

RESILIENCE TO OUR DECAYING URBAN INFRASTRUCTURE

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RESILIENCE TO OUR DECAYING URBAN INFRASTRUCTURE

A Design Thesis Submitted to the
Department of Architecture and Landscape Architecture of
North Dakota State University

By

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In Partial Fulfillment of the Requirements
for the Degree of
Bachelor's in Landscape Architecture



Primary Thesis Advisor



Thesis Committee Chair

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Name: Pat Benson Date: 5/12/2011

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THESIS ABSTRACT

In what ways can environmentally functioning plants reverse the decay of urban infrastructure and reveal the lack of visibility in areas that are left abandoned, unrecognized and unnoticed? The project typology in this scenario would be a 'greening' brownfield. The theoretical premise/unifying idea is that the high density urban core of St. Paul, Minnesota must be revamped into an active participant in the urban fabric to stimulate population growth in the downtown core districts. The project justification is livability and sustainability. Most importantly the inert feeling of quality should find itself in the very fabric of the urban landscape. As a steward of the landscape I feel obligated to revive our urban lands in an attempt to better our world and its natural processes even in the most unnatural settings.

Key Words:

Environmentally functioning plants, Visibility, Urban Infrastructure

PROBLEM STATEMENT

In what ways can environmentally functioning plants contribute to the creation of urban infrastructure and reveal the lack of visibility to areas that are left abandoned, unrecognized and unnoticed?

STATEMENT OF INTENT

Project Typology:

A 'Greening' Brownfield

Claim:

By introducing environmentally functioning plants, the surrounding communities will reveal a sense of resilience to areas of ecological and economical significance that have been abandoned, unrecognized and unnoticed.

Premises:

Working within existing site conditions, functioning plants hold the capacity to influence natural processes and to become an appealing attraction that should be celebrated within the regions climatic patterns.

Discouraged by decaying infrastructure, those living outside of the city avoid it, and those living in the city are faced with the burden of maintaining large amounts of infrastructure. Population growth can reverse infrastructural decay.

Suburban sprawl is directly responsible for abandoned, unrecognized and unnoticed portions of cities. Community participation is required to determine the future of these parcels in which ecological restoration and compact neighborhood development can coincide together.

Theoretical Premise/ Unifying Idea:

The urban fabric of the Highland Park Neighborhood must be updated into a more appealing and efficient environment to stimulate population growth in the downtown core districts of St. Paul.

Project Justification:

Livability, sustainability, but most importantly the inert feeling of quality should find itself in the very fabric of the urban landscape. As a steward of the landscape, I feel an obligation to revive our urban landscape in an attempt to better our world and its natural processes even in the most unnatural settings.

PROPOSAL

NARRATIVE

In what ways can environmentally functioning plants reverse the decay of urban infrastructure and reveal the lack of visibility to areas that are left abandoned, unrecognized and unnoticed? The project typology in this scenario would be a 'greening' brownfield. The theoretical premise/unifying idea is that the high density urban core of St. Paul must be revamped into an active participant in the urban fabric to stimulate population growth in the downtown core districts. The project justification is livability, and sustainability. Most importantly is the inert feeling of quality should find itself in the very fabric of the urban landscape. As a steward of the landscape, I feel obligated to revive our urban lands in an attempt to better our world and its natural processes even in the most unnatural settings.

Questions that arise when considering the repurposing of the site and helped formulate the context of my narrative for the Twin Cities Ford Assembly Plant are as followed:

In what ways can Saint Paul blend native landscapes, including environmentally functioning plants, into the urban fabric and provide a more resilient and biodiverse ecosystem for the region?

How can visibility both transform traditional mixed-use neighborhoods and sustain healthy economic growth while accommodating a wide variety of outdoor recreational uses for the community?

The Ford Assembly Plant's closure and redevelopment will be an excellent addition to the urban infrastructure of the region. In what ways can this site stimulate and differentiate viable growth opportunities for the landscape?

Mixed-use neighborhood design can create a stable and attractive solution to the integration and integrity of pre-existing urban infrastructure. The decision to revamp the core of the fabric urban overlay of Saint Paul should accommodate smart growth in these downtown districts.

USER/CLIENT DESCRIPTION

The Highland Park Neighborhood is located in the southwestern portion of Saint Paul, Minnesota. Also known as Highland District Council, it is one of 17 neighborhood district councils in Saint Paul. The district councils were formed in 1975 to advise the city council on issues related to the development of the area as well as city and state issues. The neighborhood is home to the public Highland Park Senior High School and the private Cretin-Derham Hall High School.

Currently, Highland Park Neighborhood is a mix of well-maintained older housing, commercial and retail property and light industrial buildings. This is the city's primary Jewish neighborhood and it is home to most of the city's synagogues.

Population

- 23,202 people lived in this neighborhood in 2000.

Race and ethnicity, 1990-2000

- The White population decreased from 93% to 86%.
- The Latino population grew from 1% to 5%.
- The Black population grew from 2% to 4%.
- The Asian population increased from 3% to 4%.

Housing in 2000

- The U.S. Census counted 10,620 occupied housing units in 2000.
- 56% were owner-occupied (5,930 units) and 44% were rented (4,690 units).

Cars and drivers

- 15% of households had no vehicle, 41% had one vehicle, 37% had two, and 8% had three or more.
- 73% of workers in this neighborhood drove alone to work, 9% carpooled, 9% took public transportation (including taxis), 5% walked, and 3% worked at home.

- U.S. Census, 2000

MAJOR PROJECT ELEMENTS

The site includes a waste water treatment plant and steam plant along the shores of the Mississippi River, a production building, a paint building, rail dock, truck dock, rail loading and a warehouse building. Ford Parkway connects Saint Paul to Minneapolis and is adjacent to the site. This provides the opportunity for an excellent thoroughfare network to the region in terms of transportation.

The reuse of all buildings on site is being considered, with a special emphasis on the paint building, the main production building and the training center.

Creating a district with strict green standards and smart growth codes will include an addition to the pre-existing parkway and an integrated open space plan that highlights connectivity.

Retail, residential and office space comprise the type of mixed-use neighborhood center that will be developed on site. This complex will offer a variety of housing types, including single-family dwelling units, apartments and town homes.

Finally, reduced parking footprints will be the driving force in the decisions that are formulated for this project. Parking was a major project element in the operation of the factory, and with large amounts of open space made available to the community, the opportunity to reestablish a diverse corridor for the region to use for recreation as well as habitat for wildlife exists. Making these connections not only visually, but so that plants ecological function reveal the natural foundations of their habitat.

SITE INFORMATION

Region: The Midwest: A geographic region within the United States of America, generally referred to by many as “The Heartland.”

State: Minnesota: The twelfth largest state in the U.S. and the twenty-first most populous with 5.3 million residents. Nearly 60 percent of Minnesota’s residents live in the Minneapolis-Saint Paul metropolitan area known as the “Twin Cities.”

City: Saint Paul: Capital of Minnesota and the state’s second-most populated city. It serves as the county seat of Ramsey County, the smallest and most densely populated county in Minnesota.

Neighborhood: Highland Park: The Twin Cities Ford Assembly Plant closure is set for 2011 and is widely considered a significant loss to the community, the city and the state. However, the site provides an unprecedented redevelopment opportunity in the center of the Twin Cities region. Highland Park is one of the most beautiful, stable and economically strong neighborhoods of Saint Paul and will benefit from the redevelopment of this site.

Site: Twin Cities Ford Assembly Plant: Ford Parkway borders the northern portion of the site. South Mississippi Boulevard defines the western and southwestern portions of the site. West Hampshire Avenue defines a clear southern boundary to the site and an existing residential neighborhood. Finally, Cleveland Avenue South borders the eastern portion of the site. The 122-acre parcel is located in southwestern Saint Paul, Minnesota. The Ford Motor Company also controls a 22-acre parcel situated along the Mississippi River. Surrounding the site is a mixture of commercial, residential, and recreational uses. The site includes a waste water treatment plant and steam plant along the shores of the Mississippi River. Other landmarks on the site include a production building, a paint building, rail dock, truck dock, rail loading and warehouse building.

Through the examination of the Ford Assembly Plant, opportunities emphasized in this project will transform this portion of Saint Paul into a more appealing environment for pedestrians and public transit in an effort to stimulate population growth in this neighborhood corridor.

“The term “thoroughfare” will be used in this document instead of other names such as street or roadway when distinguishing lower speed urban roadways from other types of roadways.”

(LEED, 2009)

The Parkway opportunities found on site would be a tremendous addition to the pre-existing diverse ecological community. Connecting this greenway to the regional transit system and orientating thoroughfare elements to the pedestrian level will lead Saint Paul into the development of sustainable thoroughfare networks. Existing structures will be considered in the research, analysis and development of the district.

PLAN FOR PRECEEDING

Design Methodology:

I will be conducting my research using a mixed method-model. This involves the concurrent gathering and analysis of quantitative and qualitative data. Strategies for the development of these proceedings will occur in stages that support my research, analysis and interpretation of the site. Synthesizing these inquiries will enhance the understanding of my theoretical premise/unifying idea.

Research Process:

Research will be conducted with a focus on enhancing the understanding of the theoretical premise/unifying idea. Research will also be devoted to understanding the project typology, including further investigation of the site/existing building, historical context and the programmatic requirements of the project.

Research will be conducted in the following areas:

- a. The Project Typology
- b. The Theoretical Premise or Unifying Idea
- c. Site Analysis
- d. The Historical Context & Narrative

A mixed-method approach through qualitative and quantitative analysis will be represented in the following media:

- a. Graphic
- b. Literature
- c. Digital

A work schedule and meetings with advisors will be scheduled on a weekly basis, set by the discretion of myself and each professor. I will adhere to the thesis syllabus that was given to me at the beginning of the spring semester.

PREVIOUS STUDIO EXPERIENCE

ENVD 172 - Environmental Design Fundamentals
Spring 2006
Instructor: Carol Scott

LA 271 - Landscape Architecture I
Fall 2007
Instructor: Kathleen Pepple

LA 272 - Landscape Architecture II
Spring 2008
Instructor: Mark Lindquist

LA 371 - Landscape Architecture III
Fall 2008
Instructor: Stevie Famulari

LA 351 - Residential Landscape Design
Spring 2009
Instructor: Kathleen Pepple

LA 372 - Landscape Architecture IV
Spring 2009
Instructor: Kathleen Pepple

LA 471 - Advanced Landscape Architecture I
Fall 2009
Instructor: Mark Lindquist

LA 472 - Advanced Landscape Architecture II
Spring 2010
Instructor: Stevie Famulari

LA 571 - Advanced Landscape Architecture III
Fall 2010
Instructor: Catherine Wiley

PROGRAM DOCUMENT

The urban fabric of the Highland Park Neighborhood must be updated into a more appealing and efficient environment to stimulate smart population growth in the downtown core districts of St. Paul.

With the closure of the Twin Cities Ford Assembly Plant set for spring 2011, the future of this parcel of land is in question. Environmentally functioning plants can reestablish the ground, which is currently covered with 85% impervious material. Repurposing the site involves an endless amount of considerations that range from walkability to the conservation of Hidden Falls, a crucial natural corridor on the southern edge of the site. Considerations that must be made derive from Leadership in Energy and Environmental Design, LEED- ND (Neighborhood Development), and are part of my attempt to produce a design that not only stimulates population growth, but becomes LEED certified as well.

