Closing the Gap:

FINDING PRODUCTIVE USES FOR VACANT LAND IN NORTH ST. LOUIS, MISSOURI

By

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A REPORT

submitted in partial fulfillment of the requirements for the degree

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Department of Landscape Architecture/Regional and Community Planning
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Abstract

Inner city areas of many major American cities have fallen victim to "urban decay." In many instances the result is abandonment. Nevertheless, the inner city can be redeveloped by landscape architects and others to provide a place to live, work, learn, and play while displaying sensitivity to the environment. Such developments can be wisely designed by following planning/design guidelines that follow sustainable design principles.

The neighborhoods of the 5th Ward in St. Louis, Missouri are the victims of an aging industrial city. Many neighborhoods are troubled with socio-economic problems such as unemployment, low housing values, lack of educational services, scarcity of fresh, reasonably priced food, and elevated crime rates. The socio-economic problems listed above have been major factors in extensive depopulation and disinvestment since the mid 20th-century.

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The overall goal for this project is to create a productive uses for the 5th Ward's vacant land in order to encourage economic and social growth. This can be achieved through investments in urban agriculture and accessible community space. This project serves as a potential solution for renewal of lost urban community infrastructure that includes parks and agricultural cropland. Implementing recreation and urban agriculture on vacant land could help spawn a rebirth and sustain a vibrant and economically-viable community fabric.

Closing the Gap:

Finding Productive Uses For Vacant Land in North St. Louis City

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Master's Thesis Project and Report 2011

Kansas State University
College of Architecture, Planning, and Design
Department of Landscape Architecture and Regional and Community Planning

LAR 700 - Project Programming
LAR 705 - Master's Project and Report

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Acknowledgements

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Abstract

Inner city areas of many major American cities have fallen victim to "urban decay." In many instances the result is abandonment. Nevertheless, the inner city can be redeveloped by landscape architects and others to provide a place to live, work, learn, and play while displaying sensitivity to the environment. Such developments can be wisely designed by following planning/design guidelines that follow sustainable design principles.

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Introduction

Dilemma

"St. Louis a once grand city, earned its title as Gateway to the West. Today, it is hard to see why. Still a city that believes real progress is defined by demolishing old and building new, St. Louis continues to let much of what is left of its notable older commercial buildings crumble away. Instead, those historic buildings could be the best resource on which to recultivate a genuine urban garden, but that does not seem to be this city's inclination" (Gratz 1998, 317).

The quote above serves as a reminder that there are various dilemmas present within the city of St. Louis, and that acknowledging these dilemmas is vital to the health of the city St. Louis has great potential to be the "grand city" it once was, but it needs a catalyst to drive and give direction.

The St. Louis City Area is characteristic of buildings that were constructed in the early 20th century. Many of the homes and buildings, and parks in the area are in need of restoration. Since the mid 20th-century the population of the city has dropped by more than half due to population leaving for the suburbs. This leaves a huge gap in economic backing for the remaining community creating a cyclical problem. People leave because of decaying infrastructure and increased crime rates, and the tax base that is supposed prevent and correct these problems diminishes as the people leave.

Located in North St. Louis City, directly North of St. Louis Downtown, is a collection of neighborhoods known as the 5th Ward. The neighborhoods of the 5th Ward in St. Louis, Missouri are the victims of an aging industrial city. Many areas of the neighborhoods are troubled with socioeconomic problems such as unemployment, low housing values, lack of educational services, scarcity of food markets, and elevated crime rates. The socioeconomic problems listed above have been major factors in extensive depopulation and disinvestment since the mid 20th century. Areas throughout the ward show the symptoms of urban decay; demolished or dilapidated buildings and large tracts of vacant land that fragment the community fabric. The vacant land is an eyesore on the community and is wasted urban space.

How can the community of the 5th Ward be revitalized in a way that utilizes vacant land to reconnect the community fabric and serve as a catalyst for economic development?

Figure 1.1: Aerial Image of Pruitt Igoe Public Housing. Photo from (www.kwmu.org).

Figure 1.2: Image of Pruitt-Igoe Demolition. Photo from (www.so-and.org).

Figure 1.3: Image of Pruitt-Igoe Current Conditions. Photo from (www.flickr.com).

Figure 1.4: St. Louis Place Neighborhood Urban Prairie.
Photo from (www.flickr.com).

Figure 1.5: St. Louis Place Neighborhood Urban Prairie.
Photo by Author.

Figure 1.6: Image of Vacant Building in the 5th Ward.
Photo from (www.flickr.com).

Thesis

Revitalizing vacant land within the community with productive uses such as urban agriculture and park space will serve as a catalyst to renewal of the 5th Ward.

Key Questions

How to instill community activity?

- Interactive/educational landscapes
- Recreation space
- Activity / Festival / Gathering spaces
- Urban farming
- Farmers market
- Diversity

How to instill economic activity?

- Create jobs
- Create nutritious food sources
- Draw people (business)
- Draw residents (tax base increase)

Site Context

St. Louis City is known as the gateway to the Midwest. At the front edge of St. Louis' downtown core stand the Gateway Arch, one of the most recognizable sculptures and an important piece of St. Louis and American history. Downtown land uses support businesses, residences, parks, memorials, sport venues, and numerous other activities. For most of St. Louis' downtown core there are attractive and active public spaces that generate revenue, draw people, and create a welcoming sense of place to the cities core. Attractions includes the Archgrounds, Laclede's Landing, the Gateway Mall, Soulard, and Washington Avenue.

To the north of St. Louis' downtown core are a number of neighborhoods that form the 5th Ward. These neighborhoods include St. Louis Place, Carr Square, Old North St. Louis, and portions of Downtown West, Jeff VanDerlou, Hyde Park, and Columbus Square. The thriving activity of business and entertainment downtown St. Louis abruptly transforms into areas of urban blight within a few blocks. The area changes from iconic buildings and grand plazas to dilapidated structures and large vacant lots.

Although the greater St. Louis metropolitan area has a total estimated population of over2,890,000 people, less than 360,000 people reside in the St. Louis City limits. Much of the growth and development occurs outside the city limits in the suburbs of the surrounding counties.

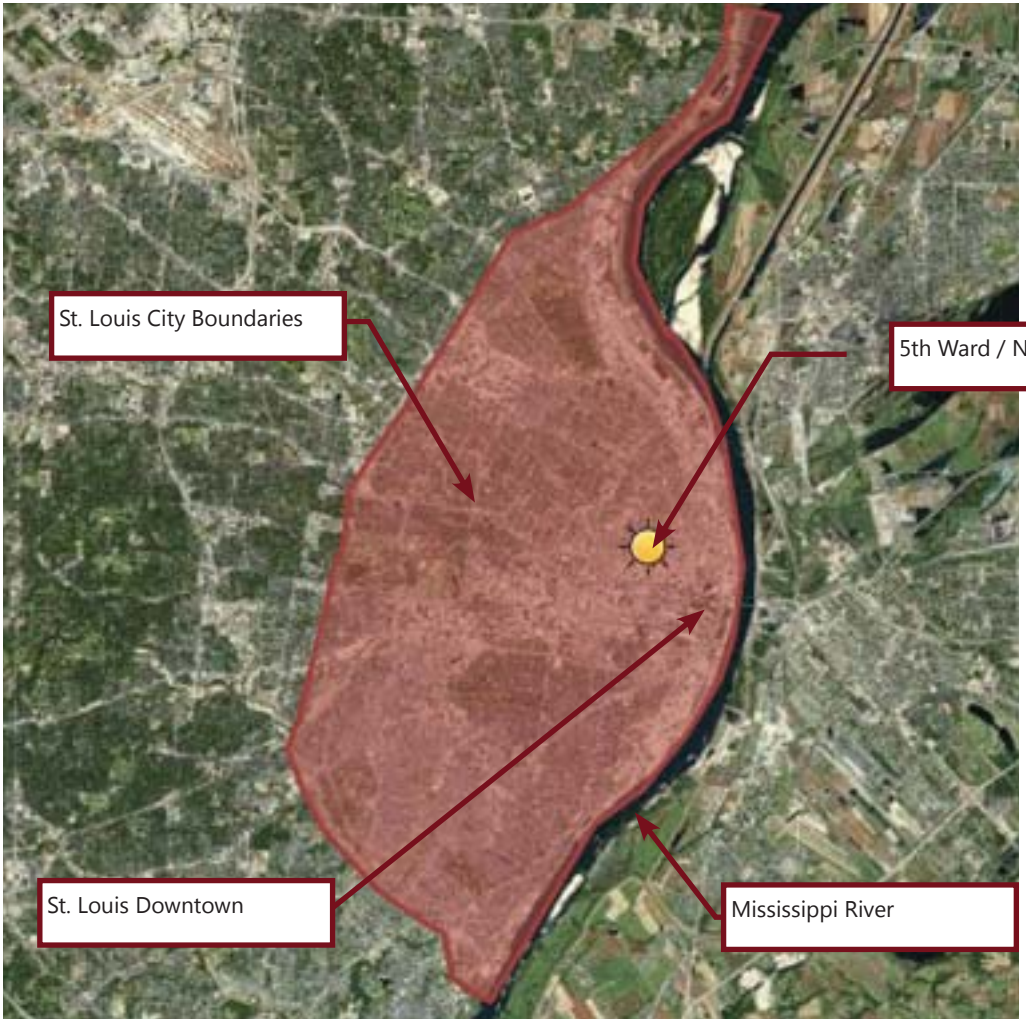

Figure 1.7: St. Louis City Context Map. Map Adapted from Bing Maps (2011)

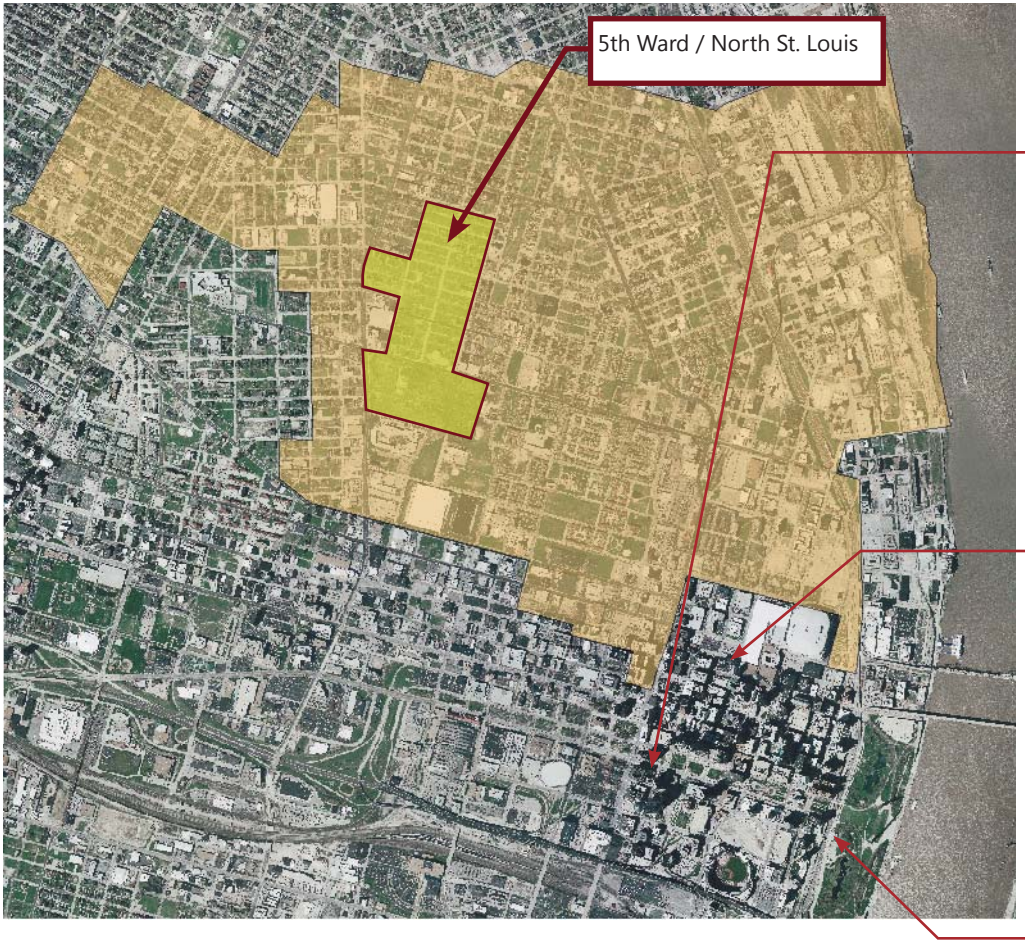

Figure 1.8: 5th Ward Context Map. Map Produced by Author.

Figure 1.9: Image of City Garden on the City Mall. Photo by Author.

Figure 1.10: Image of the America's Center Convention Complex. Photo by Author.

Figure 1.11: Image of the Gateway Arch. Photo from (www.dearwinona.com).

Critical Existing Site Conditions

A Lost Community:
In many parts of the St. Louis City area there has been a large decrease of population since the mid 20th-century. In 1950 the population for St. Louis City was estimated at 856,796 people. In 2009 the population was estimated at 356,587 people (www.census.gov). This migration of over a half-million people from the city toward suburban areas, has led to a loss of the city's tax base (stlouis.missouri.org). The Carr Square neighborhood has a population of 2,339 and a total land area of .41 sq. mi. St. Louis Place neighborhood has a population of 2,763 people and land area of .69 sq. mi.

Pruitt-Igoe:
The site located on the previous is the former location of the Pruitt-Igoe public housing project. The intent Pruitt-Igoe was to provide affordable public housing for the poor St. Louis population. This project, which received design awards upon construction, soon became a victim of "urban decay" and became a danger to the community. Within two decades of being built the project housing was demolished due to severe crime and unsafe building conditions. Most of the site remains vacant today due to low land value, crime rates, and the existing building foundations that remain on the site.

Wasted Land Use:
Vacant lots and abandoned buildings are a social eyesore as well as a lost opportunity for productive community spaces. Abandoned buildings and vacant lots are caused by the migration of residents to other areas, and the removal of industrial and commercial businesses. The area northof the Pruitt-Igoe site in the St. Louis Place neighborhood is characterized by "urban prairie." Once highly populated and developed, the area has succumbed to "urban decay" and has been left almost entirely vacant. Large expanses of grass and weeds replaced historic buildings of the early 1900s. Many buildings remain vacant and serve as a potential safe haven for crime.

Figure 1.12: Image of Urban Prairie in St. Louis Place Neighborhood. Photo by Author.

Figure 1.13: Building Displaying Historical Architectu St. Louis Place Neighborhood. Photo by Author.

Figure 1.14: Image of Remnant Infrastructure on the Former Pruitt-Igoe Site. Photo by Author.

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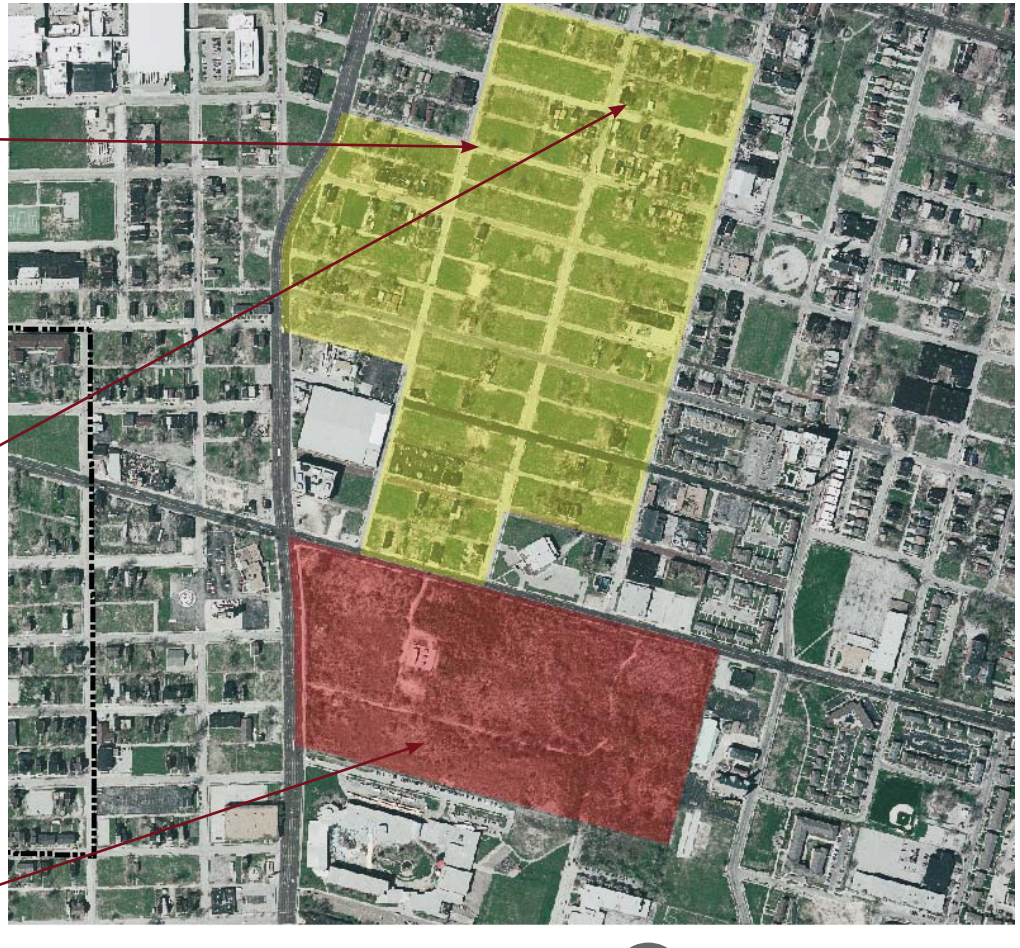


Figure 1.15: Site Study Location Map. Map Produced by Author.

Location of Study Sites

Site #1: St. Louis Place Neighborhood
The west side of the St. Louis Place neighborhood is predominately single family residences. The neighborhood blocks were once lined with single family houses, but since the mid-to-late-1900's St. Louis Place has seen extensive depopulation and demolition of buildings. Currently much of the land is undeveloped, un-planned, and left vacant. Population rates continue to decrease because of this area's degraded infrastructure and lack of community amenities.

Site #2: Former Pruitt-Igoe Site
This study area was the former location of the Pruitt-Igoe Public Housing Project. Pruitt-Igoe is infamously known is a major failure to provide public housing. Due to high levels of crime, poverty and vacancy the 33 high rise apartment buildings were demolished within two decades of being built. A majority of the site remains vacant and is known to be a brownfield, containing demolished infrastructure from the failed housing project. Currently two schools and a church are located nearby the Pruitt-Igoe site.

Project Context

The 5th Ward Comprehensive Neighborhood Plan, developed by the City of St. Louis Planning and Urban Design Agency, Schwetye Architects, Inc., SWT Design, and the residents of the 5th Ward encompasses approximately 1370 acres of land within North St. Louis, Missouri.

The goal of the project was to develop a comprehensive neighborhood plan that improves the physical and economic characteristics of the community, leading to a better quality of life for the residents. The plan is meant to be a feasible and buildable plan. The project and planning process began in September of 1999 and was composed of four major segments; data collection, analysis, conceptual plans, and final master plans (stlouis.missouri.org). The planning process involved numerous community meetings to gather information from residents and city officials. This data was then used to generate concept plans, strategic land use plans, and proposed zoning plans. The planning process coincides with other local master plans including the St. Louis Regional Long-Range Transit Plan.

To the right is a list of key program elements from the draft master plan for the 5th Ward. The program elements were developed through community meetings with residents and the consultants listed above.

Relevance to Project

The overall goal of this masters project is to implement productive uses on vacant land within the 5th Ward. The Existing 5th Ward neighborhood plan is an excellent study and proposal for future development. The 5th Ward Neighbor Plan is relevant to this report because it has helped serve as a guideline for community needs and delineates areas of the plan need further study.

The goal for this study is to highlight various portions of the plan that need further study and to critique the concepts that have been generated within the plan. Although the plan excels in providing strategies for residential and commercial development, the plan leaves some of the most degraded areas of the 5th Ward open for future study. These areas have some of the greatest potential for implementing designs that will improve the sustainability of the neighborhood and contribute to an improvement to the quality of life for the residents.

Figure 1.16: Image of St. Stanislaus Church. Photo by Author.

Program Elements

- Convenience Retail
  - -125,000 square feet
- Restaurants
  - -80,000 square feet
- New Housing
  - -1825 units
- Light Industrial
  - -45 acres
- Streetscape Improvements
  - -4 major streets
- Open Space Improvements
- Mixed Use Development
  - -320,000 square feet
- Rain Transit Expansion
  - -3 stops in within the community
- Golf Course and Community Center
  - -Nine hole course with educational and community center
- Movie Theater
- Parking Garage

Proposed Land Use Plan

The strategic land use plan that was developed for the City of St. Louis left out a large portions of area within the St. Louis Place and Carr Square neighborhood for further study or opportunity areas. St. Louis Place is one of the most vulnerable areas to the 5th Ward to declining conditions due to large amounts of land vacancy. The area shown in Figure 1.17 has potential for various forms of recreational and agricultural developments due to the large expanses of vacant land. Existing master plans for this area developed for the 5th Ward propose a golf course and housing development throughout much of the St. Louis Place neighborhood extending into the former Pruitt-Igoe site. The incorporation of urban agriculture mixed with various housing developments and recreational opportunities could better serve the community of the 5th Ward.

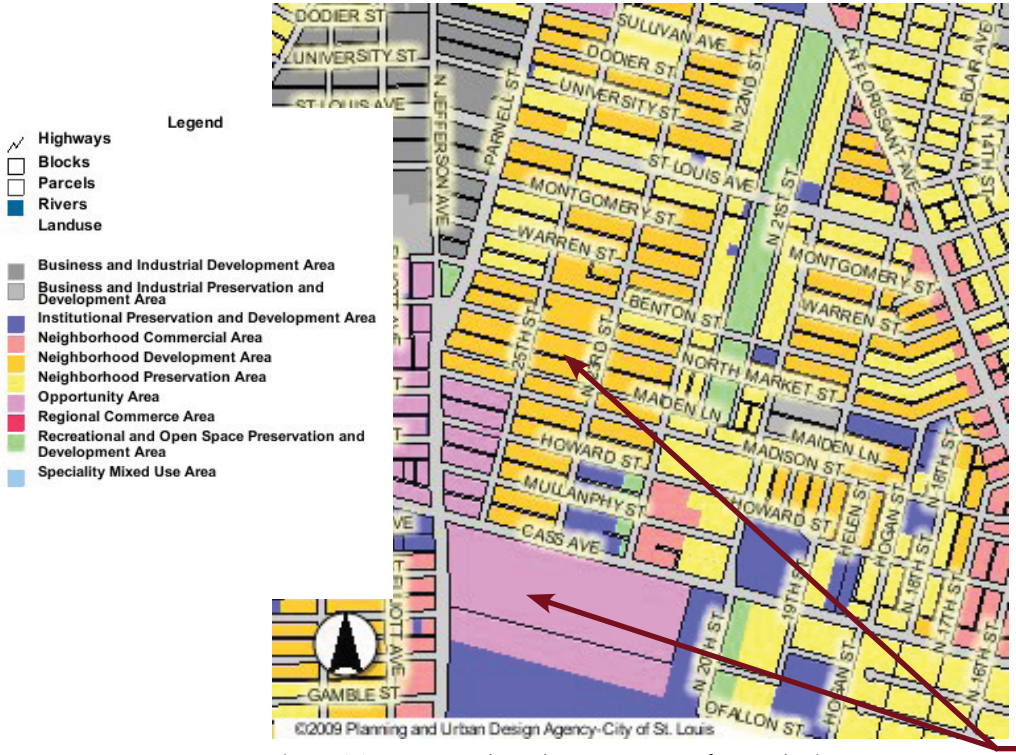


Figure 1.17: Proposed Land Use Map. Map from (stlouis.missouri.org).

The purple areas are designated as "Opportunity Areas." These areas were designated as opportunity areas to allow for flexibility in development types. The area to the north is currently designated as neighborhood development. This area has potential for the incorporation of urban agriculture. The intent of this project is to generate alternate ideas for these area.

Goals

The overall driving goal for this project is to create productive uses for the 5th Ward's vacant land in order to encourage economic and social growth. This can be achieved through investments in urban agriculture and community space. The final product that will be generated with this project is an analysis of the existing conditions of the community, strategies for solving the issues listed above, and the creation of a vision to improve socioeconomics.

It is important to note that the goal of this project is to increase the vitality of the existing community economically and socially, without replacing the current population. A community that is characterized by social and cultural diversity can thrive to produce many benefits including renewed interest and investment, development, and economic growth.

The goals and concepts displayed in this book represent ideas for temporary and permanent solutions to the current issues that are at hand within the community of the 5th Ward.

To the right the underlying goals for this project are listed. These goals helped to guide a community and site analysis, project programming, and design work. These goals were generated by synthesizing information from the existing master plan, literature review, and site inventory and analysis.

- Promote a community with increased vitality.
- Attract permanent residents without displacing the current population.
- Maintain existing cultural character of the community while allowing for diversity.
- Design for a diversity of uses and character.
- Create safe and active public spaces.
- Provide employment opportunities for current residents as well as future residents.
- Utilize vacant land as a sustainable food source and as community park space.
- Provide social activities geared towards multiple age groups.
- Maximize access to public transportation and increase walk-ability.
- Improve "curb appeal" of the neighborhood using sustainable design strategies.
- Promote a sense of environmental stewardship within the community.

Goals and Rationale

Promote increased community vitality.
The intent of this design is to provide options for the community to grow socially and economically. An increase in community vitality would be characterized by a new vigor of development that could serve as a catalyst to sustained positive improvements to the community fabric. This can be achieved through community involvement, activity, and action to draw various forms of investment to the community.

Attract permanent residents without displacing the current population.
The neighborhoods of the 5th Ward currently display a downward trend of population growth. The loss of residents can be attributed to the degraded conditions of the community. Improving the conditions of the community will increase the overall economic and social value. This will increase the attractiveness of the community to potential future residents. The goal is to produce a design that increases the value of the community, allowing the existing residents opportunities to grow with the community as a whole. It is important to prevent gentrification of existing residences. Gentrification can be avoided by creating a design that has opportunities for residents of diverse economic and social backgrounds.

Maintain existing cultural character of the community while allowing for diversity.
The neighborhoods of the 5th Ward have a historical character present throughout the community. This is displayed in the existing infrastructure and buildings of the community. Designing for community improvements that reflect the historical character can serve as a great cultural amenity and provide an attractive identity to the community.

Design for a diversity of uses and character.
Designing for diverse uses will allow for flexibility in investment strategies, residents, business, and industry. Allow for flexibility will maximize the areas potential for social and economic improvements. Flexibility can help to protect the economic and social value from stagnation, sustaining future growth. Diversity of uses can occur at different scales from single parcel to the community as a whole. Diversifying the character of development will protect the community from monotony and increase the attractiveness of the community to potential future residents. Varying the size, visual appearance, and layout of future developments can help to achieve diversification of character.

Create safe and active public spaces.
The success of community activities will rely heavily on the safety of the participants. Crime is an issue within and near the neighborhoods of the 5th Ward. Improving the appearance of the neighborhood to look more maintained than neglected will help increase a positive perception of safety and deter crime. With a positive perception of community safety, residents and non-residents will more likely frequent amenities in the community.

Provide employment opportunities for current residents as well as future residents.
Currently within the neighborhoods of the 5th Ward the unemployment rate of the civilian labor force is approximately 25%. This rate is more than double the citywide average of St. Louis City which is approximately 11% (stlcin.missouri.org). Utilizing the 5th Ward's vacant land for urban agriculture and park space will create jobs needed for maintenance, construction, and management. Redeveloping the community will increase the attractiveness for industry and businesses, creating the opportunity for new jobs.

Utilize vacant land as a sustainable food source and community park space.
Much of the 5th Ward can be characterized as a "food desert." A "food desert" means that healthy nutritious food such as fruits and vegetables are more readily available than junk food. Many of the neighborhoods of the 5th Ward have limited access to nutritious

Goals and Rationale (cont.)

foods leading to unhealthy diet options. The vast expanses of vacant land within the neighborhoods could be utilized as a self sufficient food source. This will increase resident access to nutritious foods and reduce the need for transport to bring food from outside sources. The food produced on the land could also bring income to the community by selling produce to the nearby restaurants and stores of St. Louis City.

Provide social activities geared towards multiple demographic groups.
Drawing a diversity of demographics, including age, gender, and race, to the community will be important to the success of public park space development, community gardens, and urban agriculture. Promoting and providing space for various kinds of activities will maximize the quantity of users to developed areas. For example, providing educational activities for the youth is just as important as providing activities for retired adults and providing opportunities both ages groups within the same space will benefit both groups.

Maximize access to public transportation and increase walk-ability.
Easy access to public transportation including buses and rail transit will be essential for many residents of the 5th Ward. Public transportation will allow for residents to easily travel to other parts of the city. Access to other parts of the city will allow for residents to have a larger range of job opportunities if they do not have access to automobile transportation. An increased use of public transportation will also help to create a more walkable community. Design strategies that encourage walking and use of public transportation as a major means of travel should be implemented.

Improve "curb appeal" of the neighborhood using sustainable design strategies.
Streetscape, buildings, park space, and open space improvements will help to create a positive image and perception of the community as a whole. Creating a plan for the spatial layout and physical characteristics of these improvements is a major goal of this project. Within these improvements sustainable design strategies can be incorporated to improve the environment and surrounding communities. These improvements will incorporate strategies that address stormwater pollution, urban heat island effect, food deserts, poor air quality, and excessive energy consumption.

Promote a sense of environmental stewardship within the community.
Supplying the community with ecologically rich landscapes will provide and educational and aesthetic benefits for the residents. Providing residents with access to natural areas and landscape will encourage a sense of pride for the landscape and environmental stewardship.

Overall Program Elements

Vacant Land into Productive Land:
The "urban prairie" comprised of vacant lots and abandoned buildings will provide locations for a new park space, urban agriculture, and other community amenities. Renovating "urban prairie" areas by improving the aesthetic appearance and restoring to more productive uses will turn the land into an asset for the community. The large quantity of vacant land present in the 5th Ward could be transformed into a local food source for the community as well as surrounding areas of the city. This could dramatically improve the efficiency and availability of the food supply in the St. Louis City area.

Environmental Stewardship:
Renovation of the "urban prairie" into new ecologically rich learning environments can help to inspire environmental stewardship in the community. The community can serve as an archetype of environmentally sensitive design for St. Louis and similar Midwestern cities. This can include stormwater best management practices, incorporation of native vegetation, alternatives to automobile transport for community individuals, and alternative energy sources. Community gardens and park space can provide an excellent setting for educating the community about ecological processes and environmental issues.

Phased Community Development:
Transforming declined areas into livable space will help to draw the community back towards growth, thus increasing the taxable base. The increase in tax payers will help to rejuvenate the quality of the city environment. A plan for future growth will be necessary to guide developments, land uses, and improvements. The plan will include the spatial layout of the various developments and land uses, and will be displayed to show the phasing for implementation. Phasing will be essential to developments within the community due to a lack of budget resources.

Streetscape Improvement:
Improving the appearance of the community will be necessary in order to attract residents and visitors to the 5th Ward. Streetscape improvements can include street trees, re-paved sidewalks, restored public gathering spaces, lighting, and signage. Sustainable design strategies such as stormwater BMPs and planting native vegetation will be implemented through these improvements.

End Products

- An inventory and analysis mapping the dilemmas, assets, and potential strategies for the 5th Ward.
- A overall framework plan for the proposed developments.
- Diagrams to illustrate connectivity, access, circulation, population density, housing type, etc.
- Detail plans for recreation and urban agriculture development.
- Renderings and other supporting graphics to help illustrate the vision of the design.

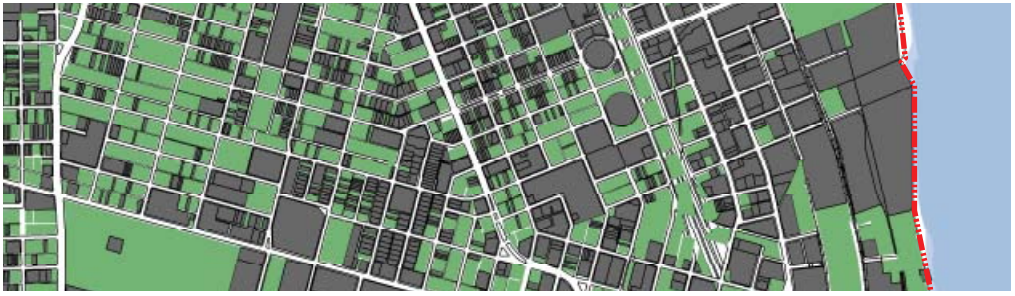


Figure 1.18: Sample Image of Community Analysis. By Author.

Figure 1.19: Sample Image of Proposed Master Plan. By Author.

Figure 1.20: Sample Aerial Perspective of Proposed Master Plan. By Author.

Relevance to Landscape Architecture

"Here in the inner city, with its frequent stretches of boarded-up buildings and rubble-strewn land, there is opportunity to acquire at affordable cost the sites for clustered housing enclaves or whole new communities... In city after city, such reclaimed tracts of inner-city wasteland are now sprouting with well-planned, mixed-use, residential developments. Dwellings range in type from single-family homes to multistory apartments. Residents, many of whom are employed nearby, may be workers of low to moderate income or high-salaried executives"(Simmonds 2006, 306).

The inner city of many major American cities have fallen victim to "urban decay." The result is abandonment. This serves as a great opportunity. The "urban prairie" of the inner city can be seen as a place for regenerative development. This gives the designer full opportunity to create a thriving human development that is environmentally sound. Sprawl has been noted as one of the causes for "urban decay" and the antithesis of environmentally sensitive lifestyle. The inner city can be redeveloped to provide a place to live, work, learn, and play while also displaying sensitivity to the environment. The development can be designed to exhibit sensitivity to the environment by following sustainable design principles.

"Today, as never before, conditions are ripe for parks to reenter the urban planning agenda. This opportunity exists because so much inner-city land that was once actively used now lies fallow and can be reused for intelligently planned parks, because so much suburban land has been developed without adequate public open space that there is now a huge suburban constituency to support park development, and because so much undeveloped land is now subject to recently enacted legislation intended to protect the environment" (Garvin 1996, 30).

This project can serve as a potential solution for renewal of lost urban community fabric. Implementing recreation and urban agriculture on vacant land could initiate a sustainable community infrastructure.

Literature Review

Methodology

The goal for this literature review is to gather resources and precedents to expand my knowledge base on topics pertaining to this project including, urban renewal, park development, urban agriculture, socioeconomic issues, historical information, and design. This literature review was used to relate the project goals to ideas and theories taken from contemporary landscape architectural literature.

The literature review is an integral piece of this project by providing support for the different design and analysis decisions made throughout the design process.

This process began by delineating the major themes that were essential to this project including: Community (Socioeconomics, Parks, Urban Agriculture), Design, History, and Environment.

During literature reviews, ideas that pertained directly to the project thesis were noted. During the process a list of glossary was prepared.

From this review the rationale for site inventory and analysis decisions was produced. The literature review thus serves as a valuable guide to design decisions for this project. On the opposite page is a literature map was produced to graphically represent the linkages between resources.

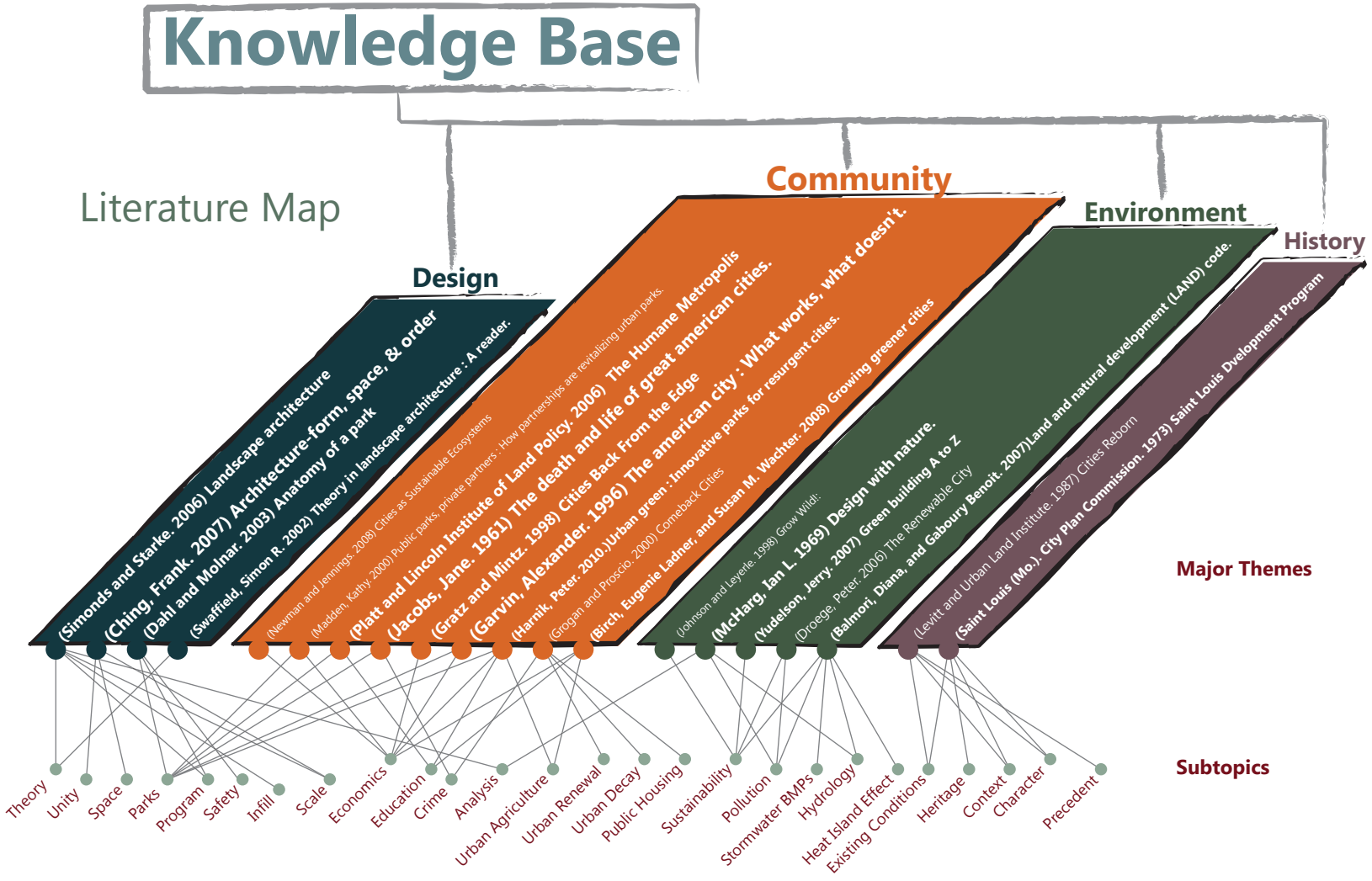


Figure 2.1: Literature Map. Produced by Author.

Literature Review Synthesis

The literature review portion of this report was used to gather information to support and inform important design decisions related to the following four areas:

- Community (with a focus on Socio-Economics, Parks, and Urban Agriculture)
- Environment
- Design Theory
- History

For a more intensive review of the literature used during the process of this project see the annotated bibliography in Appendix B.

Community

One of the most important goals for this project is to create productive uses for vacant land that will help to potentially reduce the pressure of socioeconomic issues within the 5th Ward, and serve as a catalyst for future development. This can be achieved by the creation of parks that increase community activity. Garvin (1996) argues that parks can help improve conditions of stressed cities, indicating that parks help to draw investment to areas, which in turn leads to development and increase tax support.

The Death and Life of Great American Cities by Jane Jacobs (1961) is useful in identifying typical dilemmas that are common to urban environments as well as sources of these dilemmas. Jacob's text covers issues related to park use, success, and failure. Jacobs notes that the success and or failure of neighborhood parks is directly correlated to use by the public. Success is derived from a number of factors including diversity of uses and activities. The diversity of a park in turn creates an attraction from the surrounding area. Failure of parks, according to Jacobs, comes from a lack of diversity and activity, which leads to monotony and unattractiveness.

Growing Greener Cities by Birch and Watcher (2008) provides steps that are presently being taken in order to create more sustainable systems within urban areas. Chapter 14 discusses the use of growing edible cities to help curb environmental as well as social issues. The text identifies a need for change in the current energy over-consuming food supply. Urban agriculture to produce food locally is seen as a potential solution to reducing energy costs necessary to obtain food. This text highlights the strong match between inner-city environments and the use of urban farming. Not only does the implementation of urban agriculture supply food, it also supplies community interaction and economic stimulus (Birch and Watcher 2008).

Figure 2.2: Park Space. Photo from (www.tripadvisor.com).

Figure 2.3: Community Gardening. Photo from (www.modeldmedia.com).

Figure 2.4: Farmers Market. Photo from (www.flickr.com).

Figure 2.5: Environmental Integration. Photo from (www.plannersweb.com).


Figure 2.6: Environmental Integration. Photo from (www.scottsaquaticcreations.com).


Figure 2.7: Historical Development. Photo from (www.kwmu.org).

Environment

Design with Nature by Ian McHarg(1969) provides an excellent view on ecology, natural processes, and the effect of urbanization and development on these natural processes. A major goal for this project is to improve the ecological vitality of the 5th Ward through environmentally sensitive design and planning practices. This book will be a great resource for how to analyze and design with the forces of nature. This will make for a community that can experience social growth with an increased sense of environmental stewardship. Environmental stewardship is becoming more important with the realization of the global effects of human development on the vitality of the natural environment.

