



# Urban Ecological Design: The Booth-Kelly Eco-District Concept Winter 2012 • Landscape Architecture

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## Acknowledgements

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## About SCI

The Sustainable Cities Initiative (SCI) is a cross-disciplinary organization at the University of Oregon that promotes education, service, public outreach, and research on the design and development of sustainable cities. We are redefining higher education for the public good and catalyzing community change toward sustainability. Our work addresses sustainability at multiple scales and emerges from the conviction that creating the sustainable city cannot happen within any single discipline. SCI is grounded in cross-disciplinary engagement as the key strategy for improving community sustainability. Our work connects student energy, faculty experience, and community advisory to produce innovative, tangible solutions for the creation of a sustainable society.

## About SCYP

The Sustainable City Year Program (SCYP) is a year-long partnership between SCI and one city in Oregon, in which students and faculty in courses from across the university collaborate with the partner city on sustainability and livability projects. SCYP faculty and students work in collaboration with staff from the partner city through a variety of studio projects and service-learning courses to provide students with real-world projects to investigate. Students bring energy, enthusiasm, and innovative approaches to difficult, persistent problems. SCYP's primary value derives from collaborations resulting in on-the-ground impact and expanded conversations for a community ready to transition to a more sustainable and livable future. SCY 2011-12 includes courses in Architecture; Arts and Administration; Business; Economics; Journalism; Landscape Architecture; Law; Oregon Leadership in Sustainability; and Planning, Public Policy, and Management.

## About Springfield, Oregon

The City of Springfield has been a leader in sustainable practices for more than 30 years, tackling local issues ranging from waste and stormwater management to urban and suburban redevelopment. It is the first and only jurisdiction in Oregon to create two separate Urban Renewal Districts by voter approval. Constrained by dramatic hillsides and rivers to the north and south, Springfield has worked tirelessly to develop efficiently and respectfully within its natural boundary as well as the current urban growth boundary. Springfield is proud of its relationships and ability to work with property owners and developers on difficult developments, reaching agreements that are to the benefit of both the project and the affected property owners. These relationships with city residents are what continue to allow Springfield to turn policy and planning into reality. Springfield recruited a strong, diverse set of partners to supplement city staff participation in SCYP. Partners include the Springfield Utility Board, Willamalane Park and Recreation District, Metro Wastewater Management Commission, United Way of Lane County, and Springfield School District 19.

## Course Participants

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*This report represents original student work and recommendations prepared by students in the University of Oregon's Sustainable City Year Program for the City of Springfield. Text and images contained in this report may not be used without permission from the University of Oregon.*



## Executive Summary

This report presents a summary of student design process and urban design ideas for the Booth-Kelly Center in Springfield, Oregon. The report includes precedent studies of successful eco-communities around the world, working sustainable urban design practices, background information on the 17-acre site and how it can thrive independently, and individual student design proposals that recommend their own ideas and suggestions for urban spatial organization.

At the beginning of the term, the City of Springfield proposed an open set of goals for the improvement of Booth-Kelly. With advancements in technology and creative design methods, the students were encouraged to think creatively about designs that will help the area come to life and benefit a community in need. The city asked students to consider sustainability, avenues for generating profits and attracting residents, and solutions to pedestrian and vehicular circulation problems, while acknowledging the property's history as part of the Oregon milling industry. Producing comprehensive proposals was further complicated by adjacent property use, downtown urban fabric, and the condition of existing buildings occupying the Booth-Kelly Center.

Students in this studio went through a journey of design exploration. The class considered ways to produce alternative energy, methods for organizing roads and pathways to increase foot traffic, theories for developing facilities that spawn successful food and retail businesses, and even technologies for establishing green roofs and collection systems for water re-use. These are just a small sample of design ideas that were explored by the group.

Working from a plan for downtown Springfield, located just a few short blocks from the site, students' designs attempt to respond to the need for a more bustling sense of place. The ideas presented in this report suggest urban designs that create a robust atmosphere with a high level of walkability and multitudes of people patronizing local businesses. Currently this area is awash with cars, parking lots, and industrial development that make it difficult to promote livability on the street level. However Booth-Kelly has immense potential to become a wonderful place for people to dwell. With all the necessary components, it needs an overhaul to change its course into a growing sustainable community.

## Introduction

The City of Springfield currently owns and operates the Booth-Kelly Center, which includes 17 acres of land and over 200,000 square feet of large industrial building spaces currently renting to Springfield businesses. Once a very productive lumber mill, Booth-Kelly was situated on the Springfield Mill Race Pond that is currently being restored. With the amenity of the Mill Race running along the Booth-Kelly site, students were asked to develop conceptual eco-district designs for redevelopment of the whole Booth-Kelly site, basing their design concepts on themes and ideas developed as part of Professor Brook Muller's three-term architecture studio, which also focused on the Booth-Kelly site.

During winter term of the 2011-2012 school year, under the instruction of studio professor Anita Van Asperdt, 16 Landscape Architecture students prepared precedent studies, conducted a site analysis, and developed ecological design solutions for the Booth-Kelly site, a "brownfield" just south of downtown.

In the beginning of the term students met with the City of Springfield and discussed the history of the site and general ideas for future uses. City staff were open to a wide range of ideas that supported their goals of generating revenue, responding to nearby Springfield downtown (and its future improvements), and close concentration on the Mill Race. Students were provided with ecological design precedents from around the world that had similarities to Booth-Kelly and informed their design solutions for the site. All research and creative work was gathered by students, condensed into a presentable format and shared with staff at the City of Springfield, University of Oregon design faculty, local planners, students, and guests.

## History

Elias Briggs first settled the site that became the City of Springfield with a donation land claim in 1852. A portion of the Briggs family's land was fenced off, which included a natural spring that later served as the community's water source for over 25 years and provided the city its name. Elias Briggs hand-dug connections to naturally existing waterways to create a Mill Race which would drive a sawmill and gristmill. The gristmill thrived until it burned down in 1930.

Springfield was platted in 1856, was incorporated as a city in 1885, and a town blacksmith named Albert Walker served as the first mayor. Springfield continued to grow, and in 1891 welcomed the Portland, Eugene and Electric Railroad streetcar.

In 1901, the Booth-Kelly Lumber Company purchased the sawmill and the entire Mill Race. Booth-Kelly constructed a lumber mill and Mill Pond at the base of Springfield Butte. A water tank was built on the butte to serve the city with water pumped from the Mill Race. Booth-Kelly built and leased a steam plant to the Oregon Power Company in 1911. Later that year, a fire burned down everything

on the Booth-Kelly site except the steam plant. In 1915, an electric mill was constructed and thrived through the late 1950's.

In 1958, Booth-Kelly sold the mill and Mill Race to Georgia-Pacific. In 1964, competition and other market forces resulted in the closure of most of the mill. Several of the buildings were converted into a retail center that lasted until the early 1980's.

In 1985, Georgia-Pacific donated most of the Mill Race (including water rights), the Mill Pond, and the old Booth-Kelly lumber mill to the City of Springfield. Since then, the city has refurbished portions of the old mill buildings to encourage development of the wood products industry. A large part of this industry is located along the railroad that runs through the Glenwood and downtown districts (Figure 1) (City of Springfield 2004).

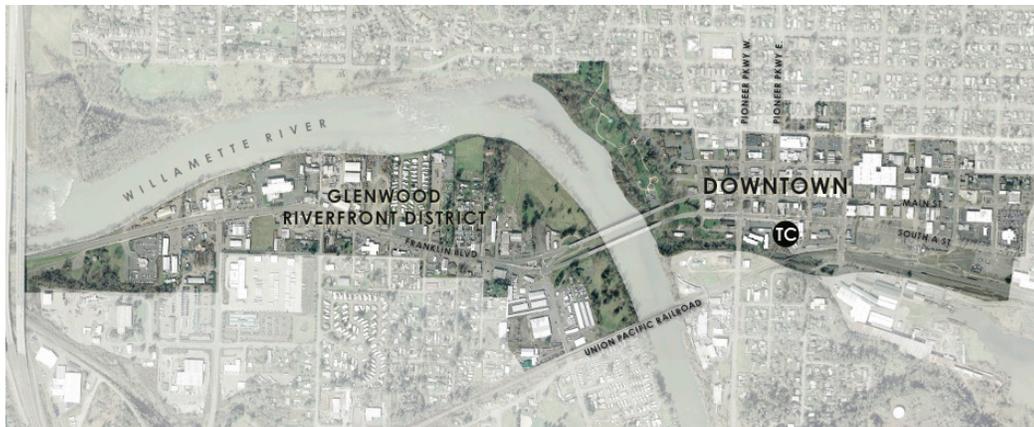


Figure 1. Context map (Downtown Citizen Advisory Committee 2010)

## City Goals: A New Downtown

In 2010 the City of Springfield, the Downtown Citizen Advisory Committee, and selected planning professionals and consultants developed a detailed analysis and strategic vision of downtown Springfield. It was acknowledged in the report that the current condition of Springfield's downtown was in poor shape visually, structurally, and economically. The city stated the following goals:

### Land Use

- Introduce a community plaza or gathering place
- Identify opportunities for retail and entertainment uses
- Provide for safe and convenient parking
- Preserve and expand downtown employment
- Revitalize underutilized sites
- Increase density and mix of uses

## Circulation (Figure 2)

- Identify safe, direct connections to neighborhoods (Including nearby new Riverfront District)
- Promote pedestrian-friendly streets
- Improve access to the river, parks, and open space
- Reduce the impact of traffic that trucks create downtown

## Implementation

- Encourage investment in public infrastructure
- Create standards and guidelines for development
- Identify incentives for new and existing businesses
- Maintain and enhance historic character
- Improve overall downtown safety and friendly image

