring more people closer to the water. This provides a great opportunity to educate the people for future pollution of the river system, while encouraging people to be outside for biking, walking, and recreation.

SHAWSEEN RIVER

The Shawsheen River is roughly a 25-mile long river that starts in Bedford, then joins the Merrimack River. The majority of the river winds through Den Rock Park where most of the land is undeveloped. The Shawsheen River Walkway goes through Costello Park, which is right near the South Lawrence East School. Often times when the weather is appropriate teachers will hold classes on portions of this walk. There is a Shawsheen River Watershed Association that conducts frequent cleanups since 2002 (2009 Open Space Plan).

SPICKET RIVER

The Spicket River is a 17.7-mile river that starts in Derry, New Hampshire then joins the Merrimack River in Lawrence. The city of Lawrence, Groundwork Lawrence, and many other contributors have been working on a Spicket River Greenway since 2002 (Groundwork Lawrence). Since then a lot of work has happened along the river making it one of the most aesthetically pleasing areas in the city. The green way has restored the river by many hours of cleaning and removal of trash, but it also has brought together different neighborhoods in the city. Multiple parks have been built off the greenway creating wonderful recreation areas for people of all ages. Since the Spicket River was channeled during the industrial time, much of the densely surrounding area was built on the flood plain. One particular area in the Northwestern Part of Lawrence where the Spicket enters the city was constantly getting flooded. Efforts from FEMA and other organizations bought these houses and made a public park in help to reduce the amount of flooding that occurs. This was a perfect example of what the new and current parks along the river are trying to achieve, flood and water quality control, along with creating a beautiful path system that will connect neighborhoods throughout the city.
Greenway Design

CONCEPT

Our team focused on the importance of the water to the city of Lawrence. The whole reason why Lawrence was founded was because the location of the Merrimack River provided such a great opportunity for hydropower to operate the mills. However over time the importance of this has been forgotten and the river and its waterways neglected and polluted. We wanted to connect the people back to the river by using the historic value of the water systems to engage and educate the people about the significance it holds.

In order to achieve this, we needed to create a greenway system that will connect the important features in the city to the water system, thus bringing more resident attention to the water. The greenway system which we developed involved using three main corridors in Lawrence to form a green loop with secondary connections within the loop tying the area together. The three main corridors implemented are the Spicket River corridor, the Rail Trail corridor, and the Canal/Merrimack River corridor, these three will join together providing a vibrant pedestrian circulation system that will be able to draw people from one area to the other. In doing so we believe that our plan will help clean the Spicket River, slow down and mediated the flooding problem, create an attractive access to the Spicket River Greenway, and bring life and business back to the empty mills.
Greenway Design

SPICKET RIVER

The Spicket River has been a polluted river, prone to flooding, and lightly used river. We are creating a way to solve these problems to create a betting economy for the city of Lawrence. We first needed to have key points of access points to the greenway for the people of the neighborhood communities to the north of the Spicket River. When accessing the greenway you can enter a network of green streets within the Spicket and Merrimack River to connect to the various cultural and green spaces of the downtown area. The Spicket River Greenway plan is based on implementing a sustainable green network that brings the community together.
FOCUS AREA 1

The first focus area of the Spicket River Greenway is set around the Arlington Mills in the Northwest Corner of Lawrence. The main road (Rt. 28) in the middle connects north to Methuen and if you follow it south the road brings you to the canal region of the town. To the regions northeast the roads bring you to neighborhoods and a few schools. To the southeast is the common and downtown area, full of shops, schools, and historical culture. Finally to the west is the cemetery as well as the Lawrence-Manchester rail line.

GREEN STREETS

First off I saw some opportunities to improve some streets in the area indentified in the green dotted lines. Route 28 could be a great gateway leading into the town of Lawrence, and in this area it could show a sign of growth and sustainability (shown in perspective). In the street there is enough room in places for widened sidewalks, street trees, and areas for water infiltration. Along the edges are unused areas that could be used for small sitting areas that could be nestled in meadows used to allow water to infiltrate into the soil. This could draw people’s attention to the area and its ability to draw in business and bring leisure for the people who live and work in the area.
The streets on the right side of the screen are two-way streets with little traffic and two ways to access the road. Along with that they reside in an area severely prone to flooding of the Spicket River. The streets run roughly 40ft including the sidewalks. As well as the topography runs south into the Spicket River which rainwater can pollute the water. What we are proposing is to slightly narrow the street and turn it into a one-way street and use the space for water infiltration. These could be made scattered throughout the street and be simple as a slight depression with appropriate plantings to absorb and clean the water. With this the streets could still have on street parking on both sides as well as let traffic go through.
SPICKET RIVER GREENWAY

The Spicket River Greenway begins along the Spicket Rivers edge at the Manchester Street Park. The greenway will connect to our proposed greenway on the old Lawrence-Manchester Rail Line creating the link to the looped greenway system. The greenway moves down Rt. 28 along the proposed green street that walks by an assortment of commercial buildings. This would create passerbies on the trail more likely to go in and check out the businesses. As well as crossing commercial buildings, it crosses Central Catholic High School giving students in the area a safe route to school.

