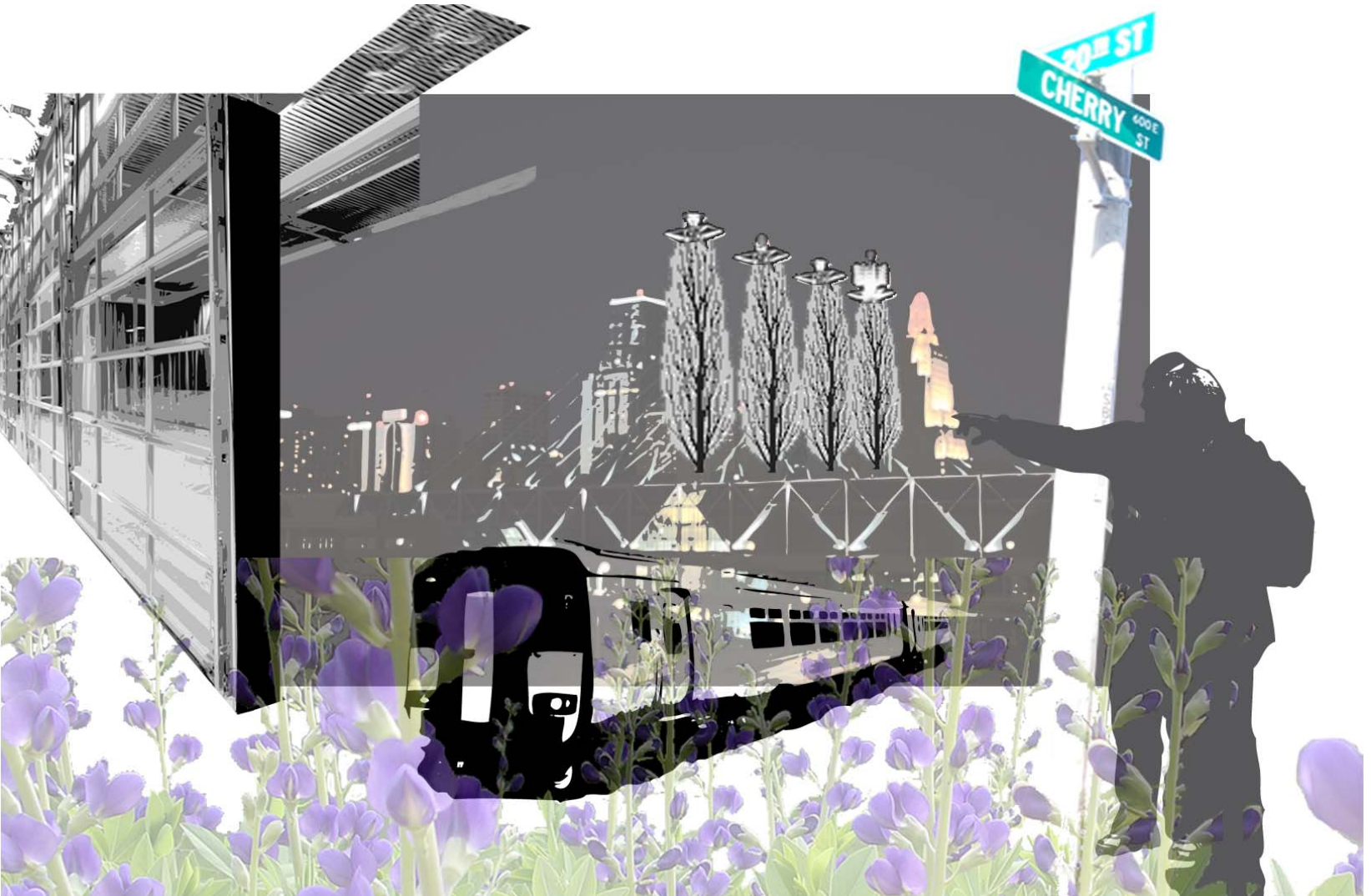


Changing the Nature of the City

integrating phytoremediation for the future of Kansas City

Stephanie Mallinckrodt Master's Project



CHANGING THE NATURE OF THE CITY
INTEGRATING PHYTOREMEDIATION FOR THE FUTURE OF KANSAS CITY

by
STEPHANIE MALLINCKRODT

A REPORT

submitted in partial fulfillment of the requirements for the degree

MASTER OF LANDSCAPE ARCHITECTURE

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Approved by:
Major Professor
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Abstract

There are six square miles of vacant land spread throughout Downtown Kansas City unkempt and untouched for the fear of what may exist in the soil, air, and water and the consequences that come with it (COR Team 2010, EPA 1997). Not developing the vacant/underutilized land causes more harm than good for the city, the locals, and the environment. It costs the city loss of tax revenue (Holt 2002). It hurts locals' pro-property values and possibly health. It inhibits the environment's functions with potential toxins. By activating vacant/underutilized land through phytoremediation and redevelopment, it can meet the needs of the projected population growth in the next 30 years, accommodate the Rock Island Corridor, and dissolve any threats of contamination. With the threat of possible contamination on the vacant/underutilized land,

surrounding properties, and industrial properties within the culturally rich Jazz and Crossroads districts downtown, phytoremediation is used as a continuation of the Rock Island Corridor's linear park system and transit in the city context while allowing for redevelopment.

The strategy examines regional to site specific strategies where phytoremediation is used to connect people to the environment, contain contaminant-producing places, and counteract contamination from new development. The development serves as a model for Kansas City to use the Rock Island Corridor to control site-specific problems as a catalyst for redevelopment of districts to solve large-scale issues through the use of phytoremediation. Phytoremediation allows for light contaminant production industries

to remain functional and rely on phytoremediation to clean some of the waste to prevent excessive clean up in the future.

With the help of the phytoremediation and development, it allows for us to understand how phytoremediation works while preventing sites from becoming vacant/underutilized urban areas for the betterment of the community as a proactive strategy to prevent brownfields. Phytoremediation supports sustainable preventative/remediation strategies while catering to community needs such as redevelopment along Rock Island Corridor and Common Line, multi-modal transit, Metrogreen, character of place, and city life. It blends site suitability with community needs, while creating a cleaner more efficient environment that is aesthetically appealing.

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Abbreviations

MARC - Mid-America Regional Council

RIC - Rock Island Corridor

VOC - Volatile Organic Compounds

PAH - Polycyclic Aromatic Hydrocarbons

EPA - Environmental Protection Agency

MDNR - Missouri Department of Natural Resources

KCDC - Kansas City Design Center

Thanks to my Committee Members:

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To my family for their encouragement and unconditional love.

To my peers who held me up during difficult times.

To my professors for pushing me to work harder everyday.

Preface

Initial Driving Forces

Going into my fifth and final year, I knew I had to create my own project. I needed one project to sum up my entire career at Kansas State University. It was not an easy task to focus on one subject because landscape architecture is diverse with numerous possibilities, which is one of the reasons why I love this major.

Over the summer, I sat down and thought about the things I like to do. I love to problem solve and use it for the greater good of a community. That only just opened up more questions and possibilities. I didn't realize that my project was right in front of me my whole life.

I always loved to go to Downtown Kansas City, but there were many obstacles to get there from the suburbs. Also, parts of Kansas City lack space to linger and wander around. It is uncomfortable for pedestrians. There is much potential to cater to these needs because most of the space is underutilized.

Involvement with MARC

At the beginning of the school year, we were introduced to the Rock Island Corridor. MARC (Mid-America Regional Council) was looking for opportunities to use the old railroad route for transit and trails. MARC brought in the help from Kansas State University, University of Kansas, and University of Missouri Kansas City for new ideas and analysis.

My first questions were: how is the corridor going to connect to Downtown? What can happen around the corridor? What reasons can encourage people to use it to go downtown? I started to map and find underutilized areas around the corridor that could be used to enhance the corridor and Kansas City.

I picked the Jazz and Crossroads Districts because the corridor went through the districts to reach Downtown. The surroundings had clusters of underutilized areas. Most of my inventory focused on connecting the Jazz and Crossroads District to extend the downtown experience.

Evolving to a Project

As the Rock Island Corridor began to evolve to more concrete ideas, I learned about an alternative that proposed a regional rail with transit stops located within the Crossroads and Jazz Districts.

My project operates at two scales. One is the broader scale that connects Crossroads and Jazz districts to enhance the connectivity, which directed me toward developing an area around one station located just East of 71 called the Crossroads Station. The Crossroads Station is the smaller site scale. I used the overall strategies to connect the station while using community strategies to enhance the character of the area.

My problem-solving strategy focused on connecting regional issues district issues and finally community issues to create a site that functions for all three by accommodating a regional rail, city growth, and industrial and art community needs.

The project is guided by Mid America Regional Council's (MARC) Rock Island Corridor and Creating Sustainable Places to address the dilemmas of Downtown Kansas City. The background explains the relationships of the project to MARC and Kansas City.





Background

Rock Island Corridor

Rock Island Corridor

MARC is negotiating the purchase of a segment of the Rock Island Corridor from Union Pacific for future transit and linear park to support new growth in Greater Kansas City. It marks the first step to a multi-modal system for Greater Kansas City.

There are six corridors including the Rock Island Corridor that will span across Greater Kansas City to connect to a possible streetcar system downtown, bus system, park-and-rides in bedroom communities, and a trail system over the whole metropolitan shown in Figure 1-1. Downtown Kansas City has potential to sustain the Rock Island Corridor through new opportunities for the vacant/underutilized land of Kansas City as it grows and becomes a multi-modal city.

Alternative Analysis

The Rock Island Corridor has a ROW from Pleasant Hill to the Truman Sports Complex. Currently, an Alternative Analysis is determining the best form of transit along the corridors and how the

corridors are going to access downtown after Truman Sports Complex. The railroad right-of-ways are used for freight and prohibits the use for transit and trail. Unfortunately with six square miles of vacant land, there is a patchwork of underutilized spaces that discourage connections from the corridors to Downtown. Past the stadiums there will need to be a Common Line. The Common Line accommodates multiple corridors in the downtown area. For the purpose of this study, the Common Line alignment alternative chosen is along Truman Road then follows south along Cherry Street to the terminus point: Union Station (TranSystems 2011). It is the cheaper and more feasible option of the two common line regional rail routes proposed.

Regional Rail was chosen for its economic value, ability to accommodate multiple communities, capability of long distances as well as short distances, can alleviate highway traffic, and its ability to use some of the existing infrastructure.

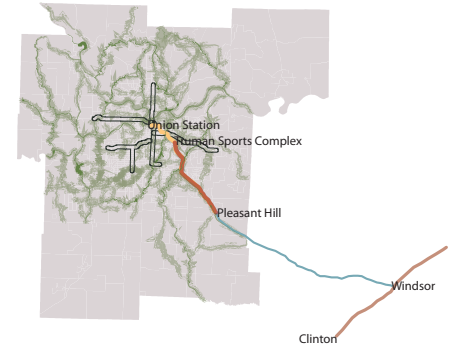


Figure 1-1: Regional Context (MARC GIS Data adapted by author)

The 17 miles of purchased route exist from Pleasant Hill to the Truman Sports Complex.

- █ Purchased Route
- █ Katy Trail
- █ Connection to Katy to Rock Island
- █ MetroGreen
- █ Route to Downtown

⊙ Not to Scale

Common Line (Image to Right)

- █ Common Line
- Highways
- KCT Railroad
- Transit Stop

⊙ 1"=2000'





Figure 1-2: Common Line (Google Earth adapted by author)

Dilemma

Vacant/Underutilized Land

6 square miles of vacant land are scattered throughout Downtown Kansas City (COR Team 2010). Figure 1-3 shows MARCs land-use data vacant land. In reality vacant is just a land-use term, but traces from the past still occupy the space. Traces could mean historical significance, leftover materials and structures, and contaminated soil and groundwater that often get overlooked or feared. The traces often go unnoticed or ignored for the fear of extra cost, liability, more labor, and site constraints. These traces make urban vacant/underutilized land a potential environmental threat and a health hazard. There is an 85% chance that urban vacant/underutilized land is lightly contaminated (Fitzgerald 2002).

Most construction projects are located on undeveloped land because the process is less complicated rather than go through the process to see if vacant/underutilized urban land is contaminated.

Research Question

How can regional transit within the Rock Island Corridor to Downtown Kansas City catalyze redevelopment of slightly contaminated under-utilized sites in the Jazz and Crossroads Districts in a way that supports the environmental health of the land and promotes cultural values?

Downtown the route follows KCT Railway right-of-way to the south and Truman Road to the north.

-  Highway
-  Railroad
-  Regional Rail
-  Vacant/Underutilized

1"=4000' 

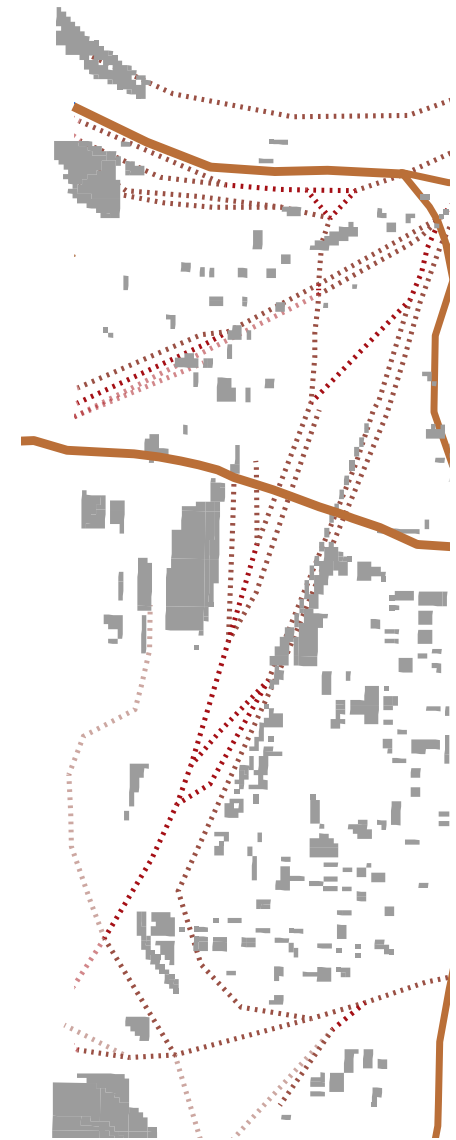


Figure 1-3: Networks (created by author)

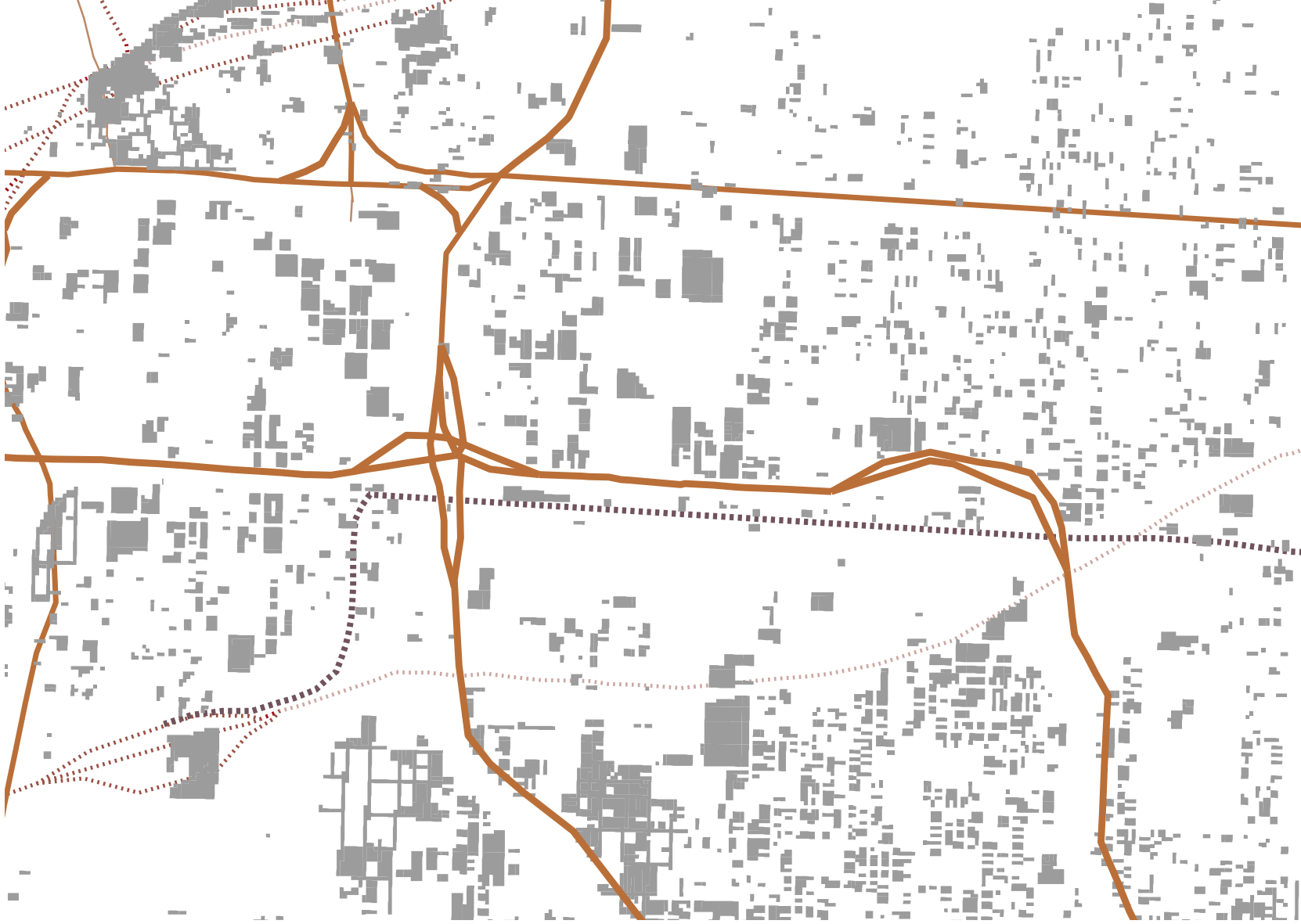




Figure 1-4: Downtown Void in the Middle of the Crossroads (taken by author)





Figure 1-5: Underutilized Spaces with Great Views (taken by author)

Underutilized



Kansas City

Kansas City's Urban Land

From an economic standpoint, greenfield development produces immediate results without considering the environmental impact and social factors of the new environment and the affect on the urban. The new developments direct growth away from the downtown core. Greenfield development is chosen over redevelopment because the land is cheaper, there are fewer site constraints and there is no clean up process or testing for contamination. Fortunately, the land-use called vacant in Figure 1-3 are mostly lightly contaminated and not a threat to human health.

Characteristics of Contaminated Land

Vacant land in this part of Kansas City is mostly comprised of parking lots, which contain polycyclic aromatic hydrocarbons (PAH) from cars, treatments on the pavement, and the pavement itself. PAH exists on the surface because most of the

contaminants are contained on the asphalt concrete. The asphalt itself is a petroleum based product, but even so contaminants are located on the surface. Water can not access the soil and groundwater to spread the contaminants. Within this part of Kansas City, there is not a need for extensive clean up that heavily contaminated sites go through for years to make sure groundwater and soils are clean. The parking lot sites remediation strategies are to contain the asphalt concrete, which is recycled for aggregate and then test the soil is for high concentrations of contaminants.

Other vacant land in Downtown Kansas City are places that store materials and trucks. The sites contain a variety of different contaminants from various materials. Therefore, clean up requires a more thorough and site by site, spot by spot clean up. Each site contains different concentrations of different contaminants located in specific areas of

the site known as hot spots (Hollander 2010). Different treatments are used for different contaminants. If the site only contains hot spots, then not necessarily the whole site needs remediation.

Treating Contaminants

Usually contaminated soils are removed. In this project the strategy treats contaminants on site with phytoremediation. Treating contamination in different innovative ways is the piece that ties the project together to change from past practices. It creates a more sustainable clean up and sustainable community.



Figure 1-6: Above Ground Storage Tanks (taken by author)



Figure 1-7: Underutilized Blacktop (taken by author)



Figure 1-8: Materials Dump Site (taken by author)



Figure 1-9: Character of Industrial Area (taken by author)

Connection to MARC

From Vacant Land to Community

Kansas City's underutilized urban land used together counteract the lack of green space and control stormwater runoff, social and cultural identity, and economic opportunity for the community, district, and region. The underutilized land is important now because of the regional growth and constraints occurring within the next thirty years according to MARCs projections.

Vacant land has the potential to connect to the Greater Kansas City regional rail and linear trail system, potential to cater to the new 750,000 residences within the next thirty years, the potential to enhance the ecological quality for the betterment of the community, and the potential to create a unique social community proposed in this report.

MARC Creating Sustainable Places

This report started with regional concerns and strategies addressed by MARC (Mid America Regional Council). MARC's initiative is to create vibrant, connected and green centers and corridors that cater to the economy, society and environment. The report expands on those ideas.

Based on those initiatives I determined three levels to examine: regional, district, and neighborhood scale and how these three scales coexist for a sustainable region and sustainable site to connect to the over arching goals of the region proposed by MARC.

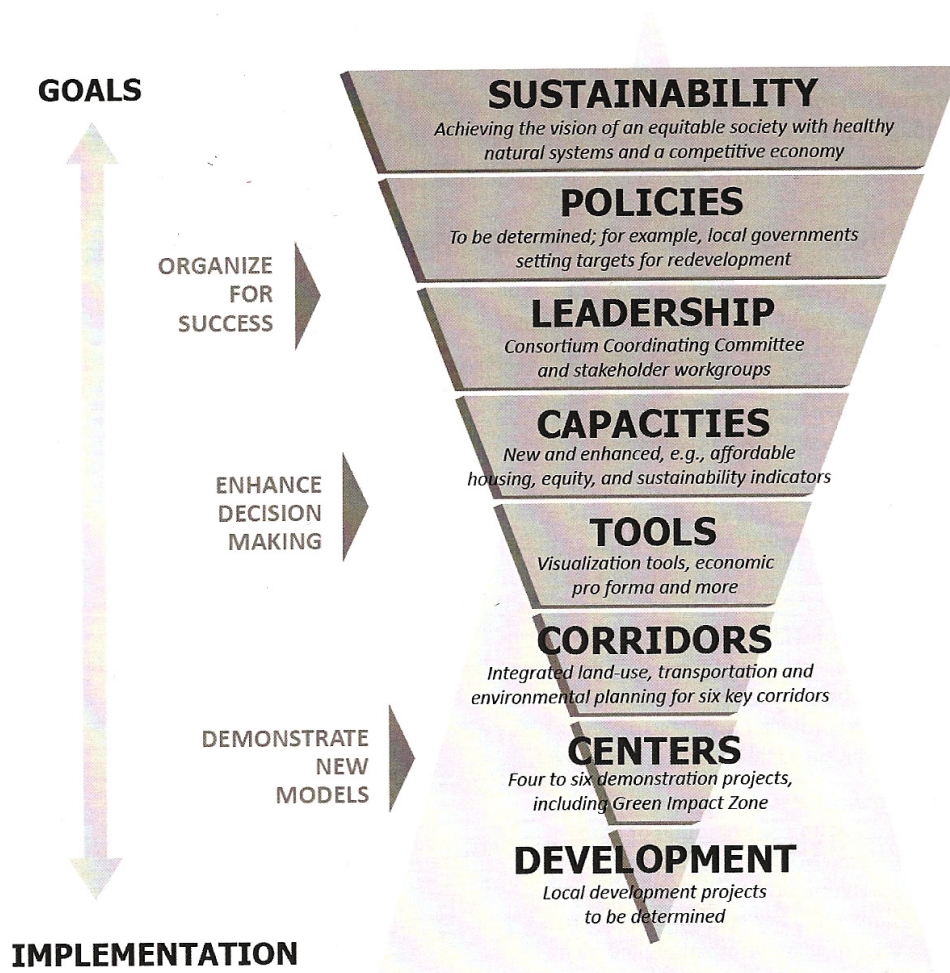


Figure 1-10: MARCs Initiative (created by MARC 2011)

Master's Project Initiatives

Initiative

What is going to happen to Downtown when a multi-modal system consumes Greater Kansas City and activates spaces the highway system forgot? The transit and park system are a catalyst for ecological enhancement, social interaction, and an economic generator that the vacant/underutilized spaces could accommodate.

My approach analyzes the regional rail line from the Jazz District to the Crossroads District and how the vacant land could best cater to the corridor and the community. After analyzing the Jazz District and the Crossroads District, the analysis directed to the Crossroads Station as an area of interest. There is a large cluster of underutilized spaces around the transit stop to use together for a greater good rather than focusing specifically site-by-site basis.

The use of vegetation is a driving force that will enhance the overall ecological quality for optimal usage of the community as a transit-oriented development on the Rock Island

Corridor. Vegetation serves as a sustainable measure to control current vacant/underutilized spaces and toxins produced in the future, while creating an identity for the neighborhood.

Thesis

By recognizing the patterns of past industries, a plan created to enhance the ecological quality with community needs for now and the future as a way of healing the environment and connecting city life back to the environment. It creates a network that links the pedestrian to public life from Ecosystem Services and transit that the Rock Island Corridor has to offer. The Crossroads Station supports sustainable preventative/remediation strategies and redevelopment unites the Rock Island Corridor, multi-modal transit, Metrogreen, character of place, and city life. It blends site suitability with community needs, while creating a cleaner more efficient environment that is aesthetically appealing.



Figure 1-11: Hazardous Waste Producer (taken by author)



Figure 1-12: On Brownfield List (taken by author)

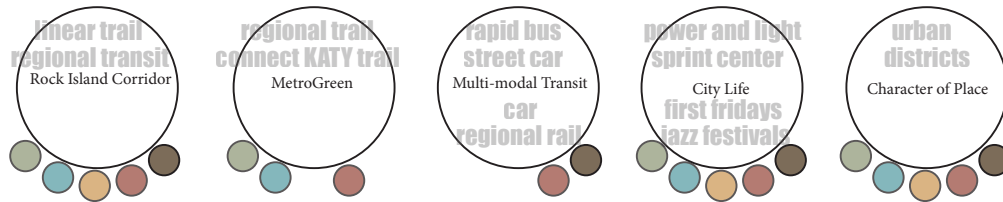


Figure 1-13: Site with Certificate of Completion (taken by author)

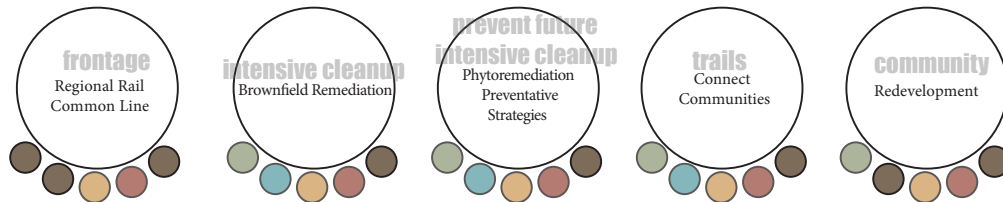
DILEMMAS



REGIONAL INITIATIVES



STRATEGIES



VISION

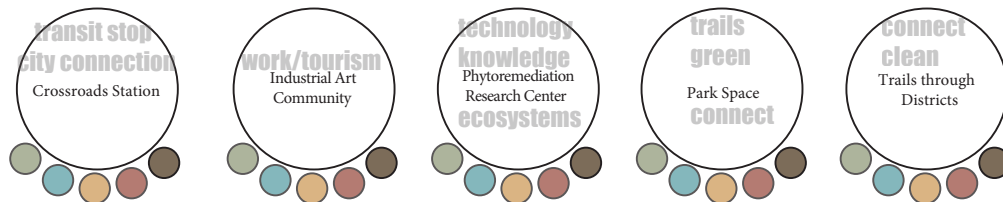


Figure 1-14: Thesis (created by author)

Goals

1. Connect transit station in the southern Crossroads to the phytoremediation brownfield strategy for community needs and surrounding hazardous waste producers.
2. Counteract the possible contaminants from Industrial Arts Community (proposed) and surroundings to decide correct remediation strategy and the time length for remediation while fitting into the context of the community and bring back ecological quality.
3. Contain potential brownfields into usable space through the remediation process and into future usage. It could serve as pocket parks, trails to transit stations, and outdoor recreation then overtime potential future development.

4. Connect, contain, and counteract through a phasing plan from soil amendment, to planting design, to monitoring, to removal, and future usage of sites.
5. Counteract stormwater problems through the phytoremediation strategies and retention and detention areas.
6. Connect a pedestrian oriented environment through easy access to multi-modal transit, amenities, and trails.
7. Connect historical identity and enhance the character of place and aesthetical quality.
8. Contain recycled materials to promote on site clean up and new ways to reuse that can help the community.

Guiding Principles

- Promote mixed use
- Fit into context with identity (building heights and materiality)
- Pedestrian oriented design
- Site sensitive design
- Sustainable clean up while in use to prevent more brownfields

	GOALS	FACTS	CONCEPTS	NEEDS	PROBLEMS
FUNCTION people activities relationships	transit stop housing/hotel green space pedestrian oriented mixed-use multi-modal trails	walking distances number of people needs of community footprint of usages	multi-modal transit stops using remediation for more than face value pedestrian scale design complete streets	connection to downtown and Rock Island Corridor	barriers of highway unknown city and MARC usage of some properties
FORM site environment quality	enhance ecological keep character native species phytoremediation	remediation strategies existing plans on character city plans	brick buildings under 75' historic relationship native vegetation for human comfort and energy poplar tree groves	economical materials ecological quality	don't have enough density yet to support system
ECONOMY initial operating life cycle	costs in terms of ecosystem services construction energy life cycle of remediation	government funding for remediation tax credits industrial development bonds groundwater mitigation fund state funding brownfield insurance redevelopment programs	use government funding then provide revenue for government phasing for best economic output phytoremediation life cycle	government approval	not on EPA list not enough government funding
TIME past present future	mitigation for each site lifespan of industries in use rezoning construction start of light rail phasing all pieces uniting past practices with new	phase 1, 2, 3 facts about industries industries projections brownfield information timeline of MARC timeline and data from city	gradually introduce rail and brownfield sites while not looking unfinished (self-sustaining)	flexible usage	uncertain development Alternative Analysis in May

Table 1-15: Pena Diagram (created by author)

The analysis operates at three scales: region, districts, and neighborhood to create better connectivity. The regional scale helped determine the local scale and design of the project. The chapter is organized from regional scale, district, and neighborhood. Each addresses important findings that helped shape the project.





Analysis

REGIONAL: History

Cause of Vacant Land

Over the years people and businesses moved to the fringes of the city that left several vacant/underutilized spaces downtown especially in the Jazz and Crossroads Districts where most of the small industry was located. Many of these sites received the brownfield reputation because previous usages left contaminants or the fear of potential threats to human health, liability issues, cost, and development constraints. As the city grows and potential regional rail system unites the Greater Kansas City Area, there is going to be a demand for these vacant/underutilized areas for transit and growth along the Rock Island Corridor. A multi-modal transit system and reuse of vacant/underutilized spaces can repair the urban fabric that was destroyed by the highway system and contaminants whether the threats are real or perceived. As the infrastructure is reaching its life expectancy or capacity, it is time to think of alternatives to create a strong connected downtown that Kansas City once had.

Historical Reference

In the 1800s two settlements sparked the growth of Kansas City: one along the Missouri River and the other one called Westport (Kansas City Missouri 2010). Transportation corridors such as the railroad and soon to follow Kansas City's Boulevard System created by George Kessler connected the centers. It changed as the needs of Kansas City and the region altered after World War II to highway driven development that allowed industries and development to move to the fringes. Downtown Kansas City lost its roots as a transit and industrial influenced city and became a commuter city encompassed by highways. Railroads are still used for transportation of goods and are expected to increase freight use by 40 to 60 percent nationally in the next twenty years (Missouri Department of Natural Resources 2009). Rock Island Corridor is currently an inactive corridor that is not necessary or limited by freight usage that could accommodate passengers. The use of the corridor creates a separate railroad system

specifically for passengers that will not interfere with freight. The rail provides a system that has no time limitations while providing connections to other forms of transit.

Take Away Message

The multi-modal system encourages people to go downtown rather than drive around the confusing Downtown Loop. Also, other systems allow more space for other usages rather than parking lots because less automobile traffic. A multi-modal system encourages vibrant life the city had before it became a commuter oriented city that took away the rich character of each district especially the two districts the regional rail stop through before Union Station (Jazz and Crossroads).

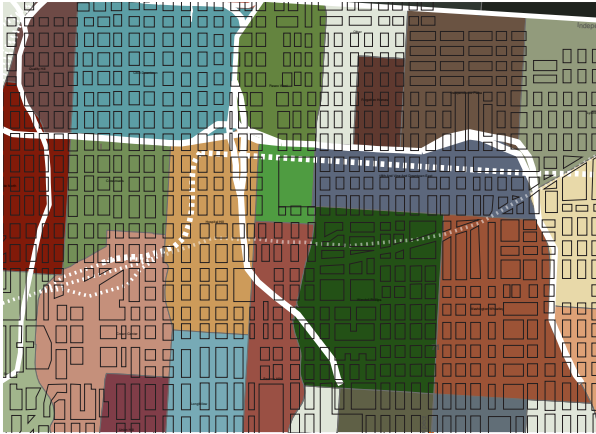


Figure 2-1: 1907 Street Grid (MARC GIS Data adapted by author)

In 1907 Kansas City had a strong grid that accommodated all modes of transit.