The bulk research of my theoretical premise is separated into six categories, each containing pertinent project development information. These categories are Mixed-Use Development, Natural Corridor, Open Space, The Street, Thoroughfare and Walkability. Detailed descriptions and procedures on how these areas should be approached and how they all fit together in a cohesive and comprehensible fashion will be discussed over the next several pages.

A neighborhood should have places where the public feels welcome and encouraged to congregate. It is important for a neighborhood to have boundaries as well as a defined center, and these characteristics are often achieved through identifiable edges. The Twin Cities Ford Assembly Plant has edges such as the Ford Parkway and Mississippi River Boulevard that exhibit these definable characteristics. Bringing these elements together to function in both ecological and economical sustainability can stimulate population growth by surrounding neighborhoods with a high quality public realm designed for people and embraced by nature.

A mix of uses is often integral to the vitality of a neighborhood; the mix can include not only residential and commercial but also a variety of retail establishments, services, community facilities, and other kinds of “diverse uses,” whether available within the neighborhood or adjacent. Urban theorist Ray Oldenburg would classify diverse uses as “Third Places”—small neighborhood grocers, coffee shops, pubs, or post offices that allow residents and workers to mingle and have social interactions. A mix of active and diverse retail uses on a walkable street can create a place that is alive day and night, and not closed down at 6 p.m.

(LEED, 2009, pg. 20)

“Three approaches to mixed-use development are used today:

1. Increase intensity of land uses
2. Increase diversity of land uses
3. Integrate segregated uses”

(Miller, 2003)

A mixed-use district is considered the “downtown” of a local community, and ideally it should be associated with public transit nodes in accordance with principles of transit-oriented development (TOD). Although the Highland Park neighborhood is not part of St. Paul’s downtown corridor, it still displays characteristics of a downtown. Providing diverse land uses to the residents of Highland Park and its visitors, as well as a variety of transportation options, will create an area that is both easily accessible and offers multiple destinations.

Live/work is by its very nature a mixed-use building type and land use. As such, it enables far less reliance on the automobile, by its residents and the traffic impact that others may bring to the area. By compacting development and orientating it to the pedestrian, a mixed-use development within the Highland Park neighborhood can be transformed into a more natural and appealing setting.

Hidden Falls is a natural corridor located on the site, and it plays a crucial part in the management of stormwater runoff from the site. A corridor is defined as, "...avenues along which wide-ranging animals can travel, plants can propagate, genetic interchange can occur, populations can move in response to environmental changes and natural disasters, and threatened species can be replenished from other areas" (Elmiger, 2008)

In the case of Hidden Falls, it is a stream corridor, specifically a natural, spring-fed waterfall and an important natural and historic amenity for the community. Water runoff from the site is collected in a stormwater system and discharged to the Mississippi River through a culvert by Hidden Falls Regional Park which is part of the St. Paul park system.

"Impervious surfaces located on site such as buildings, parking lots and walkways comprise 114.6 acres, or 85.2 percent of the site. The impervious surface on Ford's site alone is 103.4 acres, or 85.1 percent of the entire 122-acre parcel" (Barr Engineering, 2009, pg. 9)

I have two goals in mind when considering this natural corridor; conserving nature and providing recreational opportunities for the community. To acquire more land to preserve this natural corridor, reducing the parking footprint is necessary. Replacing parking with an integrated treatment system to manage stormwater and provide a multifunctional corridor would be beneficial to both the environment and the Highland Park Neighborhood. The preservation and use of native trees and shrubs will promote biodiversity of the natural habitat and support local bird populations.

By connecting Highland Park Neighborhood to Hidden Falls Park and the Mississippi River, movement of wildlife between the neighborhood and the parkland along the river could be promoted through what is known as a travel corridor. Aside from the obvious dangers of introducing deer into urban landscapes with vehicular traffic, promoting the movement of wildlife (birds, butterflies, small animals, etc.) could provide an enhancing experience for those who live and work in this community.

“Open space is the part of a residential zoning lot (which may include courts or yards) that is open and unobstructed from its lowest level to the sky, except for specific permitted obstructions, and accessible to and usable by all persons occupying dwelling units on the zoning lot. Depending upon the district, the amount of required open space is determined by the open space ratio, minimum yard regulations or by maximum lot coverage.”

(NYC City Planning Department, 2011)

Open space within the public realm should include a variety of urban public spaces and gateway features to contribute to an interesting and creative public realm.

To have access to the most outdoor space possible, compact development will encourage dense urban form and promote intensification of dwelling units. Maintaining human scale and compatible development, as well as achieving high quality building and landscape design will contribute to a sense of place and an identifiable corridor.

If LEED-ND is to award points for open space preservations, my project needs to be a part of a regional plan to maintain a healthy and functioning ecosystem. Land will be preserved with the goal of protecting local ecological communities and enhancing the region’s beauty and trail systems. Preserved open spaces provide green relief with little or no human intervention. By concentrating lawn areas in larger, more usable configurations, irrigated water will be managed and conserved better than in individual, segmented lawns.

“The open space ratio (OSR) is the amount of open space (in square feet) required on a residential zoning lot in non-contextual districts, expressed as a percentage of the total floor area on the zoning lot. For example, if a building with 20,000 square feet of floor area has an OSR of 20, 4,000 square feet of open space would be required on the zoning lot ($0.20 \times 20,000$).”

(NYC City Planning Department, 2011)

The purpose of streetscape standards is to ensure the development of coherent neighborhood streets and to assist property owners with an understanding of the relationship between the street and their front yards. A pedestrian oriented streetscape is encouraged along all streets and should include coordinated streetscape elements such as furniture, street trees, pedestrian scale lighting, and a variety of hard and soft landscaping features.

“Connectivity defined is the number of publicly accessible street intersections per square mile, including intersections of streets with dedicated alleys and transit rights-of-way, and intersections of streets with non motorized rights-of-way.”

(LEED, 2009, pg. 30)

A Connectivity Index can be used to quantify how well a roadway network connects destinations by dividing the number of roadway links by the number of roadway nodes or intersections. A higher index means that travelers have increased route choice, allowing more direct connections for access between any two locations.

A project that has high levels of internal connectivity, as well as connections to the community at large, a paradigm should be used to measure the availability of land uses. “Overall, within a ¼-mile walking distance there should be four land uses available or within ½-mile walking distance there should be six available land uses.”

(LEED, 2009, pg. 30)

When a neighborhood has a robust network of internal streets and good connections to surrounding communities, pedestrians, bicyclists and drivers can move more efficiently and more safely. Multiple intersections and short blocks also provide pedestrians with an extensive selection of route choices.

“The maximum average block perimeter to achieve an integrated network is 1,500 feet, with a maximum uninterrupted block face of ideally no more than 450 feet; intersecting streets should be placed at intervals of 500 to 600 feet, and no greater than 800 feet apart along any single stretch.”

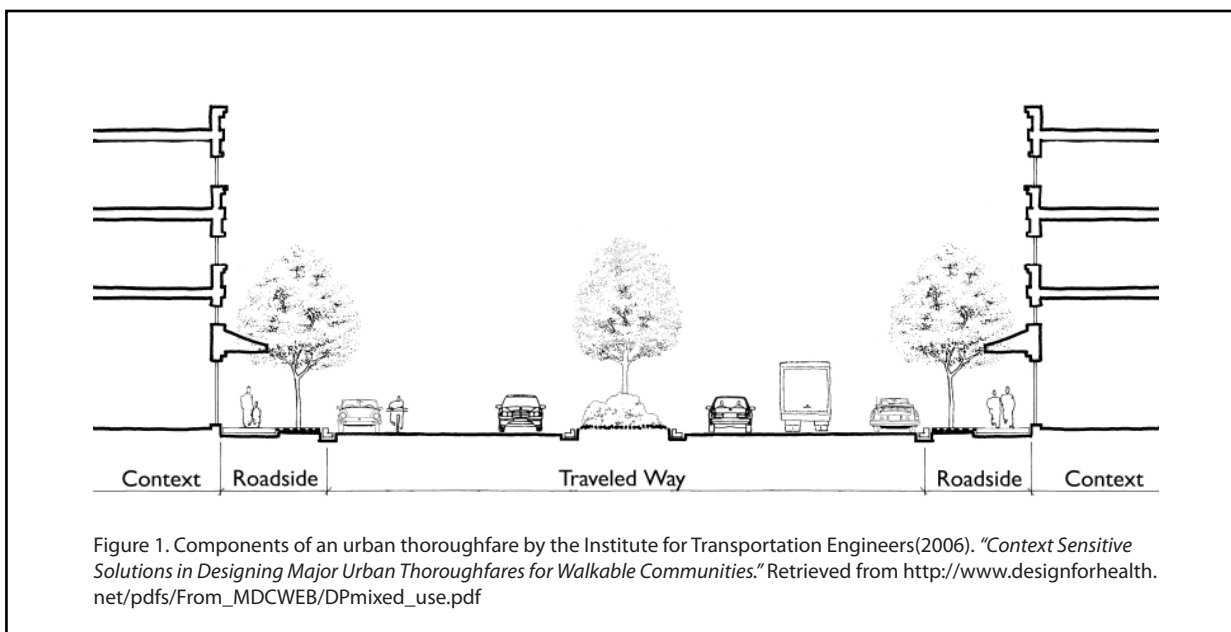
(LEED, 2009, pg. 19)

The Institute of Traffic Engineers defines **thoroughfare** as a transportation corridor that serves multiple ways of traveling, including walking, bicycling, driving and riding transit. By applying special traffic control strategies and suitable land development guidelines in order to maintain travel efficiency, reliability and safety for all thoroughfare users, it is imperative to address this topic early on in the planning process. Listed below are some definitions to better understand the topic.

Context—encompasses a broad spectrum of environmental, social, economic and historical aspects of a community and its people, context can be the built environment or part of the natural environment.

Roadside—the public right of way typically includes planting area and sidewalk, from the back of the curb to the front property line of adjoining parcels. The streetside is further divided into a series of zones that emphasize different functions, including frontage, throughway, furnishings and edge zones.

Traveled way—the public right of way between curbs that includes parking lanes and the travel lanes for private vehicles, goods movement, transit vehicles and bicycles. Medians, turn lanes, transit stops and exclusive transit lanes, curb and gutter and loading/unloading zones are included in the traveled way. (ITE, 2006, pg. 59)



One major goal of walkability is to promote transportation efficiency, including reduced vehicle miles traveled (VMT), and encourage walking by providing safe, appealing, and comfortable street environments. In addition, attractive streets support public health by encouraging daily physical activity.

Within pedestrian-oriented, mixed-use neighborhoods, the potential to enhance social capital is large because they enable residents to interact. This interaction can be intentional or accidental, as residents spontaneously “bump into” neighbors within the public realm. Regardless, there must be sidewalks and pedestrian crosswalks at all locations where needed.

Lowering interior speed limits will encourage a pedestrian oriented development and promote walking. Mixed-use developments should include sidewalk frontage entries and limited distances between entry doors to energize streets and make them strolling friendly. Size is a defining feature of a neighborhood and is typically based on a comfortable distance for walking from the center of the neighborhood to its edge; an area of 40 to 160 acres.

