

RESPONDING TO SHOCK:

A COLLABORATIVE PROCESS FOR THE ST. ROCH NEIGHBORHOOD

BY

J. LIAM MAHONEY

A REPORT

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

MASTER OF LANDSCAPE ARCHITECTURE

DEPARTMENT OF LANDSCAPE ARCHITECTURE/REGIONAL & COMMUNITY PLANNING
COLLEGE OF ARCHITECTURE, PLANNING & DESIGN

KANSAS STATE UNIVERSITY
MANHATTAN, KANSAS

2011

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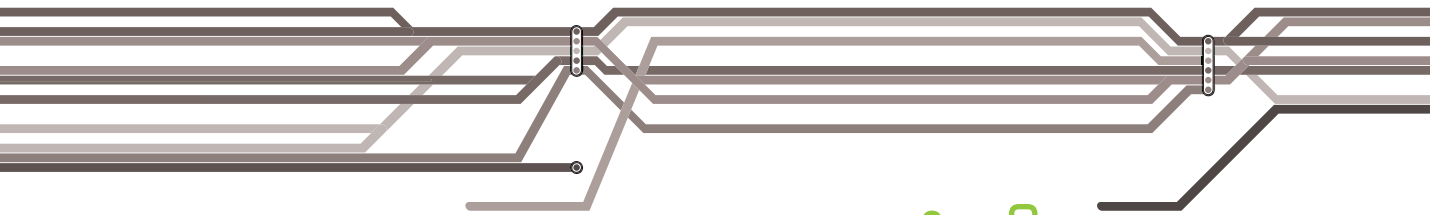
2011

ABSTRACT

Hurricane Katrina displaced many New Orleans residents, leaving in its wake tens of thousands of vacant lots and buildings. In 2010, estimates show that over 57,000 properties lay empty in the city, especially in the poorer neighborhoods. These properties are not contributing to the fabric of the city; in most places, they are a sign of defeat, an eyesore, or a haven for crime. The neighborhood of St. Roch is experiencing the negative effects of these properties day in and day out and from year to year. Almost a quarter of the lots are vacant in the St. Roch neighborhood, leading to crime and creating a nuisance and a blemish on the community. Coupled with the lack of ownership there is an ailing stormwater management infrastructure leading to areas of flooding after routine storms. In addition to these concerns, there is a lack of fresh, inexpensive and accessible food throughout the area.

Although St. Roch's vacant lots have a negative effect on the community, they present a tremendous opportunity. Their dispersal around the neighborhood presents the opportunity to connect them to churches, schools, retail outlets, as well as providing other uses and services to the neighborhood. The thoughtful design of these locations will demonstrate a site-sensitive approach to the local ecology, culture, and economy of the neighborhood. Such design includes the community throughout the entire lifecycle of each site from its planning phase to the end of its use. The primary goal throughout the planning and design process is to foster stewardship for both the landscape and the community as a whole by means of collaborative planning, direct interaction with each site during implementation, and the observation and monitoring of crucial processes throughout a site's lifecycle.

The intent of this project is to apply a participatory framework to the site design process in order to rejuvenate critical areas of the St. Roch neighborhood. This project seeks to demonstrate the need for a collaborative process while allowing for a balance between the experts who help design each site and the community members who take ownership of the renewed parcels.



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table of contents

list of figures

introduction

shock

reorganization

growth

conservation

conclusion

appendix a: literature

appendix b: site analysis

appendix c: precedents

ix

1

27

45

79

105

119

131

139

145

list of figures

introduction

- Figure 1.1. St. Roch Ave. Neutral Ground. Liam Mahoney. 4
- Figure 1.2. St. Roch Context. Liam Mahoney.
Source: (City of New Orleans GIS 2010). 7
- Figure 1.3. Jean LaFitte National Historic Park and Preserve. Liam Mahoney. 9
- Figure 1.4. Jean LaFitte National Historic Park and Preserve. Liam Mahoney. 10
- Figure 1.5. Norman's Chart of the Lower Mississippi River.
Source: Library of Congress. 11
- Figure 1.6. Marigny Plantation.
Source: American Decorative Arts Forum of Northern California. 12
- Figure 1.7. St. Roch character. Liam Mahoney.
Source: NAIP Imagery, CNOGIS. 13
- Figure 1.8. Our Lady Star of the Sea Church.
Source: Preservation Resource Center. 14
- Figure 1.9. St. Roch Community Church.
Source: Preservation Resource Center. 14
- Figure 1.10. St. Roch Neutral Ground.
Source: Faubourg St. Roch Project. 14
- Figure 1.11. St. Roch Cemetery.
Source: Flickr user sunflwrs101. 14
- Figure 1.12. St. Roch street conditions.
Source: Flickr user drainthe8th. 14
- Figure 1.13. Colton Jr. Middle School.
Source: Preservation Resource Center. 14
- Figure 1.14. St. Roch street ponding.
Source: Flickr user drainthe8th. 14
- Figure 1.15. Design Timeline. Liam Mahoney. 15
- Figure 1.16. Design Framework. Liam Mahoney. 17
- Figure 1.17. Participating Parties. Liam Mahoney. 19
- Figure 1.18. Adaptive Cycle in 2D.
Source: Holling and Gunderson (2002). 22
- Figure 1.19. The Collaborative Process. Liam Mahoney. 22
- Figure 1. 20. Eight Rungs on a Ladder of Citizen Participation.
Source: Adapted From Sherry Arnstein's Ladder of Citizen Participation. 23
- Figure 1. 21. St. Roch Vacant Lot. Liam Mahoney. 25

shock

- Figure 2.1. Aerial of Flooded New Orleans.
Source: National Oceanic and Atmospheric Administration. 29
- Figure 2.2. Katrina, August 24, 2005.
Source: National Oceanic and Atmospheric Administration. 31
- Figure 2.3. Stranded Survivors wait in the Superdome, New Orleans.
Source: Mario Tama. 31
- Figure 2.4. Hurricane Aftermath in Biloxi.
Source: National Oceanic and Atmospheric Administration. 31
- Figure 2.5. Aerial of Flooded New Orleans.
Source: National Oceanic and Atmospheric Administration. 31
- Figure 2.6. 2000 Population Map. Liam Mahoney.
Source: Census 2010, CNOGIS. 33
- Figure 2.7. 2010 Population Map. Liam Mahoney.
Source: Census 2010, CNOGIS. 33
- Figure 2.8. 2000 Population Infographic. Liam Mahoney.
Source: Census 2010. 34
- Figure 2.9. 2010 Population Infographic. Liam Mahoney.
Source: Census 2010. 34
- Figure 2.10. School Map. Liam Mahoney.
Source: CNOGIS. 35
- Figure 2.11. Charles J. Colton Jr. Middle School. Liam Mahoney. 36
- Figure 2.12. Oretha Castle Haley Elementary School. Liam Mahoney. 36
- Figure 2.13. Our Lady Star of the Sea School. Liam Mahoney. 36
- Figure 2.14. John A. Shaw Elementary School.
Source: Flickr user New Orleans Lady. 36
- Figure 2.15 Vacant Lot Dispersal. Liam Mahoney.
Source: NAIP Imagery, CNOGIS. 37
- Figure 2.16. St. Roch area in Football Fields. Liam Mahoney. 38
- Figure 2.17. St. Roch Flood Duration. Liam Mahoney.
Source: FEMA, CNOGIS. 39
- Figure 2.19. St. Roch conditions.
Source: NAIP Imagery, CNOGIS. 41
- Figure 2.20. St. Roch street conditions.
Source: Flickr user drainthe8th. 42
- Figure 2.21. Interstate 10 Overpass.
Source: GNO Community Data Center. 42

list of figures

- Figure 2.22. St. Roch Crime.
Source: Times Picayune. 42
- Figure 2.23. St. Roch Industrial Land.
Source: Bing Maps. 42
- Figure 2.24. St. Roch street ponding.
Source: Flickr user drainthe8th. 42
- Figure 2.25. St. Roch Market. Liam Mahoney. 42
- Figure 2.26. St. Roch Vacant Lot. Liam Mahoney. 42

reorganization

- Figure 3.1. St. Roch Abandoned Building. Liam Mahoney. 47
- Figure 3.2. Citizen Participation in Organization of Roles. Liam Mahoney.
Source: Adapted From Sherry Arnstein's Ladder of Citizen Participation. 49
- Figure 3.3. Parties' Roles in the Planning Phase. Liam Mahoney. 50
- Figure 3.4. The Planning Phase of the Collaborative Process. Liam Mahoney. 51
- Figure 3.5. Citizen Participation in Site Selection. Liam Mahoney.
Source: Adapted From Sherry Arnstein's Ladder of Citizen Participation. 53
- Figure 3.6. Site Selection Methodology. Liam Mahoney. 54
- Figure 3.7. Community Garden Site Selection Methodology. Liam Mahoney. 55
- Figure 3.8. Church Locations. Liam Mahoney.
Source: (CNOGIS 2010). 58
- Figure 3.9. Bus Stop Locations. Liam Mahoney.
Source: Regional Transit Authority. 58
- Figure 3.10. Park Locations. Liam Mahoney.
Source: (CNOGIS2010). 58
- Figure 3.11. Selected Site in the St. Roch Neighborhood. Liam Mahoney.
Source: (CNOGIS 2010). 60
- Figure 3.12. Community Garden Context. Liam Mahoney. 61
- Figure 3.13. Community Garden Drainage. Liam Mahoney.
Source: Louisiana GIS Atlas. 61
- Figure 3.14. Community Garden Visibility. Liam Mahoney. 61
- Figure 3.15. Community Garden Panorama. Liam Mahoney. 62
- Figure 3.16. Wetlands Site Selection Methodology. Liam Mahoney. 63

- Figure 3.17. Vacant Lot Hydrology Suitability Map. Liam Mahoney.
Source: (CNOGIS 2010). 66
- Figure 3.18. Vacant Lot Soil Suitability Map. Liam Mahoney.
Source: (CNOGIS 2010). 66
- Figure 3.19. Vacant Lot Social Suitability Map. Liam Mahoney.
Source: (CNOGIS 2010). 66
- Figure 3.20. Selected Wetland Site in the St. Roch Neighborhood. Liam Mahoney.
Source: (CNOGIS 2010). 68
- Figure 3.21. Wetlands Context. Liam Mahoney. 69
- Figure 3.22. Wetlands Drainage. Liam Mahoney.
Source: Louisiana GIS Atlas. 69
- Figure 3.23. Wetlands Visibility. Liam Mahoney. 69
- Figure 3.24. Wetlands Panorama. Liam Mahoney. 70
- Figure 3.25. Citizen Participation in Program Development and Vision. Liam Mahoney:
Source: Adapted From Sherry Arnstein's Ladder of Citizen Participation. 71
- Figure 3.26. Potential Collaborators. Liam Mahoney.
Source: NPNNOLA. 72
- Figure 3.27. Program Development. Liam Mahoney. 73
- Figure 3.28. Citizen Participation in Design Deliberation. Liam Mahoney.
Source: Adapted From Sherry Arnstein's Ladder of Citizen Participation. 75
- Figure 3.29. Community Design Charrettes. Liam Mahoney. 76
- Figure 3.30. Grid of Design Concepts. Liam Mahoney. 77
- Figure 3.31. Citizen Participation in Design Decision. Liam Mahoney.
Source: Adapted From Sherry Arnstein's Ladder of Citizen Participation. 78
- Figure 3.32. Design Concepts. Liam Mahoney. 79
- Figure 3.33. Community Gardens Plan. Liam Mahoney. 80
- Figure 3.34. Wetlands Plan. Liam Mahoney. 80

growth

- Figure 4.1. St. Roch Avenue Looking South. Liam Mahoney. 81
- Figure 4.2. The Implementation Phase of the Collaborative Process. Liam Mahoney. 83
- Figure 4.3. Citizen Participation in the Implementation. Liam Mahoney.
Source: Adapted From Sherry Arnstein's Ladder of Citizen Participation. 84
- Figure 4.4. Community Garden Implementation. Liam Mahoney. 85
- Figure 4.5. Community Garden Site Plan. Liam Mahoney. 88

list of figures

growth

- Figure 4.6. Arts Street Section. Liam Mahoney. 89
- Figure 4.7. N. Johnson Street to N. Galvez Street Section. Liam Mahoney. 91
- Figure 4.8. Community Garden Vegetation. Liam Mahoney. 93
- Figure 4.9. Community Garden Compost Cycle. Liam Mahoney. 93
- Figure 4.10. Community Garden Vegetation Section. Liam Mahoney. 94
- Figure 4.11. Wetlands Implementation. Liam Mahoney. 95
- Figure 4.12. Wetlands Site Plan. Liam Mahoney. 98
- Figure 4.13. Elysian Fields Avenue to Marigny Street Section. Liam Mahoney. 99
- Figure 4.14. Agriculture Street to Abundance Street Section. Liam Mahoney. 101
- Figure 4.15. Wetlands Water Interaction. Liam Mahoney. 103
- Figure 4.16. Wetlands Vegetation. Liam Mahoney. 103
- Figure 4.17. Wetlands Erosion Patterns. Liam Mahoney. 103
- Figure 4.18. Wetlands Vegetation Section. Liam Mahoney. 104

conservation

- Figure 5.1. Mandeville St. Liam Mahoney. 107
- Figure 5.2. The Conservation Phase of the Collaborative Process. Liam Mahoney. 109
- Figure 5.3. Citizen Participation in the Conservation of the Sites. Liam Mahoney.
Source: Adapted From Sherry Arnstein's Ladder of Citizen Participation. 110
- Figure 5.4. N. Johnson St. Farmer's Market Perspective. Liam Mahoney . 111
- Figure 5.5. Community Garden Maintenance. Liam Mahoney. 114
- Figure 5.6. Wetlands Park Perspective. Liam Mahoney. 115
- Figure 5.7. Wetlands Maintenance. Liam Mahoney. 118

conclusion

- Figure 6.1. St. Roch Market. Liam Mahoney. 121
- Figure 6.2. Community Involvement Throughout the Process. Liam Mahoney.
Source: Adapted From Sherry Arnstein's Ladder of Citizen Participation. 123

appendices

- Figure 7.1. Literature Map. Liam Mahoney. 134
- Figure 7.2. Community Garden Site Analysis Metric. Liam Mahoney. 141
- Figure 7.3. Wetlands Site Analysis Metric. Liam Mahoney. 143
- Figure 7.4. Norris Square Perspective.
Source: (PHS 2010). 148
- Figure 7.5. Norris Square Perspective of Museum Lot.
Source: (PHS 2010). 148
- Figure 7.6. Carroll Park Location. Liam Mahoney. 149
- Figure 7.7. Carroll Park.
Source: (PHS 2010). 149
- Figure 7.8. Cliveden Park.
Source: Friends of Cliveden Park. 150
- Figure 7.9. Cliveden Park Location. Liam Mahoney.
Source: Bing Maps. 150
- Figure 7.10. Programs Application to St. Roch. Liam Mahoney. 152

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"In New Orleans, culture doesn't come down from on high; it bubbles up from the street." Jazz patriarch Ellis Marsalis



introduction



project background and intent

Hurricane Katrina displaced many New Orleans residents, leaving in its wake tens of thousands of vacant lots and buildings. In 2010, estimates show that over 57,000 properties lay empty in the city, especially in the poorer neighborhoods. These properties are not contributing to the fabric of the city; in most places, they are a sign of defeat, an eyesore, or a haven for crime. The neighborhood of St. Roch is experiencing the negative effects of these properties day in and day out and from year to year. Almost a quarter of the lots are vacant in the St. Roch neighborhood, leading to crime and creating a nuisance and a blemish on the community. Coupled with the lack of ownership there is an ailing stormwater management infrastructure leading to areas of flooding after routine storms. In addition to these concerns, the community faces a lack of fresh, inexpensive and accessible food through the area.

Although the vacant lots in St. Roch currently have a negative effect on the neighborhood, they also present a tremendous opportunity. This empty unused land could potentially connect local churches,

schools and retail outlets, as well as providing innumerable uses and services to the people of St. Roch. The thoughtful design of these locations will demonstrate a site-sensitive approach to the local ecology, culture, and economy of the neighborhood. Such design includes the community throughout the entire lifecycle of each site from its planning phase to the end of its use. The primary goal throughout the planning and design process is to foster stewardship for both the landscape and the community as a whole by means of collaborative planning, direct interaction with each site during implementation, and the observation and monitoring of crucial processes throughout a site's lifecycle.

This project applies a participatory framework to the site design process in order to guide community members and those who assist them to rejuvenate critical areas of the St. Roch neighborhood. This project seeks to demonstrate the need for a collaborative process by balancing the relationship between expert designers at each site and the community members who take ownership of renewed parcels.



Figure 1.1
St. Roch Ave. Neutral Ground

personal goals

- To better understand the role of the landscape architect in a site design project and expand the landscape architect's leadership function in the community.
- Gain a deeper understanding of the cultural and social systems that make New Orleans such an interesting place to live.
- Broaden our collective understanding of the Mississippi River Delta landscape and how its people may appropriately interact with it in productive ways.

project goals

- **Stewardship:** The initial sites targeted are two pilot sites, these would be the first vacant lots to benefit from the opportunity for renewal and change. The two selected lots are meant to act as models for the community. Residents are encouraged to discuss the best options for these and other vacant lots. This would include considering uses that may be much more practical than simply rebuilding homes. These two properties would be examples and serve as symbols for the rest of the neighborhood. Pilot projects would enable residents to explore specific ideas for these and other properties, and motivate the residents to understand firsthand the benefits of site renewal.
- **Collaboration:** This project illustrates the various roles the landscape architect, stakeholders, and individual residents have in the trajectory of a project. The roles of each party are defined for each stage of the project. This includes the planning and design or reorganization (alpha) stage; the implementation or growth (r) stage; the management or conservation (K) stage; and during instances of disturbances and shock (omega) stage. This process draws from the adaptive cycle of ecosystems (Walker & Salt, 2006).
- **Contact and Stewardship:** In order to foster a better connection between people and the landscape they live in, stronger emotional connections to the physical environment need to be established. In turn, there is a need to create a sense of respect for both the residents of St. Roch and the Mississippi Delta landscape. It is anticipated that as local residents interact with specific parcels and realize the vital relationship between the people and the land, an interest in the social and biophysical community will develop. These potential stewards include property owners and other residents actively involved in the neighborhood. Hands-on implementation and management strategies will enhance the interaction between the community members and the site's potential development.

- **Regenerative and Place-Based Design:** In order to develop self-regulating sites that work chiefly on closed cycles using local materials (ideally from the neighborhood), appropriate materials and equipment must be secured (McDonough 2002). This would include procuring plants from regional nurseries and stone, wood and other construction materials from local organizations. In addition, dynamic ecosystem and interactive human community processes must be granted (through design) a functional structure to spring from. It is expected that many materials will be donated as re-used or recycled resources from entities such as non-profits and local churches, thus creating a sense of cooperation and mutual coexistence (McDonough 2002; Walker & Salt 2006).
- **Collaboration:** To demonstrate St. Roch's ultimate renewal following Hurricane Katrina, project teams must be organized to increase human capital and develop a network or series of partnerships for ongoing community involvement. If possible, the residents should be involved at every stage of the project in some way or another. The stakeholder(s) responsible for or designated to guide change in St. Roch should operate as supervisors to maintain the site for any changes needed following implementation of specific design ideas. The long-term goal will be to ensure that the site is self-regulating, self-renewing, and flexible.
- **Adaptability:** There should be an openness to civic participation and interpretation throughout each phase of site/parcel development (Newman 2008; Randolph 2004; Arnstein 1969). These initial sites should act as experiments so that the community can learn together and discuss the evolving outcomes. The more community involvement each time a site is built and managed, the better chance there is to develop a place-based model for vacant lot stabilization in St. Roch.
- **Place-Based Stormwater Management:** The goal for stormwater management would include implementing storm water BMPs to demonstrate softscape practices and address flooding, pollution and other drainage issues in St. Roch, while conserving water for re-use in crop and landscape irrigation.
- In sum, there should be openness to civic participation and interpretation throughout each phase (Newman 2008; Randolph 2004; Arnstein 1969).



- St. Roch boundary
- Study Area (adjacent neighborhoods)



Figure 1.2
St. Roch Context



St. Roch

St. Roch is located in the Eight Ward of New Orleans. The neighborhood is bordered by the Seventh Ward, and the Fairgrounds neighborhoods immediately upriver from the site's boundary. The Marigny neighborhood is located immediately riverside of St. Roch. The St. Bernard, Dillard, and Gentilly Terrace neighborhoods are located directly lakeside of the site, while the Desire Area, Bywater Area, Florida Area, and St. Claude neighborhoods are all located immediately downriver from the site.

There are approximately 4,142 properties in the neighborhood of St. Roch. Of those properties, approximately 870 of them were vacant lots as of 2010 (Census 2010).

history of the site. pre-development

To begin to understand the makeup of New Orleans compared to other American cities it is important to note the natural processes and systems that have formed the city's landscape during both the past and the present. Besides Sacramento, California, New Orleans is the only major city U.S. city to sit on a delta (Campanella 2010).

The delta as it exists today began to take shape approximately seven millennia ago, starting somewhere between Lafayette and Baton Rouge. At this line, the Mississippi River emptied into Gulf waters. The river would dump into the Gulf waters and deposit much of the sediment there. Sediments dropped out from the loss of kinetic energy as the fast-moving Mississippi slammed into the placid Gulf waters and began to aggregate.

"Alluvium began to accumulate as a deltaic lobe at the mouth of the river. As that alluvium rose in elevation, the Mississippi sought paths of less resistance around it. Occasionally a crevasse opened in the bank, allowing a trickle, or a torrent into adjacent wetlands instigating the same land-building process in yet another area" (Campanella 2008; 77) This continual process of land building and abandonment pushed the delta into the Gulf of Mexico farther and wider with each cycle. The Mississippi River delta now sits atop a thin layer of alluvium rather than layers of bedrock

like many other cities in the United States (Campanella 2008).

In New Orleans, the higher land is located closer to the river due to geomorphic and land building processes. Annual flooding occurs during the spring months discarding new layers of sediment. The floodwaters deposit heavier sediments near the river –building it up higher and, effectively creating the "Sliver by the River" or a natural levee (Campanella 2008). Waters farther from the river deposit smaller sediments, which slowly built the bottomland landscape upon which St. Roch and other low-lying neighborhoods sit. In historical accounts of New Orleans, these low-lying areas are referred to as backswamps (Campanella 2008).

Consequently these would be some of the hardest hit areas during Katrina. These bottomlands were above sea level when New Orleans originally settled, but they have sunk from a lack of sediment supply throughout the city's tenure. This delta relies on a constant lifeline of sediment from spring flooding to evade soil subsidence and sinking. At New Orleans, the Army Core of Engineers effectively cut off the replenishing sediments in an attempt to maintain an impossible steady-state (Campanella 2008).



Figure 1.3
Jean LaFitte National
Historic Park and
Preserve

bottomland hardwood forests



Figure 1.4
Jean LaFitte National Historic Park and
Preserve

The type of wetland found in the St. Roch neighborhood pre-development would typically have been a riparian wetland ecosystem. Riparian wetlands are ecosystems influenced by adjacent streams and rivers, particularly in their soils and soil moistures. They typically follow the floodplain of an adjacent river (Mitsch 1993). Along the Mississippi River, these ecosystems are called bottomland hardwood forests. Bottomland hardwood forests have three defining features per Mitsch (1993).

- These habitats flood periodically (by surface or groundwater) during the growing season. In New Orleans, flooding typically occurs during the springtime.
- Consequently, the soils are inundated during the growing season.
- The vegetation in these wetlands, especially the woody plants, shows an ability (through adaptation) to survive for a period without oxygen, and they can also weather droughty conditions.