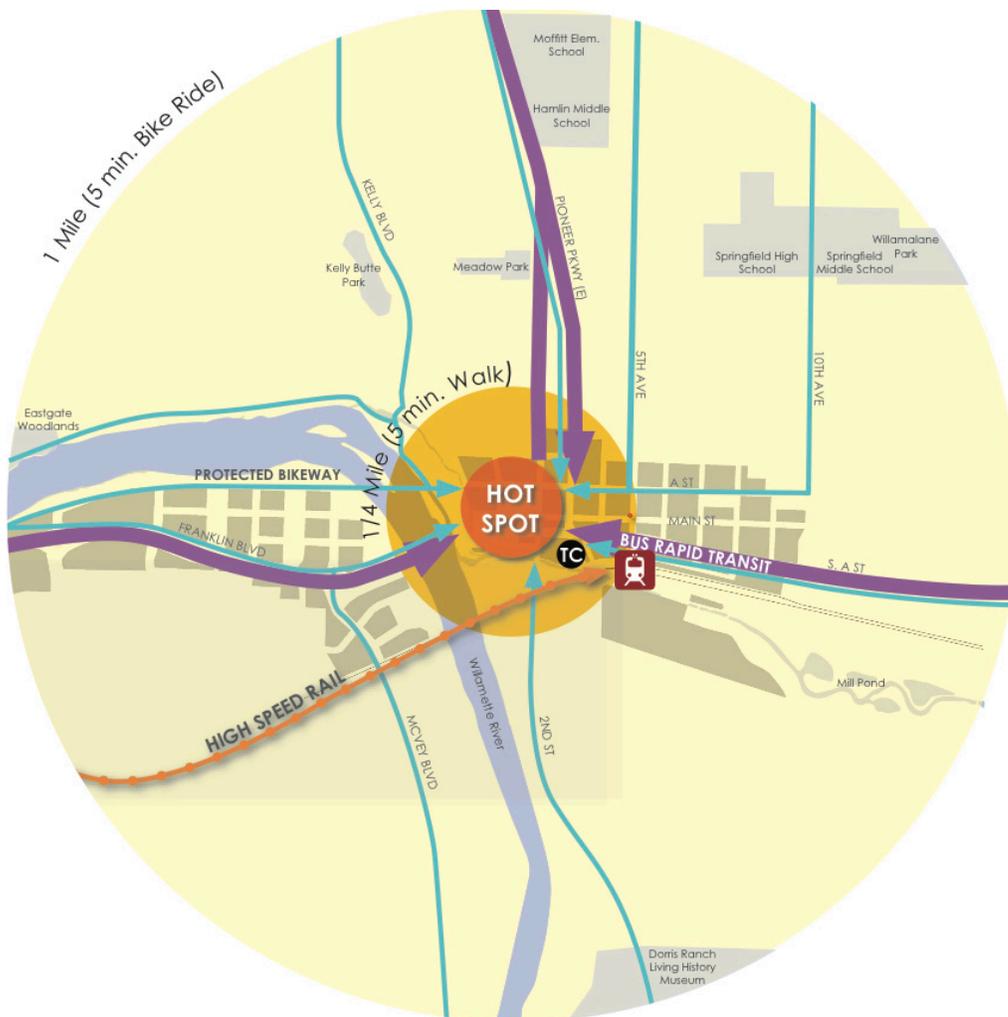


Figure 2. Springfield's important circulation routes to retail "Hot Spot" (Downtown Citizen Advisory Committee 2010)

Springfield's downtown is not developed to the density of downtown cores in comparably-sized cities, and focuses too heavily on the provision of large, free parking lots for customers. If a walkable format is applied to its street structure, the density of building would increase, and its overall image may become more appealing to businesses.

The first goal is to create essential projects that will act as catalysts for improvement. These key projects would be the introduction of a two-way Main Street instead of the current one-way, and the demolishing of an existing parking lot to make way for a new plaza space adjacent to Pioneer Parkway and in a key position downtown (Figure 3). These big moves for improvements might trigger stimulation in growth and interest in the area, drawing businesses in to increase density and create a retail hot spot as in Figure 2.

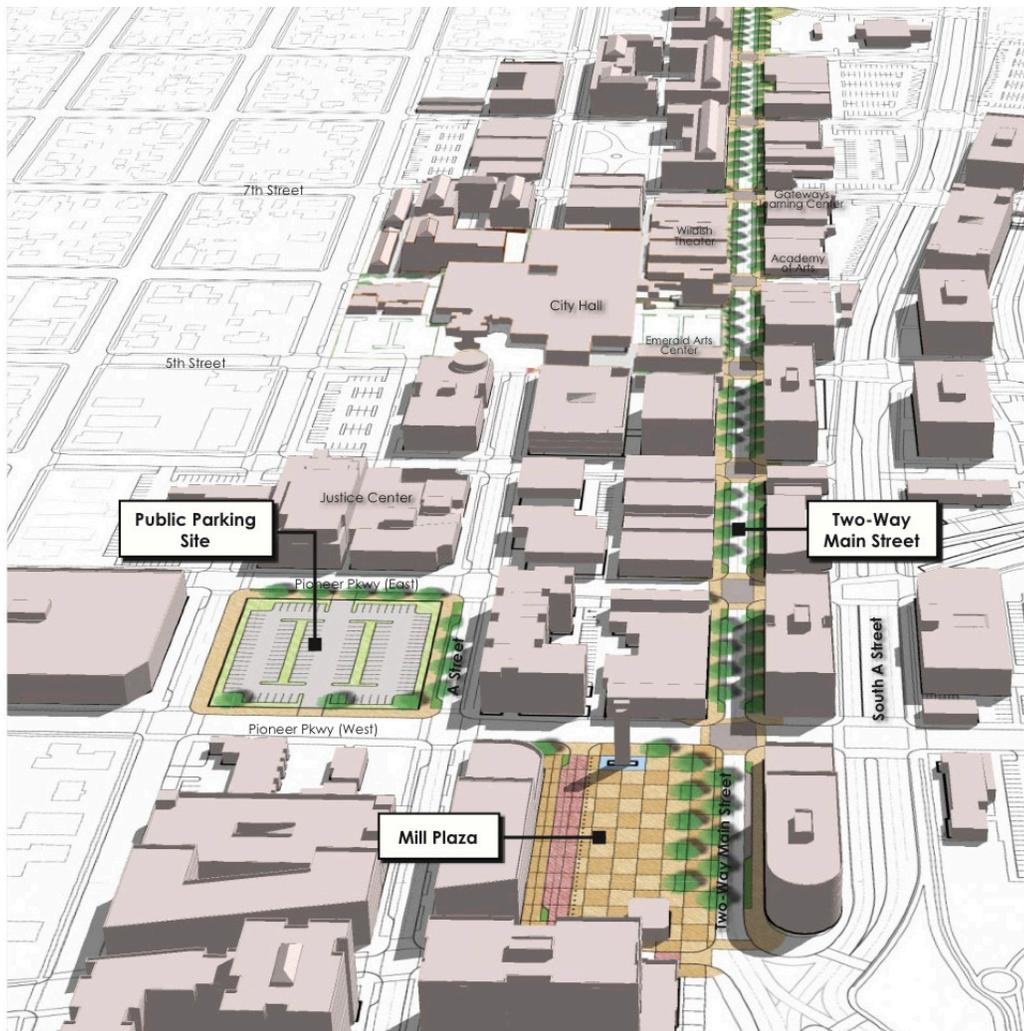


Figure 3. Bird's eye view of Springfield's "Hot Spot" (Downtown Citizen Advisory Committee 2010)

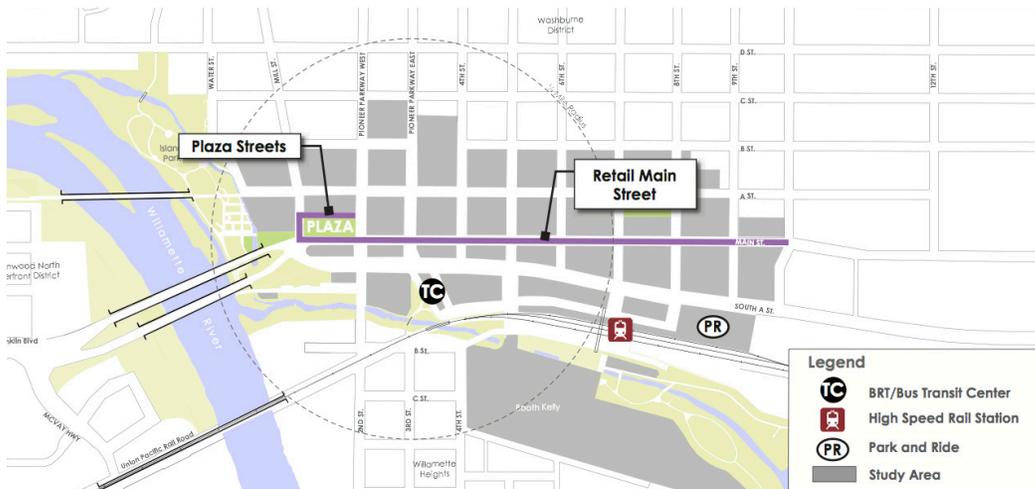


Figure 4. Retail Main Street diagram (Downtown Citizen Advisory Committee 2010)

Once the catalyst spaces are established, then comes the mobility improvements which include bike and pedestrian connectivity to the newly established Glenwood Housing District, existing parks and open spaces, as well as special routes through the downtown (Figure 4 and 5). These “Mobility Corridors” also feature increased vehicular traffic efficiency and support bus rapid transit to, from, and around the city.