GREEN PARKING LOTS

The parking in the area is unattractive, and in places is lightly used. They serve as parking for Polartec located in the top left of the picture, and an assortment of businesses in the mills below the Spicket River. All the parking is located on the brownfield, a brownfield defined by the Environmental Protection Agency (EPA) means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. With the threat of these sites being a contaminated site we would need to implement design strategies to create a green parking lot.

What we proposed was a mixture of an engineered filtration system and creating bioswales. The engineered system would be a series of Ground Water Migration Borders that would push water away from areas prone to pollution and direct the groundwater to certain areas of the parking lot. From there the water would infiltrate into Permeable Reactive Barriers, which are walls that are built below ground and are composed of materials that remove contaminants from ground water as it flows through the permeable barrier. Then finally from there the water would enter a groundwater treatment system, which would then put the water back into the Spicket River.
The bioswales would be scattered throughout the parking lots in minor strips. They would be long narrow depressions composing of soil brought onto site, plantings that thrive in water, and canopy trees. These depressions would allow water to enter the depression and infiltrate, and all of the water it couldn’t hold it would then enter the treatment system. The bioswale system would bring much needed greenery to the once bare impervious area. The trees and plantings would cool the area, suck up water, and create a more appealing environment for businesses to settle in the area. Along with the swales being a very small system it would still allow for ample parking space for the surrounding businesses (shown in cross section). All in all, these parking lot implementations would prevent pollution, create a green environment, and bring more business to the Arlington Mills region.

**FLOODPLAIN RESTORATION**

The area focused on floodplain restoration is a small area settled between a group of residential lots. A floodplain is a nearly flat plain along the course of a stream or river that is naturally subject to flooding. Though we cannot restore the whole thing it is still an area that could be used to create a small region for educational and scenic purposes. The banks of the Spicket River are steeply banked and we would propose to ease that bank. In the area there would be the riverbed sediment, scattered rocks and wetland planting. This area in the end could benefit the flooding problems slightly.
FOCUS AREA 2

The second focus area is located north of the Campagnone Common. To the west is the first focus area where the Spicket River Greenway continues down the Spicket River. To the north is the residential part of town, within the region there is schools scattered around. This is an important region to reach out to; it will create a way to access the greenway and the downtown region. To the east is an assortment of parks, homes, and businesses. Finally to the south is downtown and North Canal region.
STREETS

The streets in this region are used to access the important and cultural areas of downtown and create access to the greenway. The system will be used to create a visual for people to know they are in a system that creates access to other green systems. The streets to the northwest of the common are along a couple schools and libraries and connect up to Central Catholic High School. These are important streets to create safe access for students to get home. So implementing a widened sidewalk and a tree canopy, will slow traffic down and create a more safe access to the greenway. Haverhill street could do the same but creating a more direct access to the homes to the east.

The streets directly north are already relatively green because they are beside O’Neill Park. But creating a more visually appealing access point will bring more people to the park and the Spicket River Greenway. The area will contain packets of areas to have water infiltrate as well as some light tree plantings.

And finally to the east, the streets are all one-way streets that are way too wide to be a one-way street. In these streets there is ample room to create a large series of bioswales with tree plantings (shown in perspective). The swales could collect stormwater runoff in these streets to decrease the pollution of the surrounding rivers. The streets could still serve as street parking for residents, but be a narrower street to slow down traffic and create a safer environment. The roads could be great way to access the common as well as the parks to the east. To the northeast, the point where E. Haverhill Street meets the Spicket River is a large triangle plot of grass surrounded by an impervious surface. This is a space that there could be a large meadow surround by street trees to create a major point where stormwater can infiltrate soils. Along with it being a swale it will also serve as small space for rest.
SPICKET RIVER GREENWAY

The Spicket River Greenway is a path that runs along the tree line of the Spicket River. It is built all the way until it hits Jackson Street, from there the trail is proposed to go up Jackson and crosses streets and enters Dr. Nina Scarito Park.