For St. Roch and New Orleans, to re-establish some semblance of these bottomland forests, the most that can be done is in creating temporary (rain-garden-like) wetlands and selecting appropriate vegetation. Using a plant palette of local vegetation will provide a mixture of ecological benefits while also promoting a sense of place and connection to the historic landscape.

history of the site. cadastral

New Orleans began to urbanize rapidly throughout the 18th and 19th centuries. The early developers employed an interesting radiating framework to lay out the streets. The street grid actually traces back to a central-European landparcelling system from the turn of the first millennium (Campanella 2008). Before the city developed into the crescent grid, there were adjacent plantations that set the stage for this to happen. Their radiating pattern results from the "cadastral", or land parceling, system developed from the aforementioned region of Europe (Campanella 2008; 131).

The logic behind this system stemmed from three components that attempted to give an equal share of productive land to a given plantation. The first was to allow some frontage to a common route such as a river or road, in this case the Mississippi River. From there the plots would be laid out perpendicular to a known area of unproductive land, in this case the wetlands. The land between the Mississippi and wetland was the natural levee, and good for crop production. The goal was to maintain a reasonable level of productive land and accessibility, and for this a certain level of proportion between frontage and depth was needed (Campanella 2008).

The French monarchy conceded large amounts of land to its colonists with the Edict of October 12, 1716. The Monarchy "exasperated with overly generous land concessions stipulated

that land delineation occur 'in the proportion of two to four arpents front by forty to sixty in depth.' Surveyors used the unit arpent to measure the cadasters (parcels), which equates to 180 French feet (191.835 American feet) lineally and 0.845 American acres superficially" (Campanella 2008; 131). Rectangular parcels averaged 67 to 202 acres. The river's meander would often result in trapezoidal lots that strayed from these proportions (Campanella 2008), as seen in Figure 1.5.

The fire of 1788 in New Orleans created a demand for land in the city. Thus, plantation owners began to sell off their land for development. Bernard Marigny owned the plantation that would become St. Roch. Marigny would become the first plantation owner to sell downriver from the French Quarter in 1805. The new developments needed to respond to the existing street grid from the city. These constraints formed from existing property lines, and created the street grid as it is seen today (Campanella 2008).

This unorthodox system has lent itself well to the New Orleans streetscape providing for an interesting and diverse urban fabric. This compelling street grid has allowed New Orleans a unique streetscape unlike any other in the United States (Campanella 2008). The potential to weave a new open space network on these vacant lots provides for a tremendous opportunity.

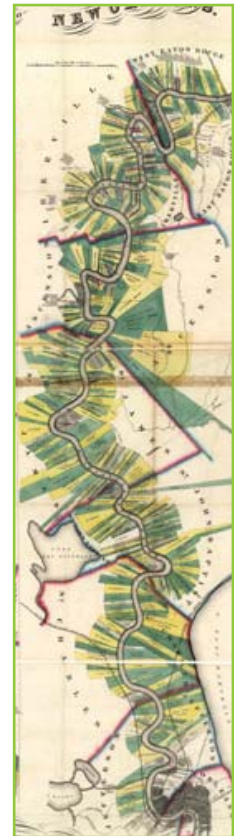


Figure 1.5
Norman's Chart of
the Lower Mississippi
River

history of the site. urbanization



Figure 1.6
Marigny Plantation

St. Roch first saw development in the 1830s with the expansion of the Pontchartrain Railroad that ran from the Faubourg Marigny to the settlement of Milneberg along the Lake. Elysian Fields follows the course of the railroad between the Marigny and Lake Pontchartrain. The railroad, developed by Creole business owners, would spur competition from American business owners uptown (Campanella 2008). The neighborhood would continue to grow steadily throughout the remainder of the 1800s until the early 1900s. At that time sewer and waterlines had extended to the area thereby allowing the neighborhood to continue development until 1920. The neighborhood was a racially mixed neighborhood, home to a Creole and German population (Greater New Orleans Community Data Center 2002). The neighborhood's slow development led to a mixture of architectural styles in the décor of the houses.

During St. Roch's development, there were three periods of architectural trends to take place in New Orleans. In the early stages of the neighborhood, the City was going through the Antebellum Period, which consisted mostly of the Greek revival style. The Victorian Period, which reigned from the middle of 1860s to the turn of the century and consisted primarily of Gothic, Italianate, and Romanesque styles. The Early Twentieth Period brought about the Bungalow style to New Orleans and specifically to

the area of St. Roch. Many of these styles are present in the facades of the shotgun style houses and Creole cottages throughout the neighborhood (Greater New Orleans Community Data Center 2002). This mix of architectural styles lends to an interesting urban fabric when one walks through the neighborhood.

The neighborhood got its name in 1867 with the dedication of the St. Roch shrine and cemetery located in the neighborhood. A German priest, Rev. Peter Leonard Thevis, arrived in the neighborhood during a Yellow fever outbreak in the city. He prayed to God through the help of St. Roch, the patron of good health, to protect his parish. When no one died throughout the remainder of the outbreak, the Priest resolved to build a chapel in St. Roch's honor. (Greater New Orleans Community Data Center 2002).

This brief discussion of St. Roch in the 1800s and early 1900s reminds one of the past and potential vibrancy of this historic New Orleans neighborhood. It is interesting to see the way in which St. Roch and New Orleans in general, urbanized into its modern iteration, and how this process occurred over several generations. Now, an almost reverse urbanization is occurring, with the new fabric of vacant lots throughout the city. This fabric of vacant lots presents a new possibility for a balance between constructed wetlands and the built environment.

St. Roch today

The images to the left give an idea of the character and style of buildings and open space in St. Roch today. A few major landmarks are important identity features in the St. Roch neighborhood. In particular, the St. Roch market, Figure 1.10, is an especially important landmark of the neighborhood. One of the more notable open air markets in New Orleans, it sits along St. Claude Avenue adding to its appeal and visibility. Originally built in 1875, the market came about as part of a growing trend in open-air markets, following the success of the French Market in the French Quarter (Campanella 2008).

Unfortunately, the market sits closed, like many other landmarks in the neighborhood, following Hurricane Katrina, but there is a substantial amount of civic support to renovate it. St. Roch Avenue and St. Roch Park also act as important social arteries in the neighborhood. St. Roch Avenue is a calmer neutral ground that runs through the center of the neighborhood connecting the neighborhood riverside to lakeside. St. Roch Park also acts as an

important social gathering site for the neighborhood (Lambert et al. 2006).

A number of community gatherings occur in the park because of its visibility and its proximity to other social uses such as Our Lady Star of the Sea and the St. Roch Community Church. Other outdoor gathering spaces may help bring more life to this community and could be created given the amount of vacant land available in St. Roch (Lambert et al. 2006).

The adjacent pictures also illustrate some of the drainage conditions that St. Roch is facing, as well as the conditions of the vacant lots throughout the neighbor. One of the more unfortunate issues to face St. Roch is it is the high rate of violent crimes it has been experiencing partly because of these conditions (Lambert et al. 2006). Regular, well-attended outdoor community events and activities would help put eyes on the street and neighborhood and could also be a draw for new housing and mixed-use development schemes.

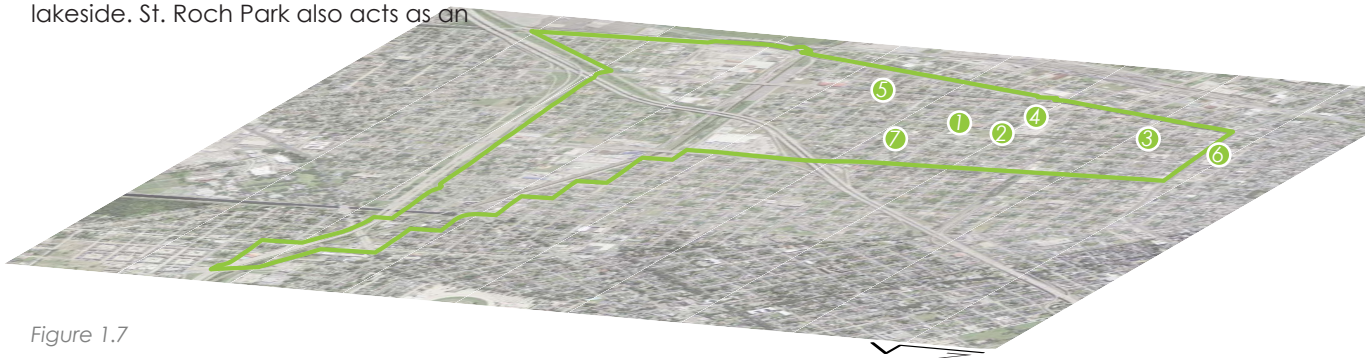


Figure 1.7
St. Roch character



Figure 1.8
Our Lady Star of the sea



Figure 1.9
St. Roch Community Church



Figure 1.10
St. Roch Neutral Ground



Figure 1.11
St. Roch Cemetery

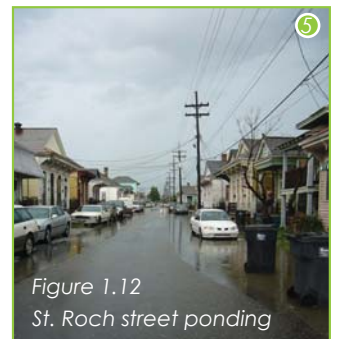


Figure 1.12
St. Roch street ponding



Figure 1.13
Colton Jr. Middle School



Figure 1.14
St. Roch street conditions

design philosophy + process

The design process and philosophy for this project focuses on creating a resilient community that feels connected to the landscape. Through collaborative planning and an emphasis on the local ecology and culture, a resilient community, including the associated landscape, can be realized over time (Randolph 2004; EPA 2002). Through an inclusive design and planning process the community leaders and members

can become stewards. It is necessary to establish the community members as stewards to increase the resilience of the site (de Souza Briggs 2003; Anonymous 2007; Innes & Booher 1999; Pickett, Cadenasso, and Grove 2004). Not every scenario can be, nor should be, planned. By establishing the community as stewards of their place, the adaptability of the place is expected to increase.

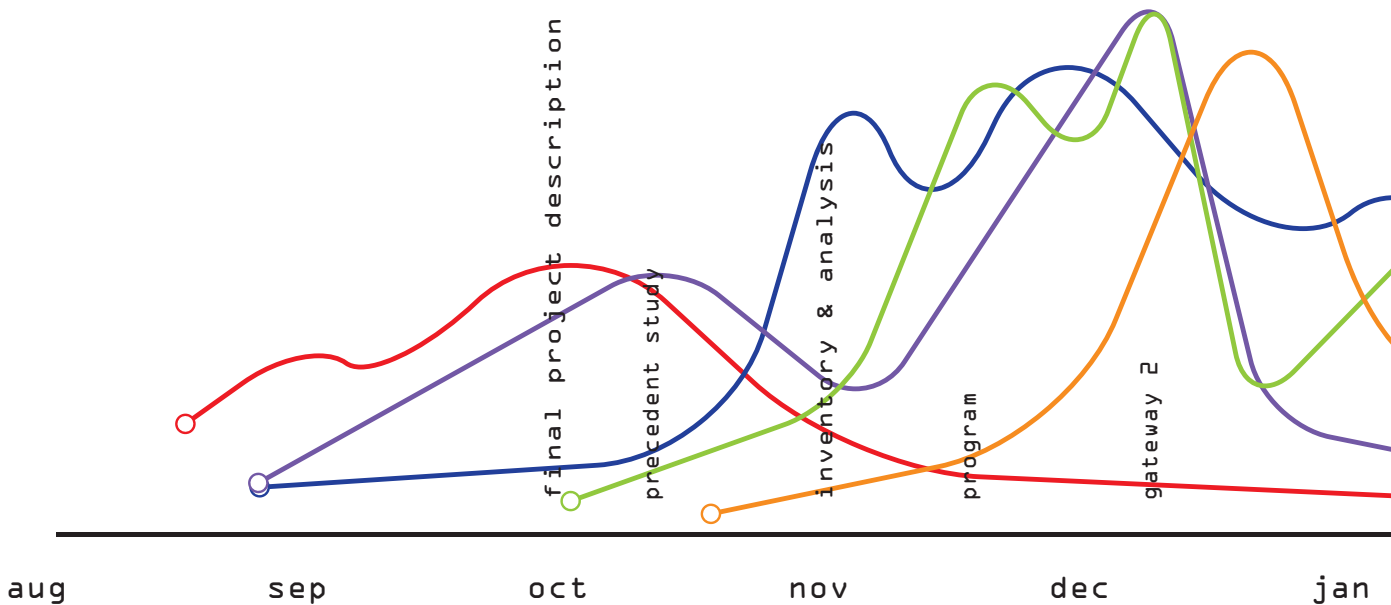
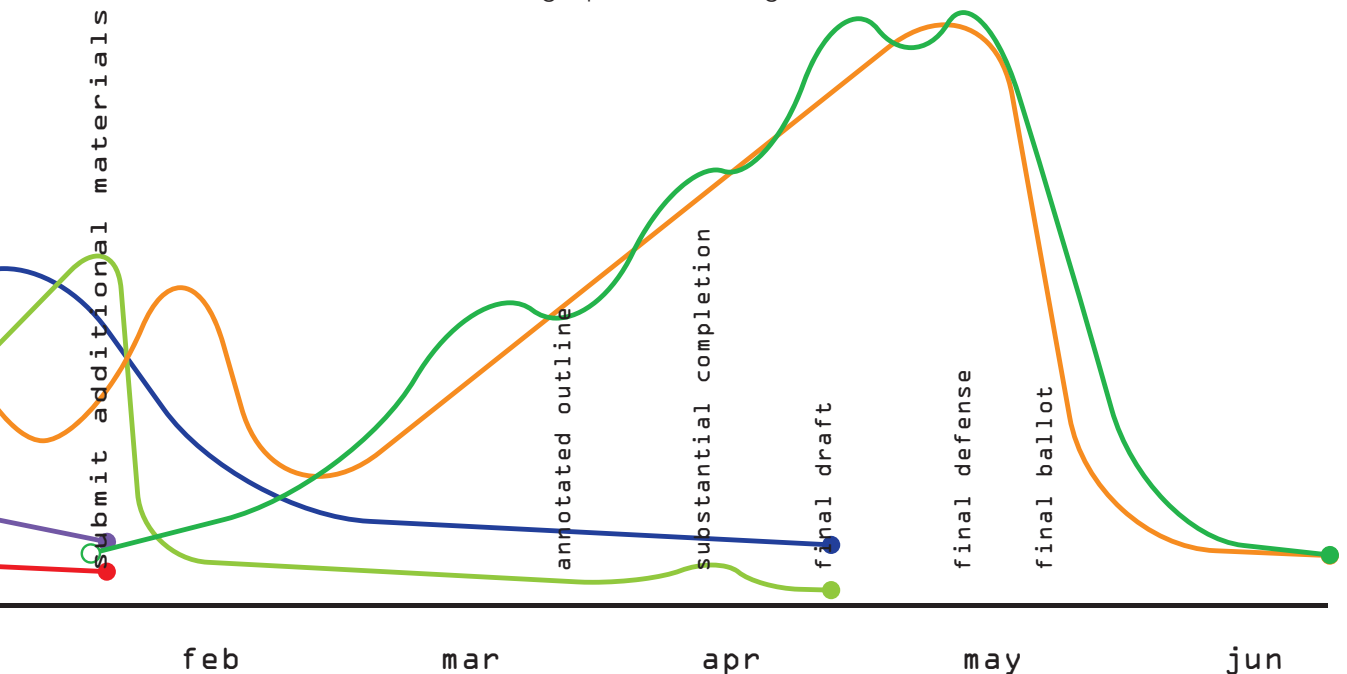


Figure 1.15
Design Timeline

The project framework to achieve this feat is a distilled version of the author's own personal beliefs and experience with the literature reviewed in this project. The concepts of collaboration, interaction, and observation, come from Bossel's Systems Model of Sustainability (1999). Bossel bases this model of sustainability on a systems-based approach that is founded on his observations about the creation and function of healthy ecosystems. This model focuses on eight points of sustainable ecosystems: "healthy (effective), zero waste, self-regulating, resilient and self-renewing, flexible, ethical, psychologically fulfilling, and cooperative" (Newman 2008; 109). From these eight points, one thing

is clear; education is of the utmost importance to succeed in a project such as this. For example, education is essential in the establishment of community volunteers and stewards.

In this design framework and philosophy, there are essentially three means for educating the parties involved: collaboration, interaction, and observation. These three means of education applied to the local ecology, culture, and economy are expected to help community members develop a holistic vision for the neighborhood's landscape.



philosophy into framework

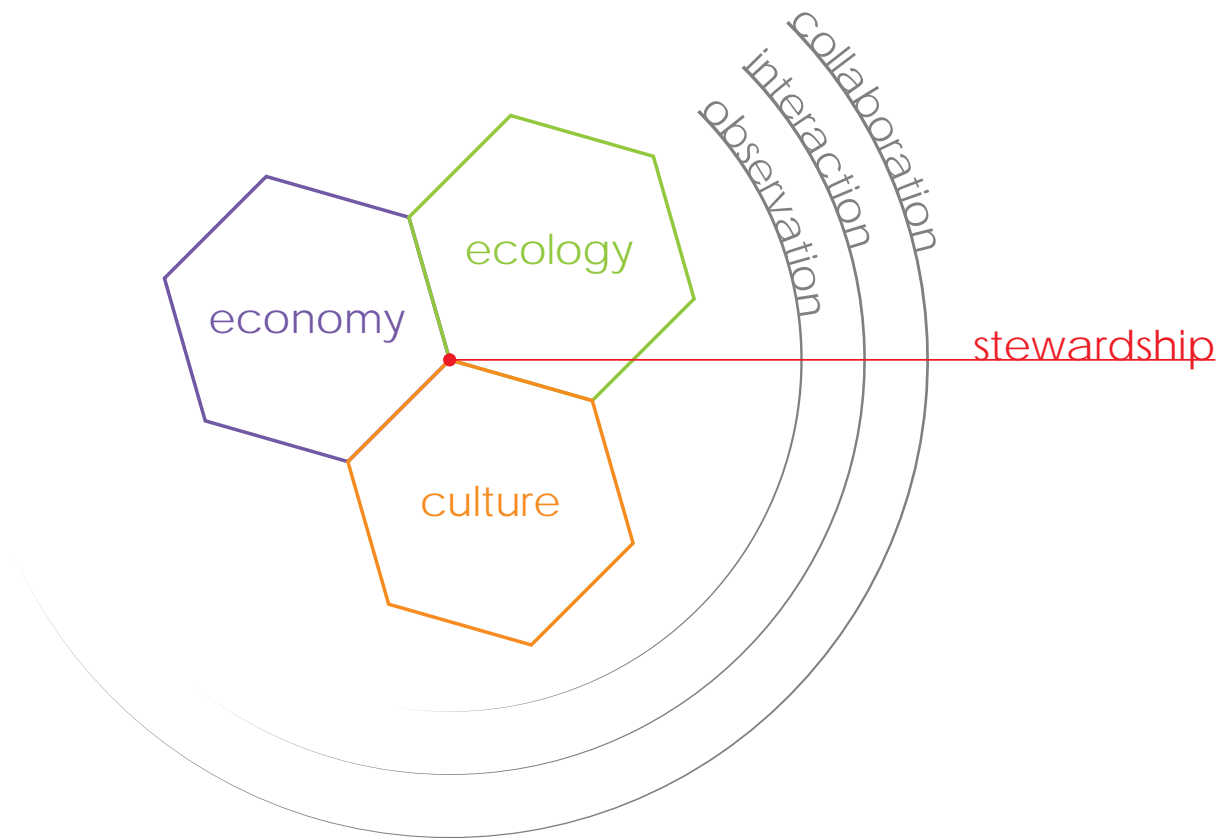


Figure 1.16
Design Framework

collaboration

In order to create a sense of co-learning and foster a true sense of stewardship in the community, it is necessary to bring the community into the project as early as possible. This includes actively involving those affected by the project's outcome, whether they are living in the area or otherwise work and encounter St. Roch regularly. At the end of the day, the site should fit with their day-to-day needs. Community residents should be represented and heard throughout the entire process, and also be granted some level of authority, whether that is through collaborative policy development, or by electing and interacting with community representatives. Residents should be encouraged to voice their opinions at charettes and workshops, via written surveys, or during site visits led by the design team. This exchange of knowledge is essential and plays a key role in developing "a sense of community" amongst the residents and other parties involved in the project (EPA 2002). Collaboration is essential for three reasons: psychological fulfillment, political power, and practical means (de Souza Briggs 2003; 7).

interaction

Interaction is important to create a sense of psychological fulfillment in an individual and community. Besides the common thread of physical needs, humans also require certain psychological needs. A set of traditions and rituals have always connected people to the land, but the explosion of technology has left many people disconnected from

the landscape. Ongoing or regular interaction between people and the land promotes a certain sense of ritual and tradition in association with a site. Places for interaction can promote socialization and a sense of connection between different groups of people. This socialization is essential for creating psychological fulfillment as well as a connection and commitment to a place (Newman 2008).

observation

Likewise, observation and monitoring is important for continual adaption. A visibility of process is essential, whether it is visibility of the planning process or visibility of ecological processes. The visibility of the planning process is one that is transparent to the decisions being made, while the visibility of the ecological process helps people understand how landscapes function and provide a vital human-support system. Traditional knowledge systems rely on repeated experiences or adaptive learning processes, which is "learning by doing," to develop a collective set of knowledge (Newman 2008; 107). This collective set of knowledge is essential to make the sites truly adaptive. By collectively learning from one another during project design future sites can be better adapted to St. Roch to make them more appropriate and resilient for the Mississippi River Delta.

the adaptive process

Although a natural disturbance like Hurricane Katrina may be drastic for a community at first it does provide the potential for new opportunities and resources, for both ecosystems and the city. For New Orleans, land for parks and green space is now available, making it possible to enhance the open space and park network of the city and its neighborhoods.

The body of this book follows the same steps as the adaptive process of an ecosystem as derived from the way ecosystems respond to shock and disturbance, as discussed by the ecologists Holling and Gunderson (2002). For these ecosystems, there is a need for leaders, essentially, certain flora and fauna, to return the community to a state of relative stability. In this project, there is that same need for actors, and in this sense community leaders and members to

fill this role. The goal of this project is to show how community members and leaders can be involved throughout the entire process. At the inception of site design, community engagement will allow these community members to find their voice. Once successful, the site planning/design and implementation process will motivate community members to learn from these sites. These members can then go out and apply their own knowledge to other sites and areas.

The steps of the process can be broken into four stages: Shock, Reorganization, Growth, and Conservation. Each section relates to a certain stage in the project's timeline.