Walkscore.com identifies seven criteria for walkability:

A center: Walkable neighborhoods have a center, whether a main street or a public space.

People: Enough people for businesses to flourish and for public transit to run frequently.

Mixed income, mixed use: Affordable housing located near businesses.

Parks and public space: Plenty of public places to gather and play.

Pedestrian design: Buildings are close to the street, parking lots are relegated to the back.

Schools and workplaces: Close enough that most residents can walk from their homes.

Complete streets: Streets designed for bicyclists, pedestrians, and transit. (Walk Score, 2011)

The urban fabric of the Highland Park Neighborhood must be updated into a more appealing and efficient environment to stimulate smart population growth in the downtown core districts of St. Paul.

“A neighborhood is defined as an area of dwellings, employment, retail, and civic places and their immediate environment that residents and/or employees identify with in terms of social and economic attitudes, lifestyles, and institutions. Providing amenities to the site’s users in a safe and comfortable environment, will suit not only the residents of the development, but also promote visitors from around the region.”(LEED, 2009, pg. 18)

Through my theoretical premise research I have concluded several statements that will influence design decisions to be made in the future. First, accommodating a diverse and dense population in a mixed-use development offers a long list of land uses that will attract visitors. Third places such as restaurants, fitness centers or bookstores, offer destinations, but using proper streetscape standards within a pedestrian-oriented development (POD) will allow safe and interesting travel to and from the mixed-use development.

The reclamation of Hidden Falls, a natural corridor found on the southern edge of the site is a critical component for wildlife. Larger areas of nature function better for wildlife when linked together. Creating a continuous, interconnected system will have recreational benefits for residents and wildlife alike. Reducing the parking lot footprint will also contribute to the reestablishment of Hidden Falls.

The amount of open space that the site should make available to the public needs to be determined using the open space ratio (OSR). The neighborhood will include a social center, such as a plaza or square, to create a focal point for the development. A major programmatic goal will be to provide access from every dwelling within the Highland Park Neighborhood to an interconnected and continuous park system.

Streetscape standards will be critical in the detailing phase of my project. Urban sidewalks will be located in business and mixed-use districts where there is a concentration of higher intensity development, ground floor retail, restaurants, entertainment uses and on-street parking. They will be designed for heavy pedestrian use and will be compatible with retail or similar uses in a dense urban environment. They will also be used with offices and housing at street level when such uses are located in business or mixed-use districts rather than neighborhoods.

Thoroughfares should be organized into an interconnected and hierarchical network. The larger of the thoroughfares should be connected to the urban center, while dividing areas of the city into neighborhoods. The overall goal is to fine tune street networks to accommodate more walking, transit use, and other alternatives for those who may not be able to depend on a car for their mobility.

“On average, residents in highly-walkable neighborhoods take twice as many walking trips as people in less walkable neighborhoods” (Walk Score, 2011)

Besides the health benefits of walking, with everyday use through the neighborhood, it will be motivation for the city to develop proper streetscape standards to provide a safe and comfortable environment for pedestrians.

Through conscious project development and the use of streetscape standards and LEED-ND policies, a prosperous Highland Park Neighborhood will create a unique public realm accessible to everyone. By highlighting natural and social concerns of the environment and adhering to core smart growth principles, the redevelopment of the Ford Assembly plant site will bring a flourishing neighborhood to the Twin Cities.



Figure 2. Duisburg Nord Landscape Park perspectives of blast furnace, old gas tanks and night lighting by Peter Latz. "The Idea of Making Time Visible." *Topos* 33 (2000): 94 - 99. "Landschaftspark Duisburg-Nord." Retrieved from <http://www.landschaftspark.de>

Landscape Park Duisburg Nord

Ruhr District of Duisburg, Germany

Project Team: Latz + Partner, Latz-Riehl- Schulz, G.Lipkowsky

Client: LEG NRW in trust for the town of Duisburg

Covering approximately 570 acres, Latz + Partners created new uses for many of the old structures, such as turning the former sewage canal into a process of cleansing pollutants; recycling and dealing with the historical contamination was a major task at the site.

The preserved blast furnaces play an important role in attracting visitors, as the primary motive to visit the park is for individual and personal interest in the unique atmosphere. The concrete bunkers create spaces for a series of intimate gardens, old gas tanks have become pools for scuba divers and concrete walls are used by rock climbers.

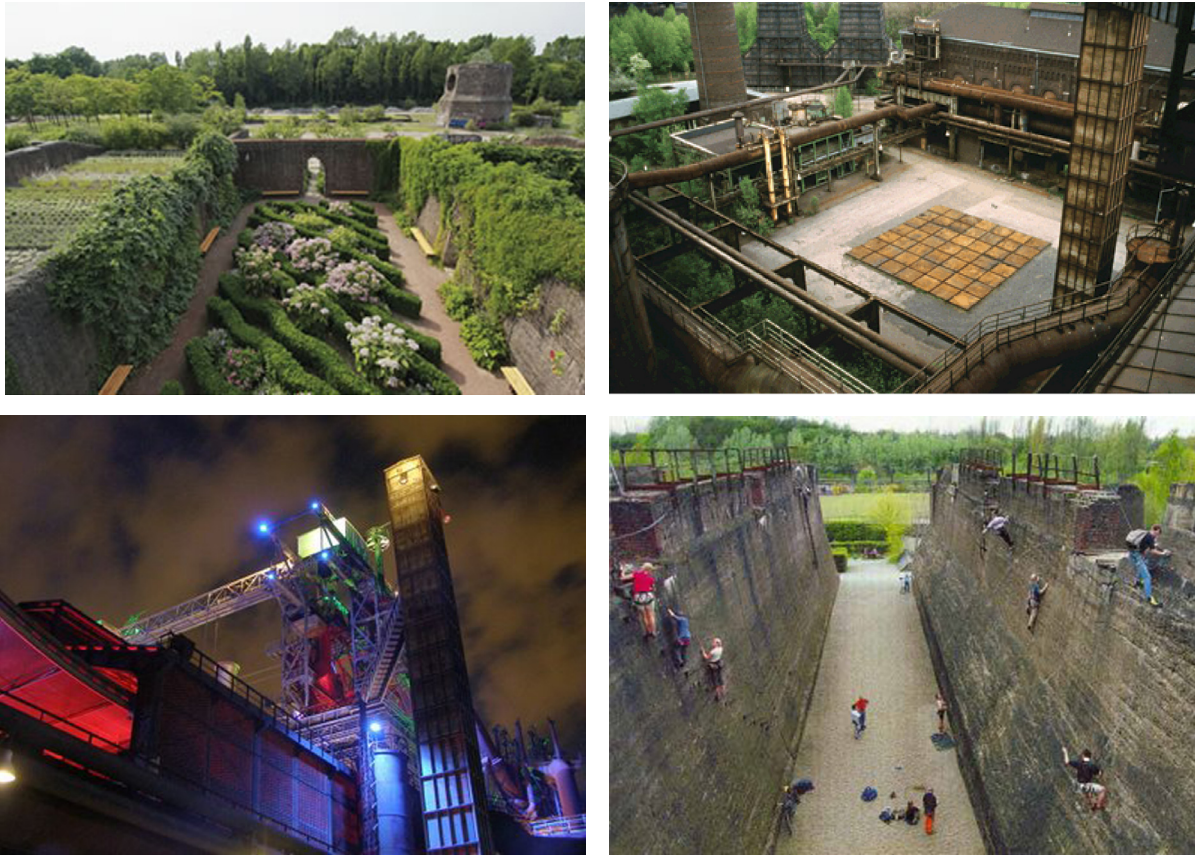


Figure 3. Duisburg Nord Landscape Park perspectives of concrete bunkers, "piazza" night lighting and recreational climbing walls by Peter Latz. "The Idea of Making Time Visible." *Topos* 33 (2000): 94 - 99. "Landschaftspark Duisburg-Nord." Retrieved from [http:// www.landschaftspark.de](http://www.landschaftspark.de)

Landscape Park Duisburg Nord

Ruhr District of Duisburg, Germany

Analysis:

"Vegetation does not cover the park evenly as it might in "natural landscapes". Instead, vegetation fields lie like single clumps between the structures, covering isolated areas with differentiated forms and colors" (Latz, 2000)

The Duisburg-Nord Park project offers a holistic approach to repurposing a contaminated site into a gathering space. This case study offers a clear example of how historical preservation and remediation technologies can coexist to establish cultural connections to our industrial heritage.

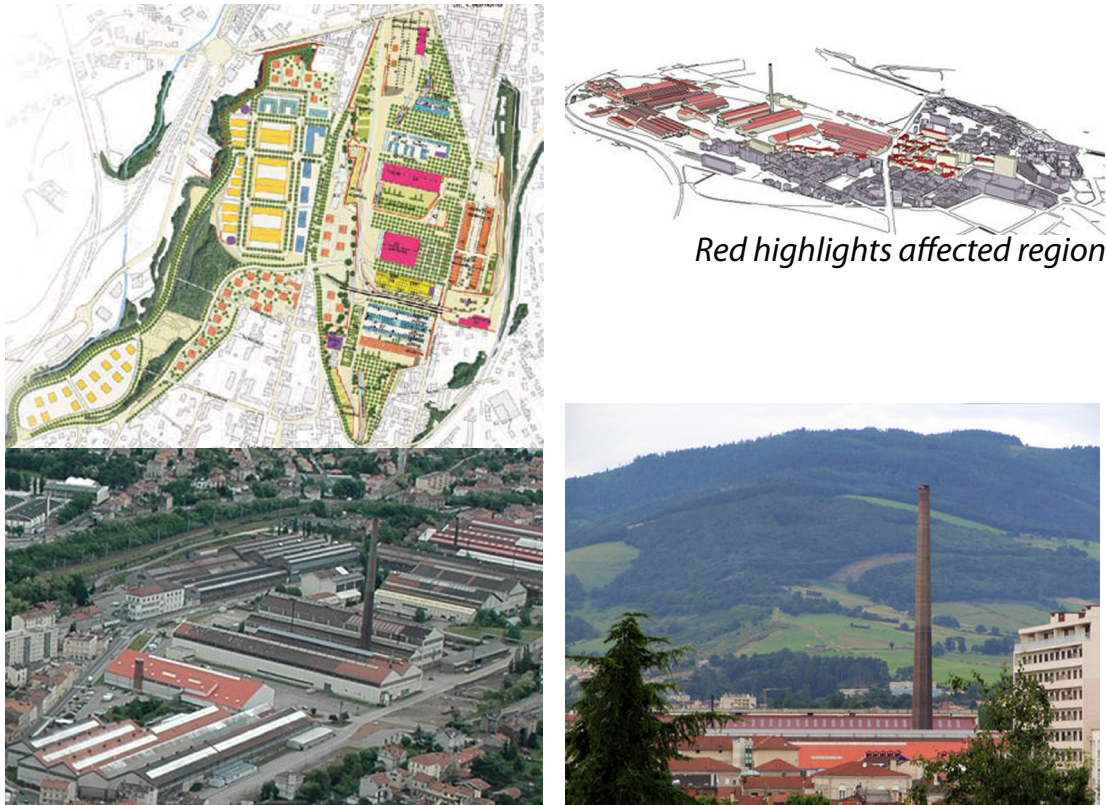


Figure 4. Saint-Chamond's former Giat Steelworks base plan, context model, and perspectives retrieved from "To Restructure The Site of The Former GIAT Creation of a BIA." Retrieved from <http://translate.google.com/translate?hl=en&sl=fr&u=http://saintchamond.canalblog.com/archives/23>

Former GIAT Steelworks

Saint-Chamond, France

Project Team: Based on the study conducted by the firm Latz + Partners, jointly led by Saint-Etienne Métropole, and the City of Saint-Chamond

Client: Saint Chamond which is the largest suburb of the city of Saint-Étienne, and is adjacent to Saint-Étienne on the northeast.