Along Mill Street and Main Street are proposed “Livability Routes,” which make the street more attractive for retail businesses. The street structure creates efficient two-way traffic along the stretch and preserves on-street curbside parking (Figure 7). Intersections are reduced in size to reduce the distance a pedestrian needs to travel in order to cross the street. The incorporation of pedestrian-scaled lighting, street trees, and furniture (such as benches, garbage



Figure 5. Downtown protected bikeway loop diagram (Downtown Citizen Advisory Committee 2010)

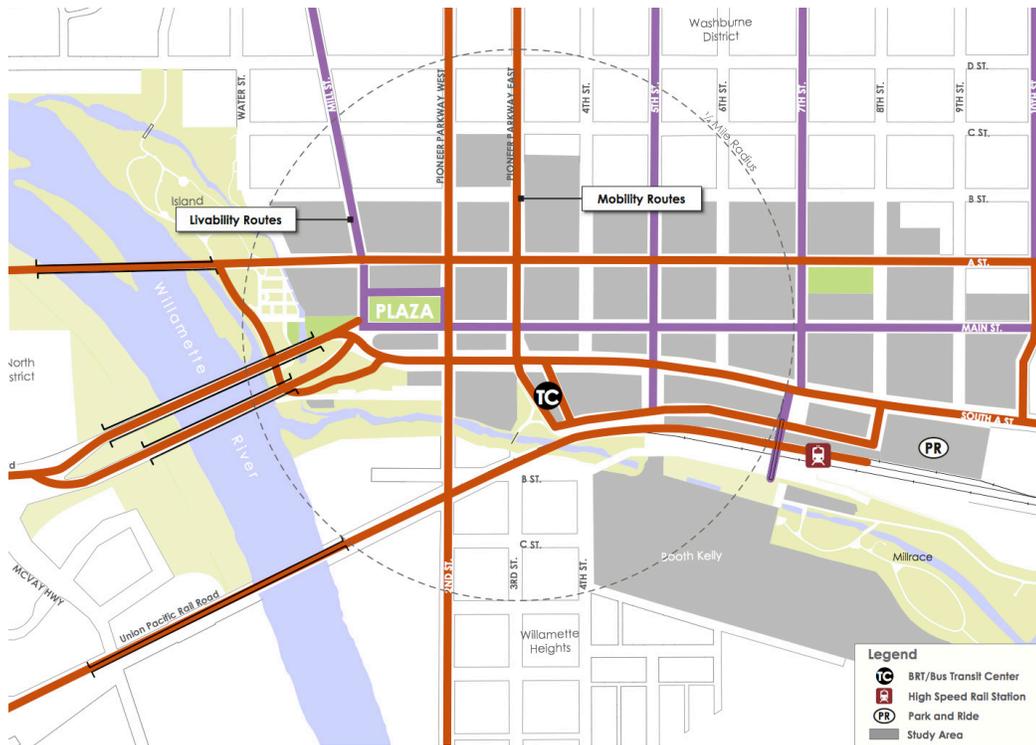


Figure 6. Circulation diagram (Downtown Citizen Advisory Committee 2010)

cans, plantings, bicycle racks, and bollards) ensures a more intimate and interesting street atmosphere as seen in Figure 7. Along the Plaza are streets lacking curbs so that roads could be closed and used for events beyond the bounds of the block.

The goal is for Springfield’s downtown to become a walkable, bikeable, and interesting space to inhabit that sets the framework for the city to become bigger, more efficient, and more mobile (Downtown Citizen Advisory Committee 2010).

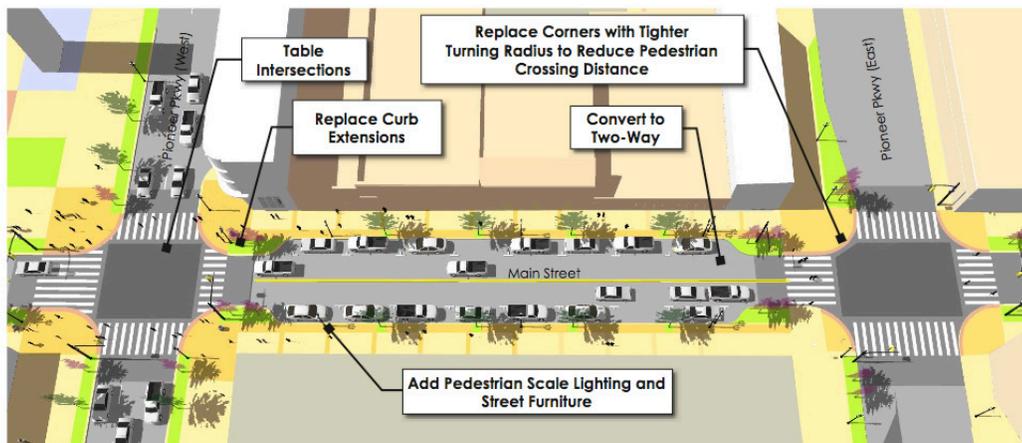


Figure 7. Typical block looking north (Downtown Citizen Advisory Committee 2010)

## Mill Race Restoration

Restoration of the Mill Race began in July 2009 and is currently in the second phase. The goal of the restoration is to enhance function and bring in clean enough water to stimulate a growing salmon habitat. The Mill Race project was contracted and led by the US Army Corps of Engineers.

Phase 1 of the project, from July 2009 to May 2010, was designed to provide year round flow through the Mill Race, enhance native vegetation and habitat along the waterways, place large wood pieces in the stream channel for bank protection and fish habitat, and renovate Clearwater park facilities and storm drainage. Invasive blackberry vines were removed, and native trees and shrubs were planted (Figure 8) along the upper Mill Race corridor. Plantings extended 100 feet on both sides of the Mill Race within public ownership and 10 feet of private property lines where private ownership existed.



*Figure 8. Springfield Mill Race restoration project*

Phase 2 began in March 2010 and is still in progress today. This phase is focused on the Mill Pond area adjacent to the Booth-Kelly site to the east. During Phase 2 the Mill Pond was drained and graded to create a meandering channel for wetland habitats. The channel was narrowed to create a deeper flow, and native plant species were planted out from the Mill Race 100 feet or more (Figure 8). Thousands of plants were added to the Mill Pond area. Wildlife benefiting from the enhancement include neotropical migratory song birds, butterflies, reptiles, amphibians, pollinating insects, and fish in the Mill Race. Future plans include creating a boardwalk and trail system that will run along most of the Mill Race. Small trails have been created but no work has been done to create a large-scale path system.



*Figure 9. Booth-Kelly site November 28, 2011 (City of Springfield 2012)*

## Site Analysis

The Booth-Kelly site consists of a 15 acre wetland with a two-phase restoration plan, which has now begun the second phase. The largest building on the site is a roughly 100,000 square foot railcar maintenance building (constructed of I-beams and corrugated metal) was originally built in San Francisco, disassembled, and reconstructed on this site. Several other light industrial/office buildings are currently used by local businesses or abandoned due to poor conditions. Running through the northern third of the site is a stretch of the Mill Race, a hand-dug channel from the Willamette River that flows west through the site. The Union Pacific Railroad tracks run along the north edge of the site.

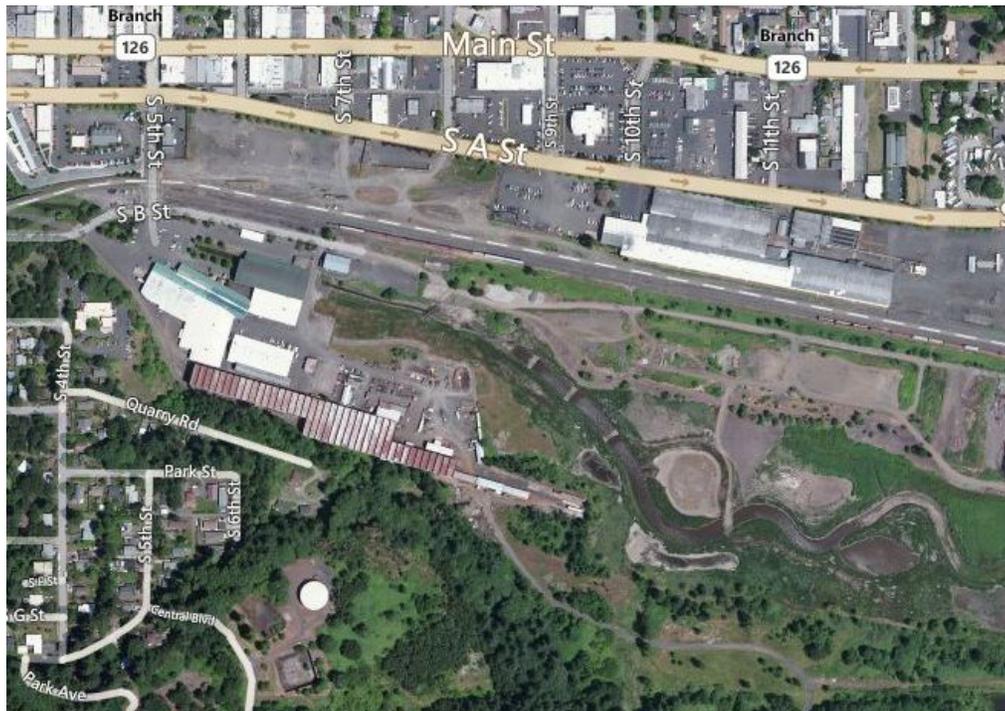


Figure 10. Booth-Kelly aerial photo

The railroad crosses A Street without a bridge or tunnel, creating up to a 15-minute wait for vehicles and pedestrians needing to reach Booth-Kelly or the neighborhood located on the butte at the south edge of the site (City of Springfield 2012).



Figure 11. Wetland East of Booth-Kelly site



Figure 12. Historic crane shed

## Neighborhood Connections

- **Mill Street:** Connects the Kelly Butte neighborhood to downtown and provides a direct link between Meadow Park and Mill Plaza.
- **5th Street:** Connects the Washburne Historic District to downtown and provides direct link between the Springfield Public Library and Hamlin Sports Complex.
- **7th Street:** Provides a safe route to school with a direct link between Springfield High School, Gateway Learning Center, the proposed future high-speed railway station, and the Mill Race.
- **10th Street:** Provides a safe route to school with a direct link between Springfield Middle School/Willamalane Park, and the South A Street protected bikeway.
- **Pioneer Parkway:** Links the Gateway area and the Sacred Heart Medical Center to downtown.
- **2nd Street:** Links Willamette Heights neighborhood and Dorris Ranch to downtown.
- **South A Street:** Links the Regional Sports Center to downtown.



Figure 13. Neighborhood transportation connections diagram (City of Springfield 2012)

## Site Challenges Checklist

**Railroad:** The railroad running along the northern border of the Booth-Kelly site causes traffic delays, pollution, and noise.

**Unconsolidated Fill:** The site has a rich history that has left a substantial impact. The sawmill that was once operational created a significant amount of waste, some of which was buried on-site. This resulted in unconsolidated fill along the southeast side of the site that has been advised to be remediated before any development occurs in that location.

**Hillside Erosion:** The hill South of Booth-Kelly has had a recurring history of hillside erosion.

**Planting:** Extensive care has been taken to revitalize the Mill Race, and it would be counterproductive to disrupt the efforts already begun. Wetlands to the East of the site are an important ecological habitat for many endangered plants and animals.

**Existing Infrastructure:** Structural engineers have declared that it would be more costly to maintain the existing buildings than to remove them. Currently, much of the revenue that is collected from tenants on the site is reinvested in maintaining the buildings.

**Circulation:** Poor internal circulation on the site has isolated and ultimately limited development opportunities. The placement of the railroad tracks limits crucial access to the site, and the more the site is used, the higher the need for emergency vehicle access.

**Day/Night Uses:** For a site to be most valuable or successful during all hours of the day, flexible, usable space should be maximized.