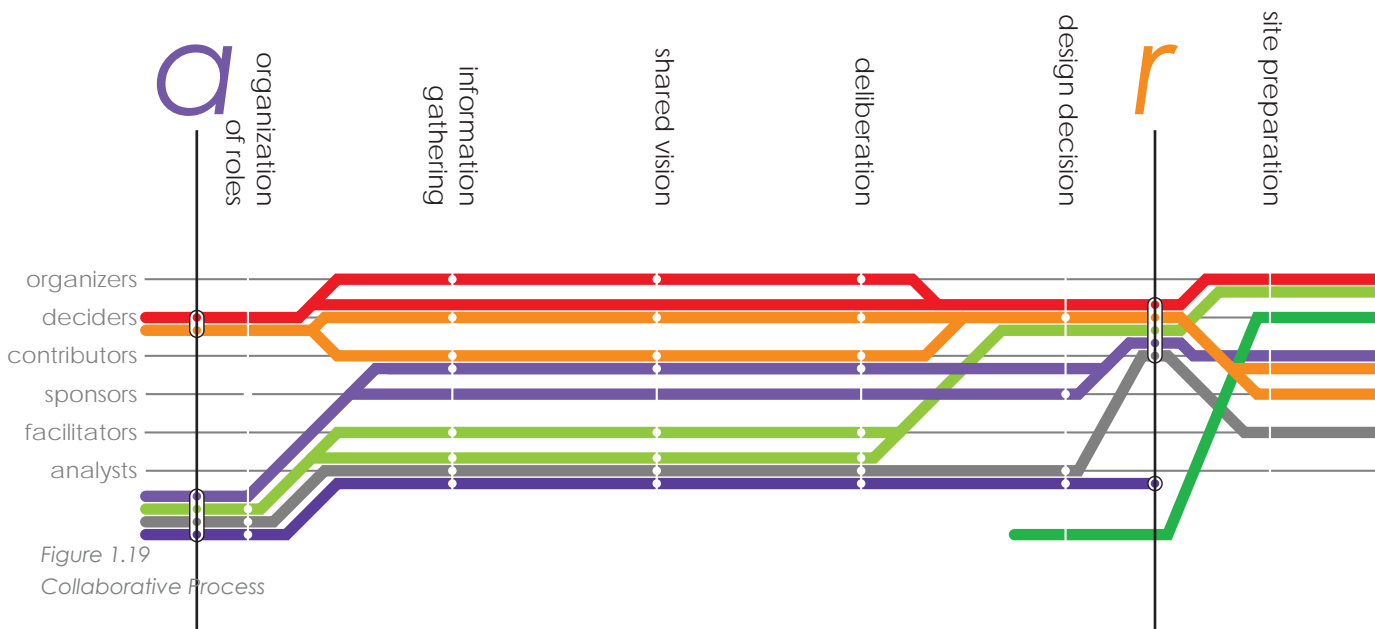


Figure 1.19
Collaborative Process

Adaptive Cycle in 2D

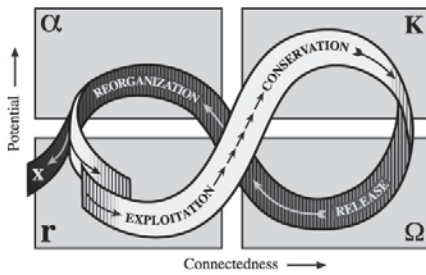


Figure 1.18
Adaptive Cycle in 2D

- Shock is the disturbance that causes the chaotic unraveling and release of resources.
- Reorganization is the phase in which new actors (species, groups) and new ideas can take hold. It generally leads into another rapid growth phase.
- Growth is the phase in which resources are readily available and entrepreneurial agents exploit opportunities.
- The conservation phase is when resources increasingly lockup and the system becomes progressively less responsive to disturbance (Walker & Salt, 2006; Newman 2008; Holling & Gunderson 2002).

In this book, these stages mean to act more as a metaphor rather than a precise example of the adaptive process. The following chapter discusses the Shock that this project is responding to, (Hurricane Katrina). The Reorganization phase demonstrates the planning and design phase for two sites. The Growth phase describes

the implementation schedule and coordination needed to involve needed skill sets in the construction. The last section, the Conservation phase, provides an overview of the experience of each site as they feel during certain important moments throughout their lifecycle.

heavy construction

site amenities

punchlist

day by day maintenance

long term maintenance

- effecting stakeholders
- community
- design team
- labor crews
- third party NGOs
- research teams
- city government

- stewards
- ownership
- collective owners
- monitoring
- review

participating parties

This section introduces the parties and stakeholders who will contribute throughout the project. These parties group into their similar communities in terms of what they contribute to the project as well as how they relate to

the community of St. Roch. They will each take on different roles throughout the design process, but will interact and connect with one another at several different times.

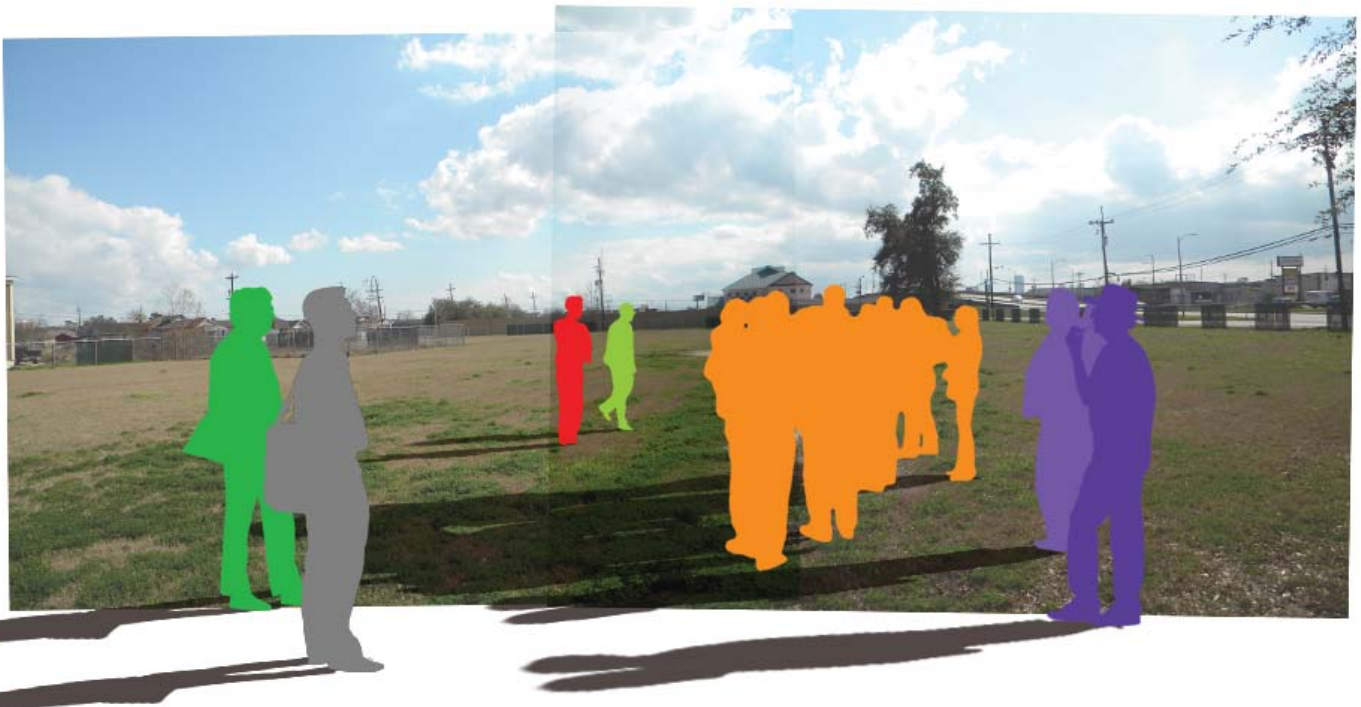


Figure 1.17
Participating Parties

- **Effecting Stakeholders:** Randolph (2004; 53) defines stakeholders as “those effecting change as well as those affected by it.” In this project the effecting stakeholders are the one initiating the change. They will be the community entity, whether it is a non-profit, school, church, local business, required to take official ownership of the site. They will be one of the lead decision makers while also organizing and funding the project (in most instances).
- **Community** members typically include “groups of people self-identified, or identified by others, who interact socially, have common historical or other ties, meet each other's needs, share similar values and often share physical space” (EPA 2002: 10-11). In the scope of this project, the community includes those individuals who live and work in close proximity to the site. These individuals will encounter the site on a regular basis, be most affected by the outcome of the site, and should have equal say in its design and trajectory.
- The **design team** is a collective group of experts from various fields in hard and soft sciences. Typically, a landscape architect, planner, or facilitator with a design background would be best suited to head up this type of project. Specialists are required for certain areas or details of the design or community outreach, but generally the landscape architect can play a lead role in coordinating the groups in play. When doing so, it is important for the designer to shift their thinking from “tacit and explicit knowledge” to “complex, interactive, and responsive knowledge” (Berger 2007, 239).
- **Construction crews** play an important role mostly in the implementation stage of the project. They will be required for some of the heavier infrastructure that is required on some of these projects. Of course, these sites need not be labor intensive in their design, but they do provide a chance to involve local businesses and to educate community members in the labor force.
- **Part-time effecting stakeholders** are third party NGOs that will play some role in the process at different coordinated times. This group encompasses people in a neighborhood that are often natural or trained leaders. These entities could be non-profits, schools, churches, or businesses that have recurring roles but do not play a full-time role (Sanchez-Jankowski 2008). They could be involved in charettes and events such as field days. They could also include leading small maintenance projects.
- **Researchers** and **University Teams** present outside professional help in site monitoring and maintenance. They are essential for information gathering and assisting the community in adapting the sites and applying it to other sites as needed.
- The **city government** is important to note because of their need for plan and design reviews. City government officials should be included early in the project to review concepts and designs as well as help understand how these projects fit into the larger fabric of the city. Their presence is especially important during key dates or events. These officials will help provide stability and create a sense of validation for the project in the community's eyes.

ladder of citizen participation

Sherry Arnstein developed the Ladder of Citizen Participation to simplify the gradation of participation and non-participation citizens have in a given planning process (1969). In this masters project the Ladder will be used as a framework to illustrate the level of participation community members have throughout each stage of the design project. Figure 6.2 on page 124 gives an idea of the community's level of participation throughout the design project.

The overall process seeks to balance power and decision making between the effecting stakeholders and the community throughout the project, while also producing an effective design. There are eight levels on the ladder of citizen participation, ranging from non-participation in manipulation and therapy to participation in citizen control and delegated power. The following page gives a brief description of each level to give an idea of the variation in participation citizens will have over the course of the entire design project.

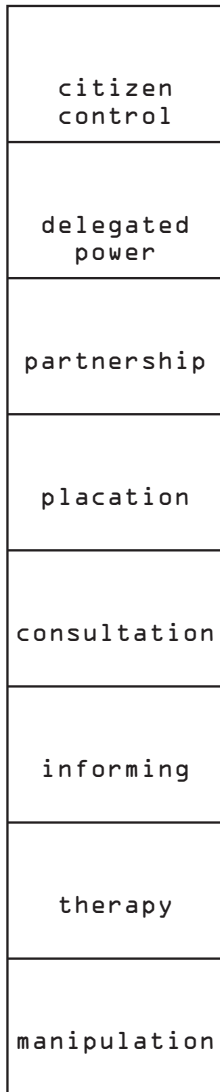


Figure 1. 20
Eight Rungs on a
Ladder of Citizen
Participation

- This level of participation grants the community the ability to govern the given site. **Citizen control** grants the community "managerial aspects" and allows to negotiate conditions and make final decisions (Arnstein 1969; 223).
- Delegated power** is the tipping point in which the community holds the majority of seats in the decision making. Delegated power grants the citizens enough power to "assure accountability of the program to them" (Arnstein 1969; 222).
- Partnership** is appropriate for this project as it allows a balance between the contributing parties. Partnership is the result of the contributing parties reaching an agreement to share decision making. Partnerships are most effective when the community is organized and "citizen leaders are accountable, have reasonable finances to pay its leaders, and hire or fire its organizers" (Arnstein 1969; 221).
- In **placation** a group of community members are handpicked to sit on the decision making boards. The community representatives hold a minority position however. The representatives advise decisions but do not hold any real power and are often disregarded.
- Consultation** invites community members to contribute their opinions through surveys, meetings, and public hearings. Consultation is most effective in the context of other modes of participation. Without representatives regarding these contributions however, consultation is simply a practice in information collecting.
- Informing** is important for a given process because it provides the community members with information on their rights and responsibilities. However, informing can often be a "one-way flow of information" (Arnstein 1969; 219) By itself informing sits very low on the participation ladder but is essential in the support of other levels.
- Therapy** employs administrators, such as social workers, to address the community in group treatments. Therapy perceives the community as powerless. Therapy is to be avoided throughout the design project.
- Manipulation** is the bottom rung of the ladder. Manipulation is to be avoided in this project because it simply educates citizens instead of actually involving them in the project. Manipulation "engineers" community support (Arnstein 1969; 218). It gives the illusion that the citizen's are participating when in fact they hold no real power in the decisions being made.



Figure 1. 21
St. Roch Vacant Lot



thesis

Applying this design framework and mindset to the St. Roch neighborhood, is fundamental to its future. The relationship the people have with the land should be one of respect and understanding for how it functions and sustains itself. By approaching these vacant properties and landscapes as opportunities for native ecosystems to re-establish their services and aesthetics, the neighborhood can

increase its resiliency and adaptability to future shocks and disturbances. Through collaborative planning, interaction with each designed site, and the effective use of collaborative management strategies, the community can learn to appreciate the river delta as well as build the community capacity, human capital, and the resourcefulness of the neighborhood.



shock





Figure 2.1
Aerial of Flooded New Orleans

overview

Recovering from a shock like Hurricane Katrina is no easy feat. The emotional and physical damage that the storm exerted will be felt for many generations to come. This section provides a synopsis of the damage Katrina caused to St. Roch and New Orleans, and how it guided the thinking for this project.

Katrina forming over the Bahamas



Figure 2.2
Katrina, August 24, 2005

New Orleans prepares for the storm



Figure 2.3
Stranded survivors wait in the Superdome, New Orleans

Katrina makes landfall



Figure 2.4
Hurricane Aftermath in Biloxi

New Orleans aftermath of the levee failures



Figure 2.5
New Orleans flooded

Katrina timeline

On Monday August 29, 2005 Hurricane Katrina made landfall along the Mississippi coast setting into effect one of the most tragic disasters in the history of the United States (Feireiss 2009). There was a feeling of uncertainty as Katrina approached and increased in intensity, as to whether this was the "big one" or just another storm.

- Katrina began developing as early as August 23, 2005 in the southeastern Bahamas. There were several factors, both fabricated and natural, that made Katrina such a catastrophe. Katrina quickly ascended to the highest level for a hurricane after because it was fueled by a loop current of deeply layered warm water somewhere near Cuba. Colder waters in the Gulf cool typical hurricanes but this loop current of warm water allowed Katrina to grow to a Level 5 Hurricane (Campanella 2008).
- The Friday before Katrina struck New Orleans, there was still a sense of calm throughout the city, and many saw Katrina as simply another storm. However, Friday evening computer models predicted the storm to make landfall somewhere in Louisiana or Mississippi. The following day a state of emergency was announced at the state level for Mississippi and the federal level for Louisiana. New Orleans initiated its contraflow evacuation plan, allowing all lanes of the highway for evacuation. Many left the city on Saturday, August 27th with more following the 28th (Campanella 2008).
- By the end of Sunday the 28th, all evacuation out of the city was cutoff, and over 100,000 New Orleanians remained in the city (Campanella 2008).
- Katrina officially made landfall at 6:30 am on August 29, 2005, somewhere over the Barataria Basin. The storm's winds had cooled to a Level-2 Hurricane level but the adjoining storm surge maintained its Level-5 status. This storm surge would force the Mississippi River to rise 16 feet above its normal stage, and Lake Pontchartrain to rise almost 9 feet above its typical stage (Campanella 2008).
- This rising water level would contribute to fifty-three levee breaks throughout the Greater New Orleans area (Feireiss 2009). The first of these levee breaks was at the Industrial Canal adjacent to the Lower Ninth Ward. The 17th Street Canal would follow soon after as well as the Orleans Avenue and London Avenue Canals. These levee breaks would contribute to flooding of over eighty percent of the city (Feireiss 2009).
- This flooding would send New Orleans into a state of near apocalypse. The remaining 100,000 people were subject to extreme weather conditions as well as rioting, looting, and violence (Feireiss 2009). The city was in a state of complete unrest that is impossible to communicate through text or images (Campanella 2008; 333). It took two to three days before a majority of the population evacuated to surrounding areas, especially Houston, and a level of stability returned to the city (Campanella 2008).

population

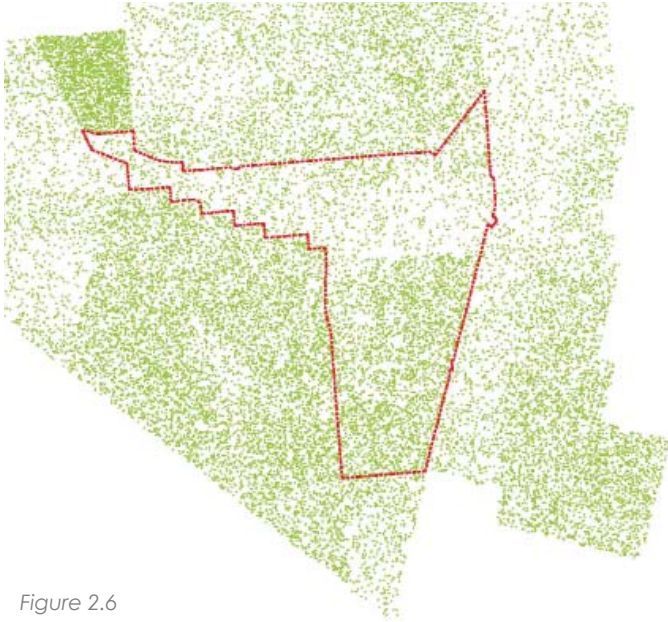


Figure 2.6
2000 Population Map

The true effect of Katrina's damage cannot be equated to one statistic since Katrina affected every aspect of every New Orleanian's life. Population loss within New Orleans is one way of summing up the far-reaching effect of the storm.

Pre-Katrina Population: Figure 2.6 exhibits that the population before Katrina lies evenly around the neighborhood; however, there was a significantly lower density in proximity to the Florida Avenue canal and other industrial zones throughout the neighborhood. This was most likely due to the undesirable traits that come from living in close proximity to train tracks and other industrial infrastructure.

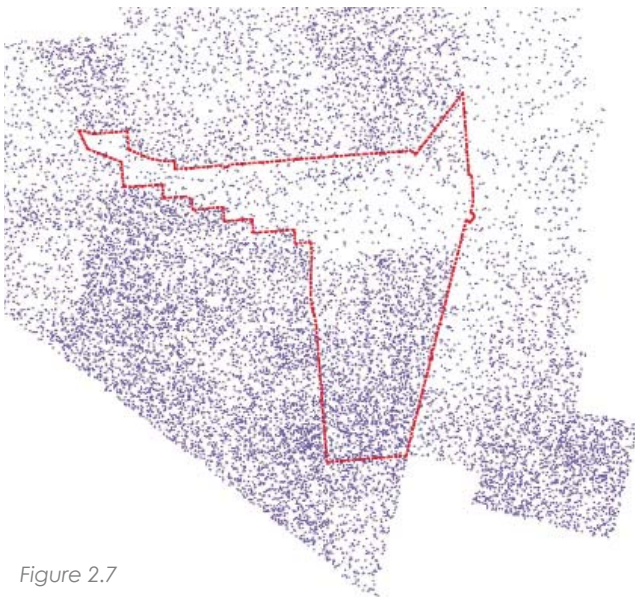


Figure 2.7
2010 Population Map

Post-Katrina Population: As found in the Census 2010 data, exhibited in Figure 2.7, the population is significantly sparser in the lower lying areas of the neighborhood, most likely out of extensive water damage from the standing flood waters associated with Hurricane Katrina. The decline in density around Florida Avenue worsened with the storm, but now provides opportunities for wetlands construction. A lack of population density there and the potential for the creation of a movement corridor for fauna through the canal makes that section of the neighborhood ideal for ecological-centric programs.



St. Roch population 2000

Figure 2.8

2000 Population Infographic



St. Roch population 2010

Figure 2.9

2010 Population Infographic

education

Along with population, the public school system was one of the hardest hit sectors in New Orleans and four schools are within or near to the St. Roch neighborhood. There are still large strides that need to be taken in order to bring the New Orleans public school system back to an acceptable standard. The population of New Orleans school has dropped from 62,000 pre-Katrina to 38,000 post-Katrina. Test scores have risen substantially, however, since Katrina, with only 42 percent of the schools failing to meet state standards as compared to two-thirds pre-Katrina (Chang 2010). The school system has moved to a charter style system. This gives families more options on where to send their children, but is decentralized and requires an extensive amount of busing and longer school days (Chang 2010). Charles J. Colton Middle School on St. Claude is to become a KIPP charter school. However, several community members are hoping that this school will be re-opened as a public school (Chang 2011).

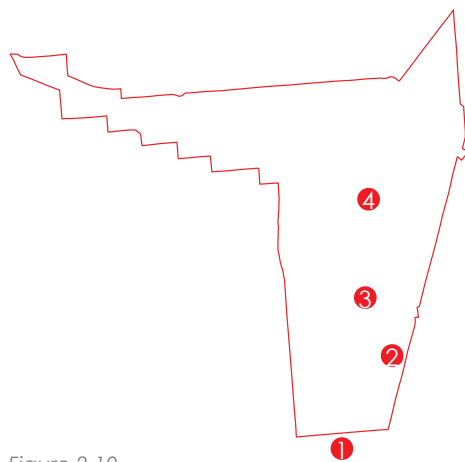


Figure 2.10
School Map

Charles J. Colton Middle School

- Status: Scheduled to be reopened as KIPP Charter school



Figure 2.11
Charles J. Colton Jr. Middle School

Oretha Castle Haley Elementary School

- Status: Closed



Figure 2.12
Oretha Castle Haley Elementary School

Our Lady Star of the Sea School

- Status: Closed



Figure 2.13
Our Lady Star of the Sea School

John A Shaw Elementary School

- Status: Closed

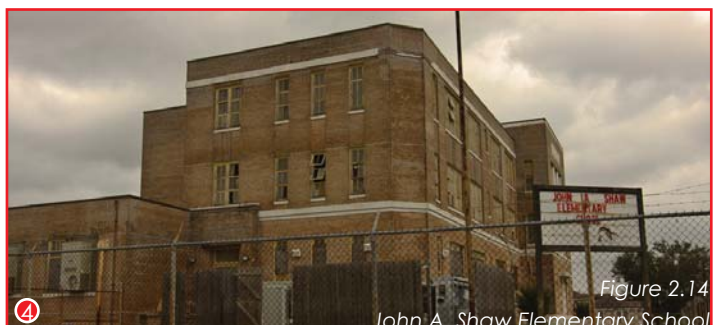


Figure 2.14
John A. Shaw Elementary School

vacant land

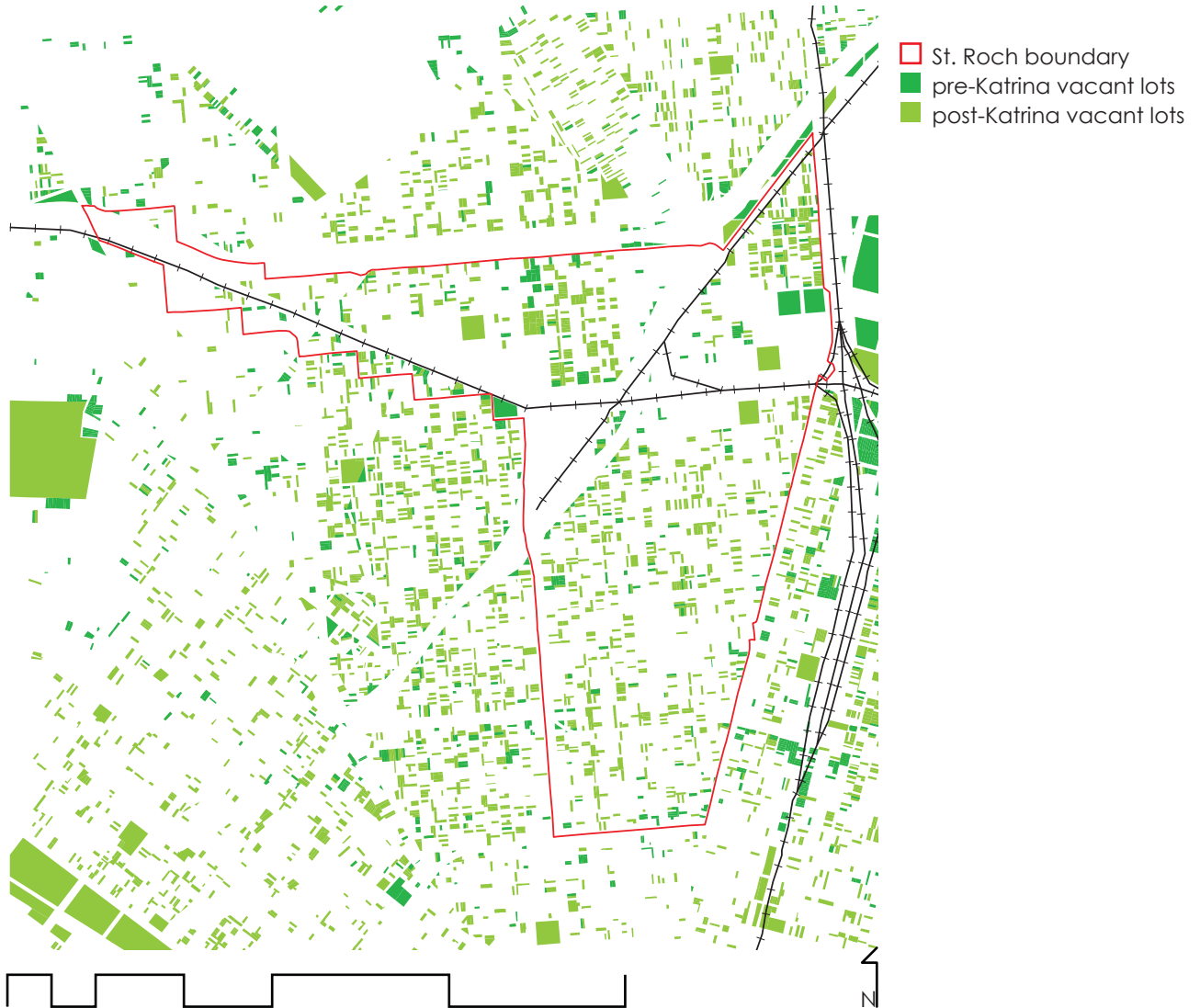


Figure 2.15
Vacant Lot Dispersal

For a truly visible effect of Hurricane Katrina, one needs not look further than the vacant lots scattered through the city. The number of vacant lots exploded after the storm due to extensive wind damage and water (saturation and mold) damage. The vacant lot density indirectly relates to the topography, in that as topography decreases in elevation the amount of

vacant lots increase. The area lakeside of the Florida Avenue canal has more lots that are vacant per area than anywhere else in the neighborhood. This is because of the extensive saturation that occurred in this area. Figure 2.16 illustrates the total area of vacant lots in St. Roch as relative to football fields.