The factory itself covers 106 acres and has been in operation for over two centuries. The scheduled closure for the site of Giat Industries, led the city of Saint-Chamond to the question of the fate of the entire site that the company occupies. Three distinct urban areas will be upgraded: an eco-neighborhood in the northern part, an eco-industrial site to accommodate companies playing back the sustainable development and "green technology", and finally a linear public park, or "green line", across the entire site. (Renard, 2009)



Figure 5 . Saint-Chamond's former GIAT Steelworks perspectives of repurposing old structures into trade and industry retrieved from "To Restructure The Site of The Former GIAT Creation of a BIA." Retrieved from <http://translate.google.com/translate?hl=en&sl=fr&u=http://saintchamond.canalblog.com/archives/23>

Former GIAT Steelworks

Saint-Chamond, France

Analysis:

Recycling the building components of this project is what appealed to me due to the similarities the structures show to the Twin Cities Ford Assembly Plant. Visitors to the buildings enjoy not only picturesque landscape views but also green spaces nearby. This project also makes larger connections within the city by connecting the two industrial towers of Saint Chamond and Izieux, based on a circulation axis reclassification (pedestrians, bicycles) and creating a unified urban area, which proved to be easier to understand by users. In the future the site will develop residential and leisure/recreational areas, trade and industry within the development and will be contrasted by a soft and hilly landscape.

Beijing Olympic Village

Beijing, China

Project Team: Beijing Urban Construction Group (BUCG)

Client: City of Beijing

“The Beijing Olympic Village is the first Olympic Village to receive LEED certification, and is one of only eight developments and the first international project to thus far achieve certification under LEED for Neighborhood Development” (Pasternack, 2008)

City development occurring in preparation for the 2008 summer Olympics included Beijing’s Olympic Village. The recent recipient of LEED-ND stage 2 gold, the world-class Olympic Village exhibits a variety of sustainable features which include solar panels, green roofs and an extensive rainwater recycling system.



Figure 6. Beijing Olympic Village bird's eye perspective by Alex Pasternack. "Beijing's Olympic Village is World's Largest Green Neighborhood." <http://www.treehugger.com/files/2008/08/largest-green-leed-certified-building-beijing-olympic-village.php>. Treehugger, 8/27/2008.

Analysis:

The project reduces stormwater runoff from the site through an extensive network of parks and green open space. Vegetated green roofs on more than 60 percent of the total roof area lowers the amount of impervious surfaces, which further reduces stormwater runoff. The site also places 95 percent of automobile parking underground creating large open green spaces above ground. (Pasternack, 2008)

The pedestrian and bicycle networks throughout the site connect the community to the Olympic Village with the placement bikeways and multi-use trails. There have been mixed views on whether the project has been successful; all units were occupied by athletes during the Olympics, but have been difficult to sell, the luxury apartments are considered to be overpriced at \$1 million for an individual unit. There is still success in the sustainable practices the site exhibits in creating innovative ways to harvest rainwater, and tying community gathering into the layout of the village has increased the economic value of the complex.



Figure 7. Beijing Olympic Village stormwater management reservoir, rose beds, and pedestrian crosswalk retrieved from "Beijing's Olympic Village is World's Largest Green Neighborhood." <http://www.treehugger.com/files/2008/08/largest-green-leed-certified-building-beijing-olympic-village.php>. Treehugger, 8/27/2008.

TYOPOLOGICAL RESEARCH

Quick Study #1



According to the U.S. Green Building Council, "Excelsior & Grand has earned this recognition for excellence in the built environment and a place among the finest developments incorporating the principles of smart growth, urbanism and green design" (ESG Architects, 2008)



- A -Phase I (Completed 2002)
- B -Public Space (Completed 2002)
- C -Amphitheater (Completed 2002)
- D -Phase II (Completed 2005)
- E -Phase III (Completion 2006)
- F -Phase IV (Completion 2007)



Dennis Sutliff of Elness Swenson Graham, said "Consistent with the goals of LEED-ND, Excelsior & Grand exemplifies how new, multi-purpose neighborhoods can transform single-use, automobile environments into vital, diverse and walkable communities, which reflect stewardship in how we plan the future form of our cities" (ESG Architects, 2008)

Figure 8. Excelsior & Grand perspectives and site plan by ESG Architects. (2008, September 18) "Excelsior & Grand Redevelopment." Retrieved from http://www.wisconsinplanners.org/attachments/ConferencePresentations2008/Excelsior_Grand_Redevelopment.pdf

TYPOLOGICAL SUMMARY

Through the analysis of these case studies, several conclusions can be drawn regarding the successful repurposing of an industrial site into a prospering neighborhood community. First, open space must be a crucial component in the programmatic goals of the project. Making large connections add: to the regional ecosystem as well as contributes to the biodiversity of the site itself. Recreational purposes are also a driving force in making these larger connections; longer paths going through a more natural landscape make a more serene landscape to experience.

Duisburg Nord is an example of a site that was once not so glamorous, but had interesting features. Greening the site and transforming the structures to accommodate visitors, the site became an amenity to the city of Duisburg. By preserving interesting architectural features that the plant once had to offer, the designers found new uses for many of the old structures.

The former GIAT in Saint Chamond is an interesting example of the repurposing of a large industrial facility within a thriving neighborhood community. By providing shopping, trade and industry within a park surrounded by a soft and hilly landscape, it is capable of stabilizing the socioeconomic network of the city. The repurposing of old structures and elements such as the large halls or smokestacks into a community attraction is the type of attention I would like the Ford Assembly Plant to gain as it is redeveloped in the future.

TYPOLOGICAL SUMMARY

Compact development is another crucial component in my project. The Beijing Olympic Village case study demonstrates its capacity to accommodate a large number of residents and provide for their everyday needs within the same neighborhood blocks. The project's capacity to satisfy the needs of people from different cultural and religious backgrounds gives insight into just how rewarding intensive and diverse mixed-use/pedestrian-oriented developments can be for a community.

Finally, as the LEED-ND Pilot Program evaluates the principles of smart growth, urbanism, and green building, I felt it necessary to do a quick study on a project that regionally has acquired LEED certification. Excelsior & Grand, a 17-acre mixed-use residential and retail community located in St. Louis Park, Minnesota, is perfect in demonstrating what I want to do on a neighborhood block scale. It demonstrates how new, multi-purpose neighborhoods can transform single-use, automobile environments into vital, diverse and walkable communities.

Through my analysis of these case studies, I've come to realize just how influential mixed-use neighborhoods can be on both cities and regions. Accommodating a variety of land uses, which provides a high quality public realm designed for people, mixed-use, pedestrian-oriented neighborhoods can function in both ecological and economical sustainability to stimulate population growth in areas that were once abandoned, unrecognized and unnoticed.

HISTORICAL CONTEXT

Ford Motor Company's long history in Minnesota began in 1912 in a converted warehouse in downtown Minneapolis. Production was later moved to a 10-story building in Minneapolis which at the time was the tallest automotive manufacturing building in the world.

Construction on what is the current St. Paul plant began in 1923. The Twin Cities Ford Assembly Plant factory floor alone is some two million square feet. The plant was built on a bluff overlooking the Mississippi River and housed an 8.4 - mile long assembly line.

Aside from the assembly plant, another unique feature is the hydro-electric facility on the Mississippi River banks, built at the same time the plant opened. The facility generates enough surplus power to sell back part of what it produces to the local power grid. In 2007 the plant was sold to Brookfield Power, a company based out of Canada.

Henry Ford's greatest contribution to manufacturing would have to be his creation of the moving assembly line. While proving to work at a considerably more efficient rate than its competitors, in the end it would also make vehicles more affordable for the average American.



Figure 9. Artist's rendition of early settlement of Twin Cities Ford Assembly Plant by Annie Tietema. (2007). "Twin cities ford plant: the end of an era." Minnesota Economic Trends.

HISTORICAL NARRATIVE

The Twin Cities Ford Assembly Plant since its creation has remained in the spotlight for economic growth and job creation. The automobile is obviously one of the most significant inventions of our time; it was in 1896 when Henry Ford created the Quadricycle that he seriously considered marketing and manufacturing his invention. The Model T was the first car to be produced using the efficiency of the assembly line; Ford Motor Company was able to drive a Model T off the line every 10 seconds. Henry Ford once famously said of the Model T, "Any customer can have any color he wants, as long as it is black" (Tietema, 2004)

Thanks to the efficiency of the automated assembly line, the price of the Model T would drop over time, but Henry Ford believed that sales could not reach their potential until his own employees could afford to buy the car. In 1914 Ford Motor Company established the first minimum wage of five dollars for an eight-hour day, nearly doubling Ford workers former pay rate. As minimum wages were established across the country, the automobile would ultimately find itself in the hands of the average American.



Figure 10. Henry Ford standing next to the first Ford car manufactured at the Twin Cities plant by Annie Tietema. (2007). "Twin cities ford plant: the end of an era." Minnesota Economic Trends.

HISTORICAL NARRATIVE

In October 1913, Henry Ford revealed a revolutionary step in the advancement of factory assembly when he unveiled his moving car assembly line. Ford was the first manufacturer to use the moving assembly line at such a large scale and production time for a single Ford vehicle dropped from 12 hours and 30 minutes to 5 hours and 50 minutes.

The Twin Cities Ford Assembly Plant in the Highland Park Neighborhood is the only auto manufacturer in Minnesota that produces finished automobiles. At its pinnacle in 1920, Ford Motor Company was mass producing over 45 automobiles and trucks regularly, by far the largest manufacturer in Minnesota. In 1932, as Ford Motor Company was producing one third of the world's automobiles, Henry Ford had become so powerful that Germans coined the term "Fordism" to describe the American capitalism he had created. With production going so well, Henry Ford was looking to expand outward, and a hydroelectric dam along the Mississippi River was just what he was looking for.



Figure 11. Early photograph of hydroelectric dam and Twin Cities Ford Assembly Plant by Annie Tietema. (2007). "Twin cities ford plant: the end of an era." Minnesota Economic Trends.

HISTORICAL NARRATIVE

In 1923, Henry Ford saw an opportunity to obtain a hydro electric contract from the federal government. A plant next to the Mississippi River appealed to Ford because it could be an economical source of energy to power the plant's operations. As it made sense economically to have an affordable power source next to his plant, Ford decided to ask the federal government and was granted a license to run the power plant. He immediately began mining tunnels for silica, which was then processed into glass for Ford automobiles.

"The Glass Plant was part of plant operations through the 1920s and 1930s" (Tietema, 2004) producing glass for automobiles on site. Later, a decade of mining had created a tunnel system that is by far the most extensive in the Twin Cities area. The tunnels connect both the active Ford Assembly Plant from the bluff to the Ford Hydro Plant on the dam of the Mississippi River. Connecting historical features like these should be celebrated and open to the public for exploration, rather than fenced off from the public realm.