In the built area of the Spicket River Greenway there are two locations along the edge capable of a green space. One being a cluster of buildings, which their edges create a large space in the middle, and a narrow space northeast of O’Neill Park. The large space that settles between the buildings I am proposing to be a space for parking, a water filtration system, and a small gathering space. What I was proposing was to take down the building that is the edge of the Spicket River. The building itself is in the worse of the four buildings and it would create a direct connection to the Spicket River Greenway. Along with creating a larger more direct space, the usable materials of the building can be used to create the park. With creating this nearly abandoned lot into a usable people friendly space it would intrigue business men to bring their small companies into the vacant spots and bring people to the space, which would lead into the Spicket River greenway. The other space is a narrow space that could be used for small gatherings as well as small bioswales (shown in the perspective). This space could give people a break on their walk and enjoy the river. As for the remaining small spaces east of the common they were spots that could be used for more of those community gardens. This would give more people the chance to garden.
FOCUS AREA 3

The last of the Spicket River Greenway focus area is an area east of the Champagnone Common. The area consist of the eastern part of cultural downtown, residential buildings, and businesses including the famous Everett Mill which was the start of Bread and Roses’s Strike. The areas to the east are residential buildings as well as Marston Street, a major access point to Rt. 495. To the south is the mouth of the Spicket River, which leads in to the Merrimack River.

STREETS

The streets to the northeast are the one-way streets that connect to Misserville Park and the Everett Mill region. They will be series of bioswales with canopy trees to create a connection from the common to the Spicket River Greenway. As well as the streets running from east west there is one long green street that run north south. The street is Newbury Street and it connects the tip of E. Haverhill Street to Common and Essex Street. Common and Essex Street are the main downtown street with a lot of culture and energy. These streets will not have as many bioswales but there will be a tree canopy and a slightly widened sidewalk to create a more pedestrian friendly connection. Finally Green Street creates access to the Lawrence General Hospital and the end of the Spicket River Greenway. The street continues to Prospect Street this area can be used as a gateway into the downtown area, again like Rt. 28, it can show the growth of the city. Prospect Street is a very wide street that has the opportunity to have a
bioswale in the median (shown in the image) as well as create a tree canopy on the south side of the street.

SPICKET RIVER GREENWAY

The Spicket River Greenway continues down to the mouth of the Spicket River where it meets the
North Canal and Merrimack River. As the Greenway runs south it connects to green streets as well as green parking lots similar to the ones in the Arlington mills. This part of the greenway is just a generous sidewalk of 8 ft; it is more of an access to the parks and downtown area. Towards the end it crosses the new proposed park east of the Everett Mill Parking lot. It finishes off at a proposed trail along the Merrimack River; this is more of a forested feeling to the walk creating an access to the forested walk along the Merrimack River. The other has a connection to the Lawrence History Tour Route, this meanders through the historical canal region. Then further west the loop completes by connecting to the Lawrence-Manchester Greenway.
Greenway Design

CANAL/ISLAND

Linking the spaces on the island through paths and proposed routes to experience the historic value that the area holds through its rich postindustrial character and strong connection to the water system. I did this by proposing residences, business, studio space, and recreational spaces in the renovated mill buildings along with proposed green space and connection linking them around the island.

The Island and canal area have a rich history being a part of the textile mill expansion during the last half of the 19th century and continued for decades after. The character of this area can be taken advantage of through the use of the buildings and the vacant sites around the island. Renovation of the mills have begun and will continue which will enhance the quality of living within the island.

Also restoration of brown fields and reclaiming vacant areas will improve the quality of the
environment. Roof tops of some renovated mills have been outfitted with solar panels and this character could be built on with the addition of green roofs and gardens. They would create a different feel and function to the area and make the community stronger.