- City Blocks
- Jazz District
- Crossroads District
- Central Business District
- Hospital Hill
- Union Station

1"=5000'

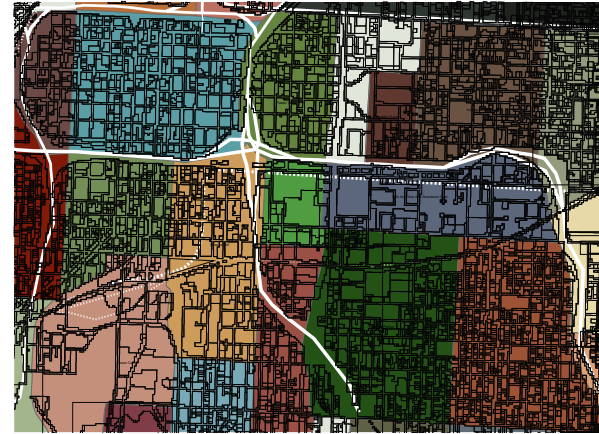
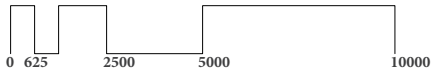
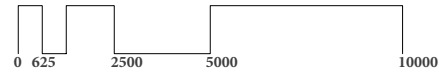


Figure 2-2: Existing Street Grid (MARC GIS Data adapted by author)

Current urban fabric after highways decreased unity between districts.

- City Blocks
- Jazz District
- Crossroads District
- Central Business District
- Hospital Hill
- Union Station

1"=5000'



REGIONAL: Land Use



Figure 2-3: Developed Land (MARC GIS Data adapted by author)

In the Central Business District and Crossroads there is little green space left.

- Developed*
- Trees*
- Grass*

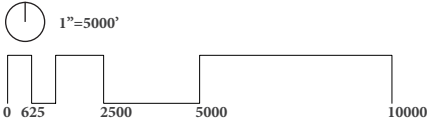


Figure 2-4: Connections to MetroGreen (MARC GIS Data adapted by author)

MetroGreen and parks serve as vital connections to the light rail to unite the system at a pedestrian scale.

- MetroGreen*
- Parks*
- Activity Center*
- Historical Center*

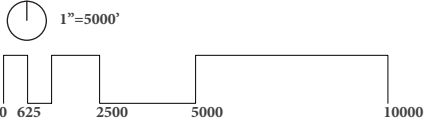




Figure 2-5: Economic, social, and ecological (MARC GIS Data adapted by author)

The area of study is a strong economic producer surrounded by living and social activities.

- Economic
- Social
- Ecological

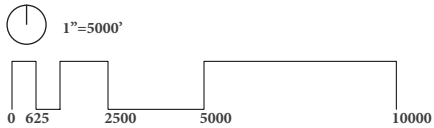
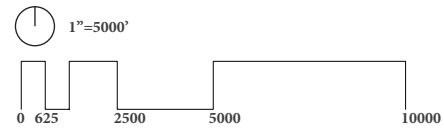


Figure 2-6: Future Land Use (MARC GIS Data adapted by author)

Future land use keeps its strong industrial roots to the southern border while promoting mixed use.

- Industry
- Commercial
- Green Space
- Residential
- Institutional
- Vacant Land



DISTRICT: Route

Truman Road

The area was once strongly connected before highways, social structures, and industry divided Crossroads and Jazz districts. In the middle of the two districts are metal industries with patches where industries were located. Highway 71 built in the early 1990s physically divides Jazz District from Crossroads District. Since highways and railroads cater more to a region than local access, it spurred more regional businesses rather than cater to the needs of the community along Truman Road in the Jazz and Crossroads Districts (PGAV 2000). For instance mail distribution center and several auto-repair shops.

Truman Road's decline of an arterial road to a side street running parallel to I-70 left numerous decaying and vacant buildings with most of the buildings over 30 years old and need improvement to keep up with modern times. The lots are narrow and aren't large enough to support the size of

new commercial and retail needs (PGAV 2000). It makes it difficult for new development. Truman Road is important not only for possibly supporting the Common Line, but it links the Central Business District, Crossroads District, and the Jazz District elevated above I-70. With the new usage as part of the regional rail, Truman Road will serve as an arterial road once again and support a regional rail with a vibrant community that this area was known for in the early 1900s.



Figure 2-7: Truman Road (taken by author)

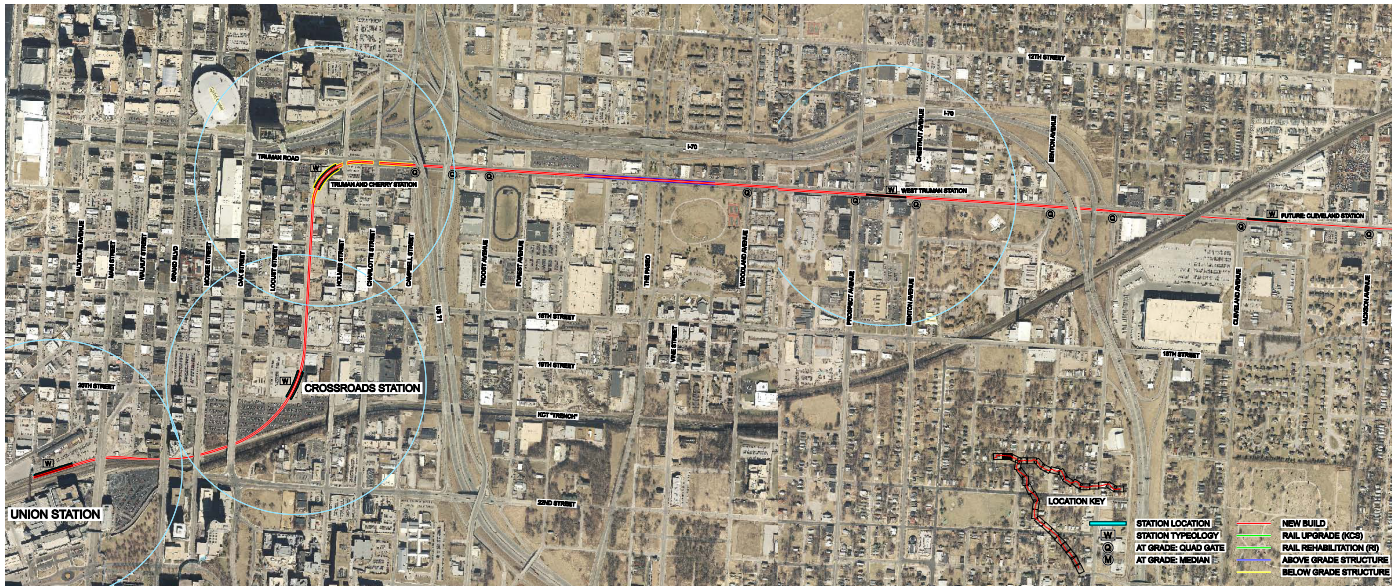


Figure 2-8: Map of Characteristics (Transystems 2011)

Truham Road is surrounded by small auto repair shops and lacks much diversity.



Not to Scale

DISTRICT: Underutilized Land

Character of Districts

The problem is the conditions of the approach of the Rock Island Corridor's Common Line. The Common Line serves as the eastern gateway to Downtown. The Common Line runs along Truman Road then turns south on Cherry Street. The Line runs in two strong cultural districts of Kansas City: Jazz District and Crossroad District, but the character isn't shown around the corridor.

The current conditions around the Common Line contain scattered commercial and industrial businesses with many vacant lots scattered throughout. Some are designated under Missouri's Department of Natural Resources' Voluntary Cleanup Program and Hazardous Waste Producers. Also, there are vacant/underutilized properties not on the list but could be potential brownfields that could be a hazard or essential to the growth of Kansas City.

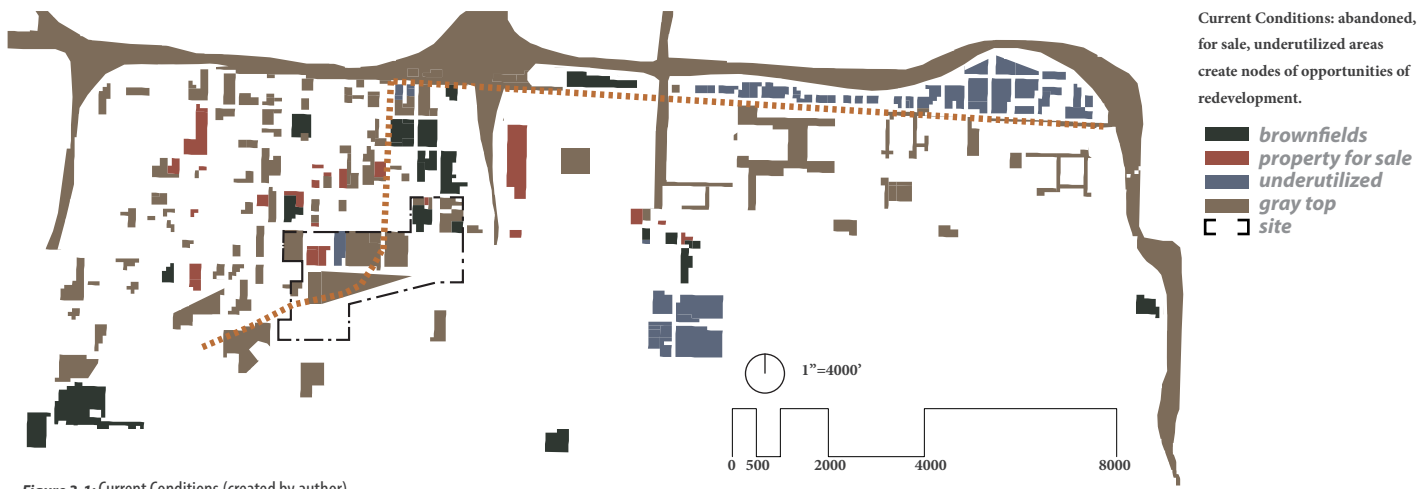


Figure 3-1: Current Conditions (created by author)

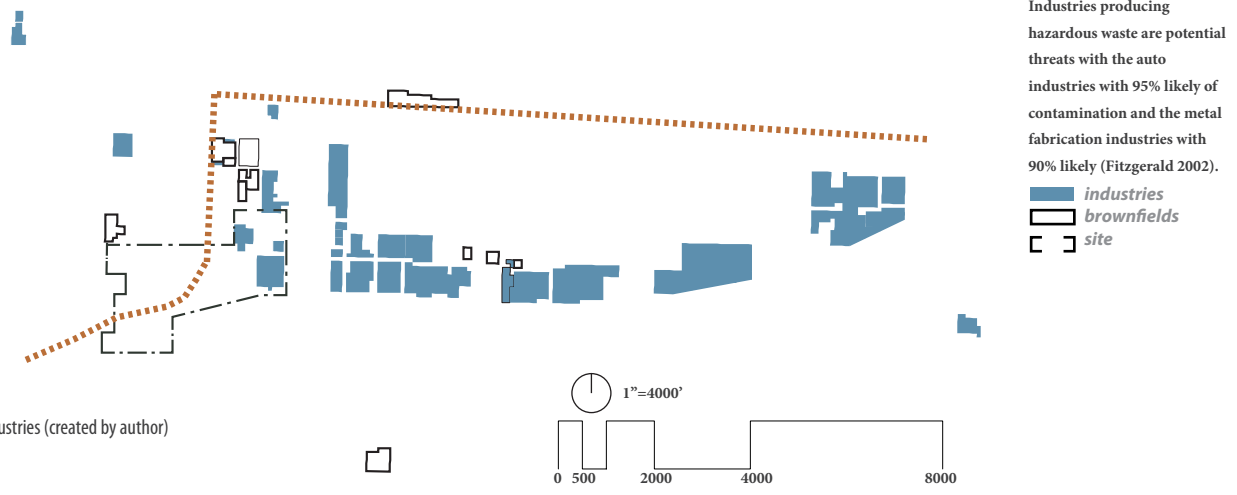


Figure 3-2: Current Industries (created by author)

DISTRICT: Conditions

Jazz District

The Jazz District has seen a lot of changes over the years. It has a strong industrial influence and African American culture. The Jazz District started in the 1800s as an African American Neighborhood (Jazz District Redevelopment Corporation 2011). It reached its peak in the 1930s and began its decline in the 1950s. The segregated area began as far south as 27th street to as far east as Troost. It was a self-supporting community (Jazz District Redevelopment Corporation 2011). Unfortunately, some of its historical buildings were put on the brownfields list such as the Paseo YMCA where the Negro League Baseball was founded in the 1920s. Other historical buildings still have movie set facades from a film made in the 1990s along historic Vine Street. The Jazz District has great bones for redevelopment because it has a larger population, larger household size, and great connection to green space than the Crossroads provides.

Crossroads District

Crossroads has underutilized areas that could support a larger population. It reached its lowest population in the 1970s (Osborn 2003) and still doesn't have a large density for its urban context. In attempt to create new housing many old warehouses were converted into lofts. Western Auto loft used to be the Coca-Cola Building, Firestone Building, now Futon; 1819 Baltimore used to be KC White Goods Manufacturing Company; Stuart Hall Building was the NaBisCo bakery, and the Freight House District is now restaurants and shops (Osborn 2003). This conversion gave the area a new identity as an incubator space for young professionals to live, work, and play. The arts in the area boomed with the help of First Fridays for people to view the crafts of people in the area. The life of this area just dies before the proposed Crossroads Station to the west just before highway 71 where it is trapped by railroad tracks to the south where Hospital Hill/Crown Center are located.

Hospital Hill/Crown Center

Currently Hospital Hill uses the Crossroads Station for employee parking. Hospital Hill contains Truman Medical Center, Children's Mercy Hospital, and University of Missouri-Kansas City School of Medicine. Also, on the hill are Crown Center and the World War I Memorial that bring lots of visitors. Crown Center served as a redevelopment project to create activity surrounding the Hallmark Headquarters.

Hospital Hill has great views of the Central Business District along with the Crossroads, but lacks physical connection to Jazz and Crossroads District. A rail trench completely cuts off Hospital Hill from anything to the north. There are limited bridge connections with narrow sidewalks along the road. It is important to connect it to the Jazz and Crossroads because the employees of Children's Mercy Hospital utilize those districts for parking and come from the site to Hospital Hill.



Figure 2-11: Jazz District Multifamily (taken by author)



Figure 2-12: Jazz District Single Family (taken by author)

The images above are new housing projects within the Jazz District. The area contains a wide variety of options from single-family to multi-family projects.



Figure 2-13: Crossroads District (taken by author)



Figure 2-14: Stuart Hall and Freight House (taken by author)

The Crossroads District has great character, but the in-between spaces are left as voids (top image). A solution to the underutilized spaces was to turn older buildings into lofts such as Stuart Hall and create new dining in the Freight House (bottom image).



Figure 2-15: KCT Railroad (taken by author)



Figure 2-16: Hospital Hill/Crown Center (taken by author)

The KCT Railroad is difficult to cross to get to Hospital Hill/Crown Center (top image). The bottom image shows one of the bridges to get to Hospital Hill and Crown Center. The sidewalks are narrow with no buffer to traffic.

DISTRICT: Demographics

Connecting and Separating Districts

The Jazz District increased in multifamily and single family housing in adjacency to activity centers. It is paving the way for improvements in transportation, new jobs, and activities that the Rock Island Corridor can provide. The Jazz District and the Crossroads District offer rich history the Common Line could enhance by bringing in new opportunities of development and bring people into the rich culture. Also, providing physical connections to Hospital Hill to utilize the high traffic it could provide the rail line and the area around the Crossroads Station.

Through the synthesis of the demographics, it helped inform additions to the neighborhood scale to not only accommodate the new rail line, but to the people who live there and will live there in the future.

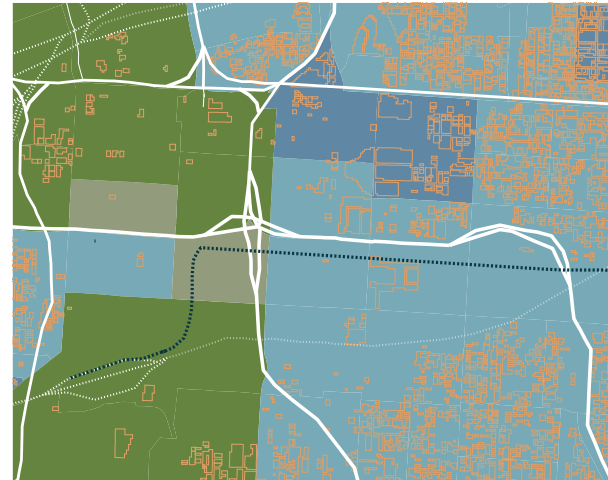
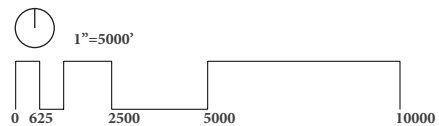


Figure 2-17: Household Size (MARC GIS Data adapted by author)

Household size is larger in the Jazz District than the Crossroads and Central Business Districts.



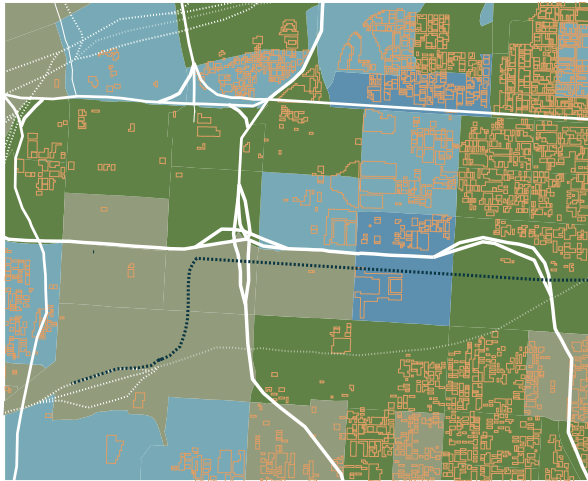


Figure 2-18: Population (MARC GIS Data adapted by author)

In the year 2010 more population existed to the northeast.

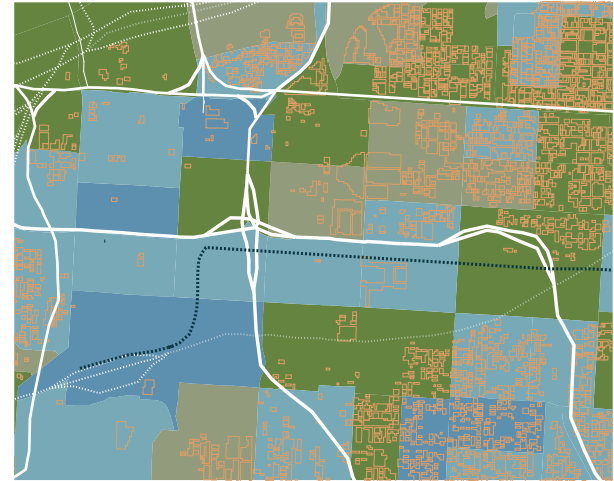
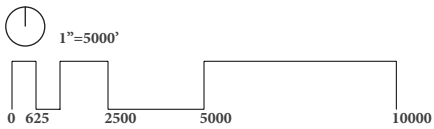
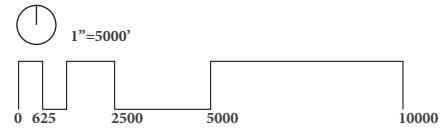
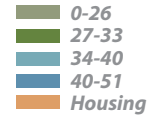


Figure 2-19: Age (MARC GIS Data adapted by author)

The average age is younger in the Jazz District.



DISTRICT: Contaminated Land

Barrier in Districts

Although the three Kansas City districts offer framework for new growth. There is still a large barrier that prevents the growth from happening: brownfields and potentially contaminated spaces.

Missouri Department of Natural Resources identified 24 sites within the Jazz and Crossroads Districts as brownfields. Missouri's Voluntary Clean Up program successfully identified contaminants, and 17 out of the 24 sites received the Certificate of Completion. The Certificate of Completion signifies that there is no longer any need for remediation. The site is ready for reuse.

Rather than just aiming for the certificate and removing contaminated materials, these sites collectively could enhance the ecological quality and influence it has on the neighborhood while it is being remediated. While most of the sites contamination isn't in large concentrations or very harmful, the remediation doesn't need

to be intensive which allows for more innovative techniques and no need to clean up in a certain amount of time. Most of the contaminants are related to oil, asbestos, and metal because of its past usages. Light oil and metal contamination could easily be cleaned up through phytoremediation, which uses specific plants that can absorb those pollutants. It prevents the contaminated soil from being removed and adding to the landfills. Asbestos will have to be removed from site and placed in a hazardous waste treatment facility, but everything else could be treated on site.

The Missouri Department of Natural Resources' Voluntary Cleanup Program provides oversight for the cleanup of all Brownfield Redevelopment sites in Missouri, whether state or federally funded. The department found, after studying 50 projects completed under the department's oversight in the Brownfields/Voluntary Cleanup

Program, the redevelopment resulted in 11,053 new jobs and over \$2.2 billion in investments. Missouri Department of Natural Resources 2010).

The Missouri Department of Natural Resources achievements of new jobs and investments are precedents of how it could be used for the Crossroads Station. It is proof that good can come from these projects and can continually get better as technology and sustainability advance in the future.

ADDRESS	CONTAMINANTS FOUND	SITE STATUS	NAME OF SITE	CERTIFICATION	APPLIED	ACREAGE
1400 Main St., 1401 Baltimore, 1415 Baltimore	Asbestos,Lead	Cert. of Comp. Issued/AULS	KC Live Entertainment District - Block 138	03/16/2014	06/14/2009	1.36
1500 East 19th Street	Asbestos	Cert. of Comp. Issued/AULS	Jazz District - 19th & Paseo	05/10/2010	02/25/2009	0.82
1509-1515 West Truman Road	Arsenic,Lead,Metals	Cert. of Comp. Issued/AULS	Independence Regional Entrepreneurial Center		07/30/2012	15.95
1514 Campbell Street	Asbestos,Heating Oil	Cert. of Comp. Issued/AULS	Kansas City Community Center		11/07/2012	.99
1608 Charlotte Street	Arsenic,Asbestos,Diesel,Lead,Lead-Based Paint	Cert. of Comp. Issued/AULS	Hertz Contractors Supply-Kansas City#2		10/14/2003	2.0
1608 Holmes	Asbestos,Lead-Based Paint	Cert. of Completion Issued	Kirk Welding Supply, Inc.-Holmes		04/22/2012	
1610 E 19th St and 1612 E 19th St	Arsenic,Petroleum - misc,VOCs	Cert. of Comp. Issued/AULS	Jazz District - 19th & Highland	03/14/2011	06/16/2009	0.51
16th & Grand	Diesel	Cert. of Completion Issued	McGrew Color Graphics			0.61
1708 Campbell		Active/Investigation	Eddor Safety (former)		03/04/2015	1.5062
1735 Charlotte Street	Ammonia,Asbestos,Coal Tar,Cyanides,Metals,PAHs,Petroleum	Cert. of Comp. Issued/AULS	Hertz Contractors Supply - Kansas City		09/25/2003	2.45
1735, 1711-1715 Cherry Street	VOCs	Inactive/Withdrew	Unitog Rental (Cintas)-Kansas City		06/11/2013	1.5
1801 Walnut St.		Active/Remediation	Grand at 18th Devco	12/20/2011	04/20/2009	0.22
1816 Charlette		Active/Idle	Buie Brass		12/15/2003	0.3
20th and Indiana	Diesel,Oily Wastes,PAHs,Solvents	Cert. of Completion Issued	Missouri Gas Energy Natural Gas Storage facility	06/06/2005	03/13/2005	1
2440 West Penneway Avenue		Active/Investigation	Carter-Waters Corporation - West Penneway		08/25/2011	3
2530 Southwest Blvd.	Asbestos,Lead	Cert. of Comp. Issued/AULS	Kansas City Terminal Railway Co.	02/07/2008	03/13/2001	0.5
500 West Pershing Road	VOCs	Inactive/Withdrew	Union Station Power House Building		07/09/2012	2.121
814 East 19th Street		Active/Idle	C & D Auto Salvage Company	11/17/2009	01/15/2009	0.5
Michigan Street, Garfield Street, and 24th Street	Heating Oil,PAHs	Cert. of Completion Issued	Quality Heights II	12/02/2001	06/10/1999	6.8
Multiple Addresses - HQ at 2012 E. 25th St.	Heating Oil	Cert. of Completion Issued	Oakland Heights I		02/25/2015	6
Numerous Locations	Asbestos,Heating Oil,Lead-Based Paint,PCBs	Cert. of Comp. Issued/AULS	Kansas City Missouri School District		06/14/2000	0.001
21st and Vine Streets	BTEX,Petroleum - misc	Cert. of Completion Issued	21st and Vine	12/14/2005		
1824 Paseo Blvd	Asbestos	Inactive/Terminated by VCP	Negro Leagues Baseball Museum (Paseo YMCA)	09/13/2009		
2405-2407 Troost Ave		Cert. of Completion Issued	Washington Laundry (former)	05/05/2015	08/23/2005	0.2
2120 Wyandotte	Heating Oil	Cert. of Completion Issued	Wyandotte Investors	11/16/09	09/03/2009	0.3677
		Hazardous Waste Generator	Tension Envelope Corp		12/19/2013	1888
		Hazardous Waste Generator	Wintech Corp DBW Jetalum		10/27/2009	3

Table 2-1: Missouri Department of Natural Resources Brownfield List (Missouri Department of Natural Resources 2012)

List of sites examined through Missouri Department of Natural Resources within focus area.

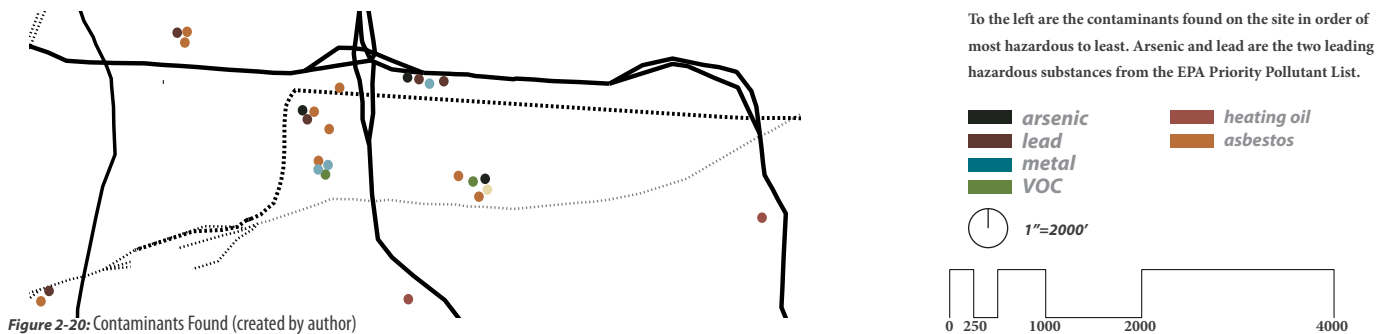


Figure 2-20: Contaminants Found (created by author)

DISTRICT: Potential Brownfields

Unlisted Sites

Many sites are not listed as a brownfield under EPA (Environmental Protection Agency) or Missouri Department of Natural Resources because industries are still in business and were not inspected or qualify for EPA standards. Small businesses don't have the same criteria to meet as large businesses and often get overlooked. EPA's brownfield list only accounts for 10% of the listed brownfield sites in the United States in 1996 (Simons 1998, 33). Most industries in the Jazz and Crossroads Districts are metal and auto industries that are 75 to 95 percent likely to contain some contaminants in the soil (Fitzgerald 2002, 99-100). The hazards the industries make should be planned for to be sure they don't become voids in the urban fabric filled with contamination.

The industries still in the urban core are a potential threat from the production of waste while hurting the ecological and social aspects of a community now

and possibly the future. The industries recycle and dispose of materials like past industries that are now titled "brownfields." This could be the fate of the industries when they are no longer in production. Many of the sites entering the BVCP (Brownfield Voluntary Cleanup Program) are not heavily contaminated, and are contaminated by sources not addressed by any of the Department of Natural Resources' regulatory programs such as Emergency Response, Superfund, Resource Conservation and Recovery Act or Petroleum Storage Tanks. (Missouri Department of Natural Resources 2010).



Figure 2-21: Potential Contaminated Sites (created by author)



Figure 2-22: Potential Contaminants (created by author)

NEIGHBORHOOD: Significance of Brownfields

Current Process

Although sites on the brownfield list acquire federal and/or state fundings, it is a difficult process and takes years to go through all three phases. By examining lightly contaminated sites throughout its lifespan, it prevents at least phase one (total of three phases) of the brownfield cleanup process. It speeds up the process for redevelopment because there are no unknowns of what exists on site and it doesn't require further investigation from the EPA or state brownfield programs.

All businesses should keep records of every process on site to determine potential threats. Examining toxicity in the soils early on will prevent it from becoming a threat for redevelopment.

Future of Brownfields

Rather than leaving these sites and spaces in between as voids, the sites should create a balance for needs of the economy and social aspects of

the community while respecting the capabilities of the environment without depleting its resources for now and the future.

Downtown lacks cohesion and needs a second chance through the use of vegetation to support new growth and provide natural resources for the community. There are many opportunities within the Crossroads and Jazz District to create a vibrant, green, connected community along the corridor through the use of the listed brownfield sites along with the vacant/ underutilized spaces. The patchwork of industries and vacant/ underutilized/ brownfields could create a unique neighborhood that helps local industries while creating an inviting area for visitors and residents while respecting the environment.

Past industries were once strong economic producers and an essential part to how our communities grew, but

now lack social, economic, ecological relevance to the urban fabric. By not developing the sites it is causing more harm than good. It costs the city loss of revenue. It hurts locals' property values and possibly health. It inhibits the environment's functions. By recognizing the patterns of past industries, a plan created now for the future of the current industries can help prevent urban decay and start a new phase of the site as society and conditions change over time.

By identifying sites as a collective whole, some sites can accommodate what another cannot. The sites can help sustain one another economically, socially, and environmentally along with sustaining the Crossroads and Jazz Districts that could eventually influence all of downtown and Greater Kansas City.



Figure 2-23: Hertz (taken by author)

Hertz lots are contaminated but still used for storage of equipment.



Figure 2-24: Lot on Site(taken by author)

Lot used to store materials.



Figure 2-25: Storage Lot(taken by author)

A once beautiful building now boarded up and the lot used as a parking lot for large trucks.

NEIGHBORHOOD: Site

Finding the Crossroads Station

After analyzing the approach of the Rock Island Corridor, the site was selected. The reasons I chose Crossroads Station is its adjacency to the corridor and transit stop, cluster of underutilized lightly contaminated urban land, need for redevelopment, area that could connect districts, and close to hazardous waste producers.

In amidst this divided land just east of Highway 71 there is a possible transit station: Crossroads Station. Within a five-minute walk time, most of the land is at risk for possible contamination. With the indicators known, the sites for the Crossroads Station are lightly contaminated and could easily be redeveloped through phytoremediation strategies and removal of materials.

There are roughly 1400 parking spots where the route bends before Union Station. The lots are uncomfortable with solid spans of asphalt with no trees and no clear connection to its surroundings.

Not only the heat island effect is an issue, but also with this large span of asphalt the oils from the vehicles drain to the streets when it rains. The parking lots are bounded by three bridges that span to Hospital Hill/Crown Center. The Oak Street Bridge cuts the site in half, but is the taller of the three bridges that it is easily accessible underneath.

The eastern portion of the site contains industries creating hazardous waste, which is a concern over time.

The listed constraints are the framework to my project to capitalize on those restrictions to make a unique site through the use and knowledge of what is existing.



Figure 2-26: Locust Street (taken by author)

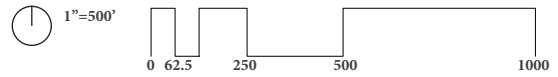


Figure 2-27: Oak Street Bridge (taken by author)

The top image shows Locust Street facing north. The bottom image shows the Oak Street Bridge spanning over the parking lot.



Figure 2-28: Site (Google Earth created by author)



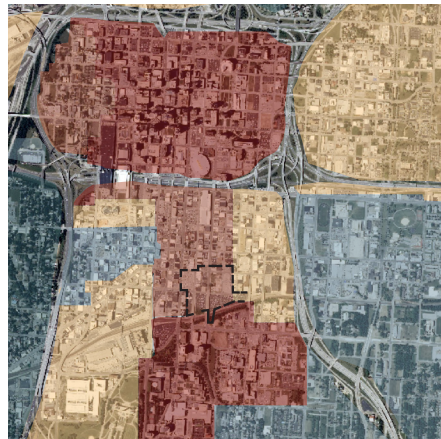
NEIGHBORHOOD: City Regulations

Site Regulations

The site is situated at a low point between the Central Business District and Crown Center/Hospital Hill. The site is surrounded by great skyline views with the Central Business District to the northwest and a clear view of Crown Center directly south. In order to preserve the views, within the area there is a set building height restriction.

The site has much potential to control contaminants, preserve views, help locally owned companies, support a transit station, and new incubator space for this growing community because of its location in the city context.

The area has room for development that can frame current conditions while providing new connections.



Building height restrictions established by the Kansas City to protect viewsheds.

- no max height
- 130' max
- 75' max
- 55' max
- 35' max

1" = 5000'

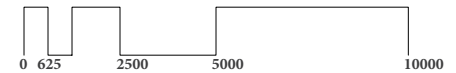


Figure 2-29: Building Heights (adapted from Kansas City Missouri 2010)

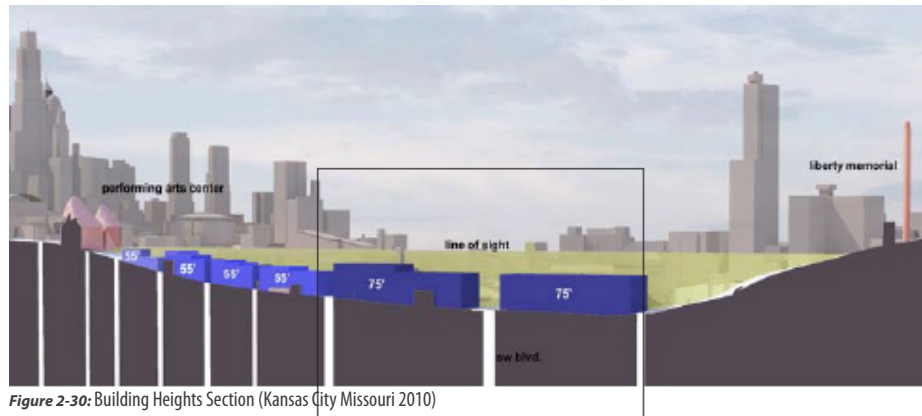


Figure 2-30: Building Heights Section (Kansas City Missouri 2010)

Section how it fits into the greater scheme of downtown.