Site analysis is a key component to the success of my intended designs. McHarg provides great insight on how natural processes should be analyzed, and how the analysis should influence design and planning decisions. Site analysis is important for this project in determining the most suitable locations for park and urban agricultural space. McHarg's method of analysis is relevant in addressing social and economic issues as well (McHarg 1969).

Design

The goal of this portion of the literature review is to provide information on design process, design elements, natural processes, people, and many other topics relating to Landscape Architectural design. Books such as *Landscape Architecture* by Simmonds (2006), *Form, Space and Order* by Ching (2007), *Anatomy of a Park* by Dahl (2003), and *Agricultural Urbanism* by De la Salle and Holland (2010) were used to help inform the design of various programmed elements for the 5th Ward

History

The 1976 St. Louis Development Program provides an extensive look into the historical progression of the city since its first settlements in 1766. This document provides information on previous conditions of neighborhoods located within St. Louis, including the neighborhoods of the 5th Ward. This text was used to determine what causes have led to the current patterns of development and the condition of the city today (St. Louis Missouri City Planning Commission 1973).

Precedent Studies

Methodology

Precedent studies are a critical part of the design process employed during this project. Precedents inform possible solutions, potential outcomes, potential liabilities, and help to serve as a catalyst for creative thinking. Precedent studies show whether or not certain projects are successful or failures. The diagram shown in Figure 3.1 maps out the process used for selecting precedent studies for this master's project. First, the major influences on the design of my project were identified and were used these to determine the relevance of selected precedents. The questions noted help determine if the precedent is relevant in each major realm of the project. If the precedent was determined to be relevant, a critical analysis was performed to diagram how the precedent informs design decisions. The literature review was used to help show how each precedent study relates to issues in landscape architecture. Finally the critical analysis of the precedent studies and literature review were synthesized and used to inform design decisions.

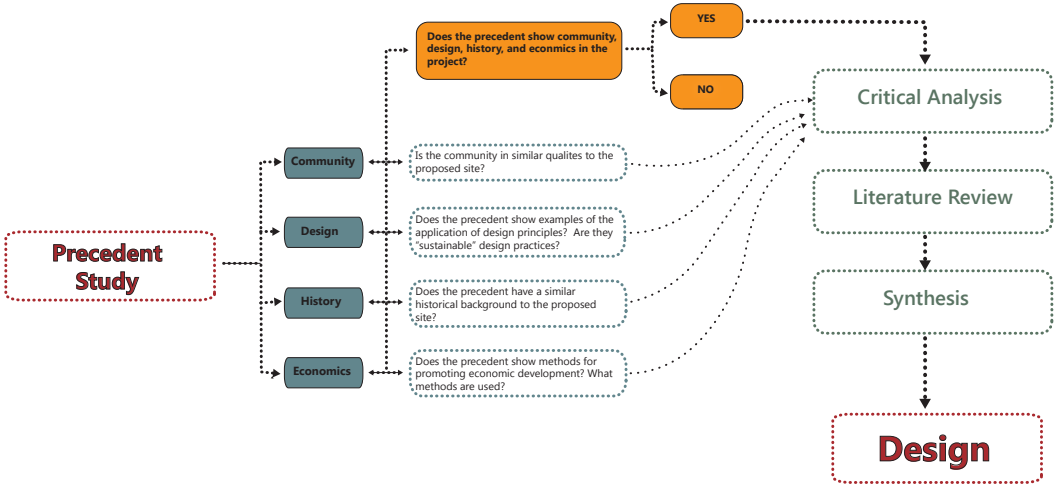


Figure 3.1: Precedent Methodology Diagram. By Author)

Figure 3.2: Philadelphia Green Community Garden. Photo from (www. wordpress.com).

Figure 3.3: Montage of Viet Village Urban Farm. Photo from (www.asla.org).

Selected Precedents

The search for precedent studies began by identifying the characteristics of projects that are similar to my master's thesis. I determined that projects that have existing distressed communities, that use a design process to attempt to solve neighborhood problems, that have similar histories to St. Louis, and that show the effects of the project on economic development, are most relevant to my thesis. The two projects/programs that have been selected pertain to different pats of my design process. The two projects are the Philadelphia Green Program and the Viet Village Urban Farm in New Orleans.

The Viet Village Urban Farm was selected because it provides potential program elements and design solutions for urban agriculture.

Philadelphia Green was selected because it provides a solution to stabilizing vacant urban land, in order to improve the economic and social conditions of the surrounding neighborhoods. The program deals with incremental improvements to achieve a larger goal of improvement.

Figure 3.4: Aerial View of Viet Village Urban Farm Design. Photo from (www.mqvncdc.org).

Project Name: Viet Village Urban Farm
Project Size: 28 acres
Location: New Orleans, LA
Date Designed: 2008
Designers/ Clients / Partners:

-Mossop + Michaels
-Tulane City Center
-Urban Landscape Lab LSU
-Mary Queen of Vietnam Community Development Corporation

(www.asla.org, 2011)

Historical Context

Located in New Orleans East, Viet Village is a predominately Vietnamese-American Community established in the mid 1970's. Community gardening and food production has been a major activity within the community since its establishment. The size and characteristics of these gardens varied from small backyard gardens to vacant lots, and also included some informal markets. Prior to hurricane Katrina the community farmed more than 30 acres of gardens. New Orleans East suffered immense damage after hurricane Katrina in 2005.

Project Background

This project arose in the wake of hurricane Katrina. The hurricane had drastic effects on the community, causing tremendous damages and destroying the existing urban farmland. To rebuild the Viet Village community, organization and planning of an urban farm took place. This urban farm was planned to serve as the center of the Viet Village community. The farm is designed to supply food to the residents of the community, as well as providing commercial farming opportunities to supply local restaurants and grocery stores. The plan for the urban farm also includes a marketplace to meet and sell the produce. Based on the previous

Figure 3.5: Viet Village Urban Farm Site Context. Photo from (www.asla.org).

Project Background (cont.)

participation in community farming before Katrina it is expected that 3,000 or more people would attend Saturday markets at the urban farm. (www.asla.org)

The site for this urban farm contains several planning issues that influenced the design of the project. First, the site has extensive soil and water issues due to high water tables and frequent flooding. Secondly, the existing site topography lacks the positive drainage necessary for successful crop growth.

The project also saw issues with funding and labor resources. The success of the project will be dependent on the availability of funding from the community and other agencies. The labor required to build and maintain the farm requires more than unskilled laborers from the community. Due to the construction of roadways and the extensive hydrology network the project required professional builders and skilled laborers to maintain the site. (www.asla.org)

Program Elements

Site Development
- Service Entrance
- Service Roads
- Grass Paver Parking Lot
- Central Boardwalk
- Public Vehicular Entrance
- Pedestrian Entrance
- Composting Area

Community Farming
- 20'x20' Community Plots

Commercial Farming
- Poultry Farm
- Five One Acre Commercial Plots

Farmers Marketplace
- Plaza Space
- Three Paviliions
- Lotus Pond
- Eating and Gathering Space

Hydrologic Network
- Bio-Retention Ponds
- Bio-Swales

Recreational Ammenities
- Sports Fields
- Childrens Play Area

Figure 3.6: Viet Village Urban Farm Photo Montage. Photo from (www.asla.org).

Figure 3.7: Section View of Proposed Bioswale. Photo from (www.asla.org).

Figure 3.8: Viet Village Urban Farm Photo Montage. Photo from (www.asla.org).

Figure 3.9: Viet Village Urban Farm Plan. Photo from (www.mqvncdc.org).

Design Principles

The elements of the Viet Village Urban Farm are laid out on a grid and are connected by the strong axis of the central boardwalk. This axis serves as the main circulation route. The grid also guides the hydrologic network that is setup in order to gather, filter, and store storm and run-off water.

Several sustainable design technique are incorporated within this site including bio-swales, bio-retention ponds, and grass paver parking areas. These design techniques are employed in order to improve air and water quality, reducing heat island effect and water pollution.

The location of the urban farm within the community allows for easy access for volunteers and residents. This close proximity to the community allows for a close sustainable food source, reducing the need for external food sources.

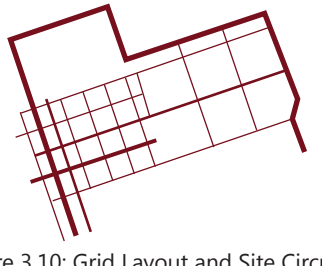


Figure 3.10: Grid Layout and Site Circulation. By Author.

Figure 3.11: Programmed Spatial Usage. By Author.

Phasing

The construction of the design has been laid out into different phases in order to ease funding and to guide to process of development.

Phase 1: Site clearing, earthwork, the implementation of the proposed water management system, and the construction of community garden plots. Phase one also includes construction of the main circulation systems. The circulation systems include service roads, main entry avenue, pedestrian circulation, and boardwalks.

Phase 2: Construction of commercial agricultural plots and expansion of community garden plots.

Phase 3: Development of the farmers market area and the livestock area (www.mqvncdc.org).

The diagram to left produced by Mossop + Michaels Landscape Architecture shows the major phases for implementing the major program elements (www.tulanecitycenter.org).

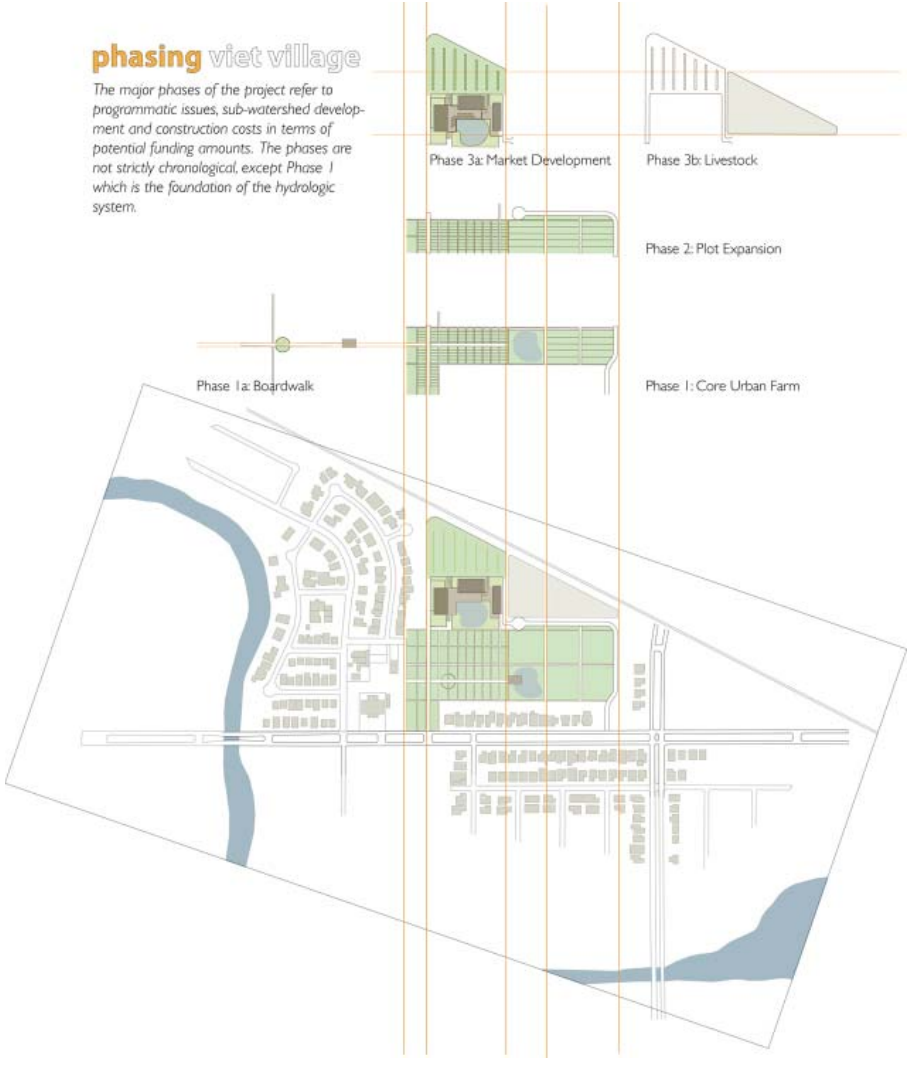


Figure 3.12: Proposed Phasing Diagram. Photo from (www.asla.org).

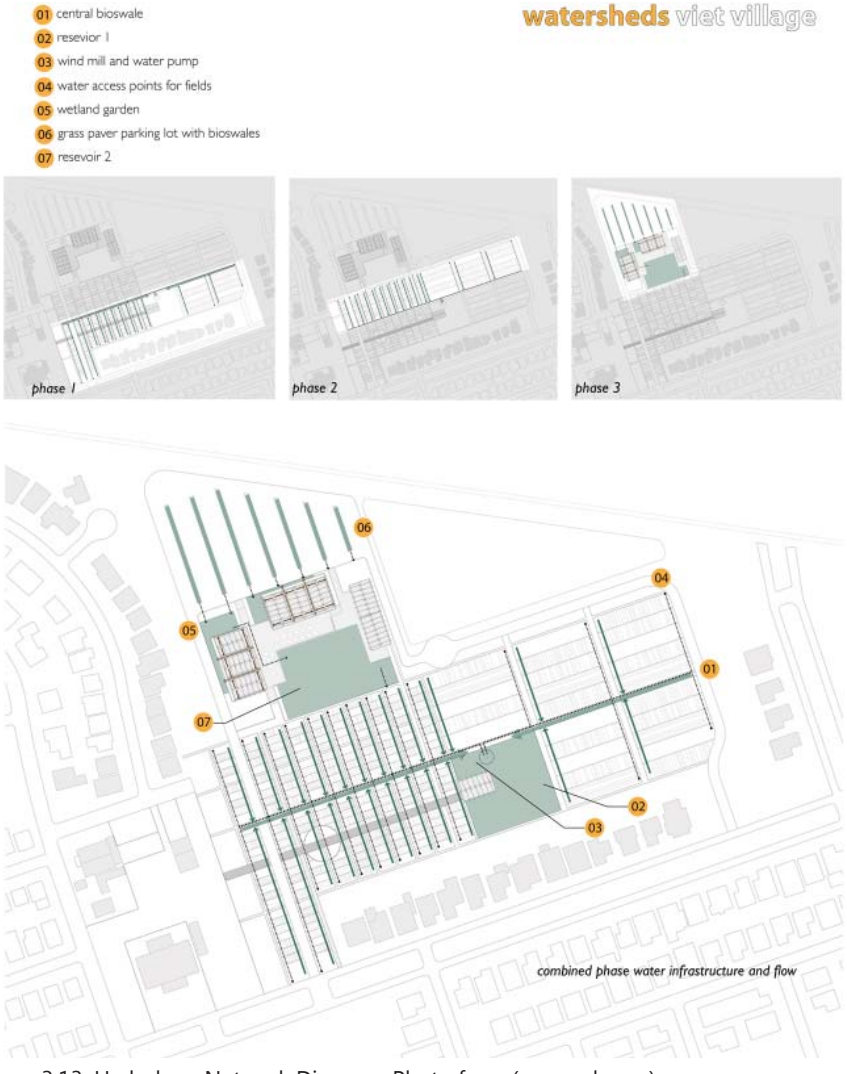


Figure 3.13: Hydrology Network Diagram. Photo from (www.asla.org).

Hydrology Network

The hydrologic design for this project is used to direct and store water run-off on site for future use. The system includes a major bioswale that collects water from secondary bio-swales, a central bio-retention resevior, a secondary bio-retetnion pond, and wetland gardens. The diagram to the left shows a phased plan for the development of the sites hydrologic system (www.tulanecitycenter.org).

Labor Resources

A major asset to the future of the Viet Village Farm is the significant number of volunteer labor that is expected to be donated to the project. Combining the volunteer labor with skilled and professional labor can allow for reduced funding issues and the ability of the project to be divided into sub projects.

The design team for this project identified three major labor categories for the construction of this project; unskilled voulnteers, skilled volunteers, and professional contractors. The diagram by Mossop + Michaels shows the kinds of tasks that various labor categories will provide and the locations where these tasks will take place (www.asla.org).

Figure 3.14: Labor Resource Diagram. Photo from (www.asla.org).

Findings

The design for Viet Village Urban Farm incorporates sustainable design techniques and community analysis to produce a vision for a sustained food and economic resource.

Grid Layout and Strong Axis:
The grid layout of the urban farm provide a solid foundation with the layout of the community garden and commercial agriculture elements. The grid also serves as the foundation for the layout of the pedestrian circulation systems and hydrologic network. The boardwalk is used to create a strong unified axial connection between the community pavilion, the farmers market, and the community gardens.

Sustainable Design Techniques:
The sustainable design techniques include the use of bio-swales and bio-retention to mitigate stormwater, shade tree to provide aesthetic appeal and prevent heat-island effect, and permeable paving.

Community Analysis:
Community analysis was used to determine the labor resources available for the construction of the farm and to create a strategic plan for the use of the various funding resources. The plan was then divided into a number of phased, fully functional sub-projects that align with the various labor and financial resources (www.asla.org).

This project serves as a precedent for the selection and sizing of program elements related to urban agriculture. The program elements will be adapted to fit accordingly to the site that has been selected.

The community analysis portion of this project has also helped to guide the analysis questions that were needed to investigate the community resources available within the 5th Ward.

Philadelphia Green Program

Figure 3.15: Philadelphia Green Program Community Garden. Photo from (www. wordpress.com).

Project Name: Philadelphia Green's Parks Revitalization Project
Project Size: Citywide
Location: Philadelphia, PA
Date Designed: 1974 - Present
Designers/ Clients / Partners:

-Philadelphia Green
-Pennsylvania Horticultural Society
-Philadelphia Department of Recreation
-Neighborhood Transformation Initiative

(Madden, 2000)

Historical Context

Philadelphia once considered the "workshop of the country" has suffered from the ills of an aging industrial city since World War II. After World War II Philadelphia was characterized by loss of businesses, unemployment, and depopulation. In half a century the population fell from roughly 2.1 million residents to 1.5 million residents. This led to the closing of former industrial sites and business corridors. The aftermath was large expanses of vacant lots and abandoned buildings with boarded windows and doors. Figure 3.15 to the right shows the density of vacant land parcels in Philadelphia as of 1999. As nearby property values dropped the sense of community deteriorated in many effected neighborhoods (Birch, Ladner, and Wachter. 2008).

As of 2001 Philadelphia was reported as having the highest level of vacant properties in the United States. It was reported that Philadelphia contained approximately 31,000 vacant lots and 26,000 abandoned buildings, many of which were structurally unsafe and in need of demolition. The situation has been referred to as the "vacant land crisis." This crisis is a factor that has led to conditions such as increased crime rates, increased high school drop-out rates, disinvestment, and an overall diminished quality of life (Birch, Ladner, and Wachter. 2008).

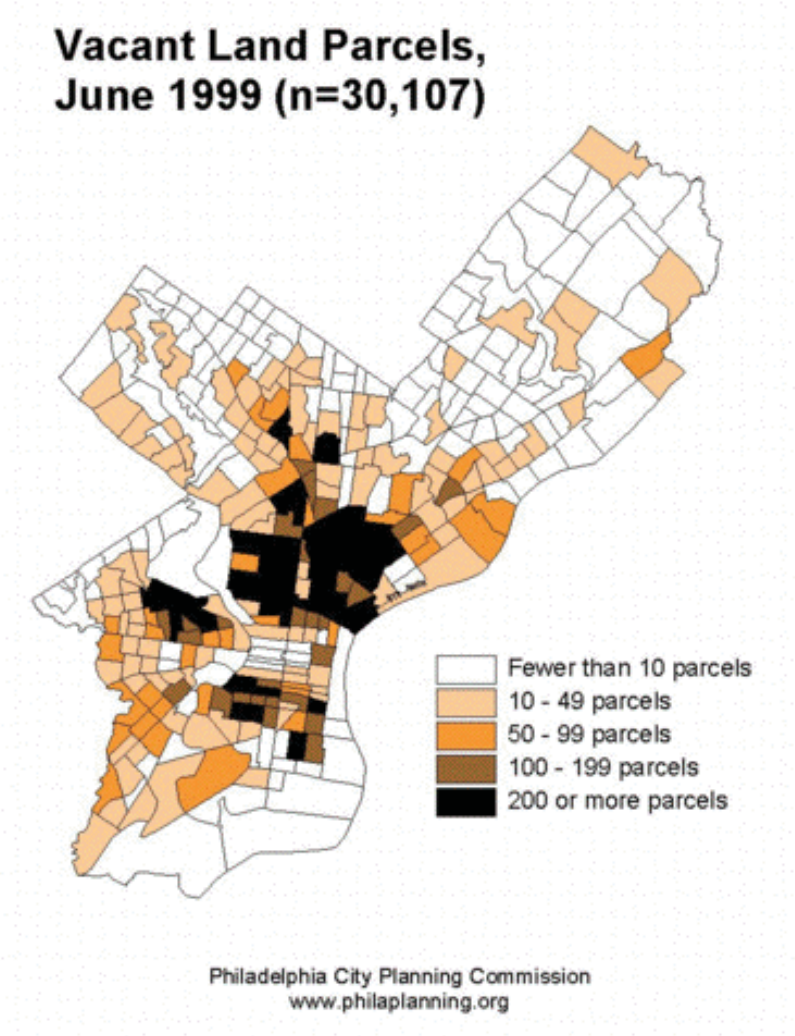


Figure 3.16: Philadelphia Vacant Land Parcels Diagram. Photo from (www.philaplanning.org).

Project Background

Philadelphia Green began in 1974 as an offshoot from the Pennsylvania Horticultural Society. The program began by teaming with the Philadelphia Department of Recreation to sponsor the construction of ten resident-built community vegetable gardens on sites that were formerly vacant. The vegetable garden was immediately successful and led to the expansion of Philadelphia Green.

Philadelphia Green has worked on projects ranging from streetscape restoration, urban greening to build social capital, community gardens, and vacant lot stabilization (Birch, Ladner, and Wachter. 2008).

Today Philadelphia Green is composed of more than 40 employees, nine of which are landscape architects. As of 2007, the program had stabilized more than six million square feet of vacant land into "clean and green" urban spaces (Birch, Ladner, and Wachter 2008).

Philadelphia Green has also addressed environmental issues in the urban setting, including air and water pollution. Solutions that have been a part of their green initiative include green roofs, stormwater BMPs, and street tree plantings.

Program Elements

Vacant Land Stabilization:
Philadelphia Green has largely been known for its process of vacant land stabilization. The program takes an approach which they call "cleaning and greening." This process typically involves removing trash from a vacant site, adding and grading soil, installing plant material, and adding amenities such as benches and fences (Birch, Ladner, and Wachter. 2008).

Sustainable Design:
Philadelphia green has implemented design strategies that have attempted to combat the negative effects that urban areas have on the natural environment. These negative effects include water pollution, air pollution, and heat island effect. Strategies include green roofs, stormwater BMPs, and street tree plantings (Birch, Ladner, and Wachter. 2008).

Community Involvement:
The maintenance and manpower involved in revitalizing vacant land areas is driven by community involvement. The community involvement helps foster a sense of pride within the residents of the neighborhoods (Birch, Ladner, and Wachter. 2008).

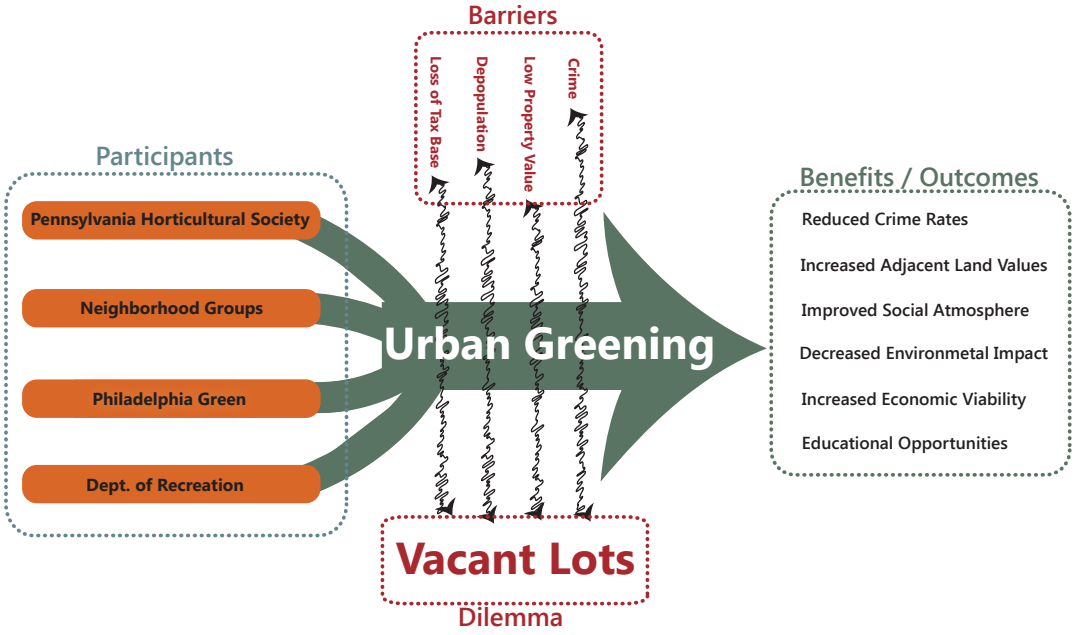


Figure 3.17: Philadelphia Green Flow Diagram. By Author.

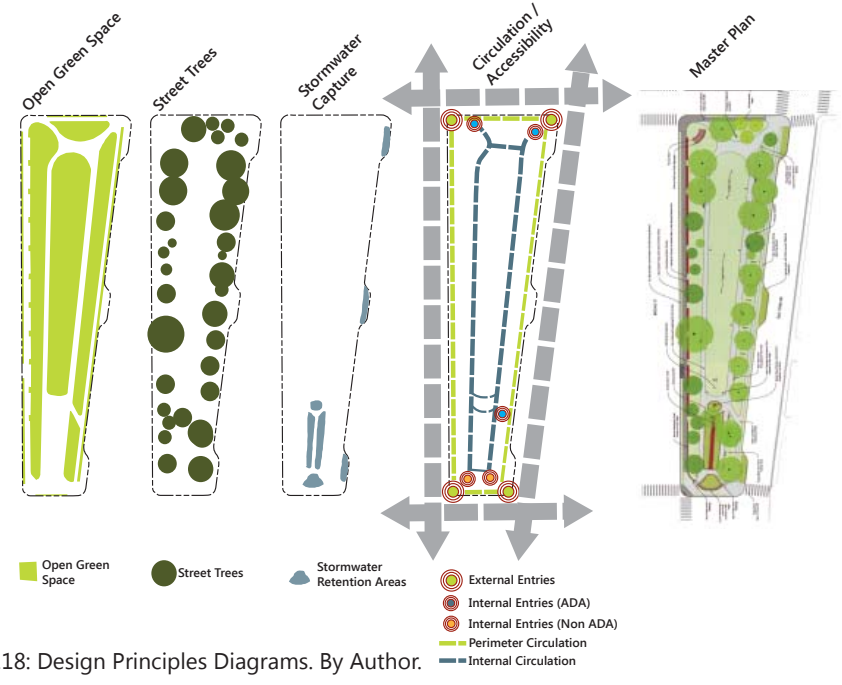


Figure 3.18: Design Principles Diagrams. By Author.

Design Principles

- Green Space Revitalization
- Functionally and Aesthetically Used Vegetation
- Stormwater Management
- Circulation and Accessibility

Figure 3.19: Image of a Green Roof. Photo from (www.pennsylvaniahorticulturalsociety.org)

Figure 3.20: Image of Vacant Lot. Photo from (www.pennsylvaniahorticulturalsociety.org)

Figure 3.21: Image of Greened Vacant Lot. Photo from (www.pennsylvaniahorticulturalsociety.org)

Figure 3.22: Image of Stormwater BMPs. Photo from (www. wordpress.com).

Findings

Reduced Crime Rates:
High crime rates have been shown to be associated with low property value. Increasing property values increase a sense of community pride and awareness, decreasing crime rates.

Increased Adjacent Land Values:
Vacant land has been proven to reduce property value. Studies in Philadelphia have shown as much as a 37% total gain in property value from greening adjacent vacant lots.

Positive Environmental Impact:
Revitalization of vacant properties can be achieved in a way that shows better stewardship toward the environment. Applications of sustainable design principles reduce air and water pollution by sequestering carbons emissions, reducing heat island effect, and properly mitigating and filtering stormwater.

Educational Opportunities:
Revitalization and design of vacant land into park space and environmentally sensitive communities can serve as an educational tool to sustain healthy lifestyles for generations to come.

Increased Economic Viability:
Increased property values and improvements to business corridors have shown to be a successful way in building social capital.

This program has thrived on incremental improvement to the economic viability of the community (Wachter, 2006.).

The Philadelphia Green Program was selected as a precedent study first because of Philadelphia's similar history as an aging industrial city. Similar to St. Louis, Philadelphia has suffered from large losses in population to the suburbs. The depopulation has led to neglect of neighborhood parks, large amounts of vacant land, and an overall disinvestment in the city.

Philadelphia Green has been successful in stabilizing vacant land within the city and creating community involvement. Studies by Susan Wachter and Kevin Gillen at the University of Pennsylvania have shown an increase in housing value from the stabilization of adjacent vacant land and improvements to neglected and run down streetscapes. Philadelphia Green serves as an example of the effect that maintained open space can have on a neglected urban community.

Figure 3.23: Philadelphia Greening Program in Action
Photo from (www.pennsylvaniahorticulturalsociety.org

Figure 3.24: Image of Stormwater BMPs. Photo from (www. wordpress.com).

Figure 3.25: Community Gardening Education. Photo from (www. wordpress.com).

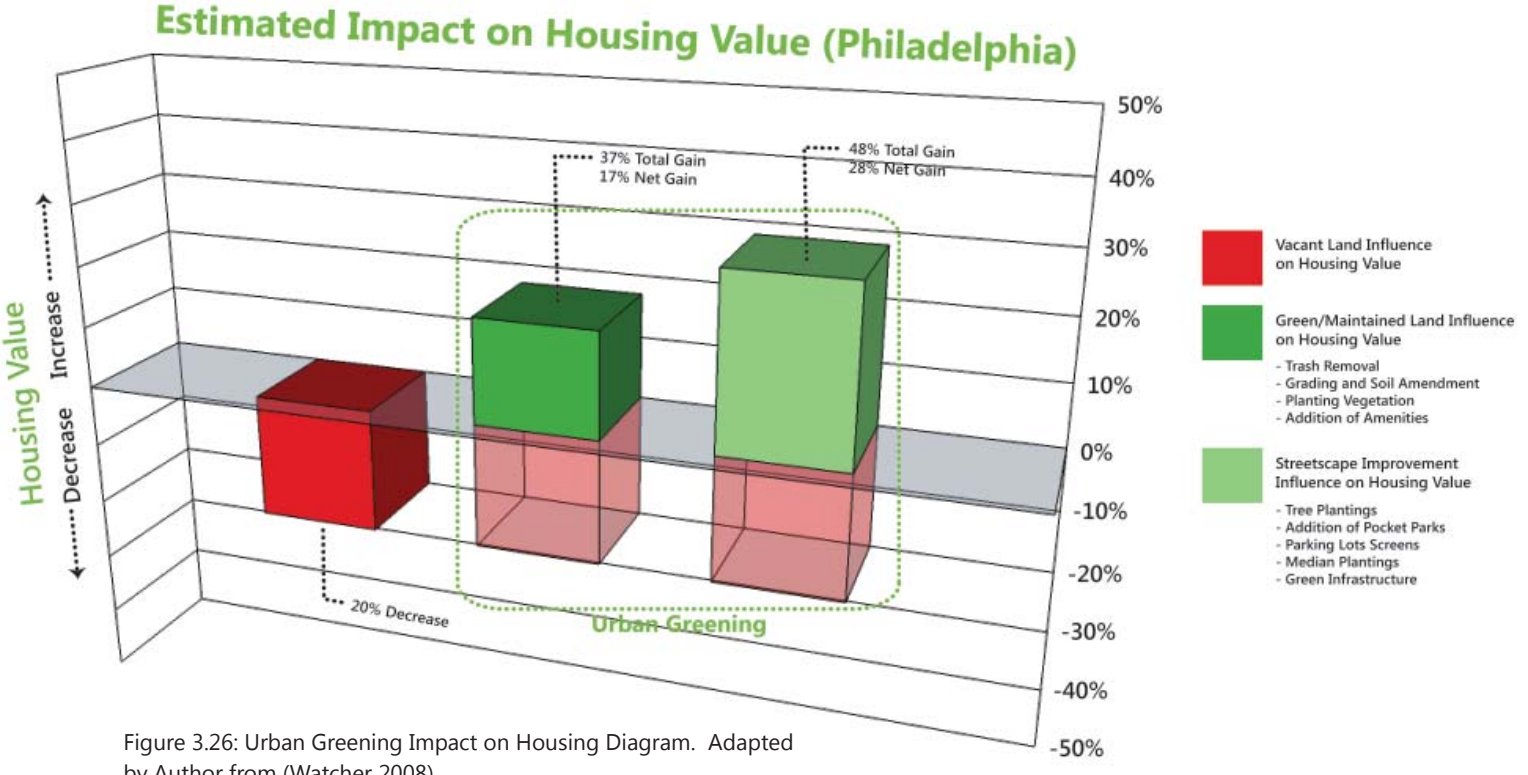


Figure 3.26: Urban Greening Impact on Housing Diagram. Adapted by Author from (Watcher 2008).

Community Analysis

Methodology

The first phase of inventory and analysis was focused on the community scale, analyzing the neighborhoods of the 5th Ward.

Secondly, additional analysis needs for this project were determined by noting the issues associated with the study area goals created in order to address these issues. Also playing a role in the determination of the analysis needs was the project program, which determined the proposed site elements and directed the analysis.

The next step of the site inventory and analysis was to gather and inventory data into easily readable maps and supporting graphics. The inventory maps reveal site information and essential data, providing a foundation for the analysis that supports and guides design decisions.

The next step of the process was the analysis of the inventoried data. This process involves cross mappings, drawing relationships, and synthesizing data to inform design solutions. The process involved combining the inventoried layers by using weighted overlays to determine the suitability of designated program elements, and the vulnerability of the site in relation to the primary issues. The suitability analysis was used to guide the selection of the project study areas, to synthesize the site analysis, and to determine the driving forces on the site.

* The spatial data used for the GIS inventories and analyses were obtained from the St. Louis Urban Planning and Urban Design Agency.

Site Analysis Questions

Community

- Who currently lives within the community of the 5th Ward?
- Who will live within the 5th Ward in the future?
- Where do people live, work, and play within the community?
- Where are jobs located and how will the residents get there?
- What is circulation and access like within the community? What are the barriers?
- Where are food sources located within the community?
- What is the availability of park space to residents?
- What are the current housing options and densities within the community?

History

- What is the historical background and character of the community?
- How has previous planning decisions affected the community of the 5th Ward?

Environment

- What are the current ecological conditions of the area?
- What are the soil conditions of the community?
- What climate is characteristic of the area?

COMMUNITY ANALYSIS PROCESS DIAGRAM

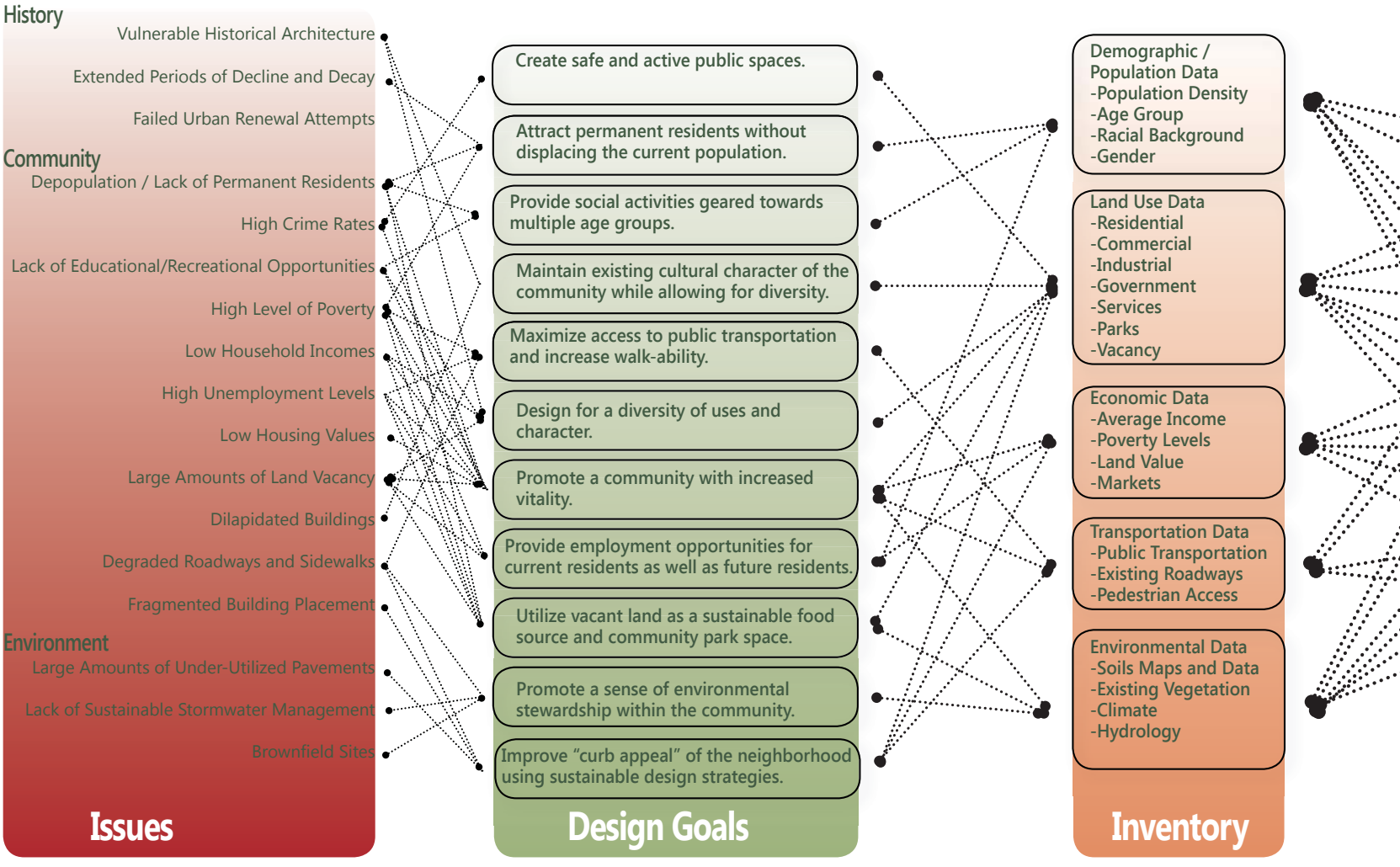
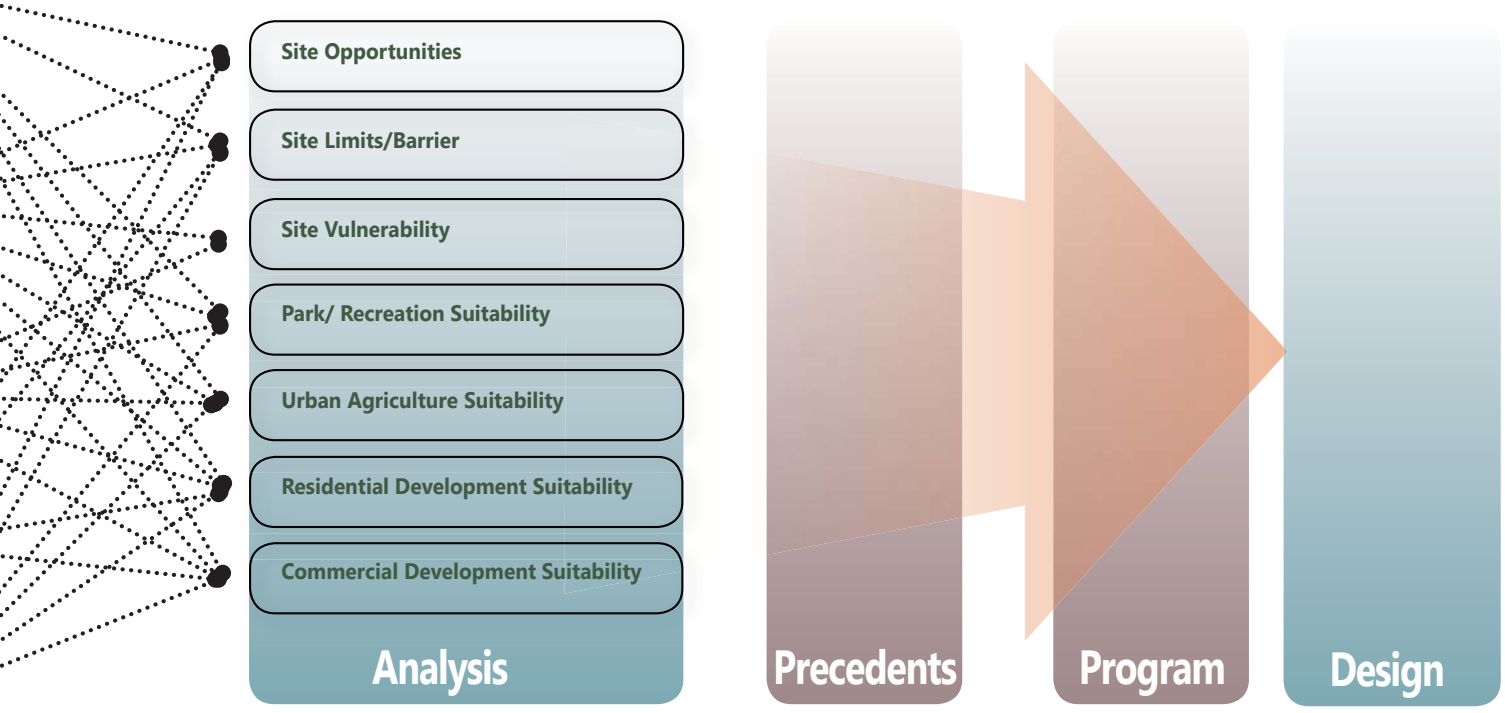


Figure 4.1: Community Analysis Process Diagram


Site Opportunities
Site Limits/Barrier
Site Vulnerability
Park/ Recreation Suitability
Urban Agriculture Suitability
Residential Development Suitability
Commercial Development Suitability
Analysis
Precedents
Program
Design

Site Visit

The site was visited October 22, 2010 to obtain a feeling for the study area. Observations and images were collected to identify the current conditions of the landscape and document the community's sense of place. The site visit revealed that the community has a diverse mix of land uses as well as rich cultural and historic elements. Socioeconomic issues were revealed during the site visit. The mix of new housing, historic churches, dilapidated buildings, and vacant lots demonstrate the complex issues that affect the study area. The images on this page speak to the diverse characteristics of the community.