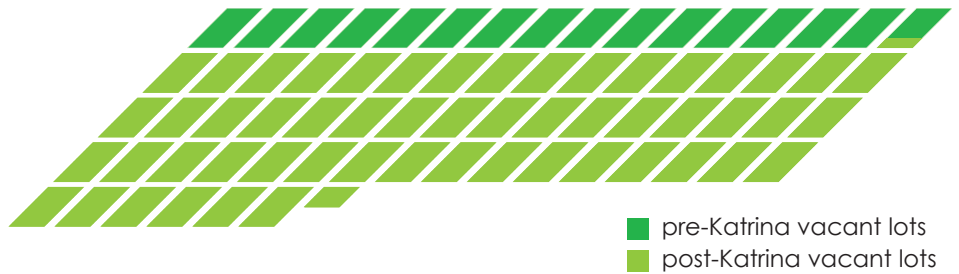


Figure 2.16
St. Roch area in Football Fields

flood duration

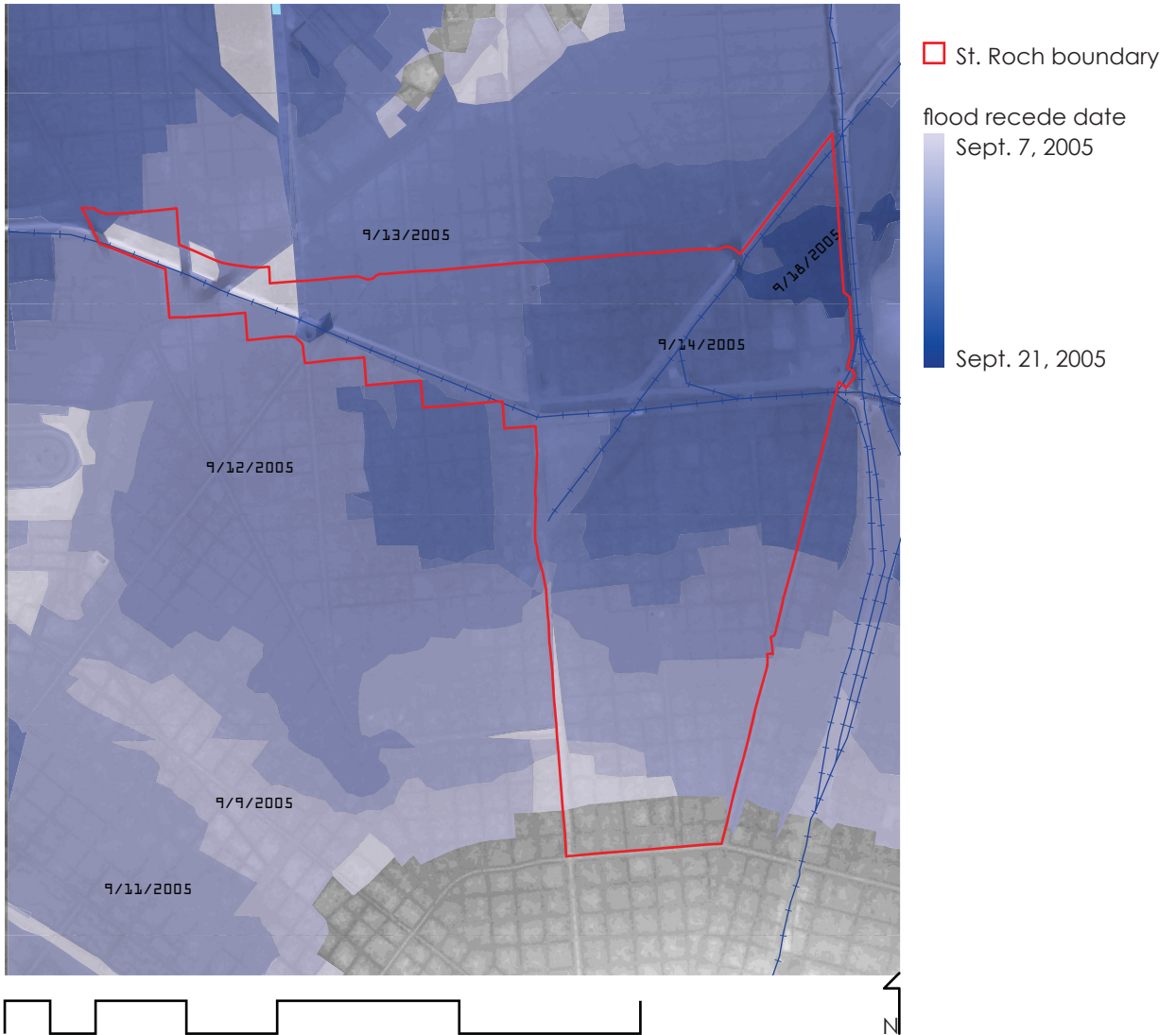


Figure 2.17
St. Roch Flood Duration

The floodwaters were the main threat to the structures throughout St. Roch. Figure 2.17 illustrates the floodwaters and the time it took them to recede within the St. Roch neighborhood. The September 18, 2005 area was one of the last portions of New Orleans to drain. It clearly illustrates the bowl in which St. Roch sits, and how a good portion of the neighborhood sits within that bowl. Only the southern most part of the neighborhood was not extensively flooded.

existing conditions

There are a number of critical conditions to be addressed in the St. Roch neighborhood, some from pre-Katrina and some from post-Katrina. These include: ailing storm infrastructure, scars of urban renewal, a high rate of crime, unproductive industrial land, poor street drainage and a lack of safety, and an extensive amount of blighted historic and residential buildings (Lambert et al. 2006). This project seeks to address many of these conditions through its physical design as well as the process in its design, implementation, and maintenance.

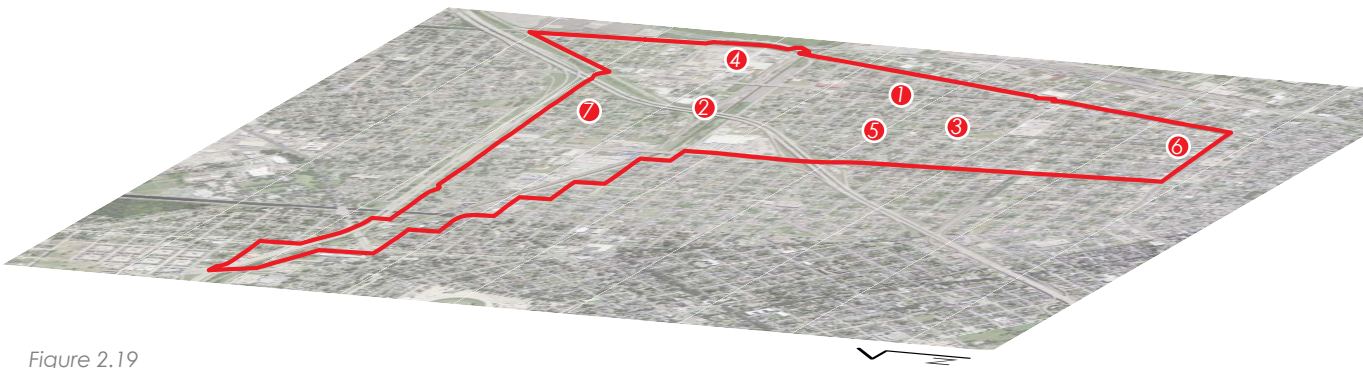
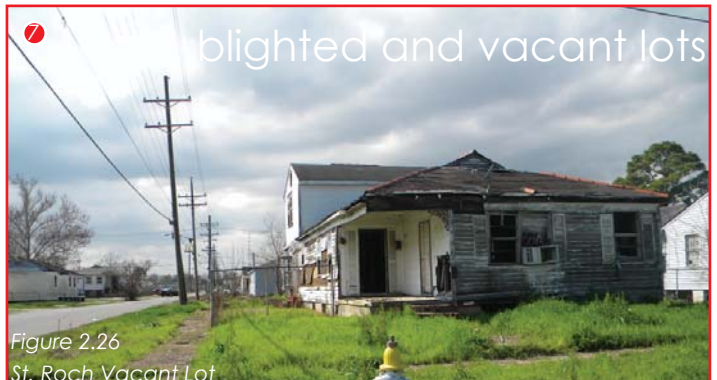


Figure 2.19
St. Roch conditions



dilemma

Five years after the Hurricane Katrina, a significant portion of the population has not returned to the City of New Orleans. In 2000, the Census recorded a population of 484,674 people living in the Orleans Parish, but as of 2008 estimates, the population numbers were down to 311,853 people from Katrina. This Diaspora has left in its wake a substantial amount of abandoned buildings and vacant lots. In May of 2010, 57,485 residential addresses were unoccupied equaling roughly 27% of the total residential addresses. Only Detroit, a city with almost three times the population outranks New Orleans in terms of total blighted addresses (Plyer 2010, 1-5).

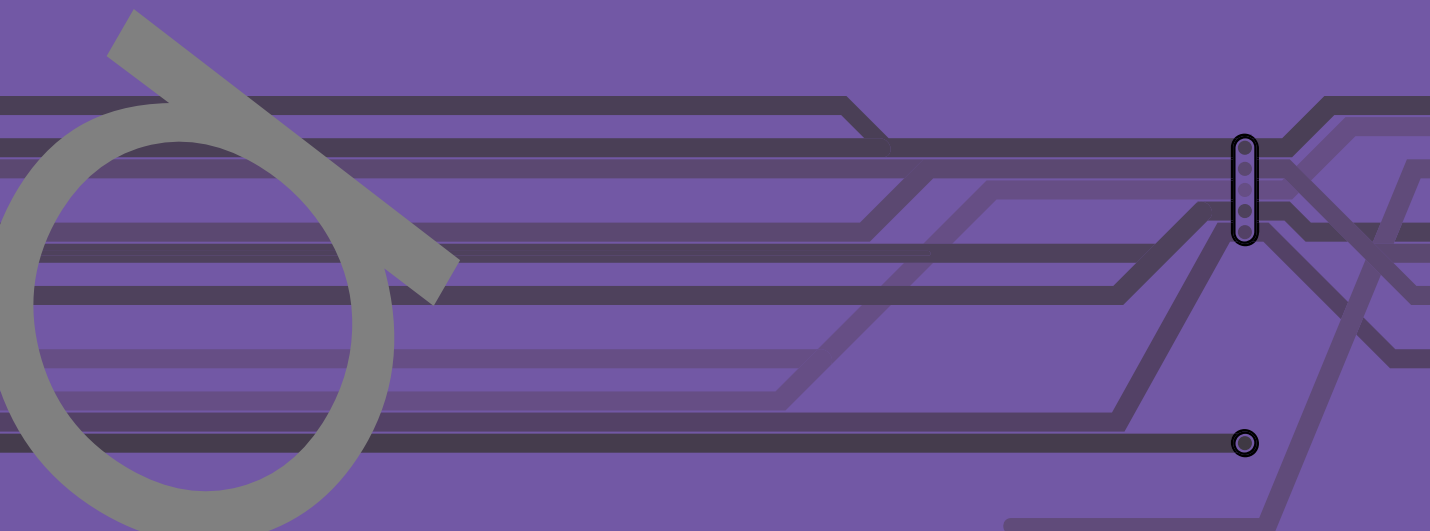
New Orleans' vacancy rates are due to very different circumstances than Detroit's combined deindustrialization and suburbanization (Berger 2006, 197-217). The circumstances of the abandonment in New Orleans are largely due to Katrina. These

properties still have owners despite first appearance, and many of these owners still want to come home, but simply do not have the funds to do so. The city has made significant strides in reclaiming vacant land and properties, bringing their total numbers down from 71,657 properties in March 2008 to the current projection of 57,485; a 7% reduction. This effort attributes to the individuals and non-profit organizations that have worked to come back and the New Orleans Redevelopment Authority (NORA) Road House Program, (which builds new homes for displaced city residents). While this increase has been good, there are signs that it is beginning to level off, and not all markets are suitable for new homes. Besides market stabilization the city is making aggressive plans to remove vacant homes and commercial properties; several thousand properties in the next three years (Krupa 2010).

There is also the present concern of a natural disaster striking again. As described earlier, New Orleans sits on the Mississippi River delta, a site that is facing a complex set of natural threats in continued coastal erosion, sinking land, rising sea levels, intensifying tropical storms and hurricanes (Campanella 2010). New Orleans has effectively cut off the delta from its life source (spring flooding and sedimentation replenishment) with levees and conventional flood infrastructure creating an ailing delta system. If New Orleans is to continue its existence into the next centuries, it must reevaluate how it lives with the land and how its people view this precious landscape.

The neighborhood of St. Roch exhibits many of these problems aforementioned, including increased blight, vacant lots, extreme poverty (before and after the storm), and other pressing concerns. The neighborhood

also faces increased crime rates along with aging and damaged infrastructure. The streets and sidewalks are in poor condition and there is a lack of visionary and practical approach to these issues. However, there are glimmers of hope; the people were able to organize and resist heavy-handed parts of the Bring New Orleans Back Plan in 2006, illustrating their resilience (Campanella 2008). The community continues to persevere in their social groups, churches, and non-profits, leading to great potential for the future of the neighborhood.



reorganization

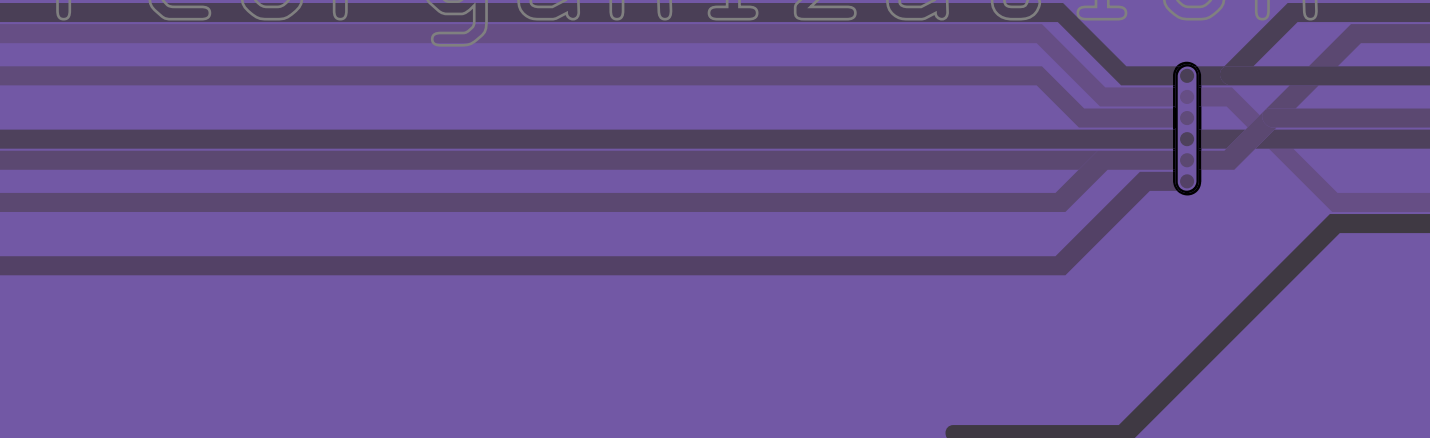




Figure 3.1
St. Roch Abandoned Building

overview

There are several ways to deal with such a tragedy as Hurricane Katrina. The physical and emotional toll that Katrina had on the city will no doubt last for many decades, but St. Roch has already made strides to come back. In more than one instance the neighborhood has taken a political stance on a certain issue. For instance, in the "Great Footprint Debate," St. Roch, along with several other neighborhoods organized and stop the "economic pressure to create a smaller city" (Donze & Meitrodt 2005; 1). The ULI's plan to shrink the city's footprint and replace certain neighborhoods with wetlands promoted an outburst of civic engagement, of which St. Roch had a primary role in (Campanella 2008). This event illustrated St. Roch's resolve to organize and stand against pressures to eliminate human habitation from flood-prone parts of the city. St. Roch can raise its collective voice again although under very different circumstances.

"The vision of the Neighborhood Recovery Plan is to restore the quality of life in St. Roch to the level that existed prior to Hurricane Katrina and to make key improvements to the quality of life in the neighborhood by addressing preservation of historic properties, high crime, large concentrations of blighted and adjudicated properties, and poor street conditions (Lambert et al. 2006, 4)."

Now is the time for the neighborhood to take a proactive role instead of reacting to the will of others.

Community members have already produced a vision for the St. Roch neighborhood, one that should be developed further. The City Council issued a team of consultants led by Lambert Advisory, LLC to work with specified neighborhoods in articulating their revitalization plans following Katrina. These plans, commonly known as the Lambert Plans, produced a set of goals and a vision for each of the targeted neighborhoods (Lambert et al. 2006).

This masters project is an extension of that process, as well as an expression of the author's own experiences and a synthesis of the literature researched for this report.

For St. Roch the vision is as follows:

organization of roles

citizen control
delegated power
partnership
placation
consultation
informing
therapy
manipulation

The first step in expanding this vision is the identification of roles for the contributing parties. The roles of each party will fall into six different categories. The six roles include: organizers, sponsors or conveners, contributors, deciders, facilitators, and analysts (de Souza Briggs 2003, 12).

- Organizers identify and gather the stakeholders in the project. They serve as one of the leading forces throughout the process and are essential in organizing the masses of people, especially in disenfranchised communities (de Souza Briggs 2003, 12). The effecting stakeholders will often serve this role throughout the planning and design process.
- Sponsors invite the participation of the community. They are central for their services of making accommodations during the planning process (de Souza Briggs 2003, 12). Community centers or schools are good examples of parties serving in this role due to their influence in the community (and for their ability to house large groups of people).
- Contributors are those individuals or groups who will be the main lifeblood of collaboration. They would be the common thread of community members who live and work in the area. Contributors are essential for prioritizing issues and goals (de Souza Briggs 2003, 12-13).
- The role of decider is the group of people or parties who have authority over the project's process and design (de Souza Briggs 2003, 12). In most cases the deciders make most decisions on their own, however, in this instance a representative from the contributors must be present to reinforce the partnership between community members and those supporting their collaborative planning/design efforts.
- Facilitators are essential for increasing the level and efficiency of exchange between the participating parties. A role like this might be best suited for the design team given their ability to present information in different ways and to prepare graphics that help the community visualize future outcomes. They may lead community presentations and ask questions that frame the outcome of the project (de Souza Briggs 2003, 13).
- Analysts, much like facilitators, provide information to spur the conversation forward and allow the contributors and deciders to think differently about important issues to be addressed through collaborative planning, design, implementation, and management (de Souza Briggs 2003, 13).

Figure 3.2
Citizen Participation
in Organization of
Roles

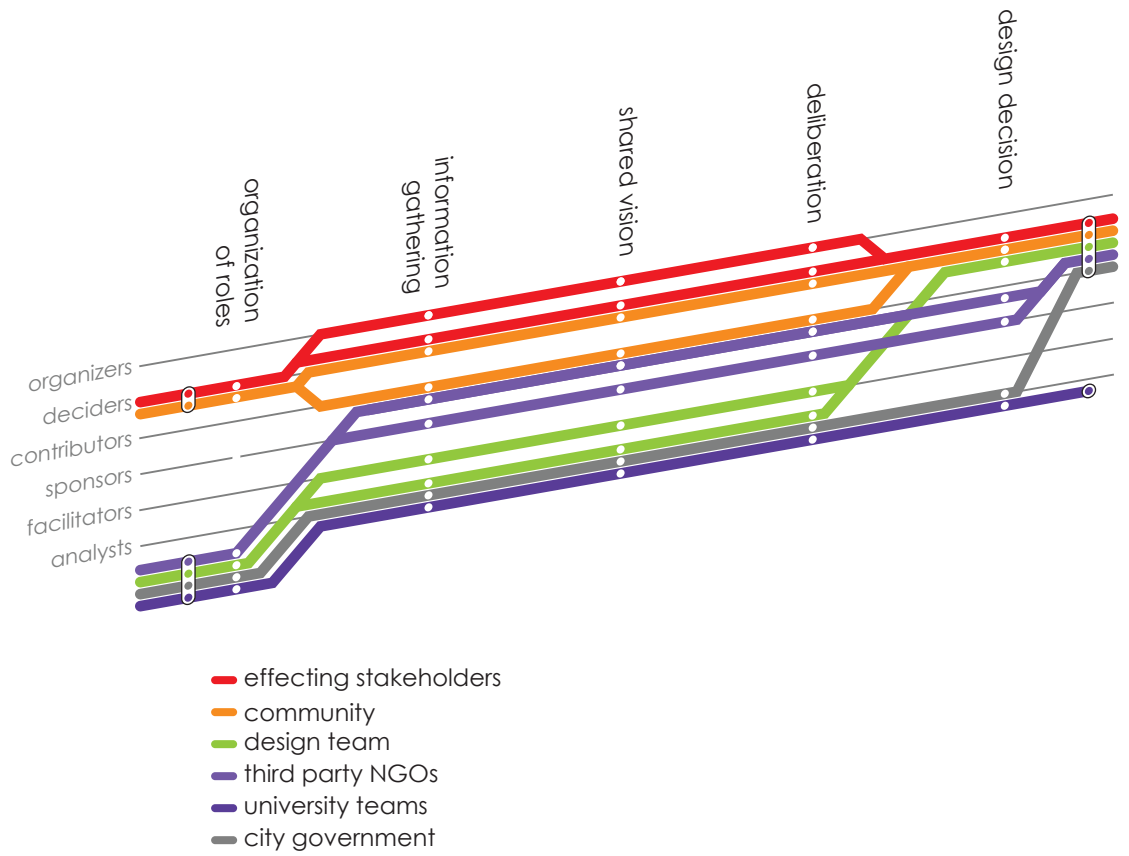
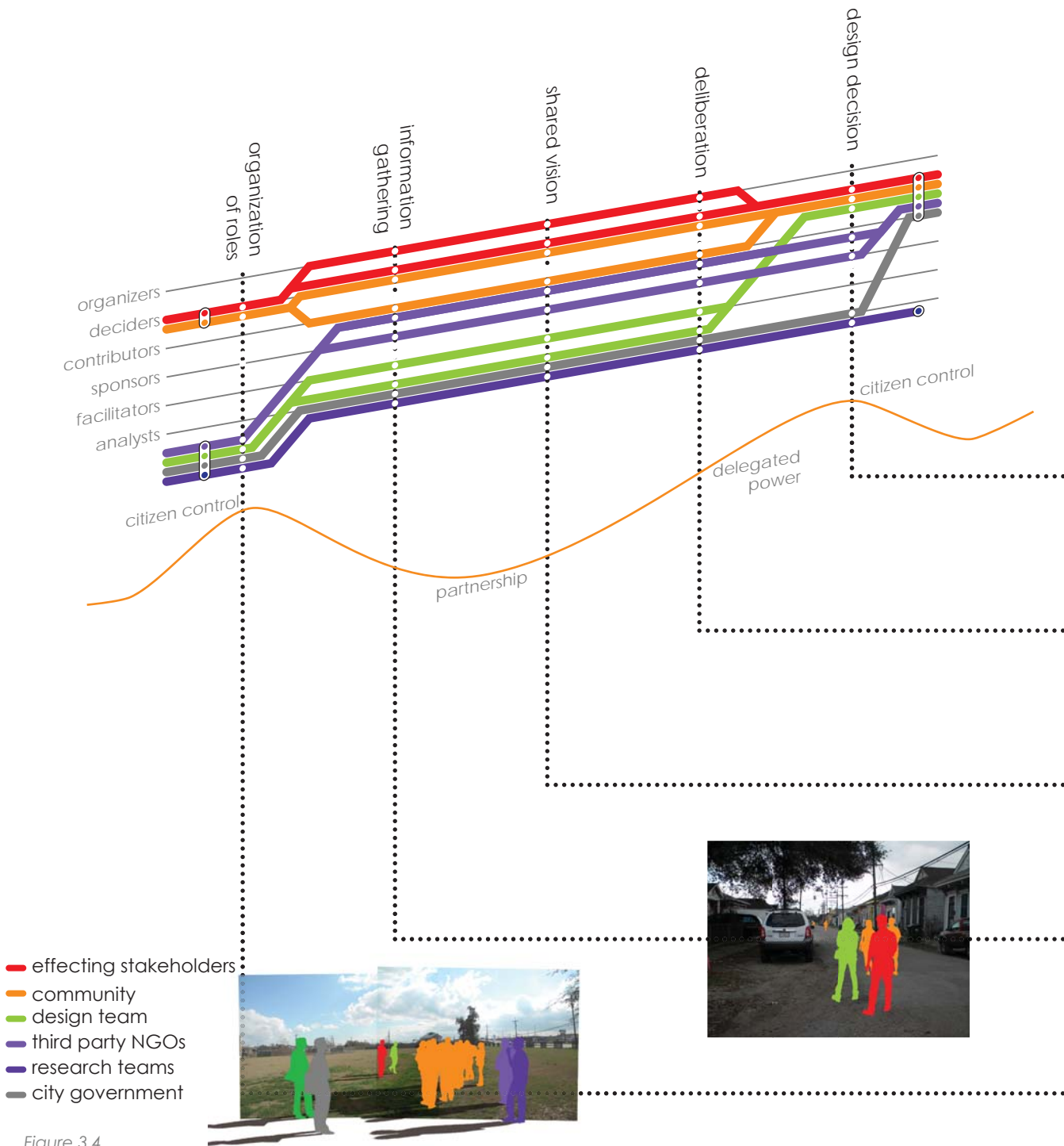