**Integration with Downtown:** Booth-Kelly is disconnected from its surroundings due to the bordering railroad, the Mill Race, and the Willamette Heights neighborhood.

**Sense of Place and Identity:** Booth-Kelly Center and the City of Springfield do not have a clear focal center.

**Sustainability:** The existing resource system is very linear in terms of inputs and outputs allowing large amounts of imported resources to produce waste on the site. Infrastructure upgrades that could yield economic benefits are presently lacking on the site.

## Ecological Design Opportunities

The first four weeks of the term were devoted to studying successful cities, ecological parks, eco-cities, brownfield remediation, alternative energy sources, housing, habitat, soils, and transportation. Students examined thriving eco-district precedents to understand how they work and to generate a wide range of possibilities for the site. Small groups were assigned to existing sites and asked to examine attempts to create a zero impact design. These studies were presented along with beginning site analyses and design solutions during the midterm review to get feedback from both faculty and City of Springfield staff.



Figure 14. Student first impression

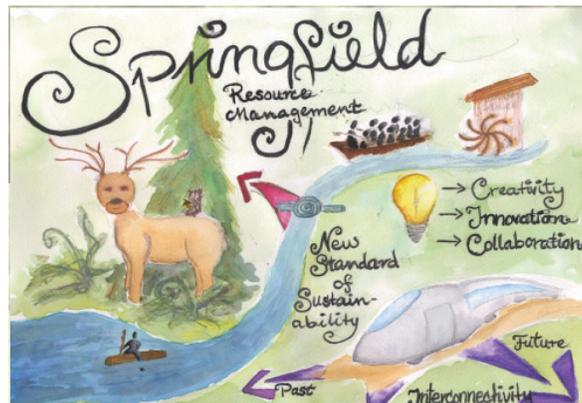


Figure 15. Student first impression

Eco-districts typically fall under the study of civic ecology. Civic ecology is the integrated web of energy, nutrient, resource, financial, information, and cultural flows and interactions that are envisioned, created, and managed by city residents acting for the common good within a geographically-defined community and its city-region. It is a human ecology of place, intimately integrating both natural and social/cultural systems (Seltzer et al. 2010).

Eco-district benefits are as follows: First, civic ecology is locally controlled. Second, the civic ecology framework creates real and enduring value. Benefits accrue to all forms of capital — physical, monetary, environmental, and social — as a result of proceeding with the civic ecology model in mind. Third, using civic ecology as a guide will create greater resilience for the neighborhood or district. Fourth, as should now be apparent, a key outcome is a stronger community, something that all communities have as a critical concern. Finally, using civic ecology as a framework for thinking and acting holds the promise of creating a “living culture” in the neighborhood.



*Figure 16. Eco-district concept (EAI Education 2011)*

Creating an eco-district using the Civic Ecology Framework will require that neighborhood/district stakeholders collaborate in public discussions to answer five questions:

1. Where are we now?
2. Where do we want to be in 5, 10, 20, 50 years?
3. How do we get to where we want to be?
4. How do we know if we are getting there?
5. Who wants to help find out? (Seltzer et al. 2010)



## Bo01

Bo01 is an eco-district located in Malmö, Sweden. Planning and construction of the site started in 1996 and ended in 2001. Before re-development, the area was a brownfield, heavily polluted from years of heavy industrial use. The site is 25 hectares (almost 62 acres) and has over 1,000 housing units.

The project was organized in eight focus areas designed to create the high environmental and social standards around which Bo01 would be created:

**Planning:** Bo01 planned for the creation of a dense and “living” district. Goals were set for human sustainability, and quality of life was supported with detailed criteria compiled by community members and experts.

**Soil Decontamination:** The procedures for creating housing on formerly industrial land generated many concerns. Could and should people live on previously contaminated soils? Bo01 successfully devised a revitalizing method to remove toxic soils and replace them with fresh alternatives.

**Energy:** Bo01 takes a unique approach to a systematic solution for 100% local renewable energy. While many similar communities focus on reduction in energy use through building construction techniques, Bo01’s concept presents iconic and easy-to-understand approaches of zero energy balance. To maintain a high level of thermal comfort for the residents of Bo01, the renewable systems have been linked with existing energy systems in Malmö. This provides storage as well as energy reserves for the district, allowing thermal comfort to be maintained.

**Waste Management:** Intentions to create a “cradle to cradle” approach to waste for the whole neighborhood resulted in many recycling and reuse techniques, including neighborhood source separation, two different organic waste separation systems, and biogas extraction.

**Traffic:** Traffic solutions were based on creating as many alternatives as possible for the residents and visitors of this neighborhood. Bus stops were integrated into the schemes to make them easily accessible. Only 0.7 car parking spaces were provided per household, and most of the area is open to pedestrians only.

**Biodiversity in the dense city:** Stormwater retention and use of stormwater in water features, as well as habitat-rich green and open space, were integral to the shaping of this development. Tools like the green space factor and green points list are used for increasing biodiversity.

**Building and Living:** Variety in building appearances, construction types, and provisions for student and senior housing contribute to a varied population and interesting experience. The adjacency of so many different solutions located in one development provides an opportunity for research into which methods work best when trying to create energy (Canada Mortgage and Housing Corporation 2005).

## Dockside Green

Dockside Green is 15 acre site in Victoria, Canada. For the better part of the century the area was used for light industry which expelled petrochemicals and toxic heavy metals into the soil. One third of the site is a landfill made up of garbage and hazardous materials from the factories. Dockside Green plans to take the brownfield site and transform it into a sustainable eco-district. In the first phase \$12 million was spent cleaning up the soil after years of negligent land use.

As of 2011 Dockside Green finished their second phase of construction attaining a LEED platinum score with 63 out of 70 possible points. Within the site two residential and commercial districts have been completed along with several sustainable systems to drive the eco-district to an unprecedented level of sustainability in the world.



Figure 19. Dockside green concept (Vancity 2012)

Dockside Green is home to a centralized biomass gasification plant that converts waste wood (tree clippings, construction excesses) into a gas that is burned to provide hot water and heat. Additional natural gas boilers are used in peak periods. The biomass plant allows Dockside Green to be carbon neutral or even negative in terms of greenhouse gas production and even allow it to sell energy to surrounding communities.

Dockside Green treats its own sewage using a specialized process designed by Zenon of Canada. Treated water will be used in toilets, irrigation, and the project's creeks and ponds system. Other measures include the use of highly efficient shower heads, faucets, urinals, dishwashers, and clothes-washing machines.

Dockside Green incorporates alternative methods of transportation to reduce the impact of car ownership and use, including a car sharing program, the construction of a dock for the harbor ferries, the provision of bicycle racks and showers for those commuting to the development's commercial areas, and ensuring that the Galloping Goose regional cycling trail is fully connected with Dockside Green.

Other steps taken to reduce Dockside Green's environmental footprint include:

- The use of solar power technologies, including street lights and garbage compactors
- Wind turbines
- The incorporation of green roofs on many buildings
- Use of only native and adaptive species in landscaping, and the planned planting of over 1,000 trees on the site overall (Vancity 2012).



Figure 20. Dockside green sustainable housing (Vancity 2012)



## Design Proposals

Students discussed the attributes and challenges presented by the Booth-Kelly site and developed two themes with full or partial removal of the industrial site: 1) parks and open space and 2) eco-district transportation hubs with high density development.

### Parks and Open Space

Some groups of students chose to develop the site into a community-oriented space that would create integration between downtown and the Mill Race. These students worked under the assumption that there would be enough residential development in downtown that the Booth-Kelly area should become an outdoor space that the entire community could use. Through research and interviews with the city, students began to develop ideas for their parks.

The designs looked to create a connection and transitional space that can take you from Springfield's urban downtown to the historically significant Mill Race. These students found Booth-Kelly to be the key to linking these two important spaces and creating a community focused destination.

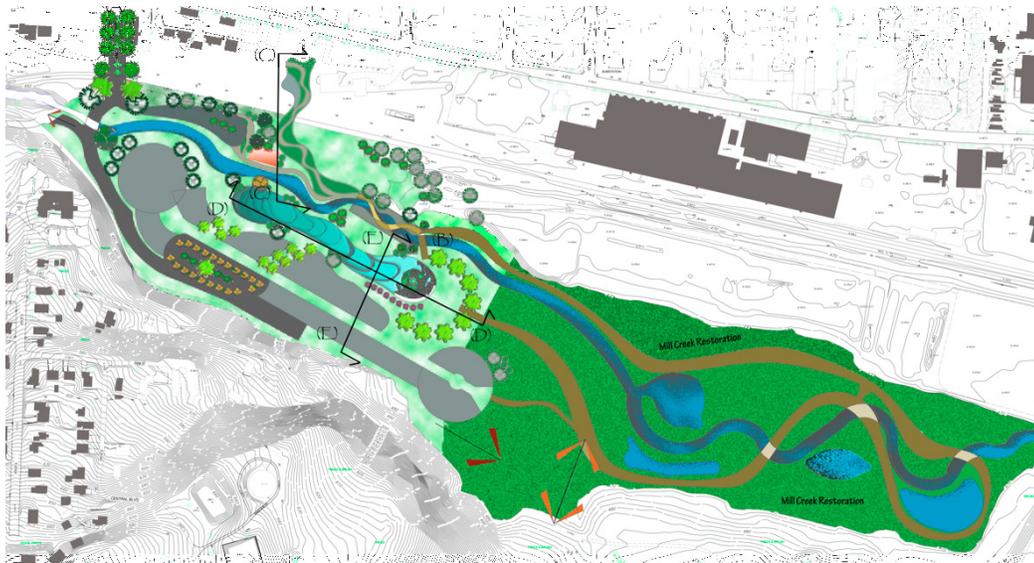


Figure 21. Site plan by Michael Vampran

## Urban Landscape Design: Michael Vampran

The juxtaposition of man-made (The Jeffersonian grid) and the natural form of the Mill Race play a key role in this design. This project proposes an ecological park that intends to blend the two distinct areas into one whole harmonious area.

The project examines approaches to create an ecologically sustainable design. By creating a terraced swale for stormwater from the site and downtown, water would be filtered and re-used. Black water will be used as fuel for a biomass plant to reclaim the electrical supply the area once created. Closing these resource loops is a key aspect of this design hoping to lessen the ecological impact of Booth-Kelly and downtown.