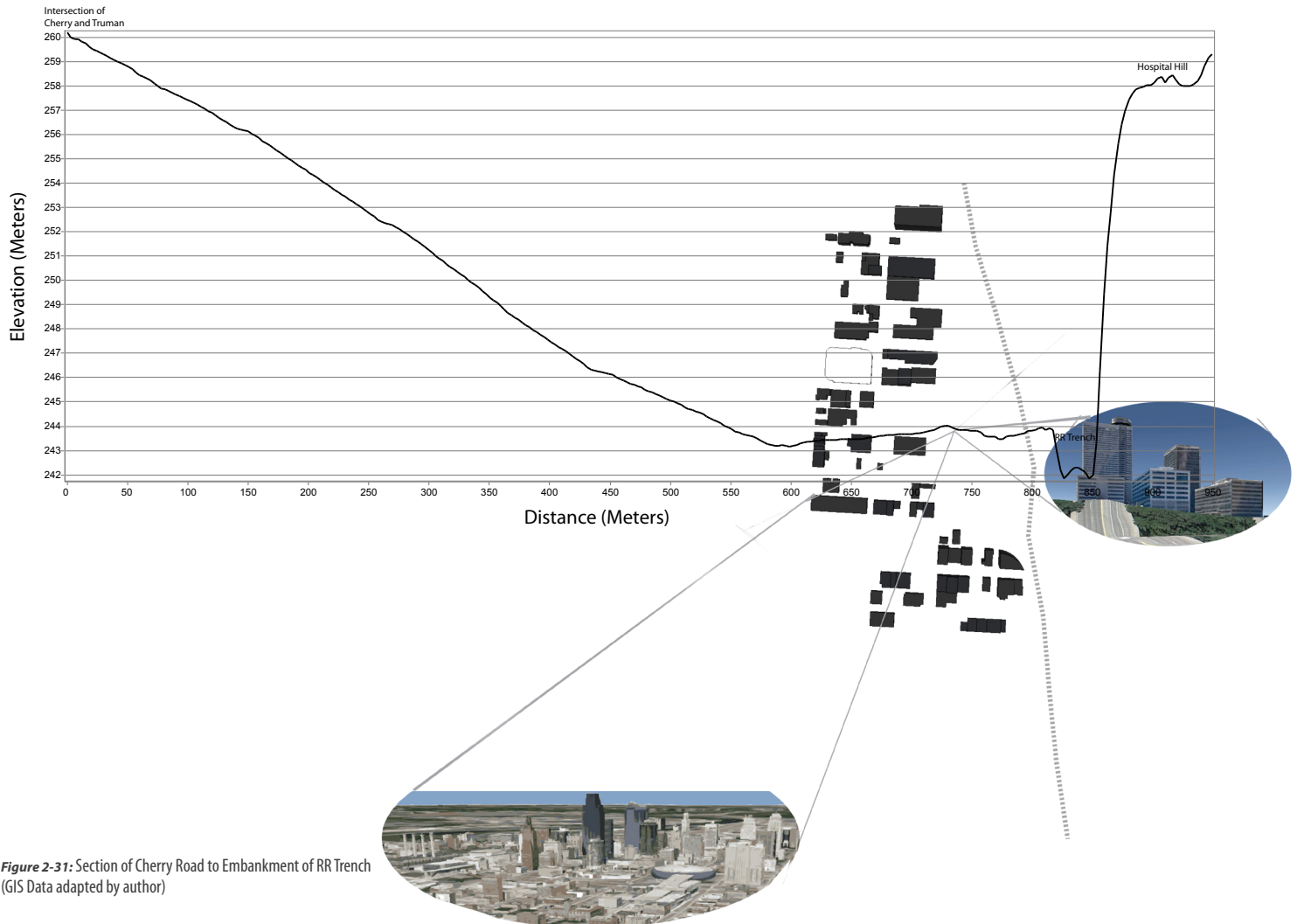


Figure 2-31: Section of Cherry Road to Embankment of RR Trench
(GIS Data adapted by author)

NEIGHBORHOOD: Collective Action

Current Setting

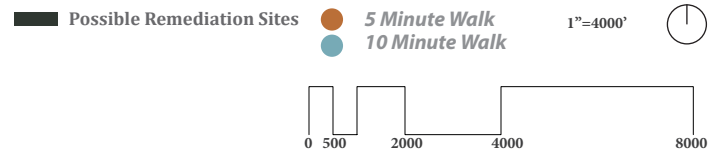
The surroundings currently are not suitable for pedestrians and lack connection to important places within a five-minute walk radius. The places in close proximity are companies with less than ten employees. Other companies are hazardous waste producers such as Tension Envelope producing Volatile Organic Compounds (VOC) and light industrial companies producing metals surround the site that could potentially be an environmental or health threat.

The overall strategy is to connect transit, nature, and activity through preventive and remediation strategies. By remediating collectively instead of site by site, it creates an opportunity to connect the community to the possibly contaminated land for the greater good of the environment, economy, and social benefits. It will also help protect the small industrial businesses.

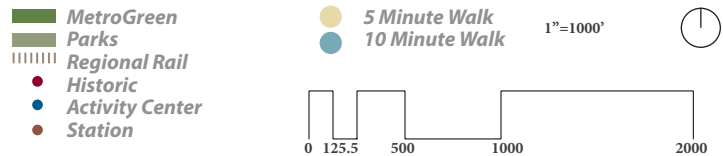


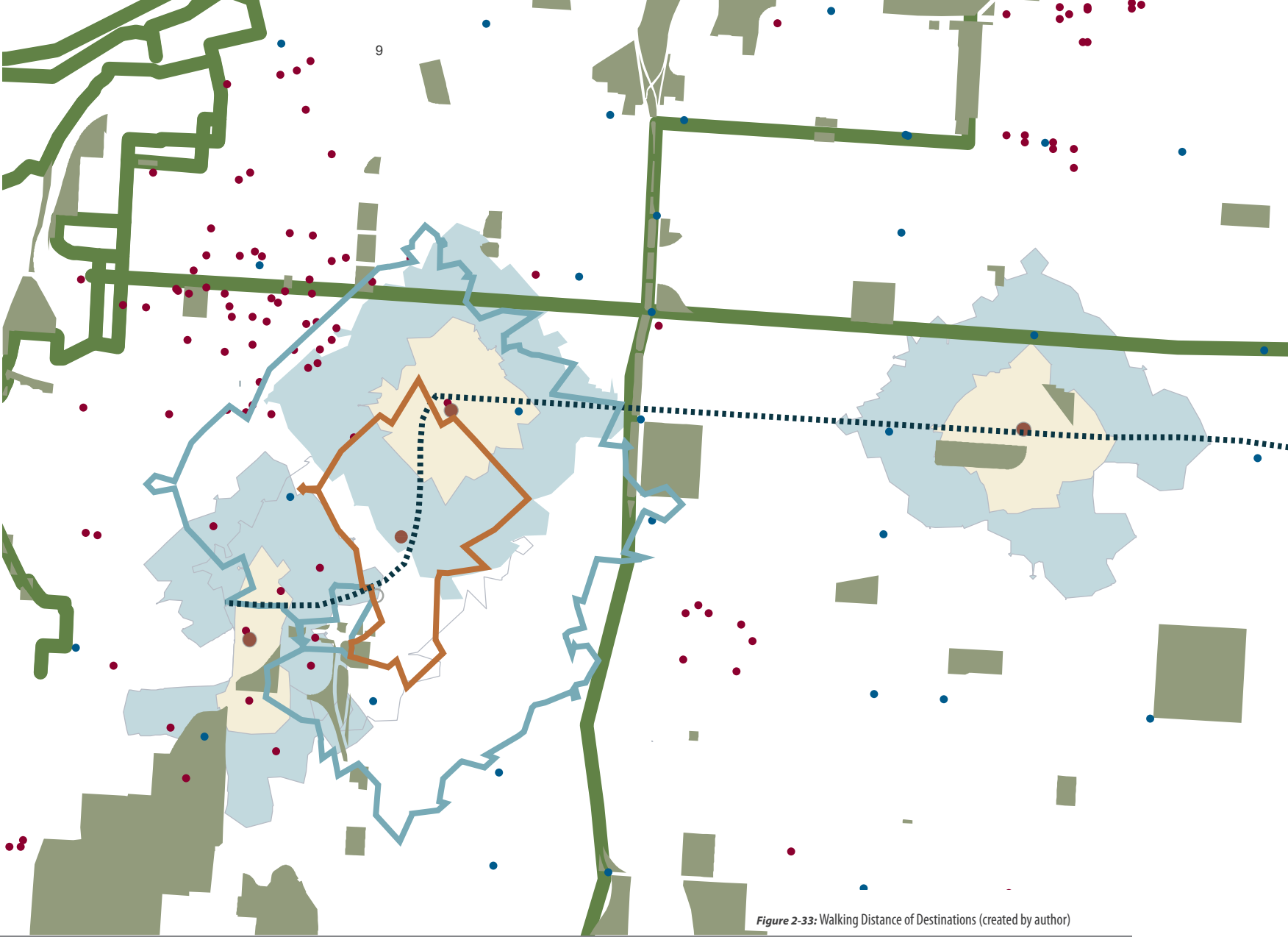
Figure 2-32: Possible Remediation Sites (created by author)

Remediation Sites used together creates a walkable community and easy access to the light rail.



Along the regional rail lines there are central destinations that allow walking distances various activities.





9

Figure 2-33: Walking Distance of Destinations (created by author)

Based on the analysis , five strategies emerged to create the connectivity between the region, districts, and neighborhood. The strategies are transit, brownfield remediation, phytoremediation preventative strategies, connections, and development.





Strategic Framework

Strategy Summary

The Crossroads Station design is further advanced with the understanding of the overall goals to connect to the Rock Island Corridor, MetroGreen, multimodal transit system, city life, and character of place.

The design encompasses five strategies for the common good of creating a sustainable place that fits into the three contexts: regional, district, and community. The prevention strategy occurs third, but it is the glue that holds everything together. It creates a unique environment along the transit line that can withstand the harsh conditions of an urban environment as the city evolves over time.

Regional Transit

Regional transit serves as the catalyst that makes the sustainable place possible. The rail line provides access to the site and allowed for a transit stop to activate the site.

Remediation

Remediation allows for new growth.

The analysis of the conditions of Jazz and Crossroads District requires at least phase one of Missouri's brownfield process. Some see brownfields as constraints that it takes longer and costs more, but the remediation can create green space either temporarily or permanently.

Prevention

Prevention strategies stop brownfields from happening in the future because it is continually being cleaned by phytoremediation. Phytoremediation is a long process to clean the soil, but if put into action now, it will not require much time during the actual clean up process. In return it allows new usages to replace old ones faster.

Connect Districts

Connecting districts allows for access that was separated over time and allows for strategies to span over a larger area. The connection is through the phytoremediation areas that allows for trails.

Redevelopment

Redevelopment allows for infill and encouragement for people to invest in downtown. It is possible when land is now available to be reused after remediation.

Strategies Create Vision

Crossroads Station is a new activity center while catering to the exiting industries. It is a part of the redevelopment strategy, but is a larger strategy to encompass all five strategies.

Through the understanding of brownfields and contamination, preventative and remediation strategies can be used to develop park space, new growth, and cater to the strong industrial influence. It creates better cohesion through preventative/ remediation strategies. The goal is the sites can withstand the contamination overtime.

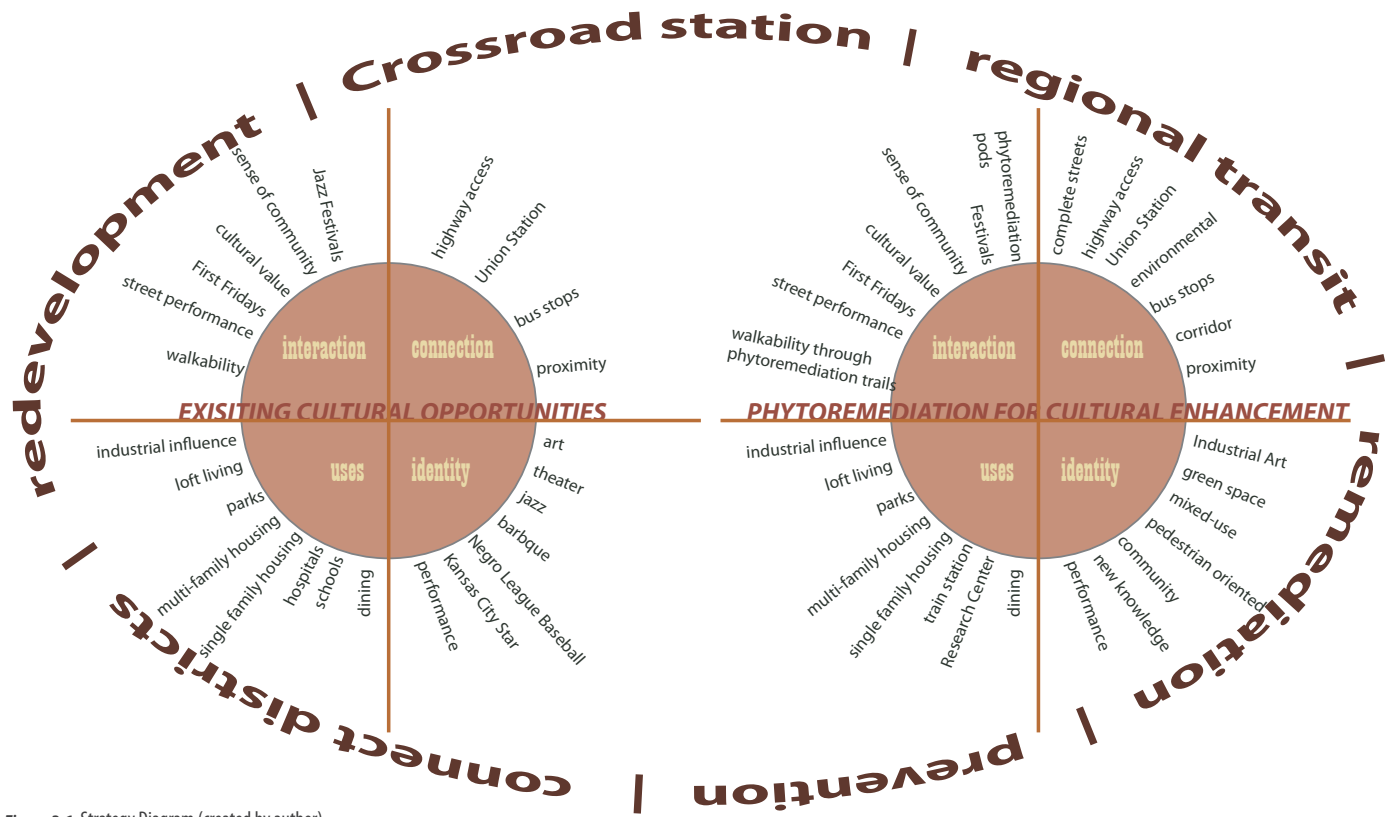


Figure 3-1: Strategy Diagram (created by author)

Through the five strategies to create the Crossroads Station, it enhances existing character of place by creating new ones through phyto remediation. The phyto remediation strategies enhance the cultural value of the area.

Regional Transit

Regional transit makes the trails, and growth possible. Not only are the phytoremediation networks plants to contain contaminants, but it also allows pedestrians access to Crossroads and Jazz districts three transit stops because the phytoremediation allows for trails.

Through the analysis in the previous chapter, the sites are identified for new usage that the transit helps activate. The rail allows for opportunities for activity centers, green space and trails, living, employment, and allows Kansas City to stand out from the rest of the cities with a unique identity.

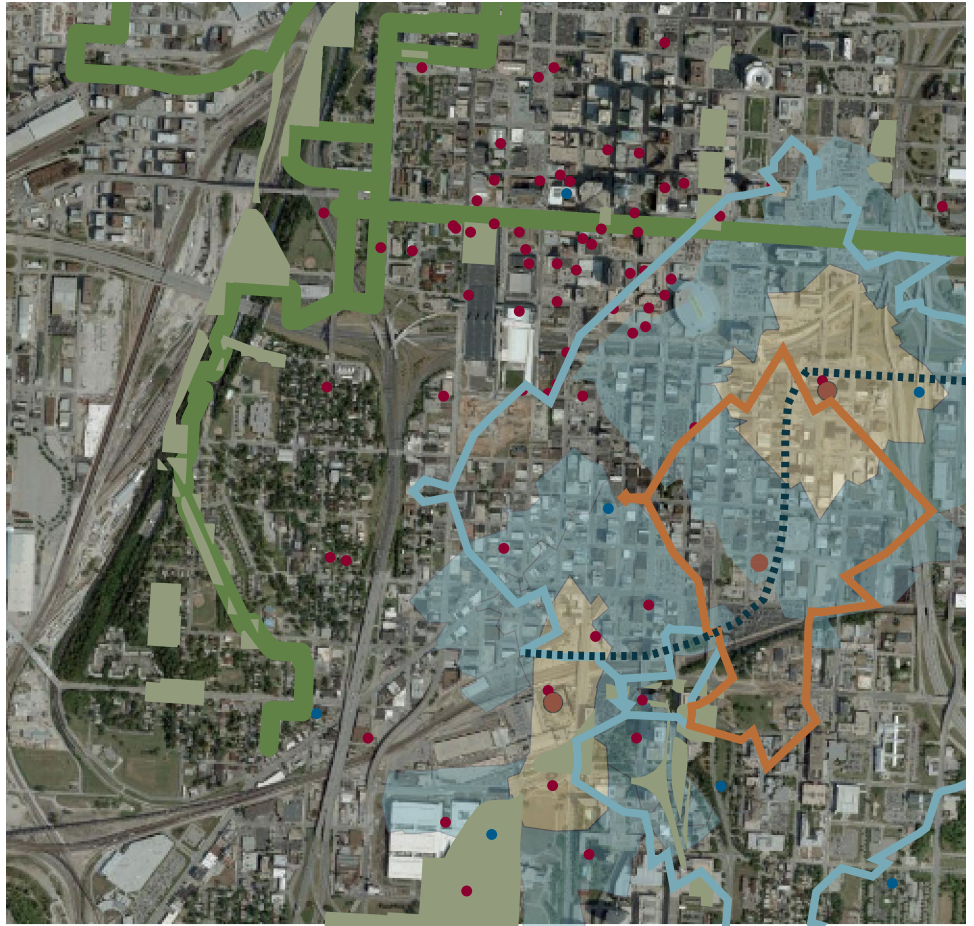
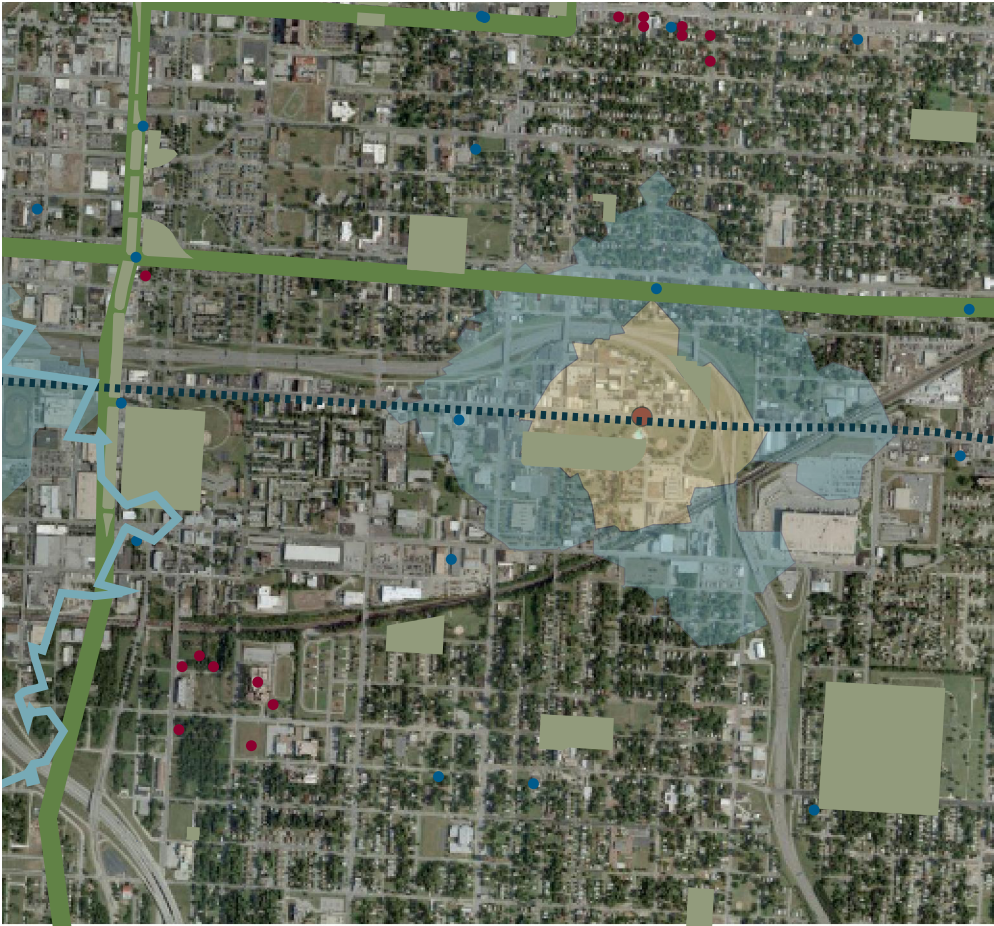
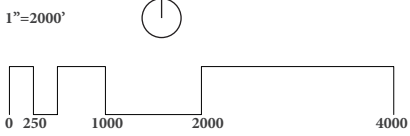


Figure 3-2: Regional Rail (created by author)



- 5 Minute Walk
- 10 Minute Walk
- MetroGreen
- Parks
- Regional Rail
- Historic
- Activity Center
- Station



Remediation

Brownfield Remediation Strategy

The sites chosen are not on the brownfield list, but contain similar characteristics to lightly contaminated brownfield sites. The sites receive the name brownfield because it is unknown what the site contains. Therefore, selected industries in the area were picked because of the contamination produced such as auto-shops produce polycyclic hydrocarbons from all of the leaks from cars. Since the industries are still fully functional, plants that are successful for brownfield sites are used. The plants can withstand harsh conditions from contaminants and when the time comes to remove the industries' structures, materials, and waste. The plants have a higher survival rate and can control erosion while certain areas are excavated.

The industries on the left of Figure 3-3 are industries that are not producing contamination, but contamination could be from the structures on site.

The brownfield plants listed in Figure 3-3 are planted now so the plants are well established for whatever the future entails.

The industries listed on the right of Figure 3-3 are industries producing contamination and waste. Therefore, brownfield plants are used for similar reasons as the others to prevent erosions. The plants don't specifically uptake the contaminants so further phytoremediation might be needed in some areas.

Plants for Brownfields

Using vegetation as a means to clean and control brownfields is still developing. The plants specifically for brownfields are plants that are easily adaptable. The plants can live in poorer conditions and can withstand movement of earthwork. These plants are not specifically used to absorb toxins, but are able to grow in these poor conditioned sites.

Native vegetation is used because it is accustomed to grow in the region. The questions with natives are its influence on wildlife if the plant becomes toxic for the animals. The toxicity depends on each plants absorption nutrients, and what animals eat it. Trees are safer for wildlife and can be left in place for a long time because the contaminants remain in the roots.

The vegetation are more specifically used for sites in transition. The service these plants provide are cultural (native vegetation), aesthetics, erosion control, and control stormwater runoff.

Knowing the uncertainty, the plants are monitored to understand how the plants can be used across various sites and protect people and wildlife. The brownfield vegetation are used with the phytoremediation plants because they offer a different service.

Industries with only brownfield plantings

Your Tel America

Dan Holiday Furniture and Appliance

Walker Towel and Uniform Service

Park Parade Shop and Stop

Cherry and 17th Street

big bluestem	deertongue grass	grass	
buffalo grass	timothy		
switchgrass	weeping lovegrass		
red canary grass	tall fescue		
rye			
redosier dogwood	indigobush	shrubs	
viburnum	autumn olive		
alfalfa	lespedeza		
crownvetch	silky dogwood		
black locust	london plane tree	trees	
red maple	honey locust		red oak
river birch	loblolly pine		norway maple
hackberry	scotch pine		hawthorn
gingko	silver maple		

Figure 3-3: Brownfield Plants (Holt 2002 adapted by author)

Industries need phytoremediation before reuse

Real Deal Autos

Midwest Radiator

Dr. Ron's Auto Repair

R&R Grinding

Certified Safety Manufacturing

Friends & Family

CFI

Miracle Auto Care

Brownfield Plant Plan

The brownfield plants are located in transitional areas. The areas are considered transitional because those sites will be redeveloped in the future, but uncertain when redevelopment will occur. Most of the redevelopment is along Truman Road because most of the buildings are already reaching their life expectancy (PGAV 2000).

The sites identified are sites already considered areas for redevelopment from Kansas City Missouri and PGAV. In the future as more redevelopment is required and more buildings reach life expectancy, brownfield plants can be used. The plants also serve as a palette to unite the whole area aesthetically.

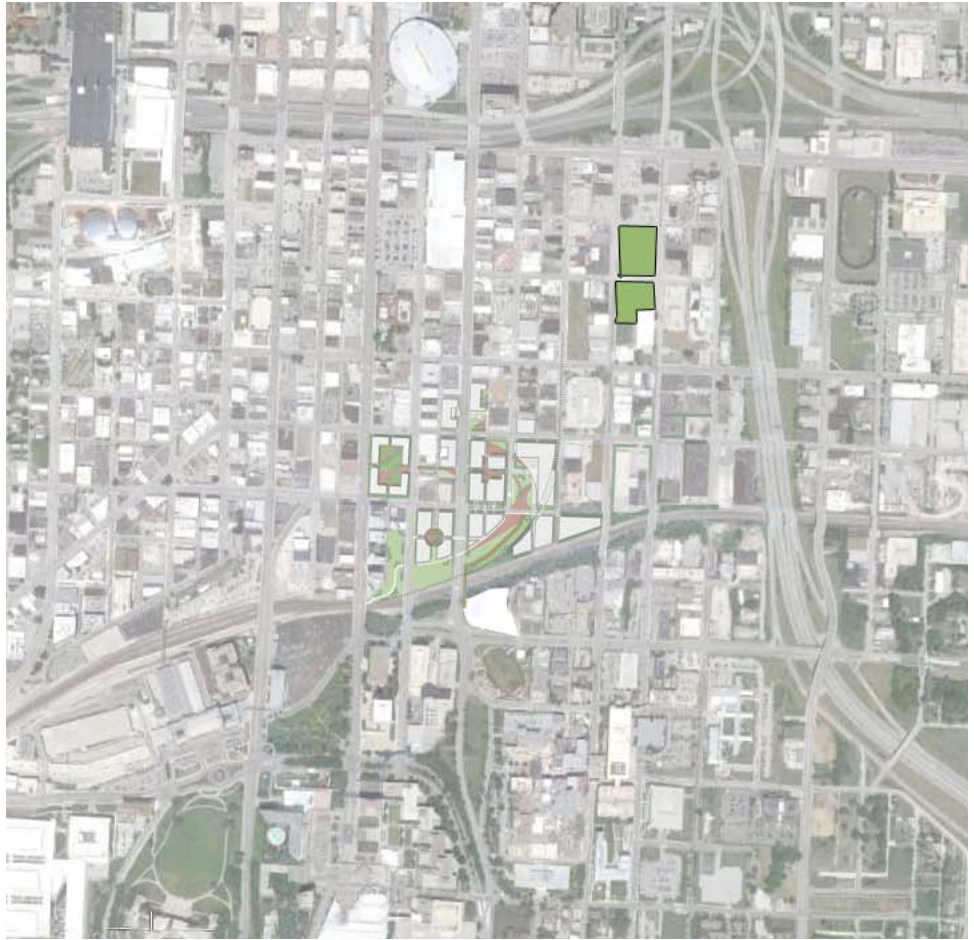



Figure 3-4: Brownfield Plant Sites (created by author)



 *Future Redevelopment*

 1"=2000'



Prevention

Ecosystem Services

Ecosystem Services are how people and the environment can coexist. The natural processes provide a service to the community without depleting the natural resources. The services contribute to ones well-being.

Phytoremediation as a Service

Vegetation in the form of phytoremediation is used to clean up the brownfield sites, but it can also be used for other means in the community. This is known as Ecosystem Services where ecology is used for regulatory, cultural, and creation of products without depleting natural resources. Phytoremediation is used in this project to direct site usage, form space, control environmental hazards, and produce products. Figure 3-5 to the right explains some of the services provided on this site.

Ecosystem Services

1. Climate regulation
2. Local climate
3. Air and water cleansing
4. Water supply and regulation
5. Erosion and sediment control
6. Hazard mitigation
7. Pollination
8. Habitat functions
9. Waste decomposing and treat
10. Human health
11. Food
12. Cultural benefits

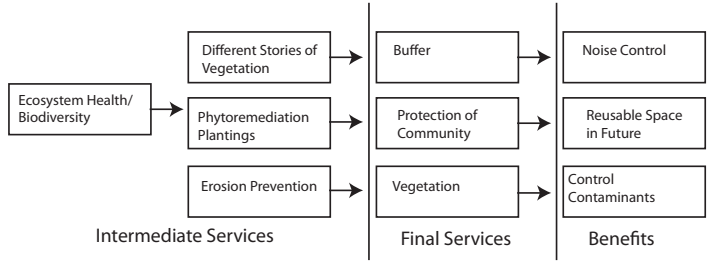
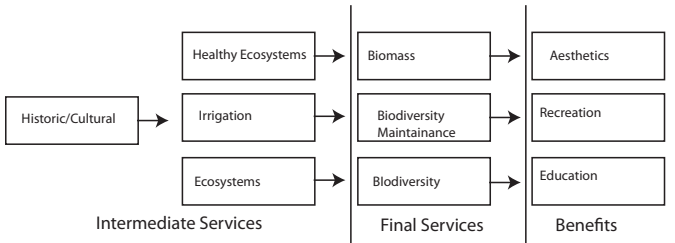
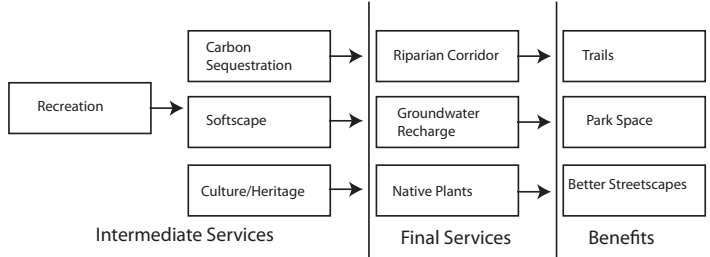
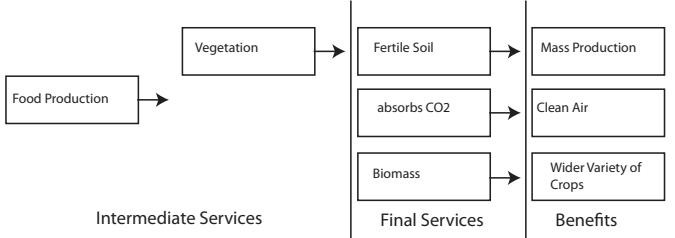
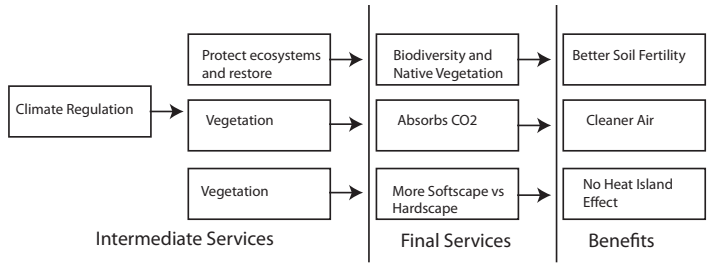
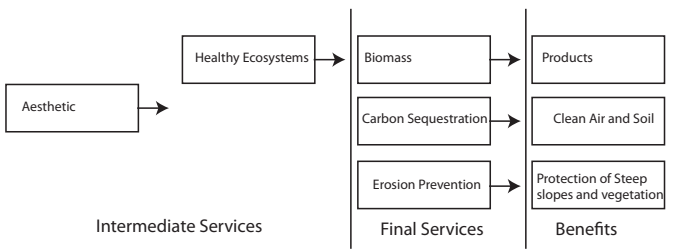
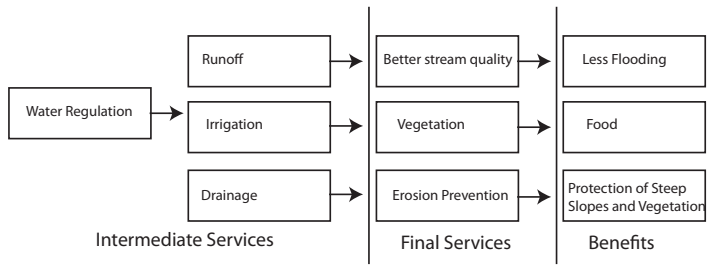


Figure 3-5: Ecosystem Services (Millenium Ecosystem Assessment adapted by author)

Phytoremediation as Service

Vegetation is not being used in ways that could sustain the industries and support new growth. Phytoremediation can be used to prevent the spread of contamination to keep industries functional while catering and protecting the surrounding community. The network of phytoremediation techniques at the district scale of the Crossroads and Jazz Districts could eventually influence all of downtown and the Greater Kansas City Area and influence the linear park along the Rock Island Corridor. “Because it is a natural process, phytoremediation can be an effective remediation method at a variety of sites and on numerous contaminants. However, sites with low concentrations of contaminants over large cleanup areas and at shallow depths present especially favorable conditions for phytoremediation” (EPA 2012). There are plants called hyperaccumulators that absorb the toxins and withhold the contaminants in the roots. The types listed below are strategies for the different lightly contaminated areas by the Crossroads Station.