Figure 3.3
Parties' Roles in the Planning Phase



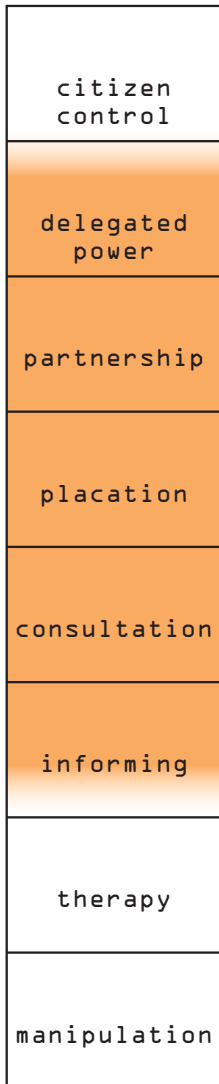
- effecting stakeholders
- community
- design team
- third party NGOs
- research teams
- city government

Figure 3.4
The Planning Phase of the Collaborative Process

Figure 3.4 illustrates the development of the project through the planning phase. The colored lines each correspond to a certain party and how their roles change over the project. The orange graph line illustrates the community's level of participation throughout the planning phase. The products of each phase are listed on the right.



site selection



Once roles are established and a preliminary vision and set of programs is developed, appropriate sites may be selected to execute the vision. The intent of site analysis is to identify key sites for wetlands and rain-garden creation and communal spaces. The design of the each site should take a systems based approach that draws on the literature. Each site focuses on a specific set of goals oriented towards environmental and socio-economic outcomes. During site selection the

community can take a number of roles, from contributing essential information to partnering with the design team in their site selection. The site analysis is essential to the site selection process, being used to identify preferred sites by employing a set of criteria synthesized from the community's priorities and the design team's technical knowledge of the landscape. Figure 3.6 illustrates the general steps in selecting sites for renewal.

Figure 3.5
Citizen Participation
in Site Selection

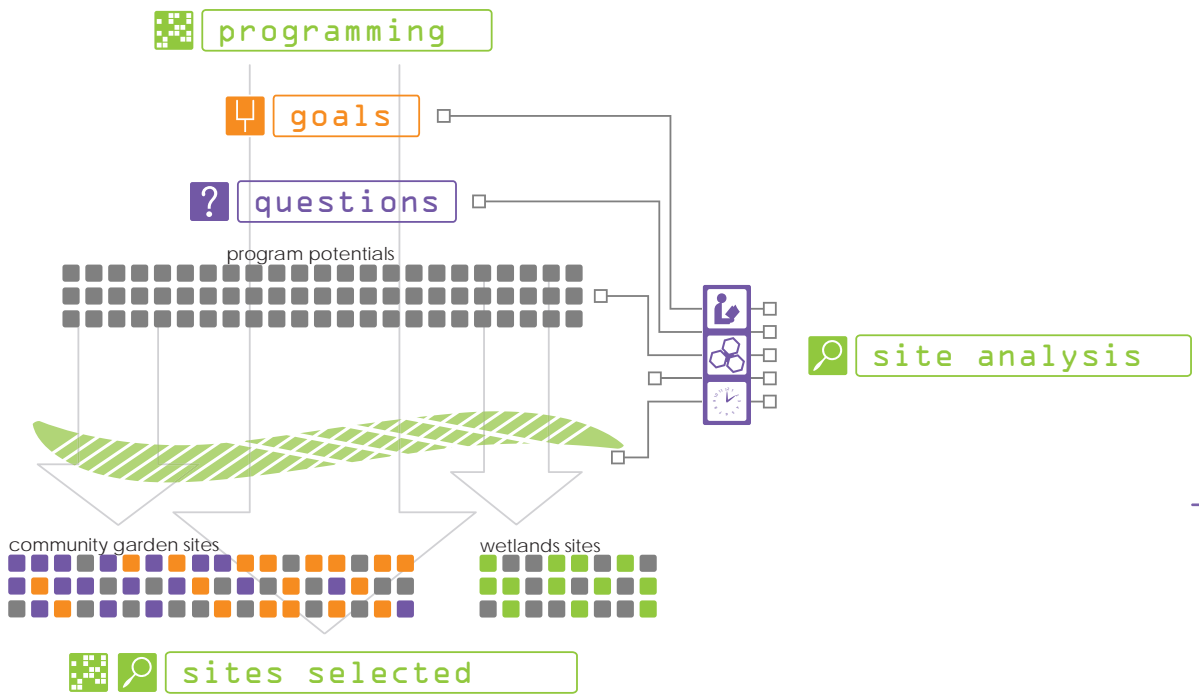
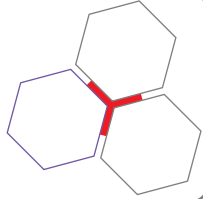


Figure 3.6
Site Selection Methodology

community garden sites.

which lots are best suited as community gardens?



goals

Select a site situated in a highly visible and trafficked location to illustrate to the neighborhood of St. Roch the potential that they have to affect change in their community. The site should be in close proximity to daily uses such as churches, parks, bus stops, etc. The site intends to create a sense of psychological fulfillment through visibility and proximity to key elements and entities of the neighborhood.

Illustrate the potential productivity of the available land in the neighborhood as well as create an amenity in the community for local businesses. This site should also illustrate the potential of local sites supply food and resources.

The site should demonstrate some territorial aspects, that not all vacant lots can be safe havens for drug dealers and criminals. The site should develop slowly at first and move in phases with improvements such as trash removal and lawn maintenance, then site improvements, to create markers such as fences, benches, and street lighting. The programs for the site can change from an initial open lawn with nearby parking to full-blown community gardens/park. A primary concern is to establish a level of safety for the residents.

Figure 3.7
Community Garden Site Selection Methodology

programs

neighborhood watch

maintenance + site improvements: benches, lights, etc.

stormwater management BMP's

urban agriculture: family lots

identity markers: fences, art, etc.

filters

proximity to:

Churches

Parks

Public Transit

Schools

visibility from

Churches

Parks

Public Transit

Schools

specifications

size

existing land use

within St. Roch

product

community gardens identified

eyes on the site

sites

conditions

community garden site selection

The rationale for selecting the community garden site draws on criteria taken from studying the St. Roch neighborhood, talking with St. Roch's community leaders, and learning from the Philadelphia Green vacant lot reclamation guidebook (Haefner 2002). The main contextual programs associated with the site were churches, parks, and bus stops. The main idea is to establish a site that is visible to daily use, and to promote an idea of safety and well-being within the community. Visibility and eyes on the site maintain the level of safety needed and provide a sense of territory and defensible space (Zelinka 2001).

In the initial study, lots over a quarter of an acre were targeted first because they are typically made up of multiple lots amassed together. From these sites, the sites with other vacant lots clustered around them received higher priority since they should make a bigger splash in the neighborhood. For an in-depth look at the methodology used to select the wetland sites see Figure 7.2 in Appendix B.

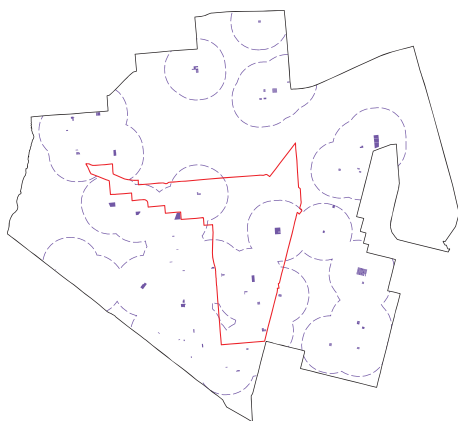


Figure 3.8. Church Locations

churches

Churches were selected because of their weekly use and ability to act as a staple in the community. Philadelphia Green notes churches as an amenity in the community, indicating that churches are often interested in adopting the site for events, parking lots, or even new buildings (Haefner 2002). For this project, churches will likely be more concerned with events and parking than food production. St. Roch community leaders stated that churches have events and activities on several days of the week.

- church
- 1/ 4 mile walking distance

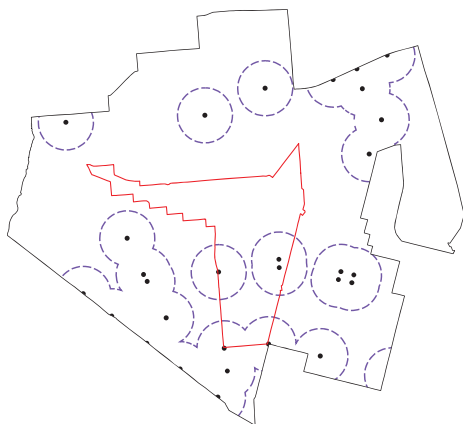


Figure 3.9. Bus Stop Locations

bus routes

Public transportation is important to note because of its high use in the neighborhood. The 2000 Census showed that almost 1 in 4 people use the bus to get around, especially for work. Philadelphia Green has also targeted bus routes and other forms of public transportation because of its ability to bring together groups of people (Haefner 2002). A site visible to bus routes provides a consistent set of eyes on the site throughout the day.

- bus stop
- 1/ 4 mile walking distance

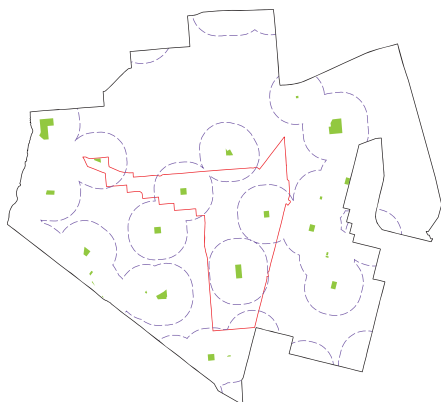


Figure 3.10. Park Locations

parks

The parks in St. Roch are some of the few spaces seen as strong essential community areas in the neighborhood. St. Roch Park has several uses for community gatherings (Lambert et al. 2006, 4). The Square houses a public pool, basketball courts, and a backstop for baseball and softball games. St. Roch Park also houses community gatherings and other public events.

- park
- 1/ 4 mile walking distance

selected community garden site

From appropriate sites identified, attention was given to the existing conditions of each site. The most notable criteria were the surface and use of the site. Most of the aggregated sites were parking lots and thus would be more expensive to resurface and

repurpose. Sites that are vacant lots are of higher priority because of their lack of use and contribution to the community at large. Eventually a site was selected in the central portion of St. Roch.

Location: 2000 block of Music Street and North Johnson Street

Size: Three-eighths of an acre

Owner: Louisiana Land Trust

Existing Site Conditions: The selected site is currently a set of vacant lots aggregated together. Two of the lots have driveway slabs, and the sidewalk is in disrepair and crumbling. One street tree is prominent on the site and appears to be a Pecan. The vegetation is overgrown and unmaintained, and there are some remains of a chain link fence on one of the middle lots. The lighting is located on each end of the block but does not light the site effectively.

Rationale: The site is ideal because of its proximity to the Our Lady Star of the Sea church, bus stops along the Galvez bus route, and its adjacency to St. Roch Avenue and St. Roch Park. Besides that, it is of an ideal size and one of the few highly visible sites that consists of multiple vacant lots. The site is currently owned by the Louisiana Land Trust, providing a great opportunity for public ownership.

site goals

- Illustrate the potential productivity of the available land in the neighborhood and create an amenity in the community for local residents and businesses.
- Illustrate the potential of local sites to produce food and employment or opportunities for skill-development. This will help the community develop self-sufficiency in terms of food and resources, (Newman 2008)

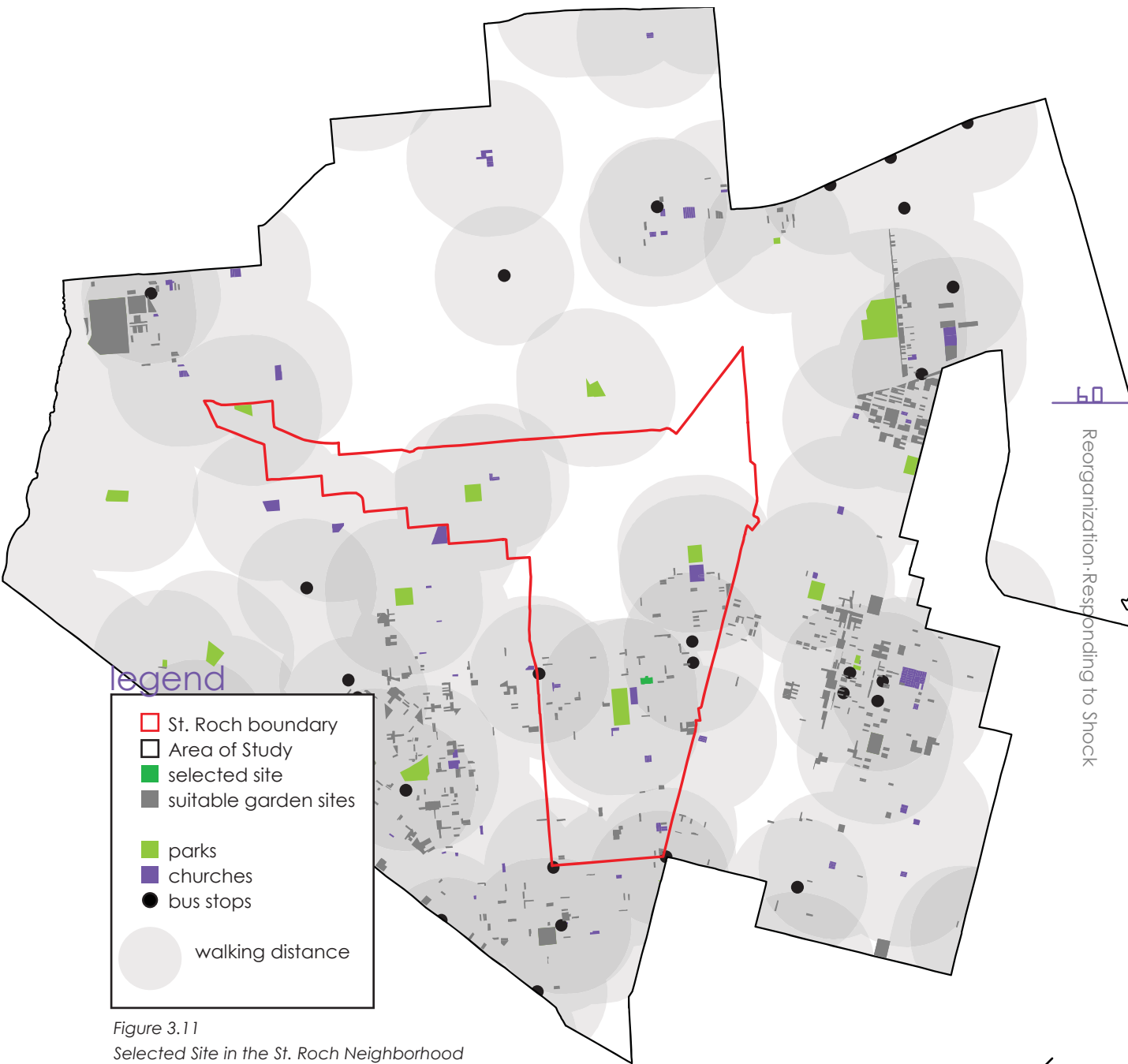
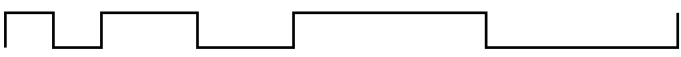


Figure 3.11
 Selected Site in the St. Roch Neighborhood



site analysis

site context

The site is very beneficial because of its proximity to St. Roch Park, some neighborhood businesses, and Our Lady Star of the Sea church.

- St. Roch boundary
- vacant lots
- retail
- Our Lady Star of the Sea
- St. Roch Park



Figure 3.12
Community Garden Context

drainage

Like most New Orleans blocks stormwater drainage goes to each corner of the street and drops into a pipe/storm sewer.

- St. Roch boundary
- watershed
- higher elevation
- lower elevation

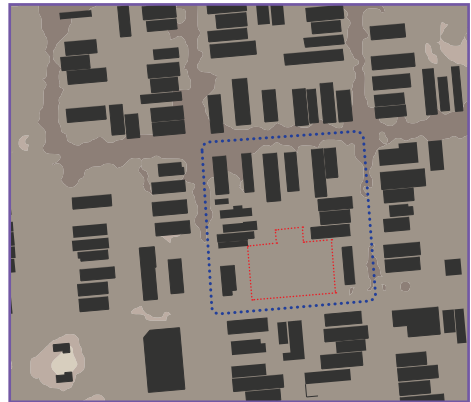


Figure 3.13
Community Garden Drainage

visibility

The church, park, and other neighborhood businesses provide for a constant set of eyes on the site. However, the streetlight system is disjointed and presents no real identity to the site.

- St. Roch boundary
- viewshed
- existing light
- bus route
- bus stop

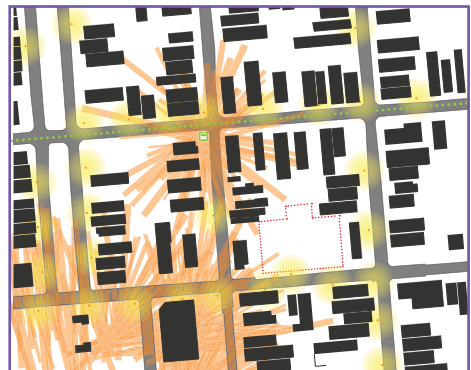


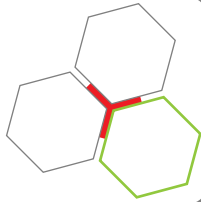
Figure 3.14
Community Garden Visibility



Figure 3.15
Community Garden Panorama

wetlands sites

which lots are best suited for temporary wetland creation?



goals

Build high functioning native cypress wetlands to detain water in times of flooding and storms. The design of the wetlands should be effective in its ability to detain standing water and demonstrate softer practices to stormwater management.

There should be stewardship of the site , with local residents working with representatives from the Sierra Club National Wildlife Federation, and Audubon Society.

Use this site to decrease the urban runoff and urban heat island effect of the area.

Increase the biomass and diversity of the neighborhood in this localized site to expand the amount and resilience of the habitat.

Functional as an educational site for local schools, churches, youth groups, adult education and other demonstrational programs. The site should encourage the development of other ecological sites in the neighborhood.

Be executed in an economically feasible and replicable manner but also as a localized typology based on the natural cycles of the neighborhood and eco-region. Practicality is important in terms of being able to repeat the model in other areas or different times.

Figure 3.16

programs

tree canopy restoration

flood retention + detention

carbon sequestration + urban heat island reduction

temporary wetlands

cypress wetland demonstration + education

filters

hydrology

flood priority

proximity to canal

receded flooding zone

depth to water table

soils

permeability

pH level

socio-econ

proximity to parks

population density

tier 1

appropriate size

land use

within St. Roch

tier 2

vacant lot dispersal

block density

product

wetlands sites identified

environmental

wetlands site selection

In selecting the wetlands site, the criteria for the wetlands suitability derives from a number of sources. The overall guiding influence, like much of this project, takes its methodology from the design philosophy and framework. The goals for the selected site derives its overall meaning and definition from the design

framework. The program for the site is defined to better focus the inventory maps needed to prepare the suitability map. For an in-depth look at the methodology used to select the wetland site see Figure 7.3 in Appendix B.

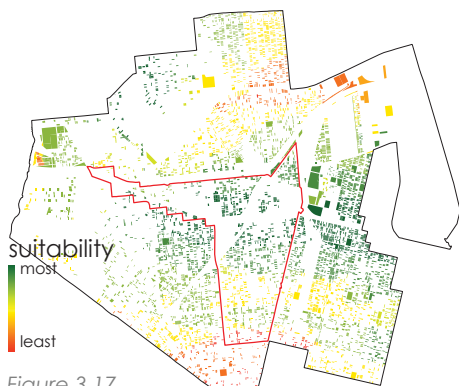


Figure 3.17
Vacant Lots Hydrology Suitability Map

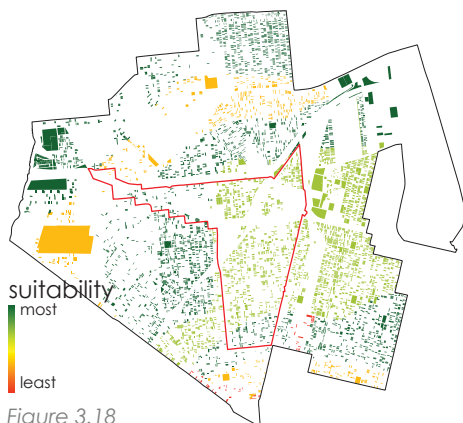


Figure 3.18
Vacant Lots Soils Suitability map

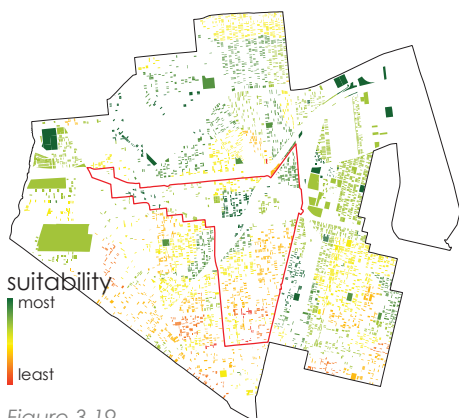


Figure 3.19
Vacant Lots Social Suitability Map

William J. Mitsch and James Gosselink (1993) synthesize the physical conditions needed for a wetland to be successful. There are three necessary factors that influence the form and function of a wetland:

- Hydrology
- Soils
- Vegetation

For ideal hydrologic conditions, it was important to consider where water was going and where it was staying. For outgoing water, the Florida Avenue Canal is the main drainage channel out of the site. For retaining water, the recession levels of the Katrina floodwaters provided an idea of where water was ponding. Figure 3.17 illustrates the areas of St. Roch where the hydrologic conditions are most suitable.