The terraced swale to treat grey water helps blend the man-made scene into a more natural one found along the Mill Race. The form of terraces is a man-made agricultural form that has been used for generations. The grey water wetland takes this man-made form and incorporates a more natural feeling.



Figure 22. Perspective of new crane shed concept by Michael Vampran



Figure 23. Site plan by Tyler Mark

### Frisbee Golf Course: Tyler Mark

This design looked specifically at incorporating an activity that could engage the entire community of Springfield. Frisbee golf is an inexpensive activity that is growing in popularity in Oregon and internationally. Springfield does not currently have any Frisbee golf courses in the area and adapting Booth-Kelly for this purpose is a realistic, low-cost opportunity worth exploring.

With a small amount of retail and restaurants to frame the entrance of the park, these economic hot spots would create beautiful vistas overlooking the park and the Mill Race in the distance.

The course layout, as seen in Figure 23, starts in the west end and loops around the park, ending back towards the west side of the site.

A basic stormwater system would meander through the whole site and would make use of stormwater from the downtown area, treating and filtering it before returning it to the Mill Race.

## Booth-Kelly Historic Landmark: Eric Bechler

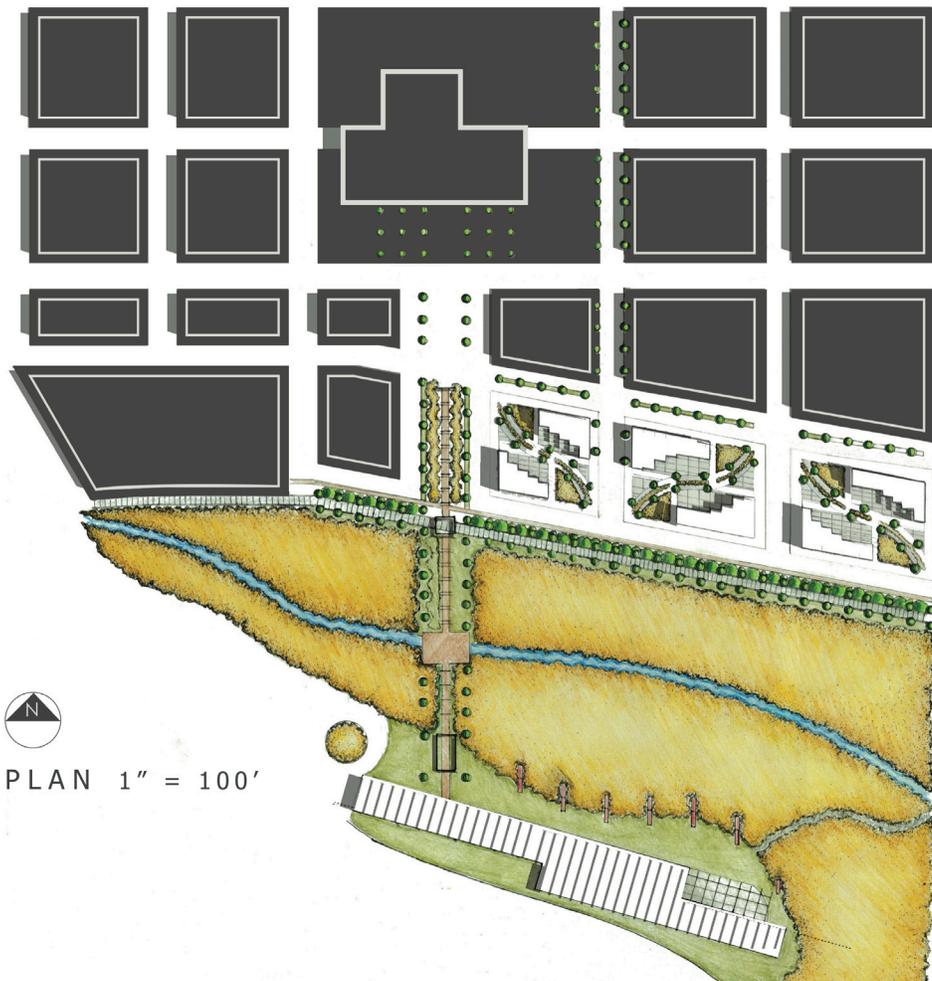


Figure 24. Site plan by Eric Bechler

In this design a small sustainable community is proposed to be built on the north side of the railroad track (Figure 24) . To provide access to the site, this design calls for a small bridge for pedestrians and emergency access.

On the south side, a park could be constructed that responds to the planting that has already been placed along the Mill Race, creating a connection from Springfield's City hall to the saw tooth building on a city scale.

The saw tooth building could be converted into a vocational school to instruct students in sustainable agriculture, industrial trades, and art focused on wood products. The school would draw a connection to the history of the site and draw in a student population that could live in the affordable housing developed to the north. With the school established, art installations can be erected from

recycled materials and the remains of the other buildings and materials, further creating a connection to Booth-Kelly’s cultural past.



Figure 25. Perspective of new development north of railroad by Eric Bechler

### Interactive Park: Sahela Kolb and Madeline Wayham

This design proposes a unique experience providing dynamic sustainable parameters emphasizing education, recreation, and interconnectivity for Springfield’s community to express a unique identity while fostering a healthy and flexible environment.

This team of two uses the golden ratio to organize the site’s design framework and integral position in determining Springfield’s DNA as a whole. The main geometry of the site is centered around two main geometric shapes based on the Fibonacci sequence that spiral out from a plaza.

Incorporating the five senses, an inclusive dynamic experience is created that is available to a larger audience as displayed in Figure 28. Everyone experiences places slightly differently and by incorporating a multi-sensory approach, everyone has the opportunity to be moved by the Booth-Kelly site.

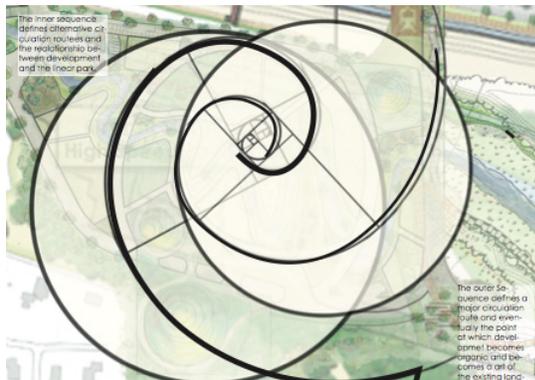


Figure 26. Design diagram by Sahela Kolb and Madeline Wayham

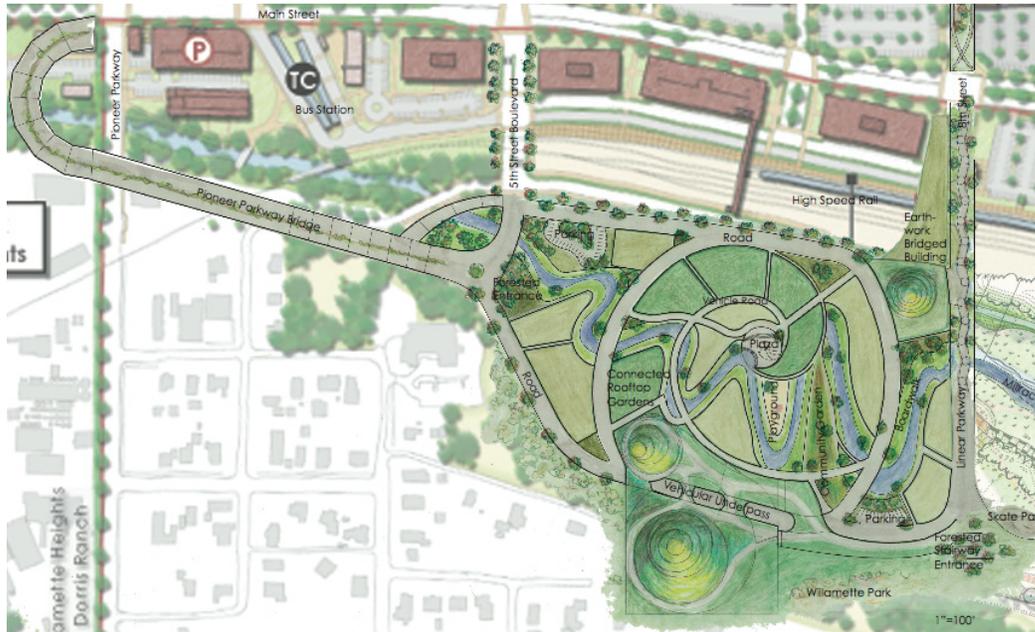


Figure 27. Site plan by Sahela Kolb and Madeline Wayham

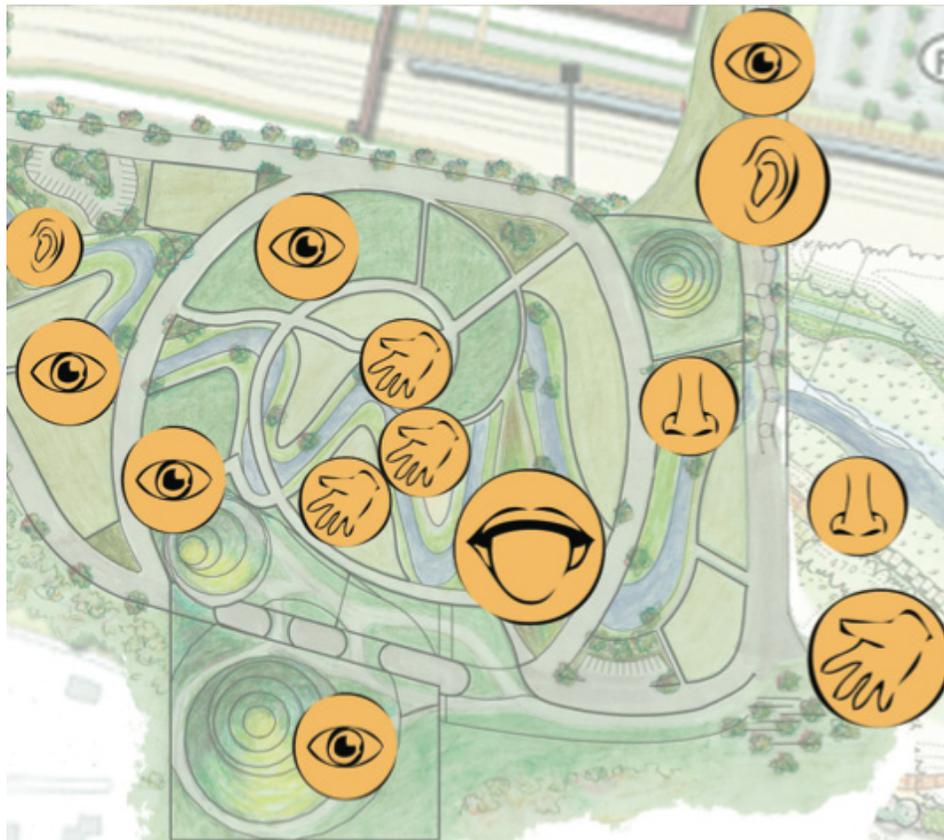


Figure 28. Thematic plan by Sahela Kolb and Madeline Wayham

## Eco-District Transportation Hubs with High-Density Development

Students began researching high-density development examples with an emphasis on those with waterfronts, nearby transit, commercial retail, and mixed-housing opportunities. The focus was to utilize the forefront of ecological technology and systems planning to create the least impact upon the site and region.