Types of Phytoremediation

1. Phytoextraction
 - . uptake metal into roots then must be incinerated or recycled
2. Rhizofiltration
 - . uptake contaminated water in roots
 - . grown in greenhouse and adapted to contaminated water
 - . must be incinerated or recycled
3. Phytostabilization
 - . immobilize contaminants in soil and groundwater
 - . reduces bioavailability so it isn't introduced in food chain
 - . restores vegetation to site
4. Phytodegradation
 - . breakdown contaminants through plants metabolic processes
 - . enzymes

5. Rhizodegradation
 - . breakdown fuel or solvents
 - . microorganisms

6. Phytovolatilization
 - . intakes organic compounds and releases into air at lower concentrations

Using the Types of Phytoremediation

Different strategies are used together depending on each site. This step remains undetermined until each site is analyzed for contaminants and hot spots for more localized contamination. Each site will require different intensities and plants. Figure 3-6 shows an idea of what each site might need based on the contaminants being produced by the industry.

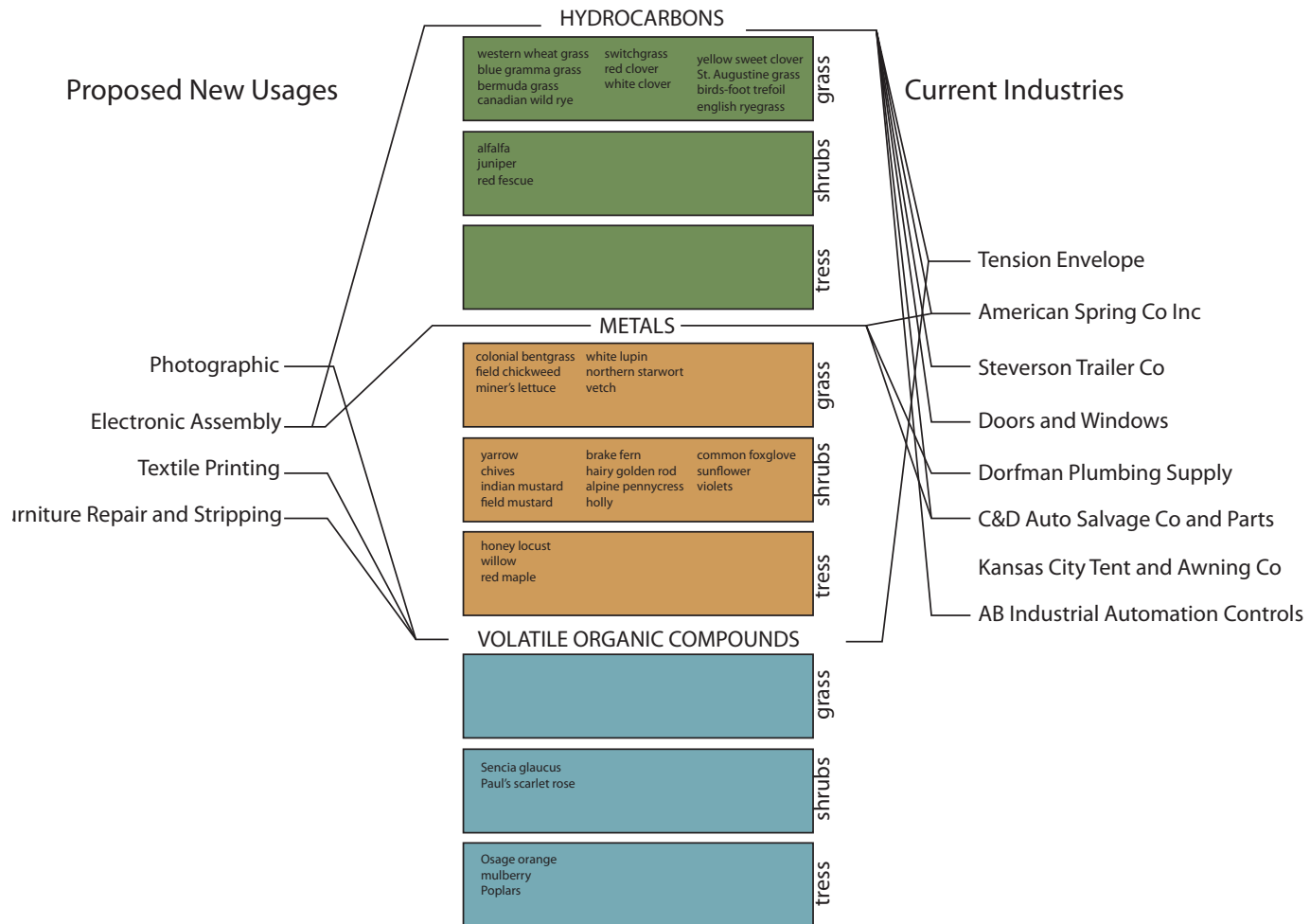


Figure 3-6: Phytoremediation Plant Charts(created by author)

Phytoremediation Plant Plan

The phytoremediation plants are located near sites producing contaminants and are permanent solutions to keep the area filled with life. The plants serve as a barrier to prevent contaminants from spreading to surrounding sites. Different types of phytoremediation are used for the different sites depending on the results to determine what kind of contaminants are relevant.

The sites use a similar plant palette to unite the whole area, but varies depending on the needs of each site after the soil is tested.

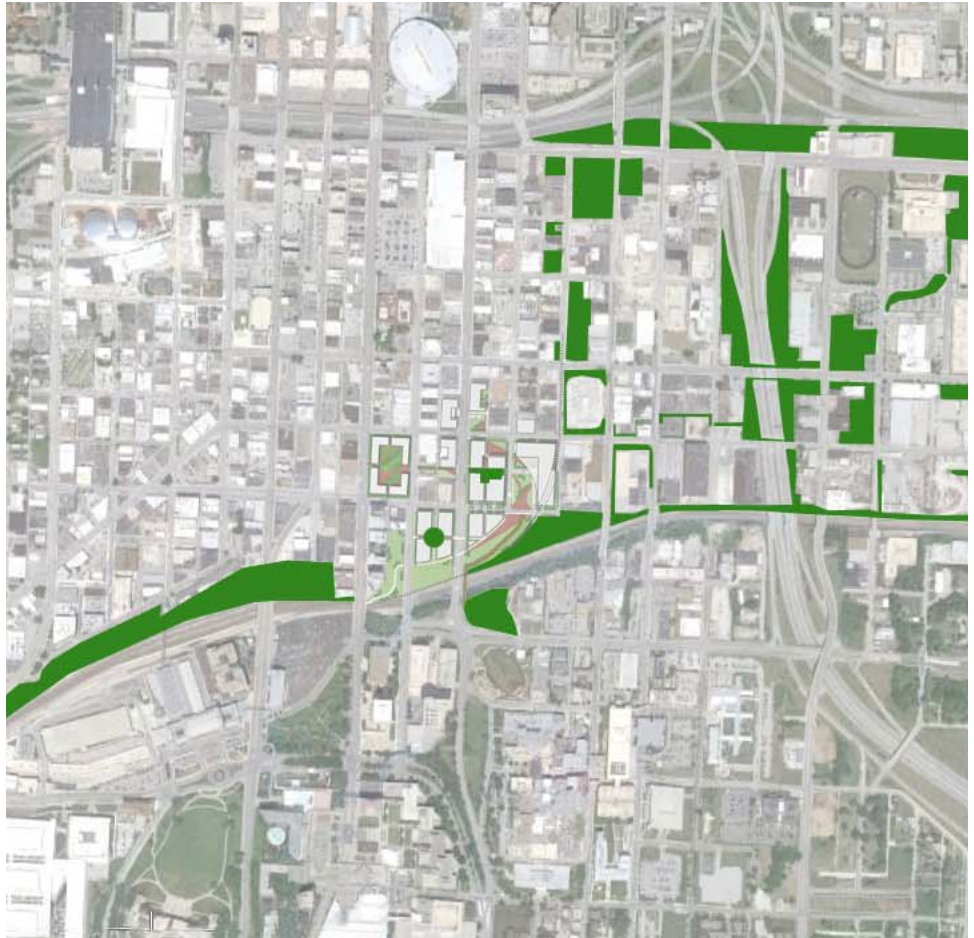
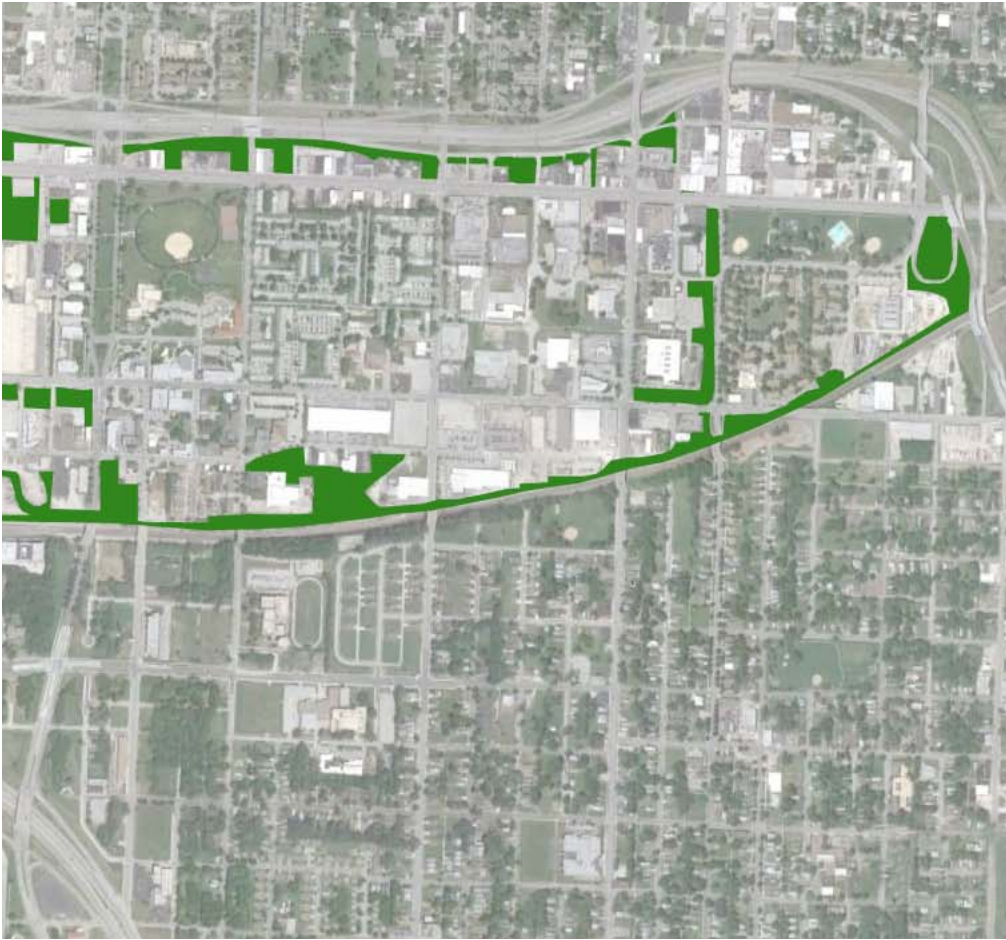

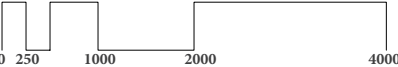


Figure 3-7: Phytoremediation Plant Sites (created by author)



 *Phytoremediation Trail*

 1"=2000'



Connections Through Phytoremediation

Hazardous Waste Producers

Contaminant producers don't have to be limiting. The companies could give back to the community. The companies can employ the brownfield plants and phytoremediation plants surrounding the site. Within this context trails are provided for pedestrians. It gives back to the community while saving the company costs later for clean up.

Establish Requirements

Each company would be required based on the amount of contaminants produced and type of contaminants to plant certain vegetation. Also, a path through the area would be required to create a more connected area to accommodate the new rail line and multi-modal transit. The plants will be near property lines and roads so it doesn't hurt the processes of the industry. It will create better streetscapes while controlling some flow of the contaminants from going to nearby sites and hopefully reduce what the company leaves behind when it no longer functions.

Over Time

There is not a definite end of remediation because there are always going to be contaminants produced. The strategies proposed can be left for a long time. It shouldn't be seen as just remediation strategies. It is also a strategy to connect the districts through these trails through the phytoremediation. As the area grows overtime new paths will form and others will be removed. It is a strategy that is functional, but is easily modified as needs change over the years.

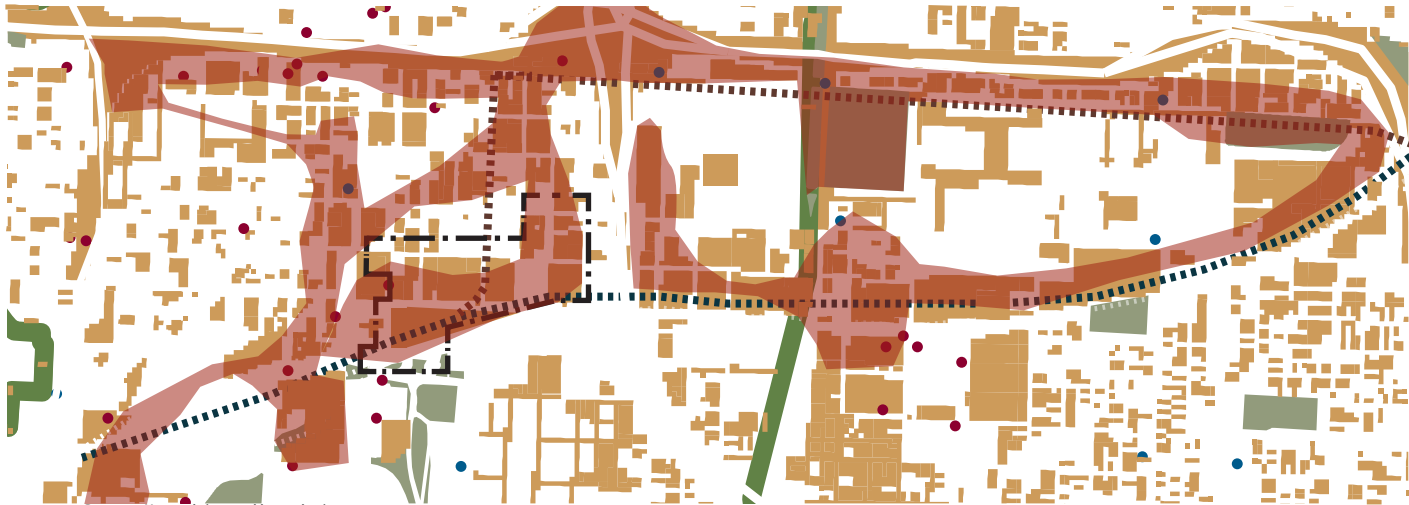
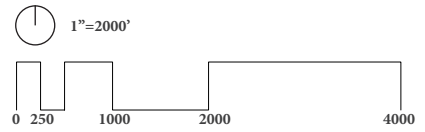


Figure 3-8: Program Network (created by author)

The pieces connect a network through innovative remediation techniques.

- Potential Sites
 - Parks
 - MetroGreen
 - Activity Center
 - Historic Center
- Remediation Network



Phytoremediation Network Connections

Not only will the trails connect to land around contaminating companies and sites, but it will also connect to the park systems: Rail Park, MetroGreen, and few other parks in the area. Redevelopment will also contribute to the phytoremediation vegetation and trail to further expand this initiative. This could further enhance MetroGreen by uniting the region with more areas like this.

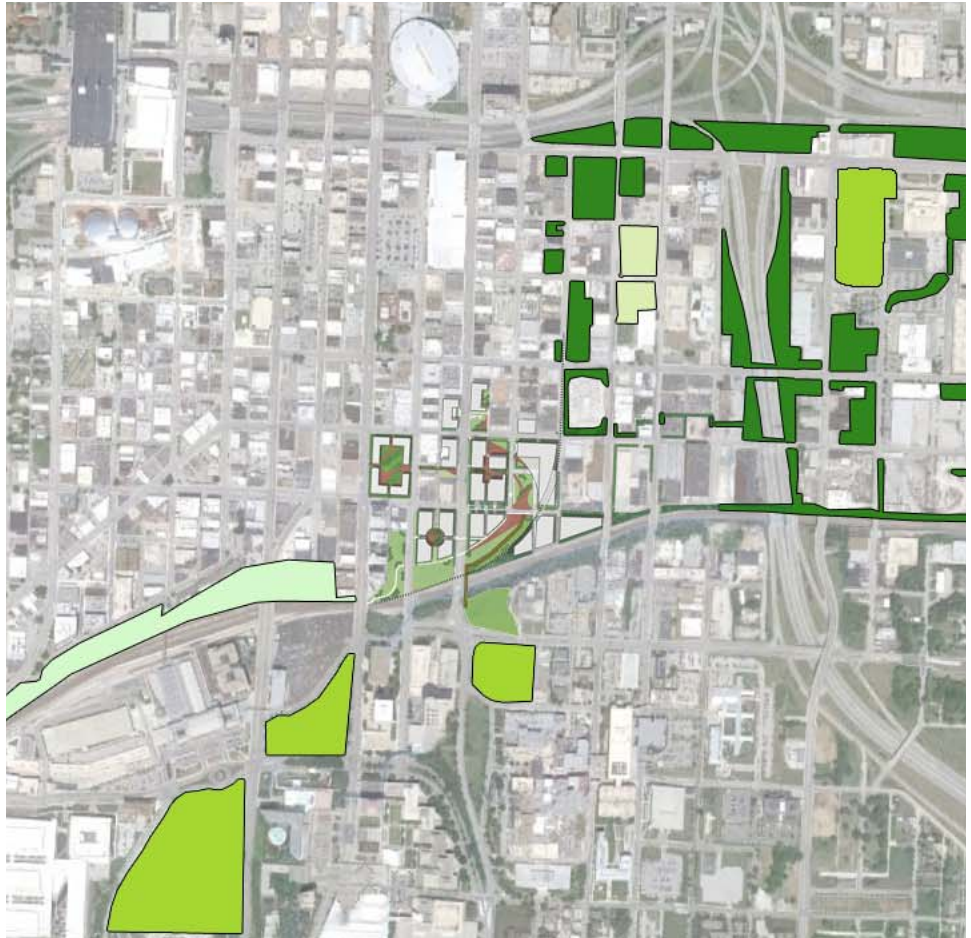
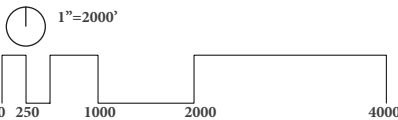


Figure 3-9: Connect Green Space (created by author)



- Rail Park*
- Phytoremediation Trail*
- Future Redevelopment*
- Existing Parks*



Development

The four other strategies focus on district unification and connect to the redevelopment proposed. The last strategy creates a place from those strategies. The regional transit provides a transit station. Remediation allows land for redevelopment. Environmental protection and improvement creates park space and a place for industries to control contamination better. Connections provide pedestrian access to and from the site. The implementation chapter discusses how the other four strategies set up the framework for the site.

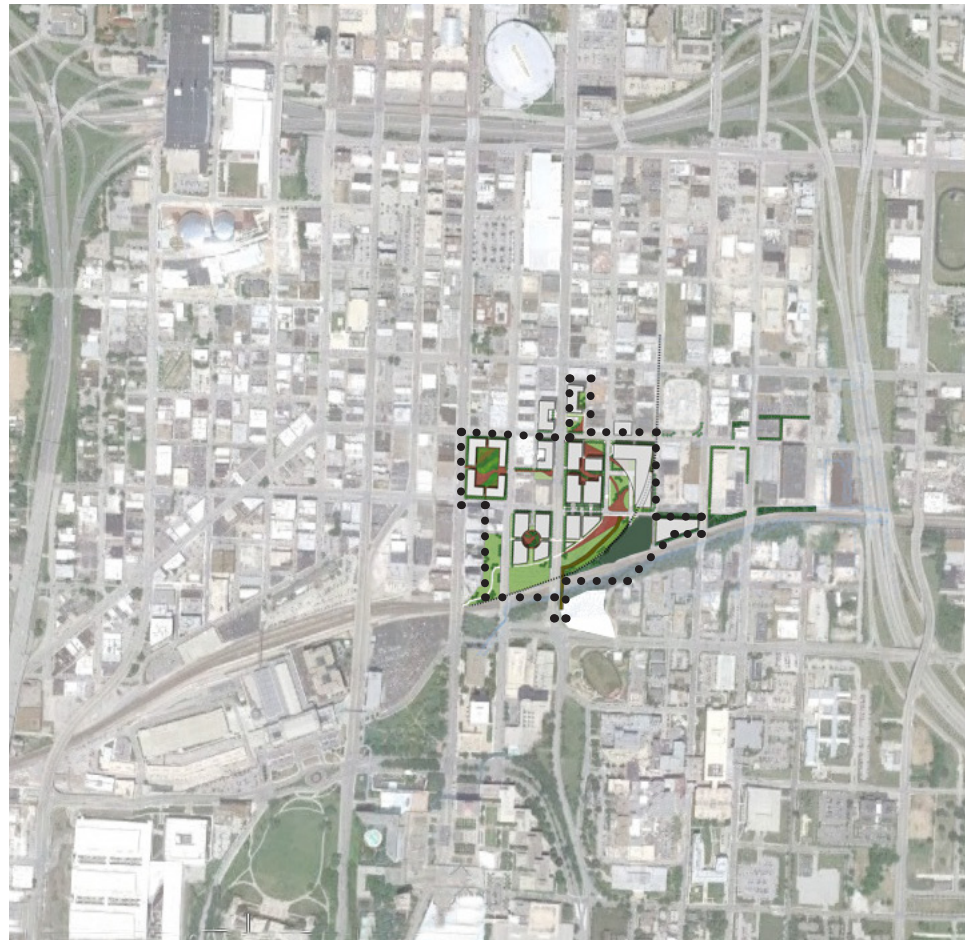
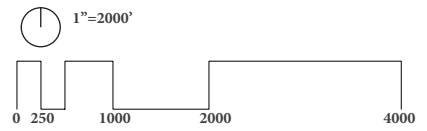


Figure 3-10: Site Development (created by author)



Connect Trails to Station

All of the trails lead to the Crossroads Station and provides multiple access points to get to Jazz, Crossroads, and Hospital Hill/Crown Center. Over time more trails are added and further expanding into other areas of Kansas City.

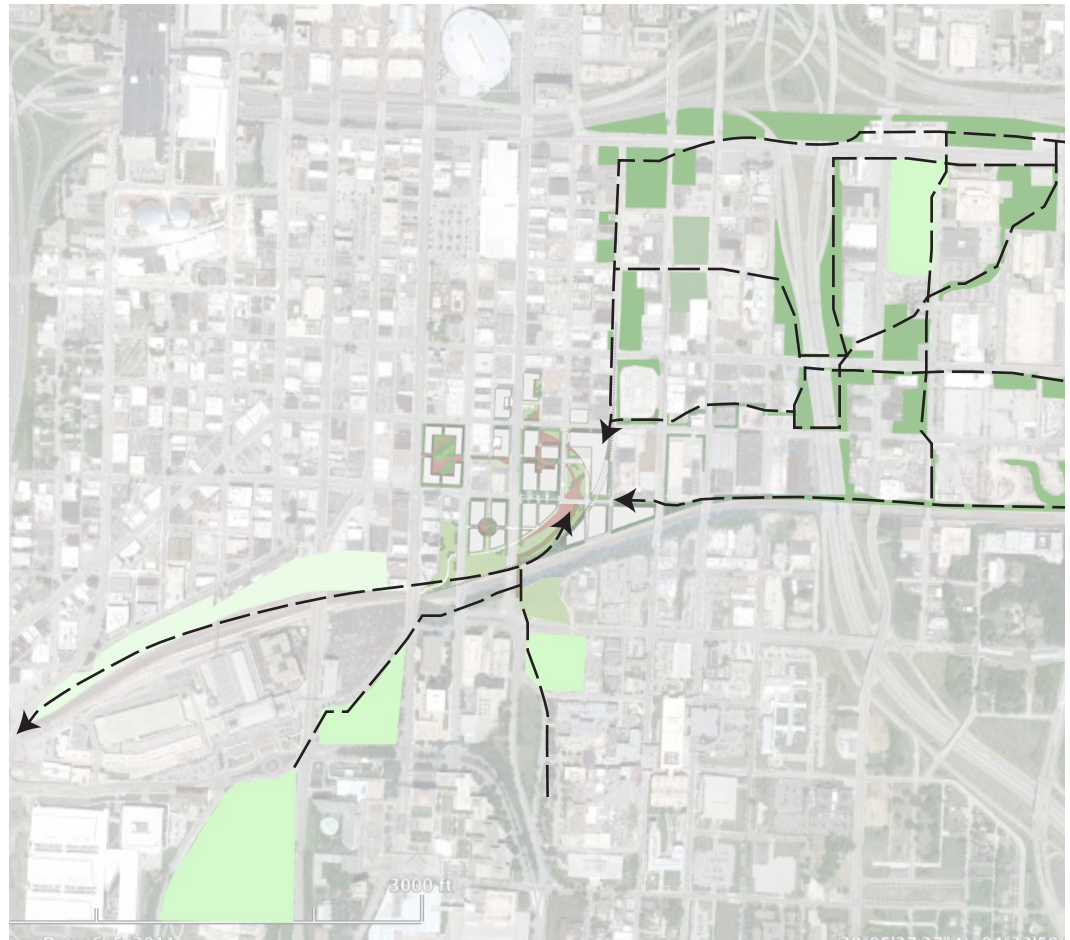

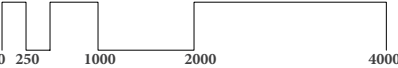


Figure3-11: Trail System (created by author)



-  Rail Park
-  Phytoremediation Trail
-  Future Redevelopment
-  Existing Parks
-  Trails

 1"=2000'



Bring in Surroundings

Not only are the trails brought into the site, but the existing character of place. The site creates a blend of the distinct surroundings.

The program of the site was influenced by its surroundings. To the west lies the art incubator space where design offices, galleries, local restaurants, and local shops. The character of the art incubator space is lost as it goes further and further east with the random assortment of light industry and underutilized/vacant land. The light industry is an art form in itself. It should be showcased along with the other art within the area.

The light industries also could provide machinery and materials for the arts to prevent wasted leftover materials and provide a service of the machinery.

Where the art incubator space and industrial space meet by the Crossroad Station, the new development will showcase both ideas to create an

industrial arts community. It supports local artists and small industry businesses. Both art practices and industry practices produce contaminants. Therefore with it being contained and creating similar usages, the site is monitored and provides further advancement in the understanding of phytoremediation and how we can design better for the future to maintain our environments. We can use the natural resources but don't inhibit the functions over all.

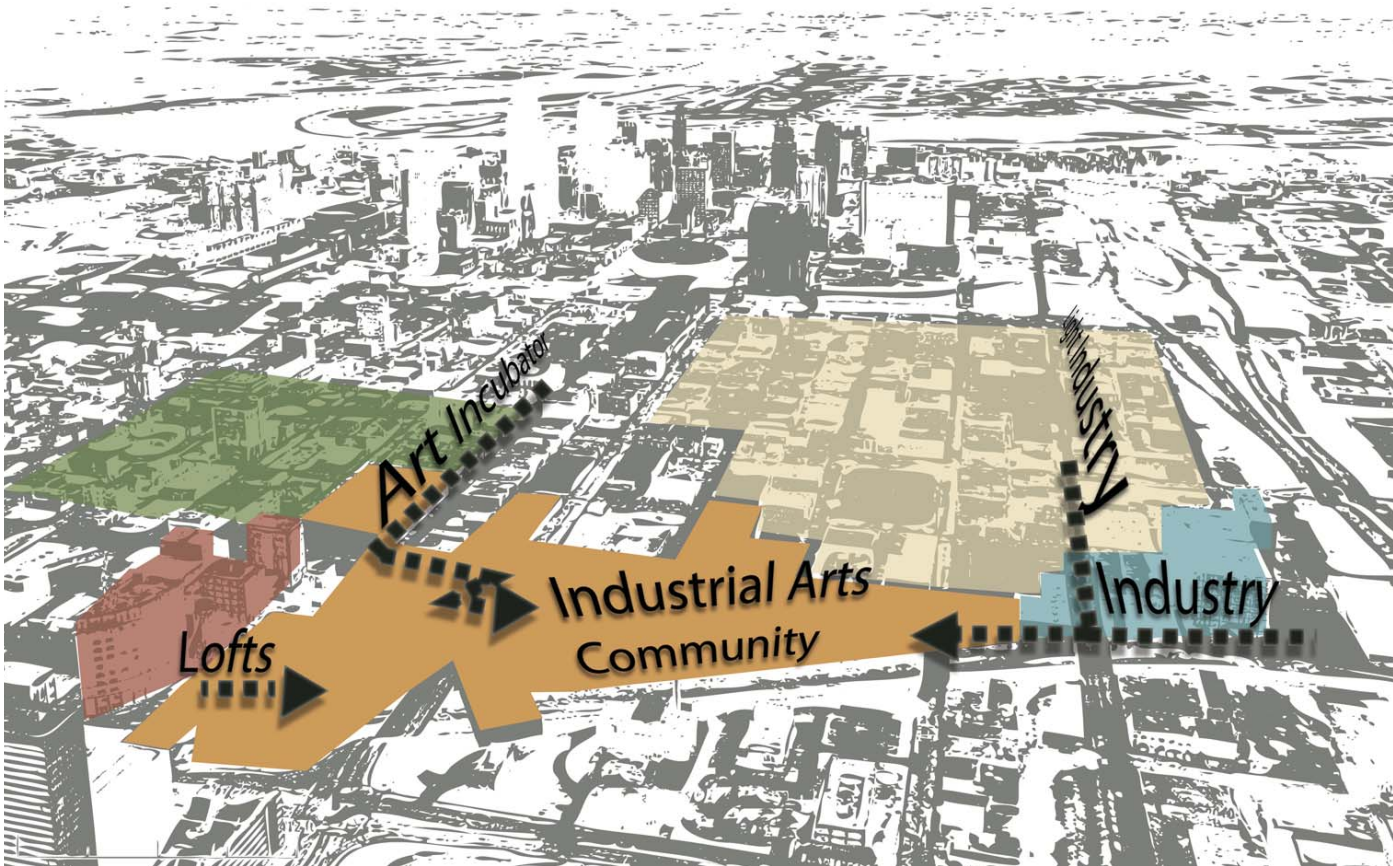


Figure 3-12: Industrial Arts Community (created by author)

The five strategies are used to create a vision of what this place could be. Phytoremediation is the key strategy that holds all of the pieces together and is further explained through the development. The chapter has three key parts: Crossroads Station, phytoremediation, and phasing plan.





Implementation

Crossroads Station

Design Intent

The intent is to design for the community without depleting natural resources, but to enhance resources through phytoremediation and other sustainable techniques for the benefits of transit, nature, and activity. The three benefits listed are the driving forces for the design to give the Crossroads Station a sense of place.

Design Goal

Although preventative and remediation strategies are the main focus of the site, it shouldn't be the primary focus for design. Everything is pulled into the train station. On the way to the train station is where people stumble upon remediation and preventative strategies. The remediation fits into daily life and not something completely obvious.

Already existing developments who would use the preventative and remediation strategies in the future don't get the chance to design around these aspects, but are designed more

for the user and program. As people meander through the spaces one can interpret the zones of the contaminants as the paths flow together.

Design Concept

The design derived from the movement of the symbiotic relationships intertwining, unraveling, and knotting. Park space is carried in from the Rail Park that mends the whole Crossroads Station. All focus on the central knot: Crossroads Station, but forming different paths along the way. Smaller knots create communities that work together with usages that compliment each other and support a similar ecosystem connected to the park. Trails weave in and out connecting people to these symbiotic relationships and create an understanding of how the environment and the usages work together.

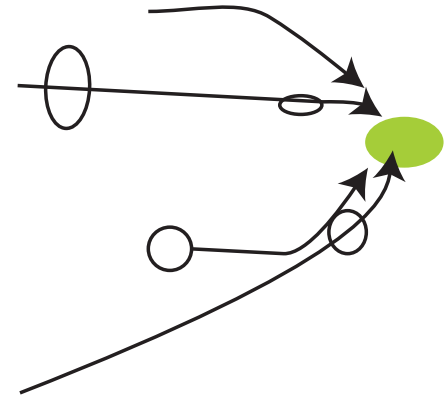


Figure 4-1: Parti (created by author)



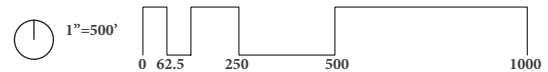
Figure 4-2: Creating Spaces (created by author)



Site Usage

- A. Train Station
- B. Hotel/Parking Garage
- C. Apartments/ Retail
- D. Market
- E. Electronic Core
- F. Rail Park
- G. Pedestrian Bridge
- H. Park Amenities
- I. Workshops, Office, Living, Parking
- J. Art Core
- K. Station Plaza
- L. Phytoremediation Fields
- M. Remediation Center
- N. Green House

Figure 4-3: Master Plan (created by author)



Sections

The building heights are three to four stories tall for pedestrian comfort and preserve sightlines to Downtown and Crown Center. Not only do the sightlines connect people to Crown Center, but also a pedestrian bridge.