In terms of soil conditions there needs to be a high water table for wetlands to be successful. In this sense, the soil should be damp at the root level for proper vegetation to thrive. Cypress Wetlands prefer more acidic soils, so soils with a pH level of 6.8 or lower are most suitable (Mitsch 1993). Figure 3.18 illustrates the most suitable sites for their soil conditions. The wetland vegetation must be added when each site is constructed.

It is important to respect the residents' needs and wishes, instead of implementing a wetland where it won't be cared for. Most people view wetlands in a negative context (Donze & Meitrodt 2005; 1). That is why areas of lower population density provide a higher chance of community buy in. In less populated parts of St. Roch there is a lower chance for encountering these and other insects that will likely be attracted to wetland areas. The community members have also exhibit a need for a stronger green space network (Lambert et al. 2006). The selected site should thus strengthen the existing green space fabric set up by neighborhood parks and add to the tree canopy.

selected wetlands site

The selected site is ideal for its hydrologic and soil conditions and its location in a sparsely populated area. The site's location on Elysian Fields

provides good visibility from passing residents. The site is currently owned by the city, but is blocked off from the community.

Location: 2300 block of Agriculture and Elysian Fields

Size: One City block, just over 2 Acres

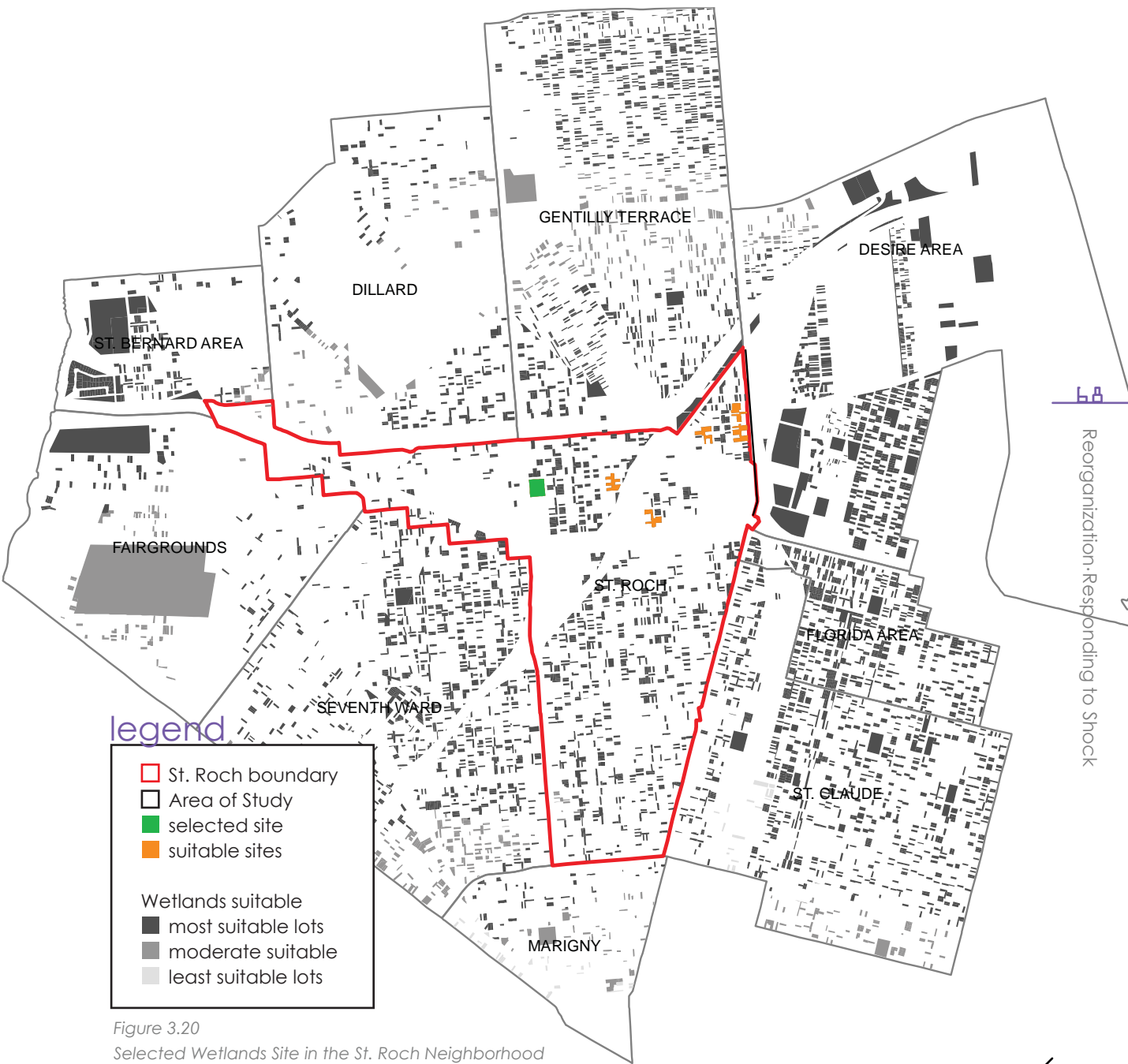
Owner: City of New Orleans

Existing Site Conditions: At this moment, the site is fenced off. After the storm, the site housed FEMA trailers, which signified ownership by the government. There are a few trees remaining on the site in the middle of the block, but appear in poor condition. There is also some lighting on site but it does not appear to be fully functional.

Rationale: This site is in proximity to the Florida Ave. Canal and experienced standing water for several weeks after Katrina. It is in a high priority flood zone according to FEMA, the 100-year line. There is also a significant cluster of vacant lots adjacent to the site, which could house additional wetland sites in the future. The pH level of the site is below 6.8 making it ideal for Cypress trees.

site goals

- Build high functioning native cypress wetlands to detain water in times of flooding and storms. The design of the wetlands should be effective in its ability to detain standing water and demonstrate softer and sustainable practices to stormwater management.
- The site should also act as an educational site for local schools, churches, youth groups, adult education and other demonstrational programs.
- The intent of the site should increase the biomass and diversity of the neighborhood in this localized site to expand the ability and resilience of the habitat.
- The site should also be executed in a economically feasible and replicable manner but also a localized typology based on the natural cycles of the neighborhood and New Orleans. Practicality is important in terms of being able to repeat the model in other areas or different times (Newman 2008).



Legend

- St. Roch boundary
 - Area of Study
 - selected site
 - suitable sites
- Wetlands suitable
- most suitable lots
 - moderate suitable
 - least suitable lots

Figure 3.20
Selected Wetlands Site in the St. Roch Neighborhood

Reorganization - Responding to Shock



site analysis

site context

In terms of context, not much exists in the area. There are a large number of vacant lots in the vicinity. This provides opportunity for the site to expand in the future. There is also a number of small businesses to provide eyes on the site. New homes could be constructed nearby, but would need to be placed on stilts in order to avoid being flooded during another Katrina-like event (Feireiss 2009).

- St. Roch boundary
- vacant lots
- retail
- city land

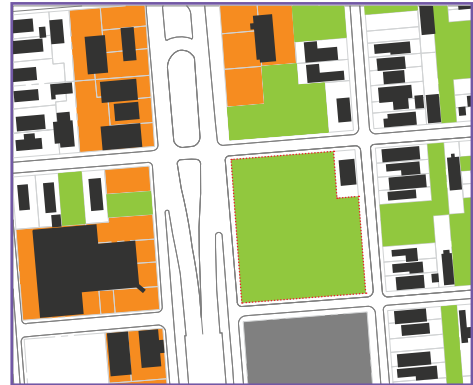


Figure 3.21
Wetlands Context

drainage

Like the community garden site, stormwater drainage goes to each corner of the street and drops into a pipe/storm sewer.

- St. Roch boundary
- watershed
- higher elevation
- lower elevation

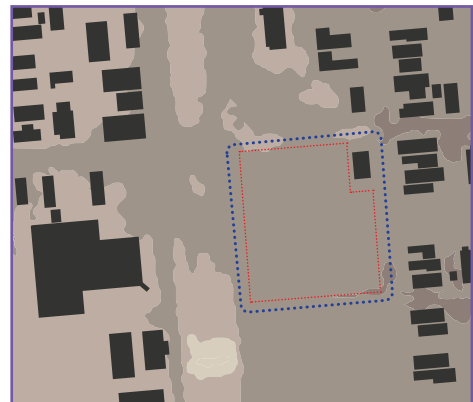


Figure 3.22
Wetlands Drainage

visibility

There is a great deal of visibility into the site from Elysian Fields and the adjoining bus route that runs along it. There is a poor lighting system, many lights are likely in disrepair and do not provide light to the entire site.

- St. Roch boundary
- viewshed
- existing light
- ⋯ bus route
- bus stop

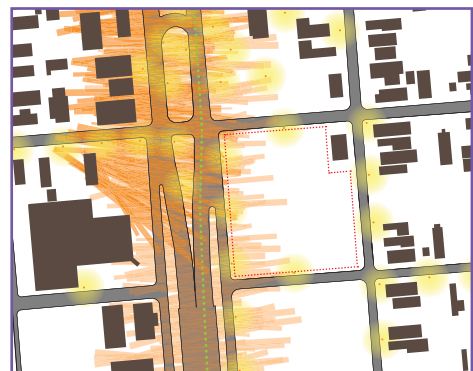


Figure 3.23
Wetlands Visibility



Figure 3.24
Wetlands Panorama

program development

citizen control
delegated power
partnership
placation
consultation
informing
therapy
manipulation

The program for each selected site reflects not only the vision of the community but also progressive strategies in both stormwater management and urban agriculture. The programs for this site do not simply include those implemented and experienced after construction. They also include activities engaged in during the planning and design, such as workshops, charrettes, community meetings, site visits, etc. These programs should be practical

and appropriate for the community and ecology of St. Roch. Figure 3.27 shows the program development over the course of the sites' lifecycle. The developed program is an extension of the vision of St. Roch. It seeks to achieve this vision while also expanding and developing its own vision. Likewise, figure 3.26 inventories the collaborators who show the potential to administer each site, based on their own goals and past projects.

St. Roch vision

*"The vision of the Neighborhood Recovery Plan is to restore the quality of life in St. Roch to the level that existed prior to Hurricane Katrina and to **make key improvements to the quality of life** in the neighborhood by addressing preservation of historic properties, **high crime**, **large concentrations of blighted and adjudicated properties**, and **poor street conditions** (Lambert et al. 2006; 4)."*

Figure 3.25
Citizen Participation
in Program
Development and
Vision

Potential Collaborators

	Community Garden Administration	3rd Party Role	Wetlands Administration
Fauborg St. Roch Improvement Association	●	●	●
St. Roch Project	●	●	●
St. Roch Community Development Center	●	●	●
Faubourg Marigny Improvement Association	●	●	●
Downtown Neighborhoods Improvement Association	●	●	●
Edgewood Park Neighborhood Association	●	●	●
Colton Jr. High	●	●	●
Local Churches		●	
Bayou Rebirth			●
All Citizens Together	●	●	
Phoenix of New Orleans	●	●	●
Rebuilding Together New Orleans	●		●
Tulane Community Health Center at Covenant House		●	
Parkway Partners			●
New Orleans Food and Farm Network	●		
Sierra Club			●
Social Entrepreneurs of New Orleans	●	●	
The Green Project	●		●
Benroe Housing Initiatives		●	
Blue Moon Fund	●		●
New Orleans Institute for Resilience and Innovation	●	●	●
Center for Ethical Living and Social Justice Renewal	●	●	
Global Green USA	●	●	●
Institute for Sustainable Communities	●	●	●
Latino Farmers Cooperative of Louisiana	●		
National Wildlife Federation			●
Operation REACH, Inc.		●	
Project Homecoming		●	
Rebuilding Information Station		●	
YOUTHAnasia Foundation, Inc.		●	

Figure 3.26
Potential Collaborators

programs list

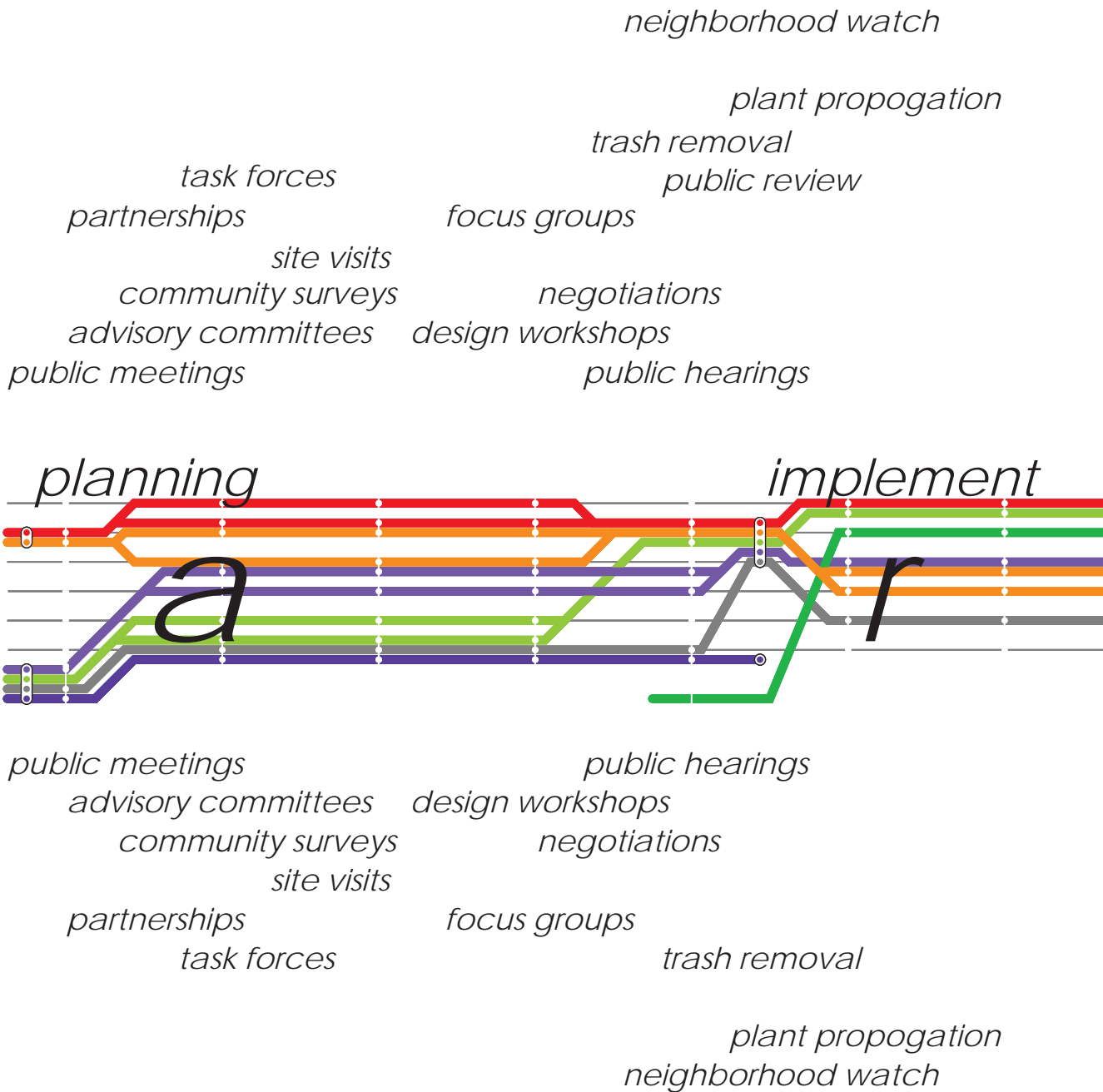


Figure 3.27
Program Development

volunteer days
tree plantings
wildflower patch
fencing
street lighting
neighborhood watch
site lighting
street trees
sidewalk repair
neighborhood picnics
stormwater management

community garden

conservation



volunteer days
water testing areas
field trips
street trees
street lighting
street side gardens
boardwalks/ bridges
site amenities
infiltration areas
temporary wetlands
shade structure
neighborhood picnics
plant sales
plant propagation / replanting
school testing programs
maintenance
wetlands
sidewalk repair

design deliberation

Following the development of a set vision for the neighborhood and the given sites those involved in the process can begin developing concepts for the actual design of the site. This will be done through a collaborative process involving charrettes and design workshops, where administrators will work hand in hand with community members, members of the design team and third party groups. This stage produces several different concepts, similar to Figure 3.30, to create a set of alternatives.

citizen control
delegated power
partnership
placation
consultation
informing
therapy
manipulation



Figure 3.29
Community Design Charrettes

Figure 3.28
Citizen Participation
in Design
Deliberation

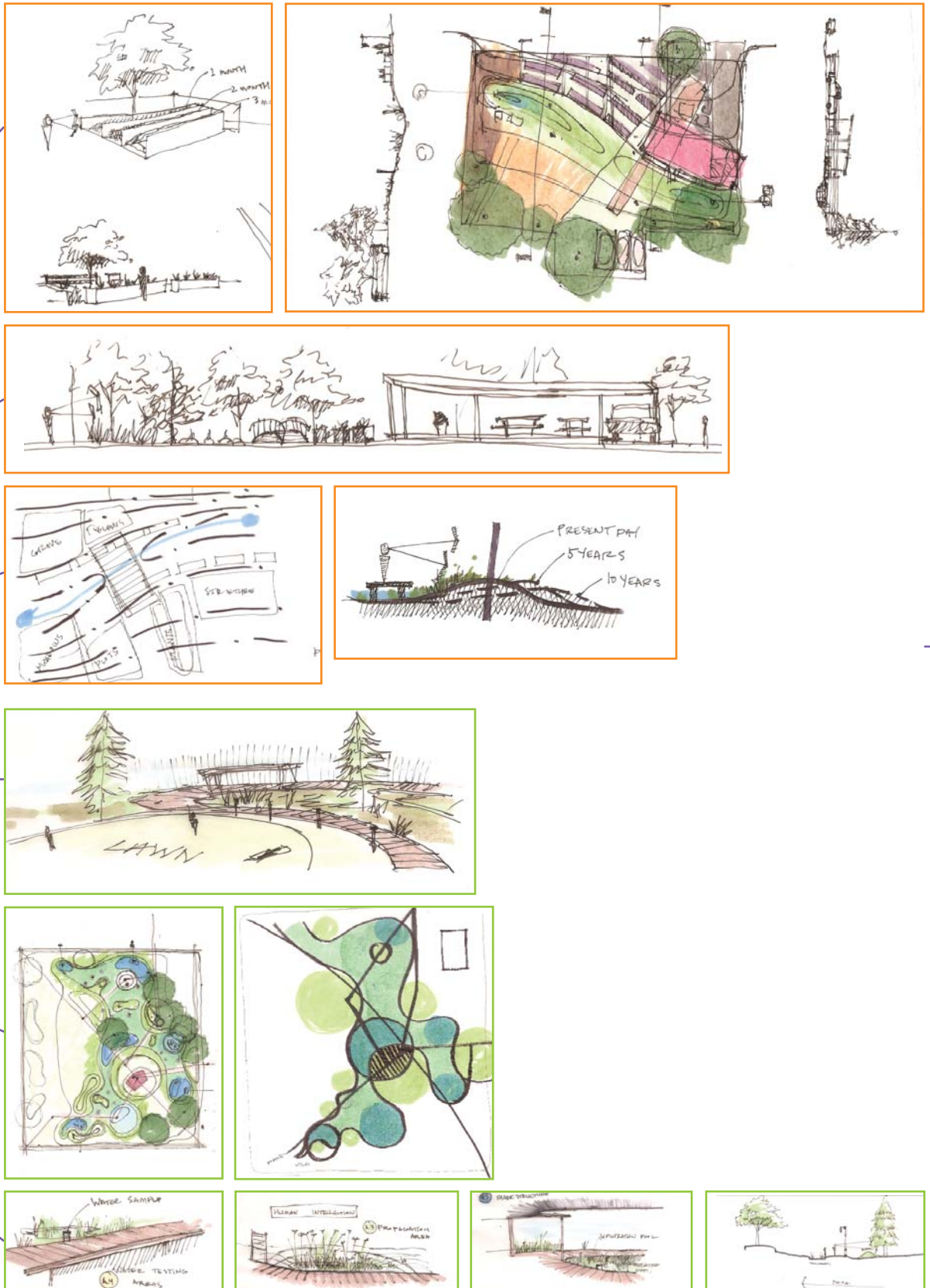


Figure 3.30
Grid of Design Concepts

design decision

Once a set of coherent and diverse alternatives have been developed, the community comes to a consensus on a preferred design for each site. A consensus allows for the strong support that will be needed for implementation of the design, and for long-term management efforts by the community. Because it is sometimes difficult to achieve a consensus, this stage will most likely require several redesigns and edits. This cyclic process weeds out design ideas deemed weak or unwise by the local community, but provides groups the chance to negotiate and bond (Innes 1999).

citizen control
delegated power
partnership
placation
consultation
informing
therapy
manipulation

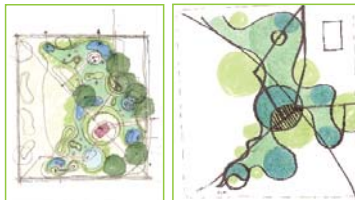
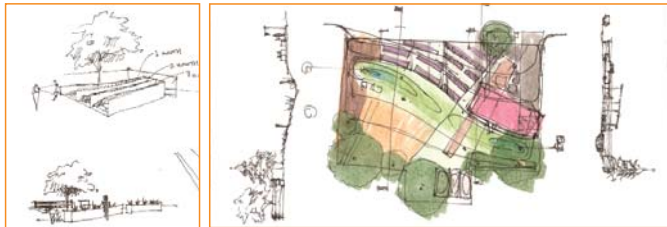


Figure 3.31
Citizen Participation
in Design Decision

Figure 3.32
Design Concepts

community garden plan



Figure 3.33
Community Gardens Plan

wetlands plan



Figure 3.34
Wetlands Plan





growth





Figure 4.1
St. Roch Avenue Looking South

overview

Following the consensus of a set design and implementation plan the community moves quickly to put the design in place. Implementation of technical portions of the designs sees the community taking a backseat to the labor crews and design teams, except when community members are employed to implement designed work or when volunteer labor is needed or desired. Community members should be present frequently throughout this phase but in an apprenticeship or neighborhood monitoring role.