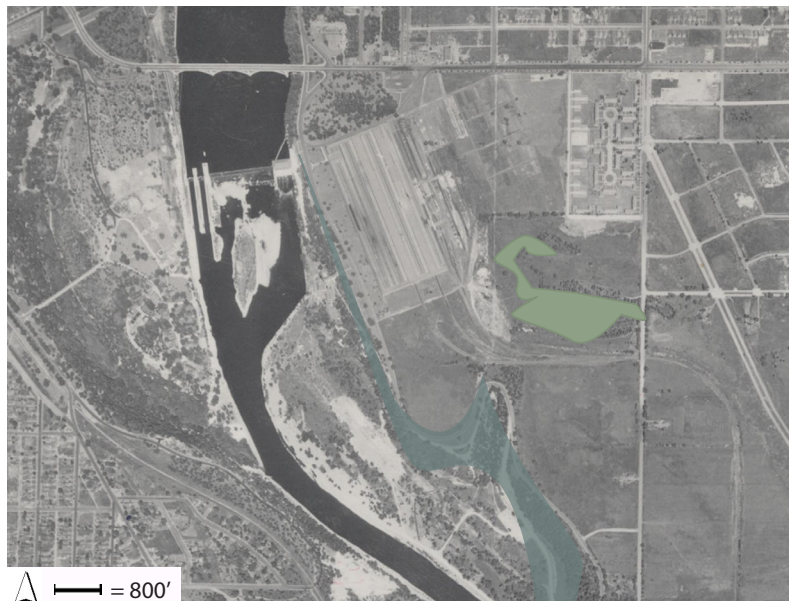


Figure 12. Early 1940 aerial photograph of Twin Cities Ford Assembly Plant (2009) *Ford Site Green Manufacturing Reuse Study*.

HISTORICAL NARRATIVE

Aside from the economical impact the plant has on the city of St. Paul, the development of the site altered the landscape in a very permanent way. Ecological systems are difficult to reclaim and establishment requires attentive planting phases and the restructuring of urban networks that surround the natural corridor. Needless to say, the industrial production that occurs on site is scheduled to close, and with the repurposing of the site underway, the establishment of the natural corridor of Hidden Falls and its watershed is necessary. Celebrating the success production had for the community and caring for the mistakes development had on the ecosystem will certainly set the grounds for a more prosperous future for the citizens of St. Paul.



Figure 13. Early 1920's aerial photograph of Twin Cities Ford Assembly Plant (2009) *Ford Site Green Manufacturing Reuse Study*.

GOALS

The Academic: Clearly demonstrate to my colleagues that I have knowledge on the subjects I discuss in my presentations. I will also develop graphics that accurately and efficiently represent topics in an engaging way.

The Professional: Comprehend topics in Landscape Architecture in the professional realm. Project development will use computer programs that are typically used within a professional design firm.

The Personal: Practice stewardship on a professional level. This understanding should address ecological and socioeconomic concerns within the public realm.

PROGRAMMATIC REQUIREMENTS

- Reestablish ecosystems within a larger regional plan
- Reduce amount of impervious surfaces on site
- Reuse material and/or structure of assembly plant
- Repurpose paint building
- Provide safe and comfortable streets/sidewalks
- Layout open space within a larger regional plan
- Establish mixed-use building types
- Create industrial heritage monuments
- Retrofit greenroofs onto portions of the main assembly building
- Deconstruct warehouse on Southern portion of the site and move athletic fields to new location
- Establish community rooftop garden plots
- Regional transit system is established

RESEARCH FINDINGS: ATLANTA ASSEMBLY HAPEVILLE, GEORGIA

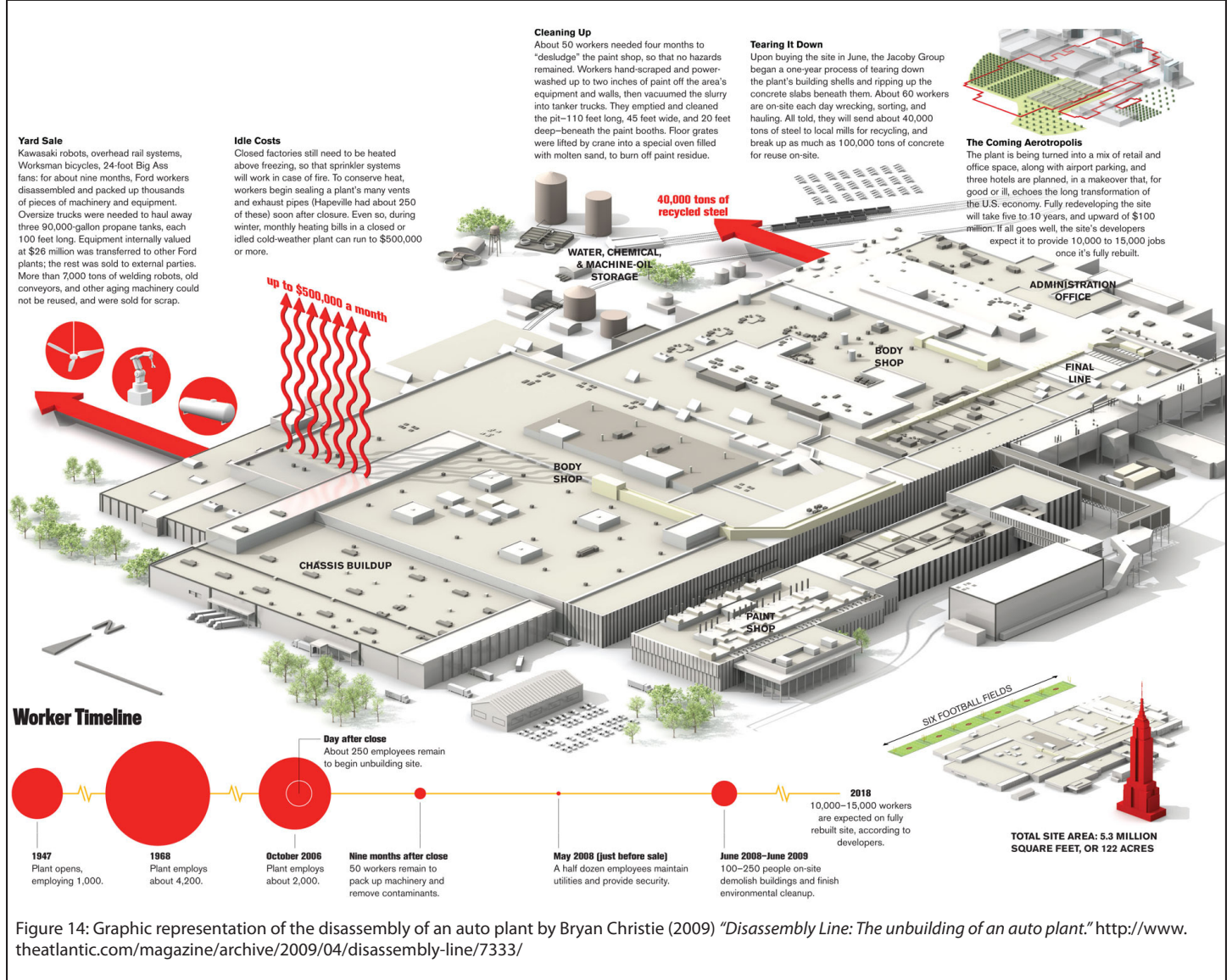
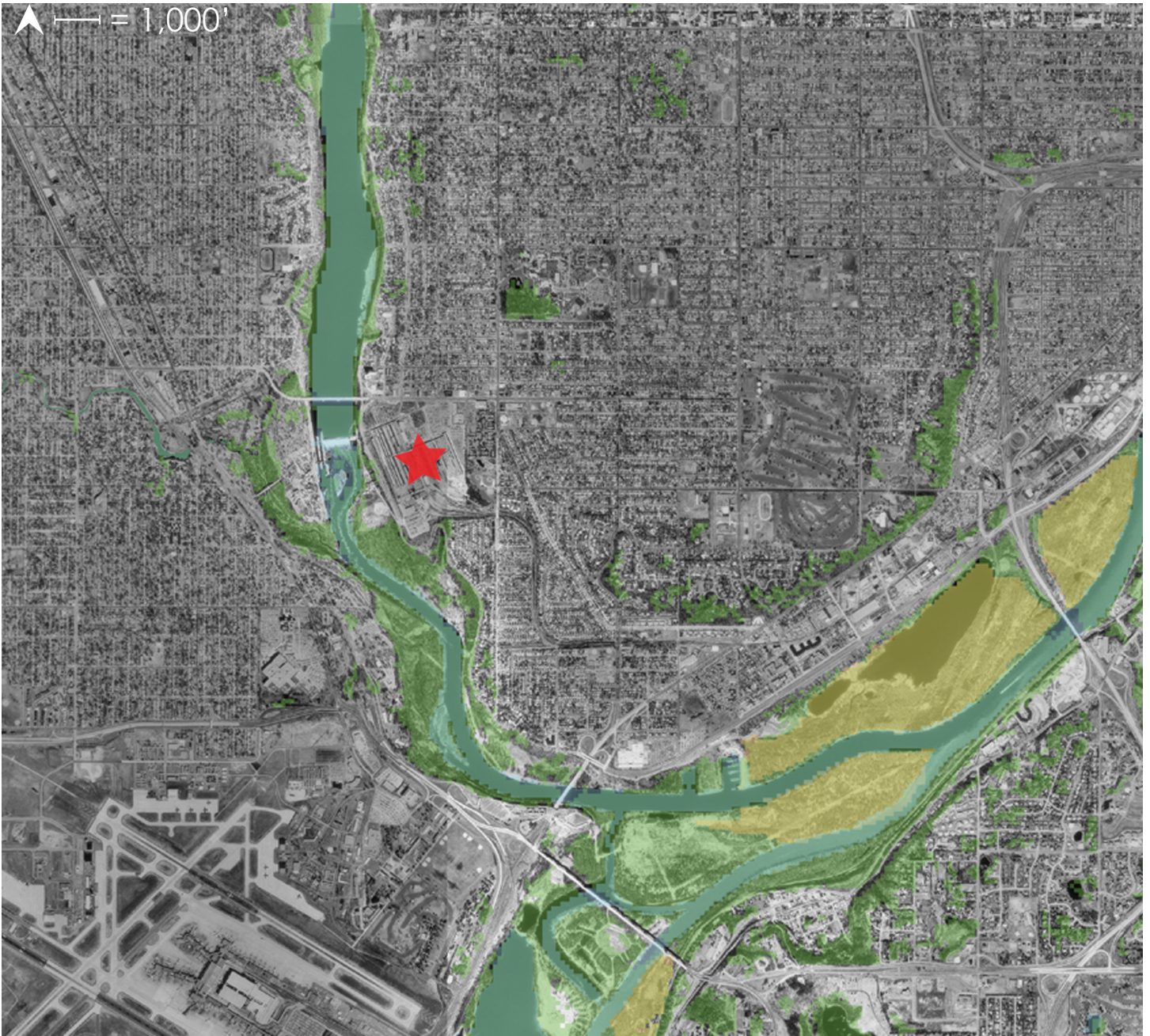