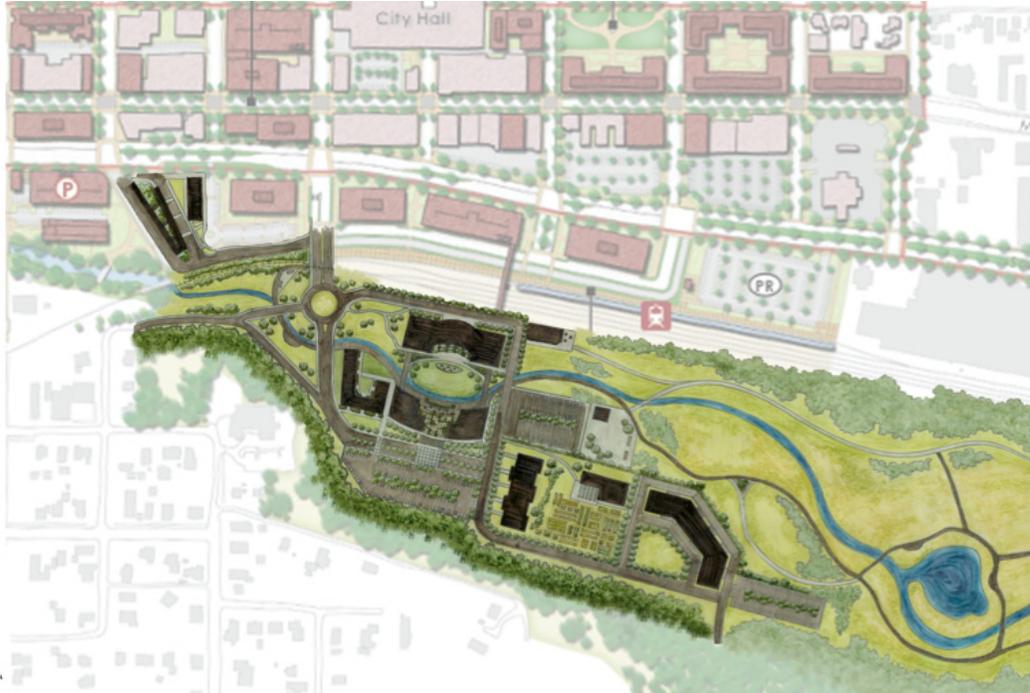


Figure 29. Site plan by Moses Drygalov

### Springfield Revival: Moses Drygalov

This student incorporates elements from every discipline the class studied, including ties to the history of the Booth-Kelly milling operations. Maintaining the current use of the site, the design utilizes light industrial at the far edges of the site and office space overlooking the wetland. Mixed-use and residential buildings offer high density housing and shopping and food options as a nearby alternative to driving for goods.

This design also proposes the use of community gardens, which are growing in popularity as local resources for food in cities. A community kitchen is also included as a facility to process produce from the garden and serve as a space to educate inhabitants of the park and site visitors.



Figure 30. Perspective by Moses Drygalov

### Booth-Kelly Town: Jesse Denny

This design proposal addresses the transportation and separation issues between Booth-Kelly and the downtown. A landbridge connecting the gap between the east section of Booth-Kelly to 7th Street continues the bicycle and pedestrian loops planned by the city. An underpass where 5th Street (the main entrance road to Booth-Kelly) and the railroad tracks intersect could be utilized for compact vehicles to bypass any railroad wait. While such an underpass creates a large dip in the topography, the designer uses it as an opportunity to create a circular terraced gathering space integrated with the Mill Race.

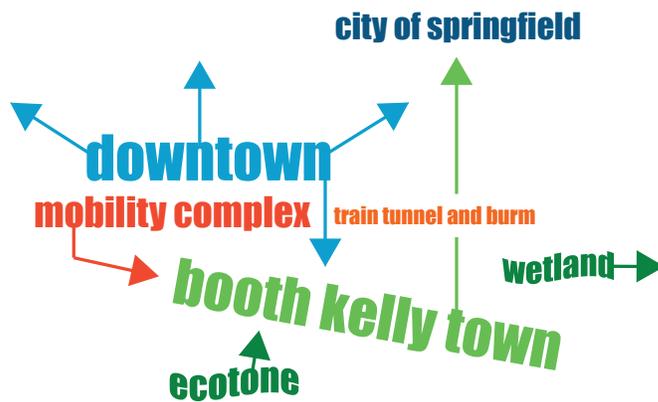


Figure 31. Parti diagram by Jesse Denny



Figure 32. Site plan by Jesse Denny

In this plan, residential and business uses are mixed with ground-floor retail and apartments on upper floors of buildings. To increase density of the area and maximize the use of space, a grid pattern of 120 feet by 120 feet is introduced for the city's blocks. Modified street dimensions and intelligent ways of organizing roads to include bike, pedestrian, vehicle, parking, and stormwater/plant implementations in a single street are applied to the design. To boost the comprehensiveness of how the city can work for itself, zero-impact methods of creating food and energy are explored and applied to the ideas for the design, including biogas, stormwater use, green roofs and a community garden in which inhabitants can tend to crops and provide goods for the on-site restaurants and businesses.

Design aesthetics include re-routing the Mill Race through the city to create a waterfront promenade, organizing streets in a way that encourages bustling street environments, creating a façade along the picturesque wetland, maintaining the grit of industrial

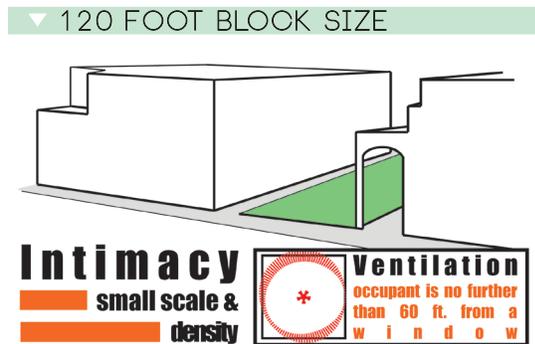


Figure 33. Block size diagram by Jesse Denny

construction by salvaging as much recyclable material as possible, and utilizing strong design of transition and gathering spaces to attract everyday city life.

▼ URBAN FARM PLAN

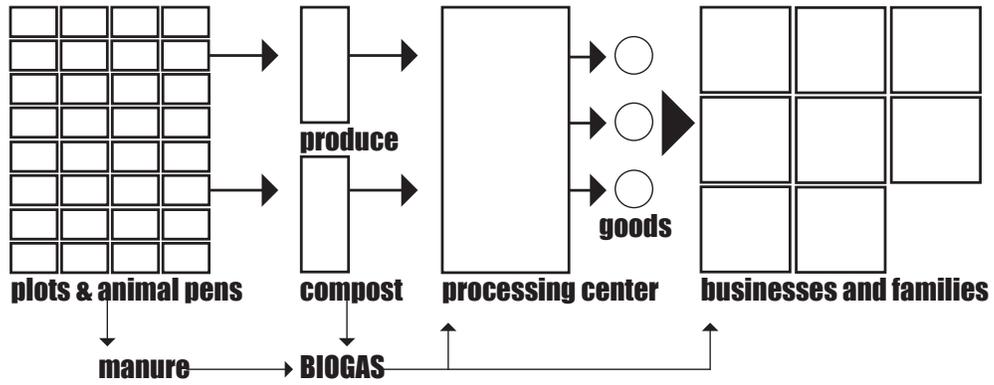


Figure 34. Urban farm plan diagram by Jesse Denny

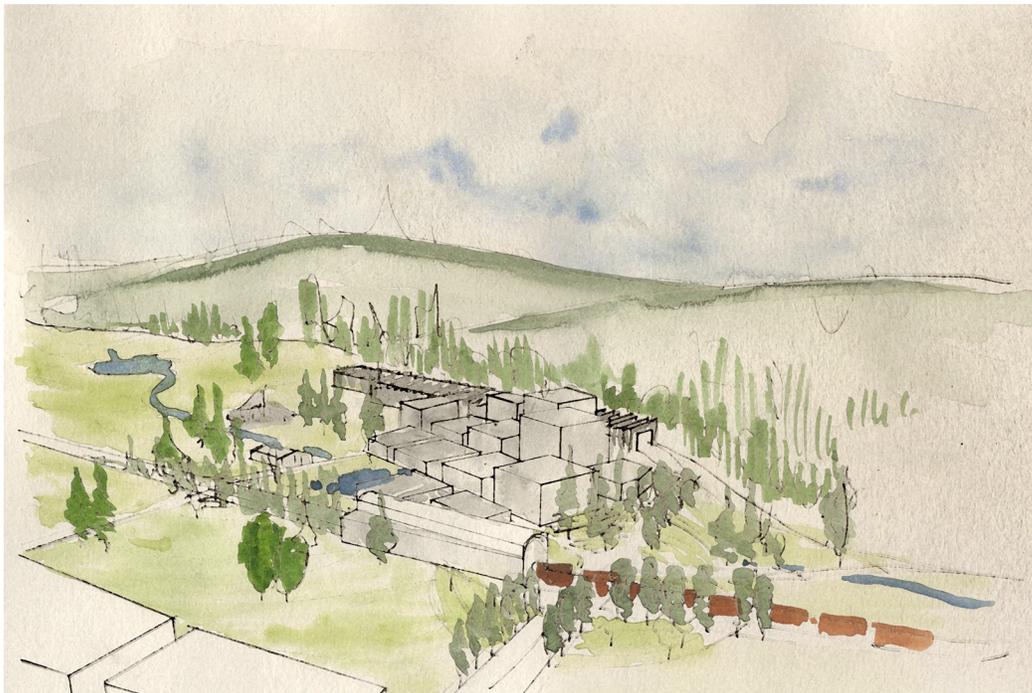


Figure 35. Contextual bird's eye view perspective by Jesse Denny



*Figure 36. Proposed amphitheater by Jesse Denny*



*Figure 37. Proposed building development by Jesse Denny*

## Modular Organization: Joyce Chao



Figure 38. Proposed modular development by Joyce Chao

This student creates a way to incorporate high density residential development at a large scale. The goal is to grade the site to incorporate terraces nestled in the existing hill on the south side of the site, thus increasing sunlight and utilizing view opportunities to the east. A modular residential building has been developed for use on the terraces, increasing the efficiency of the space by providing more homes in less area. Community gardens and on-site commercial/retail provide jobs and sustainable lifestyles for the residents. A community plaza is created to tie people together in the community.