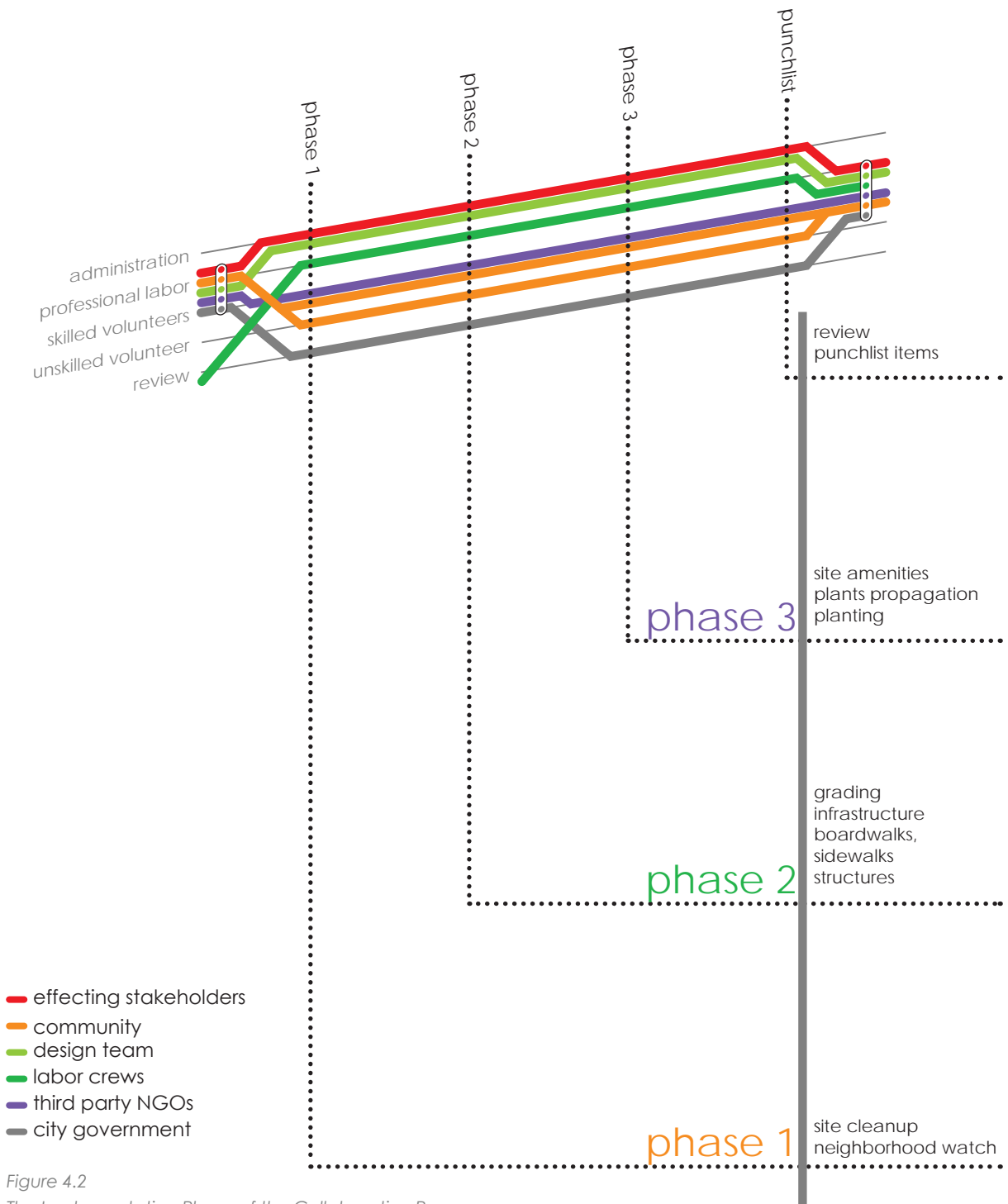
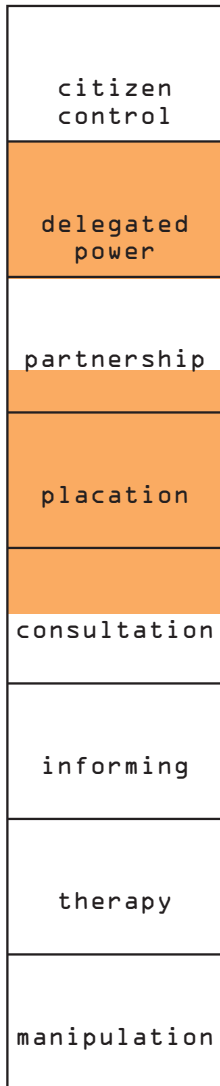


Figure 4.2
The Implementation Phase of the Collaborative Process

participating parties' roles



Each party's role will fit into one of five groups. The five groups developed from a set of skill levels and adjoining administrative levels. There are three sets of skill levels to participate in the actual construction of the given project (ASLA 2008). Figure 4,2 demonstrates how selected parties fall into the given roles for implementation.

Labor Crews

- The first is the unskilled volunteer group that comprises mainly of unskilled workers who are broadly termed as "walk-ups." These volunteers will consist primarily of the community members at large who are not attached to any group or entity in particular. Volunteers, working closely under professional labor crews, may be required for site preparation and some planting such as trees and shrubs. With their proximity to the site, community members will be essential for establishing a collective governance of the area during and after construction (Blomkey 2004).
- Skilled volunteers show up after the initial heavy labor and grading is complete. These workers belong to an organized group such as a non-profit that wants to contribute to the project. They are responsible for projects like bridge building in certain instances or large-scale plant propagation and planting (ASLA 2008).
- Professional labor crews are at hand throughout the project's construction. They are the one stable group to be present throughout the project's entire construction. They are essential for educating the other sets of workers, completing the work in a timely manner, and providing quality-control reviews (along with city personnel and designers) during construction.

Administration

- Construction administration will fall into the hands of the design team and some cases the effecting stakeholders. The design team will administer construction to make sure that what is being built is implemented as originally intended during its design.
- The city will be responsible for construction review at important dates. It is their job to make sure the project performs to code.

Figure 4.3
Citizen
Participation in the
Implementation

community garden implementation sequence

- The first step in implementation is cleaning the site. An inventory of the trash on site provides the appropriate idea of the workforce needed to clean the site (Haefner et al. 2002).
- Professional crews, or volunteers on smaller sites (such as this community garden site), handle the initial grading for the site.
- Professionals then install underground infrastructure for street lighting. Along with lighting, they install culverts from cisterns to outlets in the rain garden.
- From here, crews install formwork for the sidewalks and structure foundation. Crews pour the concrete for the sidewalks and lay gravel where required.
- Volunteers install site amenities after the initial concrete formwork is complete. This includes fences, shade structures, benches, compost piles, and recycling bins.
- Organized volunteers construct planters for vegetables. In other areas of the site, other volunteers till earth and line out areas for rows of vegetables.
- Walk-up volunteers plant trees and large shrubs as directed by professional supervisors. They also line out areas of wildflower patches, spread the seed, and then water them according to particular plant needs.
- Professionals install remaining site amenities, primarily site lighting fixtures and streetlights.
- Upon completion of these initial steps, the lead designer will walk the site and record any tasks that need to be completed. Once the crews complete this punchlist, city inspectors will review the site and give the needed approval for public use (Haefner et al. 2002).
- Finally, there is a small gathering for the site's opening to the public, commemorating the hard work of the community and stakeholders.

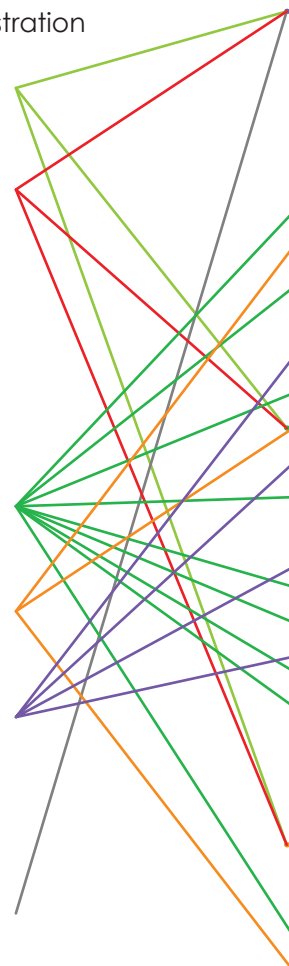
Administration



Labor



Review



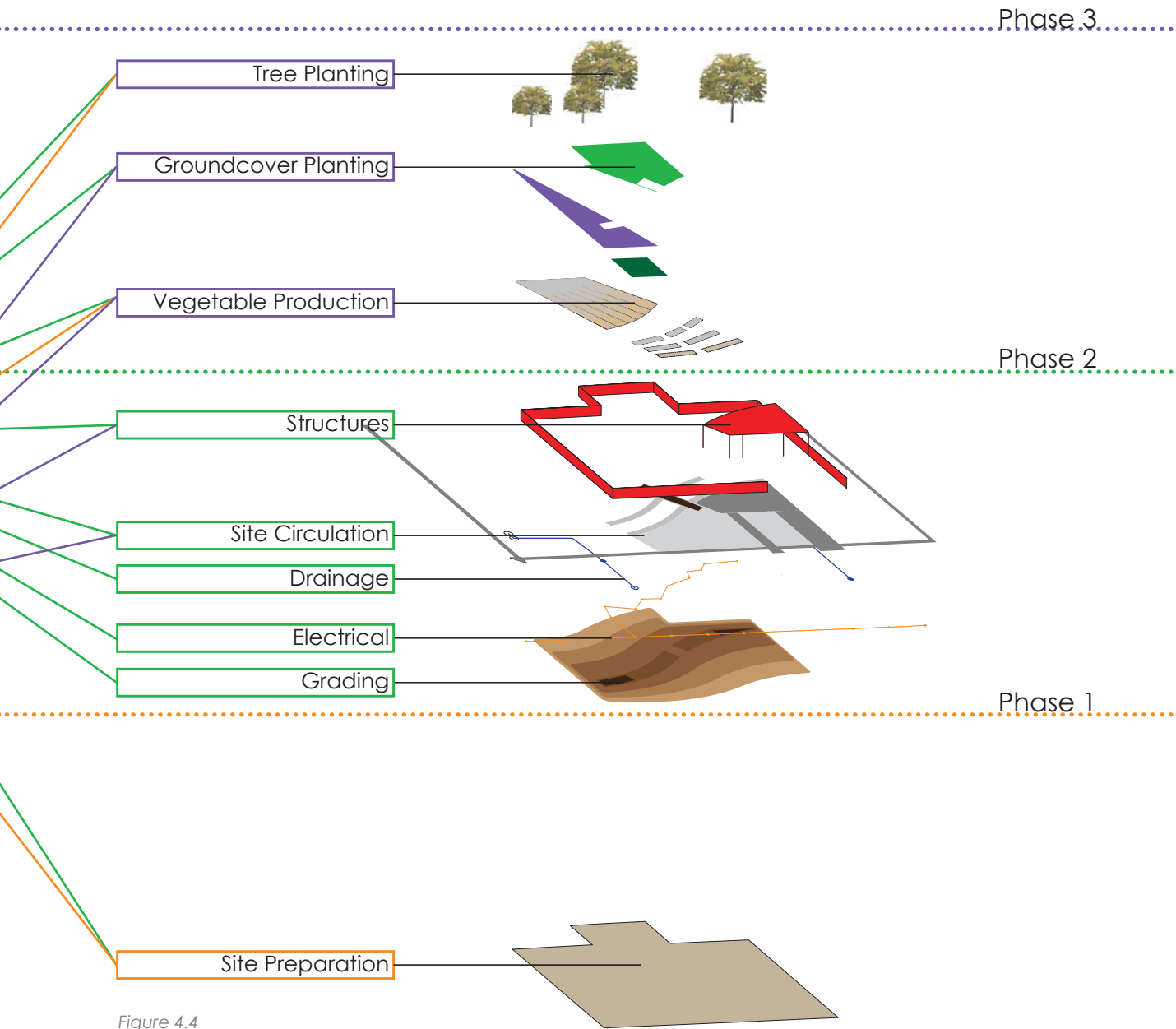


Figure 4.4
Community Garden Implementation

community garden design

The selected design for the community garden site seeks to exhibit a sense of community while providing a haven for local residents and visitors to the neighborhood. The site integrates a diverse set of food-producing trees, shrubs, herbs, and vegetable crops to draw in a wide demographic of users.

legend

- ① N. Johnson St. Market Square
- ② N. Johnson St. Community Garden Pavilion
- ③ Boardwalk
- ④ Compost pit
- ⑤ Vegetable rows
- ⑥ Wildflowers
- ⑦ Community planters
- ⑧ Fruit trees
- ⑨ Pecan trees
- ⑩ Raingarden

Figure 4.5
Community Garden Site Plan





North Johnson St.



9

4

8

5

3

2

10

7

6

1



Wildflowers

Fruit trees

Community planters

N. Johnson St. Community Garden



Figure 4.6
Arts St. Section

h Pavilion

Arts St.

90



Arts Street Section



N. Johnson St.

Community planters

Raingarden

Vegetable rows

Pecan trees



Figure 4.7
N. Johnson St. Section

N. Galvez St.



N. Johnson Street to N. Galvez Street Section

interaction vegetation

A diverse palette of plants appeals to a larger demographic. The different types of crops range from fruit-bearing trees to patches of sunflowers (Koske 2008).

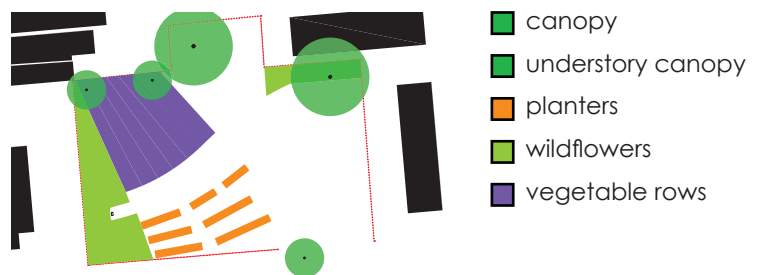


Figure 4.8
Community Garden Vegetation

compost

Stewards collect compost throughout the site and store it in constructed compost bins. Families in surrounding homes may also donate organic waste from their homes and yards. At appropriate times, workers may redistribute compost throughout the community garden's different crops as an alternative to using commercial fertilizers. Composting exhibits cradle to cradle thinking per McDonough and Braungart (2002), and provides a tangible interaction with the site's processes.

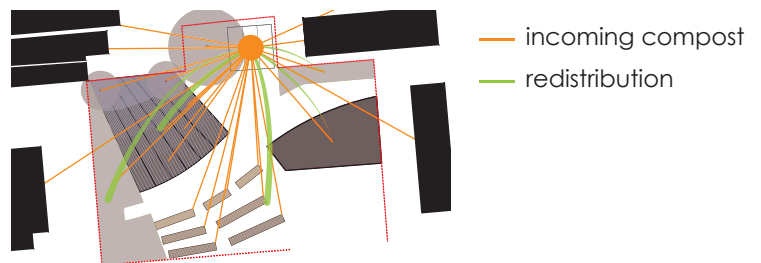


Figure 4.9
Community Garden Compost Cycle

Canopy Fruit Trees

- Pecan Tree, *Carya illinoensis*
- Shagbark Hickory, *Carya ovata*

Understory Fruit Trees

- Plum Tree, *Prunus americana*
- Mayhaw Tree, *Crataegus opaca*
- Common Persimmon, *Diospyros virginiana*

Planters

- Snap Beans, Beets, Broccoli, Brussel Sprouts, Collards, Cucumbers, Eggplant, Garlic, Lettuce, Mustard, Okra, Onion, Peas, Peppers,

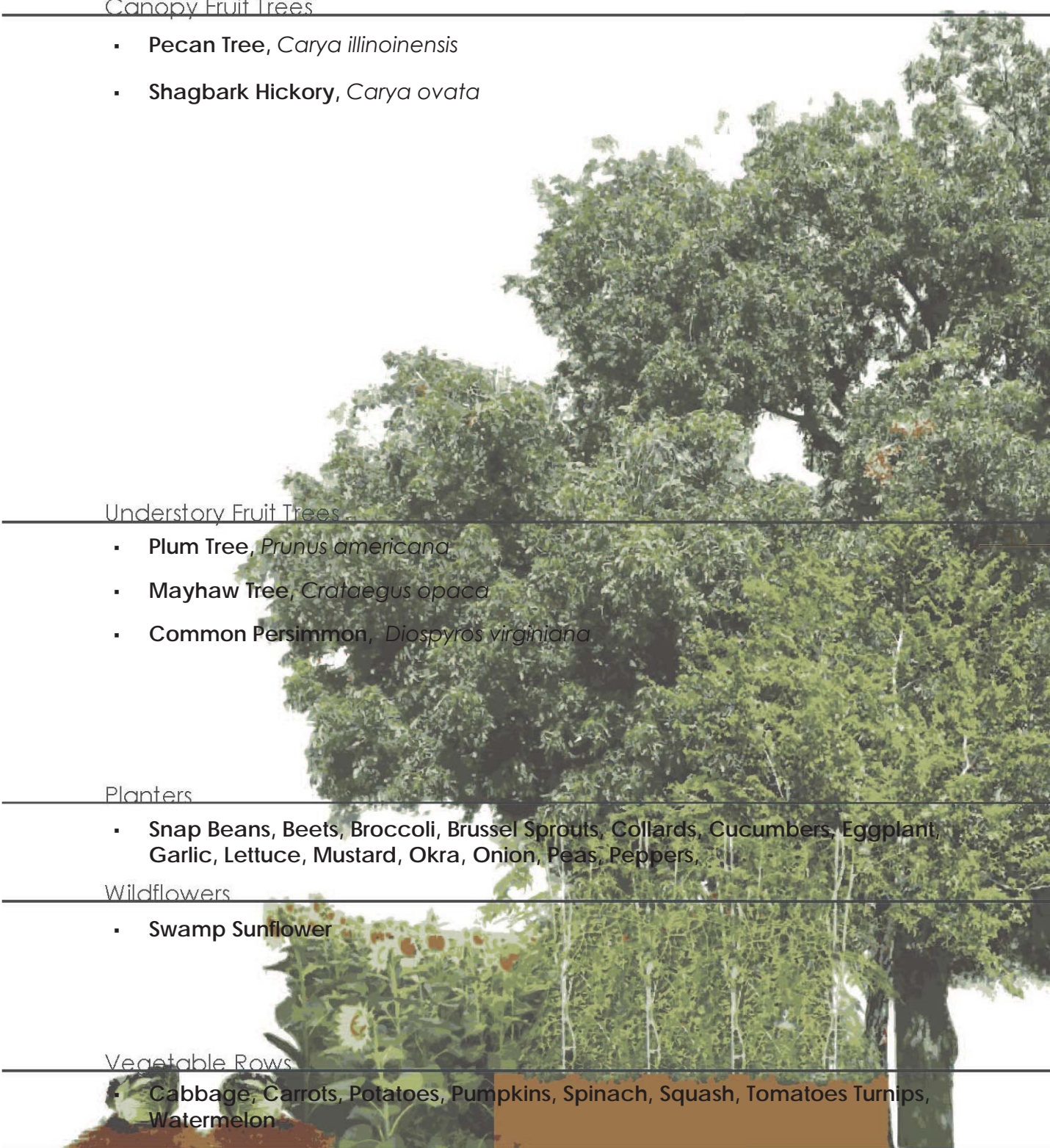
Wildflowers

- Swamp Sunflower

Vegetable Rows

- Cabbage, Carrots, Potatoes, Pumpkins, Spinach, Squash, Tomatoes Turnips, Watermelon

Figure 4.10
Community Garden Vegetation Section



wetlands implementation sequence

- Like the community garden site, the first step in implementation is cleaning the site. An inventory of the trash on site provides the appropriate idea of the workforce needed to clean the site (Haefner 2002).
- There is no need for a dumpster as any salvaged material should be recycled, plant material goes to compost, and there is not a significant amount of trash (Haefner et al. 2002; McDonough 2002).
- At this point grading is necessary for the wetland bays and land berms of the site. The site should actually sit idle for six to nine months (after a temporary cover crop is planted) to check soils and areas of water catchment. Amendments to soil are made at this time for infiltration basins and forebays (Oberts 2001).
- As the site sits idle other amenities can begin to be constructed. Electricians install the wiring for lighting and other uses. They then install the necessary street and footlights according to plan.
- Labor crews construct the frames for boardwalks and pour the concrete for sidewalks. Skilled volunteers come in to build the bridges for the boardwalks. Installation of the piles and slab for the shade structure takes place through a coordinated effort of skilled volunteers and professional labor crews (Haefner et al. 2002).
- Once the grading for the site (including refinements to wetland and rain-garden basins) has been set, the design team may review and make adjustments as needed. The administration team and professional crews stake the site for plantings. Volunteers handle planting large trees, shrubs while skilled volunteers and professionals coordinate to handle mass groundcover plantings and wetland/rain-garden pool areas (Oberts 2001).
- Both levels of volunteer workers install remaining site amenities such as benches, signage, recycling and trash cans (Haefner et al. 2002).
- Administration reviews the site and checks off any punchlist items needed to be complete. The city inspector finally visits to make sure the site is up to code. Upon completion, there is a small gathering for the site's opening to the public, commemorating the hard work of the community and stakeholders.

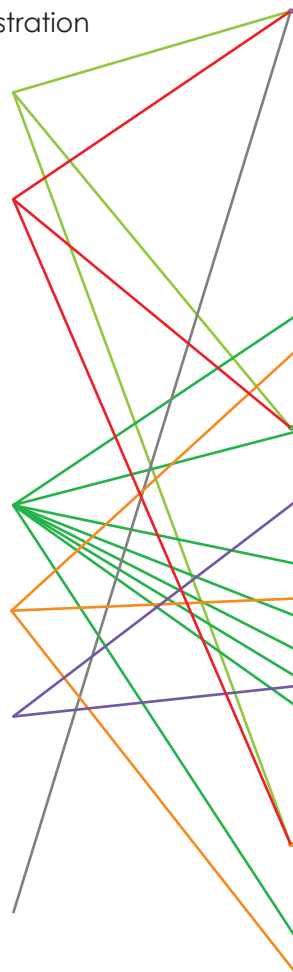
Administration



Labor



Review



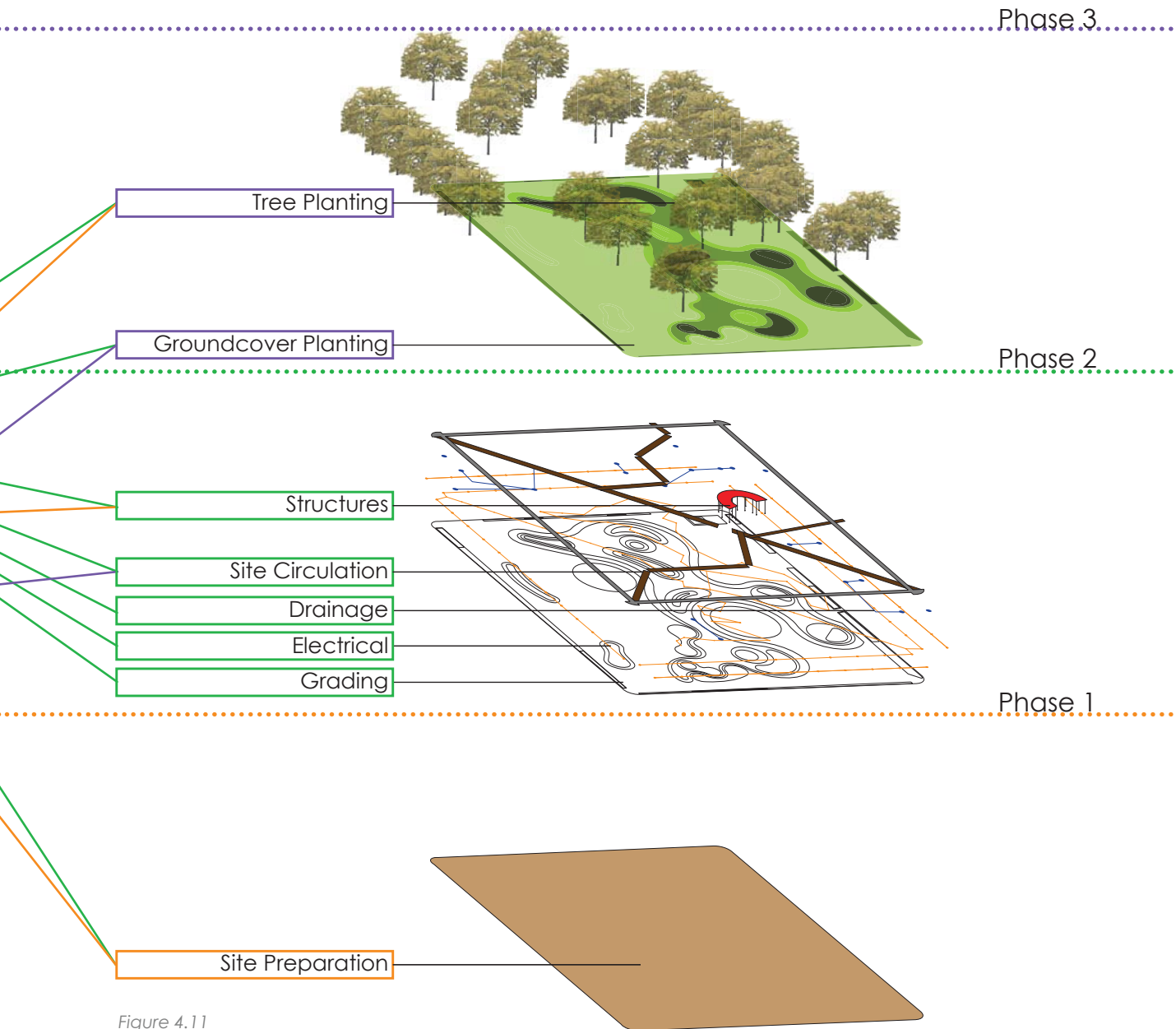


Figure 4.11
Wetlands Implementation

wetlands design

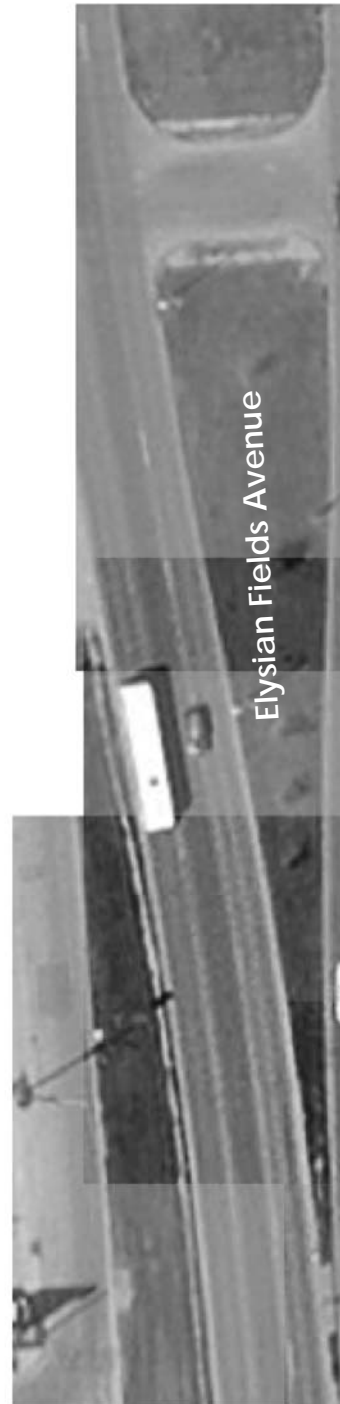
The selected design for the wetlands site means to draw stormwater runoff into the site for infiltration instead of directing this water to the a storm sewer. At the same time this site acts as an exhibit for the natural plant palette of a cypress dominant swamp. This draws the community into the site and allows all visitors to interact with a natural setting in a safe and meaningful way.