The pedestrian bridge is a constant 3% slope for accessibility and provide a leisurely stroll to and from the site. The pedestrian bridge offers views into the Rail Park and travels along the Common Line route before crossing the KCT trench to Hospital Hill/Crown Center.

Another technique for better pedestrian environment is the streetscapes. The streetscapes contain clearly delineated sidewalks and paths through the site. Also, each major street is lined with street trees as another buffer from traffic and comfort to those strolling through.



Figure 4-5: Sections (created by author)



Section AA' Facing the Train Station

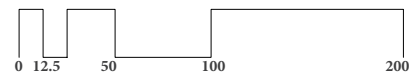
1"=100'



Section BB' Facing the Rail Park and Pedestrian Bridge

1"=100'

Pedestrian Bridge is at a constant 3% slope for a leisurely stroll to and from Hospital Hill/Crown Center.



Program

1. An incubator space that supports light industrial, artist community along with living, other offices, and activities known as the Industrial Arts Community.

- a. People witness the production of industrial art and the mechanical usage of various activities.
- b. Small industries and artists receive exposure to sell work and network.
- c. Small industries and artists support each other with materials, machinery, and knowledge.
- d. Better management system through recycling in waste by working together as a community.

2. Built within a park-like setting that prevents the spread of contaminated material through soil, groundwater, and air.

- a. Use trees to slowly release toxins in the environment to prevent harm now and in the future while also serving as street trees and break up large spans of parking lots.
- b. Stormwater detention and retention areas use plant material that also absorbs metal and oil based contaminants.
- c. Raised green space spans the hill from Crown Center over the railroad track and into the park within the Industrial Arts Community while preventing stormwater pollution from railroad tracks.
- d. Serves as pocket parks, trails to transit station, and outdoor recreation.

e. Clean-as-you-go prevents uncertainty and less clean-up time for new usages in the future and could sustain the environment overtime without much in between time.

3. Potential regional rapid rail station creates access to Industrial Arts Community.

- a. Creates a destination around transit station and purpose to go to this space.
- b. Industry is seen as a commodity rather than an unpleasant environment as people witness through their journey around the transit station that might not see otherwise.
- c. Sustains new growth and development

A. The train approaches the northwest corner of the Crossroads Station at the end of Cherry Street. The plantings on this corner serve as a buffer for noise and phytoremediation plants are located to the west and are carried through to the site as street trees. The street trees provide comfort for pedestrians while framing the streetscapes. The vegetation in this area specifically targets the Ecosystem Services listed to the right to an extent.

The new sidewalks aggregate is from the asphalt removed on site. It provides recreation through trails and prevents the asphalt from becoming waste.



Figure 4-6: View to Station from Northeast Corner of Cherry Street (created by author)

Phytoremediation

Connect|Contain|Counteract

Instead of hauling away materials to hazardous waste facilities lightly contaminated substances are on site while providing park space. It is accomplished through three different strategies: connect, contain, and counteract.

Connect

Phytoremediation connects to green space. There is a proposed rail park by KCDC that runs just west of the site. Through vegetation the park is incorporated into the space and leads one to the train station. This space controls heat island effect and stormwater runoff while providing a place for people to walk their dogs, play catch, or have a picnic. During special events it is an exhibit space and offers overflow for the industrial arts community.

Contain

Located east of the site is Tension Envelope. It is on Missouri's Hazardous Waste Producers list. Poplar trees and various other trees are planted around the building to contain any spreading of the contamination through the soil and groundwater. The trees also act as street trees. The other industries are not on the list, but are known to produce contaminants so through trees and other vegetation those will be contained as well.

Counteract

There is still much research needed for phytoremediation and understanding urban land. These manufactured spaces are a controlled environment where tests could be conducted to further advance the knowledge of phytoremediation while providing a place to visit, work, and live. While not all of the research can be conducted on site due to high levels of contamination or need to conduct in a lab setting, a

remediation center is to the southeast will provide the opportunity for research and provide for the Kansas City Area.

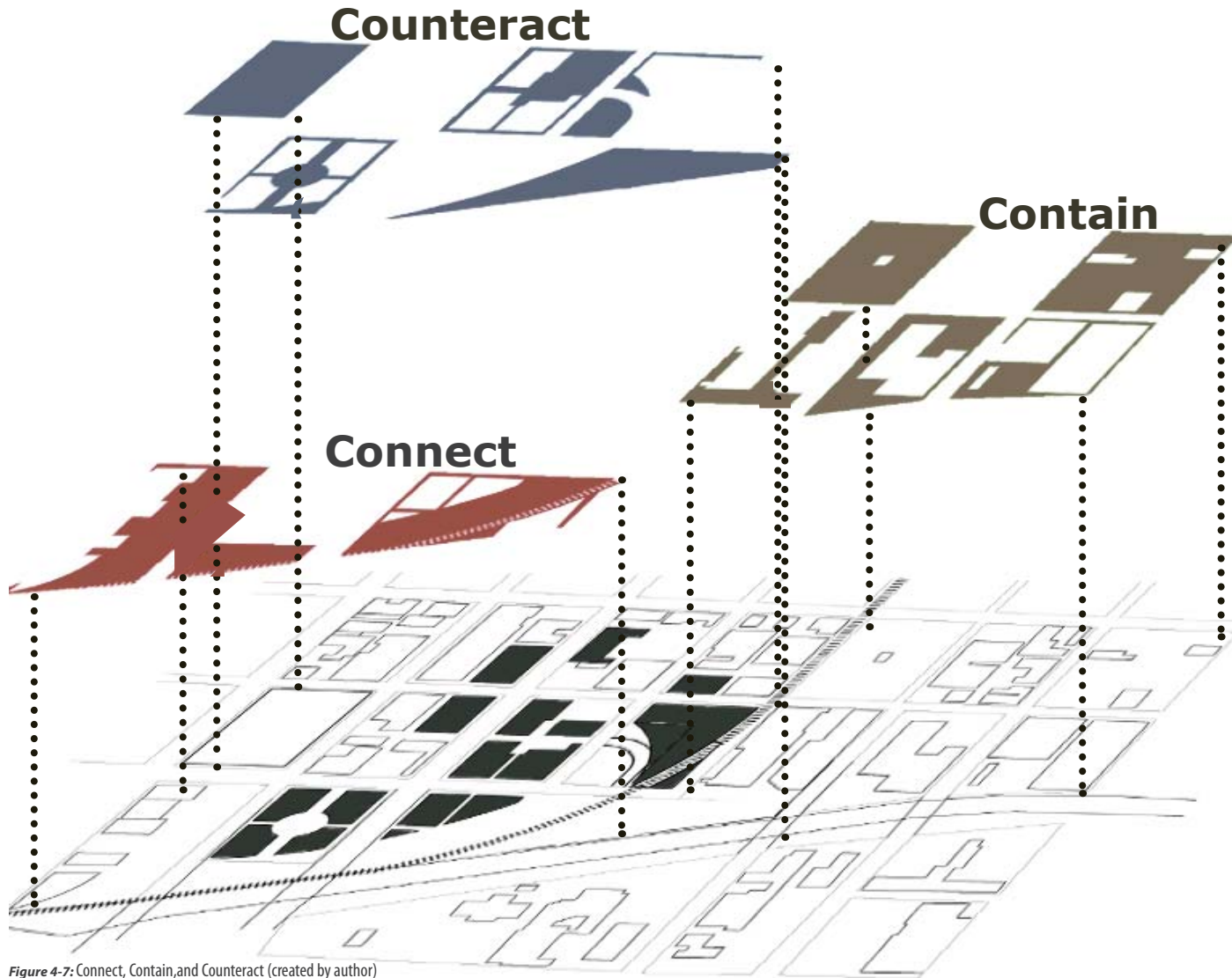


Figure 4-7: Connect, Contain, and Counteract (created by author)

PHYTOREMEDIATION: Connect

Connect Green Space

The goal is to connect the site to sites such as MetroGreen, phytoremediation trails, Rail Park, and other existing park systems. It unites the Crossroads, Jazz District, and Hospital Hill. The conditions for pedestrians deteriorated over time as highways, railroads, and decaying sidewalks.

The courtyard off of the train station serves as a place for people to meet and congregate. The courtyard offers access to the rest of the development proposed, park, and Hospital Hill.

The courtyard offers historic/ cultural services because of its use of native plants to enhance the biodiversity for a better ecosystem.

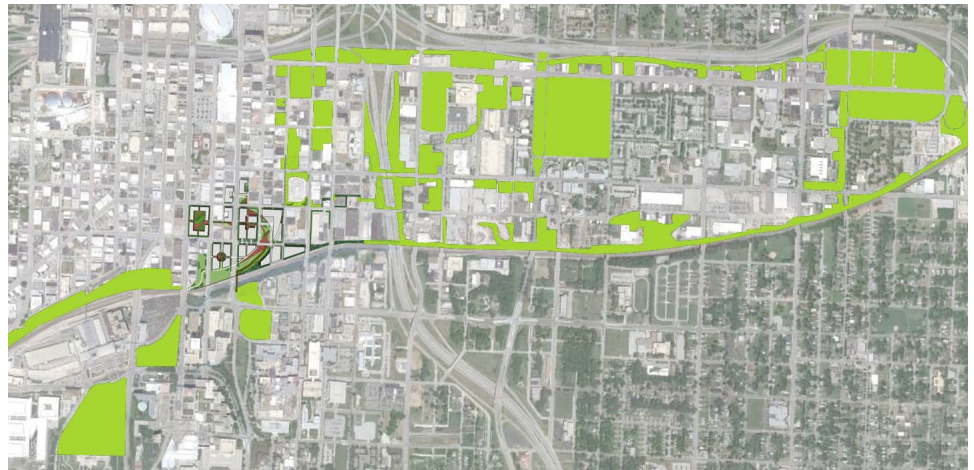


Figure 4-8: Connection (created by author)

 Green Space



1"=2000'

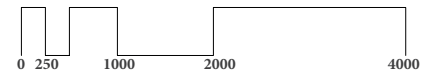




Figure 4-9: Train Station Plaza looking towards Pedestrian Bridge and Hospital Hill/ Crown Center (created by author)

PHYTOREMEDIATION: Contain

Contain Industries

Adjacent to sidewalks and industries are trails of green. The deep roots prevent contamination from the industries from spreading to nearby sites. The trees also contain dust and noise while delineating the trails. The parking lots stormwater runoff runs into the phytoremediation swales and cleanse the water before absorbed into the ground.

On Midland Metal’s website front page there is a disclaimer that states: “chemicals known to the state of California to cause cancer, birth defects, or other reproductive harm may be present in the products that we sell. We offer lead-free products that comply with AB 1953.” Therefore if it is found in the product, it could potentially be found in the soil. The industry is just a few blocks from the site.



Figure 4-10: Contain (created by author)



PHYTOREMEDIATION: Counteract

The Center

The Phytoremediation Resource Center serves as the source and control of the connect, contain, and counteract strategies. The center provides a place for research because the conclusions of phytoremediation are vague and need much research to further advance its use into everyday brownfield cleanup strategies.

The center contains a lab for research outdoor and indoor planting research along with on site. The on site locations are located along the paths around the contain strategies, in the counteract future industry cores. All are to improve the understanding of phytoremediation and how to implement it for the best.

How it Works

1. The planter closest to the rail park contains no contaminants, but it serves as a place to grow plant material for its phytoremediation capabilities. Once the plants are established the plants are then moved to the counteract sites, contain sites, or to the cement containers: #2.
2. First place for contaminated soils. Restricted access and highly monitored so levels are not a threat to the surroundings. The soil is contained in a cement container. It contains metal pollutants with different grids to determine the best functioning plants for various contaminants and conditions. The areas are divided to

contain hydrocarbon pollutants, VOCs, and metals. It is also monitored with grids and various tests for best results.

3. Contains deep soil remediation. This serves as a place to monitor deep soils and the effects over time to know the effects without capping.

4. Research Center contains labs and offices for those studying phytoremediation and other environmental problems.

5. Greenhouse to observe severely contaminated, or need controlled environment, and plant growth.

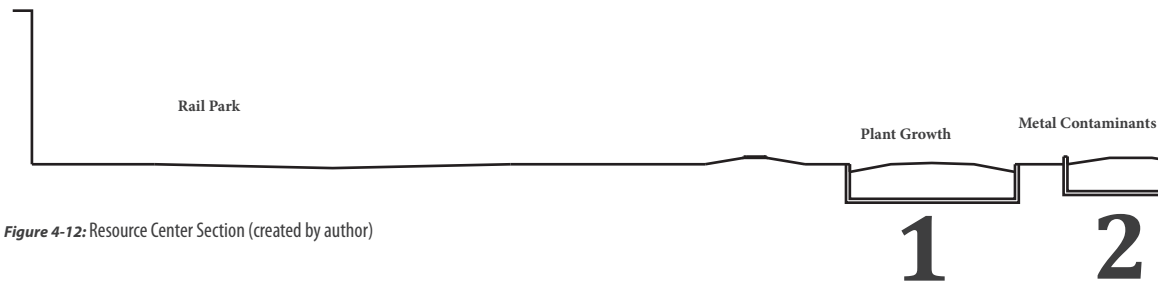
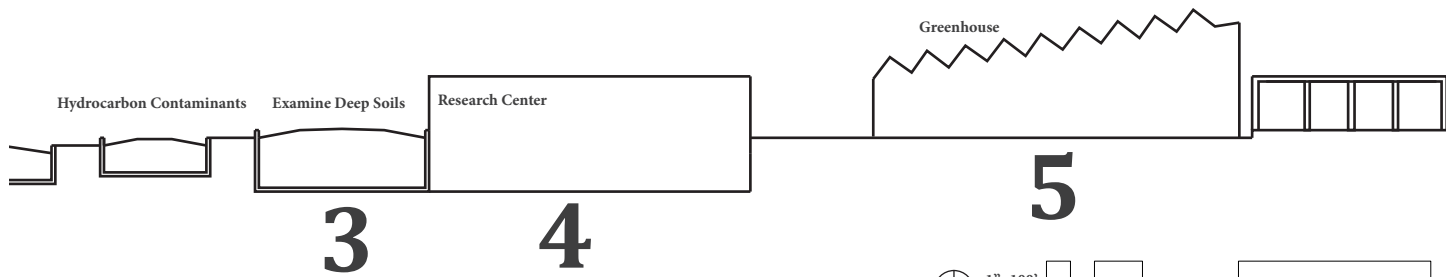


Figure 4-12: Resource Center Section (created by author)



Figure 4-11: Site Locator (created by author)



Sites using Resource Center

All of the land highlighted is examined and contained under the Phytoremediation Resource Center. The industries deliver light contaminants and the Center plants groves of trees to contain the contaminants on the sites of the industries.

The park spaces serves as connector pieces for the phytoremediation trails and serve as a control to see how existing environments survive.

The phytoremediation trails are planted used with most of the plants grown from the Center and serve as a proactive way to prevent further contamination in the future. This is a long term strategy implemented over years to include the whole trail system. It will eventually span to the entire industrial area.

The Center is closely related to the redevelopment sites to make sure all cleanup necessary is done and along how to plan better for the future from future contamination produced.

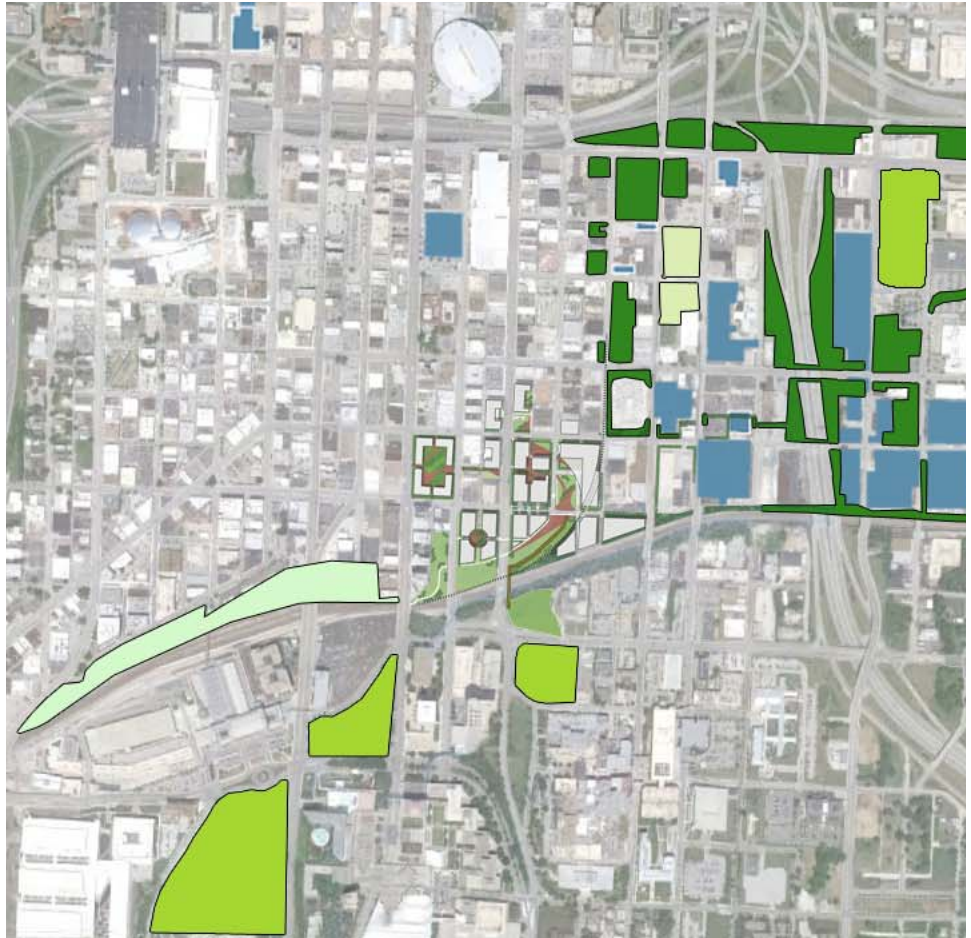
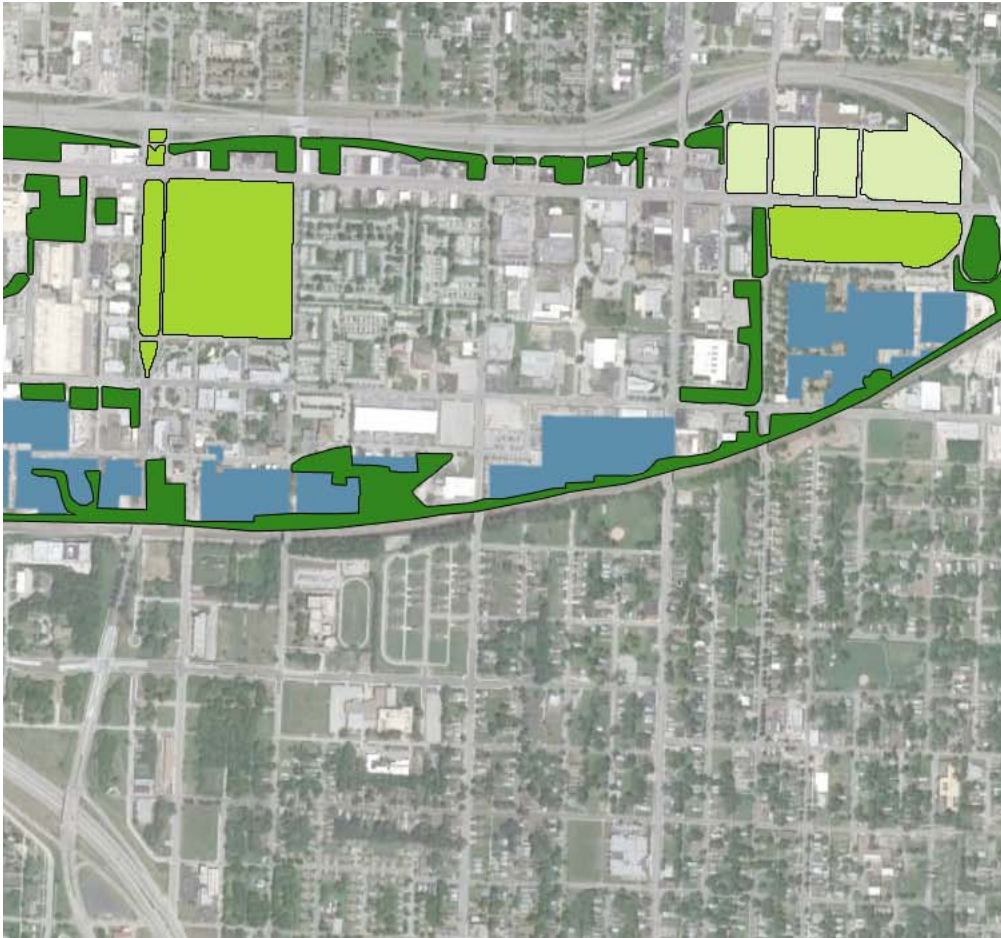
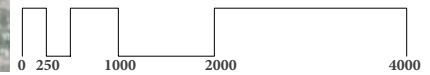


Figure 4-13: Responsibility of Resource Center (created by author)



- Rail Park
- Phytoremediation Trail
- Future Redevelopment
- Existing Parks
- Industries

1"=2000'



Phytoremediation Communities

Production

The art and industries located in the two pods produce contaminants.

Collector

The contaminants that hit the floor run into a pipe that runs underneath the path that runs in front of the shop. Depending on the type of processes there are different requirements of what to do with materials. Some materials are sent directly to the Phytoremediation Resource Center while others are placed in the phytoremediation center of the community. It is further discussed in the following pages.

Connection

The people passing through witness this process as they pass over it and can view it as they go by the shops.

Plant Intake

The collection of contaminants reach the phytoremediation area.

Absorb and Release

The plants naturally process absorb the toxins into its roots and release some of the toxins at none toxic levels into the atmosphere.

Removal

After a couple seasons of growing, some plants are removed and incinerated to prevent any risks.

Reusage

Some of the materials can be reused such as metals and are returned for new use.

Plant

Plants are replanted and planted for the best results and aesthetic value.

Results

The process is repeated and is a continuous cycle that can survive time.

Phytoremediation Resource Center

The resource center observes and controls the two phytoremediation communities to make sure the cycle is working properly.

The following pages discuss each community in further detail, but both use this general cycle. Each community handles specific industries that use similar tools and produce similar contaminants. One supports electronic manufacturing, which produces volatile organic compounds and metal. The other community contains textile and furniture industries that produce volatile organic compound and the industries share materials and support each other.

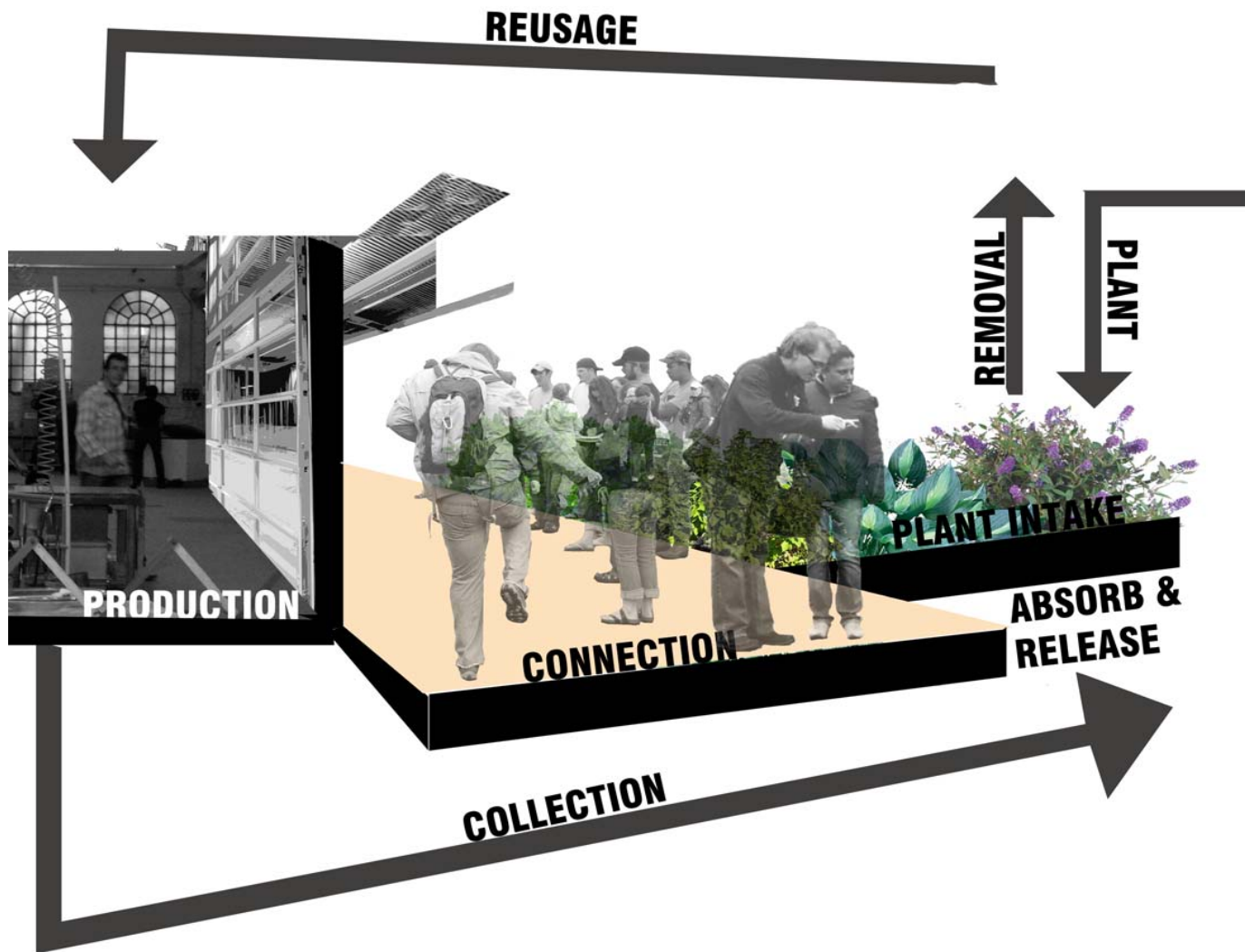


Figure 4-14: Phytoremediation Cycle (created by author)

Photoelectronic Core

The VOC Core provides a place for innovators and small companies to have a place for a workshop, office, and a place to live. The companies within the core all produce light contamination of volatile organic compounds in metals.

There are large shops for larger manufacturing and smaller shops for photographer dark rooms and studios. The shop spaces are easily adjustable to accommodate different size machinery and number of employees.

The shops open to the public to see different kind of work by locals and allow the workers to get their work noticed.



Figure 4-15: Electronic Core (created by author)

1"=250'



Figure 4-16: Perspective of Electronic Core (created by author)

Counteract Contaminants

The shops open up to the path in front. In front of the doors to is a trough where water drains when the floors are hosed down inside the shop. The water flows underneath the path into the phytoremediation area. From there it is cleansed by specific plants to control volatile organic compounds and metals.

When there is an excessive amount of stormwater, the water flows to the southern portion of the site to further phytoremediation plantings just before the KCT Railroad.

The Phytoremediation Resource Center conducts tests twice a year on the soil and leaves of the plants to observe how the contamination is being contained and introduced. In early spring the plants noted to have high levels of contamination are removed and are brought to the center for further remediation in the greenhouse where it can be contained.

The area is only producing light contamination therefore, phytoremediation can contain any hazardous toxins and doesn't require incineration.

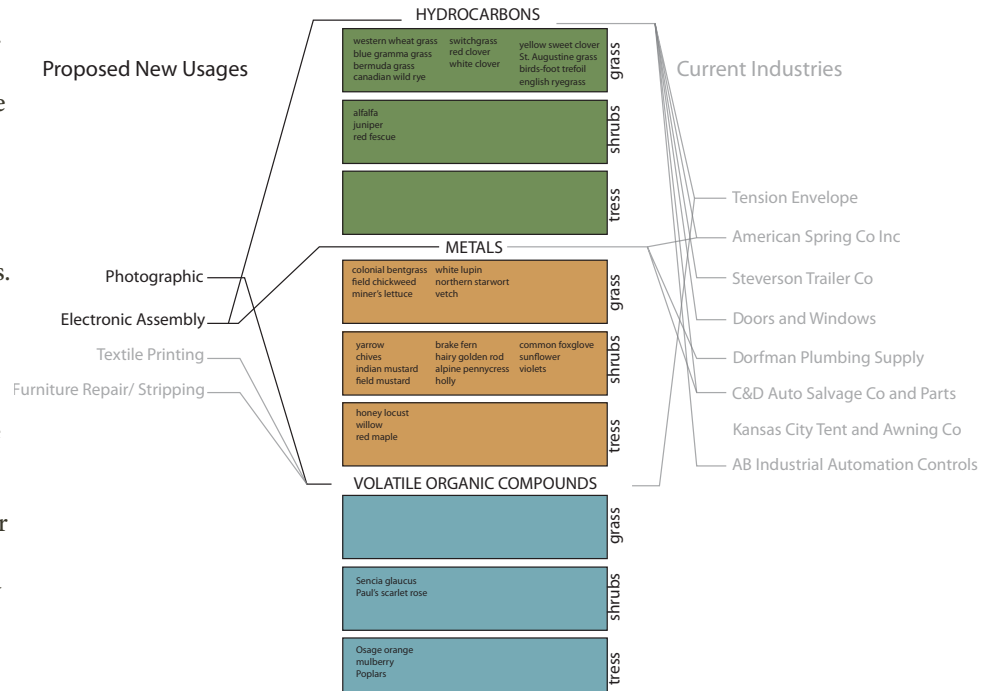


Figure 4-17: Electronic Plant List (created by author)

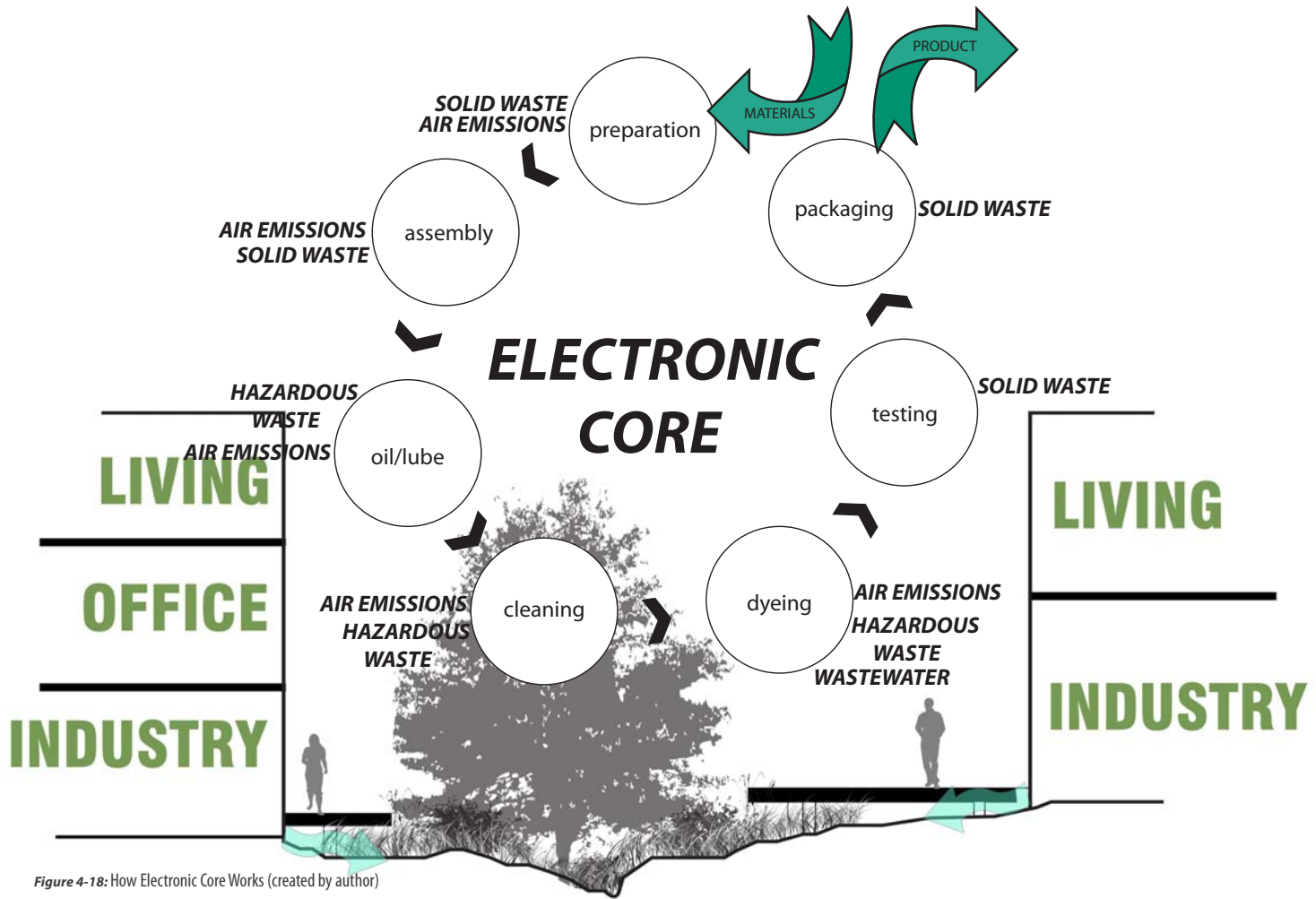


Figure 4-18: How Electronic Core Works (created by author)

Fabric and Furniture Core

The Fabric and Furniture Core also provide workshops, offices, apartments, and parking. This area produces volatile organic compounds from textile production, furniture stripping and repair.

The studios are open where each person or small company can rent out a space and share woodworking and various other machinery necessary for production. The spaces are used by fashion designers and furniture designers and new innovative industries with related needs.