Figure 14: Graphic representation of the disassembly of an auto plant by Bryan Christie (2009) "Disassembly Line: The unbuilding of an auto plant." <http://www.theatlantic.com/magazine/archive/2009/04/disassembly-line/7333/>

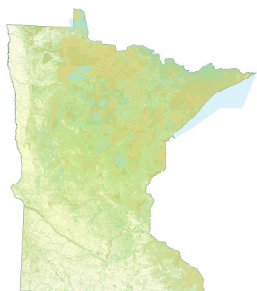
PROCESS DOCUMENTATION

ECOLOGICAL PATCHES



Legend

-  Ecological Patches
-  Lakes & Rivers
-  Natural Areas

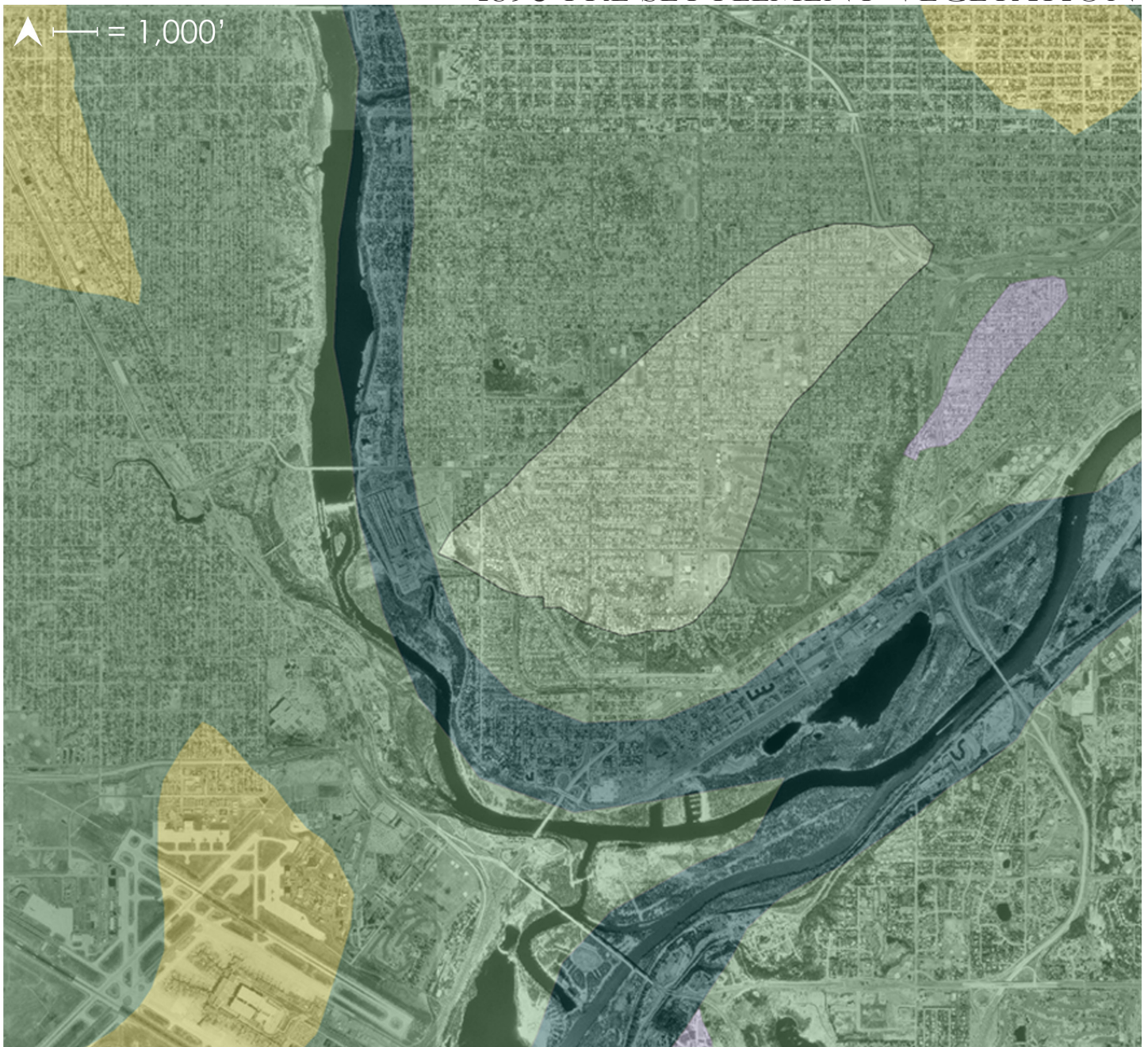


There are three states that a patch can exist in: potential, active, and degraded.

Patches in the potential state are transformed into active patches through colonization of the patch by dispersing species arriving from other active or degrading patches.

Patches are transformed from the active state to the degraded state when the patch is abandoned, and patches change from degraded to potential through a process of recovery.

1895 PRE-SETTLEMENT VEGETATION



Legend

- Wetlands
- Big Woods
- Oak Opening & Barrens
- Prairie
- River Bottom Forest

Reestablishing ecosystems begins with first understanding what existed there before human settlement. Using an aerial map masked with 1895 pre-settlement vegetation data, general assumptions can be made to guide the layout of a planting plan.

The three systems that cover the Ford site are a mixture of Oak Openings and Barrens, River Bottom Forest and a large patch of Bigwoods. Combining trees from each of these three ecosystems can reestablish the once large overhead tree canopy which will provide several benefits to the area.

RIVER BOTTOM FOREST



Floodplain forests are wet forests that occur on seasonally inundated soils along the floodplains of major rivers in Minnesota. The canopy dominants in a Floodplain Forest vary according to the successional status of the stand and the length and duration of annual flooding. The most common canopy dominants are silver maple and/or cottonwood.

American Elm
Ulmus americana



Silver Maple
Acer saccharinum



Cottonwood
Populus deltoides



Common Hackberry
Celtis occidentalis



OAK OPENING & BARRENS



The dry oak savanna community occurs where fire, animal activities, and/or soil and moisture conditions prevent a closed canopied forest from developing. Savannas are thought to be a transitional community between prairie and woodland.

Northern Pin Oak
Quercus ellipsoidalis



American Hazelnut
Corylus americana



Bur Oak
Quercus macrocarpa



BIGWOODS



Maple-Basswood forest occurs only on protected sites, where catastrophic forest crown fires were rare historically. Because the tree canopy permits so little light to reach the forest floor during the summer, maple-basswood forests have a suite of forb species (spring ephemerals) that bloom, produce seeds, and die back before tree leaves are fully developed (typically April-early May).

Sugar Maple
Acer saccharum



Pagoda Dogwood
Cornus alternifolia



White Oak
Quercus alba



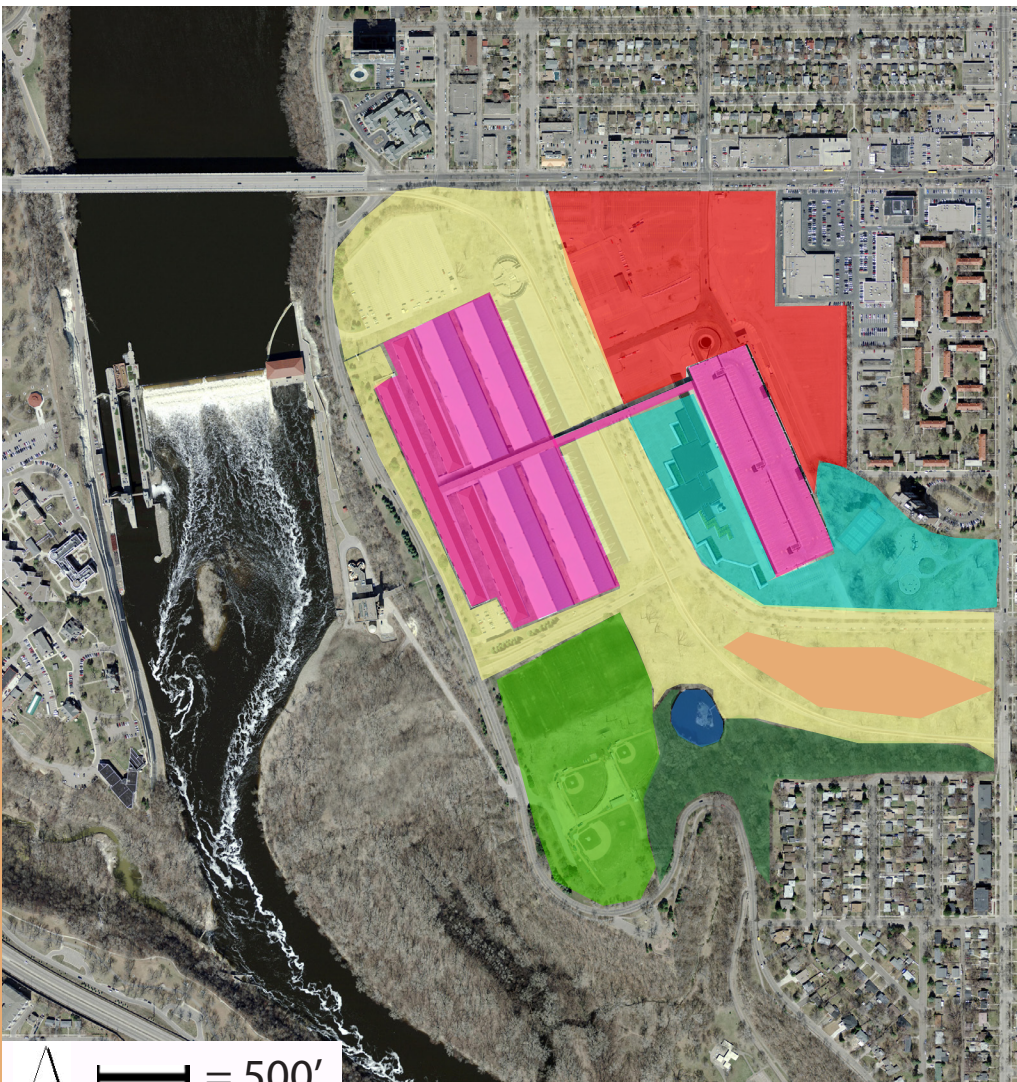
Northern Red Oak
Quercus rubra



OPEN SPACE PLANNING PROCESS



Athletic fields occupy previous warehouse space



Legend

-  Oak Savannah
-  Bigwoods
-  Urban Infill
-  Factory Structure
-  Urban Park
-  Athletic Fields
-  River Bottom
-  Water Retention