Figure 39. Perspective of community garden along the Mill Race by Joyce Chao

## The Mill Race as a waterfront: Matt Laffitte



Figure 40. Site plan by Matt Laffitte

This student embraces the Mill Race as a waterfront by creating a system of boardwalks and walkways. These generate more pedestrian traffic by attracting people to enjoy views and participate in festivals held on the many promenades located in the design. Mixed-use building development is divided into two phases based on the growth pattern of the project, which include specialty restaurants and a new brewery location.

Bioswales are used frequently throughout the design to minimize the impact of road pollution. Rainwater is stored for re-use and summer irrigation. Community gardens are established for use by the development or to sell crops locally.



Figure 41. Perspective of the Mill Race path by Matt Laffitte

## Boardwalks and Open Space: Sara Sellers

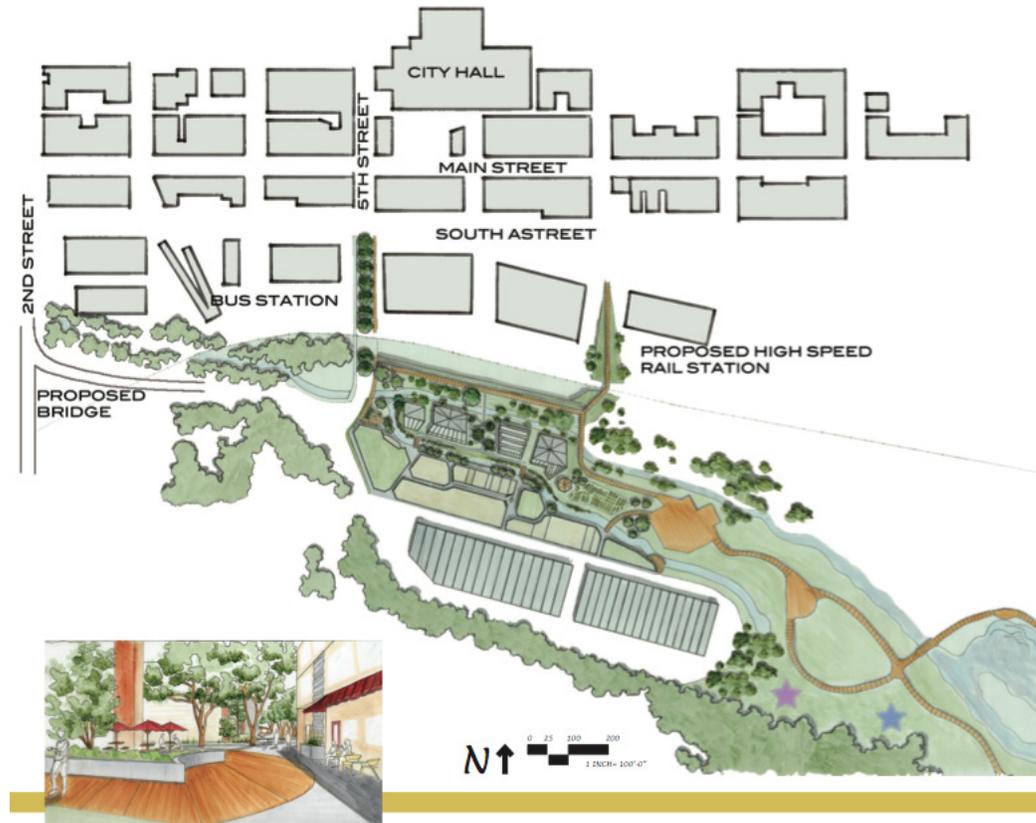


Figure 42. Site plan by Sara Sellers

This student addresses a number of electricity solutions; employing biomass energy, solar panels, and even the use of power-generating bike stands. Water is reused for non-drinking purposes from stormwater collection and roof runoff. Buildings on the site also feature green roofs to better control temperature and reduce the impact on the environment.

The eco-city boasts an ample amount of entertainment, including a movie theatre, restaurants with dining pavilions, brewery, bicycle obstacle course, and a park with large and extremely entertaining slides. All this is located about the site connected by meandering paths for pedestrians and bikes, covered by dense tree canopy, and organized in a way that promotes the gathering of people.



Figure 43. Boardwalk path along mixed use development by Sara Sellers

## Intelligent Stormwater and Native Planting: Jeff Luers

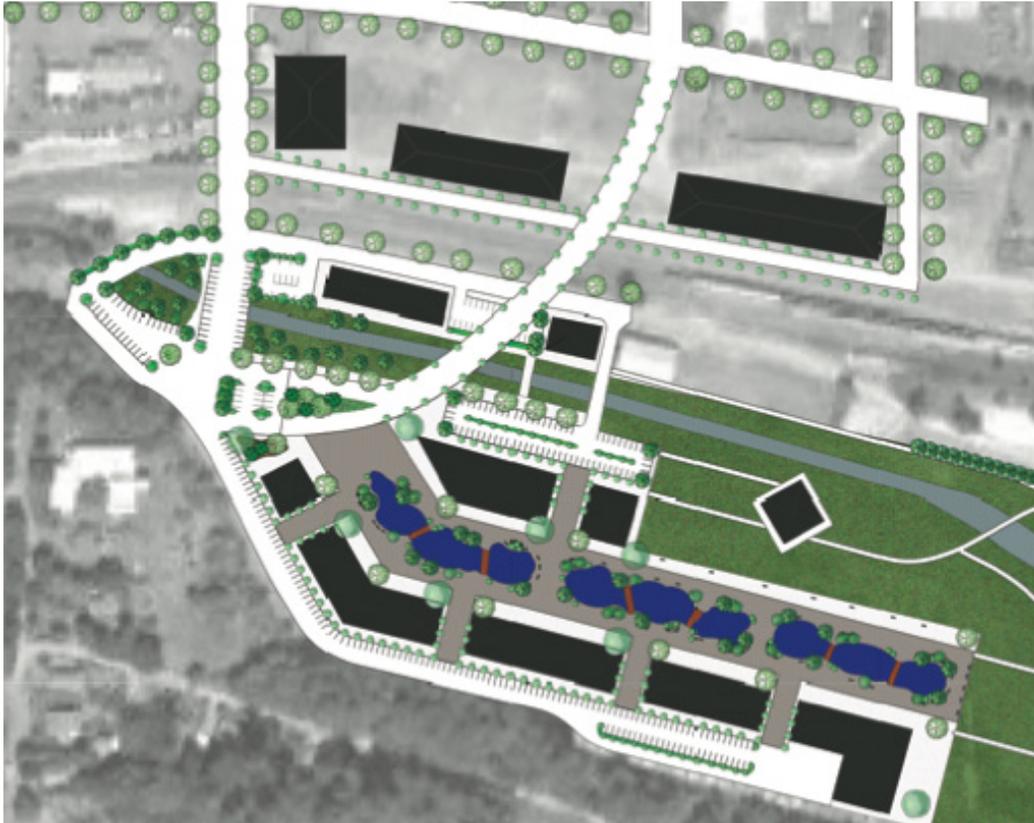


Figure 44. Site plan by Jeff Luers

This design contains all the necessary elements of a successful sustainable neighborhood. It embraces the Mill Race and the vernacular of the Northwest by utilizing the waters and planting native flora. The idea is to combine a neighborhood with all the necessities of living, such as retail, cafes, night life, food, living space, and markets, with natural wetlands existing on the site; putting people and nature back into the same community. In order to coexist, a number of sustainable methods of retaining and reusing stormwater, creating energy using biogas and solar panels, and utilizing native plants are incorporated to let the land thrive. The design occupies the west side of the site, leaving much of the wetland to the east untouched and open for respectful exploration.



Figure 45. Perspective of meandering bioswales by Jeff Luers

## Transportation Connection and Mixed Use: Brittany Swazas



Figure 46. Site plan by Brittany Swazas

This student incorporates less attention to development and more to circulation and natural space. Lots of open park space, restored wetland viewing areas, and a Mill Race running trail offer a more native atmosphere for people to get away and enjoy the outdoors. The Mill Race is re-routed through the heart of the site in order for it to always be in sight. Bike and roadways are organized in a loop for easy transportation of people in and out of the facilities. Instead of building large retail and commercial growth, office-space and low-income housing are proposed with a strong focus on community.

Community gardens help families in need to grow their own food, and develop a strong presence among the residents. Educational facilities help new growers learn the benefits and techniques of gardening. These facilities would be open to the public to help disseminate this crucial information to all.



Figure 47. View from proposed housing by Brittany Swazas

## **Springfield Eco-District: Andrew Halpin**

This student's proposal looks at creating an eco-district that could be economically, socially, and ecologically sustainable. By focusing on these three concepts and how they can work together symbiotically, will strengthen the design as a whole.

As an economic driver, the design would use mixed-use buildings; with commercial, restaurant, cafe, office, and light industrial spaces filling the lower portions of the buildings, and leaving the upper floors for housing.

In order to bring people into the retail areas and spend money, important social focal points serve as anchors and attractions. Examples of these focal points include: repurposing the skeleton of the sawtooth building as an industrial garden for growing fruits and vegetables, creating a plaza at the center of the retail area, designing a dog park, and adding a terraced rose garden at the top of the butte to the south. These social areas are not only for local residents but are meant to be shared by the entire community of Springfield. These social focal points make Booth-Kelly a destination and work symbiotically with the retail area. Once people have come to the district for the focal points, they will begin to spend money at the local retail and food businesses.