* All photos shown on pages 46-47 were taken by the Author.

Figure 4.2: St. Stanislaus Church in Carr Square Neighborhood

Figure 4.3: Falstaff Brewery in St. Louis Place Neighborhood

Figure 4.4: Abandoned Home in St. Louis Place Neighborhood.

Figure 4.5: Industrial Site in St. Louis Place Neighborhood.

Figure 4.6: Former Pruitt-Igoe Site

Figure 4.7: St. Louis Place Urban Prairie

Figure 4.8: St. Louis Place Urban Prairie

Figure 4.9: St. Louis Place Historic Architecture

Figure 4.10: St. Louis Place Multi-Family Housing

Figure 4.11: Historic Church Architecture

Figure 4.12: Industrial Site

Figure 4.13: Industrial Site

Figure 4.14: St. Louis Place Urban Prairie

Figure 4.15 St. Louis Place Urban Prairie

Figure 4.16: Cass Avenue and Former Pruitt-Igoe Site

Figure 4.17: Church North of Pruitt-Igoe Site

Neighborhoods

Figure 4.18 to the right shows the neighborhood composition of the 5th Ward. Each neighborhood has a unique personality and characteristics. Three neighborhoods that make up a majority of the 5th Ward's area and are almost completely located within the 5th Ward include:

St. Louis Place Neighborhood
Carr Square Village
Old North St. Louis

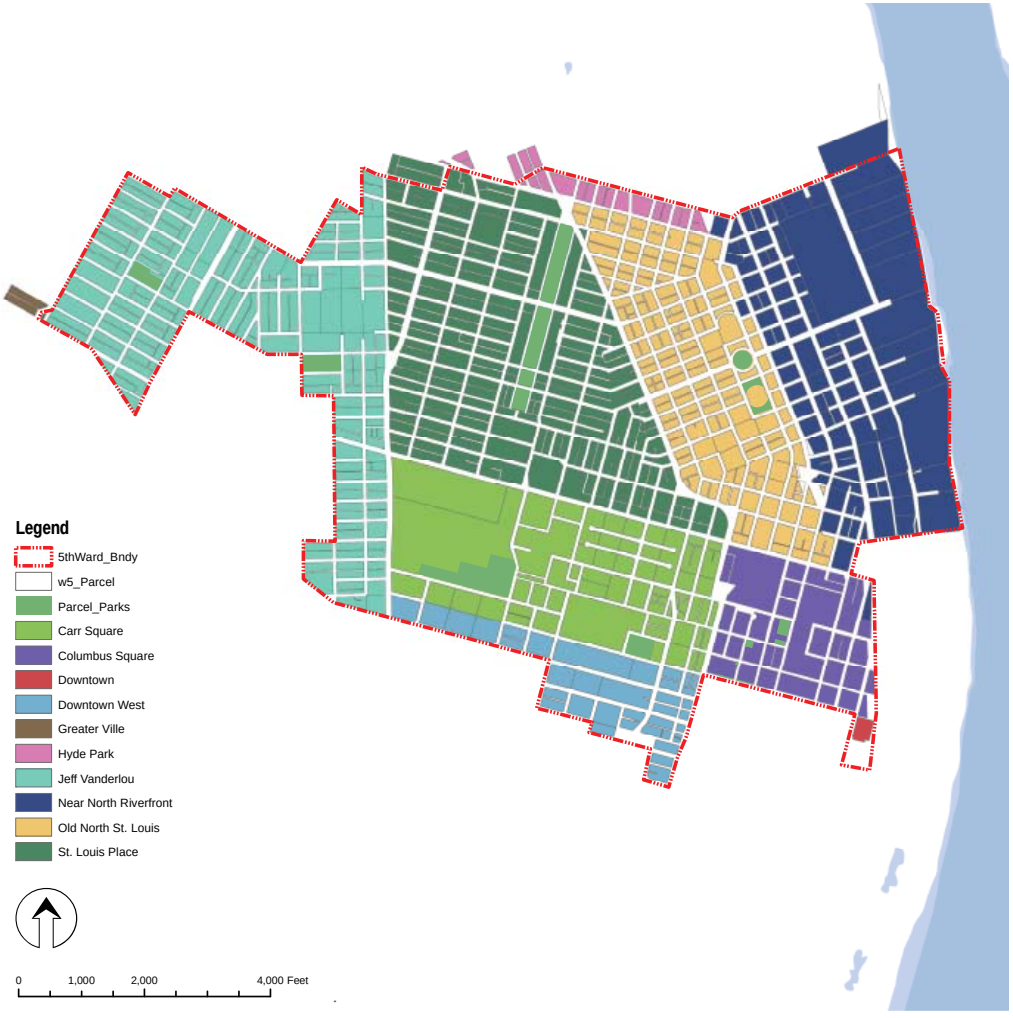


Figure 4.18: 5th Ward Neighborhood Inventory. Map Produced by Author.

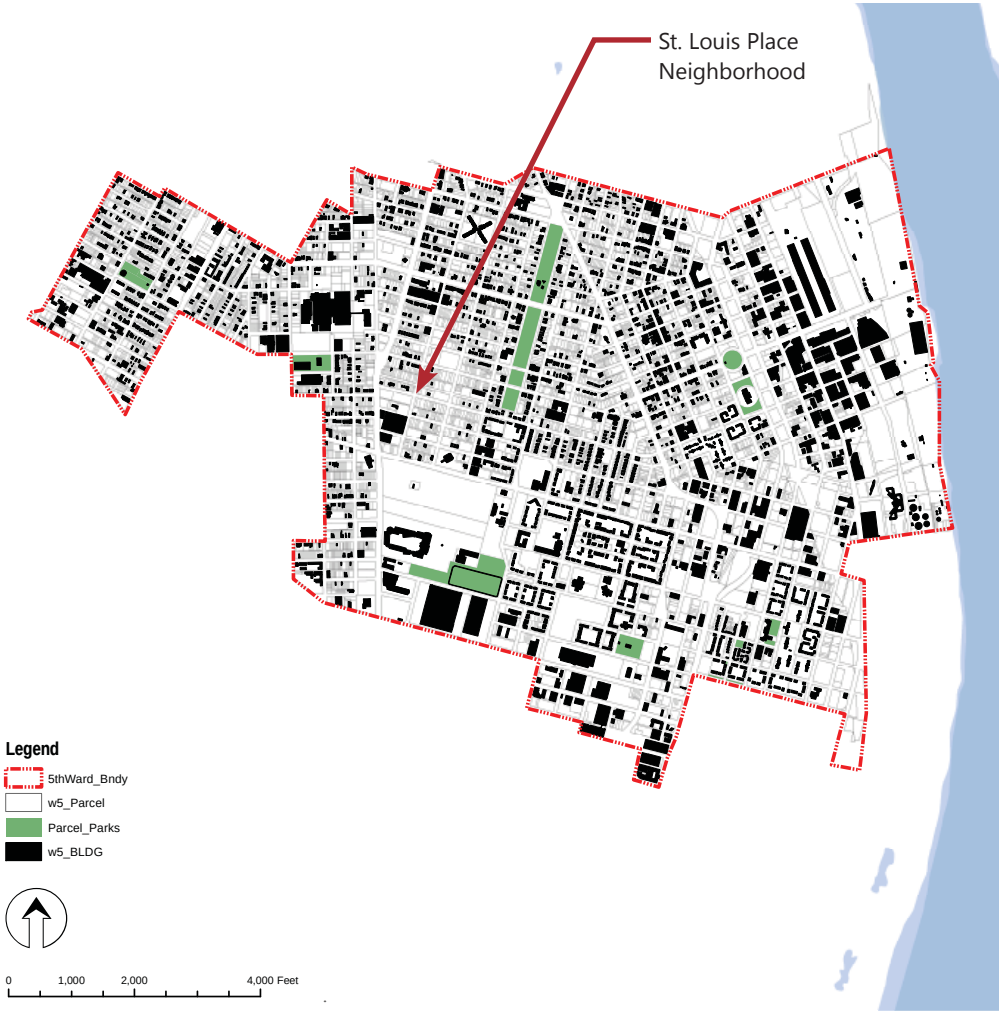


Figure 4.19: 5th Ward Figure Ground Map.
Produced by Author.

Figure Ground

Figure 4.19 shows the footprints of the buildings located within the 5th Ward. The ward has a diverse mix of building sizes, but a majority of the buildings are residential houses.

The map shows large spaces between buildings within the central core of the ward. The large spaces consist mostly of vacant land. This diagram clearly shows the fragmentation of buildings of the St. Louis Place neighborhood.

The fragmentation of buildings creates a problem within the community. Fragmentation diminishes the overall sense of place within the community. The area has a feeling of abandonment. Fragmentation also creates problems when providing services such as public transportation and food supply. Investors are more likely to place bus stops, retail stores, and food services in locations that serve the highest percentage of population. Communities that are fragmented are more vulnerable to being overlooked by investors due to a lack of density.

Land Use

The 5th Ward houses a diverse mix of land uses within its boundaries. Generally the area has major separations between different land uses, and limited mixes in uses. The Mississippi riverfront on the east side of the 5th Ward is composed mainly of industrial services. Towards the south end of the 5th Ward the land uses are mostly commercial and business related. The central core of the 5th Ward, (St. Louis Place and Carr Square neighborhoods) are composed of a mix of residential and few light industrial buildings.

Churches are prevalent throughout the 5th Ward community, many of which are historical in character.

The land use map shows a general lack of mixed uses within the central core of the 5th Ward. There are fragmented areas of residential and a lack of retail opportunities to provide basic necessities to the community.

A large percentage of the 5th Ward's central core is left vacant without a specified land use. This land is a waste of community's opportunities and has potential to better serve the community with more productive uses. Figures 4.20 through 4.28 show a few of the land uses that can be found throughout the 5th Ward, including a large industrial building, multi-family housing, school, and historic churches.

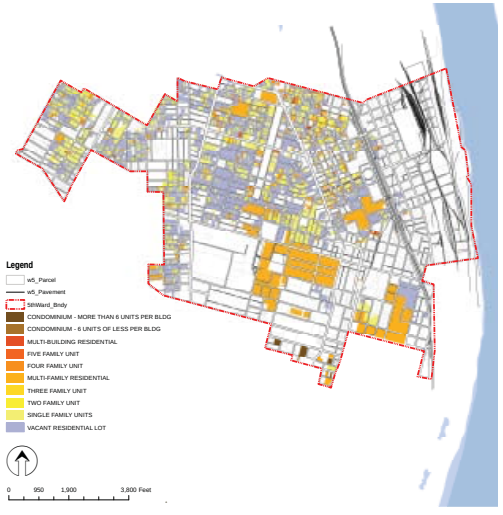


Figure 4.20: Existing Residential Landuse Map. Produced by Author.

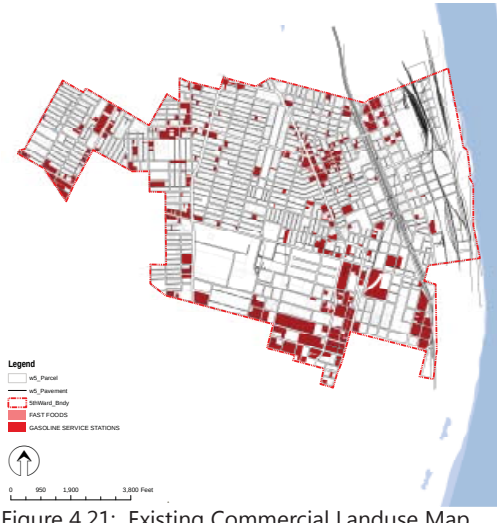


Figure 4.21: Existing Commercial Landuse Map. Produced by Author.

Figure 4.22: Multi-Family Housing St. Louis Place. Photo by Author.

Figure 4.23: Historic Architecture St. Louis Place. Photo by Author.

Figure 4.24: Old North St. Louis Commercial. Photo from (www.flickr.com)

Figure 4.25: St. Louis Place Park. Photo from (blogspot.com)

Figure 4.26: Gateway School. Photo from (www.flickr.com)

Figure 4.27: Industrial Site. Photo by Author.

Figure 4.28: Existing Park Landuse Map. Produced by Author.

Figure 4.29: Existing Services Landuse Map. Produced by Author.

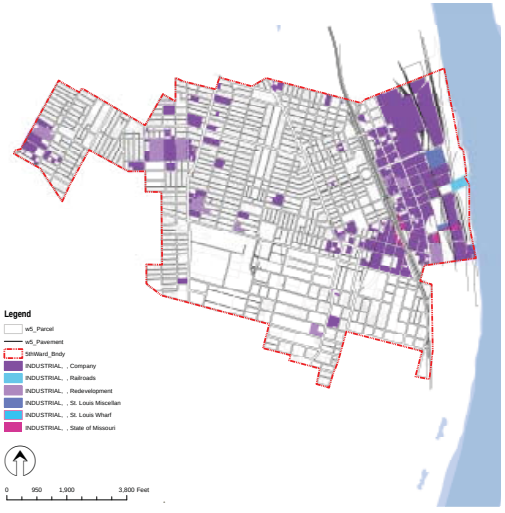


Figure 4.30: Industrial Existing Landuse Map. Produced by Author.

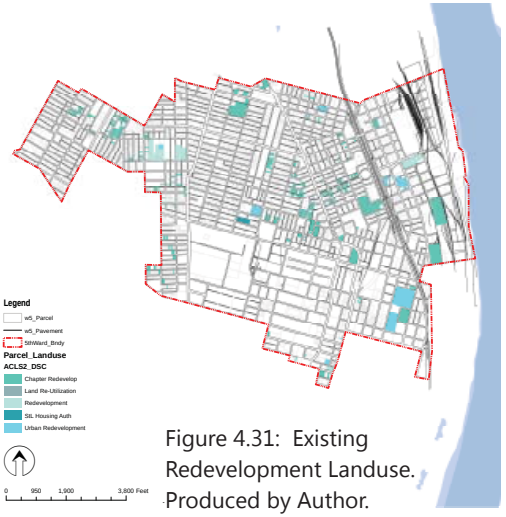


Figure 4.31: Existing Redevelopment Landuse. Produced by Author.

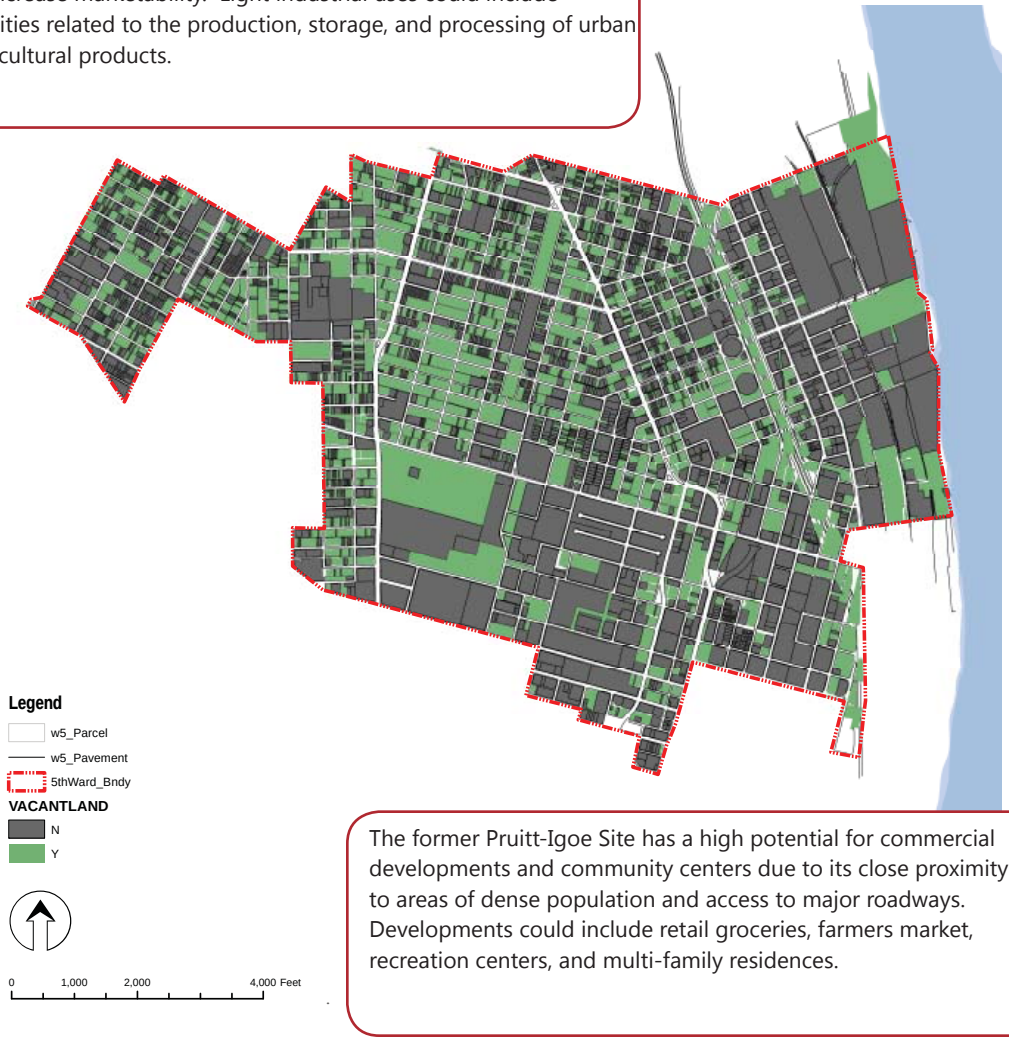
Vacant Land Inventory

Vacant land is a symptom of urban decay and an eyesore to the community. Vacant land leaves potentially productive land without use and wasted. Figure 4.32 shows the extensive amount of vacant land which is present within the site. Vacant land is a problem because it decreases adjacent land and housing values, and displays an overall lack of investment within the community. The vacant land within the study area can be seen as an asset for revitalizing the community. This inventory was a critical component to the suitability analyses and vulnerability analysis.

Large tracts of vacant land in the St. Louis Place neighborhood provides excellent opportunities for park space and urban agriculture development. Many buildings within this area have been demolished and cleared. This area also has potential for light industrial uses to increase marketability. The light industrial uses could include facilities related to the production, storage, and processing of urban agricultural products.

The former Pruitt-Igoe Site has a high potential for commercial developments and community centers due to its close proximity to areas of dense population and access to major roadways. Developments could include retail groceries, farmers market, recreation centers, and multi-family residences.

Large tracts of vacant land in the St. Louis Place neighborhood provides excellent opportunities for park space and urban agriculture. Many buildings within this area have been demolished and cleared. This area also has potential for light industrial uses to increase marketability. Light industrial uses could include facilities related to the production, storage, and processing of urban agricultural products.



The former Pruitt-Igoe Site has a high potential for commercial developments and community centers due to its close proximity to areas of dense population and access to major roadways. Developments could include retail groceries, farmers market, recreation centers, and multi-family residences.

Figure 4.32: Vacant Landuse Inventory. Map Produced by Author.

Areas shown in red on the map represent areas of the community that have limited access to public parks and recreational space. Yellow and red areas on the plan have a high potential for park space development due to proximity to highly populated areas of the 5th Ward. Implementation of additional park space would greatly increase access to residents.

Figure 4.33: Park Availability Analysis. Map Produced by Author.

Park Availability

Park availability is useful for determining which communities may need park space the most. Figure 4.33 shows the location of parks within the 5th Ward and a 1/4 mile buffer around the parks. The 1/4 mile buffer is chosen because research from numerous sources considers this the most ideal walking distance for amenities such as transit and park space. The 1/4 mile buffer represents a five minute walk.

The areas located outside of the park buffer lack recreational opportunities. Areas shown in red on the map represent areas of the community that have very limit ed access to public parks and recreational space. Implementation of park space would greatly increase access to residents.

Population Density

Figure 4.34 shows the relative population densities within the areas of the 5th Ward. Population density is important for determining the needs of the community and the ideal locations for specific services.

This map was useful for cross mapping with other inventories such as vacant land analysis, park distribution, land value, and land use. The cross mappings lead to hypotheses regarding the effectiveness of existing community amenities and their distribution. The hypotheses are discussed in the suitability and vulnerability analysis pages.

Figure 4.34 shows that the relative population densities within the 5th Ward differ from block to block. Areas of highest density are adjacent to areas of little to no population. The community lacks transitions between areas of high density and low density.

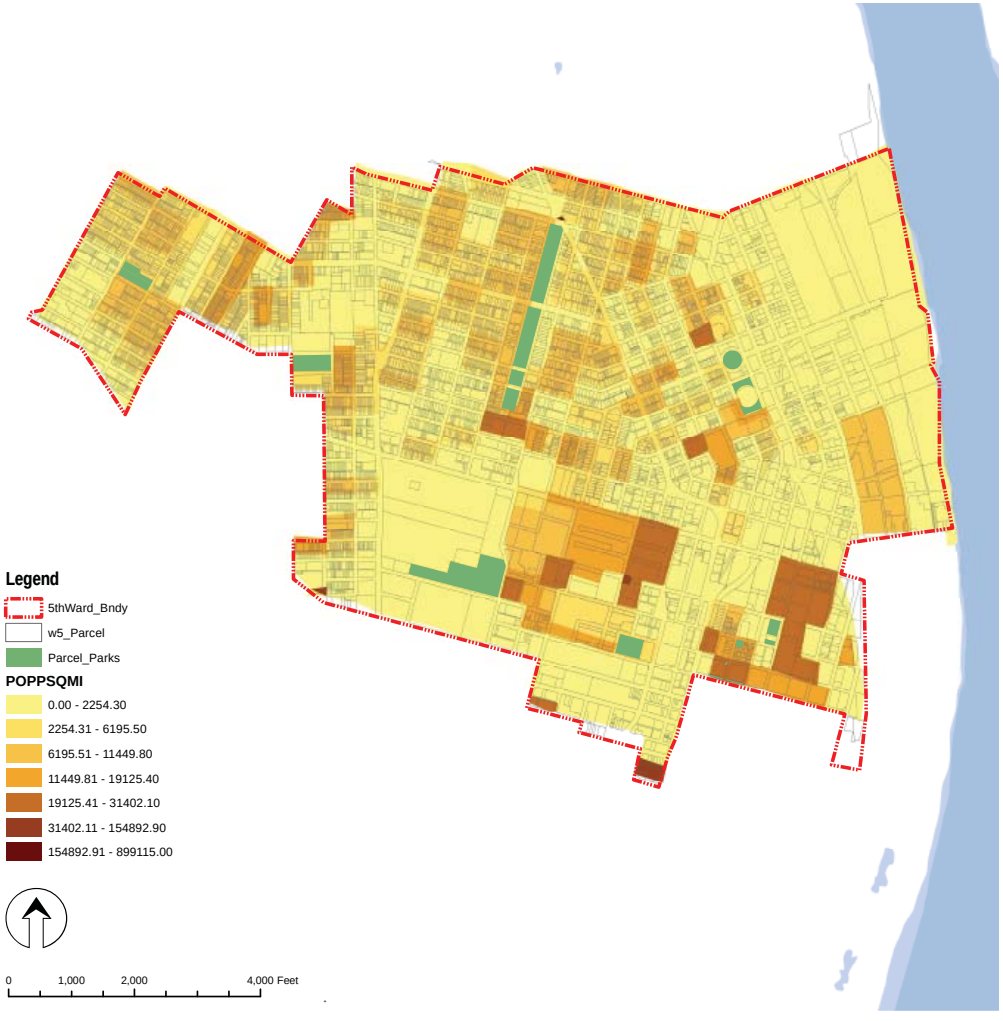


Figure 4.34: Population Density. Map Produced by Author.

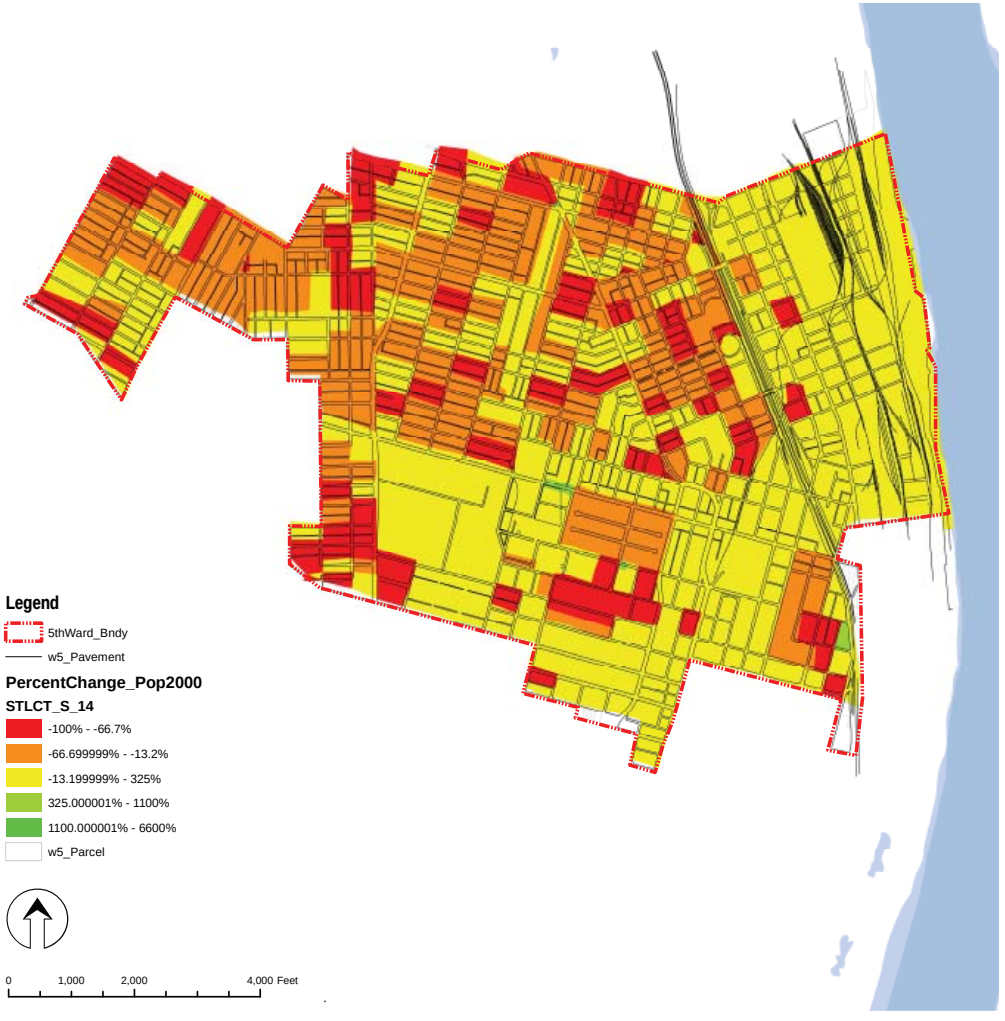


Figure 4.35: Percent Population Change 1990-2000 Map. Map Produced by Author.

Percent Population Change

The 5th Ward has suffered from depopulation. This mapping shows the significant change in population from 1990 to 2000. Figure 4.35 shows that throughout much of the study area there is a negative change in population.

The negative change in population is a result of many factors including loss of business, crime rates, and lack of educational opportunities.

This information was an important component of the vulnerability analysis. Areas with high levels of negative change are vulnerable to urban decay.

Racial Demographics

The community of the 5th Ward is largely composed of residents of African American decent (approximately 85% of the 5th Ward neighborhood's population). Issues relating to environmental justice are present within the community.

The goal of this project is to improve conditions, provide access to ecologically rich landscapes, and provide economic and social opportunities for the existing residents, while allowing for racial diversity of residents and users (stlcin.missouri.org).

Urban planning researchers have shown that place diversity can serve as a cultural and economic asset to the community. Place diversity is defined as a place that has a mix of residents from varying racial, cultural, and economic backgrounds (Talen, 2006).

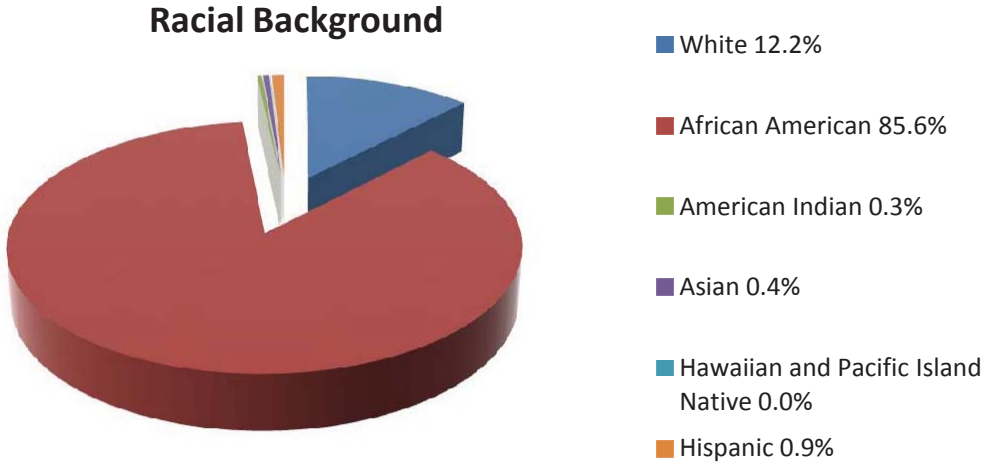


Figure 4.36: Racial Background Chart. Chart Adapted by Author from (stlouis.missouri.org)

Figure 4.37: Racial Diversity Montage. See References Section for Image Sources.

Age Group Demographics

Age groups were useful in determining the spatial location of certain programmed elements. Some of these elements can include schools, community centers, community gardens, senior living centers, and recreational facilities (stlcin.missouri.org). These maps reveal that the largest age groups are between 25 and 45 years old.

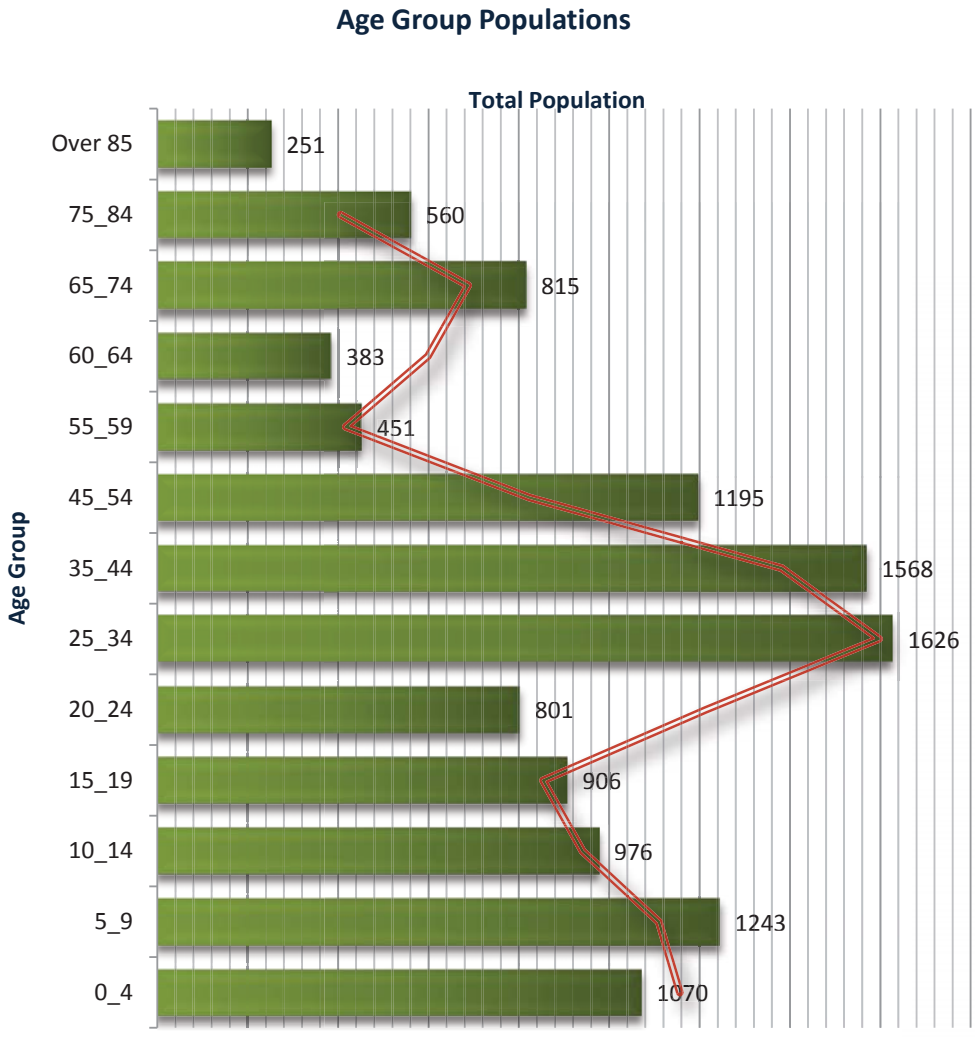


Figure 4.38: Age Group Inventory Chart. Chart Adapted by Author from (stlouis.missouri.org)

Figure 4.39: Age Group 0 to 9 Years Old. Map Produced by Author.

Figure 4.40: Age Group 10 to 19 Years Old. Map Produced by Author.

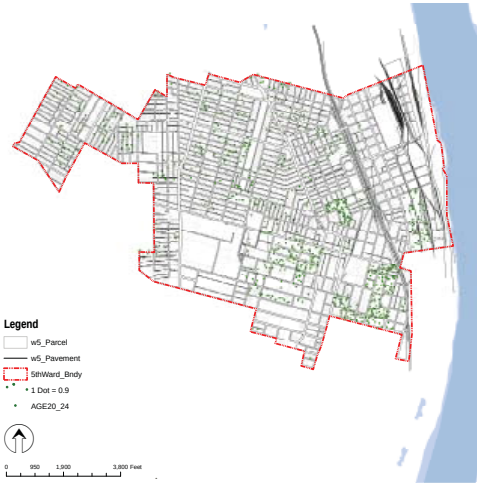


Figure 4.41: Age Group 20 to 24 Years Old. Map Produced by Author.

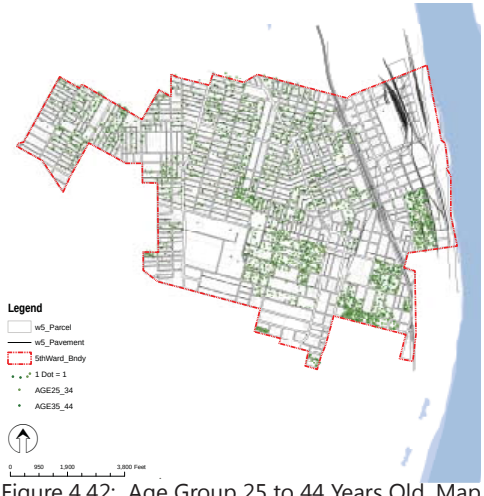


Figure 4.42: Age Group 25 to 44 Years Old. Map Produced by Author.

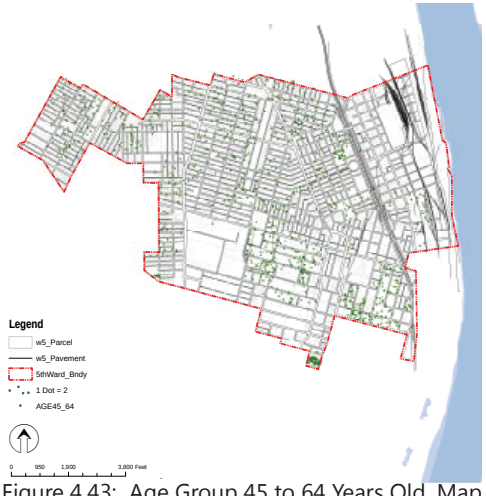


Figure 4.43: Age Group 45 to 64 Years Old. Map Produced by Author.

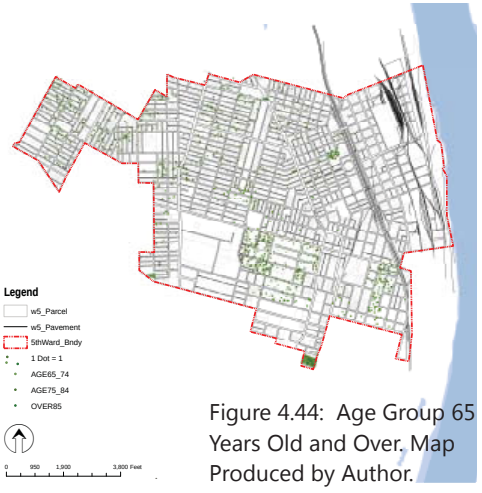


Figure 4.44: Age Group 65 Years Old and Over. Map Produced by Author.

Education

Approximately 35% of residents in the 5th Ward 25 years or older have not received a high school diploma. Approximately 5% have received a bachelor's degree. Education is seen asessential to sustaining the economic and social vitality of the community.

Providing education can come in various forms, including job training, elementary education, summer programs, and teaching environmental stewardship. A major goal of this project is to provide both educational opportunities and employment opportunities to the residents within the 5th Ward. The design incorporates elements that harbor social and environmental education experiences (stlcin.missouri.org).

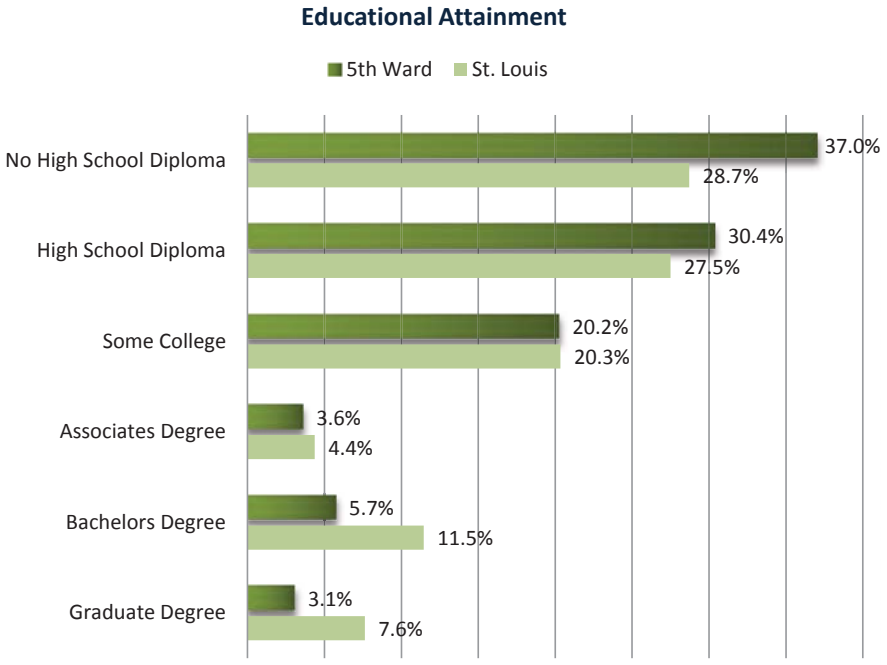


Figure 4.45: Educational Attainment Chart. Chart Adapted by Author from (stlouis.missouri.org).