PROJECT SOLUTION

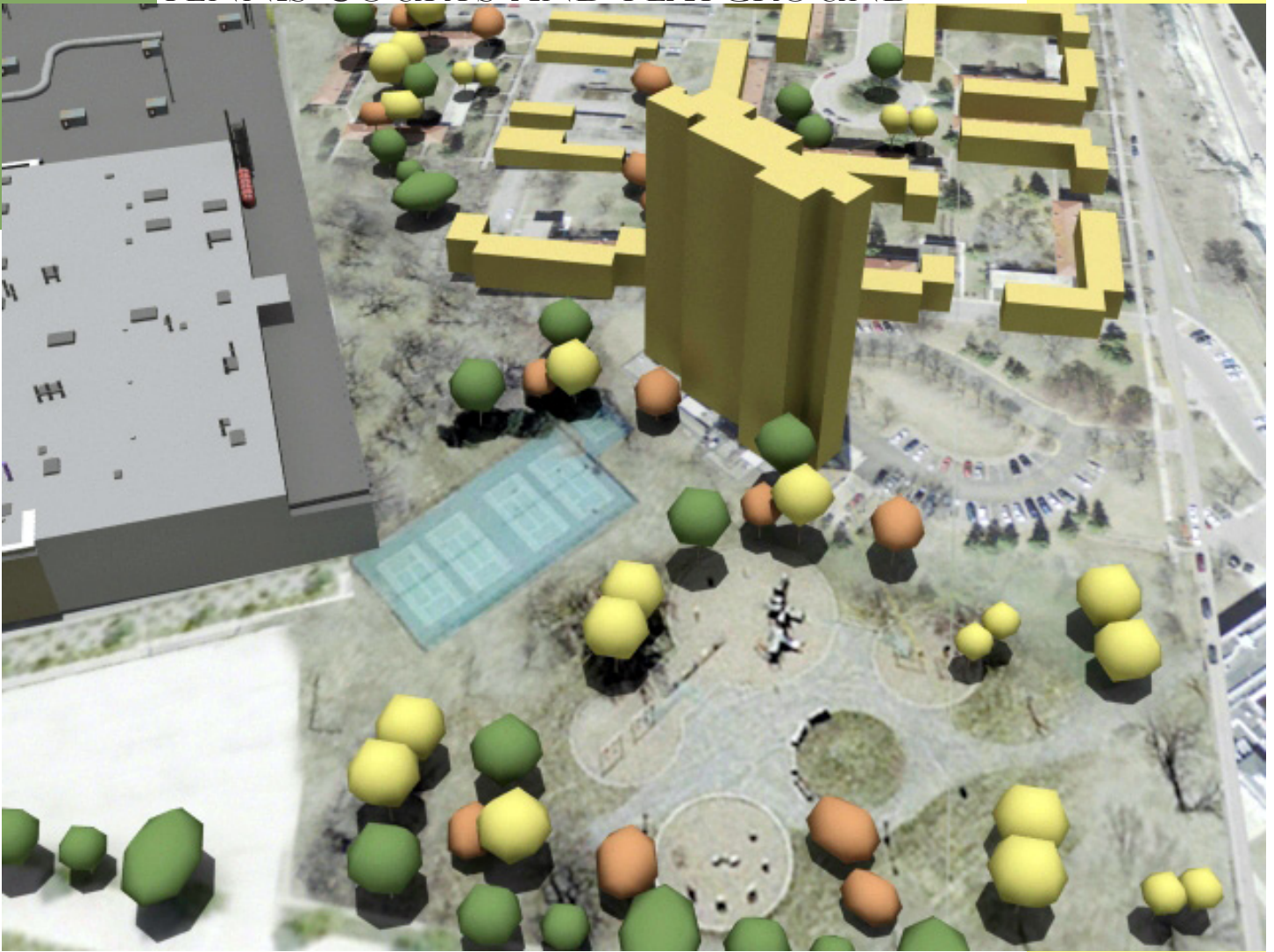
PHASE ONE: 0-5 YEARS



PROGRAMMATIC GOALS

- Construct tennis courts and playground area
- Retrofitting of main assembly greenhouses
- Deconstruct warehouse on Southern portion of site and move athletic fields to new location
- Begin the reestablishment of ecosystems within a larger regional plan

TENNIS COURTS AND PLAYGROUND



A compact urban park that is easily accessible to nearby residents offering recreation and green space. The operation and maintenance is will be done by the city park service, public rest rooms will be available on site. Semi-open and charmingly landscaped, the primary purpose is to allow city residents, especially workers from nearby businesses to relax in nature.

GREENHOUSE PLANT PRODUCTION

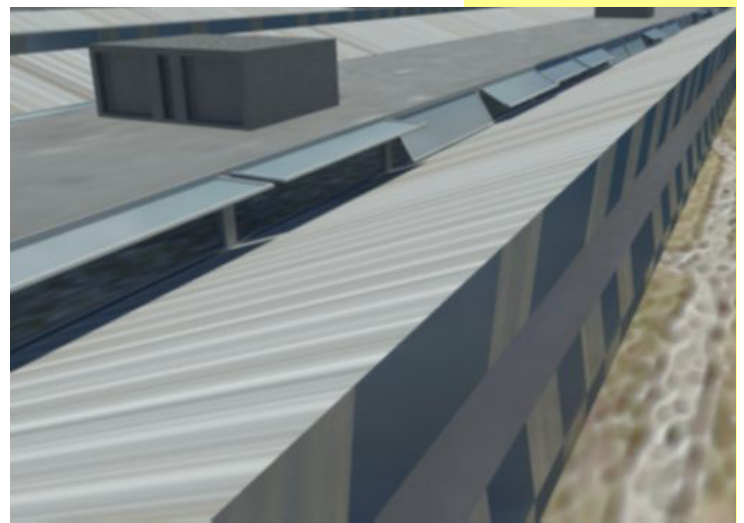
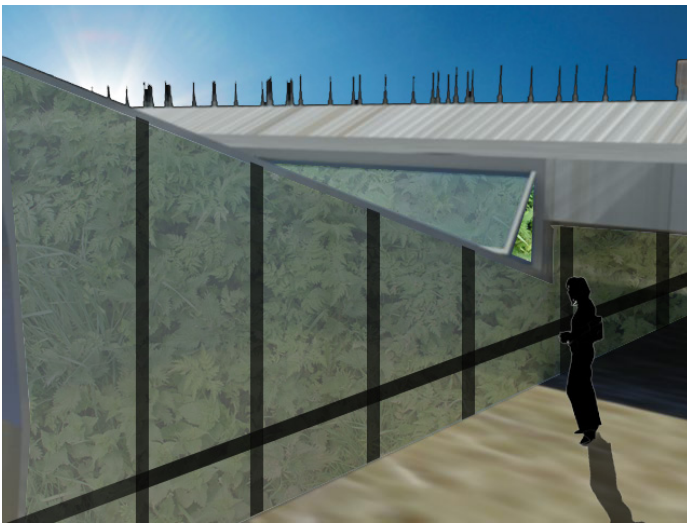


50' =

Privately rented
greenhouses

Public accessible commercial
greenhouses

RETROFITTED ROOFING & SIDING



In an effort to provide facilities that offer local food production in the Twin Cities area, I propose the retrofit of the main assembly plant into greenhouses. Pre-existing roof structures will be updated in an effort to collect rain water, as well as allowing interesting opportunities for public views within.