The space provides a place for people to share ideas and equipment while showcasing their work.



Figure 4-19: Fabric and Furniture Core (created by author)

1"=250'



Figure 4-20: Perspective of Fabric and Furniture Core (created by author)

Counteract Contaminants

The workshops aren't quite as tall the Electronic Core due to not as much large machinery. The space provides more living opportunities and small businesses can rent office space above the workshop. The office space provides a buffer for those living above.

The phytoremediation area works the same as the Electronic Core, but provides different plants that are specific to the uses in the area. The Resource Center provides the same inspection of twice a year.

These two semi-controlled contaminate producing cores provide the Resource Center a place to do research to see the affects on the environment from the different contaminants. This will help create an understanding of what plants are good for what kind of clean up and create this courtyard for the residents.

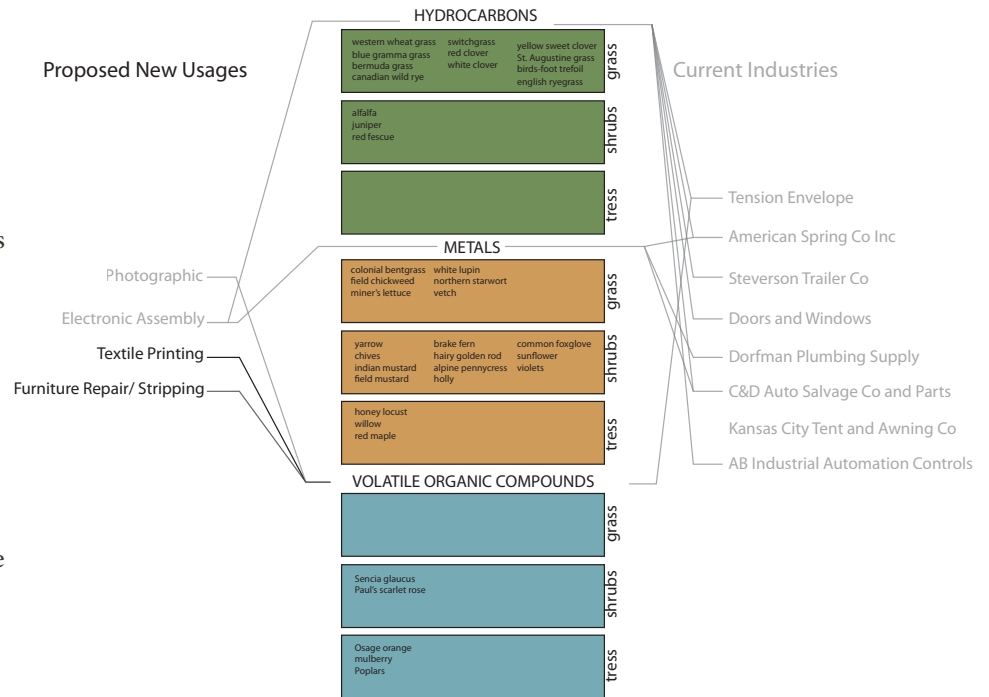


Figure 4-21: Textile Plant List (created by author)

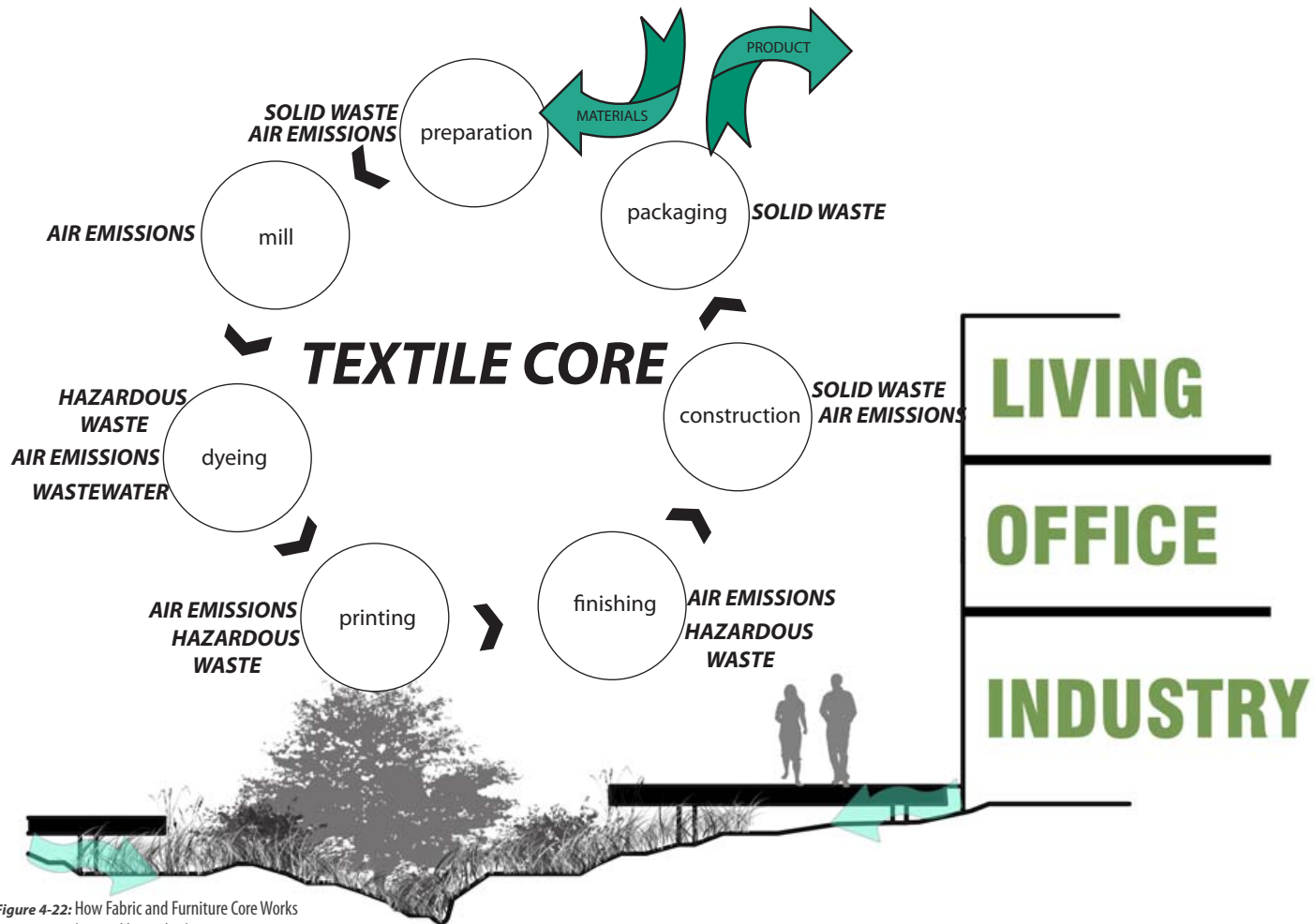


Figure 4-22: How Fabric and Furniture Core Works
(created by author)

Phasing Plan

Construction of the rail and trail are undetermined, but the rail is possible to be working within the next 2 to 5 years and the trail could occur before or after. With this uncertainty the Crossroads Station will be able to function from no rail line or transit stop to a fully functional multi-modal station through a phasing strategy.



Figure 4-23: View from Sky Restaurant (created by author)

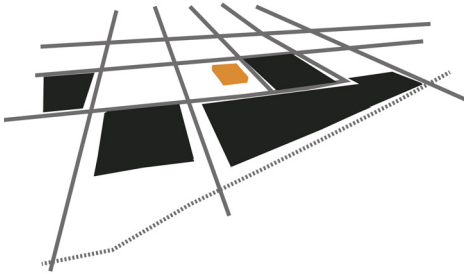


Figure 4-24: Remove Asphalt (created by author)

The first order before construction of the rail, trail, and the site the asphalt must be broken up. The remediation necessary is to simply remove the asphalt and recycle it for the trails throughout the site, the park system to the west, and trails along the Rock Island Corridor. After the asphalt is removed, construction of the buildings can start. The newly constructed buildings on the site will contain any threat to the environment and human health without the need to remediate those specific areas. The sites left vacant will be covered with plants that absorb oils and will be removed and incinerated after 6 months if contain high levels of toxins in leaves. The new plants will cater to the possible contaminants from the current usage.

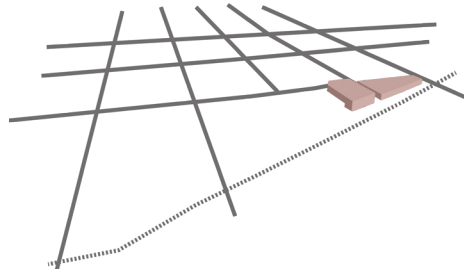


Figure 4-25: Phytoremediation Resource Center (created by author)

With the lack of research on phytoremediation, a facility is created to control light contamination from surrounding sites. It also is a place to further research of environmental hazards and how to prevent them. The facility can control moving contaminants off site and can be utilized as urban land is redeveloped.

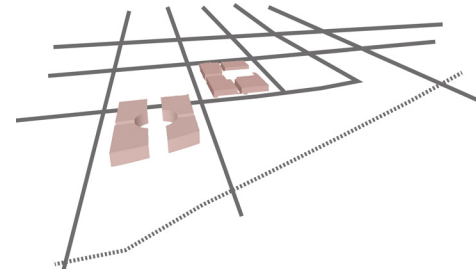


Figure 4-26: Phytoremediation Developments (created by author)

The two development pods are able to sustain without the station, but will flourish with the traffic from the station. Construction of photographic and textile unit then place plants to prevent spread of chemicals. The vegetation form space, create paths, control dust and noise while performing phytoremediation. The developments will then encourage traffic and people to live in the area therefore, infill development can occur.

The phytoremediation areas are monitored by the research facility to help keep these industries functioning over time.

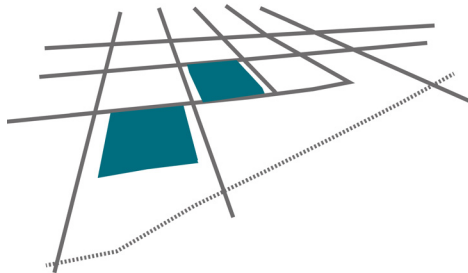


Figure 4-27: Remediation Centers (created by author)

Once each building is developed quick remediation techniques are used in the areas that are going to remain green space. The plants are plants used to uptake organic contaminants. The plants used either hold the contaminants in the root system or slowly release toxins in the air at non-toxic levels. This allows the site to be used at all times and the plants do not need to be removed. The plants will be removed when they are no longer performing or if a plant that can sustain high levels of metal contaminants is needed because of the current usage.

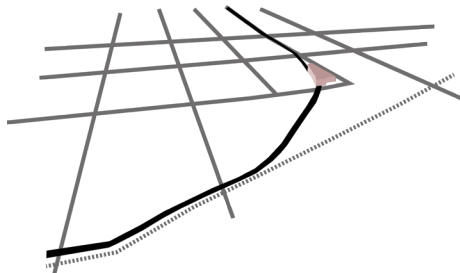


Figure 4-28: Train Station (created by author)

Once the rail line is under construction within the area, the station is constructed to accommodate the rail when the corridor is completed. It will start with the platform. Next the information center and bike rental station is attached. The last order is the wing of the building to the north, which contains a hotel and a parking garage.

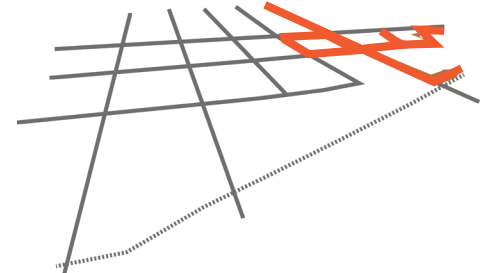


Figure 4-29: Contain through Phytoremediation (created by author)

An on going strategy is to plant street trees around current industry that absorbs the toxins from the air and ground being produced. This strategy is something that can be in place forever with no threat or harm to wildlife and people. It also creates more comfortable streetscapes, control dust, noise, and light pollution. This type of phytoremediation can be an example for the rest of the city. It will unite streetscapes across the districts while controlling the spread of contamination. This could mean less intensive cleanup in the future and possibly no contamination to surrounding sites of the contaminant producer.

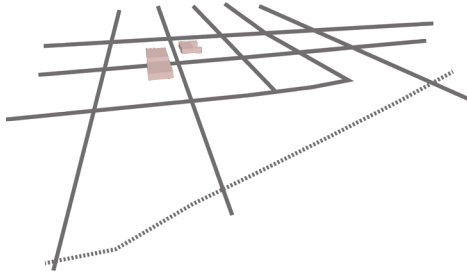


Figure 4-30: Infill (created by author)

Infill takes place in small-underutilized spaces to continue the themes from the design into the surrounding district. It serves for those who want to be part of the community and share ideas, but not specifically for the trades in the development pods.

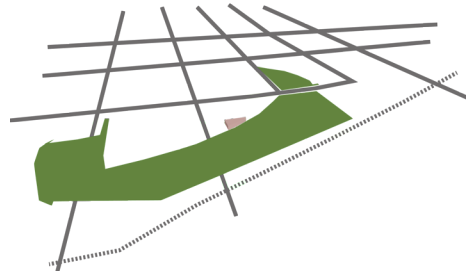


Figure 4-31: Green Space (created by author)

Final connections are to the Rail Park. It is used to access Hospital Hill and southern portions of the site. The strategies of phytoremediation continue into the park. Contaminated fill is used as berms while planted for phytoremediation. Not only is it functioning as a space to control contamination, but it also serves as a park and trail space.

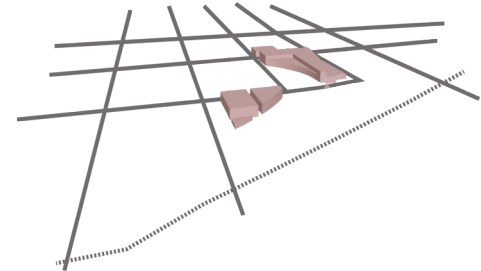


Figure 4-32: Park and Station Additions (created by author)

As the area gets more and more traffic, the amenities are added. The parking garage, information center, and hotel attached to the train station. The park amenities are added along with more high density housing and shops.

The conclusion addresses what the project is, what it accomplishes, what are the next steps, and what are the challenges.





Conclusions

Conclusions

Recap

There is a large amount of vacant/ underutilized land with the potential of light contamination. Instead of viewing it as a threat, it should be seen as a commodity. It can further help our understandings of brownfields and how to be more efficient with the clean up process to the redevelopment process. The two processes used together for better efficiency, better for environment, and better for the community.

This project evaluates the clean up process and redevelopment that capitalizes on both to create an industrial arts community. The clean up is conducted through phytoremediation because it prevents more waste added to landfills and prevents trucking in as much new soil and replacing other materials that were removed. It also creates green space while cleaning the soil and groundwater.

The redevelopment is planned to offset any contaminants produced by the

development with phytoremediation. The brownfield process ends once the Certificate of Completion is received, but the brownfield process doesn't take into account the constant evolution of urban land. Phytoremediation is used to control contaminants as they are produced to prevent extensive brownfield clean up. The process is better for the environment and the community.

Phytoremediation Challenges

The problem with phytoremediation is the outcomes are different from each site due to contaminants and different environmental conditions. The plant material is expensive and time consuming, so for most redeveloped sites the process currently isn't used. Longterm it is a better process for protecting our Ecosystem Services.

Phytoremediation still unknown, but through the help of the remediation facility and controlling substances around the Crossroads Station offers

room for advancement to reduce cost, protect the environment, and change the process of brownfield redevelopment.

Hurdles

The brownfield process offers tax cuts and some incentives. Overall the system is successful, but this is a reactive strategy. It is a long process and difficult to negotiate all incentive because the incentives are not coordinated. Some are offered by state, city, and national government. Phytoremediation preventative strategy provides a proactive solution to prevent the site and owners from going through all of the hoops.

General Conclusions

A plan created to enhance the ecological quality with community needs for now and the future as a way of healing the environment and connecting city life back to the environment. It creates a network that

links the pedestrian to public life from Ecosystem Services and transit that the Rock Island Corridor has to offer. The Crossroads Station supports sustainable preventative/remediation strategies and redevelopment unites the Rock Island Corridor, multi-modal transit, Metrogreen, character of place, and city life. It blends site suitability with community needs, while creating a cleaner more efficient environment that is aesthetically appealing.

The strategies offers beautification in a process that usually is hidden or frowned upon. Phytoremediation preventative strategy allows for these spaces to keep up with change over time without the lag time of the brownfield process. Allows the general public to be educated on industrial and artistic activities within the city along with the importance of remediation for us to be able to coexist with nature.

Rock Island Corridor Conclusions

Although this project targets one area along the corridor, the strategies can be implemented all along the corridor, but form and useage will change depending on the needs of the community and environment in that specific location.

The project creates a transit-oriented development made possible by the Rock Island Corridor, It gives travelers another destination along the route. It provides living, working, and entertainment to accomodate the new growth in Kansas City. It prevents new growth occuring outside of the corridor and encourage more development along the corridor.

The appendix includes content used in the process of the project and report. Before we developed our projects, we set up our own framework. We stated design philosophies, design process, and relevance to our program and career.





Appendix A

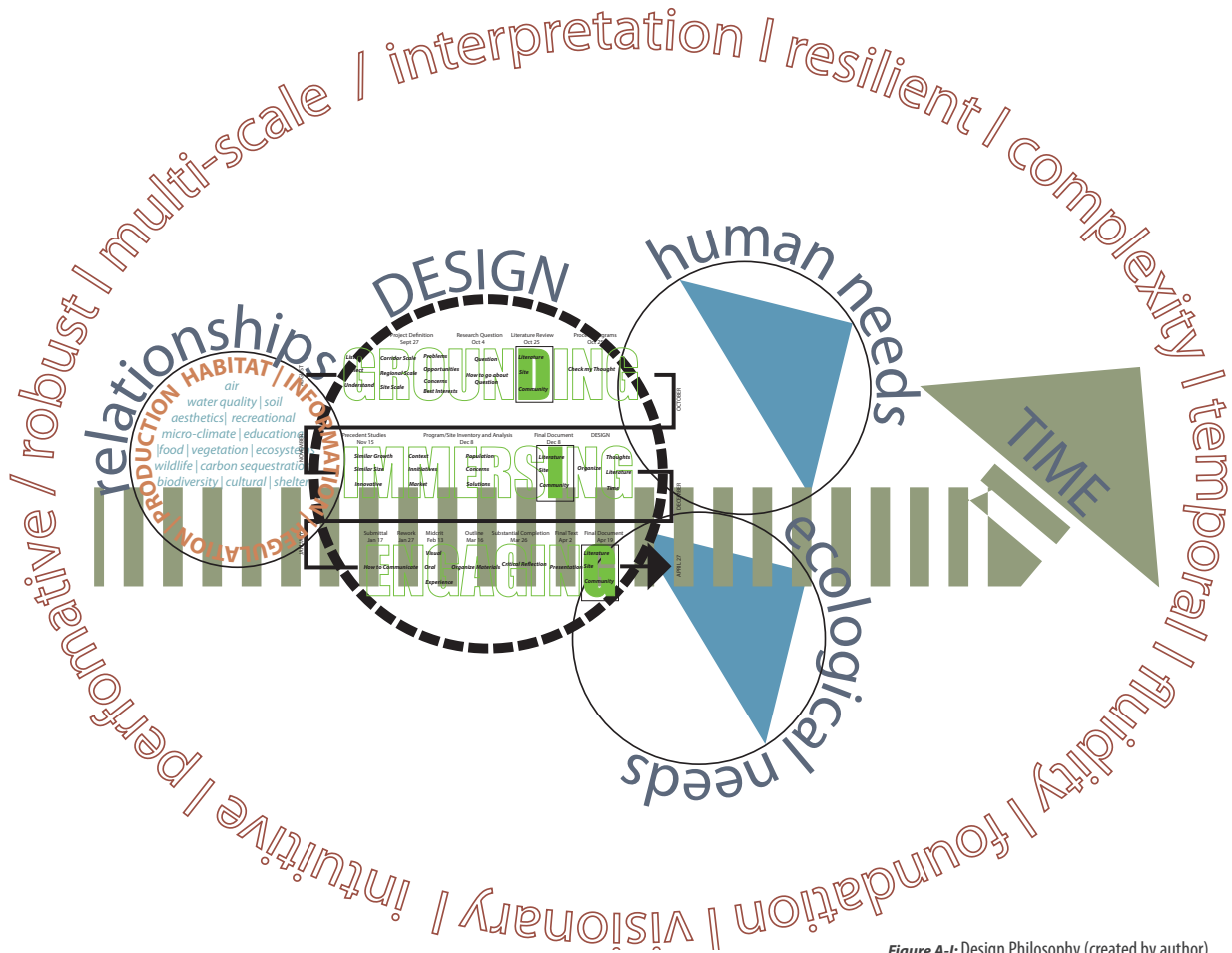


Figure A-1: Design Philosophy (created by author)

Design Philosophy

Design is based on all internal and external forces that work together to create an environment and relationships that balance human needs with the needs of nature to sustain now and the future.

Ecological Services are the foundation of how we function as an ecosystem. We rely on habitat, information, regulatory, and production functions for everyday living and create a codependence between the environment and society. By thinking about it in these four categories it helps formulate a design that caters to both human and ecological needs without harming the other. It creates a design for the present and doesn't deplete the services for future needs and use.



Figure A-2: Process Diagram (created by author)

Process Diagrams

I am a scattered-brain linear thinker. I think at multiple instances at once that all follow one path to reach the end goal of a final document. I refer to this diagram to keep me on the overall track since I usually become bogged down trying to do multiple things at once. Having these over arching words such as grounding, immersing, and engaging helps bring me back to reality with the dates displayed over each thought stage.

Grounding I consider getting oriented with the project and how to approach it. Immersing is thinking about the first stage at a deeper level by analyzing and synthesizing information. Engaging is producing a product that is relatable, understandable, and thought-provoking to those who would come across my study.

The three words spell out DIG because in each stage I am constantly referring and finding information related to literature, the site, and the community. It must be able to be understood at all levels.

All of these pieces together help lead me to a final project and focus on the greater aspects of it rather than confusing multiple information into one context. This map will always be relevant and the other pieces of my life can intertwine with the needs of my project for those are to change and this is rigid.

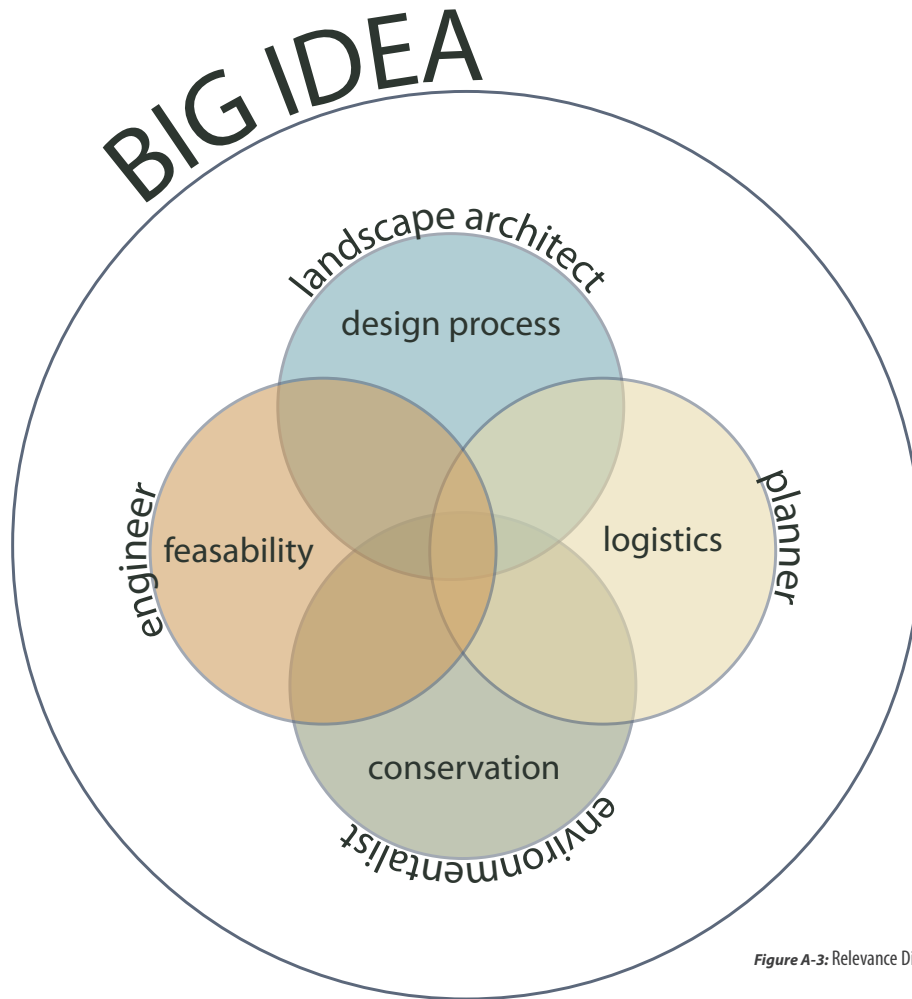


Figure A-3: Relevance Diagram (created by author)

Relevance

Relevance

The importance of this project is to combine the languages of the conservation of an environmentalist and the logistics of a planner with the design process of a landscape architect while in the beginning stages of brownfield redevelopment. The goal is to change from the view of a site to creating a place. Brownfield redevelopment should start with a designer for the site to have a purpose and direction to choose the proper remediation strategies and city planning strategies. A landscape architect can coordinate what needs to be done best for the health, safety, and welfare of a community while providing new and creative solutions to brownfield redevelopment and tie into the current studies of the Rock Island Corridor and other regional strategies. The end goal will encourage Kansas City to redevelop areas that need infill and enhancement through the combined language of environmentalism, planning, engineering, and landscape architecture.

End Product

The end product is a master plan for the entire area between the KCT RR and Truman Road Corridor. It contains details of trails, remediation strategy plan, plant material, new development, phasing of plant material and development, and location of transit stations and requirements. It will be presented in high quality graphics and text to tell each phase and how it will look over the course of thirty years. It contains each step it takes to remediate the sites and the phasing of the downtown to fit the brownfields back into the urban fabric and connect people back to the land and corridor. The format is in book form as well as a Powerpoint presentation with supplemental boards and handouts to support the presentation.

Relationships

2As a group, we will be receiving feedback from MARC and work closely with them through this process. I will also be working closely with Transystems to understand the new rail and transit alignments and future of the Truman Corridor.

There are three case studies in this chapter that discuss how brownfield sites correlate with regional transit. The case studies help inform the site and how it could fit in Kansas City.





Appendix B

Case Studies

In order to solve the problems of Kansas City, I analyzed the four key subjects that makes Kansas City what it is: deindustrialized, commuter city, strong cultures, and a transit hub. Through research I found cities that have or had similar qualities to Kansas City, but also have initiatives to better the city like MARC is looking to do for Kansas City. The cities I selected adapted to the needs of the community, has a collection of brownfields, a state or city brownfield program, anticipated growth, and has or developing regional transit. Once the city was selected then I found brownfields within the city that use a collection of brownfields to fit needs of the community, MARC initiative qualities, connection to transit, and near central downtown. From the analysis from the regional scale to the city to the site, I can accurately assess what needs to be down to the development of Kansas City's brownfields. The key things I discovered about what those cities accomplished is that the brownfield redevelopment encouraged transit downtown, environmental cleanup, compact infrastructure, and a sense of community.

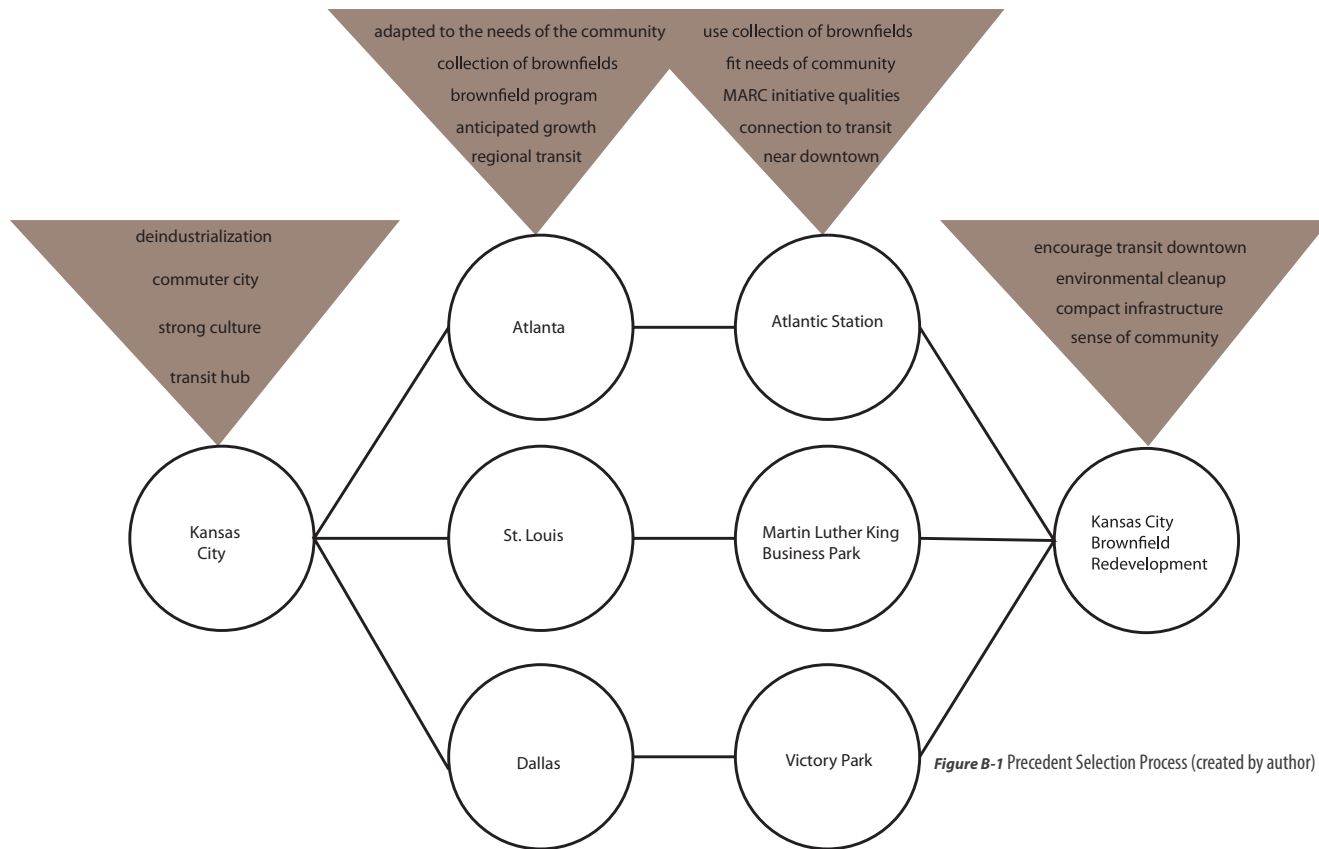


Figure B-1 Precedent Selection Process (created by author)

Atlantic Station

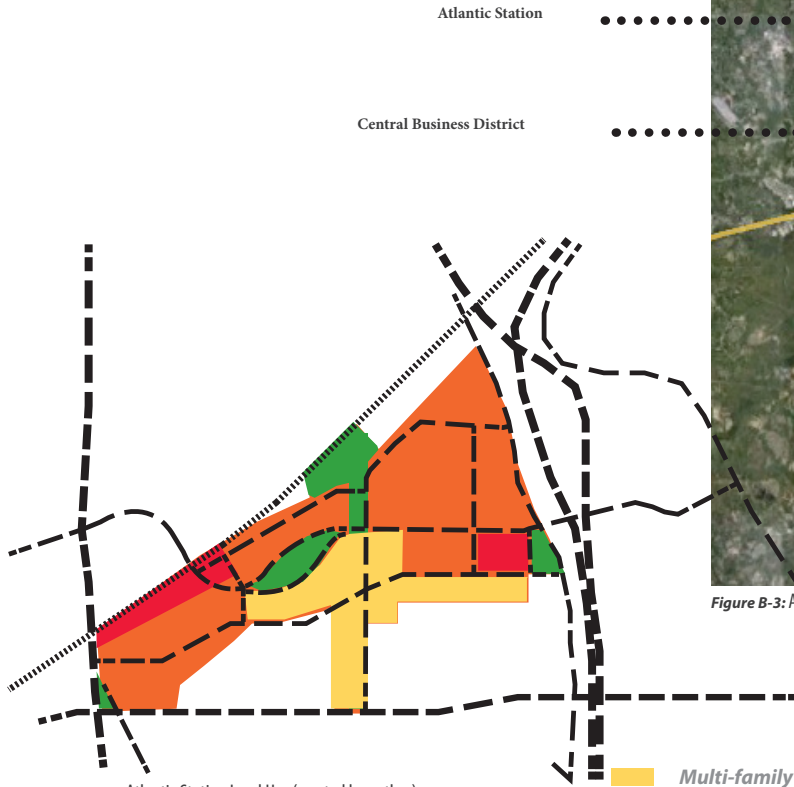


Figure B-2: Atlantic Station Land Use (created by author)

- Multi-family Residential
- Green Space
- Office
- Mixed-Use

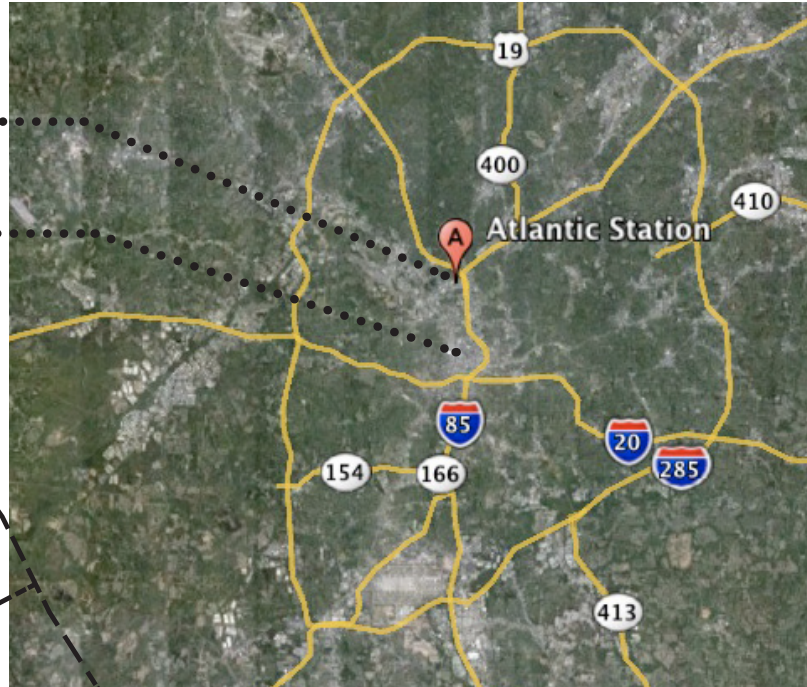


Figure B-3: Atlantic Station Map (Google Earth)

Regional Highway System creates a large loop around the entire region rather than closing off the central business district

Transit System: MARTA

Project Title: Atlantic Station

City: Atlanta, Georgia

Downtown Population: 420,000

Metro Population: 4.1 million (contains 28 counties and 140 cities)

Number of Satellite Communities: MARTA hosts 5 counties

Atlanta started as a transit hub because it was the end of the Western and Atlantic railroad line. Today it is still a transit hub for having one of the busiest airports nationally and internationally in the United States. Atlanta is “a fast-paced modern city proud of its heritage” (atlantaga.gov). Atlanta had severe sprawl problems with the growth of “edge cities.” The city only had 10% of the metropolitan population.