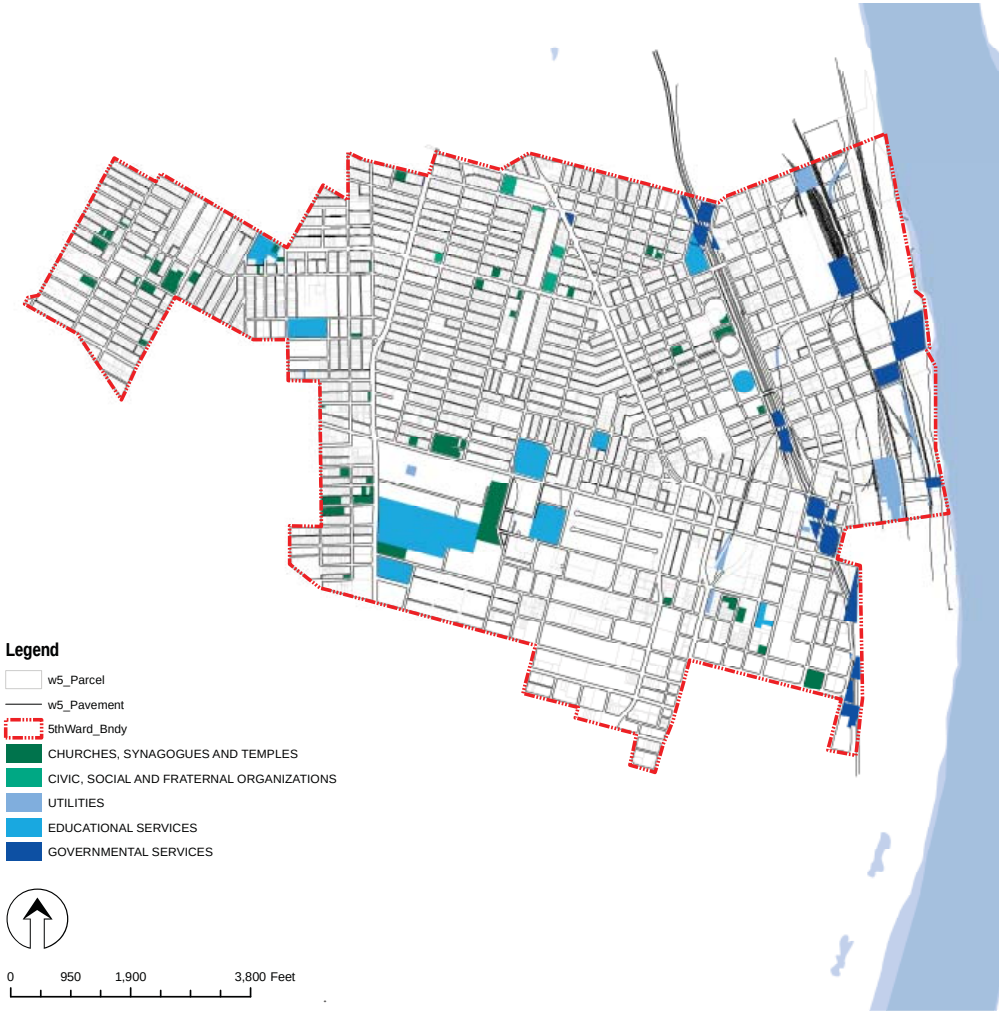


Figure 4.46: Schools, Churches, and Governmental Service Map.
Map Produced by Author.

Economic Issues

The 5th Ward is overwhelmed by a number of economic issues including high poverty and unemployment levels. Over 40% of individuals residing within the 5th Ward are below the national poverty line. The median family income of the 5th Ward is less than $20,000 a year. Approximately 16% of residents use public assistance as a major income source, which nearly double the percentage of St. Louis City residents as a whole (stlcin.missouri.org).

A design that provides economic opportunities for the existing residents is essential. One goal of this project is to use urban agriculture and recreational space to catalyze job opportunities for the community. It is important to provide opportunities that can be fulfilled by the existing residents in order to prevent gentrification of the neighborhoods.

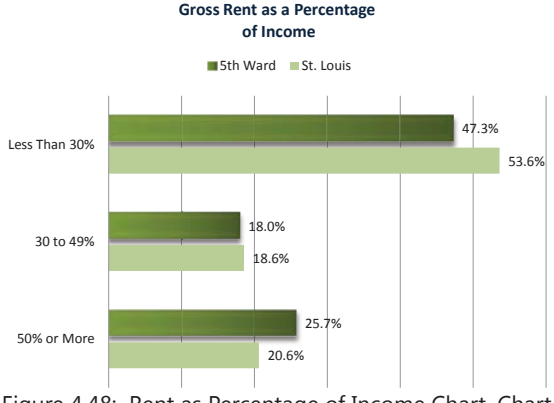


Figure 4.48: Rent as Percentage of Income Chart. Chart Adapted by Author from (stlouis.missouri.org)

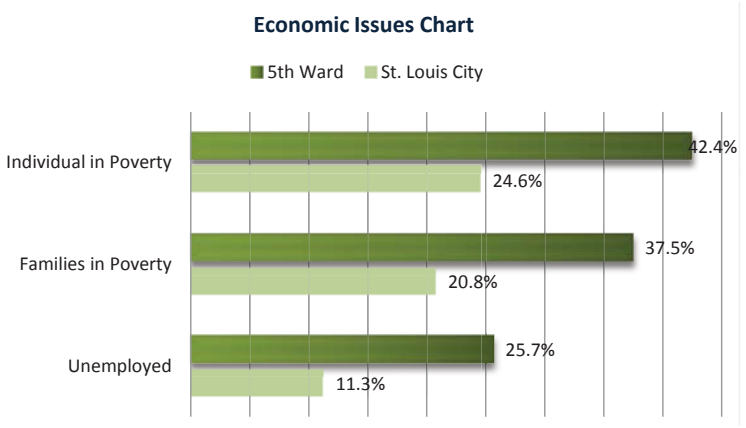


Figure 4.47: Economic Issues Chart. Chart Adapted by Author from (stlouis.missouri.org)

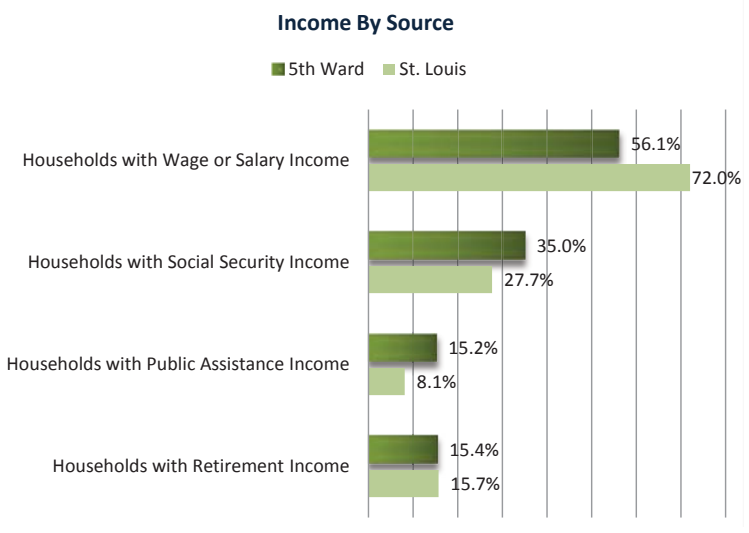


Figure 4.49: Income By Source Chart. Chart Adapted by Author from (stlouis.missouri.org)

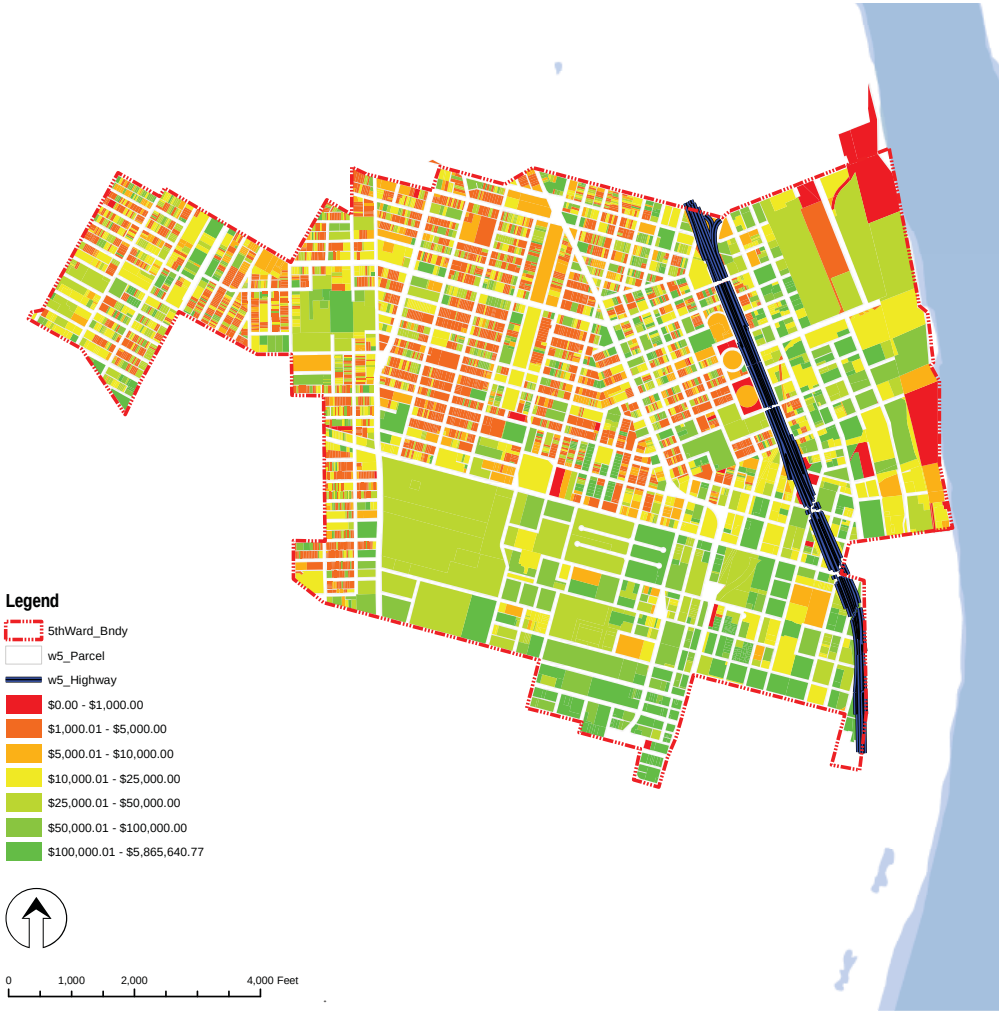


Figure 4.50: Land Value Per Acre Map. Map Produced by Author.

Land Value Per Acre

Land values can be effected negatively by high crime rates, low housing values, and adjacency to vacant land. This mapping was in determining vulnerability of certain areas to economic disinvestment and urban decay.

This map shows that the highest land values are located on the southern portion of the 5th Ward, located near the businesses of Washington Ave. The highest concentrations of low property values are located in the neighborhood of St. Louis Place.

Transportation

Analyzing transportation was essential for determining the accessibility of the resident to places of employment and other services. The most used form of transportation within the Ward is the automobile, followed by public transportation.

Currently the St. Louis Metro Bus system provides good coverage throughout a majority of the community. Good coverage is defined by residents living within a five-minute walk from a bus stop. The Metro Bus proximity and access analysis (Fig. 4.55) displays the coverage of the existing bus system.

St. Louis Regional Long-Range Transit Plan proposes the expansion of the Metro Link rail transit through the 5th Ward. The expansion will contain three stops within the 5th Ward boundaries. The Metro Rail proximity and access map (Fig. 4.56) shows the coverage of the proposed Metro Rail Transit expansion (www.metrostlouis.org).

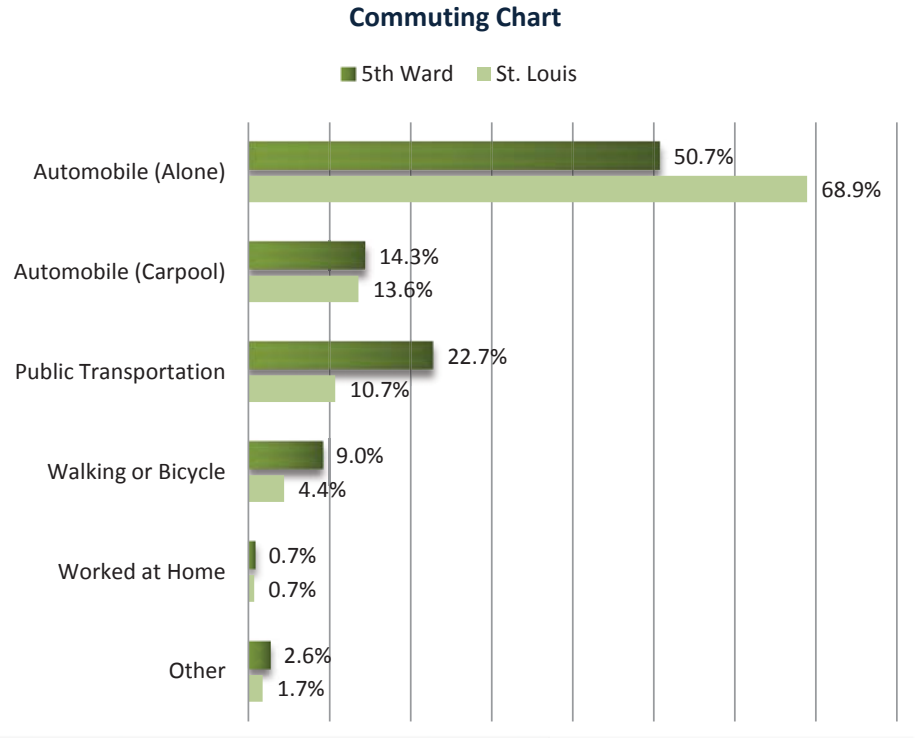


Figure 4.51: Commuting Chart. Chart Adapted by Author from (stlouis.missouri.org)

Figure 4.52: Existing Roadways Map. Map Produced by Author.

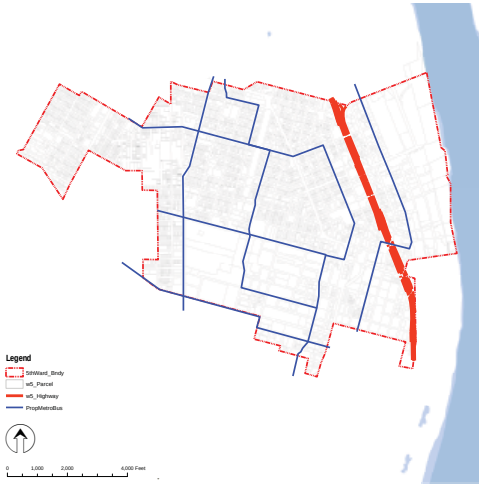


Figure 4.53: Existing Bus Routes Map. Map Produced by Author.

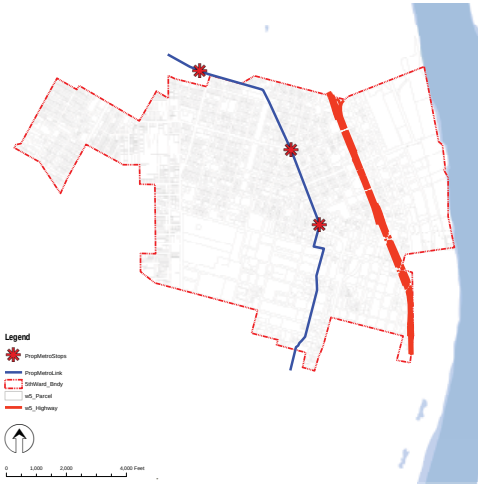


Figure 4.54: Proposed Metrolink Route and Stations Map. Map Produced by Author.

Figure 4.55: Existing Bus Route Coverage Map. Map Produced by Author.

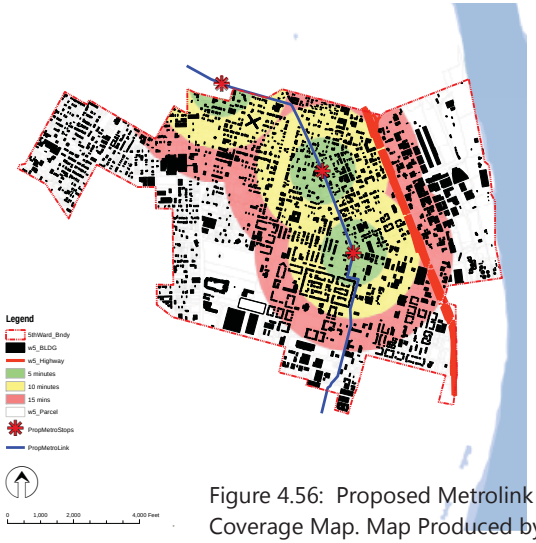


Figure 4.56: Proposed Metrolink Route and Stations Coverage Map. Map Produced by Author.

Environmental Conditions

Climate

St. Louis is located in zone 6 of the USDA Plant Hardiness Zone map. This is critical to determining what species of plants can be used for ornamental as well as agricultural and horticultural purposes. St. Louis has four distinct seasons without extended periods of extreme heat or cold. The charts to the right display the average temperatures, precipitation levels, wind speeds, and sunny days.

Vegetation

After visiting the site, it was observed that the vegetation of the 5th is mostly composed of turfgrass, shade trees, and shrubs. The vacant lots located in St. Louis Place neighborhood are covered almost entirely of turfgrass with scattered shade trees. The vast expanses of turfgrass require extensive amounts of mowing. This vegetation should be diversified with native vegetation that requires low maintenance and irrigation needs.

The former Pruitt Igoe site is mostly covered with dense pioneer shrubs and trees. Once the site is under construction most of these weedy species should be removed and ground to mulch. Desirable and healthy tree species should be preserved wherever this is possible.

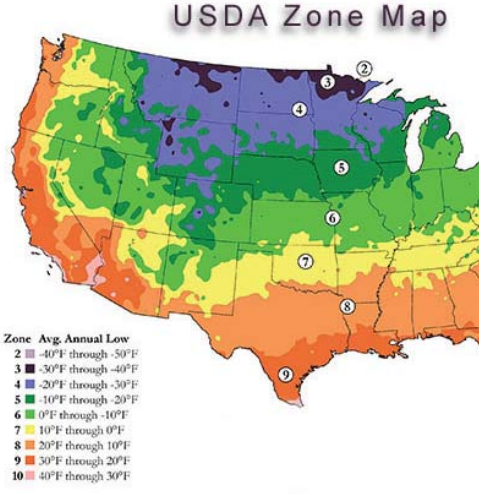


Figure 4.57: USDA Plant Hardiness Zone Map. From (www.crimson-sage.com).

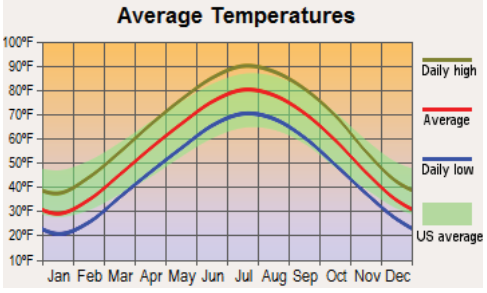


Figure 4.58: St. Louis Average Temperature Chart. From (www.city-data.com).

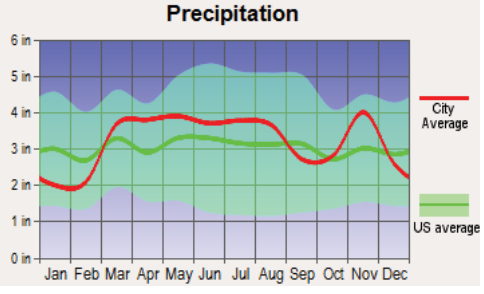


Figure 4.59: St. Louis Average Precipitation Chart. From (www.city-data.com).

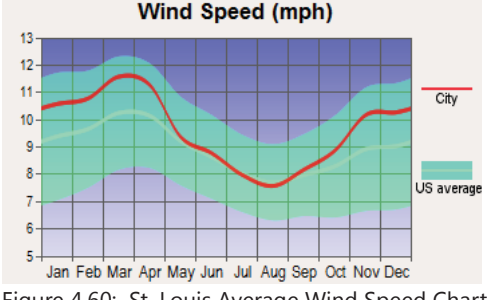


Figure 4.60: St. Louis Average Wind Speed Chart. From (www.city-data.com).

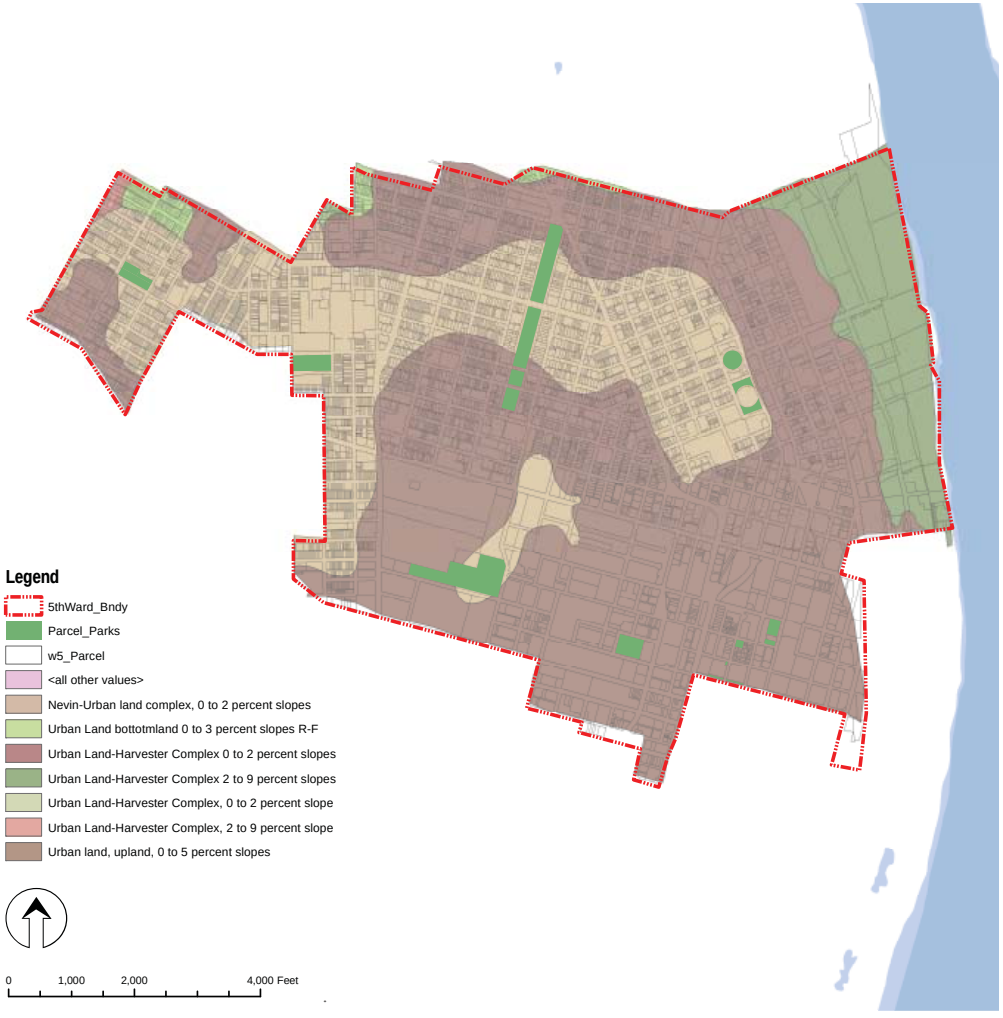


Figure 4.61: Soil Inventory Map. Map Produced by Author.

Soil Conditions

Figure 4.61 to the left shows the soils that are present within the study area. Most of the study area is composed of soils classified as urban land, due to the previous history of disturbance (including buildings, roadways, and potentially contamination).

There are numerous officially and unofficially designated brownfield sites within the 5th Ward. It is important to note this factor because it will limit or increase the cost of development in certain areas. Measures will need to be taken in order to bring brownfield sites back to usable space.

Existing Topography and Hydrology

Topography

The topography throughout the study area and the 5th Ward is relatively flat and gently sloping in some areas.

Hydrology

The existing patterns of hydrologic movement are shown by the blue arrows on the map to the left. The water generated by strowmwater runoff on site is either infiltrated into the expansive turfgrass areas or collected at storm sewer pick up points.

The water generated by stormwater runoff can better serve the community economically and ecolgically if it were collected, filtered, stored, and reused.

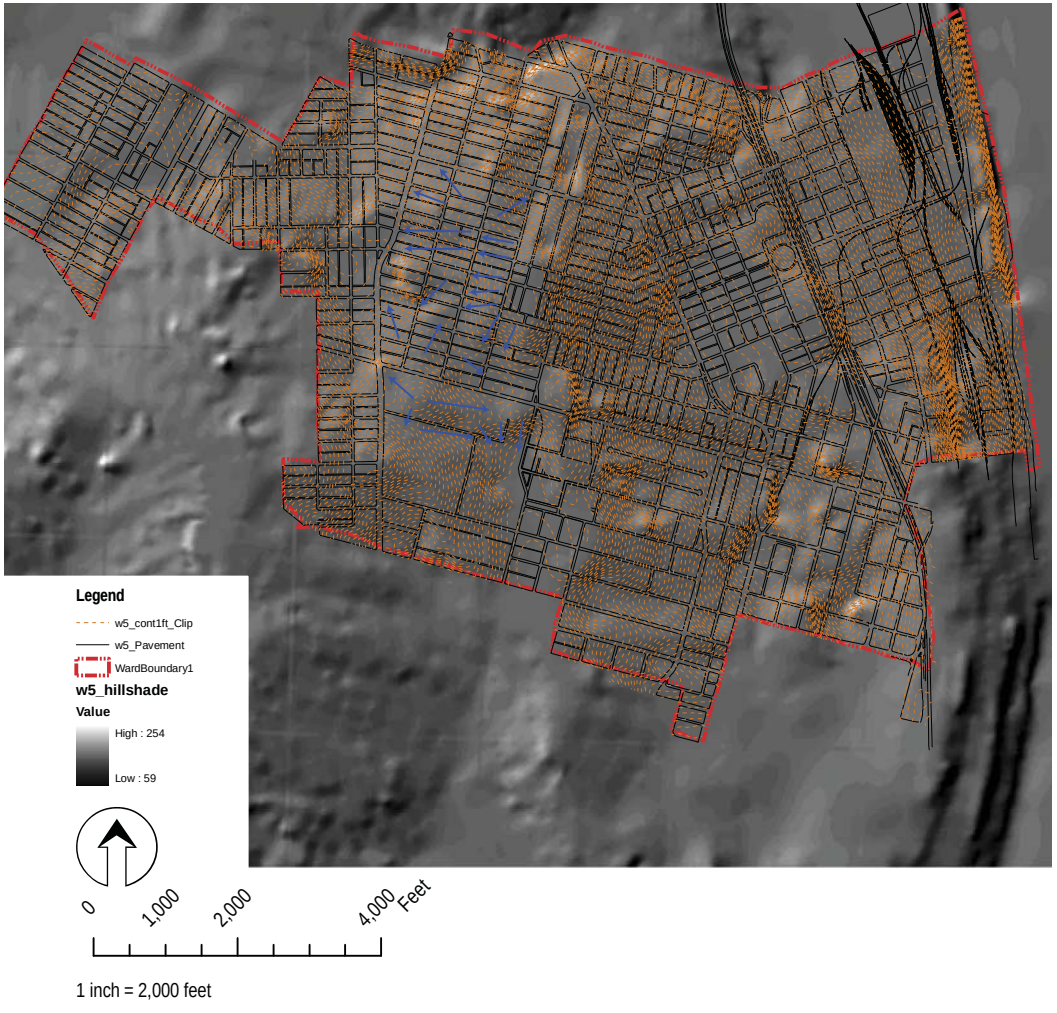


Figure 4.62: Topography anf Hydrology Map. Map Produced by Author.

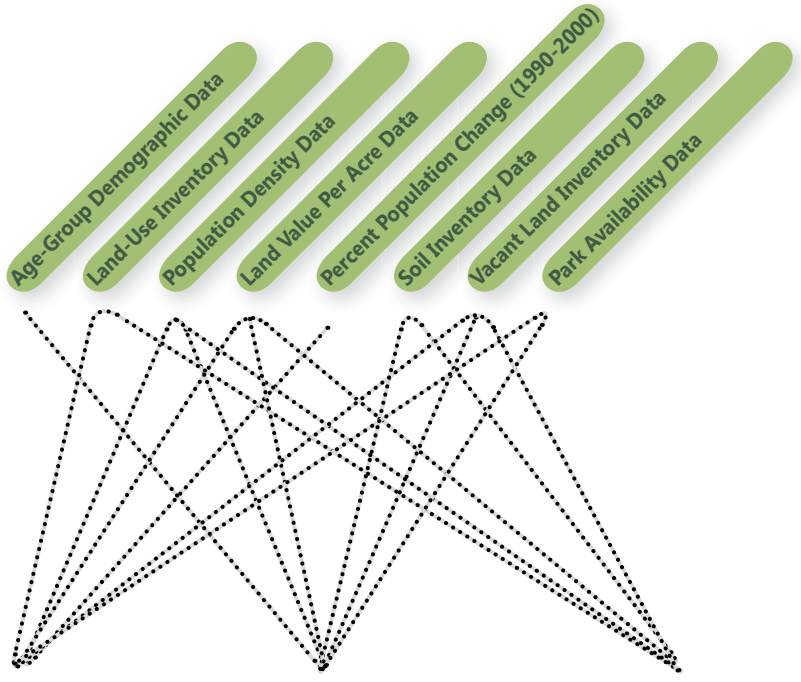


Figure 4.63: Weighted Overlay Diagram. Produced by Author.

Weighted Overlay

For the analysis stage of this project a series of vulnerability and suitability analyses were used to determine appropriate locations for programmed design elements. In order to effectively and accurately produce these analyses, weighted overlay analyses were used. The weighted overlay analysis combines inventoried data to create suitability and vulnerability mappings.

The data was weighted according to its importance to the analysis. This method was chosen because the analysis of the 5th Ward required information from many different layers of data. The weighted overlay tool allowed for the combination of data so that has a suitability/vulnerability rating was attached.

The weighted overlay was completed using Arc Map to combine and analyze GIS data. The first stage of the process was to obtain the desired inventory data and to create the appropriate symbology to graphically represent the data.

Next, the data was reclassified to assign a suitability or vulnerability rating to each dataset. Finally, the data was assigned a weight, based upon the importance to the analysis, and to identify areas of suitability or vulnerability, ranging from low to high in each case.

Site Vulnerability

Description

This weighted overlay analysis was used to determine the areas within the 5th Ward that are most vulnerable to urban decay. Urban decay is degradation of a community due to factors such as depopulation, unemployment, high crime rates, abandoned buildings and vacant landscapes.

Vulnerability, pertaining to this analysis, is the susceptibility of the community to the progression of urban decay. Progression of urban decay includes continued depopulation, increasing crime rates, loss of jobs, and an increased acreage of vacant land. The vulnerability analysis was used to determine which areas of the 5th Ward needs attention and renewal efforts the most.

Rationale

Land value per acre was chosen as a component of this analysis because low land values within the area can be linked to socioeconomic issues such as crime, degraded infrastructure, and lack of community opportunities and amenities.

Percent population change shows the growth or loss of residents within the community, and shows that the community is losing residents. This can be linked to socioeconomic issues which increase the vulnerability of the community.

Vacant land is a symptom of urban blight present throughout the 5th Ward. Vacant land has been shown to decrease land values and discourage investment and community growth (Watcher, 2006.). The inventories are equally weighted because it is assumed that they contribute equally to the the cycle of community degradation.

Land Value Per Acre (33%)

- 0-$25000 (Most Vulnerable)
- $25000-$50000
- $50000-$100000
- $100000-$500000
- $500000+ (Least Vulnerable)

Percent Population Change (33%)

- -100 to -75% (Most Vulnerable)
- -75% to 0%
- 0% to 200%
- 200% to 1000%
- 1000%+ (Least Vulnerable)

Vacant Land Inventory (34%)

- vacant land (Most Vulnerable)
- non vacant land (Least Vulnerable)

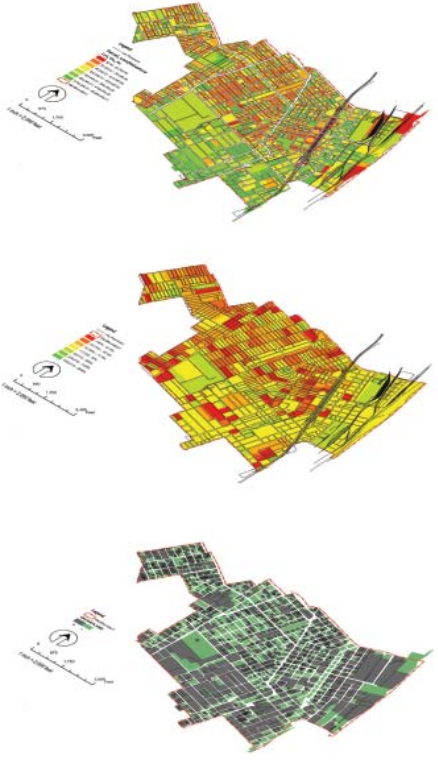


Figure 4.64: Site Vulnerability Weighting Diagram. Produced by Author.

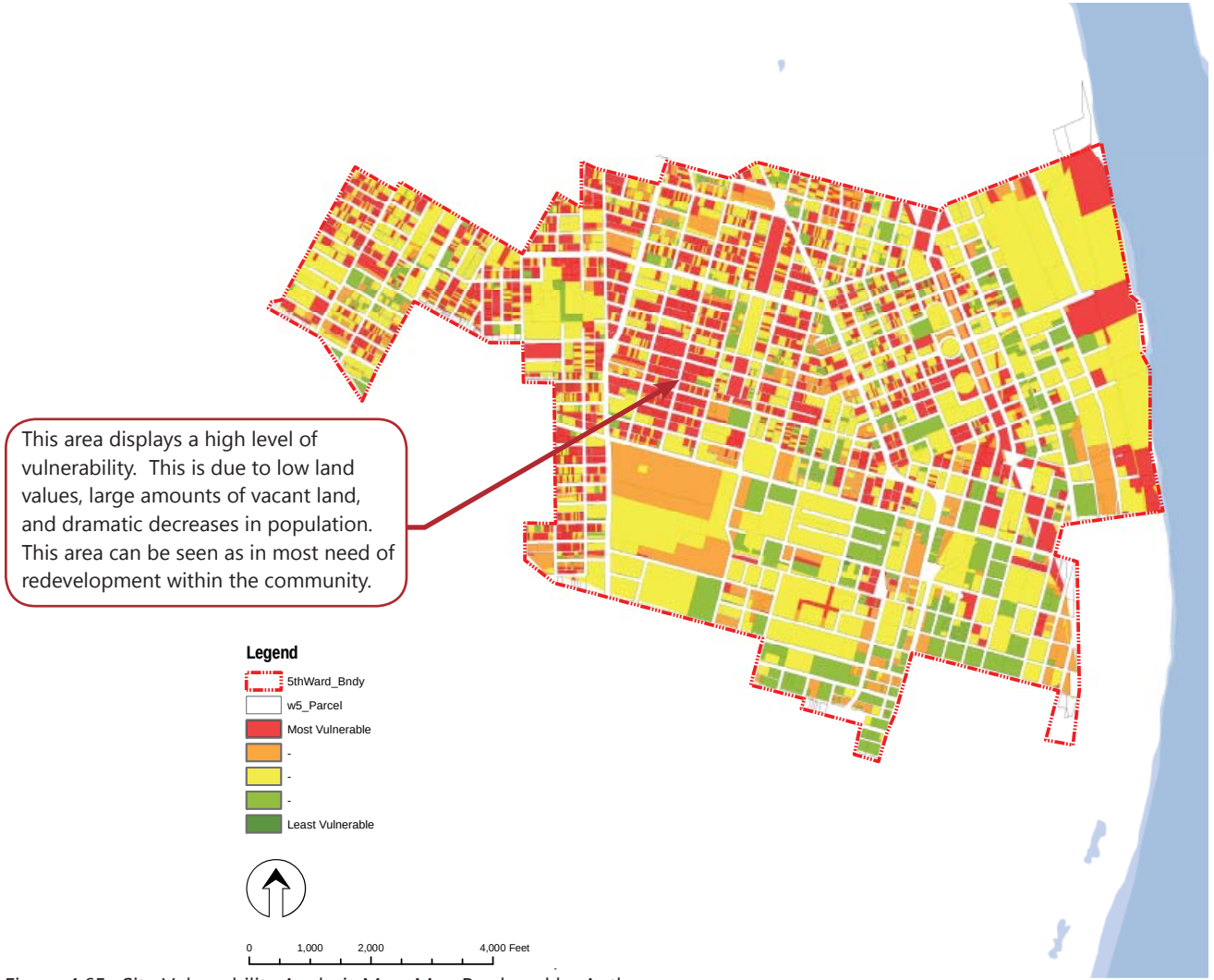


Figure 4.65: Site Vulnerability Analysis Map. Map Produced by Author.

Urban Agriculture Suitability

Description

Urban agriculture could serve as a productive use for vacant land within the community. It is envisioned that urban agriculture for this study area will include a combination of community gardens, horticultural crops, high tunnel greenhouse produced crops, and ornamental plants.

The success of urban agriculture depends on numerous factors including close proximity of residents, land available to grow and harvest crops, and the condition of existing soils. Land value is included in this analysis because low land values will be less expensive to obtain.

This analysis was created from a weighted overlay using the inventories shown to the right. The analysis map shows the suitability of locations within the 5th Ward for urban agriculture based on the inventories listed to the right.

Rationale

Vacant Land is weighted the most and is most important in this analysis because the overall goal of this project is to find productive uses for vacant land within the 5th Ward.

Population density is an important factor in this analysis because it is necessary to maximize the access of residents to the proposed urban agriculture sites.

Land value is also important because low land values will be easier to purchase and redevelop.

Population Density (30%)

- 0-1000 people per Sq.Mi. (Least Suitable)
- 1000-10000
- 10000-50000
- 50000-100000
- 100000+ (Most Suitable)

Land Value Per Acre (30%)

- 0-$25000 (Most Suitable)
- $25000-$50000
- $50000-$100000
- $100000-$500000
- $500000+ (Least Suitable)

Vacant Land Inventory (40%)

- vacant land (Most Suitable)
- non vacant land (Least Suitable)

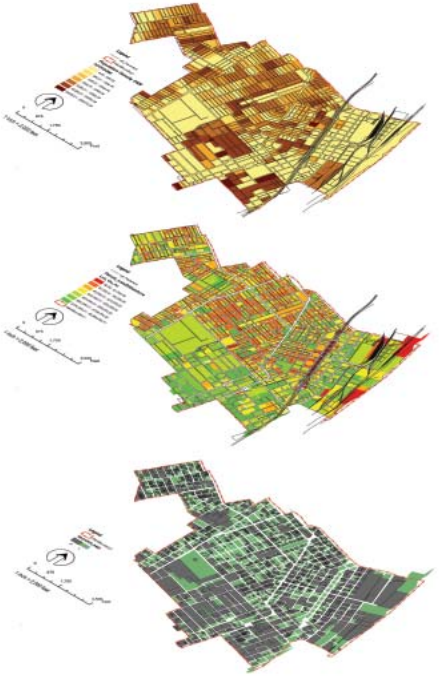


Figure 4.66: Urban Agriculture Weighting Diagram. Produced by Author.

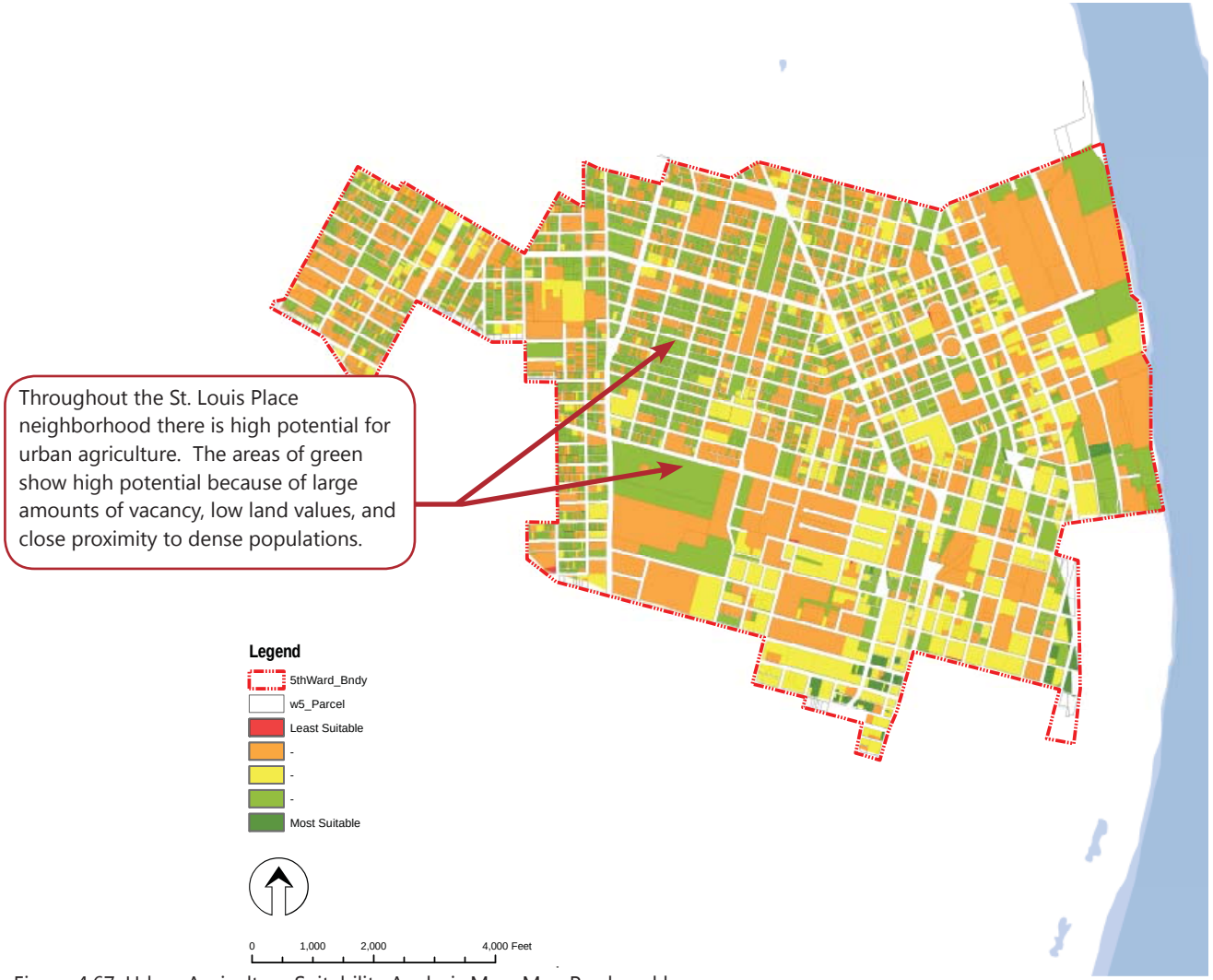


Figure 4.67: Urban Agriculture Suitability Analysis Map. Map Produced by Author.