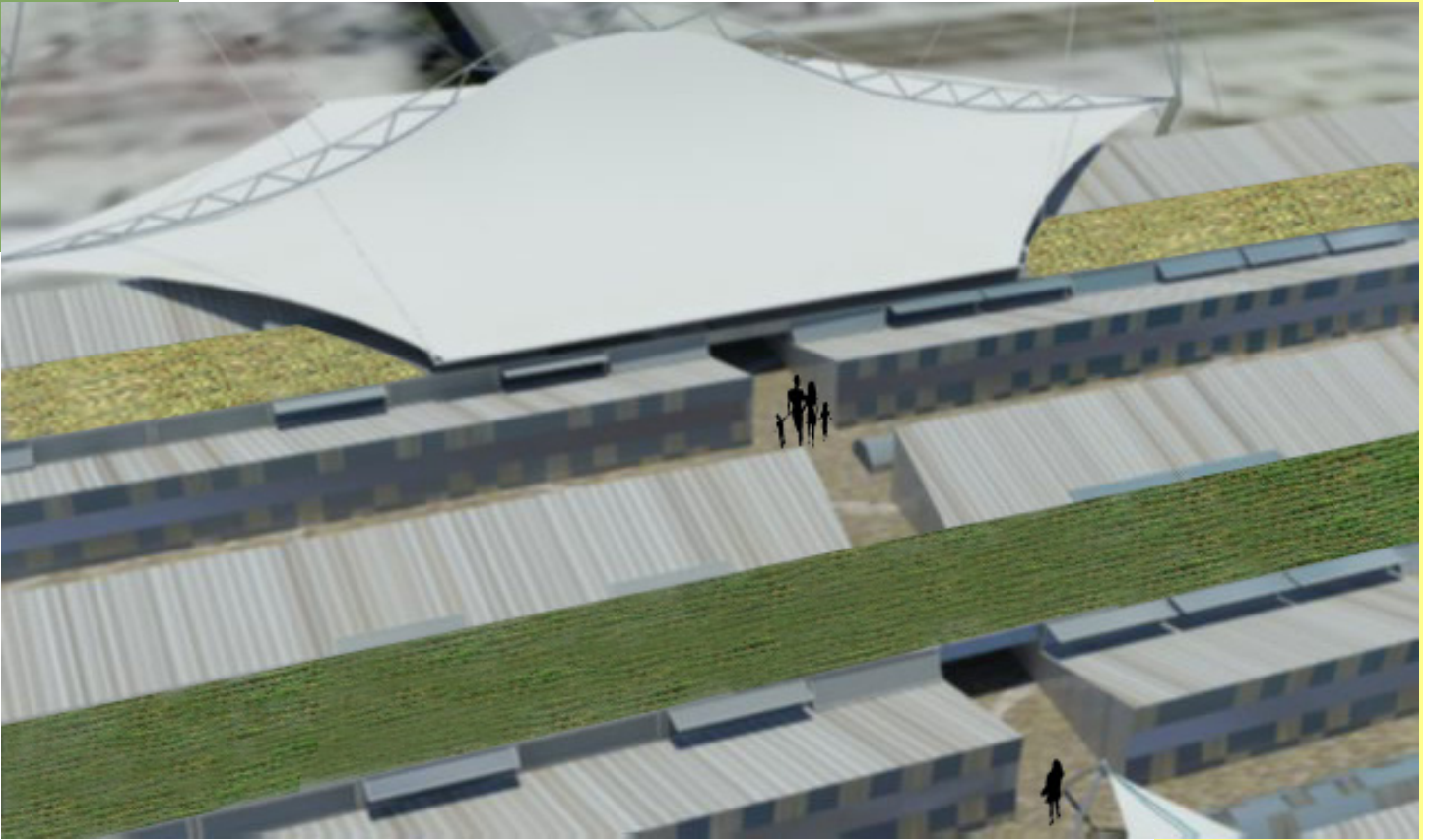
PHASE TWO: 10-15 YEARS



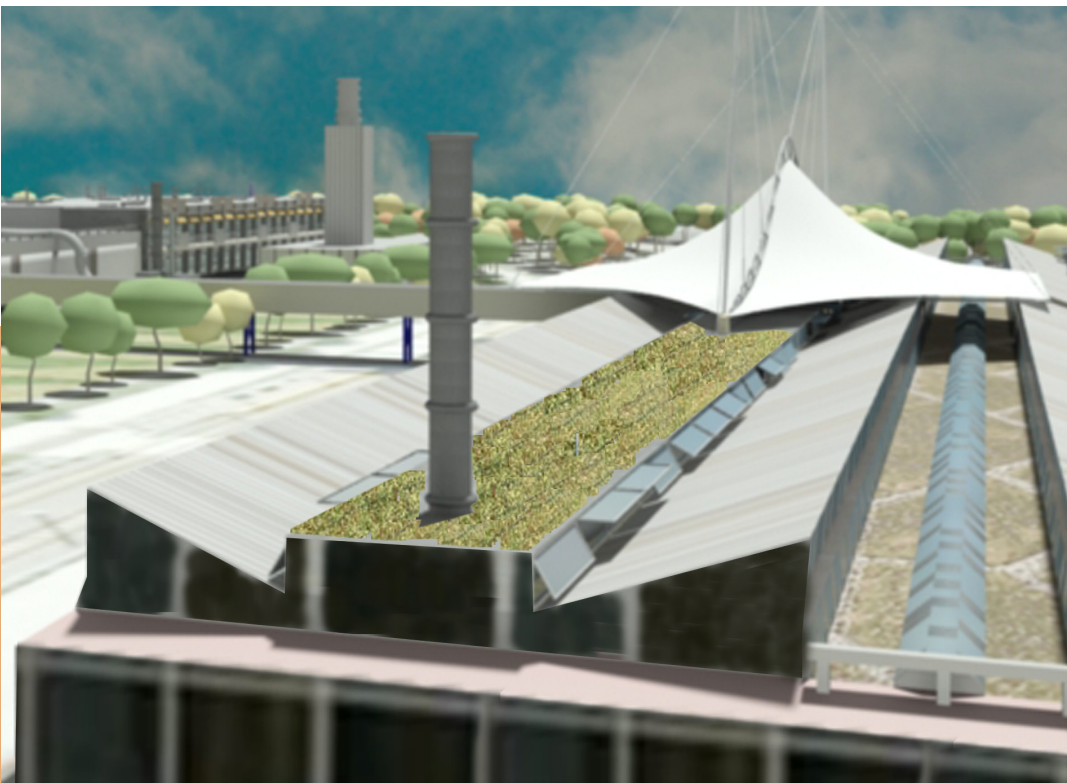
PROGRAMMATIC GOALS

- Establish community rooftop garden plots
- Repurpose paint building
- Create industrial heritage monuments
- Fit greenroofs onto portions of the main assembly building.

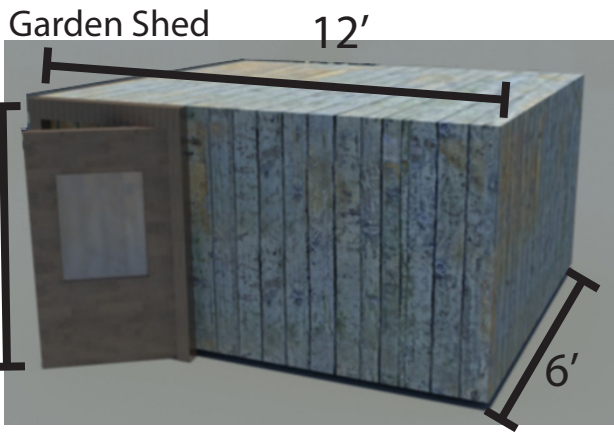
RETROFITTED ROOFING & SIDING



In an effort to conserve heat, sealing the plants many pipes and exhaust vents, as well as, greenroofing will control the idle costs needed to heat the facility.



POST-INDUSTRIAL ROOFTOP GARDENS



Public accessible



PHASE THREE: 15+ YEARS



PROGRAMMATIC GOALS

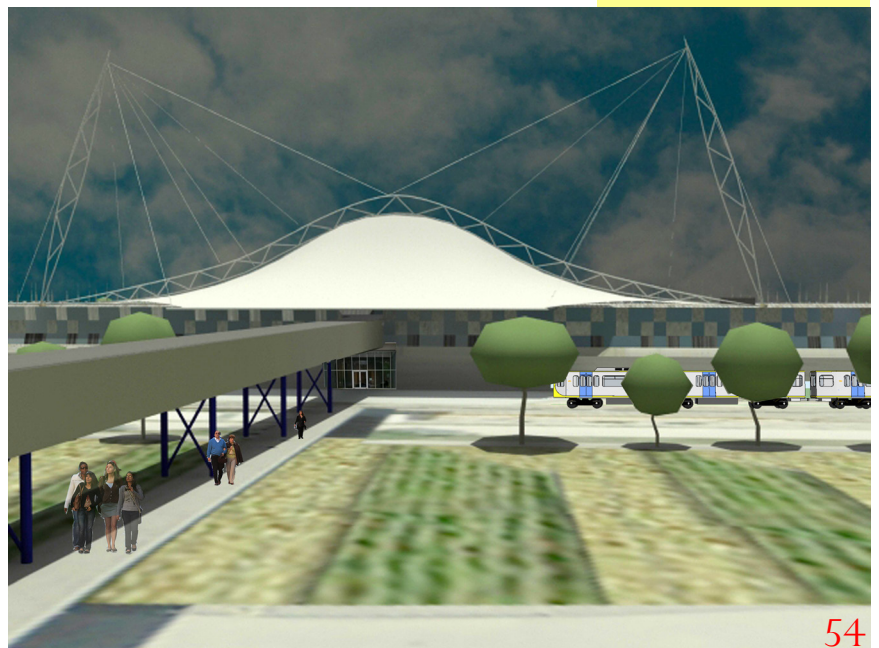
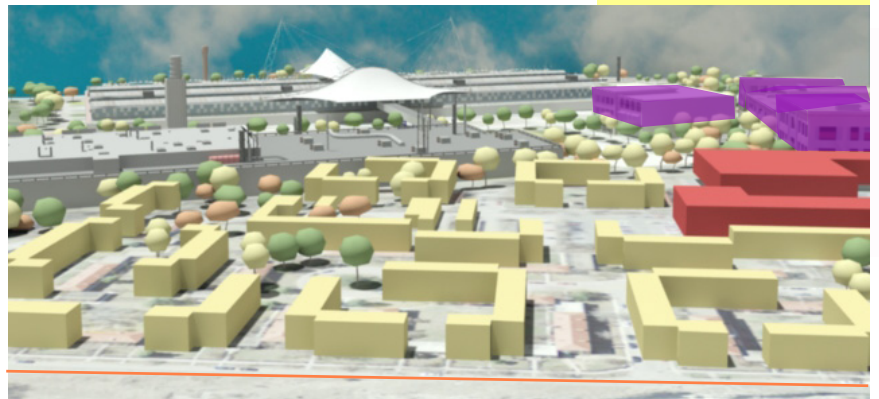
- Main assembly building retrofit complete
- Regional transit system connecting Minneapolis to St. Paul is created
- Canopied membrane tarps are constructed
- Mixed-use urban infill

MIXED-USE DEVELOPMENT

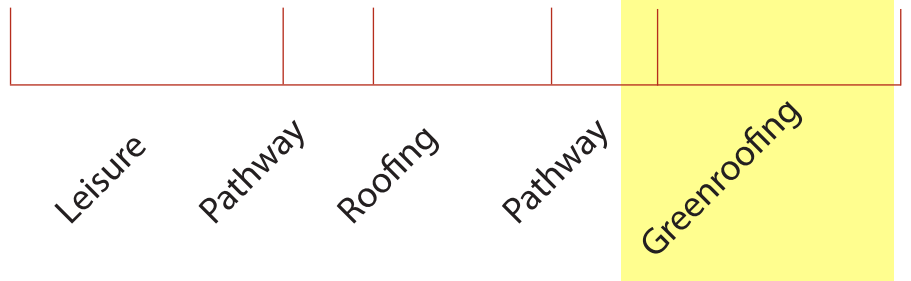
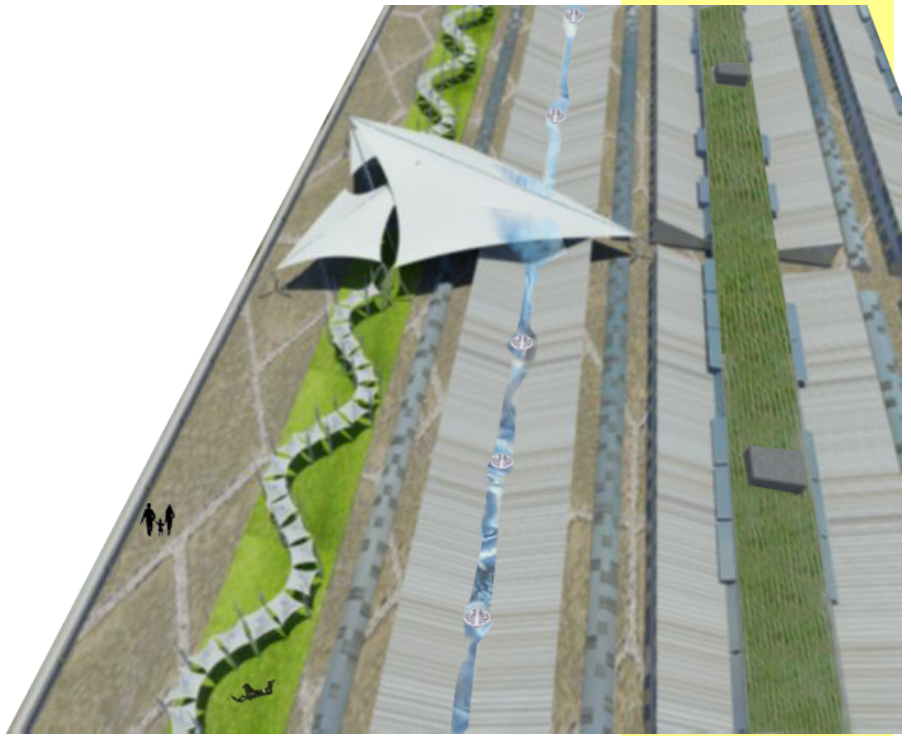
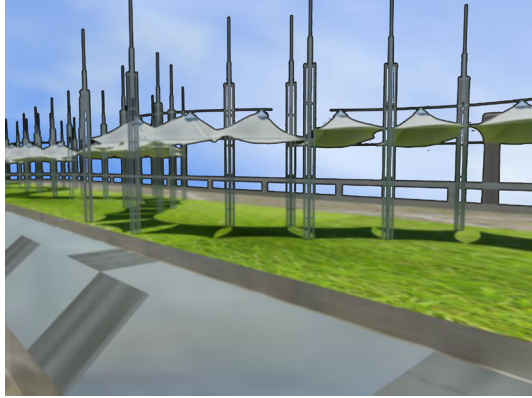
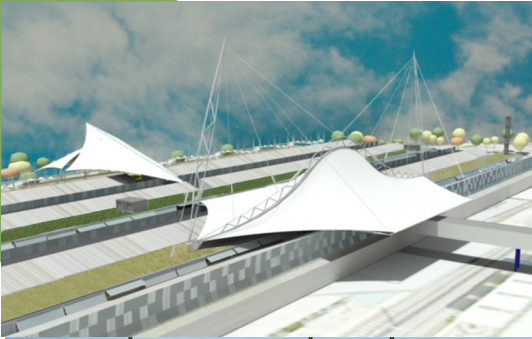


Legend

- Light Rail Line
- Automobile Thoroughfare
- Mixed-use Buildings
- Commercial
- Residential



COMMUNITY GATHERING SPACES



TRANSIT-ORIENTED DEVELOPMENT



Light-Rail



Automobile



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Go Bison !