Acquiring Corridor and Creation of the Transit System:

MARTA was formulated in the 1960s, but the rail system didn't start until 1979. It spans 5 counties. It is successful to travel through downtown and to reach the airport. In 2006 The Transit Planning Board was formed to create and expand public transit for the Atlanta Region.

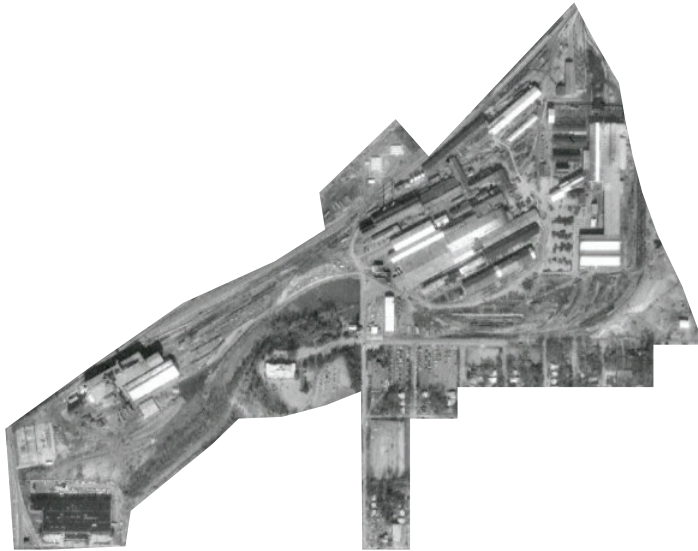


Figure B-4: Atlantic Station Before (Google Earth)

Site before cleanup lacks connection to the surrounding context.



Figure B-5: Atlantic Station After (Google Earth)

The new road network and usage fits into the existing context while creating a vibrant place. Parking garages served as caps for the contaminant that still exists on site.

Name of Site: Atlantic Station

Owner: AIG Global Real Estate Investment Corp., Jacoby Development, Inc.

Designer: Brian Leary, Jacoby Development, Inc., DPZ

Total Cost of Project: 2 billion dollars

Size: 138 acres

Parcels Acquired: 1 parcel

Different Owners: No, all owned by Atlantic Steel

Connection to Transit: It is located near Interstates 75 and 85 and it is also located near two rail lines on the Red Line and Gold Line.

Relation to Downtown: Close to Georgia Tech and Midtown

Prior Usages: Atlantic Steel Mill from 1901-1998

New Site Usages: Mixed-use development

Funding: Tax Allocation Bond paid 75 million dollars for infrastructure which included a new bridge to the site.

Acquiring Site: It was bought in 1998 then rezoned from industrial to mixed-use. The master plan started as a typical auto-oriented design then changed to an example of Smart Growth through the help of Duany Plater-Zyberk who have experience with Smart Growth. Brian Leary suggested “Atlantic Station: A Place to Live, Work, and Play.” Creating places for people.

TYPE OF CONTAMINANTS FOUND	SITE STATUS	SITE NAME	SITE ADDRESS
Asbestos	Cert. of Comp. Issued/AULs	Jazz District - 19th & Paseo	1500 East 19th Street
Asbestos,BTEX,Gasoline,Heating Oil,Lead,Lead-Based Paint,PCBs,TCE,Volatiles	Cert. of Comp. Issued/AULs	Jefferson at the Plaza	48th and Oak Street
Asbestos,Construction/Demolition Wastes,Gasoline,Heating Oil,Solvents	Cert. of Comp. Issued/AULs	Kansas City Coal Gas	899 E. 1st Street
Asbestos,Construction/Demolition Wastes,Heating Oil,Lead-Based Paint	Cert. of Comp. Issued/AULs	Kansas City Coal Gas	223 Gillis St.
Asbestos,Heating Oil	Cert. of Comp. Issued/AULs	Kansas City Community Center	1514 Campbell Street
Asbestos,Heating Oil,Lead-Based Paint,PCBs	Cert. of Comp. Issued/AULs	Kansas City Missouri School District	Numerous Locations
Asbestos,Lead	Cert. of Comp. Issued/AULs	Kansas City Terminal Railway - Service Road	27th and Southwest Boulevard
Asbestos,Lead	Cert. of Comp. Issued/AULs	Kansas City Terminal Railway Co.	2530 Southwest Blvd.
Asbestos,Lead	Cert. of Comp. Issued/AULs	Kansas City Terminal Railway Co.	27th and Southwest Boulevard
Asbestos,Lead	Cert. of Comp. Issued/AULs	KC Live Entertainment District - Block 138	1400 Main St., 1401 Baltimore, 1415 Baltimore
Asbestos,Lead	Cert. of Comp. Issued/AULs	KCPL - Baltimore Substation	13th and Baltimore
Asbestos,Lead	Cert. of Comp. Issued/AULs	KHD/Deutz	627 South Cottage Avenue
Asbestos,Lead-Based Paint	Cert. of Completion Issued	Kirk Welding Supply, Inc.-Fremont	3820 Fremont Avenue
Asbestos,Lead-Based Paint	Cert. of Completion Issued	Kirk Welding Supply, Inc.-Holmes	1608 Holmes
Asbestos,Motor Oil/Lubricants,PAHs,Petroleum - misc	Cert. of Completion Issued	Landmark Dodge	1900 South Noland Road
Asbestos,Petroleum - misc	Cert. of Completion Issued	Lawndale Apartments	5621-5701 Saint John
Asbestos,VOCs	Cert. of Completion Issued	Library Lofts	117and 127 West 10th St. and 1004 Baltimore
Lead	Cert. of Completion Issued	Quality Hill Towers	817, 905, and 929 Jefferson
Lead	Cert. of Completion Issued	Quality Wood Products	7400 E. 12th Street
Lead	Cert. of Completion Issued	Quicktrip #183	1001 Southwest Blue Parkway
Lead	Cert. of Completion Issued	QuikTrip 222 (former Georges Imports)	8011 State Line Road
Lead-Based Paint	Cert. of Completion Issued	Railway Carmen Building	4929 Main Street
Lead,Metals,VOCs	Cert. of Completion Issued	Raytown Dodge Company	10000 East Blue Parkway, State Rt. 350
Lead,PAHs	Cert. of Completion Issued	Reinties Company Inc.	3125 Roanoke Road
Lead,PAHs	Cert. of Completion Issued	Richards Gebaur Memorial Airport	15450 Hangar Road, Building 901
Lead,PAHs	Cert. of Completion Issued	Richards Gebaur Memorial Airport	15450 Hangar Road
Lead,PAHs	Cert. of Completion Issued	Richards Gebaur Memorial Airport	Highway 150, Thunderbird Rd., Botts Rd., 149th St., Andrews Rd.
Lead,Petroleum - misc	Cert. of Completion Issued	Richards Gebaur Memorial Airport	Highway 150, Thunderbird Rd., Botts Rd., 149th St., Andrews Rd.
Metals,PAHs,PCBs,Petroleum - misc,Solvents,TCE	Inactive/Application Denied	Riley Properties	36809 East 40 Highway
PCBs,Petroleum - misc,Solvents	Inactive/Withdrew	Southern Star Central Gas Pipeline Inc.-Northern Area Site	
PCBs,VOCs	Inactive/Withdrew	Southern Star Central Gas Pipeline Inc.-Northern Area Site	
BTEX,Metals,PCBs,Petroleum - misc,Solvents,TCE	Cert. of Completion Issued	Longfellow Heights Phase III	E. 27th St. and Troost Ave.

Table B-1: Brownfield Comparison to Atlantic Station (Missouri Department of Natural Resources)

Remediation Costs: 10 million

Remediation Techniques: Capped site and put parking garage over it. Removed contaminated soil and material. Collected groundwater and treated it to prevent contaminating nearby sites. Put two feet of clean fill over slag that still remains.

Cleanup Length: 1999-2001

Amount of Contaminated Material Removed: 165,000 tons of contaminated materials.

Groundwater Treatment: Yes, collected and treated.

Recycled Concrete Reused on Site: 132,000 cubic yards

Type of Contaminants: PCB lead, asbestos, and Sulfates

MLK Business Park

Central Business District

MLK Business Park

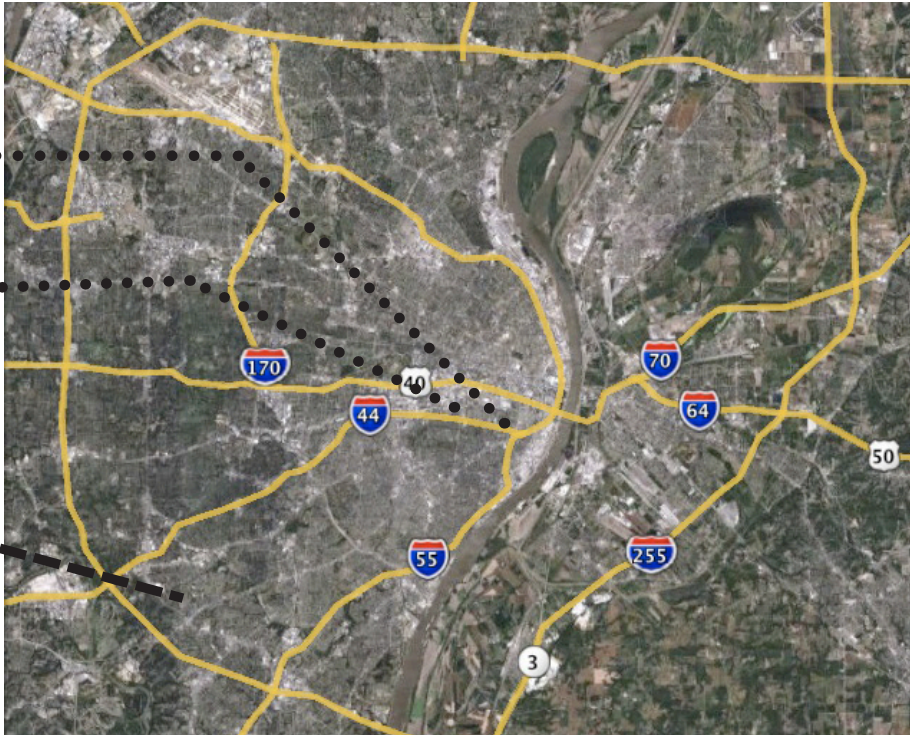
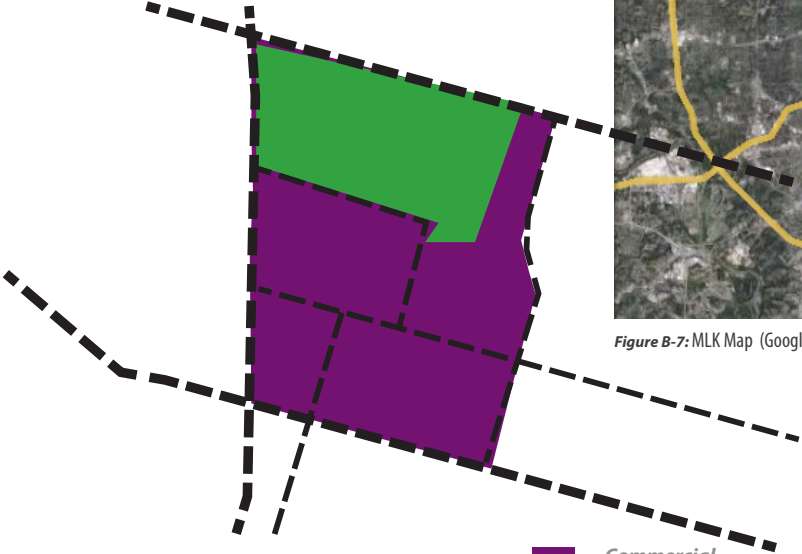


Figure B-7: MLK Map (Google Earth)

St. Louis' regional highway system encompasses two states along the Mississippi River.



Commercial
Green Space

Figure B-6: MLK Land Use (created by author)

Transit System: MetroLink

Project Title: Martin Luther King Business Park

City: St. Louis, Missouri

Downtown Population: 354,748

Metro Population: 2,836,152

Number of Satellite Communities: 16 counties

St. Louis is a central transportation hub for its location to the Mississippi River and serving as the Gateway to the west. While it is a prime location, its population and industry declined in the downtown area. St. Louis started an initiative to keep industries downtown by redeveloping areas and providing tax incentives for those companies.

Acquiring Corridor and creation of the transit system

Missouri and Illinois united to make a cohesive transit system for Metropolitan St. Louis through the Bi-State Development Agency in 1949. It wasn't until the 1990s that the light-rail system was introduced to connect Central Business District from the other side of the Mississippi River and the Lambert Airport. Since it has been so popular it has been trying to expand ever since then.



Figure B-8: MLK Before (Google Earth)

Martin Luther King Business Park in 1996 contained a mixture of businesses leaving various contaminants



Figure B-9: MLK After (Google Earth)

In 2010 parts of the site were redeveloped as a model for future brownfield projects.

Name of Site: Martin Luther King Business Park

Owner: St. Louis Development Corporation and Balke Brown Associates

Designer: Balke Brown Associates

Total Cost of Project: 19,920,900

Size: 20 acres

Parcels Acquired: 16 city blocks

Different Owners: Left abandoned for 12 years.

Connection to Transit: Connects to several bus routes, but not surrounded by major highways.

Relation to Downtown: It is located a few block from the Central Business District.

Prior Usages: plating facilities, foundries, dry cleaners, chemical companies, numerous salvage yards, gasoline filling stations

New Site Usages: Site was not allowed to have people living on the site. It could only be used for commercial and industrial purposes. It houses Gateway CDI, Killark Electrical Products, Swank Motion Pictures and McLeod USA Telecommunications, and the St. Louis Commerce Center.

Funding: city funded completion of phase one of remediation and received 1,250,000 in funding. Received 25 years of tax abatement.

TYPE OF CONTAMINANTS FOUND	SITE STATUS	SITE NAME	SITE ADDRESS
Asbestos	Cert. of Comp. Issued/AULs	Jazz District - 19th & Paseo	1500 East 19th Street
Asbestos/BTEX,Gasoline,Heating Oil,Lead,Lead-Based Paint,PCBs,TCE,Volatiles	Cert. of Comp. Issued/AULs	Jefferson at the Plaza	48th and Oak Street
Asbestos,Construction/Demolition Wastes,Gasoline,Heating Oil,Solvents	Cert. of Comp. Issued/AULs	Kansas City Coal Gas	899 E. 1st Street
Asbestos,Construction/Demolition Wastes,Heating Oil,Lead-Based Paint	Cert. of Comp. Issued/AULs	Kansas City Coal Gas	223 Gillis St.
Asbestos,Heating Oil	Cert. of Comp. Issued/AULs	Kansas City Community Center	1514 Campbell Street
Asbestos,Heating Oil,Lead-Based Paint,PCBs	Cert. of Comp. Issued/AULs	Kansas City Missouri School District	Numerous Locations
Asbestos,Lead	Cert. of Comp. Issued/AULs	Kansas City Terminal Railway - Service Road	27th and Southwest Boulevard
Asbestos,Lead	Cert. of Comp. Issued/AULs	Kansas City Terminal Railway Co.	2530 Southwest Blvd.
Asbestos,Lead	Cert. of Comp. Issued/AULs	Kansas City Terminal Railway Co.	27th and Southwest Boulevard
Asbestos,Lead	Cert. of Comp. Issued/AULs	KC Live Entertainment District - Block 138	1400 Main St., 1401 Baltimore, 1415 Baltimore
Asbestos,Lead	Cert. of Comp. Issued/AULs	KCPL - Baltimore Substation	13th and Baltimore
Asbestos,Lead	Cert. of Comp. Issued/AULs	KHD/Deutz	627 South Cottage Avenue
Asbestos,Lead-Based Paint	Cert. of Completion Issued	Kirk Welding Supply, Inc.-Fremont	3820 Fremont Avenue
Asbestos,Lead-Based Paint	Cert. of Completion Issued	Kirk Welding Supply, Inc.-Holmes	1608 Holmes
Asbestos,Motor Oil/Lubricants,PAHs,Petroleum - misc	Cert. of Completion Issued	Landmark Dodge	1900 South Noland Road
Asbestos,Petroleum - misc	Cert. of Completion Issued	Lawndale Apartments	5621-5701 Saint John
Asbestos,VOCs	Cert. of Completion Issued	Library Lofts	117and 127 West 10th St. and 1004 Baltimore
Lead	Cert. of Completion Issued	Quality Hill Towers	817, 905, and 929 Jefferson
Lead	Cert. of Completion Issued	Quality Wood Products	7400 E. 12th Street
Lead	Cert. of Completion Issued	Quicktrip #183	1001 Southwest Blue Parkway
Lead	Cert. of Completion Issued	QuikTrip 222 (former Georges Imports)	8011 State Line Road
Lead-Based Paint	Cert. of Completion Issued	Railway Carmen Building	4929 Main Street
Lead,Metals,VOCs	Cert. of Completion Issued	Raytown Dodge Company	10000 East Blue Parkway, State Rt. 350
Lead,PAHs	Cert. of Completion Issued	Reintjes Company Inc.	3125 Roanoke Road
Lead,PAHs	Cert. of Completion Issued	Richards Gebaur Memorial Airport	15450 Hanor Road, Building 901
Lead,PAHs	Cert. of Completion Issued	Richards Gebaur Memorial Airport	15450 Hanor Road
Lead,PAHs	Cert. of Completion Issued	Richards Gebaur Memorial Airport	Highway 150, Thunderbird Rd., Bolts Rd., 149th St., Andrews Rd.
Lead,Petroleum - misc	Cert. of Completion Issued	Richards Gebaur Memorial Airport	Highway 150, Thunderbird Rd., Bolts Rd., 149th St., Andrews Rd.
Metals,PAHs,PCBs,Petroleum - misc,Solvents,TCE	Inactive/Application Denied	Riley Properties	36809 East 40 Highway
Metals,PAHs,Petroleum - misc,Solvents	Inactive/Terminated by VCP	Riley Properties	36809 East 40 Highway
Metals,Petroleum - misc	Inactive/Terminated by VCP	Rival Building-Weld Wheel (former)	3601 Bennington Street
Metals,Petroleum - misc	Inactive/Terminated by VCP	Riverfront Landfill	Levee Road at Chouteau
Motor Oil/Lubricants,Petroleum - misc	Inactive/Withdraw	Security Self Storage	2748 Southwest Blvd.
PAHs,Petroleum - misc	Inactive/Withdraw	Sequentia	13720 Botts Road
PCBs,Petroleum - misc,Solvents	Inactive/Withdraw	Southern Star Central Gas Pipeline Inc.-Northern Area Site	
PCE,Petroleum - misc	Inactive/Withdraw	Southern Star Central Gas Pipeline Inc.-Northern Area Site	
Petroleum - misc	Inactive/Withdraw	St. Joseph Place	North of E. 10th Street between Woodland Avenue and Garfield Avenue
Petroleum - misc	Inactive/Withdraw	Stanford Saper Cleaners	338 W. 63rd Street
Petroleum - misc	Inactive/Withdraw	Sunshine Biscuits/Zea Chemical	1000 - 1100 West 8th Street
Ammonia,Asbestos,Coal Tar,Construction/Demolition Wastes,Cyanides,Metals,PAHs,Petroleum - misc	Cert. of Comp. Issued/AULs	Hertz Contractors Supply - Kansas City	1735 Charlotte Street
Arsenic,Asbestos,Diesel,Lead,Lead-Based Paint	Cert. of Comp. Issued/AULs	Hertz Contractors Supply-Kansas City#2	1608 Charlotte Street
Arsenic,Asbestos,Petroleum - misc	Cert. of Comp. Issued/AULs	Independence FMGP #2	1117 S. Pleasant
Arsenic,Gasoline	Cert. of Comp. Issued/AULs	Independence Main Street Property	315 N. Main
Arsenic,Lead	Cert. of Comp. Issued/AULs	Independence Main Street Property	315 N. Main
Arsenic,Lead,Metals	Cert. of Comp. Issued/AULs	Independence Regional Entrepreneurial Center	1509-1515 West Truman Road
Arsenic,Lead,Motor Oil/Lubricants	Cert. of Comp. Issued/AULs	Industrial Services Corp. (Former)	3001 & 3015 Fairmount Ave
Arsenic,Petroleum - misc,VOCs	Cert. of Comp. Issued/AULs	J.R. Body Shop	8214 Westridge
Arsenic,Petroleum - misc,VOCs	Cert. of Comp. Issued/AULs	Jazz District - 19th & Highland	1610 E 19th St and 1612 E 19th St (formerly 1832 Highland Ave)
Asbestos	Cert. of Comp. Issued/AULs	Jazz District - 19th & Paseo	1500 East 19th Street
Asbestos/BTEX,Gasoline,Heating Oil,Lead,Lead-Based Paint,PCBs,TCE,Volatiles	Cert. of Comp. Issued/AULs	Jefferson at the Plaza	48th and Oak Street
Asbestos,Construction/Demolition Wastes,Gasoline,Heating Oil,Solvents	Cert. of Comp. Issued/AULs	Kansas City Coal Gas	899 E. 1st Street
Asbestos,Construction/Demolition Wastes,Heating Oil,Lead-Based Paint	Cert. of Comp. Issued/AULs	Kansas City Coal Gas	223 Gillis St.
Asbestos,Heating Oil	Cert. of Comp. Issued/AULs	Kansas City Community Center	1514 Campbell Street
Asbestos,Heating Oil,Lead-Based Paint,PCBs	Cert. of Comp. Issued/AULs	Kansas City Missouri School District	Numerous Locations
Asbestos,Lead	Cert. of Comp. Issued/AULs	Kansas City Terminal Railway - Service Road	27th and Southwest Boulevard
Asbestos,Lead	Cert. of Comp. Issued/AULs	Kansas City Terminal Railway Co.	2530 Southwest Blvd.
Asbestos,Lead	Cert. of Comp. Issued/AULs	Kansas City Terminal Railway Co.	27th and Southwest Boulevard
Asbestos,Lead	Cert. of Comp. Issued/AULs	KC Live Entertainment District - Block 138	1400 Main St., 1401 Baltimore, 1415 Baltimore
Asbestos,Lead	Cert. of Comp. Issued/AULs	KCPL - Baltimore Substation	13th and Baltimore
Asbestos,Lead	Cert. of Comp. Issued/AULs	KHD/Deutz	627 South Cottage Avenue
Asbestos,Lead-Based Paint	Cert. of Completion Issued	Kirk Welding Supply, Inc.-Fremont	3820 Fremont Avenue
Asbestos,Lead-Based Paint	Cert. of Completion Issued	Kirk Welding Supply, Inc.-Holmes	1608 Holmes
Asbestos,Motor Oil/Lubricants,PAHs,Petroleum - misc	Cert. of Completion Issued	Landmark Dodge	1900 South Noland Road
Asbestos,Petroleum - misc	Cert. of Completion Issued	Lawndale Apartments	5621-5701 Saint John
Asbestos,VOCs	Cert. of Completion Issued	Library Lofts	117and 127 West 10th St. and 1004 Baltimore
BTEX,Diesel,Gasoline,Petroleum - misc	Cert. of Completion Issued	Loma Vista Shopping Center	8700-8817 Blue Ridge Blvd.
BTEX,Metals,PCBs,Petroleum - misc,Solvents,TCE	Cert. of Completion Issued	Longfellow Heights Phase III	E. 27th St. and Troost Ave.
Diesel,Lead,Motor Oil/Lubricants	Cert. of Completion Issued	Midland True Value Development	7117-7125 Prospect
Diesel,Lead,Motor Oil/Lubricants	Cert. of Completion Issued	MidWest Microelectronics	777 Northwest Blue Parkway
Diesel,Lead,Motor Oil/Lubricants	Cert. of Completion Issued	Midland True Value Development	7117-7125 Prospect
Diesel,Lead,Motor Oil/Lubricants	Cert. of Completion Issued	MidWest Microelectronics	777 Northwest Blue Parkway

Table B-2: Brownfield Comparison to MLK (Missouri Department of Natural Resources)

Remediation Costs: 1,726,700

Remediation Techniques: Removed 20,000 tons of soil, 50,000 sq ft of asbestos, excavated 20 underground storage tanks. Capping and groundwater treatment. 1 million to remediate paid for by the state.

Cleanup Length: First half completed in 1999-2000 and second half 2000-2004

Amount of Contaminated Material Removed: 20,000 cubic yards

Groundwater Treatment: Removed through natural chemical processes and ecosystem attenuation processes. It treated 12,000 gallons of contaminated groundwater.

Recycled Concrete Reused on Site: unknown

Type of Contaminants: PCB, lead, asbestos, and sulfates, petroleum, metals, benzene, methylene chloride

Acquiring Site: It was a pilot program to encourage businesses to stay within the downtown area.

Victory Park



Figure B-10: Victory Park Land Use (created by author)

- Mixed-Use Parking
- Office

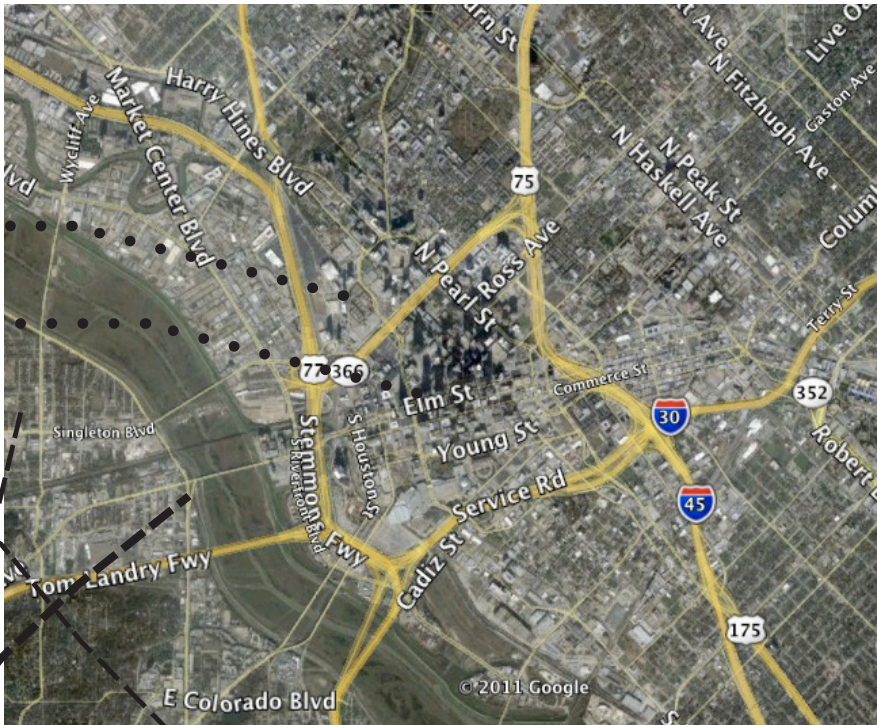


Figure B-11: Victory Park Map (Google Earth)

Dallas' regional highway system encloses it business district that separates it from Victory Park.

Transit System: DART

Project Title: Victory Park

City: Dallas Texas

Downtown Population: 1,316,350

Metro Population: 6,647,515

Number of Satellite Communities: 14 cities

Dallas was a key trading center for its oil, ranching, and cotton. Over time it became a central route and destination for transportation of goods creating strong regional road networks that formed a loop around Downtown Dallas' Central Business District.

Acquiring Corridor and creation of the transit system:

In 1983 DART was created to provide regional transit for 14 cities in Dallas County. It is the southwest's first commuter rail line. The light rail original plan was to adopt 147 miles of rail and changed to 93 miles because of funding. The start of the light rail began with the purchase of the railroad right-of-way from Southern Pacific Transportation Company. Of the 34.5 miles, 28 are used for transit while 6.5 miles are a linear park. In 1989 DART acquires 31.5 miles of ROW between Dallas and Fort Worth from Union Pacific Railroad along the

Railtran corridor. The next addition in 1991 was the ROW from St. Louis Southwestern Railway Company to use for transit in 2010. The light rail system was opened in 1996 with 11.2 miles while the rest of the system was still under construction. In 1997 DART acquires 5.25 miles more of ROW for a transit center and park. All added up to the system it is today, which has helped the community economically. "A new University of North Texas study shows DART Rail stations add value to nearby properties, particularly residential and office. According to the study, office properties near suburban DART Rail stations increased in value 53% more than comparable properties not served by rail, and values of residential properties rose 39% more than a group of control properties not served by rail"(DART).



Figure B-12: Victory Park Before (Google Earth)

In 1995 the site has been used for various uses over the course of 100 years that left the site with various unknown contaminants until phase 1 of remediation.



Figure B-13: Victory Park After (Google Earth)

The new site in 2010 was sensitive to the placement of parking and different uses to cap areas unsuitable.

Name of Site: Victory Park

Owner: Ross Perot Jr. CEO Hillwood Development

Designer: David M. Schwartz/ Architectural Services Inc. and HKS Inc.

Total Cost of Project: 3 billion dollars

Size: 75 acres

Parcels Acquired: 32 parcels

Different Owners: Yes, had to acquire different parcels.

Connection to Transit: In 2007 a study was conducted to see what should connect to the rail system, Victory Park was one. In 2009 Victory Park connected daily to the green line of the light rail system. It is also connected to the highways and bus system.

Relation to Downtown: Ross Perot Jr. saw it as a gateway to downtown. It is located just outside of the Central Business District and is considered one of the districts of downtown.

Prior Usages: It has been used for the city of Dallas since the mid 1800s as a city dump, meatpacking facility, railroad maintenance yard, cow pasture, grain silos, and electric power plant.

New Site Usages: Mixed-use community with hotel, event center, retail, offices, condominiums, apartments, and a museum.

Funding: 165 million for construction costs and over a billion dollars in private development investment and received tax increment financing and the sports teams will cover the rest of the expenses of the arena.

Acquiring Site: The existing basketball team and hockey team needed a better arena, since the Reunion Arena is outdated and not large enough. Dallas wanted to keep the teams in downtown Dallas, so were willing to fund a new arena. The teams will lease the building for 30 years to keep the teams in Dallas for at least that term then can own or lease the arena after that term. Ross Perot Jr. (developer and owner of Dallas Mavericks) acquired 12 acres to donate to the city for the use of the arena then bought the additional 40 acres for the rest of the development.