Park and Recreation Space Suitability

Description
Attractive and user friendly park space is needed within certain areas of the 5th Ward. This park space can come in the form of pocket parks, linear parks and greenways, and large open community parks.

This analysis determines the suitability of locations within the 5th Ward for park space development. A weighted overlay of the inventories to the right in Figure 4.68 was used to determine the most suitable locations for park space. Using the analysis, locations for park space were determined. The form of the park was determined by the surrounding development.

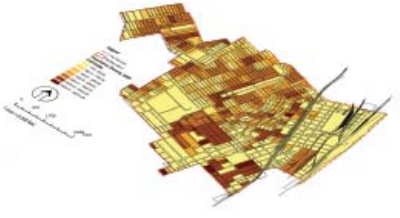
Rationale
In order to maximize access and walkabilty of the park system within the community it is necessary to develop park space within close proximity of residents. Population density of residents under the age 18 is useful when determining ideal place for youth community centers. The under 18 density was weighted less because the parks are to be designed for users of all ages.

Park availability is most important because it was used to determine which areas of the Ward are currently outside of the ideal walking distance of five minutes.

Vacant land is essential because the overall goal of this project is to find productive uses for the vacant land present within the community.

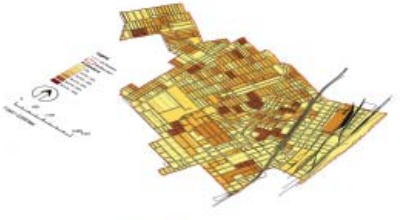
Population Density (20%)

- 0-1000 people per Sq.Mi. (Least Suitable)
- 1000-10000
- 10000-50000
- 50000-100000
- 100000+ (Most Suitable)



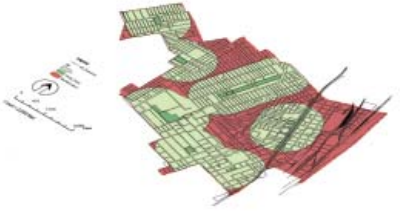
Population Density Under 18 (10%)

- 0-10 % (Least Suitable)
- 10-25
- 25-50
- 50-75
- 75-100% (Most Suitable)



Park Availability (40%)

- outside 1/4 mile buffer (Least Suitable)
- inside 1/4 mile buffer (Most Suitable)



Vacant Land Inventory (30%)

- vacant land (Most Suitable
- non vacant land (Least Suitable)

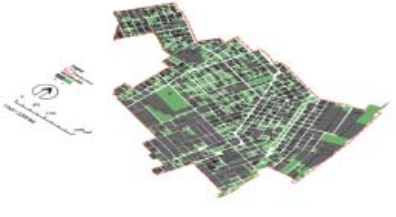


Figure 4.68: Park Suitability Weighting Diagram. Produced by Author.

Figure 4.69: Park Suitability Analysis Map. Map Produced by Author.

Potential Areas for Future Development

Figure 4.70 to the right shows potential areas suitable for various developments within the 5th Ward. The developments envisioned for these areas include residential, commercial/ retail, mixed-use, park space, and urban agriculture. The selections of these areas were developed from the inventories, analysis, and precedents previously listed in this report.

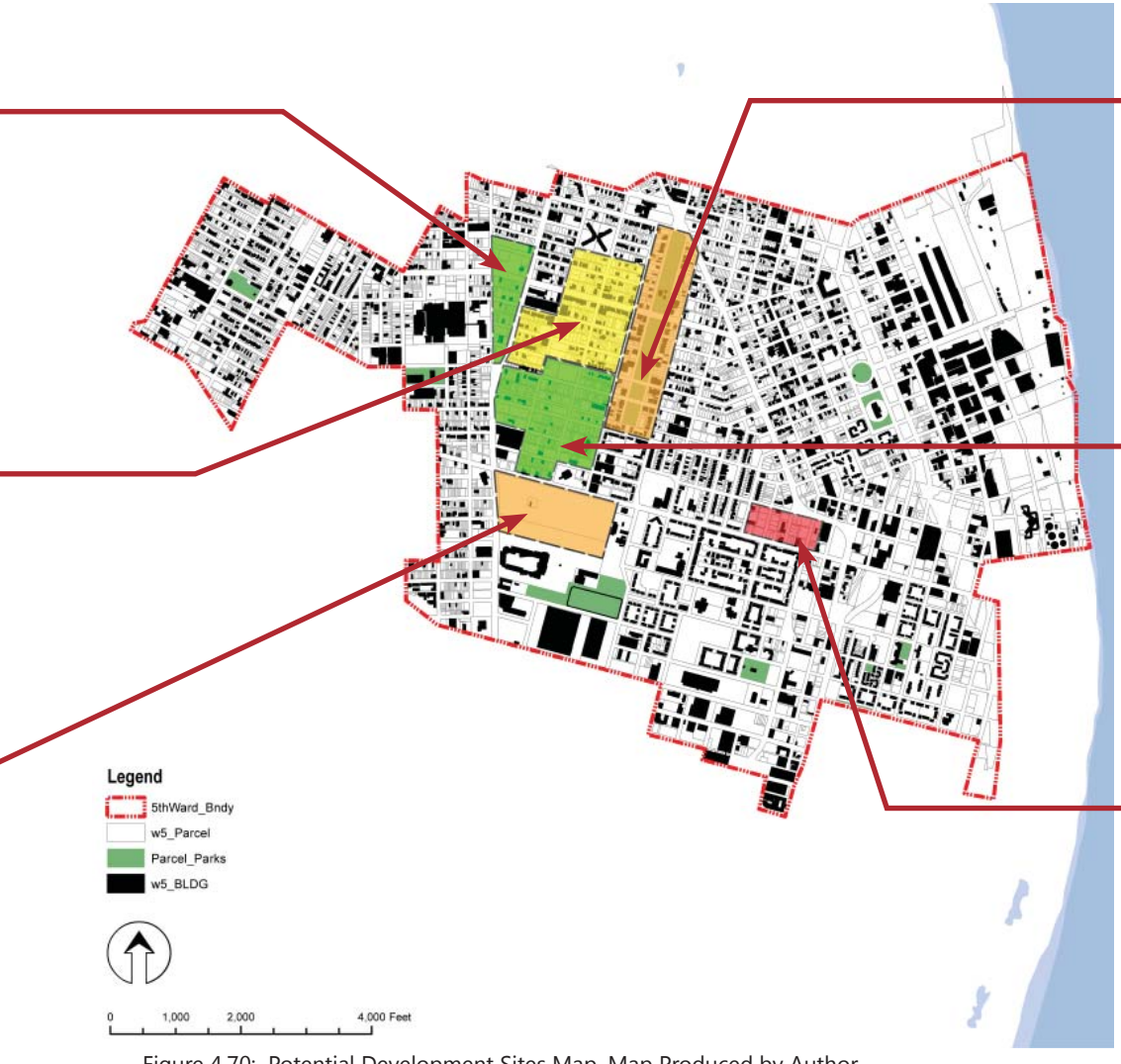
List of Potential Study Areas

1. St. Louis Place Light Industry / Pocket Park Area
2. St. Louis Place Residential Development Area
3. Pruitt-Igoe Community Center Area
4. St. Louis Place Park Mixed-Use Area
5. St. Louis Place Urban Agriculture / Recreational Area
6. Cass Avenue Commercial Redevelopment Area

1. St. Louis Place Light Industry/Pocket Parks Area
This area has a high potential for light industrial and park space development. The potential for parks space is high due to the close proximity to areas of higher population to the East and West, and the large percentage of vacant land. The site is also located inside a portion of the 5th Ward with limited park space availability. The potential for light industrial is high due the proximity to existing industrial land uses.

2. St. Louis Place Residential Development Area
This area has high potential for residential infill and development. There is high potential for residential development because of its proximity to the proposed metrolink expansion. This area has potential for a mix of housing types including mutli-family, single family, and high density housing.

3. Pruitt-Igoe Community Center Area
The former Pruitt-Igoe Site has a high potential for commercial developments and community centers due to its close proximity to areas of dense population and access to major roadways. Developments could include retail groceries, farmers market, recreation centers, and multi-family residences.



4. St. Louis Place Park Mixed-Use Area
Due to its proximity to the proposed metrolink expansion, existing land use, central location, and park space frontage, this area has a high potential for mixed use development. This area has a high potential for retail, restaurants, and apartment housing.

5. St. Louis Place Urban Agriculture/ Recreational Area
This area of St. Louis Place neighborhood provides a high potential for the implementation of urban agriculture, recreation, light industry, and low to medium density housing. This area has high potential for these development types because of the large tracts of vacant land and low land values.

6. Cass Avenue Commercial Redevelopment
This area has a high potential for commercial development. Its close proximity to the most densely populated area of the 5th Ward directly to the south and to a proposed metro link stop will allow for great access from the community of the 5th Ward and other surrounding communities.

Figure 4.70: Potential Development Sites Map. Map Produced by Author.

Program

Program Development

Having a researched and relevant program is an essential part of creating a project that will be successful in the short term and the long run. The program for the project's study area was developed from research documented in the literature review, precedent studies, site inventory and analysis, 5th Ward community meetings, and overall project design goals.

The 5th Ward has previously had meetings concerning a master plan for the community. The meetings are available to the public via the St. Louis City Website. The meeting minutes are useful in providing a look at the needs and wants of the community.

The community meetings in St. Louis Place neighborhood and Carr Square neighborhood were investigated because these neighborhoods are located completely within and make up most of the land of the study area. A synthesis of community needs and wants discussed during the community meetings are shown to the right.

5th Ward Community Meeting Synthesis

The community needs of **St. Louis Place** neighborhood:

- Community gardens on vacant lots
- Option/resources for low income residents
- Clean up debris on individual lots
- Jobs
- Expand existing youth centers
- Community construction team
- Playground
- Rehab old structures/ demolish buildings

The community needs of **Carr Square** neighborhood is listed below:

- Community pool
- Grocery
- Jobs for younger people - work in stores and recreation center
- Carr School - location good for something for children, tear down
- Mixed use
- Afterschool, recreational, and summer programs
- Pruitt-Igoe Development

Source: (http://stlouis.missouri.org/citygov/planning/cnp/schedule.html)
Date Accessed: 12/6/2010
Meeting Dates: St. Louis Place (10/7/1999); Carr Square (9/28/1999)

Program Goals

Socioeconomic Improvement:
The designs should be aimed to help improve the overall socioeconomic health of the community. This meanz designing to address high crime rates, lack of education and employment, disinvestment, vacancy, and other pressing issues.

Native Planting Schemes:
Irrigation is severely limited throughout the site. It is essential to use native and other appropriate plant materials that will thrive with little to no irrigation once they are established. Native plant materials will also be helpful in connecting to the historical context of the site.

Community Gardens:
Community gardens can be used to incorporate horticultural and ornamental crops within the neighborhood. Community gardens can be used as a recreational, economic, and educational tool for the surrounding neighborhoods.

Recreational Amenities:
Parks can be revitalized to foster a close interaction to natural elements within an urban setting. This can be achieved by creating space that is designed with natural ecology in mind as well as education and recreationneeds and interests.

Stormwater Management:
Sustainable stormwater management is a necessity to the health of terrestrial and aquatic ecosystems. St. Louis is located at the confluence of two of the United States largest Rivers, the Missouri and the Mississippi. St. Louis' close connection to the hydrologic system makes it an excellent area to demonstrate sustainable stormwater management.

Community Gathering Space:
Creating inviting gathering spaces will increase positive community use. Active and inviting community space helps to foster business and education, and leads to more interest and investment in the community.

Educational Landscapes:
Designing landscape that exemplifies the city's social and natural history can serve as an educational amenity to the neighborhood. This can be achieved by creating landscape that foster interaction of the community with the spaces.

Program Elements

St. Louis Place Urban Agriculture/ Recreational Area:

- Gathering Area - Varies
- Food Packing / Processing Facility / Light Industrial complex - 2.5 to 5 ac.
- Commercial Urban Agriculture - 20 to 30 ac.
- SPIN (Small Plot Intensive) Community Garden Plots - 5 to 10 ac.
- Farmers Market Area - 2 to 3 ac.
- Native Tree and Plant Nursery - 5 to 10 ac.
- Orchard - 3 to 5 ac.
- Composting and Storage Facility - 1 to 2 ac.
- Seating - varies
- Soil Remediation - varies (depends on land use type)
- Trail Network - varies
- Lighting - varies
- Bio-Retention Areas - 1 to 2 ac.
- Park Space - 10 ac.
- Single Family Housing - 8 du/ac
- Multi-Family Housing - 20 du/ac
- High Tunnels / Greenhouses - 2 to 3 ac.

Pruitt-Igoe Community Center Area

- Gathering Areas - Varies
- Community and Youth Recreation Center Building - 30,000 sq. ft.
- Multi-Family Housing - 8 du/ac
- Community Pool - 5000 to 10000 sq. ft.
- Bio Retention Areas - 1 to 2 ac.

Figure 5.1: Single Family Housing. Photo from (www.flickr.com).

Figure 5.2: Multi-Family Housing. Photo from (www.flickr.com).

Figure 5.3: Urban Agriculture. Photo from (blogspot.com)

Figure 5.4: Urban Agriculture. Photo from (www. wordpress.com)

Figure 5.5: Parks Space Wetland Area. Photo from (www.gocolumbiamo.com)

Figure 5.6: Recreation Center. Photo from (blogspot.com)

Figure 5.7: Mutli Family Housing. Photo by Author.

Figure 5.8: Amphitheater. Photo from (Hou 2008)

Figure 5.9: Farmers Market. Photo from (www.hotels.com).

Figure 5.10: Orchard. Photo from (www.abbeyroadfarm.com).

Figure 5.11: High Tunnel Production Houses. Photo from (www.ces.ncsu.edu)

Figure 5.12: Tree Farm Nursery. Photo from (www.plantnurseries.us).

Figure 5.13: Open Park Space. Photo from (tripadvisor.com).

Figure 5.14: Community Pool. Photo from (media.connectingstlouis.com).

Figure 5.15: Recreational Park and Trail Space. Photo from (www.nancyowensstudio.com).

Design

Design Goals and Process

Explanation of Design Process
The design for the selected study areas was produced by exploring a series of conceptual design ideas. The process was initiated by setting goals to guide design development. Next, the major driving forces that are influenced by the design goals were identified. After identifying the major driving forces, conceptual framework plans were developed to examine spatial hierarchy, layout, sizing, and design components. The framework plans were then used to inform the proposed master plan. The master plan displays site specific detail for the placement, size, structure, and character of programmed elements. Various diagrams and perspective views explain the design and provide a vision for the character.

Throughout the entire design process the literature review, precedent studies, and inventory and analysis were used to inform the design decisions.

Explanation of Design Goals
The design goals for this project were developed from the literature, precedents, inventory mapping, and community analysis The design goals listed below were used to guide the design development for this project.

- Promote a community with increased vitality.
- Attract permanent residents without displacing the current population.
- Maintain the architectural character of the community while allowing for diversity.
- Create safe and active public spaces.
- Provide employment opportunities for current and future residents.
- Utilize vacant land as a sustainably produced local food source and as community park space.
- Provide social activities geared towards multiple age groups.
- Maximize access to public transportation and increase walk-ability between dwellings, workplaces, schools, churches, grocery stores, and other businesses and shopping areas.
- Improve “curb appeal” of the neighborhood using sustainable design strategies such as rain gardens, stormwater capture, and native building materials.
- Promote a sense of environmental stewardship within the community by promoting interaction with the natural landscape.

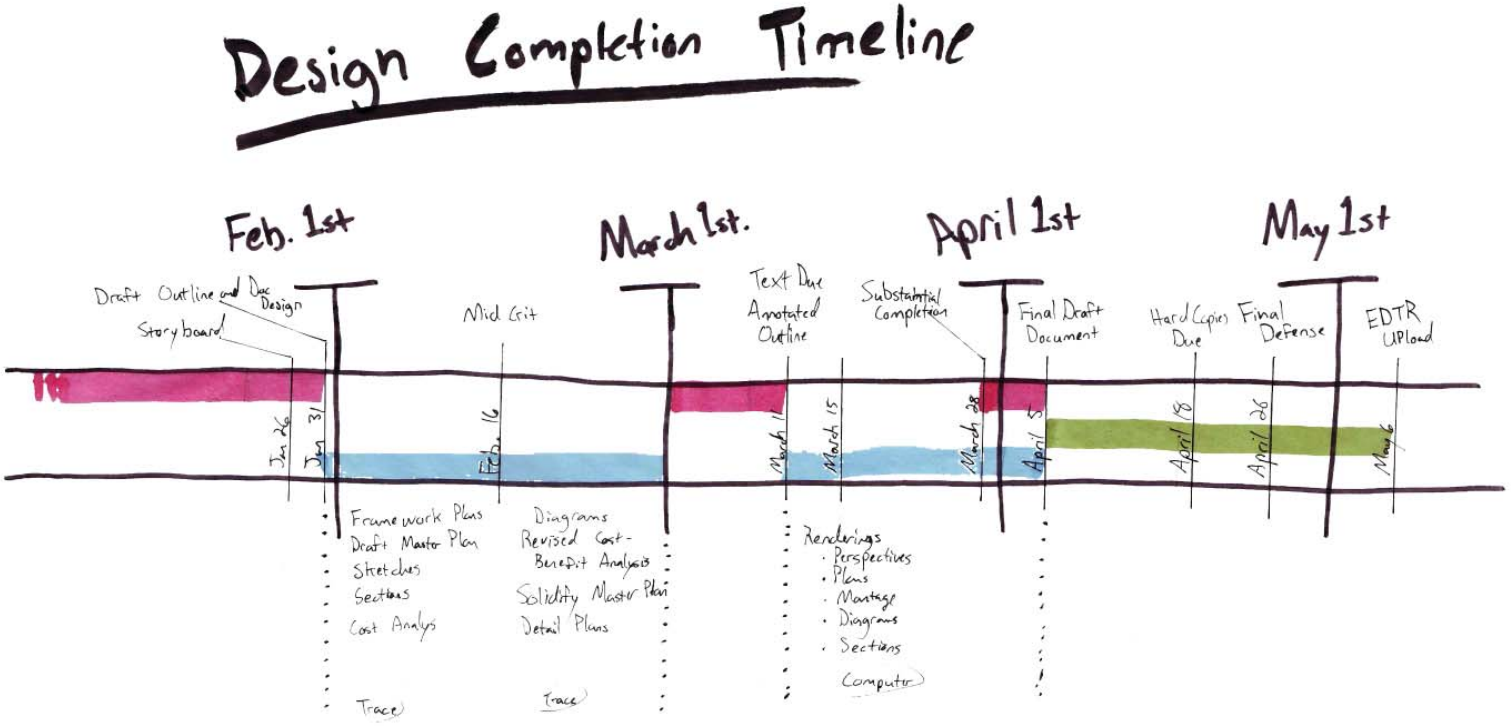


Figure 6.1: Design Process Diagram. Produced by Author.

CONCEPTUAL FRAMEWORK PLAN DEVELOPMENT

Driving Forces

Before generating ideas for the design of the selected areas within the 5th Ward it is important to identify the driving forces that are acting on the site. The driving forces were determined through the site inventory and analysis of the site and its adjacent surroundings. The community analysis of the 5th Ward neighborhood played a large role in the identification of the driving forces, and these forces heavily influenced conceptual design development. Major driving forces include:

- adjacent land uses
- location and quantity of vacant land parcels and related demographic attributes
- topography and existing environmental conditions
- major existing pedestrian and vehicular circulation patterns

1. Adjacent land uses surrounding the development include the close proximity of industrial, single-family, multi-family, mixed-use, and park land uses. The adjacency of industrial land use lends itsself to further development of light industrial program elements. The adjacency of single family land uses influences the location of potential areas for residential redevelopment. Multi-family land uses surrounding the site influences the location of proposed multi-family areas. Park space located off the site influences the connections between proposed and existing park space, the Gateway School stie, as wells as pedestrian connections. Park space will help to increase the value of adjacent land uses and should encourage investment in the 5th Ward (Garvin 30).

2. Vacant land is readily available and therefore is seen as most suitable for urban agricultural development. The vast expanses of vacant land present throughout the core of the site lend these areas to agricultural development due to the lack of existing buildings. Scarce funds can be used for soil cleansing and site preparation rather than on demolition. The location, ages, and educational attainment of residents are also critical factors in determining where and how land should be used and developed.

3. Topography is a driving force that influences hydrologic patterns. It was important to take in consideration the existing topography to minimize the amount of earthwork required and to establish a hydrologic network that filters and stores water on site for re-use (Simmonds 44).

4. The overall grid that is created by the existing circulation patterns strongly influenced the conceptual design of this project. To save funding, and minimize earthwork and construction costs, it was necessary to follow the existing grid pattern. Following this pattern allows the design to better fit into the existing character of the community, and allows for future versatility of the design.

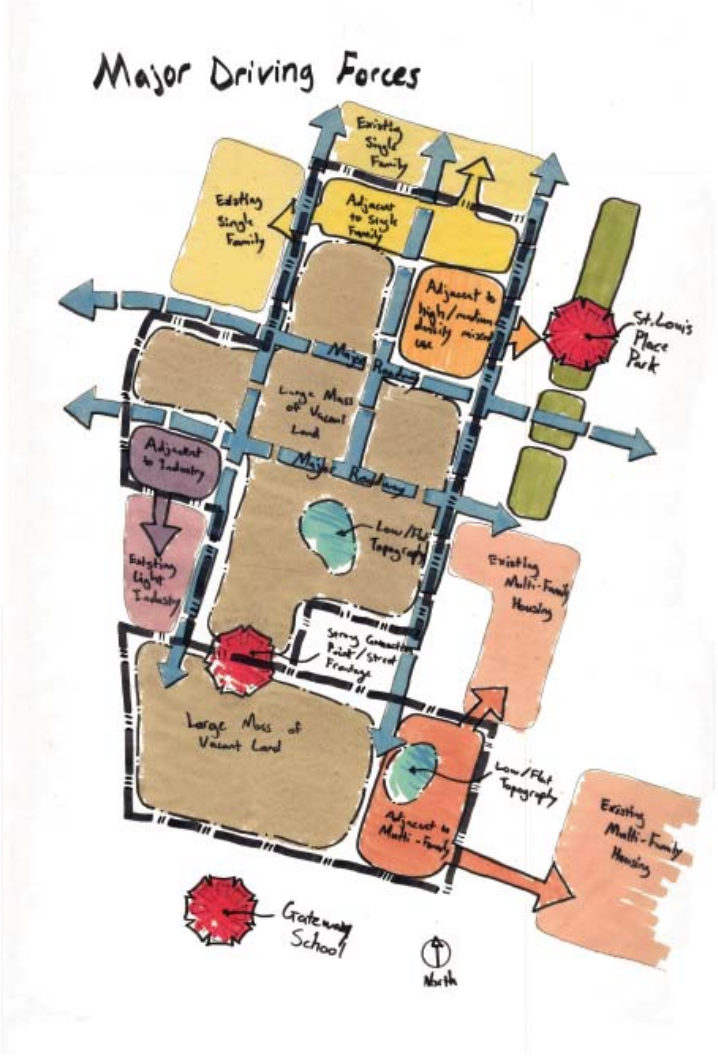


Figure 6.2: Diagram of Major Driving Forces. Produced by Author.

Framework Concepts

Overall framework land use concepts were developed to quickly determine the optimal location, sizing, density, and organization of various programmed land uses. The programmed land uses that were explored during this phase of the project include: single-family and multi-family residential, park space, community gardens, commercial urban agriculture, a native plant nursery, farmers market, light industrial, mixed-use, a recreation complex, and areas for bio-retention of stormwater runoff.

The programmed elements listed earlier in the book were used to determine the approximate sizing for the conceptual framework designs. The frameworks drew heavily on the major driving site forces listed previously.

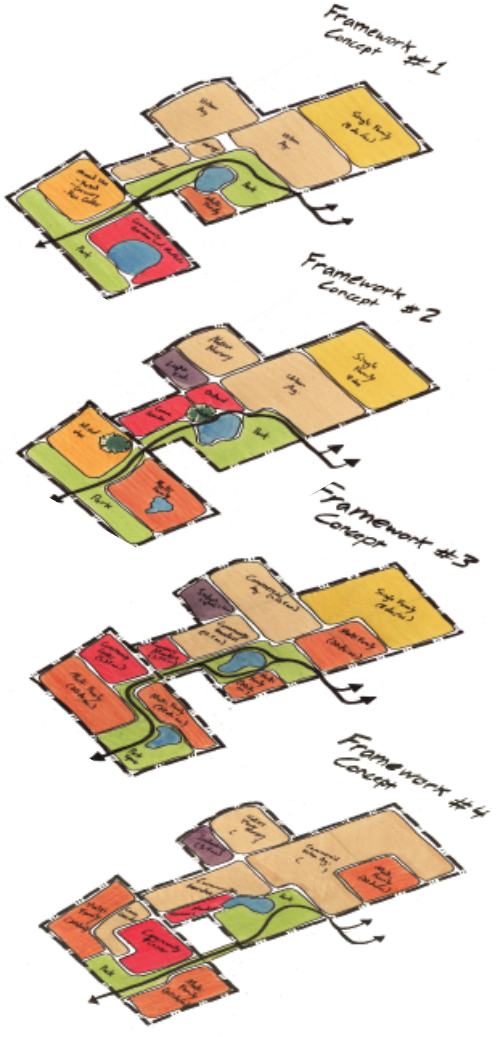


Figure 6.3: Framework Concept Development Diagram. Produced by Author.

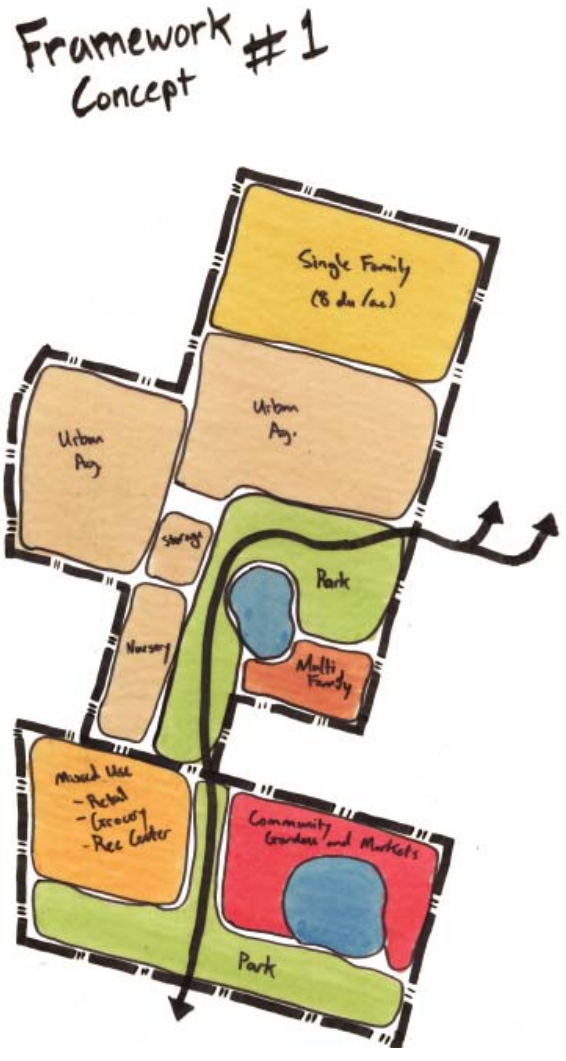


Figure 6.4: Framework Concept 1. Produced by Author.

Framework #1

Framework concept one provides a low density option for development. The plan features:

- single-family residential development to the north portion of the study area
- multi-family development near Rhema Church
- mixed-use development at the corner of Cass and Jefferson Ave.
- a large community garden and farmers market area located on the west portion of the former Pruitt Igoe site

The central core of the site is composed of:

- urban agriculture
- a native plant nursery
- park space development

The low density agriculture accounts for a majority of the study area.

This plan, along with the other three concepts, features bio-retention areas on the eastern side of the former Pruitt Igoe site and in the central area of the St. Louis Place study area. These locations were chosen because the low and flat topography lends itself to the creation of ponds and bio-retention areas.

Framework #2

Framework concept two provides a moderately dense option for development. The plan features:

- single-family residential infill and redevelopment on the northern portion of the St. Louis Place study area
- multi-family residential development on the eastern portion of the former Pruitt Igoe site

The concept features a large central core of:

- park space to connect St. Louis Place Park and Gateway school
- commercial urban agriculture
- community orchard
- farmers market
- community gardens
- a native plant nursery located in the central portion of the St. Louis Place study area

Light industrial and mixed use development is also included in this plan on the western portions of the site. These land use options will be used to help boost the number of jobs that are created by the design.

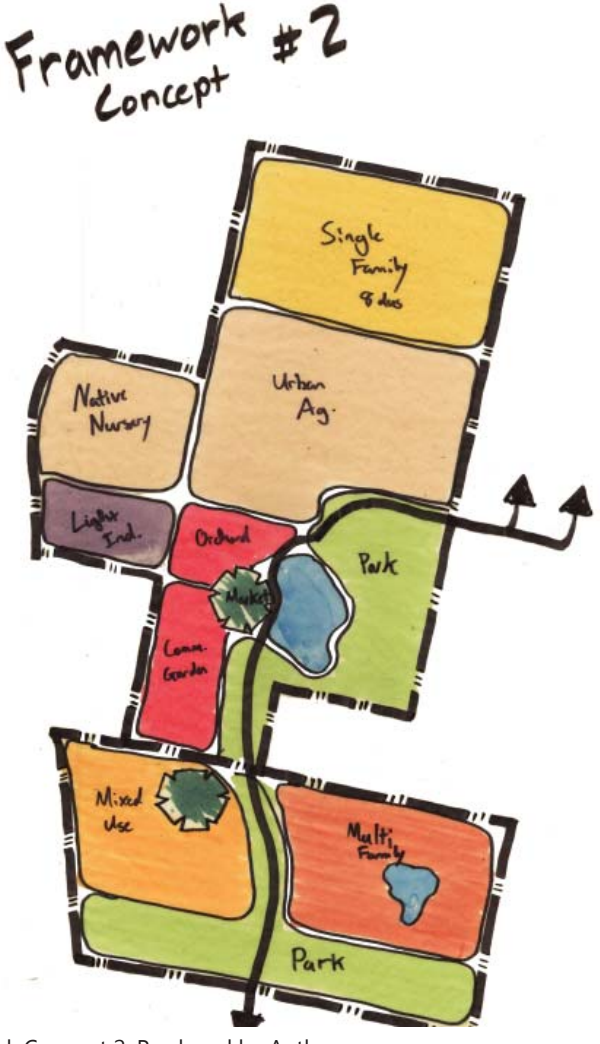


Figure 6.5: Framework Concept 2. Produced by Author.

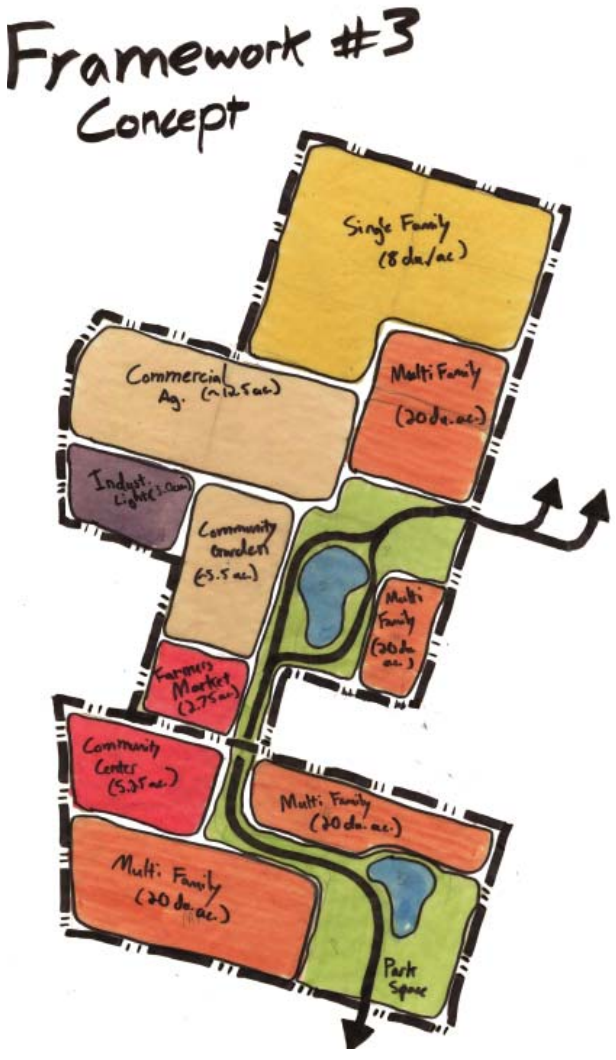


Figure 6.6: Framework Concept 3. Produced by Author.

Framework #3

Framework concept three features the highest density option for development. The plan includes:

- single-family redevelopment on the north portion of the study area
- four areas designated as multi-family residential
- light industrial use
- a community center

The plan also features:

- central park space
- commercial urban agriculture
- a farmers market
- community gardens

This concept will be very useful if it is determined that there is an increased demand for housing within and around the study area.

Framework #4

This framework concept provides a mostly low density option for development. A majority of the site is proposed for agriculture uses including:

- commercial urban agriculture
- community gardens
- a native plant nursery
- a farmers market

The farmers market is located on Cass Ave to provide the most accessibility to major existing circulation patterns.

The core of the site transitions from low density agriculture uses to multiple areas of multi-family residences on the outer edges of the site. This concept also includes light industrial land use, a community center in close proximity to the farmers market.

The core of community activity is located in the center of the site with the farmers market, the community and recreation center, and the large expanse of park space located on the east side of the study area.

Figure 6.7: Framework Concept 4. Produced by Author.

Selection of Most Suitable Framework Options

Frameworks three and four were selected for further study, including a cost analysis and a community benefit analysis (used to determine the optimal concept for more in-depth design and leading to a detailed master plan).

These two frameworks were selected because they displayed the most appropriates densities, the most ideal location and layout of programmed land uses, good transitions between surrounding land uses and proposed programmed elements, and ideal sizing of programmed elements.

Construction Cost Analysis

Early design phase cost estimates were generated to provide a quick estimate for site development and construction. The costs were estimated using a per unit, square footage method.

Costs were determined by land use type and the type of structures that were expected to be built. The costs for residential areas, community recreation center, industrial, were obtained from the RS Means Cost Data Catalog for square foot costs (R.S. Means Company 2011). The cost estimates for farmers markets and community gardens were generated from the Magnuson Community garden precedent study (Hou 2009). The costs for commercial urban agriculture were referenced from cost break downs from a Philadelphia commercial community garden venture, Somerton Tanks Farm (De La Salle 2010, 168-170). Parks space development costs were referenced from a literature review of park space construction costs that provide examples for various park sizes and types (Community Recreational Commission (CORE 2006). The appropriate cost estimate for park space was determined based on the proposed size and type of park envisioned for this project, a mid-sized community park. Development costs for the native plant nursery were generated from report published through University of Kentucky (University of Kentucky Cooperative Extension Service 2004).

To account for discrepancies in regional differences in construction costs the square foot cost data was multiplied by the regional construction cost multiplier for St. Louis, Missouri. The multiplier of 1.02 for residential development and 1.03 for commercial development shows that construction cost are slightly higher than the national average (R.S. Means Company 2011).

Cost Analysis Results

The results from the cost analysis for Framework #3 show that the implementation of the entire planned elements would likely incur costs near $372 million, including earthwork, materials, structures, and labor.

Implementation costs for Framework #4 are estimated to be approximately $278 million, including earthwork, materials, structures, and labor.

The construction costs for Framework #3 are shown to be significantly higher than Framework #4. This can be attributed to the fact that Framework #3 has a higher density and presence of single and multi family residential development. This type of development will have construction costs that are significantly higher than the cost of low density agricultural development and parkland which makes up a majority of Framework #4.

The charts and supporting graphics, shown to the right and below, display the square foot costs that were used to determine a preliminary cost estimate for the selected framework plans.

Development Cost Analysis Framework Plan #3

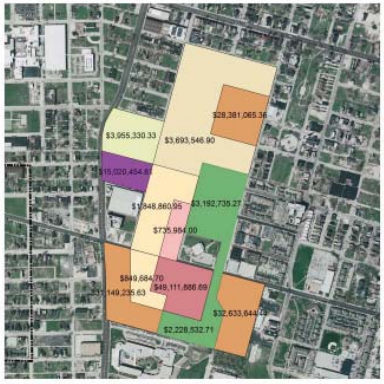
evelopment Cost Analysis Plan

Development Cost Analysis Diagram

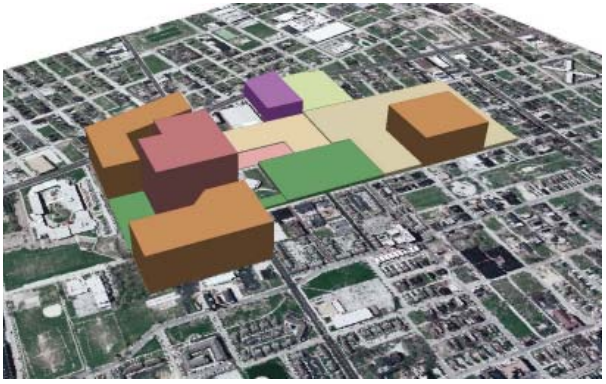
Layer	Shape_Area	Shape_Area_Acres	Const_cost_perSqFt	Total_Const_cost_acre	Total_const_costs
L-LndUse-Rec	264024.315889	6.061164	$134.00	$5,837,040.00	$35,379,260.00
L_LndUse-MF	324022.45817	7.438532	$84.00	$3,659,040.00	$27,217,886.00
L_LndUse-MF	499169.772579	11.459361	$84.00	$3,659,040.00	$41,930,268.00
L-LndUse-Park	531949.422224	12.211879	$16.00	$696,960.00	$8,511,191.00
L-LndUse-Lteind	197614.675882	4.536609	$68.00	$2,962,080.00	$13,437,796.00
L-LndUse-Ag	633282.183938	14.538157	$4.50	$196,020.00	$2,849,769.50
L-LndUse-FarmMarket	140447.533578	3.224232	$5.00	$217,800.00	$702,237.69
L-LndUse-ComGard	279022.662376	6.267796	$4.50	$196,020.02	$1,228,601.00
L_LndUse-MF	365620.948216	8.393502	$84.00	$3,659,148.00	$30,712,160.00
L_LndUse-SF	910717.893677	28.907188	$41.00	$1,785,959.96	$37,339,400.00
L-LndUse-Park	519796.841944	11.932894	$16.00	$696,960.00	$8,316,749.50

Figure 6.8: Cost Analysis Framework Concept 3. Produced by Author.

Development Cost Analysis Framework Plan #4



Development Cost Analysis Plan



Development Cost Analysis Diagram

Layer	Shape_Area	Shape_Area_Acres	Const_cost_perSqFt	Total_Const_cost_acre	Total_const_costs
L-LndUse-Rec	264024.315889	6.061164	$134.00	$5,837,040.00	$35,379,260.00
L_LndUse-MF	324022.45817	7.438532	$84.00	$3,659,040.00	$27,217,886.00
L_LndUse-MF	499169.772579	11.459361	$84.00	$3,659,040.00	$41,930,260.00
L-LndUse-Park	531949.422224	12.211879	$16.00	$696,960.00	$8,511,191.00
L-LndUse-Lteind	197614.675802	4.536609	$60.00	$2,962,000.00	$13,437,790.00
L-LndUse-Ag	633282.103936	14.536157	$4.50	$196,020.00	$2,849,769.50
L-LndUse-FarmMarket	140447.533578	3.224232	$5.00	$217,800.00	$702,237.69
L-LndUse-ComGard	273022.602376	6.267736	$4.50	$196,020.02	$1,228,601.80
L_LndUse-MF	385820.948216	8.393502	$84.00	$3,659,040.00	$30,712,160.00
L_LndUse-SF	910717.093677	20.907188	$41.00	$1,785,959.90	$37,339,400.00
L-LndUse-Park	519796.841944	11.932894	$16.00	$696,960.00	$8,316,749.50

Figure 6.9: Cost Analysis Framework Concept 4. Produced by Author.

Expected Community Benefits Analysis

The community benefit analysis was used to investigate what was expected to be produced from the differing framework options. The community benefits used in this investigation include revenues from urban agricultural ventures, availability of open green space, creation of jobs, and housing.

The average annual revenues expected to be produced by urban agriculture were referenced from various literary resources. The expected annual revenues for the native plant nursery are expected to range from $40,000 per acre to $50,000 per acre (University of Kentucky Cooperative Extension Service 2004). Expected annual revenues from moderately intensive commercial urban agriculture were expected to range from $50,000 per acre to $75,000 per acre. The SPIN (Small Plot Intensive) community garden plots were expected to produce between $75,000 per and $120,000 per acre annually (Salle and Holland, 167-169).