**Section 1 looking east**

This section shows the relationship between the canal, island, and the Merrimack River. Canal Street runs along the canal on the left and you can see the lower locks dam that holds the water on the east side of the canal. The Ferrous site is a contaminated area that was abandoned and vegetation has reclaimed it. This site is a proposed green space and will require some clean up efforts to make it inhabitable.
Section 2 looking east

This section also shows the relationship between the canal and the Merrimack River with the canal on the left, the Island centered, and the Merrimack running on the right. Mills line the canal and the Merrimack in this section of the Island and you can get a feel for the character this area holds.
Greenway Design

RAIL TRAIL

The abandoned rail corridor that goes through Lawrence north to south has great potential to fully connect the Spicket River Greenway to the Merrimack River walk, and creating this beautiful loop that connect the northern part of the city. The rail corridor is roughly 30 feet wide at the narrowest part and in some areas it can be up to 70 feet wide making it great place to have pocket parks and or picnic areas. Along the rail corridor there are four major potential lots that could be used for parks, these locations would be great places to increase the amount of green space in the city. Creating a rail trail would also bring a lot of neighborhoods together by a system or series of green recreation areas that would be used for sports, playground, walking and biking.
Currently the abandoned rail line is full of successional growth and over grown with some invasive species. The trail is also dirty with trash, railroad ties, and rail tracks. Just by simple pruning and picking up of the trash this could instantly become a welcoming trail. Some portions of the trail currently have beaten paths made and are being used. By using appropriate plants and spacing this trail could be filled with beautiful trees and shrubs and become an amenity to the city. The abandoned buildings walls also allow for potential areas for local artist to do their paintings or display their art along the trail.
Going into planning this area, I went back to our overall concept of connecting people back to the water and showing them just how important and beautiful it can be. To achieve this I wanted to highlight the river as an amenity to the community by providing them with places that the community would not only want to use, but also be proud of using. I first looked at locations along the river’s edge that can potentially be an attractive and inviting space for the people to enjoy, explore, walk, play, interact and learn. Providing these places will provide for multiple different recreational activities and in turn will attract more people of all different groups to the area because of the wide range of activities that they will be able to do.

Connections

In order to attract these potential users to the water I proposed a pedestrian circulation system that will run along both sides of the river with connections to the major streets and bridges, these connections will extend into the city through its commercial, industrial, civic, and residential areas providing a vibrant, safe, and easy way for pedestrians to access the water.
Canoe Access

I also looked at existing canoe access points to see where people can currently access the river, in looking at these locations I saw that the majority of the access points were on the southern side of the river, but the downtown area where most of pedestrian traffic will be is on the northern side, so I proposed adding two new access points on the northern side and one new access point on the southern side where there is potential open space and also abandoned mill buildings. In the abandoned mill I propose turning it into a museum related to the Merrimack and it can also generate funds by offering canoe rentals, or even having restaurant so that people can enjoy a meal while watching people canoe by.
Section A-A Looking West

This section shows the relationship between the southern side where the abandoned mill is to Pemberton Park across the river. The top shows the existing conditions, the bottom shows my proposals of changing the abandoned mill into a place where people can use to learn and enjoy the river, along with the canoe access point.
Section B-B Looking West

This section shows the relationship between the river and the and one of the mills that has been converted into apartments. Currently there is nothing there besides some trees on the shore, it is not a place people would want to use. In order to make it a pleasant place for people, I proposed adding in benches along the edge of the building as well as another bench along the other edge near the shore to help define the space created in the middle. Also I proposed a multilevel boardwalk close to the shore so that the residents can use the boardwalk and experience different levels of interaction based on the water levels.
Perspective 1: Southern Side Near the Duck Bridge and the Apartments
Perspective 2: Northern Side Looking From the Ferrous Site towards the Duck Bridge
Conclusion

We see the river as an:

- **ECONOMICAL** connection  
  - bringing money to the city by means of tourism

- **RECREATIONAL** connection  
  - multiple opportunities to explore and interact with the water

- **CULTURAL** connection  
  - a history of Lawrence on the water

- **EDUCATIONAL** connection  
  - educating people on the significance of the water

Our vision for the area is to provide a deep connection on multiple levels between the people and the water. Although simply providing these connections won’t be able to solve all of the issues Lawrence is facing, it will certainly be able to highlight the positives and bring out the best in Lawrence giving the area a new persona.
References

- 2010 United States Census Bureau on CensusViewer.com

- 2010 United States Census Bureau on Quickfacts.census.gov

- Urban redevelopment of Lawrence, MA a retrospective case study of the Plains Neighborhood by Pernice, Nicolas M., M.S., University of Massachusetts Lowell, 2011

- http://www.1911encyclopedia.org/Lawrence,_Massachusetts, Wadsworth, H.A. History of Lawrence, Massachusetts (Lawrence, 1880)

- MBTA Bluebook, Ridership and Service Statistics, 13th edition 2010

- http://www.mvrta.com/


- City of Lawrence 2009 Open Space and Recreation Plan, GroundWork Lawrence, 2009

- Economic Development Report, City of Lawrence, 2011

- http://andovertrails.org/denrock.html