TYPE OF CONTAMINANTS FOUND	SITE STATUS	SITE NAME	SITE ADDRESS
Heating Oil,PAHs	Cert. of Completion Issued	Prier Brass Manufacturing Company	7811 Truman Boulevard
Heating Oil,PAHs	Cert. of Completion Issued	Quality Heights II	Michigan Street, Garfield Street, and 24th Street
Lead	Cert. of Completion Issued	Quality Hill Towers	817, 905, and 929 Jefferson
Lead	Cert. of Completion Issued	Quality Wood Products	7400 E. 12th Street
Lead	Cert. of Completion Issued	Quicktrip #183	1001 Southwest Blue Parkway
Lead	Cert. of Completion Issued	QuikTrip 222 (former Georges Imports)	8011 State Line Road
Lead-Based Paint	Cert. of Completion Issued	Railway Carmen Building	4929 Main Street
Lead, Metals, VOCs	Cert. of Completion Issued	Raytown Dodge Company	10000 East Blue Parkway, State Rt. 350
Lead, PAHs	Cert. of Completion Issued	Reintjes Company Inc.	3125 Roanoke Road
Lead, PAHs	Cert. of Completion Issued	Richards Gebaur Memorial Airport	15450 Hangar Road, Building 901
Lead, PAHs	Cert. of Completion Issued	Richards Gebaur Memorial Airport	15450 Hangar Road
Lead, PAHs	Cert. of Completion Issued	Richards Gebaur Memorial Airport	Highway 150, Thunderbird Rd., Botts Rd., 149th St., Andrews Rd.
Lead, Petroleum - misc	Cert. of Completion Issued	Richards Gebaur Memorial Airport	Highway 150, Thunderbird Rd., Botts Rd., 149th St., Andrews Rd.
Mercury	Cert. of Completion Issued	Richards Gebaur Memorial Airport	Highway 150, Thunderbird Rd., Botts Rd., 149th St., Andrews Rd.
Mercury	Cert. of Completion Issued	Richards Gebaur Memorial Airport	Highway 150, Thunderbird Rd., Botts Rd., 149th St., Andrews Rd.
Mercury	Cert. of Completion Issued	Richards Gebaur Memorial Airport	Highway 150, Thunderbird Rd., Botts Rd., 149th St., Andrews Rd.
Metals	Inactive/Application Denied	Richards Gebaur Memorial Airport	Highway 150, Thunderbird Rd., Botts Rd., 149th St., Andrews Rd.
Metals, Organic Compounds	Inactive/Application Denied	Richards Gebaur Memorial Airport	15450 Hangar Road
Metals, PAHs, PCBs, Petroleum - misc, Solvents, TCE	Inactive/Application Denied	Riley Properties	36809 East 40 Highway
Metals, PAHs, Petroleum - misc, Solvents	Inactive/Terminated by VCP	Riley Properties	36809 East 40 Highway
Metals, Petroleum - misc	Inactive/Terminated by VCP	Rival Building-Weld Wheel (former)	3601 Bennington Street
Metals, Petroleum - misc	Inactive/Terminated by VCP	Riverfront Landfill	Levee Road at Chouteau
Metals, Solvents	Inactive/Terminated by VCP	Riverfront Park Development	1200 & 1300 East Riverfront Drive
Metals, Solvents	Inactive/Terminated by VCP	Riverfront Park Development	1200 & 1300 East Riverfront Drive
Tar, Construction/Demolition	Cert. of Comp. Issued/AULs	Hertz Contractors Supply - Kansas City	1735 Charlotte Street
Arsenic, Asbestos, Diesel, Lead, Lead-Based Paint	Cert. of Comp. Issued/AULs	Hertz Contractors Supply-Kansas City#2	1608 Charlotte Street
Arsenic, Asbestos, Petroleum - misc	Cert. of Comp. Issued/AULs	Independence FMGP #2	1117 S. Pleasant
Arsenic, Gasoline	Cert. of Comp. Issued/AULs	Independence Main Street Property	315 N. Main
Arsenic, Lead	Cert. of Comp. Issued/AULs	Independence Main Street Property	315 N. Main
Arsenic, Lead, Metals	Cert. of Comp. Issued/AULs	Independence Regional Entrepreneurial Center	1509-1515 West Truman Road
Arsenic, Lead, Motor Oil/Lubricants	Cert. of Comp. Issued/AULs	Industrial Services Corp. (Former)	3001 & 3015 Fairmount Ave
Arsenic, Petroleum - misc, VOCs	Cert. of Comp. Issued/AULs	J.R. Body Shop	8214 Westridge
Arsenic, Petroleum - misc, VOCs	Cert. of Comp. Issued/AULs	Jazz District - 19th & Highland	1610 E 19th St and 1612 E 19th St (formerly 1832 Highland Ave)
BTEX, Metals, PCBs, Petroleum - misc, Solvents, TCE	Cert. of Completion Issued	Longfellow Heights Phase III	E. 27th St. and Troost Ave.
Asbestos	Cert. of Comp. Issued/AULs	Jazz District - 19th & Paseo	1500 East 19th Street
Asbestos, BTEX, Gasoline, Heating Oil, Lead, Lead-Based Paint, PCBs, TCE, Volatiles	Cert. of Comp. Issued/AULs	Jefferson at the Plaza	48th and Oak Street
Asbestos, Construction/Demolition Wastes, Gasoline, Heating Oil, Solvents	Cert. of Comp. Issued/AULs	Kansas City Coal Gas	899 E. 1st Street
Asbestos, Construction/Demolition Wastes, Heating Oil, Lead-Based Paint	Cert. of Comp. Issued/AULs	Kansas City Coal Gas	223 Gillis St.
Asbestos, Heating Oil	Cert. of Comp. Issued/AULs	Kansas City Community Center	1514 Campbell Street
Asbestos, Heating Oil, Lead-Based Paint, PCBs	Cert. of Comp. Issued/AULs	Kansas City Missouri School District	Numerous Locations
Asbestos, Lead	Cert. of Comp. Issued/AULs	Kansas City Terminal Railway - Service Road	27th and Southwest Boulevard
Asbestos, Lead	Cert. of Comp. Issued/AULs	Kansas City Terminal Railway Co.	2530 Southwest Blvd.
Asbestos, Lead	Cert. of Comp. Issued/AULs	Kansas City Terminal Railway Co.	27th and Southwest Boulevard
Asbestos, Lead	Cert. of Comp. Issued/AULs	KC Live Entertainment District - Block 138	1400 Main St., 1401 Baltimore, 1415 Baltimore
Asbestos, Lead	Cert. of Comp. Issued/AULs	KCPL - Baltimore Substation	13th and Baltimore
Asbestos, Lead	Cert. of Comp. Issued/AULs	KHD/Deutz	627 South Cottage Avenue
Asbestos, Lead-Based Paint	Cert. of Completion Issued	Kirk Welding Supply, Inc.-Fremont	3820 Fremont Avenue
Asbestos, Lead-Based Paint	Cert. of Completion Issued	Kirk Welding Supply, Inc.-Holmes	1608 Holmes
Asbestos, Motor Oil/Lubricants, PAHs, Petroleum - misc	Cert. of Completion Issued	Landmark Dodge	1900 South Noland Road
Asbestos, Petroleum - misc	Cert. of Completion Issued	Lawdale Apartments	5621-5701 Saint John
Asbestos, VOCs	Cert. of Completion Issued	Library Lofts	117and 127 West 10th St. and 1004 Baltimore
BTEX, Diesel, Gasoline, Petroleum - misc	Cert. of Completion Issued	Loma Vista Shopping Center	8700-8817 Blue Ridge Blvd.
Diesel, Petroleum - misc	Cert. of Completion Issued	Mulberry MoDot	650 Mulberry Street
PAHs, Petroleum - misc	Inactive/Withdrew	Sequentia	13720 Botts Road
PCBs, Petroleum - misc, Solvents	Inactive/Withdrew	Southern Star Central Gas Pipeline Inc.-Northern Area Site	
PCE, Petroleum - misc	Inactive/Withdrew	Southern Star Central Gas Pipeline Inc.-Northern Area Site	
Petroleum - misc	Inactive/Withdrew	St. Joseph Place	North of E. 10th Street between Woodland Avenue and Garfield Avenue
Petroleum - misc	Inactive/Withdrew	Stanford Saper Cleaners	338 W. 63rd Street
Petroleum - misc	Inactive/Withdrew	Sunshine Biscuit/Zea Chemical	1000 - 1100 West 8th Street

Table B-3: Brownfield Comparison to MLK (Missouri Department of Natural Resources)

Remediation Costs: 12 million

Remediation Techniques: excavated soil up to 30 ft deep, treated groundwater through sparging and carbon filtering, and capped parts of the site where cooling ponds were located.

Cleanup Length: 1998-2000

Amount of Contaminated Material Removed: 310,000 cubic yards of contaminated soil

Groundwater Treatment: treated 15 million gallons

Recycled Concrete Reused on Site: 47,000 cubic yards

Type of Contaminants: lead, arsenic mercury, poly-aromatic hydrocarbons, municipal solid waste, asbestos, pesticides, and petroleum

The literature review covers a wide variety of sources to better understand brownfields, strategies, and city context.





Appendix C

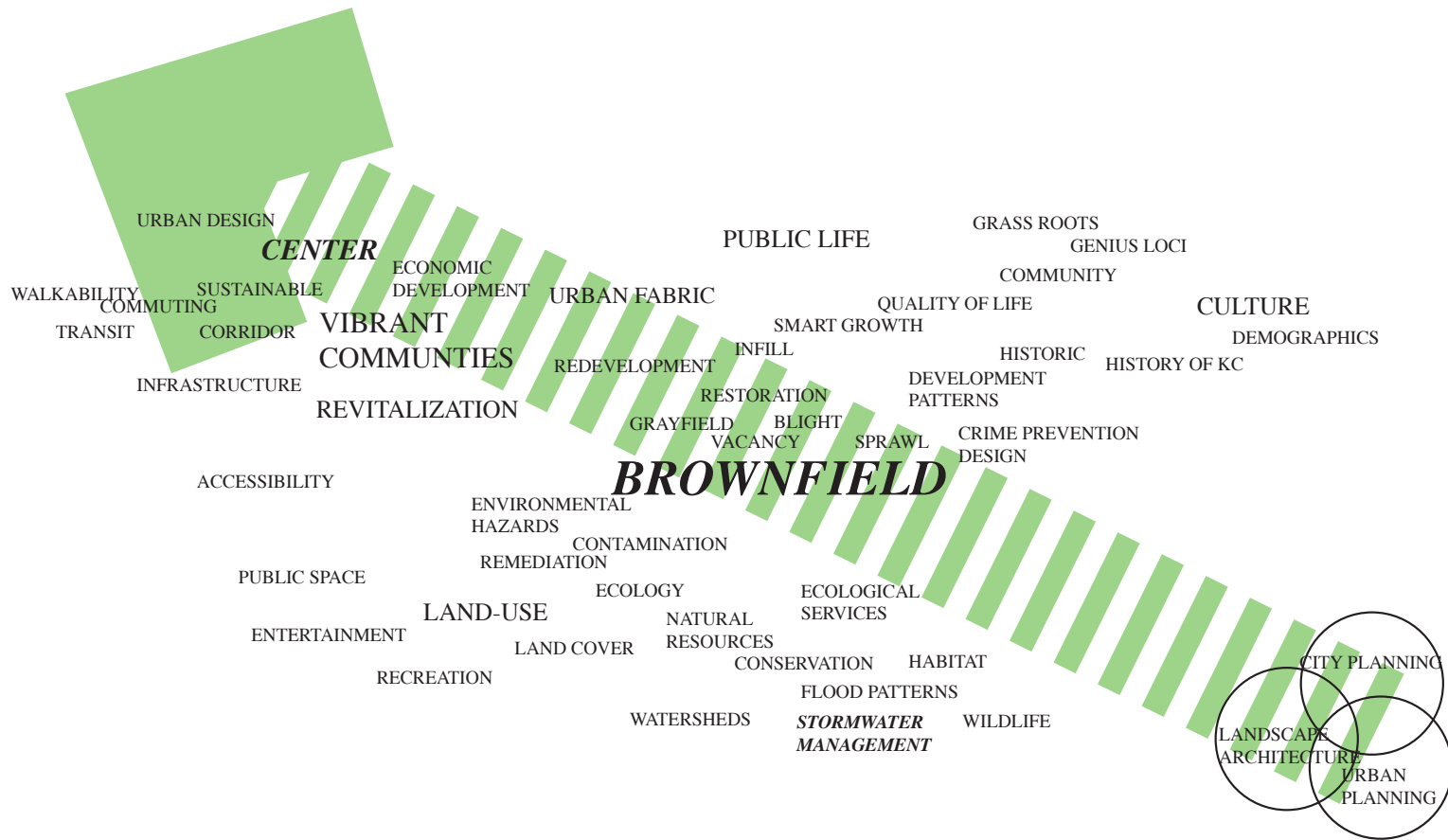


Figure 5-1: Conceptual Diagram (created by author)

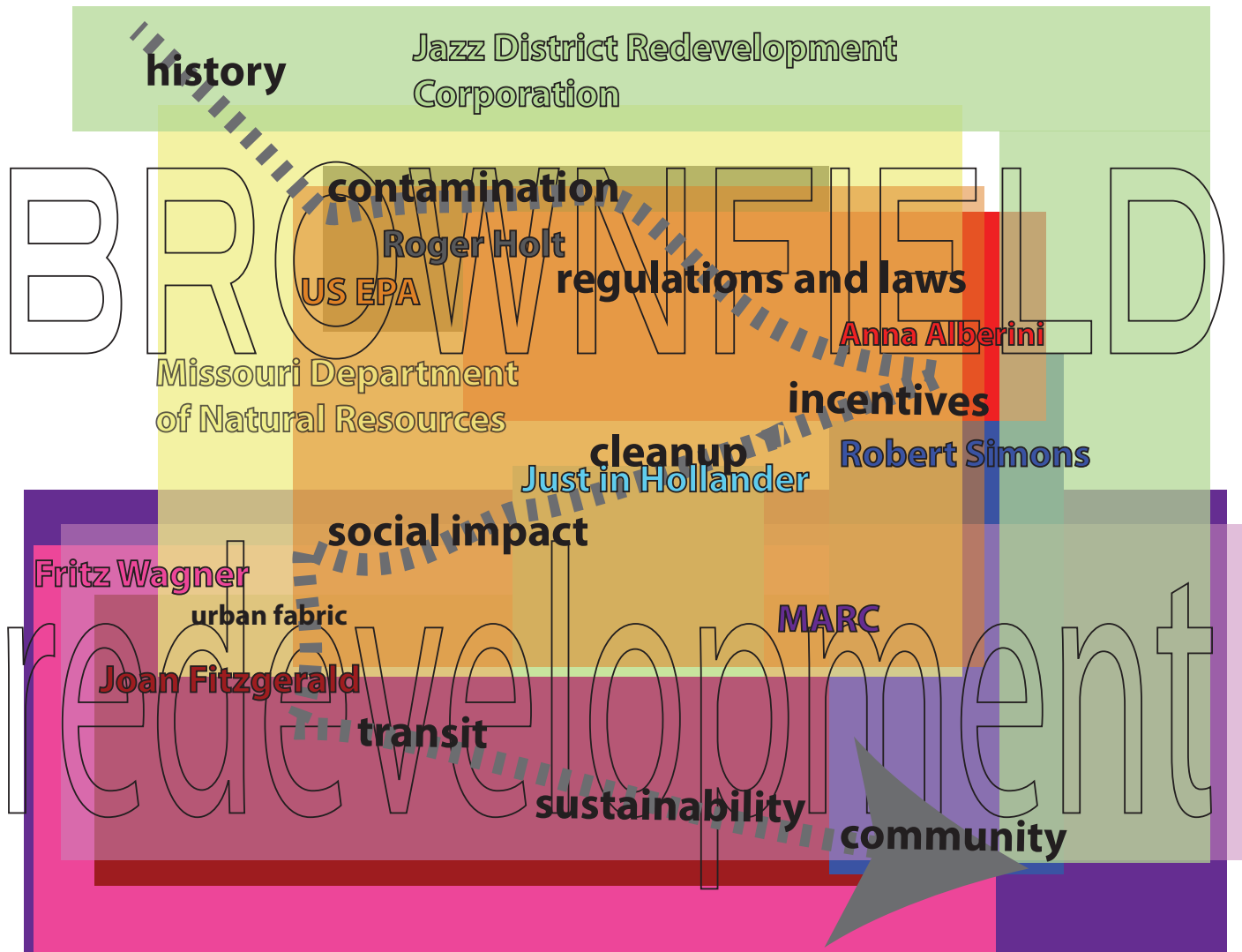


Figure 5-2: Literature Map (created by author)

Literature Review

Anna Alberini

Alberini, Anna. 2005. The role of liability, regulation and economic incentives in brownfield remediation and redevelopment: Evidence from surveys of developers. Regional Science and Urban Economics 35 (4): 327.

Initiative

From understanding the brownfield sites, one can acquire incentives and direction to redevelopment for the process is complex and scattered. “Assessments are complex because of the intergovernmental nature of the program - implementation and records are locally based, contracts are executed at the state level, and program parameters are established at the national – level and the program’s potentially widespread effects across social, environmental, and planning policies” (pg 142). The book explains the different incentives because of the varying authority it is difficult to take advantage of all of the opportunities available. Not only does it benefit the developer, but for the neighbors and the community. Some site pose threats to the health of the people through “drinking water, ingestion (soil issues), inhalation (air quality issues), dermal (absorption issues), breast milk (prenatal and postnatal issues), and human activity (product use and residential issues)” (pg 145). The clean up is far greater than an economic opportunity, but it improves the quality of life. By addressing these issues, it encourages the state and city to redevelop these areas.

Connection

“This focus on the urban core shows that brownfield redevelopment, if planned strategically and executed deliberately, can catalyze urban redevelopment and successfully mitigate environmental contaminants. From these findings, although limited, we see the promise of brownfield redevelopment programs as offering both economic and environmental relief to cities with large inventories of underused properties, particularly in the urban core” (pg 158). The current situation in the urban core of Kansas City contains several brownfields that when all cleaned up together can have several benefits for the city and MARC’s Sustainable Communities. These spaces can provide access for the commuter rail and other forms of transit, places for activity, housing, economic opportunities, or open space depending on the need of that area and the feasibility of that site.

Analysis

Although the book provides information on how to entice developers to develop brownfields, it doesn’t address who else might be involved in the clean up process of the site and the future of the site. Is there potential to draw in different types of people in groups who may have interest in the site? Many of the incentives and help provided varies from state to state and was hard to recognize when something would be useful to apply to Missouri and when it doesn’t relate.

EPA

US EPA. "US Environmental Protection Agency," *Brownfields and Land Revitalization*. "Brownfields | US EPA"; accessed August, 28, 2011. <http://www.epa.gov/brownfields/index.html>.

Initiative

It provides data on where the brownfields are, grants for redevelopment, and case studies. "EPA's investment in the Brownfields Program has resulted in many accomplishments, including leveraging more than \$14.0 billion in brownfields cleanup and redevelopment funding from the private and public sectors and leveraging approximately 60,917 jobs."

Connection

It served as a starting point to find potential brownfields and what the United States is doing about it.

Analysis

The EPA is what makes brownfield redevelopment possible by providing support for those who want to redevelop. It is the basis to all of the resources I read in the United States.

Joan Fitzgerald

Fitzgerald, Joan, and Nancy Green Leigh. 2002. *Economic revitalization: Cases and strategies for city and suburb*, ed. Margaret Seawall. Thousand Oaks, California: Sage Publications Ltd.

Initiative

Economic development is the driving force to improve the quality of life in urban developments. Brownfields can be a good economic boost in these decaying areas because it spurs development surrounding the sites and increases property values. It benefits the community and developers. There are usually several problems attached to brownfields that clean up can fix more than one problem at once economically, socially, and environmentally which all create a sustaining community.

Connection

The downtown area was once a strong economic producer because of industrial growth, but has diminished over time and moved industries to suburbs, overseas, or no longer needed. The brownfield sites have the potential to be strong economic forces for these centers again while relating ecologically and socially.

Analysis

Most of the case studies disproved the case that brownfield redevelopment costs less than greenfield development and didn't take account for the costs after the site is built. Provided strong data, but lacks information that show how brownfield development benefits are greater than greenfield's.

Michael R. Greenberg

Greenberg, Michael R. 2003. Reversing urban decay: Brownfield redevelopment and environmental health. Environmental Health Perspectives 111 (2): A74.

Initiative

Brownfield redevelopment is a good way to stimulate our city centers and to prevent further sprawl. The government sees it as a priority and the people also see it as a priority. “In 1998, the U.S. Conference of Mayors declared brownfield redevelopment to be their highest priority for federal government support” (U.S. Conference of Mayors 2000). It is an easier case for the government to take on because it has a start and stopping point. A lot of policies don’t have an end because they deal with social problems.

Connection

This article backs the importance of brownfield redevelopment can have on a city and furthers my research of why I’m doing what I’m doing.

Analysis

Greenberg tries to tie the political support, but does not have a lot of supporting evidence for claim.

Justin B. Hollander

Hollander, Justin B., Niall G. Kirkwood, and Julia L. Gold. 2010. Principles of brownfield regeneration: Cleanup, design, and reuse of derelict land. Washington: Island Press.

Initiative

It determines where the contaminations could be found such as metro forests, soils, cooling ponds, groundwater, ducts, etc. Usually brownfields contain more than one type of contaminant and each requires different techniques to clean up. Not the whole site is necessarily contaminated. Some spots aka “hot spots” are more contaminated than other parts of the site. Also, techniques depend on the use of the site after it is cleaned up. If the site is for residential use, more extreme techniques are used over commercial or industrial use. There are three remediation techniques: treatment technologies, innovative alternative-treatment technologies, and emerging alternative-treatment technologies. “If integrated into a broader strategic planning framework, brownfield reuse can address broader societal challenges of improved energy efficiency, reduced consumption of natural resources, clean air, water, land, and reduced carbon footprint.”

Connection

Understanding the different techniques helped me realize that many of the practices are not sustainable and made me question whether it is better for the environment to leave the site as is or remediate the site. With new technology and knowledge constantly driving new techniques to be more

efficient and sustainable that if chosen correctly, the sites can be cleaned up sustainably. Which benefits outweigh others? There are going to have to be some sacrifices and depends on the site and needs of the community.

Analysis

Hollander provided the most detailed remediation techniques and spurred new thought with “emerging alternative-treatment technologies” that could make the process more efficient. It looks at each site individually rather than the other sources focusing brownfields as a whole. Each site is different therefore requires different attention and time.

Roger Holt

Holt, Roger. 2002. Redeveloping brownfields: Superfund amendments should spur brownfield redevelopment. Urban Land 61 (7): 25.

Initiative

“Site designers need to acquire the language of site redevelopment and gain an understanding of the methods of the environmental professional to be effective project leaders on redevelopment projects” (pg vi). Holt then discusses the language so environmental work and design process can be done together. The book addresses different policies and acts over the years to improve our environment and our impacts on our environment and potential impacts. Holt also stresses

different techniques are required based on site conditions and what is feasible.

Connection

My goal was to obtain the language of brownfield redevelopment so I can understand how design and the clean up process relate to be efficient, produce a better product, and provide parameters for future development. Holt outlines how different policies came about and what is the purpose. He relates Clean Water Act, Safe Drinking Water Act, National Environmental Policy Act, etc. to brownfield redevelopment and how to reach those standards for a better environment.

Analysis

For being written for a designer, the language is very technical and provides no relevance to design. It just states what might be on the site and different tests and techniques that could be done to clean up the site. Never the less, it is very informative of quick facts for one to get design faster rather than having to go through several sources to find environmental policies that need to be followed.

Jazz District Redevelopment Corporation

"Jazz District Redevelopment Corporation", accessed September 10, 2011 <http://www.kcjazzdistrict.org/history.htm>

Initiative

It describes downtown Kansas City and how it became segregated and declined. It also provides plans for the future. They have invested 81 million dollars to the redevelopment of the Jazz District and have already created new single and multi-family housing. It currently is at full capacity with 1500 people. The Jazz District is vital because the museums (Jazz and Negro League Baseball Museum) draw 300,000 people a year. The Rhythm and Ribs Festival draws 35,000 people.

Connection

For all of these people entering the city, this is obviously a destination area that should connect to the Rock Island Corridor. It is important to understand where the growth is happening to determine the best form and route of transit.

Analysis

The website states how the Jazz District is moving into a new direction while supporting its history, which leaves open many opportunities available for new businesses, development opportunities, schools, and transit. They are providing the framework hoping for involvement.

Daniel Jost

Jost, Daniel. 2008. Malden river makeover: A brownfield redevelopment project shows how landscape architects can collaborate on damaged sites [river's edge, medford, massachusetts]. Landscape Architecture 98 (11): 102-9.

Initiative

Although most Landscape Architects are not experts on brownfields, Landscape Architects do know how to make spaces that people want to experience. Shadley Associates, used their ability to work alongside a licensed site professional to do what they do best, design. They were used to do design methods to deter people from going to places that were unsafe rather than just simply blocking it off. They took a creative approach rather than strictly creating a solution that caters to the environmental problem. They turned it into usable and aesthetically pleasing space.

Connection

I'm proposing also how to use design to clean up and use the sites. Most case studies go through the technical approach and not how it can become an asset through design. Technical and design combined together can create a sustainable community.

Analysis

The design allowed people to be in the space without causing any harm to themselves and the environment. They creatively deterred people without the use of signs to disturb sight lines from the water because you cannot swim or fish in the water. Techniques like these can be incorporated in various sites to control the usage of the site.

MARC

MARC mid-america regional council. [cited August, 28 2011]. Available from www.marc.org (accessed August, 28, 2011).

Initiative

MARC left many of the questions it proposed open of how to create sustainable communities, but provided statistical evidence of change in the demographics, economic forces, housing types, energy, transportation, and development of the Greater Kansas City area. The solution MARC proposed is to create “vibrant, connected, and green centers and corridors (MARC).” The idea is to create six corridors in the Metro area, one being the Rock Island Corridor. An analysis is currently being conducted to determine how to connect Rock Island Corridor to downtown Kansas City and what form of transit or other options can occur in the corridor. The Rock Island Corridor is a high-priority commuter corridor for Kansas City and is leading the way for other corridors.

Connection

The driving force for my theories came from MARC’s goals for the future of the Greater Kansas City area. It led me to the topic of redevelopment to facilitate the initiatives of MARC. For how to use the corridor to connect to downtown Kansas City and create “vibrant, connected, and green centers and corridors,” I chose to focus centrally in downtown because: “the downtown corridor represents the best opportunity for developing a successful starter-line which could be a critical

building block for more extensive regional transit system improvements (MARC).”

Analysis

MARC has a strong foundation with 60+ partners, grants, and many studies throughout the area. They have a strong idea of what needs to be done, but lacks information on how to accomplish it. With further analysis to connect what MARC believes into a feasible project to improve the region, the initiatives could come to life in the future.

Missouri Department of Natural Resources

Missouri Department of Natural Resources. "Geographic Information System", accessed September 12, 2011. <http://dnr.mo.gov/internetmapviewer/makemap>.

Initiative

Missouri Department of Natural Resources provides a database of hazardous waste producers, voluntary clean up sites, and brownfields for the state. Missouri has one of the more progressive voluntary clean up programs in the United States. Most of the sites documented are in phase 1 of the clean up process, meaning there has been a history check and collection of background information on the site. Most of the sites have been stuck in this stage for several years, and many sites have received certificate of completion for there wasn't a need for major clean up or if any. Out of 350 brownfields examined 280 sites didn't require clean up. The EPA authorizes a certificate of completion meaning that the site is cleaned up enough for its purpose that no further action is necessary. This takes the liability off of the property owner. The sites given the certificate usually just meant that lead paint of asbestos needed to be cleaned up. Other sites require a more in depth analysis such as the rail yard with arsenic contamination. "Many of the sites entering the BVCP (Brownfield and Voluntary Clean Up) are not heavily contaminated, and are contaminated by sources not addressed by any of Department of Natural Resources' regulatory programs such as Emergency Response, Superfund, Resource

Conservation and Recovery Act or Petroleum Storage Tanks." The Department of Natural Resources in Missouri oversees all brownfields whether it is state or federal. The redevelopment in Missouri of 50 projects created 11,053 jobs and 2.2 billion dollars in investments.

Connection

This provides actual information that pertains to the area. The site does not provide detailed information of the clean up sites or hazardous waste generator, but serves as a starting point to dig deeper about sites. This site was my starting point to map out different possible locations for my project and relate it to the Rock Island Corridor.

Analysis

It is an excellent database to get started with brownfield redevelopment in Missouri. It Provides further detail that the EPA website lacks. It also lists hazardous waste generators that are not listed on the EPA and provides further analysis of downtown Kansas City.

Robert A. Simons

Simons, Robert A. 1998. Turning brownfields into greenbacks: Developing and financing environmentally contaminated urban real estate. Washington, D.C.: Urban Land Institute.

Initiative

The current documentation of brownfields is flawed for there is no central database (pg 29). The EPA only documents sites that are National Priority, CERCLIS, and No Further Action (pg 30). The EPA documents these sites to provide support financially and provide resources for the clean up of brownfields. It is up to the states to document or choose not to record hazardous waste sites, where brownfields are in various stages and priorities, and the policies and regulations. “Current regulations and cost make brownfields more expensive and time consuming forcing people to develop on greenfields” (pg 15). Not only do regulations and policies vary state to state but also the term brownfield varies. Some places don’t want sites to be documented as a brownfield site for fear of decline of property value. The sites surrounding a brownfield could potentially be a brownfield due to contaminants in groundwater and other potential contaminants to flow to surrounding areas.

Simons addresses the problems through defining the regulations and comparing costs of a greenfield site to a brownfield site. An industrial site costs \$2 sf then \$4 sf for cleanup while a greenfield costs \$4 with no cleanup (pg 3). Brownfield sites also have extra expenses for any risks that site

may have, such as purchasing brownfield insurance.

Connection

This book helped me realize I need to first establish my own definition of a brownfield to discover all of the potentials, and search multiple databases because no two will be alike. Look at the federal, state, and city level. Research history to make conclusions of my own if a site could be a potential brownfield.

Analysis

Most resources document what is known in brownfield redevelopment, while this source established the unknowns and how to go about addressing the government to redevelop these sites with incentives (groundwater mitigation fund, industrial development bonds, remediation tax credit, local property tax abatements, zoning, and understanding the flaws in development and get them known to the public.

Fritz Wagner

Wagner, Fritz. 2005. Revitalizing the city: Strategies to contain sprawl and revive the core. Armonk N.Y.: M.E. Sharpe.

Initiative

Wagner identifies why our cities are sprawled and no longer centralized. Sprawl is caused by unlimited expansion, strip development, scattered development, traffic congestion, income and racial segregation, environmental problems, no open space, cost of living, not enough low-income housing, etc (pg 16). One of the things he suggests to stop sprawl is brownfield redevelopment. It could answer our problem with multi-family housing, larger impact on environment, economy, and existing social problems. The problem is “chaotic conception, covered by subjective viewpoints of sites’ redevelopment, public policies, and even definitions” (pg 161).

Connection

The misconceptions have furthered us into sprawl. In order for my project to be successful, I have to address the misconceptions in a way people will listen and understand why the need of brownfield redevelopment is important for the growth of Kansas City.

Analysis

Wagner takes a different route and says the major problem is our misconceptions rather than being an economic problem

like the other sources. If addressing the social needs of brownfield redevelopment, it can contain sprawl. Social needs are much harder to document than economic needs that it is hard to provide strong evidence of the social factors.

Glossary and Bibliography





Appendix D

Glossary

Sustainable Place: addresses long-term regional issues by making vibrant, connected, and green communities (MARC 2011).

Vibrant Places: provide easy accessibility to jobs and services; offer housing, recreation, shopping, and transportation choices; foster connections between neighbors and social engagement; and promote access to arts and culture. Vibrant places make efficient use of public and private assets and resources and are attractive to residents and businesses not just today and tomorrow, but over the long haul (MARC 2011).

Rock Island Corridor: An old Railroad corridor obtained by Kansas City to connect to trails and possibly a transit system. The Rock Island Corridor is a high-priority commuter corridor for Kansas City and is leading the way for the other six corridors proposed by MARC. (MARC, 2011)

I-70 Corridor: “the downtown corridor represents the best opportunity for developing a successful starter-line which could be a critical building block for more extensive regional transit system improvements” (MARC, 2011).

Alternative Analysis: It is the study to evaluate various transportation alternatives for cost and effects (MARC, 2011).

Crossroads District: an historic district Just south of the downtown loop that contains art galleries and studio spaces.

Jazz District: southeast of the downtown loop, it was once an African American neighborhood where Jazz and the Negro League baseball were strong influences. (kcjazzdistrict.org)

CERCLA- EPA’s Comprehensive Environmental Response Compensation and Liability Act aka Superfund Act. The law requires industries to claim what hazards they are producing and must pay a tax for the chemicals and petroleum (EPA 2011).

NPL National Priority List: EPA’s list of the highest concerned brownfield sites in the United States.

Superfund: it was created by the federal government to clean up the worst hazardous waste sites in the United States.

Voluntary Clean Up Program: it is sponsored by the states and varies state to state to encourage people to clean up sites without the government dictating every move.

Missouri Voluntary Clean Up Program: “addresses and handles brownfields cleanup and redevelopment. It was established by the state legislature in 1994, Missouri’s Brownfields/ Voluntary Cleanup Program is administered by the Hazardous Waste Program’s Brownfields/Voluntary Cleanup Section to provide state oversight for voluntary cleanups of properties contaminated with hazardous

substances. Many of the sites entering the BVCP are not heavily contaminated, and are contaminated by sources not addressed by any of Department of Natural Resources' regulatory programs such as Emergency Response, Superfund, Resource Conservation and Recovery Act or Petroleum Storage Tanks." (<http://www.dnr.mo.gov/env/hwp/bvcp/hwpvcp.htm>)

Certificate of Completion: when the cleanup is complete, a final report is submitted to the program for review. It is a written record that there is no longer a need to cleanup contaminants and the site is ready to be developed for a certain purpose. This helps the site owners for being liable for the contaminants. (EPA 2011)

Brownfield: for the purpose of this study brownfields are defined as a potential threat to the community from hazardous waste generated by current or past industries whether it is real or perceived.

Hazardous Waste: "exhibits the characteristics of a hazardous waste (ignitability, corrosivity, toxicity, and reactivity)" (Holt, 2002)

Design controls- "are site redevelopment features designed to reduce exposures to contamination or to provide passive treatment of contamination. Ex. Capping or contaminant resistant vegetation or barriers" (Holt, 2002)

Phytoremediation: environmental cleanup through the use of vegetation to absorb or fix specific contaminant. Usually a long process and varies on the type of contamination of how successful this technique is. (Holt, 2002)

Vitrification- "on site use contaminated soils with Portland cement can serve as a bedding material for roads and parking areas" (Holt, 2002)

Bioremediation- "microorganisms (bacteria and fungi) transform contaminants to a less toxic or nontoxic state" (Holt, 2002)

Life Cycle Costs- it includes the cost of background check, environmental site assessment, site design, site acquisition, construction, operation, maintenance, energy, insurance (Holt, 2002)

Lifespan: consideration for how long materials last and how long the design is going to withstand through the years. Brownfield redevelopment projects require a longer life span because it takes longer for the pre-design work than most sites.

Phase 1: background check of site and research.

Phase 2: site evaluations and samples of soil and water to

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