Framework #3

Framework #3 provides the community with:

- approximately 24 acres of open park space adjacent to multi-family housing,
- 14.5 acres of commercial urban agriculture
- 6.25 acres of SPIN community gardens
- approximately 545 dwelling units of multi-family housing
- 165 dwelling units of single-family residences

Jobs are expected to be created from the proposed light industrial space, urban agricultural elements, community recreation center, and labor for park maintenance and management.

Framework #4

Framework #4 provides the community with:

- approximately 18.5 acres of park space adjacent to multi-family housing,
- 28 acres of commercial urban agriculture,
- 14.5 acres of SPIN community gardens
- an 8-acre native plant nursery
- and approximately 500 multi-family dwelling units

Based on the presence of more agricultural land use options in framework #4 it is expected that more labor and management jobs will be created. A similar amount of jobs between Frameworks #3 and #4 will be created from the proposed light industrial space, community recreation center, and labor for park maintenance and management.

Cost / Benefit Analysis

Based on the results from the construction cost and community benefit analyses it was determined that Framework #4 provides the most feasible option for development. This option was determined as the most feasible because its density matches well with what is present surrounding the study area. Framework #4 also provides the most immediate opportunity for job creation, the land uses transition well with the surrounding land uses, and because this plan has significantly lower expected construction costs.

Methodology

The development of the master plan is directly influenced by the two selected framework plans, the literature review, precedent studies, site analysis, and previous design experience. Since Framework #4 is seen as the most feasible concept it was used to influence most of the design decisions that were taken in the development of the master plan. Some ideas generated from Framework #3 were used to influence design decisions for the master plan, mainly the inclusion of single-family redevelopment to help expand housing options and to slightly increase density.

The design of the master plan seeks to directly address the dilemma, create productivity on the vacant land uses, and create a unified and cohesive design. The driving concepts are to **connect** existing and proposed development, to **provide** a sustained food source and economic resource, and to **integrate** the built environment with natural ecologies so as to connect, better provide for, and educate residents of North St. Louis City.

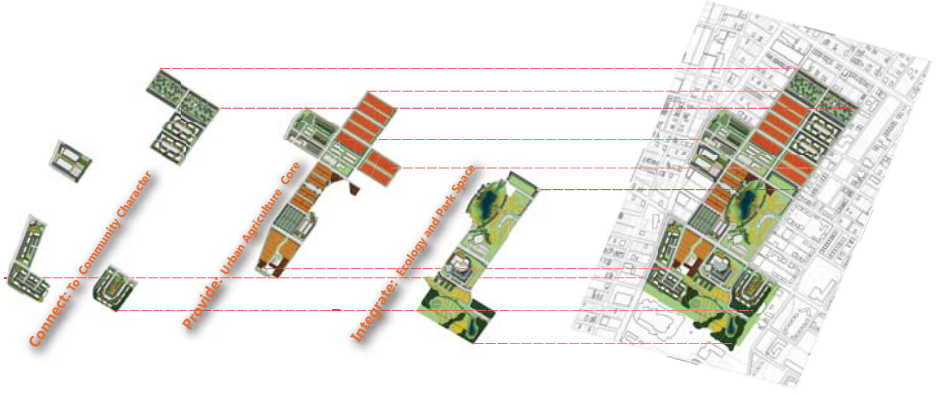


Figure 6.10: Driving Concepts Diagram. Produced by Author.

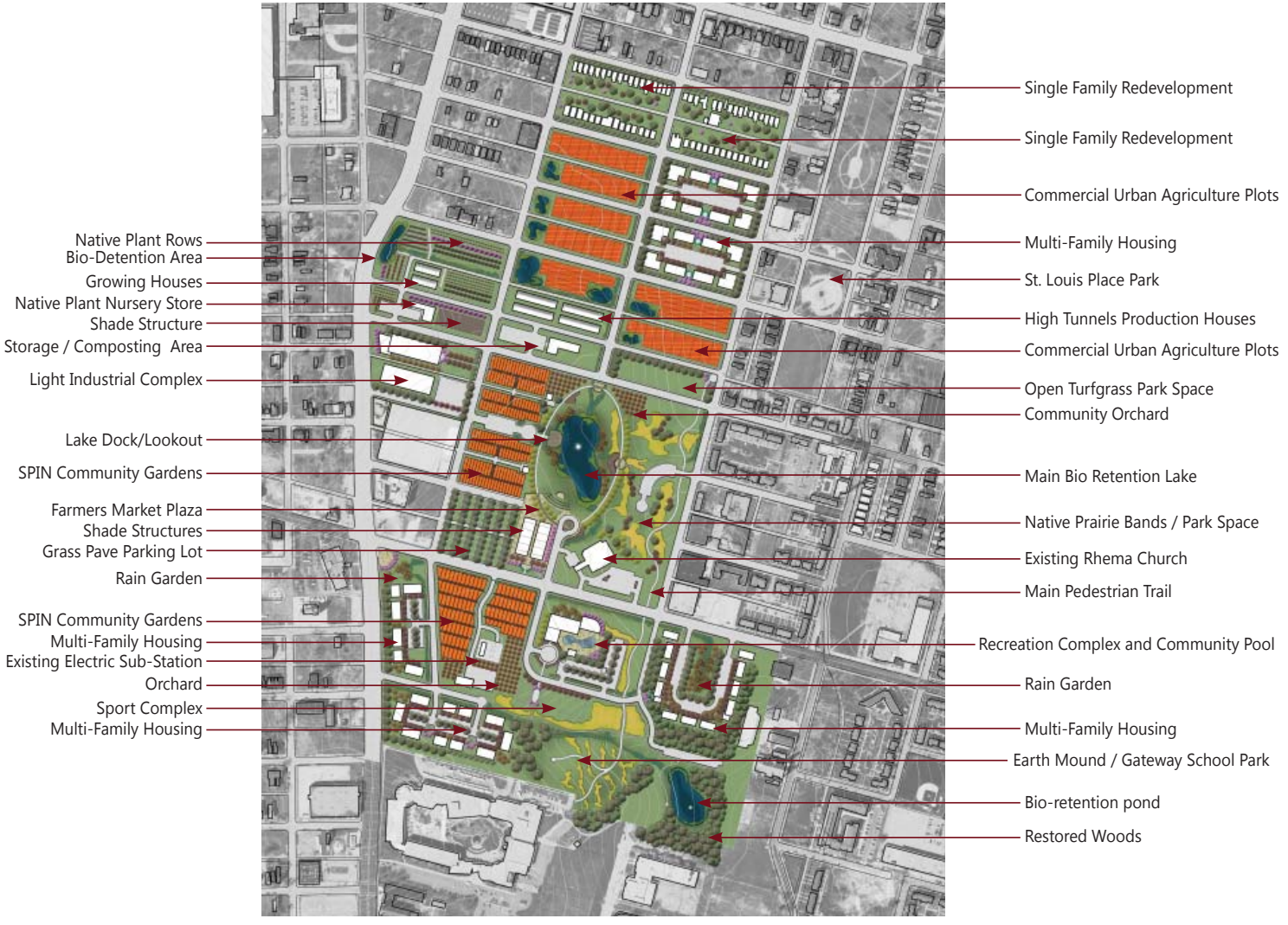


Figure 6.11: Final Master Plan. Produced by Author.

Figure 6.12: Aerial Site View From the Southeast. Produced by Author.

Figure 6.13: Aerial Site View From the Northeast. Produced by Author.

Connect

This concept seeks to connect the proposed development with existing development patterns in and surrounding the study area. In "Cities Back From the Edge: New Life For Downtown," Gratz explains the need for urban environments to recover from sprawl and broken community networks. He argues that communities should be "reborn" and not just "rebuilt" (Gratz 1998). This driving concept was utilized to connect to the existing character of the community, increasing walkability and reducing the need for single-occupancy automobile transportation, and creating activity nodes and strong access points into the community in order to facilitate a 'rebirth' of North St. Louis and the 5th Ward neighborhoods.

Connect: Community Cultural Characteristics

The master plan seeks to connect to the existing community by creating strong connections between adjacent land uses, matching densities of existing housing developments, and manifesting the character of historic architecture in new infrastructure. The density for housing was determined though analysis of the existing surrounding housing developments and by applying ideas from the St. Louis Great Streets Initiative.

It was determined that the appropriate density for single-family housing is 8 dwelling units per acre, and the density for multi-family housing is 20 dwelling units per acre (www.greatstreets-stl.org). The historic architecture present in the St. Louis City area can be preserved by retaining the existing buildings that display elegant historic architecture and that are in good structural condition.

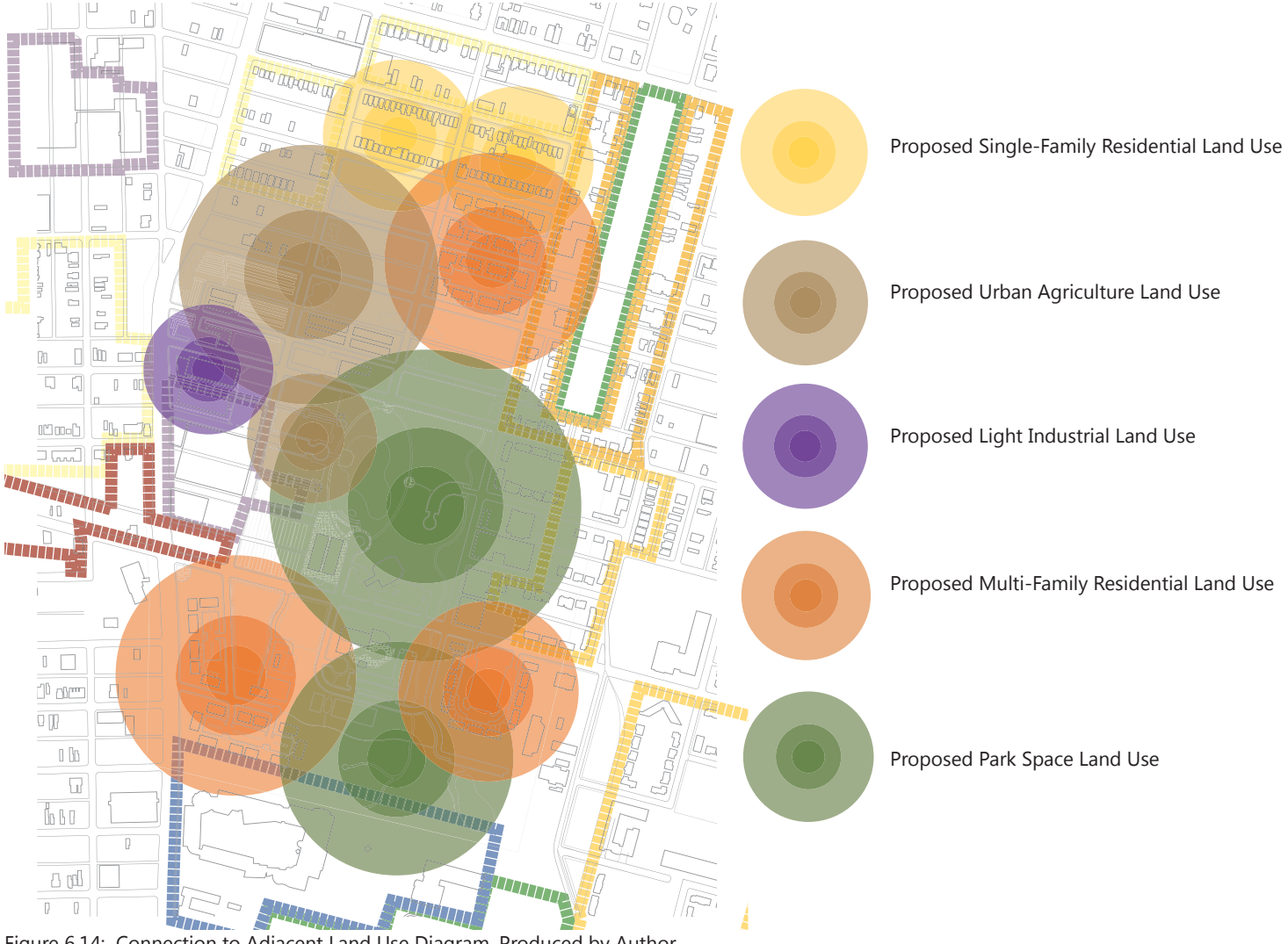


Figure 6.14: Connection to Adjacent Land Use Diagram. Produced by Author.

Connect: Community Circulation and Activity

The master plan includes a number of pedestrian circulation options that are used to increase the walkability of the study area. There are sidewalks along every major roadway and a 10-foot wide sidewalk connecting the major activity nodes on the site. The major roads shown in figure 6.17 were designed to provide sufficient vehicular access throughout the site. The graphic also shows the major intersections and vehicular entry points in the site. Figure 6.16 shows the designed pedestrian circulation for the study area. The major sidewalk connects three activity nodes, the linking point between St. Louis Place Park and the study area, the farmer's market, and Gateway School and park space.

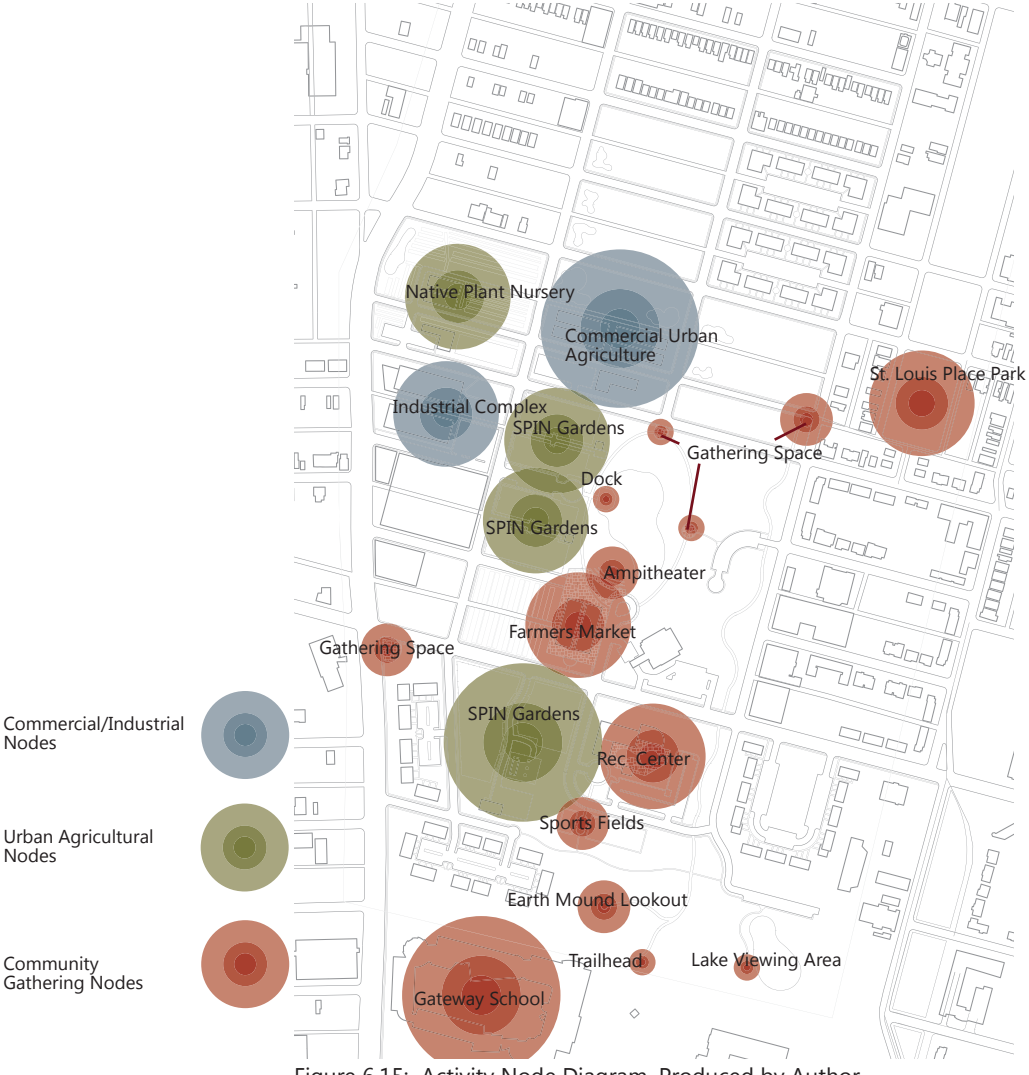


Figure 6.15: Activity Node Diagram. Produced by Author.

Figure 6.16: Pedestrian Circulation Diagram. Produced by Author.

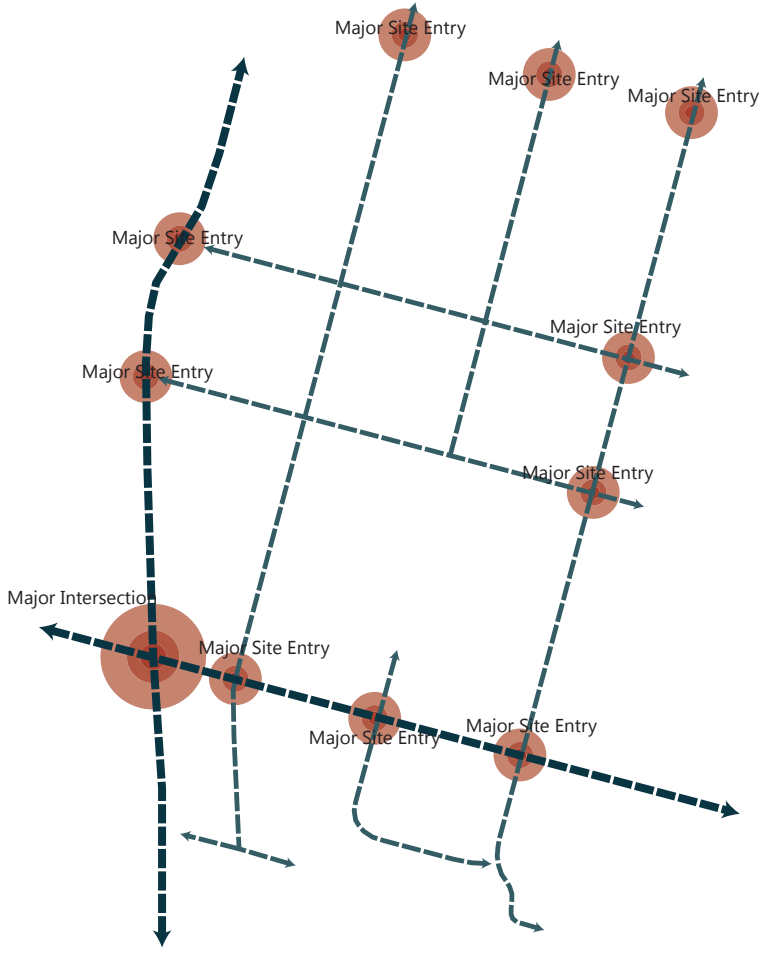


Figure 6.17: Vehicular Circulation Diagram. Produced by Author.

Provide

According to "Agricultural Urbanism" urban agriculture provides an economically sustainable resource for urban communities. This is because of the access to cheap land, the various niche markets within the city, easy access to water and organic waste, increased options for supplementary income, labor availability, and minimal capital costs (Salle and Holland 164).

The proposed master plan design provides an economically sustainable food and job labor source by creating intensive community gardens, commercial urban agriculture, community orchards, and a native plant nursery.

Figure 6.18 shows how various forms of urban agruculture will be used to increase community vitality. This dagram shows the physical and social inputs, the physical influences on the parcel, and the outputs which help to create increased community vitality.

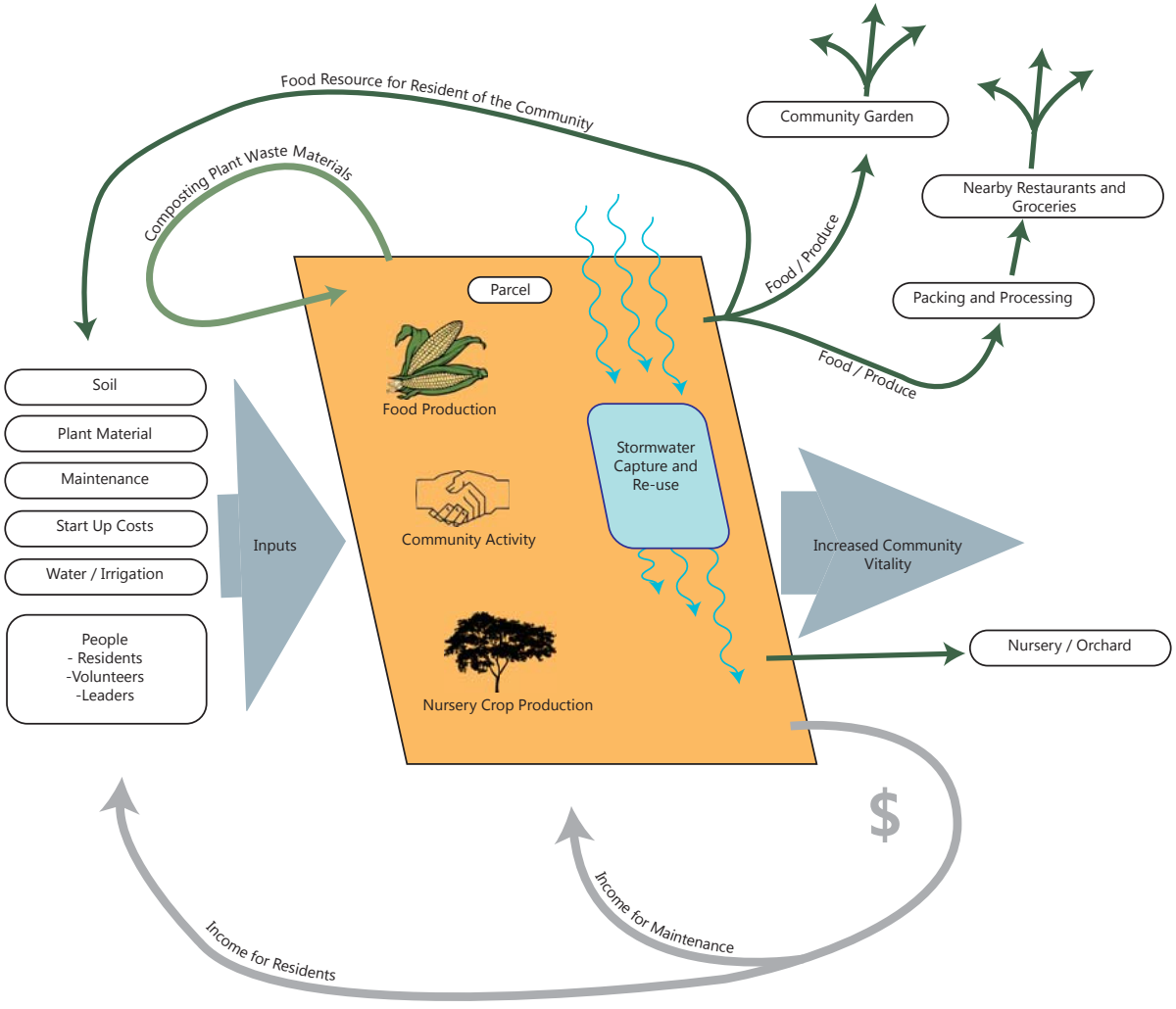


Figure 6.18: Urban Agriculture Flow Diagram. Produced by Author.

Provide: Intensive Community Gardens

The intensive community gardens and orchards are located on the site near the main activity node of the farmers market. The gardens are designed to be managed similar to a SPIN (Small Plot Intensive) farm maximizing the productivity of harvesting crops throughout the season. The SPIN method uses an intensive relay cropping method and strategic plantings. Relay cropping is achieved by planting varying crops within the same space at the same time. Usually one crop is started shortly before the harvest of the crop that is already present. The SPIN plots are designed to maximize the square footage of the garden space (Christensen 2007).

SPIN gardens are designed to be used and maintained by residents within the community (either living on site or nearby). The produce grown in these gardens can be used as a direct food source as well as a source of supplementary income.

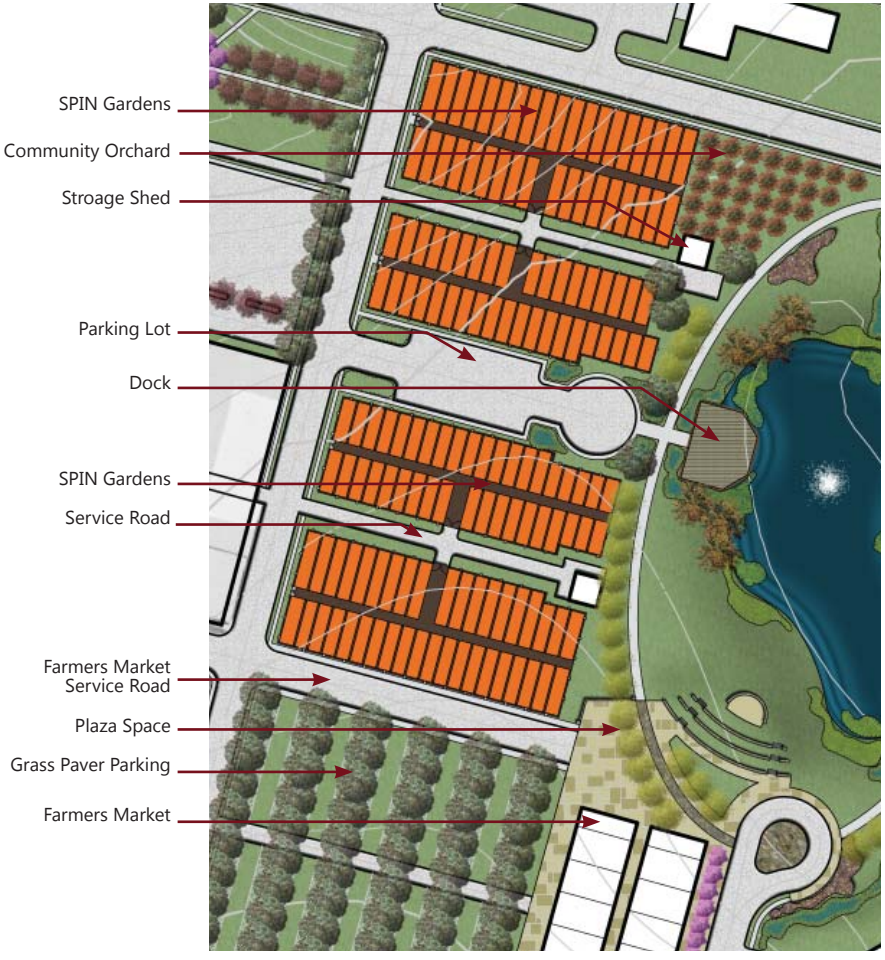


Figure 6.19: Intensive Community Garden Detail Plan. Produced by Author.

Figure 6.20: Intensive Community Garden Perspective. Produced by Author.

Provide: Commercial Urban Agriculture

The commercial urban agriculture plots are designed to use a Deep Bed Biodynamic Gardening system. This system employs deep raised beds, large amounts of compost, companion species planting, the use of pre-germinated seeds, and small undisturbed pathways between the raised beds. The idea behind this method is to more efficiently use the planting space to allow for closer plant spacing more productive yields.

This method employs raised planting beds which are double dug to at least 24" and heavily mixed with compost and soil to serve as the planting area. Between the planting areas are small pathways that are untreated due to the expected compaction from walking. The surfaces of the pathways will be covered with mulch to prevent weed growth. These plots are setup for commercial ownership due to the higher complexity of gardening method and labor requirements (Holland Barrs Planning Group 2002, 37).

Figure 6.21: Commercial Urban Agriculture Detail Plan. Produced by Author.

Figure 6.22: Commercial Urban Agriculture Perspective. Produced by Author.

Provide: Farmer's Market

The Farmer's Market serves as an organized staging area for residents and community garden participants to gather and sell and buy the produce that has been grown throughout the gardens. Farmer's markets have been shown to be very successful in generating revenues from community garden grown produce (De La Salle 2010, 168-170).

The market is located along a major transportation route, near the intersection of Cass and Jefferson avenues, in order to provide the maximum amount of visibility and accessibility. The Farmer's Market serves as the central activity node for the site, drawing users and business.

Figure 6.23: Farmers Market Detail Plan. Produced by Author.

Figure 6.24: Farmers Market Perspective. Produced by Author.

Provide: Native Plant Nursery

The native plant nursery is designed to provide the community with jobs, business, and a growing source for vegetation that is called for in the master plan. The native plant nursery includes container grown plant areas, in-ground planting beds, a retail nursery shop, a shade structure, and two greenhouses.

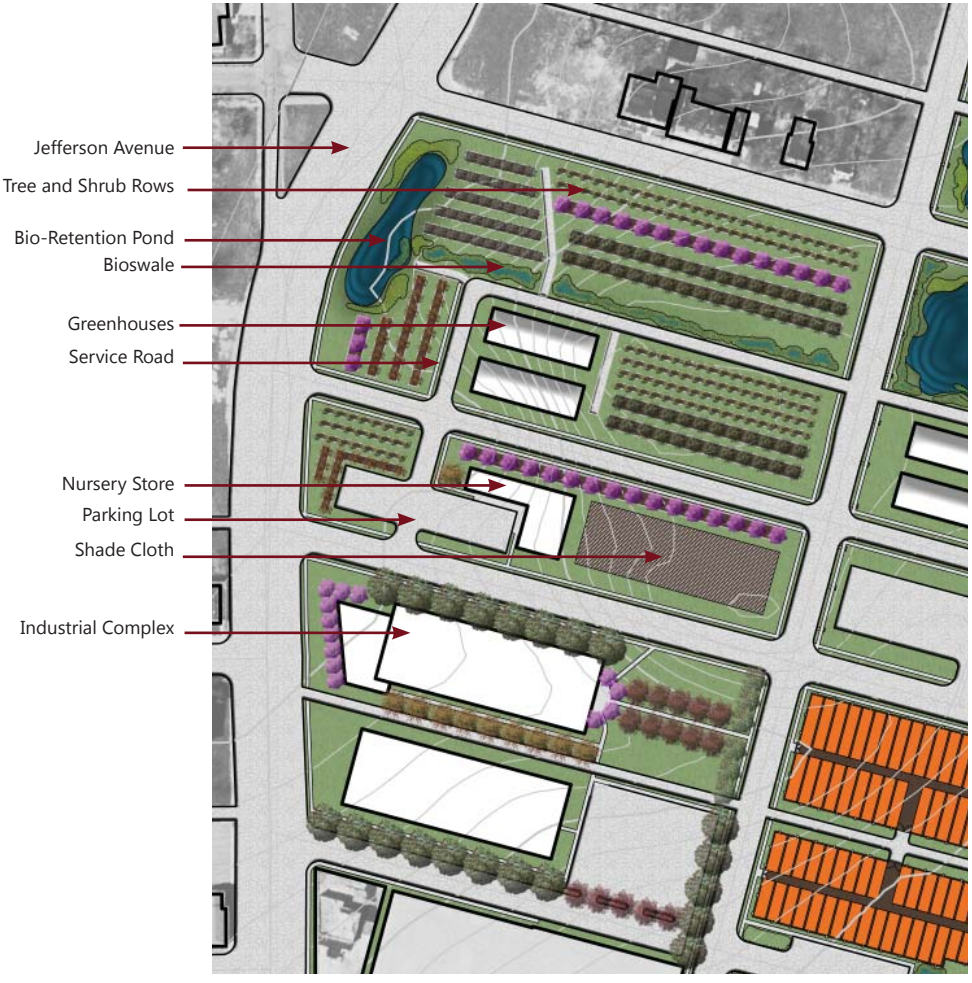


Figure 6.25: Native Plant Nursery Detail Plan. Produced by Author.

Figure 6.26: Native Plant Nursery Perspective. Produced by Author.

Food Production

The land area of the master plan urban agricultural elements were calculated, in order to quantify approximately how much food could be produced from the community gardens, commercial urban agriculture, and community orchards. The land areas were then multiplied by average production numbers synthesized from various sources in the literature review.

The Food Yield Table (Figure 6.28) shows the breakdown of how much quantity of food can be produced and the number of people that can be fed per year based on a 350 pounds per person per years diet of fruits and vegetables (Holland Barrs Planning Group 2002, 37). The results show that the urban agriculture on site has potential to produce approximately 635 tons of fruits and vegetables, which is enough to feed 3600 of the 12000 residents of the 5th Ward annually.

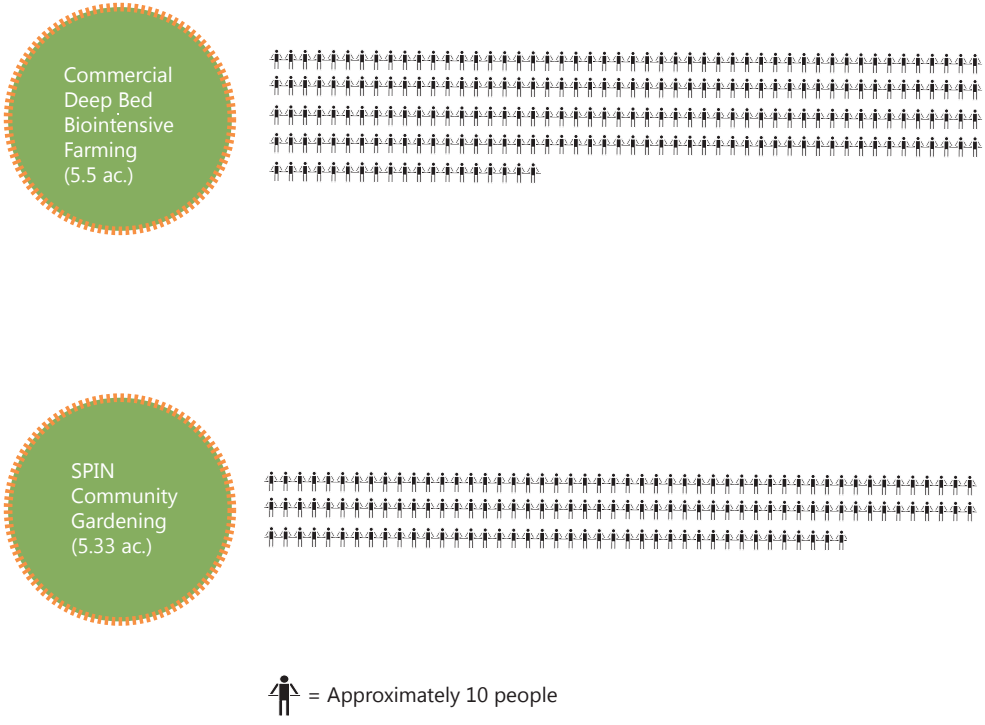


Figure 6.27: Food Yield Diagram. Produced by Author.

Method	Average Vegetable Consumption (lbs./ year)	Annual Yield (lbs./acre)	Acres required to Feed 10,000 people per year	Acres Required to Feed the 5th Ward (12,000)	People Fed Annually Per Acre
Orchard	350	5,000	700.0	829.2	14
SPIN Gardening	350	92,825	37.7	44.7	265
Deep Bed Biointensive	350	139,240	25.1	29.8	398
Hydroponic Greenhouse	350	339,170	10.3	12.2	969

Master Plan Plots	Acerage	Annual Yield (lbs./acre)	Total Annual Yield (lbs.)	Total Annual Yield (lbs.)	People Fed Annually
Orchard	1.7	5,000	4.2	8,400.0	24
SPIN Gardening	5.3	92,825	246.9	493,829.0	1,411
Deep Bed Biointensive	5.5	139,240	383.6	767,212.4	2,192
Hydroponic Greenhouse	0.0	339,170	0.0	0.0	0
Totals	12.5	576,235.0	634.7	1,269,441.4	3,627.0

Figure 6.28: Food Yield Table. Adapted From (Holland Barrs Planning Group, 2002)

Food Distribution

The distribution of the food was also studied in this report. In order to determine the distribution patterns of the food produced on site several market were delineated. The market are as follows:

Charitable Distribution

- Food provided to homeless and residents in need and nearby shelters within the community.

Inner Neighborhood Residents (less than half a mile)

- Residents that are a part of the community garden program receive a food source.
- Food comes at a reduced rate.
- Within 10 minute walking distance.

Outer Neighborhood Residents (up to 1 mile)

- Residents on the outside edge of the neighborhood
- 10 to 20 minute walking distance.

Neighborhood Commercial Market (about 1 mile)

- This range supplies to commercial markets and restaurants of the Old North St. Louis and Downtown West Area.

Niche Restaurant / Downtown Market (between 1 and 2 miles)

- Outside optimum walking range.
- Caters to a niche market of the Downtown restaurants.

Visitor / Non-Residents (varies)

- Visitors from other parts of the city as well

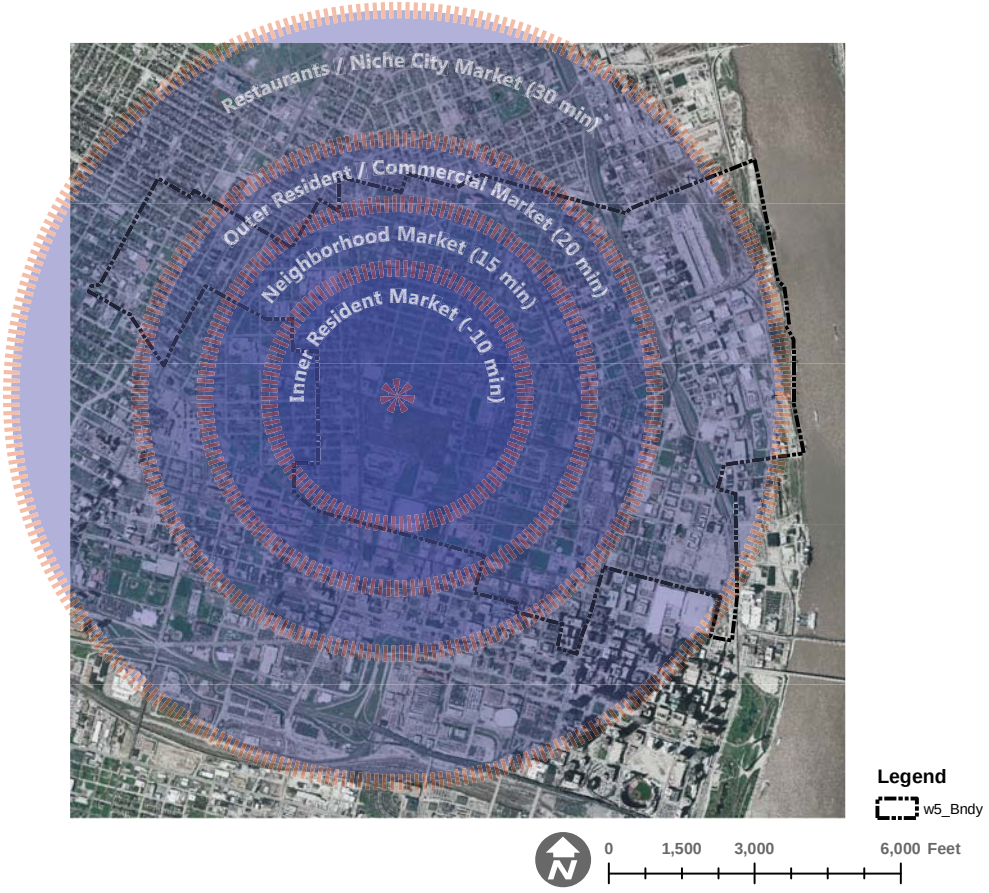


Figure 6.29: Food Distribution Diagram. Produced by Author

Integrate and Educate

Environmental stewardship and the integration of nature within the urban setting is not a new concept nor should it be ignored. In 'Design With Nature', Ian McHarg indicates that nature used for 'green purposes' such as agriculture and recreation are as intrinsically suitable for the metropolis as they are for the green belts that lie outside the boundaries of the city (McHarg 1969, 56). This is the reasoning for the transformation of large portions of the study area into spaces for ecological, agricultural, and recreational purposes. This important conceptual idea is used to integrate the urban infrastructure of the site with natural ecological design and processes.

The integration of natural ecologies is supported by the master plan presented through a water filtering hydrologic network, incorporation of native plant species, and the transformation of environmentally disturbed urban parcels into naturalized open spaces (to support recreational and educational activities within the community). This landscape transformation will provide a natural community amenity for the 5th Ward as well as neighboring communities.

Integrate: Naturalized Recreation Space

The naturalized open park space is designed to incorporate natural ecological processes with human recreational activities. This idea is enforced by using native vegetation to shape spaces, providing access to view the hydrologic system, creating activities within the park space, and incorporating educational signage to inform users about natural processes.

Activities within the park space are further expanded through the incorporation of a community recreation center. This facility provides a pool, sports fields, exercise areas, and mentorship and other community programs.

The diagram to the right (Figure 6.30) shows the various integrated parks elements by themed functionality.

Figure 6.30: Park Space Functionality Diagram. Produced by Author

Figure 6.31: Perspective View of Park Trail Network. Produced by Author

Figure 6.32: Perspective View of Central Lake Park Space. Produced by Author.

Figure 6.33: Section View Central Lake Dock. Produced by Author.

Integrate: Hydrologic Network

Water that is collected on site via rainwater could serve as a valuable resource to the agricultural processes of the proposed master plan and the ecological processes of the natural park space. The hydrologic network was designed to direct, filter, cleanse, and store stormwater for reuse around the site and to infiltrate back into natural water networks.