The final aspect of the plan is to include an ecological focus for the whole site design. Important sustainable systems incorporated into the site include: grey water treatment, a biomass plant, green roofs, vertical agriculture, and an intricate bioswale system that would treat water before allowing it to empty into the Mill Race. These sustainable systems would enhance the social focal points aesthetically and save the city money by lowering the cost and need for foreign resources such as electricity, fossil fuels, and water.

## **Conclusion**

This design studio was a journey of exploration for these Landscape Architecture students. They researched and considered techniques for alternative energy production, methods for increasing foot traffic, theories for successful food and retail businesses, and technologies for establishing green roofs and collection systems for water re-use.

The design proposals produced in this studio can be broadly categorized into two groups: (1) parks and open space and (2) eco-district transportation hubs with high-density development. Student designs attempt to respond to the need for Springfield's Booth-Kelly to become a growing sustainable community with a bustling sense of place.

## Appendix: Definition of Terms

### Brownfields

Brownfield is a term that describes the condition of a site that has been used for industrial use. Typically this land is polluted in some way, contains unsafe construction, and is in need of environmental cleansing. Revitalization methods for such places are diverse, including tiered wetlands that remove heavy metal toxins as the soil travels through a system of grass plantings.

### Biomass as an Alternative Energy Source

The use of biomass energy has the potential to greatly reduce greenhouse gas emissions. Burning biomass releases about the same amount of carbon dioxide as burning fossil fuels. However, fossil fuels release carbon dioxide captured by photosynthesis millions of years ago—an essentially “new” greenhouse gas. Biomass, on the other hand, releases carbon dioxide that is largely balanced by the carbon dioxide captured in its own growth (depending how much energy was used to grow, harvest, and process the fuel). The use of biomass can reduce dependence on foreign oil because biofuels are the only renewable liquid transportation fuels available.

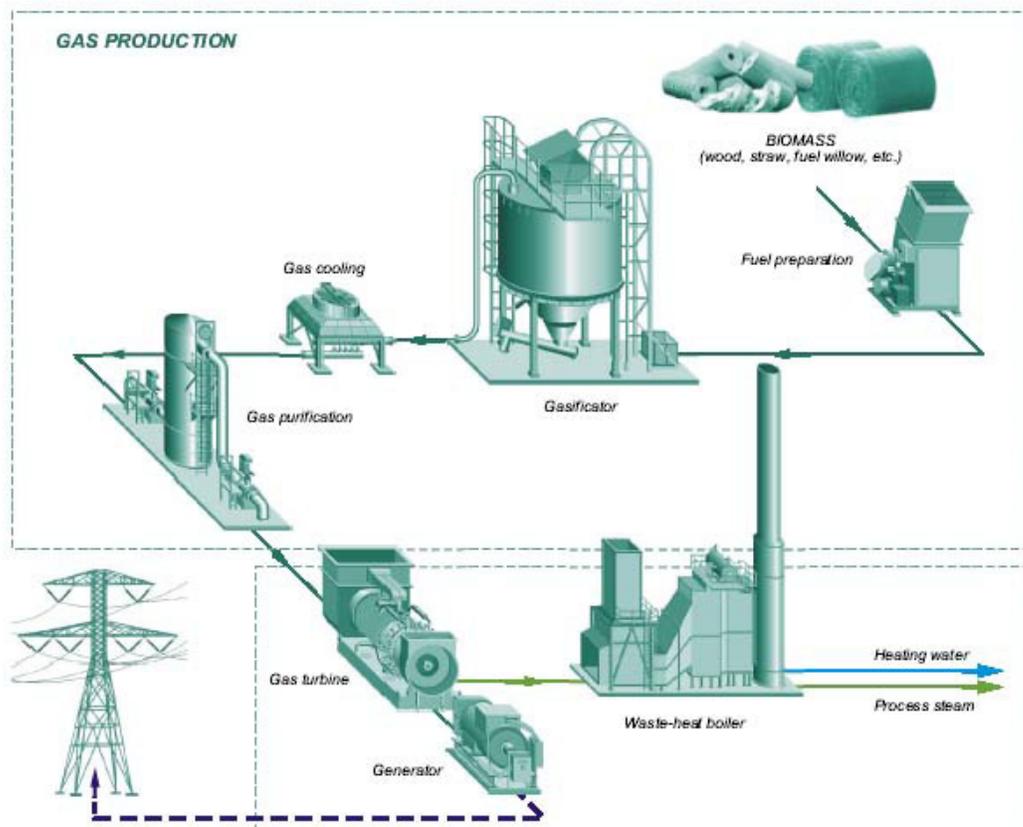


Figure 48. Biomass heat and power plant diagram (ABB 2006)

Biomass energy supports U.S. agricultural and forest-product industries. The main biomass feedstocks for power are paper mill residue, lumber mill scrap, and municipal waste. For biomass fuels, the most common feedstocks used today are corn grain (for ethanol) and soybeans (for biodiesel). In the near future, agricultural residues such as corn stover, (the stalks, leaves, and husks of the plant) and wheat straw will also be used. Long-term plans include growing and using dedicated energy crops, such as fast-growing trees, grasses, and algae. These feedstocks can grow sustainably on land that will not support intensive food crops (NREL 2012).

## Stormwater Management

Black and grey water on site can be filtered and re-used as water for toilets, washing machines and irrigation.

The grey water process takes wastewater from sinks, dishwashers, showers, and washing machines and purifies it through a series of filtering steps. After filtration, the water can be used directly for irrigation or mixed with chlorine and re-used for toilets and washing machines.

The black water process, which is wastewater from sewage, requires an extra five-step filtration process before it can be treated as grey water.

Phytoremediation uses plants to clean up pollution in the environment. Plants can help clean up many kinds of pollution including metals, pesticides, explosives, and oil. The plants also help prevent wind, rain, and groundwater from carrying pollution away from sites to other areas.

Phytoremediation works best at sites with low to medium amounts of pollution. Plants remove harmful chemicals from the ground when their roots take in water and nutrients from polluted soil, streams, and groundwater. Plants can clean up chemicals as deep as their roots can grow (USGS 2011).

Once inside the plant, chemicals can be stored in the roots, stems, or leaves, improved into less harmful chemicals within the plant, and enhanced into gases that are released into the air as the plant transpires.

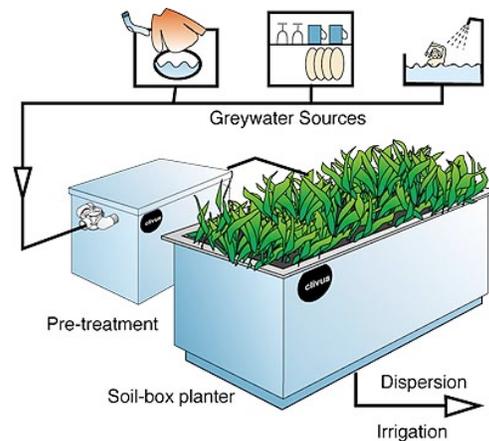


Figure 49. Greywater treatment diagram (Lindstrom 2000)

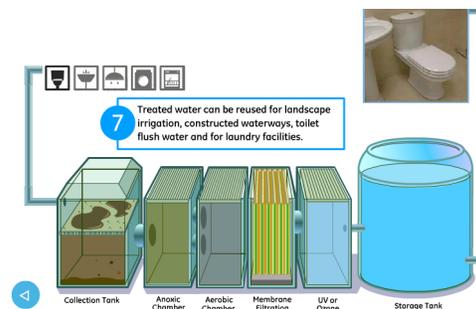


Figure 50. Dockside Green - B and G water filter (Vancity 2012)

## References

- ABB. 2006. "Biomass Heat and Power Plant." Last Modified April 20, 2006. <http://www.abb.com/cawp/plabb042/293a32d2f0d2b287c1257156003a5a52.aspx>
- Canada Mortgage and Housing Corporation. 2005. "Bo01 Sustainable Housing Development Malmo, Sweden." <http://www.cmhc-schl.gc.ca/en/inpr/bude/himu/inbu/upload/Bo01-Sustainable-Housing-Development.pdf>.
- City of Springfield. 2012. "Springfield Mill Race Restoration Project." Last Modified April 17, 2012. <http://springfieldMillRace.org/>.
- City of Springfield. 2010. "Early History of Springfield." Last Modified 2010. <http://www.ci.springfield.or.us/history.htm>.
- City of Springfield. 2004. "City of Springfield Mill Race & Mill Pond Restoration Project: History. Last Modified Summer 2004. <http://www.ci.springfield.or.us/Pubworks/MillRace/history.htm>.
- Downtown Citizen Advisory Committee. 2010. "Downtown District Urban Design Plan and Implementation Strategy: City Advisory Committee Recommendations." City of Springfield, Oregon.
- EAI Education. 2011. "Ecodistricts and Certified Communities: What's the difference?" Last Modified August 23. <http://www.earthadvantage.org/blog/single/ccecodistricts-vs.-certified-communities-whats-the-difference/>.
- GlashusEtt. 2007. "Hammarby Sjostad: A Unique Environmental Project in Stockholm." [http://www.hammarbysjostad.se/inenglish/pdf/HS\\_miljo\\_bok\\_eng\\_ny.pdf](http://www.hammarbysjostad.se/inenglish/pdf/HS_miljo_bok_eng_ny.pdf).
- Lindstrom, Carl. 2000. "Greywater: What it is...How to treat it...How to use it." <http://cmtk3.webring.org/l/rd?ring=homeimprove;id=56;url=http%3A%2F%2Fwww.w%2Egreywater%2Ecom%2F>.
- NREL. 2012. "Learning About Renewable Energy: Biomass." Last Modified May 30, 2012. [http://www.nrel.gov/learning/re\\_biomass.html/](http://www.nrel.gov/learning/re_biomass.html/).
- Seltzer, Ethan, Tim Smith, Joe Cortright, Ellen M. Bassett, and Vivek Shandas. 2010. "Making EcoDistricts: Concepts and Methods for Advancing Sustainability in Neighborhoods." Portland State University.
- USGS. 2011. "Toxic Substances Hydrology Program: Phytoremediation." Last Modified November 18, 2011. <http://toxics.usgs.gov/definitions/phytoremediation.html>.
- Vancity. 2012. "Dockside Green." <http://www.docksidegreen.com/>.