Figure 6.34 shows a diagram of the proposed hydroloic network. The network is composed of a system of major bioswales and bio-retention ponds. The major bioswales are fed by auxillary bioswales and sheet drainage. After the water is fed into the major bioswales it is directed into the bio-retention systems. The bio-retention systems are designed to allow inflow of runoff water as well as seepage from groundwater (Tourbier 1992, 33).

In order to ensure the appropriate sizing of the bio-retention features, watershed calculations were performed to provide accurate estimates. The method used to size the ponds was the rational method, sizing for a ten-year storm event. The watershed calculations can be viewed in the appendix. The watershed calculations show that the the bio-retention systems have the capacity to handle ten-year storm event runoff from their feeding watersheds.

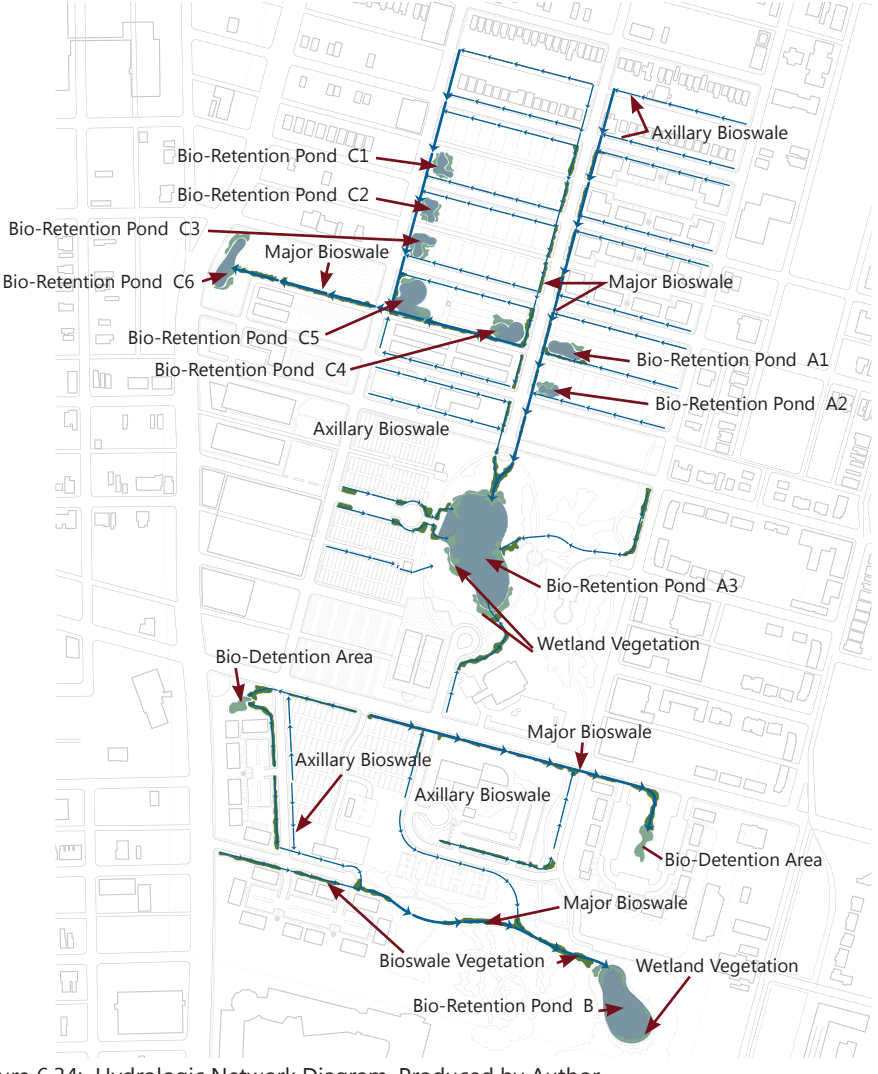


Figure 6.34: Hydrologic Network Diagram. Produced by Author

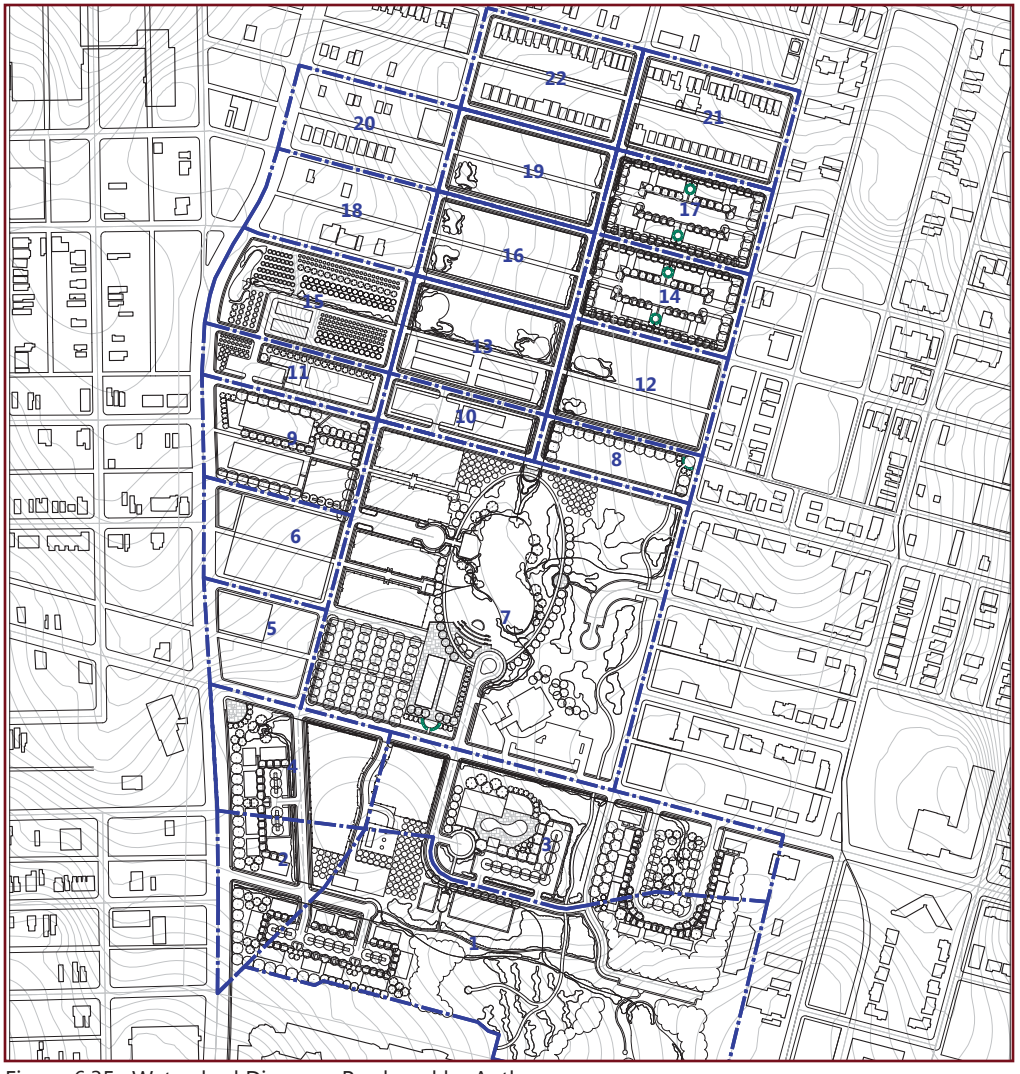


Figure 6.35: Watershed Diagram. Produced by Author

Project: Closing the Gap
Location: St. Louis, MO

Watershed Totals

Watershed	Area (ac.)	Area Adj. (ac.)	in/24hr in 10yr storm event	Ac-in(10yr)	Ac-ft(10yr)
1	21.05	8.26	5	41.30	3.44
2	3.99	2.16	5	10.80	0.90
3	11.72	6.37	5	31.85	2.65
4	5.17	2.74	5	13.70	1.14
7	26.65	11.86	5	59.30	4.94
8	2.83	1.05	5	5.25	0.44
9	4.57	2.75	5	13.75	1.15
10	2.16	1.34	5	6.70	0.56
11	2.55	1.47	5	7.35	0.61
12	4.52	1.93	5	9.65	0.80
13	4.55	2.11	5	10.55	0.88
14	3.88	2.37	5	11.85	0.99
15	5.29	2.4	5	12.00	1.00
16	2.83	1.76	5	8.80	0.73
17	3.88	2.37	5	11.85	0.99
19	3.87	1.75	5	8.75	0.73
21	4.6	2.31	5	11.55	0.96
Total System	**114.11**	**55**		**275.00**	**22.92**

Retention Pond Volumes

Pond Systems	Volume (ft.)	Volume (ac. Ft.)
A	351549	9.67
B	190723	4.64
C	103609	2.38
Total	**645881**	**16.69**

Figure 6.37: Watershed Chart. Produced by Author

Stormwater Management

Along the route through the bioswale network the water is filtered and cleansed by native vegetation suitable for bioswales. The species most suitable for this purpose are listed on page 131. The water is further treated in the bio-retention ponds by various emergent and submergent wetland species.

Bio-Retention system A is used to collect rain water from the central core of the site for reuse in the SPIN gardens and to provide a recreational amenity for park space.

Bio-Retention system B is used to collect rainwater on the southern site development and to serve as a recreational and ecological amenity.

Bio-Retention system C is broken into smaller localized ponds to collect water directly from the urban agricultural areas for reuse.

The detail plan to the right shows the basic components of the bio-retention ponds. Pond A3 is used as an example. "Lakes and Ponds" from the Urban Land Institute was used as a design guideline for safety issues, plant species, and ecological processes (Tourbier 1992).

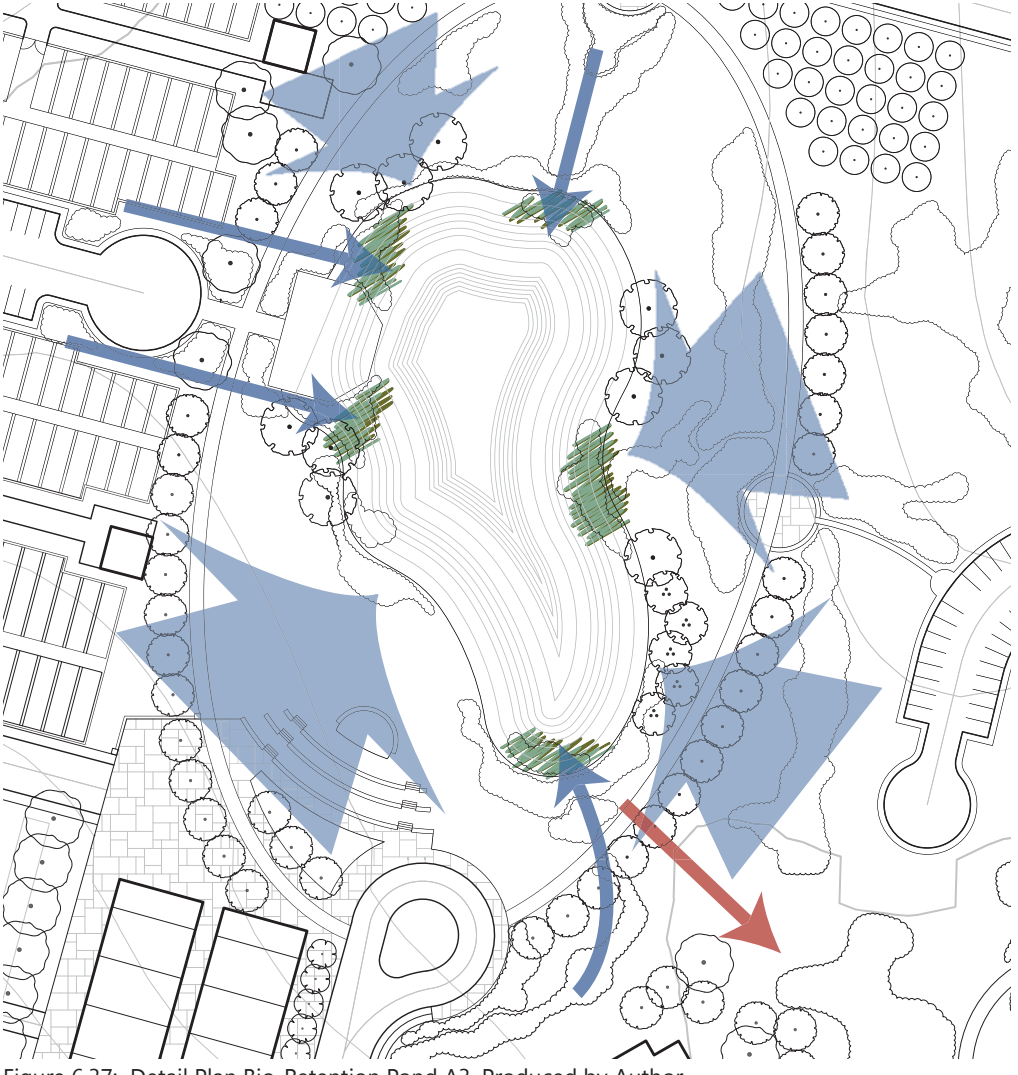


Figure 6.37: Detail Plan Bio-Retention Pond A3. Produced by Author

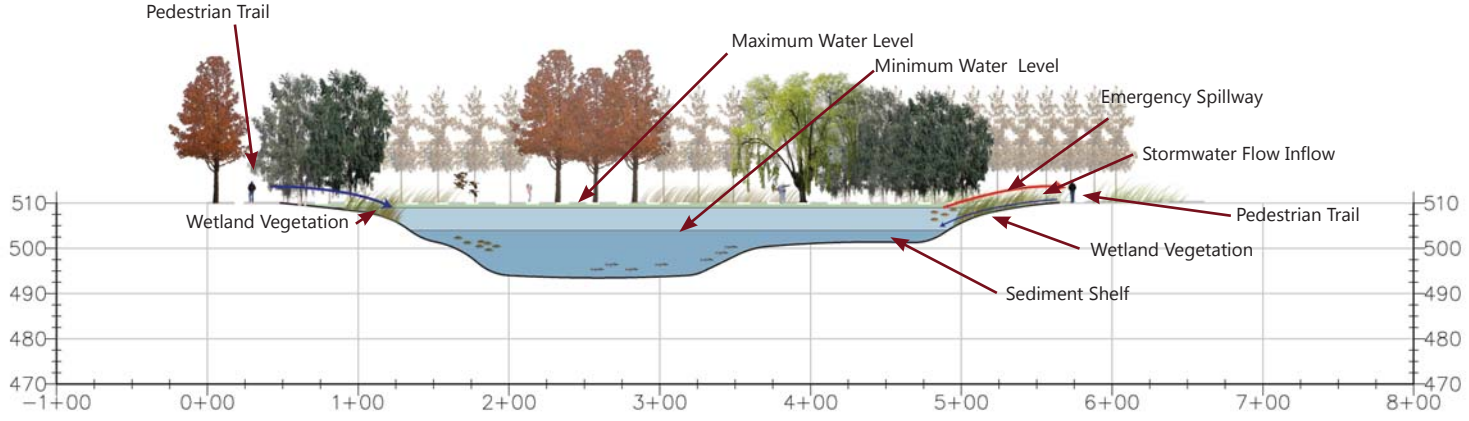


Figure 6.38: Bio-Retention Pond A3 Section. Produced by Author

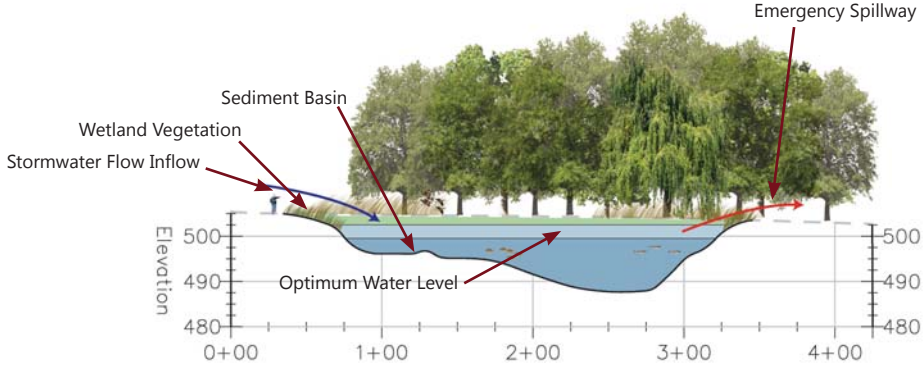


Figure 6.39: Bio-Retention Pond B Section. Produced by Author

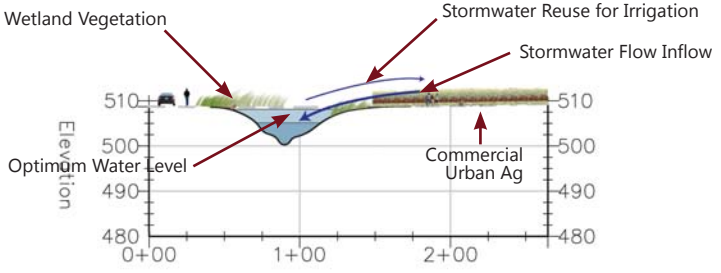


Figure 6.40: Bio-Retention Pond C5 Section. Produced by Author

Native Vegetation

The proposed vegetation on site is designed to be composed almost completely of plant species native to the Midwest United States. The appropriate hardiness zone for plantings has been identified in the climate portion of the site inventory and analysis, and was used to determine the species of plants that were used for differing design purposes.

This master plan designates different types and zones of plantings for different functional and aesthetic purposes. The zones are listed below:

Native Shade Trees
- Function in filtering air and water
- Provide shade
- Reduce heat island effect
- Reduce energy needed for building heating and cooling
- Provide aesthetic appeal

Ornamental Trees and Shrubs
- Provide aesthetic borders and plantings
- Create and define gathering and parkland spaces
- Provides food for small animals such as birds

Native Prairie Grass and Flower Mix
- Reduce the amount of regularly mown turfgrass
- Facilitate in the process of CO2 exchange with O2
- Define spaces and pathways throughout the open park space
- Provides aesthetic appeal

Bioswale Plant Species
- Provide low maintenance grasses and sedges that do not block views of those driving vehicles
- Filters stormwater from roadways

Wetland and Wet Marsh Plant Species
- Provide an aesthetic border to the bio-retention areas
- Habitat for aquatic fauna
- Help in the filtration and cleansing of stormwater runoff (treated first in bioswales to create an integrated stormwater treatment train)

Ornamental Native Trees

Winter
- American Holly - Ilex opaca
- River Birch - Betula nigra
- Sycamore - Platanus occidentalis
- Washington Hawthorn - Crataegus phaenopyrum

Spring
- Downy Hawthorn - Crataegus mollis
- Eastern Redbud - Cercis canadensis
- Flowering Dogwood - Cornus florida
- Ohio Buckeye - Aesculus glabra
- American Basswood - Tilia americana

Summer
- Fringetree - Chionanthus virginicus
- Tulip Poplar - Lirondendron tulipifera
- Yellowood - Cladrastis kentukea

Fall
- Sugar Maple – Acer saccharum
- Black Gum - Nyssa sylvatica
- Sassafras - Sassafras albidum
- Red Oak – Quercus rubra
- Persimmon - Diospyros virginiana
- Sweet Gum - Liquidambar styraciflua

Native Shade Trees
- White Oak - Quercus alba
- Shagbark Hickory - Carya ovata
- Pin Oak - Quercus palustris
- Bur Oak - Quercus macrocarpa
- Shingle Oak - Quercus imbricaria
- Willow Oak - Quercus phellos
- Hackberry - Celtis occidentalis
- Kentucky Coffeetree - Gymnocladus dioicus
- Red Maple – Acer rubrum

Ornamental Native shrubs

Winter

- Black Chokeberry - Aronia melanocarpa
- Deciduous Holly - Ilex decidua
- Winterberry Holly - Ilex verticillata
- Vernal Witchhazel - Hamamelis vernalis

Spring

- Black Haw - Viburnum prunifolium
- Spicebush - Lindera benzoin
- Golden Currant - Ribes odoratum
- Arrowwood - Viburnum dentatum
- Roseshell Azalea - Rhododendron prinophyllum
- Serviceberry - Amelanchier arborea
- Virginia Sweetspire - Itea virginica

Summer

- American Beautyberry - Callicarpa americana
- Ninebark - Physocarpus opulifolius
- Shrubby St. John's Wort - Hypericum prolificum
- Wild Hydrangea - Hydrangea arborescens

Fall

- American Filbert - Corylus americana
- Fragrant Sumac - Rhus aromatica
- Smooth Sumac – Rhus glabra
- Virginia Sweetspire - Itea virginica

Wetland and Marsh Species

Emergent Species

- Broadleaf Cattail - Typha latifolia
- American Water-Willow - Justicia Americana
- Common Reed - Phragmites australis
- Mississippi Buttercup - Ranunculus amplexicaulis
- Kansas Arrowhead - Sagittaria ambigua

Floating Species

- Watershield - Brasenia schreberi
- Common Duckweed - Lemna minor
- American Lotus - Nelumbo lutea
- Yellow Pond-lily - Nuphar lutea

Submerged Species

- Coon's Tail – Ceratophyllum demersum
- Western Waterweed - Elodea nuttallii
- Cutleaf Watermilfoil - Myriophyllum pinnatum
- Largeleaf Pondweed - Potamogeton amplifolius

Bioswale Species

- Bottlebrush Sedge - Carex lurida
- Brown Fox Sedge - Carex vulpinoidea
- Virginia Wild Rye - Elymus virginicus
- Common Rush - Juncus effusus
- Torrey's Rush - Juncus torreyi
- Rice Cut Grass - Leersia oryzoides
- Dark Green Rush - Scirpus atrovirens
- Wool Grass - Scirpus cyperinus
- Great Bullrush - Scirpus validus
- Swamp Milkweed - Asclepias incarnata
- Blue Flag - Iris virginica
- Sweet Black-Eyed Susan - Rudbekia subtomentosa

Native Grass and Flower Areas

- Big Blue Stem - Andropogan gerardii
- Indian Grass - Sorghastrum nutans
- Switch Grass - Panicum virgatum
- Little Blue Stem - Schizachyrium scoparium
- Sid- Oats Grama - Bouteloua curtipendula
- Canadian Wild Rye - Elymus canadensis
- Butterfly Weed - Asclepias tuberosa
- Heath Aster - Aster ericodes
- Prairie Coreopsis - Coreopsis palmata
- Purple Coneflower - Echinacea purpurea
- Round-Headed Bush Clover - Lespedeza capitata
- Prairie Blazing Star - Liatris pycnostachya
- Wild Lupine - Lupinus perennis
- Wild Bergamot - Monarda fistulosa
- Black-Eyed Susan - Rudbeckia hirta
- Showy Goldenrod - Solidago speciosa

Overall Phasing

Due to the large scale of the master plan and the scare funding resources present within the community, it will be necessary to phase the implementation of this project.

The project is phase to start with the implementation of program elements with low construction costs and high community involvement. The intial phases include the development of the community gardens. The community gardens will be used as a source for generating community support and involvement.

The phases following the development of the community gardens include the implementation of program elements that require more captial investment such as, single-family redevelopment, multi-family housing, light indusrtial buildings, and a community recreation center.

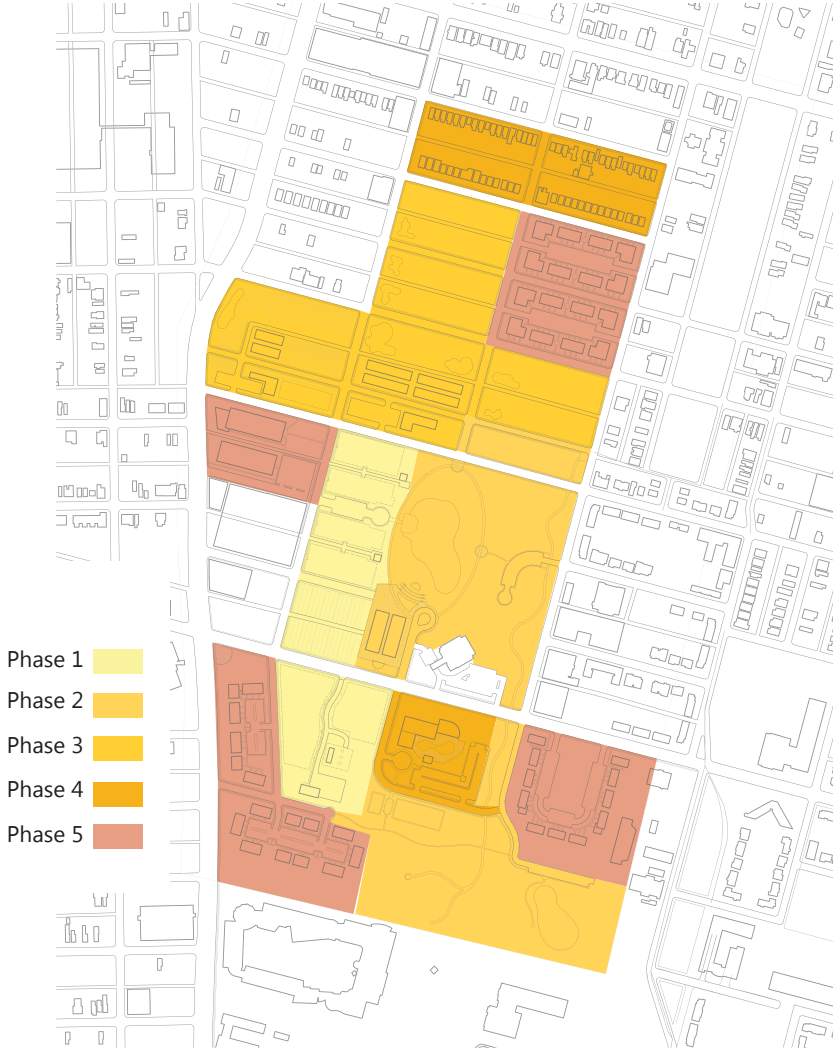


Figure 6.41: Overall Phasing Diagram. Produced by Author

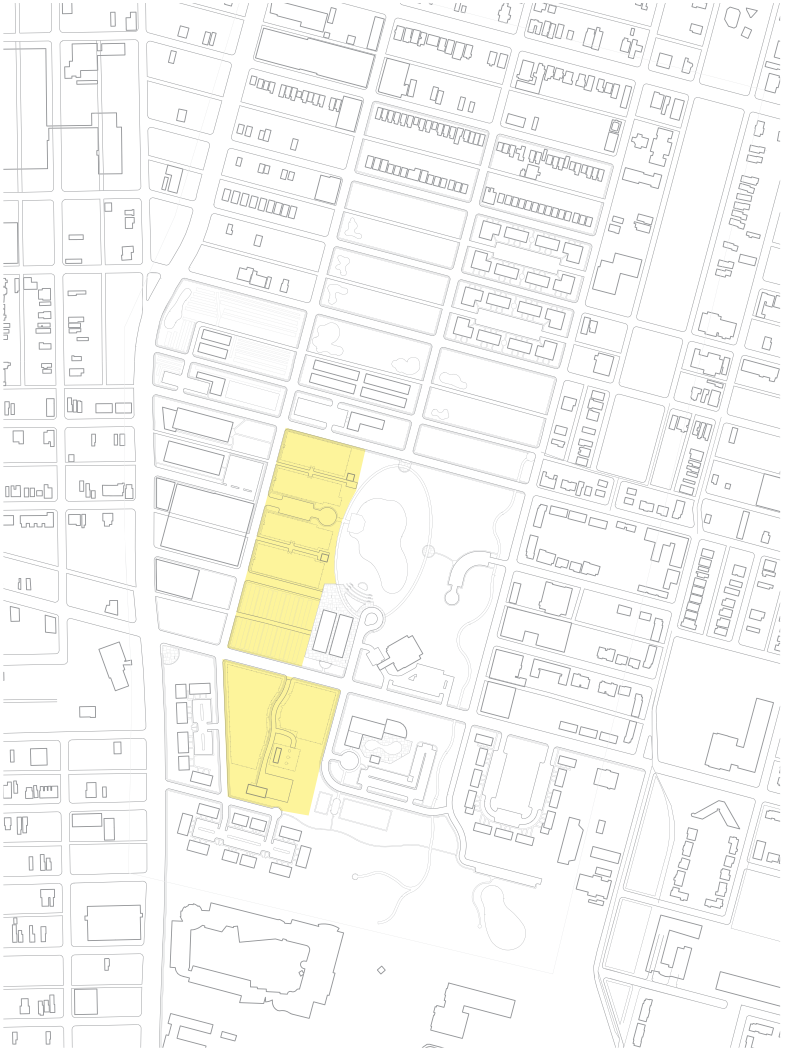


Figure 6.42: Phase 1 Diagram. Produced by Author

Phase 1

1. Development of small plot intensive community gardens

2. Includes clearing of any structure and debris

3. Includes extensive soil work
   - Areas that will serve as plots should be cleared of underground debris
   - Plots space will have an average soil depth of 24 inches
   - Plots will be graded to comply with proposed hydrology plan

4. Includes amenities such as storage space, fencing, water taps for irrigation, and grass pave parking lot

Phase 2

1. Develop park spaces and Farmer's Market

2. Clear unwanted structures, roadways, and debris within designated areas

3. Begin setup of hydrology network for entire site area
   - Bio-retention pond creation
   - Grading to setup hydrology network
   - Additional grading to begin at core farmer's market area and expand out to areas designated in later phases

4. Construct trail systems, farmer's market, pond deck, sports fieldsn and parking

5. Plant vegetation
   - Surface cover for graded areas
   - Native planting areas
   - Planting of tree and shrub species

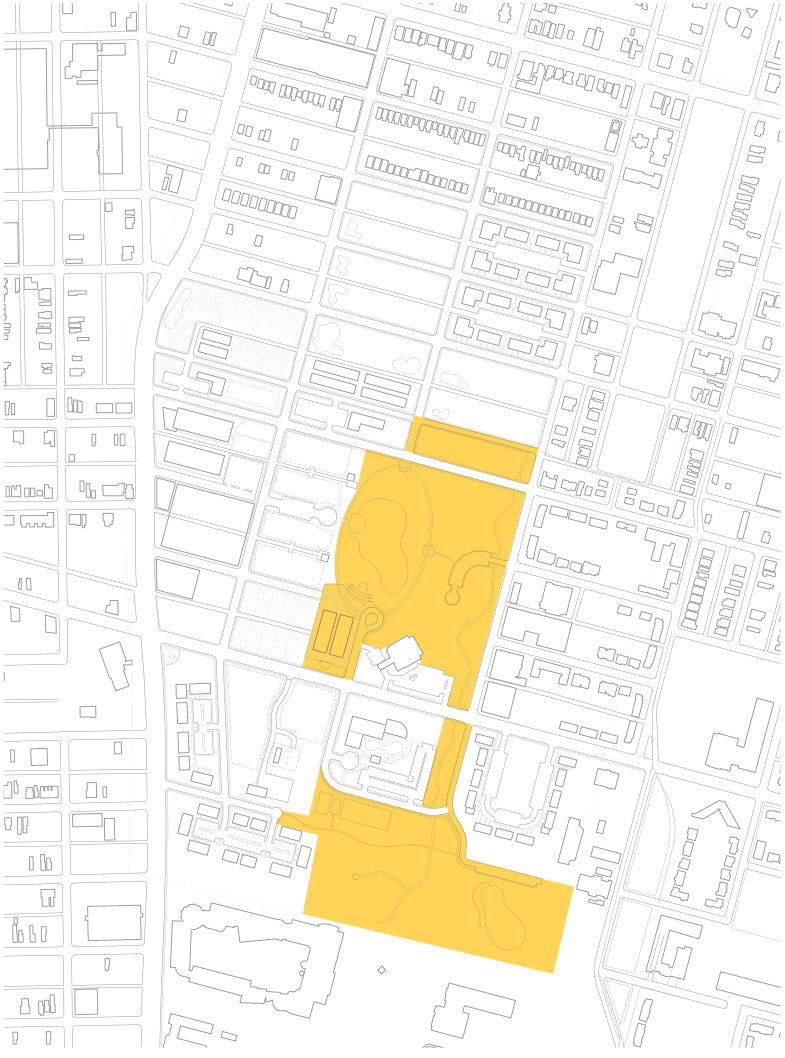


Figure 6.43: Phase 2 Diagram. Produced by Author.

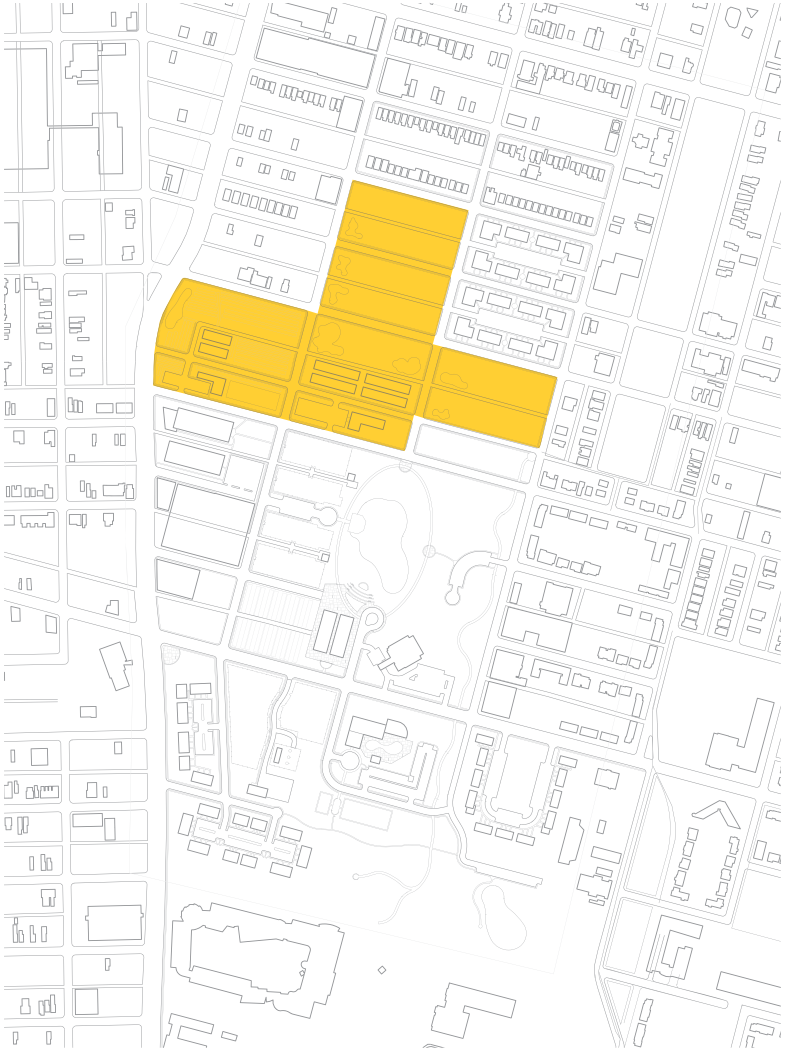


Figure 6.44: Phase 3 Diagram. Produced by Author.

Phase 3

1. Development of commercial urban agriculture areas.

2. Clear of unwanted structures and debris.

3. Continue grading for proposed hydrology network.

4. Begin phyto-remediation of commercial agricultural plots.

5. Install of high tunnels, composting area, and storage facility.

6. Construct native plant nursery.
   - Nursery store and parking lot
   - Shade structure
   - Planting rows
   - Greenhouses

7. Complete of phyto-remediation of commercial urban agriculture areas and initiation of commercial urban agriculture plantings.

Phase 4

1. Begin single-family residential redevelopment.

2. Begin construction of recreation center complex.
   - Site grading
   - Building and parking lot
   - Swimming pool

Figure 6.45: Phase 4 Diagram. Produced by Author.

Figure 6.46: Phase 5 Diagram. Produced by Author.

Phase 5

1. Development of multi-family housing and light industrial area.

2. Integration of street tree program.

Conclusion

CONCLUDING THOUGHT

Project Findings

This masters design project has served as an investigative report on the existing conditions of the 5th Ward Neighborhood and a strategic document to show how the impoverished areas near to the Former Pruitt Igoe Site and the adjacent St. Louis Place Neighborhood can be revitalized so as to invite local residents to play key roles in the community's renewal and economic development.

As stated in the introduction and uncovered through the community analysis portion of this report, it can be concluded that the 5th Ward community has been inundated by very challenging social and economic issues for decades. These issues include high levels of poverty, a lack of nutritious food sources, lack of education opportunities, a lack of employment opportunities, and elevated crime rates.

The master plan created for this project has the potential to catalyze positive changes to economic and social conditions within the 5th Ward. Through the precedent studies, it has been shown that similar communities are benefited from similar development strategies.

This project shows that different design solutions and technical analyses can be used to transform the large tracts of vacant land present within the 5th Ward into productive spaces that support urban agriculture, parks and recreation space, integrated stormwater management, and natural remediation, and place-based economic development. As a result, the community fabric can be renewed to create an area of North St. Louis that flourishes with human activity.

Limitations and Further Research

This project has been limited due to time constraints and lack of access to local expertise which have constrained research and design exploration. The complexity of the sociopolitical context for the existing site and community conditions have not been completely addressed and would need careful attention at the street level to understand how ideas shared in the master plan can actually be implemented. The content in this report can be seen as an update to the ongoing progress of the community and an informed perspective view on future visions for the community. This report should be seen as a tool to community planners, officials, and residents as a potential solution to some, but not all, of the most important problems that seem to face 5th Ward community members.

Although the project has shown to be successful in many aspects related to the thesis, certain limitations regarding implementation of the proposed master plan were discovered during the process of this educational exercise. Potential barriers to implementation of the proposed master plan could be limited community involvement, a lack of government official support, a lack of strong leadership to drive the plan, limited community funding and resources, unforeseen site conditions such as brownfield and related site contamination issues, and unexpected fluctuation in surrounding housing and business markets.

The limitations listed above situate this report as a beginning document that requires further community investigation, but also provides vision for sustainable community developments over both the short- and long-term.

Strategy For a Community Supported Revitalization

As listed previously one of the most limiting factors that could inhibit the success of this proposed master plan is the support of the community. Community support is necessary to provide labor resources and leadership. What methods could be used to obtain a solid foundation of community support?

Approximately 87 percent the land and buildings in the 5th Ward are not owner occupied. As seen from the community analysis much of the land in neighborhoods like St. Louis Place are composed of vacant lots. Many of these vacant lots are owned by governmental organizations such as the Land Re-utilization Authority and Land Clearance Redevelopment Authority (stlcin.missouri.org 2011).

What if--in return for supporting the agenda of the community, providing labor support to the various agricultural and community labor needs, and contributing to an improved social network--supporters were given rights of ownership to land within the community?

The potential of land ownership at no cost except labor and community involvement could help to instill community pride. A tight-knit community that is actively involved in collective efforts of revitalization would serve as the strongest tool in reversing the negative socioeconomic issues present.

Thoughts for the Future of the 5th Ward

Due to the location near Downtown St. Louis, the future of the 5th Ward will be largely influenced by the developments of more dense surrounding areas. This master plan was designed to be flexible given the unforeseen future of the 5th Ward. The housing options presented in this plan may vary based on the determined market demand at the time of implementation, and housing types, locations and numbers can be changed accordingly.

The urban agricultural core and remediated natural open space is designed to serve as an immediate and long-term amenity to the community. The green spaces recommended in this plan are envisioned to grow into a sustainable source for healthy food and regenerative stormwater management for the community and surrounding neighborhoods and communities. As the community of the 5th Ward evolves around the network of green spaces that has been provided, the site could potentially become part of a metro-regional network of open natural space that services the entire area of St. Louis City.

In conclusion, this report argues that simple modifications of vacant land into productively used urban spaces can catalyze a community that thrives with human activity and reconnects with the urban fabric of the St. Louis City.

Appendix A

GLOSSARY

Best Management Practices (BMPs): Structures or activities that help protect the environment. A more straightforward name might be environmental management practices. (Balmori and Benoit 2007, 205)

Bioretention Areas: Sloped Surfaces or depressions covered with soil and vegetation that slow and absorb rainwater runoff, filtering out pollutants. (Balmori and Benoit 2007, 205)

Brownfield: The U.S. Environmental Protection Agency (EPA) defines a brownfield site as property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. (Balmori and Benoit 2007, 206)

Carbon Neutral: The implementation of designs that create a neutral balance between the emission of carbon and the sequestering of carbon. Carbon neutral designs will reduce the ecological impact of human developments. Carbon neutrality can be achieved by using renewable energy sources and planting vegetation to sequester carbon. (Yudelson 2007, 41)

Charette: An intensive design exercise, in which project participants work together for a day or more until a design has been worked out or at least until areas for further study are clearly assigned to each participant. Charettes can be used to gather a large amount of ideas from various perspectives, which can then be organized and evaluated to draw synergies between ideas. (Yudelson 2007, 46)

Ecological Footprint: A measure of the amount of the planet's resources is needed to sustain human life. Ecological footprint is effected by resource consumption, resource availability, and pollutants. According to the Global Footprint Network, humanity's ecological footprint is 23% larger than what the planet can regenerate. (Yudelson 2007, 66)

Energy Conservation: Using design strategies to conserve the natural resources that are available. Strategies include best management practices, implementation of renewable energy sources, and localized material selection. (Yudelson 2007, 69)

Historic Preservation: Reusing and renovating old buildings for extended future use, opposed to complete demolition and rebuilding. Historic preservation helps to create a sense of place by keeping remnants of the sites historical context. (Yudelson 2007, 86)

Hydrology: The study of the occurrence, properties, and movement of water on and beneath the surface of the earth, (Balmori and Benoit 2007, 207)

Locally Sourced Materials: Materials that are sourced locally or regional to reduce the energy cost and resources need for transport. According to the green building movement, locally sourced materials come from within 500 miles of the site. Locally sourced materials also help to contribute to the contextual characteristics of the site. (Yudelson 2007, 115)

Permeable Pavement: The use of pavement types that allow for the infiltration of water, minimizing the quantity of stormwater runoff and pollutants that could potentially reach the water supply. (Yudelson 2007, 133-134)

Rainwater Reclamation/Reuse: The capturing and treatment of rainwater for future use (Yudelson 2007, 147)

Renewable Energy: Energy that comes from renewable sources such as the sun, wind, flowing water, geothermal energy, and growing plants. (Yudelson 2007, 151)

Runoff: Surface flow of precipitation that directly reaches the hydrologic system via streams, rivers, and lakes (Balmori and Benoit 2007, 209)

Social Capital: Is the "wealth" of a community that is obtained by the presence and effectiveness of local values and traditions, civic engagement and leadership, communities of skilled practitioners and thinkers, and strong community social networks. (Droege 2006, 84)

Stormwater Management: Mitigating stormwater in ways that reduces water runoff and pollution. Stormwater management techniques may include bioretention, rainwater capture/harvesting, rain gardens, permeable pavement, and erosion control. (Yudelson 2007, 163)

Sustainable Design: Sustainable design, pertaining to my design philosophy, is maximizing the efficiency, aesthetic quality, environmental sensitivity, social capital, economic vitality, and flexibility of a site. Potential elements that could contribute to sustainable design includes: renewable energy use, low maintenance and native planting schemes, water conservation, stormwater management, durable and locally sourced building materials, multiple uses designs, walkability, community interaction and involvement, creation of economic catalysts, and heat island effect reducing strategies. (Yudelson 2007, 164-165)

Urban Agriculture: Urban agriculture is a local response to global food network problems. Urban agriculture involves the growing of plant materials within urban environments in order to provide a food and economic resource to the surrounding community. Urban agriculture can include vegetable, ornamental, grain, and fiber producing plant production. (Birch 2008, 259-263)

Urban Heat-island Effect: The phenomena in which urban environments produce excessive amounts of heat, directly and indirectly contributing to air pollution. Urban heat island is caused by the presence of large amounts of paved surfaces, lack of vegetation, and surfaces that have low light reflectance. (Yudelson 2007, 174-175)

Urban Prairie: Urban prairie is urban land that is characterized by dilapidated abandoned buildings and most importantly large expanses of vacant land. Urban prairie is a symptom of urban decay and is commonly present in de-industrialized urban areas.

Appendix B

Community, Economics, Parks, Urban Agriculture

Birch, Eugenie Ladner, and Susan M. Wachter (2008) Growing Greener Cities: Urban sustainability in the twenty-first century.
Keywords: Community, Urban Agriculture

This reference provides steps that are presently being taken in order to create more sustainable systems within urban areas. Chapter 14 discusses the use of growing edible cities to help curb environmental as well as social issues. The text identifies a need for change in the current energy over-consuming food supply. Urban agriculture to produce food locally is seen as a potential solution to reducing energy costs necessary to obtain food. This text highlights the strong match between inner-city environments and the use of urban farming. Not only does the implementation of urban agriculture supply food, it also supplies community interaction and economic stimulus. The excerpts below show some of the author's findings on the effectiveness of urban agriculture.

Excerpt from pg. 262:

"For low-wealth communities, scholars and advocates argue that urban agriculture represents an important form of asset-based development, especially in inner cities with ample supplies of vacant land. Cornell agricultural sociologist Thomas Lyson calls such collectivized efforts civic agriculture."

Excerpt from pg. 262:

"Like other urban greening initiatives, urban farming can bring people together to achieve a variety of planning and community building goals. For example, urban farms can improve stromwater and waste management as well as local air quality. Where they increase food security, place the means of production in local hands, and restore the ecology of polluted neighborhoods, city farms can advance social, economic, and environmental justice.

Excerpt from pg. 263:

"Localized food systems necessarily include more than the farms, gardens, and greenhouses where growing takes place. Community toolsheds, seed harvesting, and agricultural education programs help sustain production and labor force."

Crompton, John L., and American Planning Association (2001) Parks and Economic Development.
Keywords: Economics, Parks, Community

This reference explores the economic benefit of parks within the context of surrounding communities. I find this reference useful because it looks at the ability of park development to catalyze economic development, alleviate social problems such as crime, and to create a sense of environmental stewardship.

Garvin, Alexander (1996) The American City : What works, what doesn't.
Keywords: Community, Parks, Economics, Urban Renewal

One of my most important goals for this project is to create productive uses for vacant land that will help to potentially reduce the pressure of socioeconomic issues within the 5th Ward, and serve as a catalyst for future development. I believe that this can be achieved by the creation of parks that increase community activity. The text by Garvin supports the argument that parks can potentially serve as factors in improving conditions of stressed cities. He argues that parks help to draw investment to areas, which in turn leads to development and increase tax support. The excerpts below explain why parks have been used within the city in order to create improvement and where they can be implemented in order to help increase the vitality of the community.

Excerpt from pg. 30:

"The idea that parks can spur the improvement of the surrounding city has at times provided an equally compelling rationale for public investment. While this strategic approach to investment in has taken different forms depending on the city, it usually has been for one of three purposes: initiating urbanization at specific locations, altering land use patterns in surrounding locations, or establishing a comprehensive system that could shape the very character of city life."

Excerpt from pg. 42:

"The best argument for additional spending on parks is that, as was the case

with Central Park, the money will stimulate widespread and sustained private investment. Simple retention of open space in its natural state, however, is not enough. Only when local governments establish programs and institutions that will make this land available for active public use and deploy the land in a manner that reshapes surrounding settlement patterns will we begin to exploit its potential as a tool for fixing the American city."

Excerpt from pg. 70:

"New parks in inner cities can also trigger second growth. Such parks are relatively easy to create from underutilized property that has been left behind by previous users. Among the possibilities are rail yards and right-of-way; waterfront areas that are no longer needed for shipping, warehousing, or manufacturing; streets, highways, and interchanges whose traffic can be rechanneled to other arteries; even residential areas where local governments already own large blocks of vacant property repossessed for failure to pay taxes."

Excerpt from pg. 69:

"Similar opportunities still exist. There are city parks that have now deteriorated so badly that they act as a depressant force for their surroundings. There are inner-city properties that are no longer in demand but can be recycled as new city parks."

Excerpt from pg. 30:

"Today, as never before, conditions are ripe for parks to reenter the urban planning agenda. This opportunity exists because so much inner-city land that was once actively used now lies fallow and can be reused for intelligently planned parks, because so much suburban land has been developed without adequate public open space that there is now a huge suburban constituency to support park development, and because so much undeveloped land is now subject to recently enacted legislation intended to protect the environment."

The excerpt above I believe applies directly to my study area within the 5th Ward because the area is located within the St. Louis inner city and similar conditions exist, as described above. The text above supports my argument for why vacant land areas within the 5th Ward should be transformed potentially into parks space. Though the planned use might be temporary, small improvements to vacant land can potentially over time improve the condition of the community and lead to investment. Small steps now could potentially lead to big steps in the future that have a positive transformation on the character of the community.
Positive transformation of the community I envision as a community that has reduced social and economic problems, improved infrastructure, an improved sense of place, and more opportunities for residents economically, socially, and environmentally. My goal is to transform the community while still keeping the historical and cultural characteristics that are present alive in new development. For this reason it is important to provide a vision for future development of the community. The vision will help guide the implementation of improvements and overall character of future development. The excerpt below from Garvin explains the importance of creating a positive community vision in order to increase investment.

Excerpt from pg. 232:

"An obvious way for government to foster private investment in an area is by making visible, public improvements. Once residents see that government is spending money on the public areas in the neighborhood, they will more readily invest their own time and money on improvements to their own property. Most federal urban-renewal projects relied on this principle. Government invested in new streets, sidewalks, street trees, lighting, schools, and other community facilities that would make an area more attractive, thereby increasing its marketability and thus justifying further investment by the private sector."

Gratz, Roberta Brandes, and Norman Mintz (1998) Cities Back From the Edge: New life for downtown.
Keywords: Urban Renewal, Urban Development

This book explores the downtown of cities across the United States. From this reading it can be taken that most downtowns across America are in need of "new life" to recover from sprawl. Strategies and theories for effectively reviving America's downtown can be materialized from Gratz's synthesis. This text is useful in gathering another perspective on successful strategies for drawing new life to downtown areas. Ultimately I envision the 5th Ward becoming a community with a successful developing downtown district, and believe that this text will provide some useful insight in how to prevent unsuccessful development.

One statement that I find very interesting from this text is Gratz's clear distinction between downtowns that are rebuilt and ones that are reborn. The statement shows that implementation of expensive plans and money investment into building is not always the driving factor for success. The excerpt below describes Gratz's opinion on the subject of rebuilt versus reborn.

Excerpt from pg. 2:
"Some downtowns have, in their own ways, grown more exciting, from Miami Beach to Denver, from Portland, Oregon, to Portland, Maine, from Boston to Savannah. Others have just been rebuilt, but not reborn, from Indianapolis to Charlotte, North Carolina, from St. Louis to Little Rock, from Cleveland to Scranton, from Detroit to Atlanta. This book illustrates the differences between rebuilt and those reborn, between what we identify as Project Planning and Urban Husbandry.

The ones rebuilt, but not reborn, have done so according to expensive plans, bankers' plans, planners' plans, politicians' plans, developers' plans – all Project Plans. The result is a collection of expensive, big activity places - tourist attractions – connected to each other and the suburbs by a massive auto-based network. When the elusive goal is merely tourism, efficiency, and big copycat civic projects, little real energy and downtown life follows, just as single-activity places. The complex, multi-dimensional urban fabric has been effectively replaced. A collection of visitor attractions does not add up to a city.

The places that have become more exciting have done so, most often, despite conventional plans, with modest public investment and through the catalytic efforts of creative citizens. We call this Urban Husbandry. When the rules of the excessive visions and overblown plans have been broken or ignored, new life, excitement, and the out-of-the-ordinary occur. New life spreads to adjacent areas where the cycle can repeat itself organically. The urban fabric is renewed."

Grogan, Paul S., and Tony Proscio (2000) Comeback Cities: A blueprint for urban neighborhood revival
Keywords: Urban Renewal, Community

Chapter 8 of this text I have found to be a useful resource in understanding the conditions that are present within communities that have or had public housing projects. The chapter, titled The Fall (and Rise) of Public Housing, discusses the Pruitt-Igoe public housing project amongst others that have taken place throughout the Unites States, including Cabrini-Green of Chicago. This text will be important to helping me understand what kind of social demographic conditions exist and how these conditions affect the communities.

Harnik, Peter (2010) Urban green: Innovative parks for resurgent cities
Keywords: Community, Parks, Community Gardens

Urban Green covers a variety of topics regarding the implementation of parkland within developed cities. I find this reference useful because it gives a number of figures for how much park space per resident is available throughout cities around the United States, how much money is invested in parks, how and where park can be implemented, and the various forms that park space can take within the urban setting.

Two important topics that I found particularly useful to my goals is utilizing urban redevelopment for parks and community gardens. This reference also shows the asset that is present in redeveloping urban land into park space. Cities are constantly changing and there is an opportunity for parks to become an important part of that change. The excerpt below describes how parks can be implemented into urban redevelopment.

Excerpt from pg. 70:

"As seeds for the regrowth, parks are key. But they must be reserved, designed, and placed in advance of the built environment that will surround them. Unfortunately, putting parks first doesn't come naturally in the United States – too often they consist of the occasional misshapen parcels of leftover space with steep slopes, poor drainage, or other problems. Making a park the centerpiece of a project requires a city with sophisticated planning capabilities, strong regulations, and an engaged citizenry with the willpower to demand excellence."

Chapter 13 of Urban Green discusses community gardens and their use within urban settings. The starts by discussing that the demand for Americans wishing to garden is not met due to the lack of space. One of my programmed elements for this project is the implementation of community gardens and urban agriculture. The 5th Ward, particularly St. Louis Place neighborhood, has large amounts of vacant land that is left unproductive. My goal is to create a productive use for this land, even if the use is temporary. I believe urban agriculture and community gardening would be a successful fit because of the benefits to the community it would provide. An excerpt from this text shows some of the benefits that can come from community gardens.

Excerpt from pg. 83:

"Community gardens do not have full-fledged pedigrees as parks, but they are certainly members of the extended family, and they are overwhelmingly urban. Coming in a diversity of forms, they can provide beauty, supply food, educate youth, build confidence, reduce pesticide exposure, grow social capital, preserve mental health, instill pride, and raise property values."

Jacobs, Jane (1961) The Death and Life of Great American Cities.

Keywords: Community, Parks

This reference is useful in identifying typical dilemmas that are common to urban environments, and the sources of these dilemmas. Jacob's text covers issues related to park use, success, and failure. The author Jane Jacobs cites that the success and or failure of neighborhood parks is directly correlated to use by the public. Success according to Jacob's is derived from a number of factors including diversity of uses and activities and a mix of user time schedules. The diversity of a park in turn creates an attraction from the surrounding area. Failure of parks according to Jacobs comes from a lack of diversity and activity, which leads to monotony and unattractiveness. Failed parks have a potential to succumb to neglect due and become potential social "vacuums".

Excerpt from pg. 69:

"Conventionally, neighborhood parks or parklike open spaces are considered boons conferred on the deprived populations of cities. Let us turn this thought around, and consider city parks deprived places that need the boon of life and appreciation conferred on them. This is more nearly in accord with reality, for people do confer use on parks and make them success-or else withhold use and doom parks to rejection and failure."

Excerpt from pg. 99:

"A generalized neighborhood park that is stuck with functional monotony of surroundings in any form is inexorably a vacuum for a significant part of the day. And here a vicious circle takes over. Even if the vacuum is protected against various forms of blight, it exerts little attraction for its limited potential reservoir of users. It comes to bore them dreadfully, for moribundity is boring. In cities, liveliness and variety attract more liveliness; deadness and monotony repel life. And this is a principle vital not only to the ways cities behave socially, but also to the ways they behave economically."

The excerpt listed above further strengthens the argument that parks are intertwined closely with the surrounding social and economic fabric of the community. From this I draw the importance of creating locations to draw and attract residents. The 5th ward has many areas that have become what Jacob's might refer to as social and economic "vacuums", particularly areas with large vacant land uses. In order to draw user to my planned areas of design and create attraction I will need to design for a mix of uses. Some of the potential uses that I envision taking place within my designed areas including community gardens and urban agriculture, exercise, sports, environmental education, and concerts and other public gatherings.

Madden, Kathy, and Project for Public Spaces (2000) Public parks, private partners: How partnerships are revitalizing urban parks.
Keywords: Economics, Parks

Due to the limited resources within the community of the 5th Ward, it will be necessary to find sources of investment to fund for development and renewal efforts. This book explores various methods for improving park space through various social programs. Topics include volunteer programs, non-profit organizations, and partnerships. This reference is also useful because it gives several precedents for park development.

Newman, Peter, and Isabella Jennings (2008) Cities as Sustainable Ecosystems: Principles and practices.
Keywords: Community, Economics

This text gives a perception that cities act as a dynamic system, similar to an ecosystem. I find this book is relevant to my study because it highlight strategies for creating economic and social security. Some of these strategies include the facilitation of local enterprises, local/ biological infrastructure, community space and overcoming car dependency, urban agriculture and community gardens, and community arts (41 Newman,Peter 2008). This reference also provide assessment forms for rating the economic sustainability of communities.

Platt, Rutherford H., and Lincoln Institute of Land Policy (2006) The Humane Metropolis : People and nature in the 21st-century city.
Keywords: Community, Park Development,

This text offer insight into various conflicts associated with urban environments and possible community design solutions to overcoming the conflicts. Some of the conflicts that this book covers within the urban context include poverty, race, lack of environmental exposure, deficiencies of parks and surrounding communities, and brownfield sites. I will use this reference as a guide to find potential program elements for my design within the community of the 5th Ward. Humane Metropolis also offers precedents for areas similar to St. Louis and the 5th Ward that have created programs to help improve communities threatened by conflicts listed above.
Humane Metropolis claims that there are seven "measures" to a successful park system. These measures include: Mission statements and updates, ongoing planning and community involvement, sufficient resources to meet the system goals, equitable access, user satisfaction, safety from physical hazards and crime, and external benefits to the surrounding city (p. 51-60 Platt,Rutherford H. 2006). From the measures I gather the importance of having a strong master plan in order to guide development of park systems. Below are a few selected excerpts that I feel provided direct reference for my intended design goals.

Excerpt from pg. 51:

"Park systems do not just happen. Wild areas do not automatically protect themselves from development, outmoded waterfronts do not spontaneously sprout flowers and promenades, and flat ground does not morph into ball fields. Even trees and flora of the desired species do not spontaneously grow in the right places. Interested citizens must identify the goals of the park system, including functions to be served, management, and landscaping. The parks department must then use that mandate as a basis for its mission statement and the definition of its core services."

Excerpt from pg. 52:

"The ideal master plan should have at least the following elements:

- An inventory of natural, recreational, Historical, and cultural resources
- A needs analysis
- An analysis of connectivity and gaps
- An analysis of the agency's ability to carry out its mandate
- An implementation strategy (with dates), including a description of the roles of other park and recreation providers
- A budget for both capital and operating expenses
- A mechanism for annual evaluation of the plan."

Excerpt from pg. 57:

"The excellent city park system is accessible to everyone regardless of residence, physical abilities, or financial resources. Parks should be easily reachable from every neighborhood, usable by those who are handicapped or challenged, and available to low-income residents."

Excerpt from pg. 59:

"To be successful, a city park system should be safe: free both of crime and of unreasonable physical hazards, from sidewalk potholes to rotten branches overhead. Park departments should have mechanisms to avoid and eliminate physical hazards as well for citizens to report problems easily.

Crime, of course, is dependent on a large number of factors that are beyond the reach of the park and recreation department, such as poverty, drug and alcohol use, population demographics, and lack of stabilizing neighborhood institutions. Yet the park agency has some control over other factors, including park location, park design, presence of uniformed personnel, presence of park amenities, and availability of youth programming. Ultimately, the greatest deterrent to crime is the presence of large numbers of users."

The text also gives strategies for creating a connection between the public and the parks. This will be very useful for my design and programming decisions, especially considering text from Jane Jacobs stressing the importance of attracting users. The text says that strategies for promoting connections include: understanding existing park features and uses, improving visibility and safety, incorporating design features that promote use, provide opportunities to the public for involvement in volunteer stewardship programs, and making small-scale improvements. Some features cited in this text that is believed to foster an attraction from the public includes: providing various seating options, creating comfortable spaces, incorporating water features, responding to needs of various users, increased park activity including mixed use options and festivals, and volunteership opportunities.

Below are excerpts that I find particularly useful from Humane Metropolis.

Excerpt from pg. 69-70:

"In general parks with more activity have increased usage, which in turn can increase perceptions of safety within the park. Food vendors and other kiosks attract the public to parks and can generate revenue for park maintenance. Increased activity can also come from festivals and other seasonal activities such as farmer's markets and concerts in the park. Designing a park for a diverse range of users can also increase park activity. For example, creating spaces that respond to the needs of children, teens, adults, and the elderly can foster park use at different times of the day. Providing for a range of park uses from active recreation to passive recreation can increase the diversity of park uses and potential park stewards. Single-purpose parks such as sports fields have narrow clientele. Successful urban parks, such as Central Park, have found ways to incorporate sports fields in a manner that still allows other more informal uses."

Environment

Balmori, Diana, and Gaboury Benoit (2007) Land and Natural Development (LAND) Code: Guidelines for sustainable land development.
Keywords: Sustainability, Environment, Planning

LAND Code provides an excellent resource for sustainable design and development technique. As stated earlier one of my most important goals is to design and plan with environmental stewardship as a driving influence. This books offer many detailed techniques for preventing environmental degradation including stormwater management, erosion control, and air quality control.

Droege, Peter (2006) The Renewable City: A comprehensive guide to an urban revolution.
Keywords: Environment, Sustainability

It is important to my design philosophy that I acknowledge the fact that human development has impacts on the natural environment. This book explores the necessity of renewable energy resources for future communities and urban environment. The author see an end to the "fossil era" rapidly approaching, and with that a decline in urbanization. This book further manifests the importance of taking steps to create internally available renewable resources within communities.

Excerpt from pg. 24:
"Historically speaking, the post-fossil fuel era has already dawned, and it is reasonable to assume that it will be accompanied by a broad and significant decline in urbanization growth rates, and ultimately their reversal. Renewable urban development relies on internal, embedded and regionally sustained energy streams, where fossil urbanization depends on external sources and globally secured flows."

Johnson, Lorraine, and Andrew Leyerle (1998) Grow Wild! Low-maintenance, sure-success, distinctive gardening with native plants.
Keywords: Environment, Sustainability

This book provides native planting solutions for various regions throughout the United States. A major component for my design of park space will be a native planting scheme to reduce maintenance and water usage. This book combined with my previous horticultural experiences will provide a great resource for my project.

McHarg, Ian L. (1969) Design with Nature.
Keywords: Design, Environment

Design with Nature provides an excellent view on ecology, natural processes, and the effect of urbanization and development on these natural processes. Another major goal I have for this project is to improve the ecological vitality of the 5th ward through environmentally sensitive design and planning practices. This book will be a great resource for how to design with the forces of nature, opposed to against the forces. This will make for a community that can experience social growth with an increased sense of environmental stewardship. Environmental stewardship is becoming more important with the realization of the global effects of human development on the vitality of the natural environment.

Site analysis is a key component to the success of my intended designs. McHarg gives a great insight on how natural processes should be analyzed, and how the analysis should influence design and planning decisions. Site analysis is important for my project because I am determining the most suitable locations for park and urban agricultural space. Although many factors that influence my site analysis for these two programmed elements are not limited to natural processes, I believe McHarg's method of analysis is relevant to social and economic issues as well.

Excerpt from pg. 56:

"The geometric planner offers another alternative, that which the city be ringed with a green circle in which green activities – agriculture, institutions and the like – are preserved or even introduced. Such greenbelts, where enforced by law, do ensure the perpetuation of open space and in the absence of an alternative they are successful – but it appears that nature outside the belt is no different from that within, that the greenbelt need not be the most suitable location for the green activities of agriculture or recreation. The ecological method would suggest that the lands reserved for open space in the metropolitan region be derived from natural-process lands, intrinsically suitable for "green" purposes: that is the place of nature in the metropolis.
A single drop of water in the uplands of a watershed may appear and reappear as cloud, precipitation, surface water in creek and river, lake and pond or groundwater; it can participate in plant and animal metabolism, transpiration, condensation, decomposition, combustion, respiration and evaporation. This same drop of water may appear in considerations of climate and micro climate, water supply, flood, drought and erosion control, industry, commerce, agriculture, forestry, recreation, scenic beauty, in cloud, snow, stream, river and sea. We conclude that nature is a single interacting system and that changes to any part will affect the operation of the whole."

Yudelson, Jerry (2007) Green Building A to Z: Understanding the language of green building.
Keywords: Sustainability, Terminology, Environment

Using the appropriate terminology will be important for described my intended design solutions. This reference provided descriptions and uses of various green building design components. This book will be a great resource for developing my glossary of terms.

History

Levitt, Rachelle L., and Urban Land Institute (1987) Cities Reborn.
Keywords: History

This text from Urban Land Institute provides at look at various cities around the US and their methods for renewing the urban centers. One of the cities discussed in this book is St. Louis. This book will be useful in providing a historical reference for various redevelopment strategies that St. Louis has employed in order to create renewal.

Saint Louis Missouri City Planning Commission (1973) Saint Louis Development Program.
Keywords: History

The 1976 St. Louis Development Program has an extensive look into the historical progression of the city since its first settlements in 1766. It provides information on previous conditions of neighborhoods located within St. Louis, including the neighborhoods of the 5th Ward. This book will be very useful in determining what causes have led to the current patterns of development, and the condition of the city today.

Excerpt from pg. 13:

"St. Louis was now for all practical purposes fully developed. Because of its maturity, its age, and other factors, primary emphasis began to shift from development to redevelopment. With the beginning of public housing and renewal, the City, working with the federal government, began to confront the urban problem. Therefore, the City's history over the last few decades can more accurately be reflected through a review of urban renewal and other improvement efforts. As background, it is necessary to understand the City's structure."

Design

Ching, Frank (2007) Architecture: Form, Space, & Order. 3rd ed.
Keywords: Design

Ching's book provides elementary design principles for spatial consideration, hierarchy, movement, form, organization, and scale. This book will be useful by providing a fundamental background for developing my design solutions for this project.

Dahl, Bernie, and Donald J. Molnar (2003) Anatomy of a Park: Essentials of recreation area planning and design.
Keywords: Design, Programming

It will be essential to my project to create an attractive park that can provide various activities and uses that will draw people to the space. The amount and type of activity that will occur within the designed park space will influence the success of the park. This book provides design considerations for the aesthetic and functionality of a park. This book will be useful in the layout and schematic design phases of park development, and the development of programmed elements for park and recreational space.

Simonds, John Ormsbee, and Barry W. Starke (2006) Landscape Architecture: A manual of environmental planning and design.
Keywords: Design

This book provides information on design process, design elements, natural processes, people, and many other topics relating to Landscape Architectural design. This book will provide a solid source for various design solutions that can apply to any portion of my design process and representation.

Swaffield, Simon R (2002) Theory in Landscape Architecture: A reader.
Keywords: Design, Theory

I believe it is essential to be knowledgeable in current design theory applications in order to develop my own style or philosophy as a designer. My knowledge base and philosophy can grow and progress by studying the work of other designers, and the perceived success of their ideas. The reader contains excerpts from Ian McHarg, Peter Walker, Elizabeth Meyer, Laurie Olin, Hideo Sasaki, and Kevin Lynch to name a few. This text will be useful in providing various perspectives on how to design. From this I can develop my own design philosophy in relation to this project.

Appendix C

WATERSHED CALCULATIONS

Project: Closing the Gap				By: Scott Runde		
Location: St. Louis, MO				Date: April 2011		
Watershed	**Area (sq ft)**	**Paving**	**Lawn**	**Roof**	**Tree Cover**	**Water Surface**
1	916962.00	156550.00	538283.00	41046.00	163301.00	17782.00
2	173730.00	61306.00	94542.00	17882.00		
3	510475.00	187201.00	283891.00	39383.00		
4	225112.00	80280.00	133019.00	11813.00		
5	134795.00	42873.00	68951.00	22971.00		
6	165664.00	64610.00	644.00	100410.00		
7	1160989.00	296556.00	756517.00	38194.00		69722.00
8	94374.00	28799.00	65575.00			
9	198873.00	75522.00	74011.00	49340.00		
10	93931.00	46101.00	40080.00	7750.00		
11	111270.00	48007.00	57638.00	5625.00		
12	196696.00	41861.00	154835.00			
13	198268.00	43913.00	110070.00	32000.00		12285.00
14	168994.00	68420.00	61574.00	39000.00		
15	230334.00	56121.00	159979.00	10000.00		4234.00
16	170235.00	42767.00	127468.00			
17	168820.00	68246.00	61574.00	39000.00		
18	177888.00	42430.00	124481.00	10977.00		
19	168765.00	42955.00	125810.00			
20	172131.00	43239.00	102056.00	26836.00		
21	200327.00	47144.00	112628.00	40555.00		
22	202626.00	44819.00	120795.00	37012.00		
TOTAL	5841259.00	1629720.00	3374421.00	569794.00	163301.00	104023.00

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 1

WS Area (sq ft)	916962.00	WS Area (acres)	21.05
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	156550.00	0.9	3.23
Lawn	538283.00	0.3	3.71
Roof	41046.00	0.6	0.57
Tree Cover	163301.00	0.2	0.75
Water Surface	17782.00	0	0.00
Totals	916962.00		8.26

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 2

WS Area (sq ft)	173730.00	WS Area (acres)	3.99
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	61306.00	0.9	1.27
Lawn	94542.00	0.3	0.65
Roof	17882.00	0.6	0.25
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	173730.00		2.16

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 3

WS Area (sq ft)	510475.00	WS Area (acres)	11.72
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	187201.00	0.9	3.87
Lawn	283891.00	0.3	1.96
Roof	39383.00	0.6	0.54
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	510475.00		6.37

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 4

WS Area (sq ft)	225112.00	WS Area (acres)	5.17
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	80280.00	0.9	1.66
Lawn	133019.00	0.3	0.92
Roof	11813.00	0.6	0.16
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	225112.00		2.74

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 5

WS Area (sq ft)	134795.00	WS Area (acres)	3.09
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	42873.00	0.9	0.89
Lawn	68951.00	0.3	0.47
Roof	22971.00	0.6	0.32
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	134795.00		1.68

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 6

WS Area (sq ft)	165664.00	WS Area (acres)	3.80
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	64610.00	0.9	58149.00
Lawn	644.00	0.3	193.20
Roof	100410.00	0.6	60246.00
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	165664.00		118588.20
		Acres	2.72

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 7

WS Area (sq ft)	1160989.00	WS Area (acres)	26.65
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	296556.00	0.9	266900.40
Lawn	756517.00	0.3	226955.10
Roof	38194.00	0.6	22916.40
Tree Cover	0.00	0.2	0.00
Water Surface	69722.00	0	0.00
Totals	1160989.00		516771.90
		Acres	11.86

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 8

WS Area (sq ft)	94374.00	WS Area (acres)	2.17
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	28799.00	0.9	25919.10
Lawn	65575.00	0.3	19672.50
Roof	0.00	0.6	0.00
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	94374.00		45591.60
		Acres	1.05

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 9

WS Area (sq ft)	198873.00	WS Area (acres)	4.57
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	75522.00	0.9	67969.80
Lawn	74011.00	0.3	22203.30
Roof	49340.00	0.6	29604.00
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	198873.00		119777.10
		Acres	2.75

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 10

WS Area (sq ft)	93931.00	WS Area (acres)	2.16
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	46101.00	0.9	41490.90
Lawn	40080.00	0.3	12024.00
Roof	7750.00	0.6	4650.00
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	93931.00		58164.90
		Acres	1.34

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 11

WS Area (sq ft)	111270.00	WS Area (acres)	2.55
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	48007.00	0.9	43206.30
Lawn	57638.00	0.3	17291.40
Roof	5625.00	0.6	3375.00
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	111270.00		63872.70
		Acres	1.47

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 12

WS Area (sq ft)	196696.00	WS Area (acres)	4.52
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	41861.00	0.9	37674.90
Lawn	154835.00	0.3	46450.50
Roof	0.00	0.6	0.00
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	196696.00		84125.40
		Acres	1.93

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 13

WS Area (sq ft)	198268.00	WS Area (acres)	4.55
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	43913.00	0.9	39521.70
Lawn	110070.00	0.3	33021.00
Roof	32000.00	0.6	19200.00
Tree Cover	0.00	0.2	0.00
Water Surface	12285.00	0	0.00
Totals	198268.00		91742.70
		Acres	2.11

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 14

WS Area (sq ft)	168994.00	WS Area (acres)	3.88
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	68420.00	0.9	61578.00
Lawn	61574.00	0.3	18472.20
Roof	39000.00	0.6	23400.00
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	168994.00		103450.20
		Acres	2.37

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 15

WS Area (sq ft)	230334.00	WS Area (acres)	5.29
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	56121.00	0.9	50508.90
Lawn	159979.00	0.3	47993.70
Roof	10000.00	0.6	6000.00
Tree Cover	0.00	0.2	0.00
Water Surface	4234.00	0	0.00
Totals	230334.00		104502.60
		Acres	2.40

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 16

WS Area (sq ft)	170235.00	WS Area (acres)	3.91
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	42767.00	0.9	38490.30
Lawn	127468.00	0.3	38240.40
Roof	0.00	0.6	0.00
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	170235.00		76730.70
		Acres	1.76

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 17

WS Area (sq ft)	168820.00	WS Area (acres)	3.88
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	68246.00	0.9	1.41
Lawn	61574.00	0.3	0.42
Roof	39000.00	0.6	0.54
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	168820.00		2.37

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 18

WS Area (sq ft)	177888.00	WS Area (acres)	4.08
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	42430.00	0.9	0.88
Lawn	124481.00	0.3	0.86
Roof	10977.00	0.6	0.15
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	177888.00		1.89

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 19

WS Area (sq ft)	168765.00	WS Area (acres)	3.87
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	42955.00	0.9	0.89
Lawn	125810.00	0.3	0.87
Roof	0.00	0.6	0.00
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	168765.00		1.75

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 20

WS Area (sq ft)	172131.00	WS Area (acres)	3.95
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	43239.00	0.9	0.89
Lawn	102056.00	0.3	0.70
Roof	26836.00	0.6	0.37
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	172131.00		1.97

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 21

WS Area (sq ft)	200327.00	WS Area (acres)	4.60
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	47144.00	0.9	0.97
Lawn	112628.00	0.3	0.78
Roof	40555.00	0.6	0.56
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	200327.00		2.31

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 2011

Watershed # 22

WS Area (sq ft)	202626.00	WS Area (acres)	4.65
Storm Freq. (yrs)	25	Avg Rainfall Int. (in/hr)	2.83

ADJUSTED SURFACE AREA PER RUNOFF COEFFICIENT VALUES

Surface type	Area (sq ft) (A)	Coefficient Value (C)	Adjusted Area (Ac)
Paving	44819.00	0.9	0.93
Lawn	120795.00	0.3	0.83
Roof	37012.00	0.6	0.51
Tree Cover	0.00	0.2	0.00
Water Surface	0.00	0	0.00
Totals	202626.00		2.27

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 8, 2011

Retention Sizing Calcs - Pond A

Watershed	Area (ac.)	Area Adj. (ac.)	in/24hr in 10yr storm event	in/24hr in 100yr storm event	Ac-in(100yr)	Ac-ft(100yr)	Ac-in(10yr)	Ac-ft(10yr)
7	26.65	11.86	5	7	83.02	6.92	59.30	4.94
8	2.17	1.05	5	7	7.35	0.61	5.25	0.44
10	2.16	1.34	5	7	9.38	0.78	6.70	0.56
12	4.52	1.93	5	7	13.51	1.13	9.65	0.80
14	3.88	2.37	5	7	16.59	1.38	11.85	0.99
17	3.88	2.37	5	7	16.59	1.38	11.85	0.99
Total Feeding Pond A	**43.26**	**20.92**			**146.44**	**12.20**	**104.60**	**8.72**

Retention Pond Area

Elev.	Volume (ft.)	Volume (ac. Ft.)
508	69742	1.60
507	59049	1.36
506	48577	1.12
505	43861	1.01
504	39303	0.90
503	34901	0.80
502	30657	0.70
501	22645	0.52
500	15450	0.35
499	13499	0.31
498	11665	0.27
497	9976	0.23
496	8543	0.20
495	7287	0.17
494	6136	0.14
Total	**421291**	**9.67**

Capacity Needed:	8.72
Actual Capacity:	9.67

Summary:

Pond A is 1.60 acres to a depth of 14.00' at the low point
Pond a is available to hold 9.67 acre ft of water
This is sufficient to handle a 10yr storm

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 8, 2011

Retention Sizing Calcs - Pond B

Watershed	Area (ac.)	Area Adj. (ac.)	in/24hr in 10yr storm event	in/24hr in 100yr storm event	Ac-in(100yr)	Ac-ft(100yr)	Ac-in(10yr)	Ac-ft(10yr)
1	21.05	8.26	5	7	57.82	4.82	41.30	3.44
2	3.99	2.16	5	7	15.12	1.26	10.80	0.90
Total Feeding Pond A	**25.04**	**10.42**			**72.94**	**6.08**	**52.10**	**4.34**

Retention Pond Area

Elev.	Volume (ft.)	Volume (ac. Ft.)
504	34118	0.78
503	26879	0.62
502	22187	0.51
501	20270	0.47
500	18409	0.42
499	16650	0.38
498	14858	0.34
497	13167	0.30
496	7940	0.18
495	6415	0.15
494	5378	0.12
493	4452	0.10
492	3614	0.08
491	2859	0.07
490	2186	0.05
489	1594	0.04
488	1082	0.02
Total	**190723**	**4.64**

Capacity Needed:	6.51
Actual Capacity:	6.65

Summary:

Pond A is .78 acres to a depth of 24.00' at the low point
Pond a is available to hold 6.65 acre foot of water
This is sufficient to handle a 100yr storm

Project: Closing the Gap	By: Scott Runde
Location: St. Louis, MO	Date: April 8, 2011

Retention Sizing Calcs - Pond C

Watershed	Area (ac.)	Area Adj. (ac.)	in/24hr in 10yr storm event	in/24hr in 100yr storm event	Ac-in(100yr)	Ac-ft(100yr)	Ac-in(10yr)	Ac-ft(10yr)
13	4.55	2.11	5	7	14.77	1.23	10.55	0.88
16	3.91	1.76	5	7	12.32	1.03	8.80	0.73
19	3.87	1.75	5	7	12.25	1.02	8.75	0.73
Total Feeding Pond A	**12.33**	**5.62**			**39.34**	**3.28**	**28.10**	**2.34**

Retention Pond Area - C1

Elev.	Volume (ft.)	Volume (ac. Ft.)
508	3136	0.07
507	1542	0.04
506	850	0.02
505	505	0.01
504	156	0.00
503	50	0.00
502	8	0.00
Total	**6247**	**0.14**

Retention Pond Area - C2

Elev.	Volume (ft.)	Volume (ac. Ft.)
506	3008	0.07
505	1540	0.04
504	893	0.02
503	501	0.01
502	250	0.01
501	82	0.00
500	16	0.00
Total	**6290**	**0.14**

Retention Pond Area - C3

Elev.	Volume (ft.)	Volume (ac. Ft.)
505	4004	0.09
504	2220	0.05
503	1413	0.03
502	608	0.01
501	186	0.00
500	63	0.00
499	15	0.00
Total	**8509**	**0.20**

Retention Pond Area - C4

Elev.	Volume (ft.)	Volume (ac. Ft.)
511	6725	0.15
510	4182	0.10
509	2537	0.06
508	1808	0.04
507	1169	0.03
506	601	0.01
505	156	0.00
504	10	0.00
Total	**17188**	**0.39**

Retention Pond Area - C5

Elev.	Volume (ft.)	Volume (ac. Ft.)
508	12470	0.29
507	8533	0.20
506	5002	0.11
505	4000	0.09
504	2918	0.07
503	2176	0.05
502	958	0.02
501	435	0.01
500	194	0.00
499	50	0.00
Total	**36736**	**0.84**

Retention Pond Area - C6

Elev.	Volume (ft.)	Volume (ac. Ft.)
500	7827	0.18
499	5669	0.13
498	4449	0.10
497	3286	0.08
496	2543	0.06
495	1824	0.04
494	1253	0.03
493	879	0.02
492	550	0.01
491	269	0.01
490	90	0.00
Total	**28639**	**0.66**

Capacity Needed:	2.34
Actual Capacity:	2.38

Summary:

Pond System C has a total acreage of .85 acres to a depth of 9.00' at the low point
Pond a is available to hold 2.38 acre foot of water
This is sufficient to handle a 10yr storm

Appendix D

LAR 410 PLANTING DESIGN CHARETTE

Charette Participants

Professors:
Jessica Canfield
Lee R. Skabelund

Garduate Teaching Assistant:
Scott Runde

Students:
Barth, Rachel
Biondolilo, Jena
Brungardt, Paul
Christner, Cammie
Craig, Sarah
Cunningham, Kevin
Denney, Anne
Ewald, Lauren
Fagan, Elise
Fakhraldeen, Sukaina
Farley, Joshua
Gutierrez, Josef
Han, Lewei
Hao, Shuang
Harper, Kylie
Hoetmer, Derek
Hundley, Anne
Jarquio, Samantha
Johnson, Aaron
Johnson, Ashley
King, Jessica
Koehler, Kyle
Mann, William
Martell, Natalie
Mayer, Angela
Molaskey, Katherine
Patterson, Lauren
Ptomey, Patrick
Ragoschke, Adam
Thomas, Valerie
Wagner, Benjamin
Whitford, Katherine

Schedule

11/8 – Address Issues, Vision and Preliminary Objectives (5pm reviews with Scott, Jessica or Lee)

11/10 – Finalize Most Important Objectives (including Strategies & Responses);
Pull together required Products;
Prepare for Friday presentations

11/12 – Present work (plan on a 5-8 minute presentation, with 10 minutes for discussion)

Products

- Project narrative (anticipated results of design interventions)
- Successional diagrams showing the progression/phasing of proposed landscape interventions through time
- Axonometrics, plans and/or diagrams to show overall visions of the proposed study areas
- Vignettes, montages or precedent images to show more detailed design concepts

Findings

Through the process of organizing and helping to run this charette I was able to gain valuable input from other designers on potential solutions for this project. The information presented by the students provided design ideas and a review of what was missing from my design and analysis strategies.

Some of ideas produced by the groups of students influenced my design and analysis thinking, and provided a fresh look what the vision for this project could look like.

Examples of Student Work

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FIGURE REFERENCES

Introduction

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Figure 1.4: http://farm5.static.flickr.com/4138/4918046069_a64947b40f.jpg
Figure 1.5: Photo by Author
Figure 1.6: http://farm4.static.flickr.com/3228/3077716759_72a5daf2ff.jpg?v=0Figure 1.7: St. Louis City Context Map
Figure 1.7: St. Louis Context Map Adapted From ESRI Map Viewer
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Literature Review

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Figure 3.26: Adapted from (Watcher 2008)

Community Analysis

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Design

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Appendices

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