The site acts as a temporary wetland, an area that is wetted longer than a typical rain garden but shorter than the allotted time to allow mosquito and vector reproduction. In its aesthetics it acts as a naturalistic wetland, but is not as highly functional because of its separation from a significant water source besides access to stormwater runoff and a seasonally high water table. The site acts more as a rain garden in its function, infiltrating stormwater runoff before reaching a traditional stormwater sewer.

legend

- ① Marigny St. Pavilion
- ② Abundance St. Promenade
- ③ Elysian Fields Ave. lawn
- ④ Forebay
- ⑤ Propagation pool
- ⑥ Street raingarden
- ⑦ Level spreader
- ⑧ Infiltration pool
- ⑨ Land berm
- ⑩ Boardwalks

Figure 4.12
Wetlands Site Plan



Abundance St.

Marigny St.

Agriculture St.





Elysian Fields Ave.

Elysian Fields Ave. lawn



Figure 4.13
Elysian Fields Ave. Section



Abundance St. Promenade

Marigny St. Pavilion

Forebay

Marigny St.

1.00

Elysian Fields Avenue to Marigny Street Section



Figure 4.14
Agriculture St. Section

Abundance St. Promenade

Propagation pool

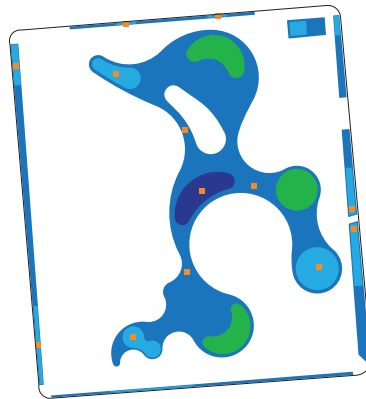
Abundance St.

Agriculture Street to Abundance Street Section



interaction water

There should be the opportunity for the community to interact with the site in a number of meaningful ways (Newman 2008). Inputs are areas where users should test the quality of the water flowing across the site, so that they can see how the transition from street to the final infiltration areas influence how clean the water is.

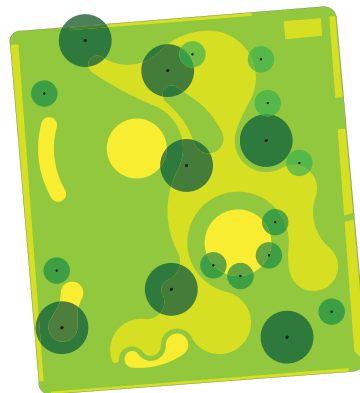


- forebays
- vegetated retention areas
- infiltration pools
- propagation areas
- monitoring stations

Figure 4.15
Wetlands Water Interaction

observation vegetation

A diverse palette of plants appeals to a larger demographic. The plant palette emulates the plant palette found in the surrounding wetlands habitats of the Mississippi River Delta. Canopy trees include the magnificent Baldcypress, the long-lived Water Tupelo, and the flowering Southern Magnolia (Dozier 2010; Lady Bird Johnson Wildflower Center, 2011).



- canopy
- understory canopy
- understory shrubs
- lawn
- marshes
- mounds

Figure 4.16
Wetlands Vegetation

soil

Over time erosion will occur as the site takes on stormwater runoff. There should be a way to see and learn from to this process (Newman 2008). It is suggested that use of visual markers such as posts can reveal the effects of erosion and the buildup of sediments over the site's lifecycle.



- erosion
- sedimentation
- visual markers

Figure 4.17
Wetlands Erosion Patterns

Canopy

- **Baldcypress**, *Taxodium distichum*
- **Water Tupelo**, *Nyssa aquatica*
- **Southern Magnolia**, *Magnolia grandiflora*

Understory Trees

- **Sweetbay Magnolia**, *Magnolia virginiana*
- **River Birch**, *Betula nigra*
- **Common Persimmon**, *Diospyros virginiana*

Understory Shrubs

- **Dwarf Palmetto**, *Sabal minor*
- **Swamp Titi**, *Cyrilla racemiflora*

Marsh

- **Giant bulrush**, *Schoenoplectus californicus*
- **Louisiana iris**, *Iris* spp.
- **Southern cattail**, *Typha* spp.





conservation

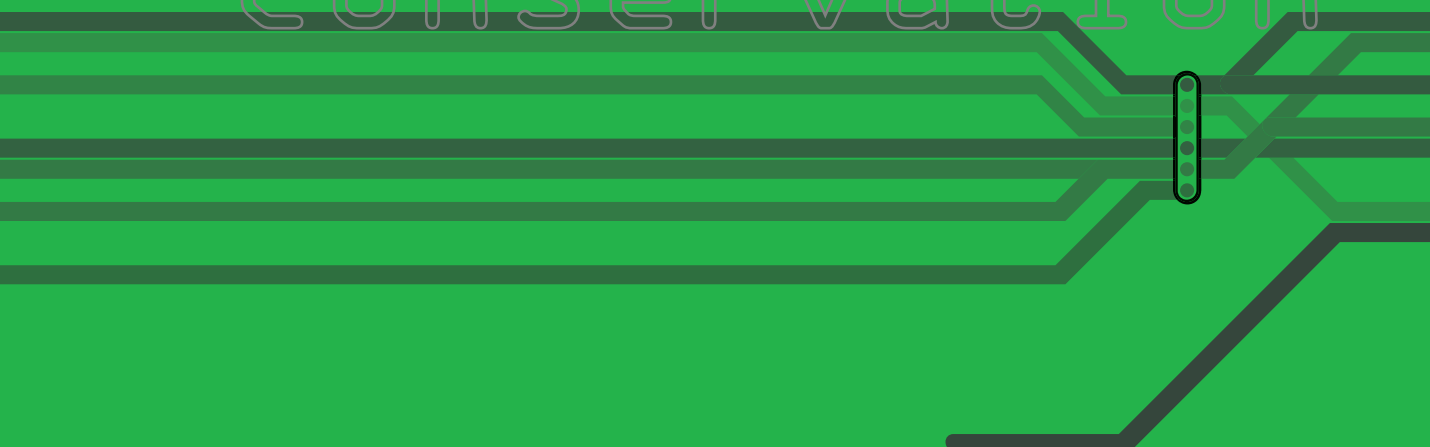




Figure 5.1
Mandeville St

overview

At this point in the process the community has invested heavily in the site and have a sense of responsibility to it. The site's maturation over time mirrors the community's growth in capital and sense of place. The maintenance of the sites seeks to integrate the community at crucial events throughout its lifecycle to sustain this sense of stewardship and promote further responsibility, learning, and growth by St. Roch's residents.

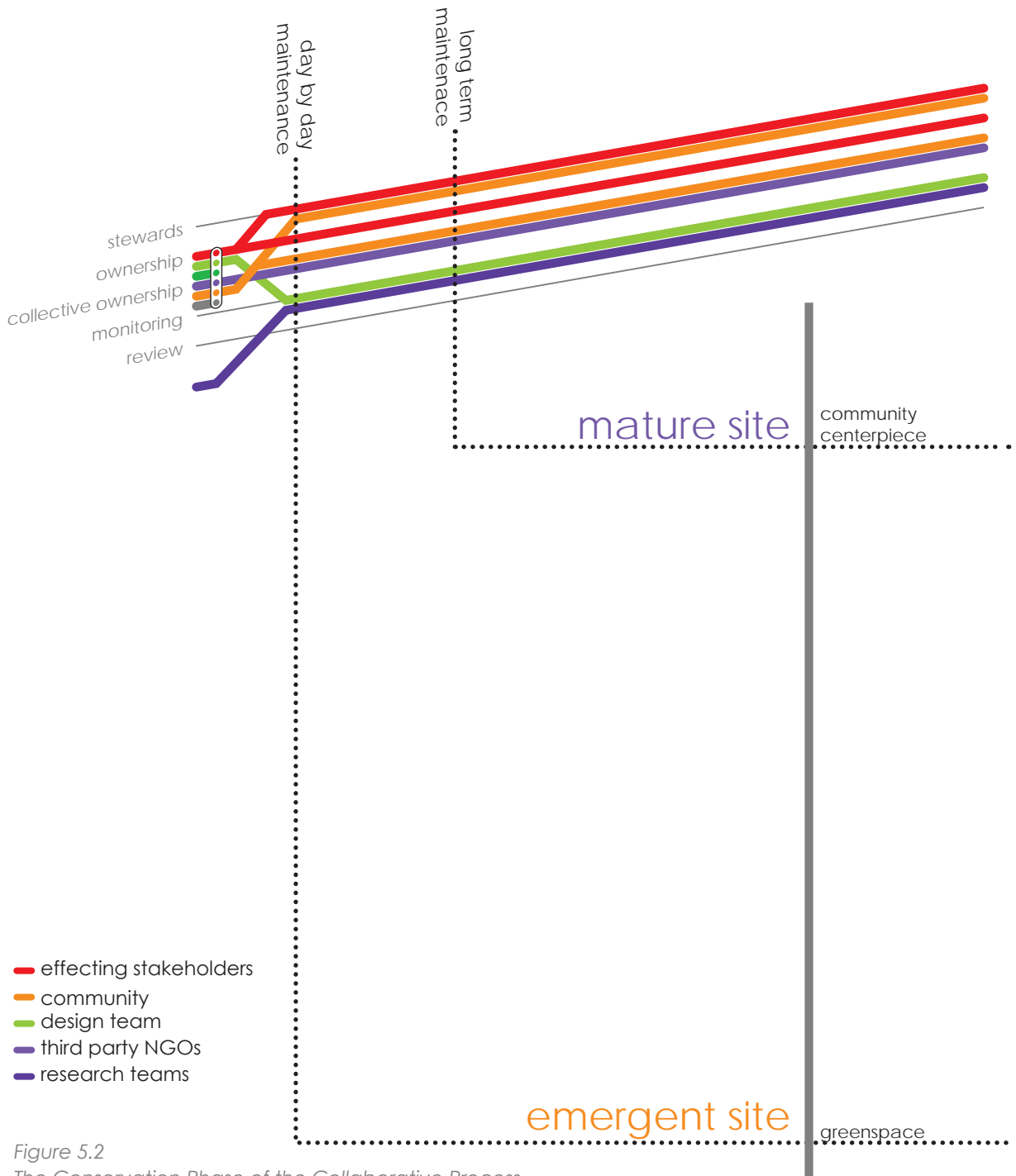


Figure 5.2
The Conservation Phase of the Collaborative Process

participating parties' roles

citizen control
delegated power
partnership
placation
consultation
informing
therapy
manipulation

The roles of the respective parties will change after the site is open to the public. Following the ribbon cutting the site is truly in the hands of the community and effecting stakeholders. Titles for the contributing parties will break down into two distinct camps, stewards and monitors. Constant maintenance will furthers these groups, investments in the site and help each site from a simple green space to a community centerpiece (Newman 2008; Corner 2004)

Stewards

- Primary stewards of the site will generally be the effecting stakeholders. This role is required in order to manage the site, fund maintenance projects, schedule events and field trips to the site, pay the wages of any regular site crews needed, and take care of any other legal or business needs for the site. Primary stewards thus serve as the legal owners and operators of the site (Blomkey 2004).
- Secondary stewards will come from the community at large. They will help local community members acquire a collective ownership mentality (Blomkey 2004). They are responsible for neighborhood watches, site cleanups, and other general maintenance as needed (Haefner et al 2002).
- Tertiary stewards are those part-time effecting stakeholders that will come on for smaller maintenance projects, such as a re-planting, or crop production and harvesting. They can be any group or set of people that is interested in contributing to a site (Sanchez-Jankowski 2008).

Monitors

- Researchers and university groups, working with secondary stewards, will be the primary monitors of the site. They can come as requested by the effecting stakeholders and community to study certain aspects of the site. They can study the production or crops, the performance of the wetlands, or how people react positively or negatively to the particular site they observe or study (Newman 2008).

Figure 5.3
Citizen
Participation in the
Conservation of
the Sites

community garden perspective



Figure 5.4
N. Johnson St. Farmer's Market Perspective



JOHNSON ST. FARMER'S MARKET

community garden maintenance

The site maintenance schedule gives the site a long-term plan for sustaining its sense of place within the community. A well-tended site boosts the sense of community, and is essential for avoiding a slip back into degradation (Haefner et al. 2002).

- **Site adoption** is the first critical component for maintaining the site. The surrounding community needs to take collective ownership of the site through a neighborhood watch program and regular site cleanups (Blomkey 2004; Zelinka 1999).
- **Watering the plants** on a regular basis is essential to establish the vegetation. This is required during the first two years of the site's lifecycle. This coupled with frequent site cleanups provide for regular gatherings in the park.
- For the given plots, a **set maintenance** plan requires that the active stakeholders commit themselves to the long-term success of the site. Plots of land and planters auctioned off to community members and groups for raising vegetables, flowers, or other crops may require their own more specific plan written or unwritten depending on the crop selection and placement in the site (Haefner et al. 2002).
- **Harvesting** should take place at certain times of the year given the crop yield. At harvest, the active stakeholders take the plants they need, per their choosing, and place the rest in storage for Saturday markets.
- Hired stewards conduct **markets**, which allow outside community members to buy fresh food and interact with the growers. Money earned may be re-distributed or saved up for future project.

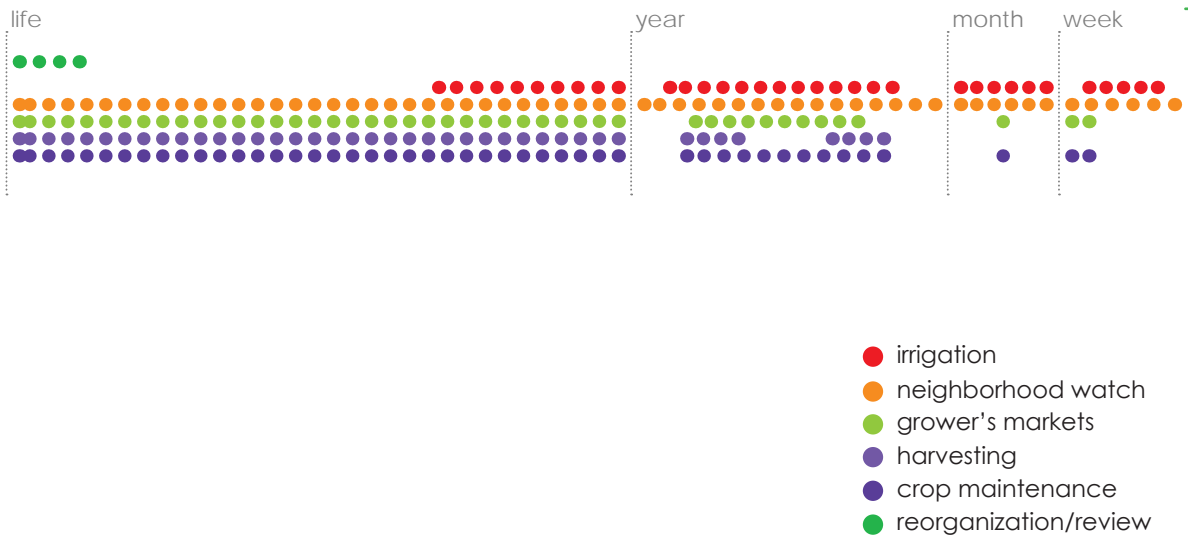
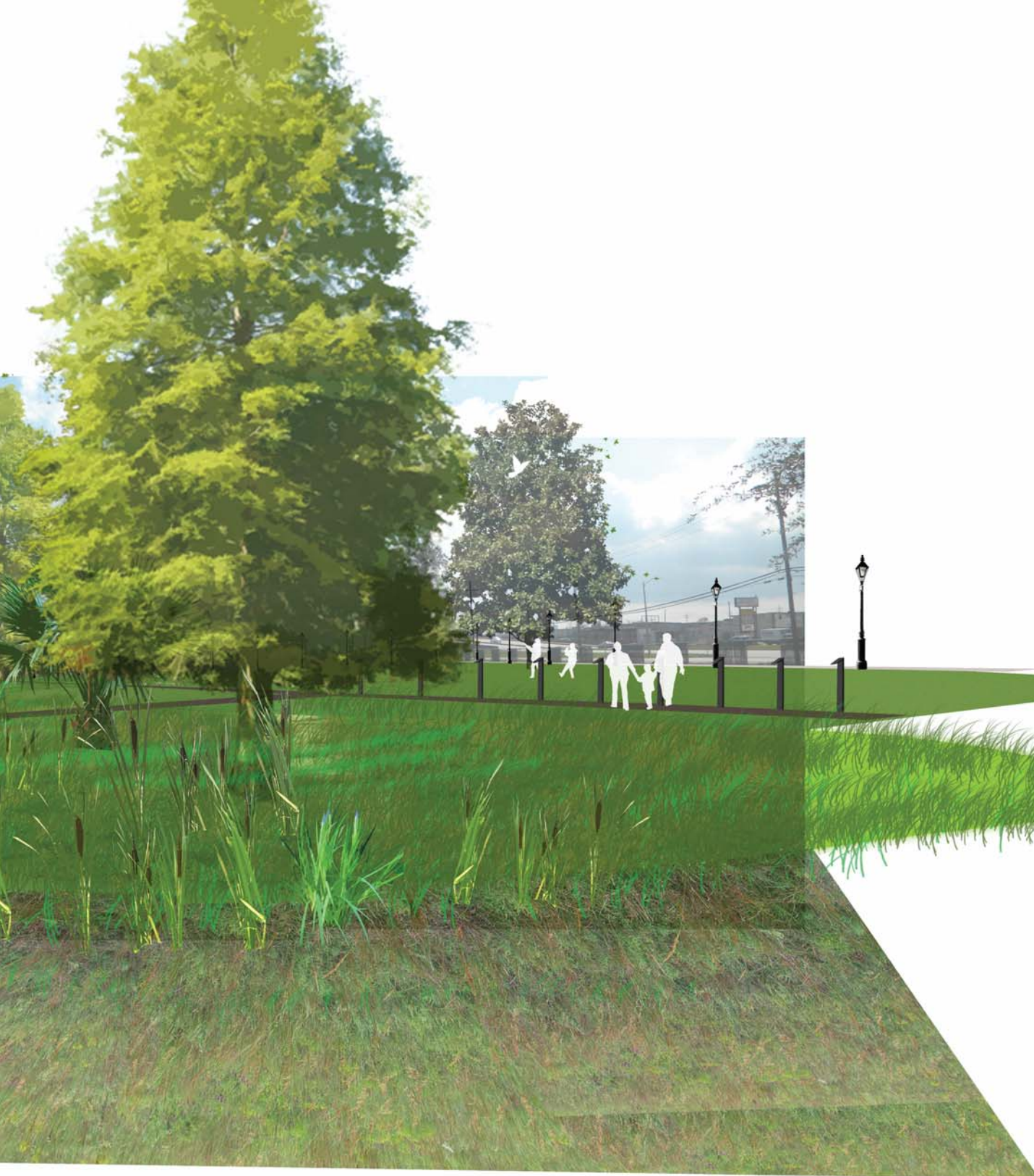


Figure 5.5
Community Garden Maintenance Timeline

wetlands perspective



Figure 5.6
Wetlands Park Perspective



wetlands maintenance

The maintenance schedule for the wetlands site is adapted from the Minnesota Urban Small Sites BMP Manual (Oberts & Rozumalski 2001). This manual gives a general idea of the necessary time and labor to maintain a functioning temporary wetland and is a useful resource for those who will maintain the created wetlands and rain-gardens. Designers and scientists working for the Louisiana Department of Natural Resources may be invited to St. Roch to discuss the connections between created wetlands and larger natural ecosystems and may have good ideas related to overall maintenance and specific plant management techniques.

- **Site adoption** is a critical first step to maintaining the site. The surrounding community needs to take collective ownership over the site through a neighborhood watch program and regular site cleanups (Blomkey 2004; Haefner et al 2002). These weekly cleanups can fit in with other weekly occurrences such as Sunday afternoon gatherings.
- **Watering the plants** on a regular basis is essential to establish the vegetation. This is required during the first two years of the site's lifecycle.
- **Plant harvesting** is another way to bring people into the site for regular occasions. On a month-by-month basis, site stewards can harvest wetland plants and sell them to the larger community.
- The first three years of the site's lifecycle requires regular observation in **formal biannual inspections**. In particular, the balance of native wetland species, invasive species, and or stagnant unvegetated water needs to be periodically checked. Researchers from a university or other designated party should check the performance of the site as needed and could be very beneficial to the site (Oberts & Rozumalski 2001).
- Regular maintenance required in this initial phase is typically **re-planting and removal of invasive species**. Re-plantings present opportunities for school groups or other part time stakeholders to contribute their time and expertise. Following the initial three-year phase, only **annual inspections** are required for baseline maintenance.
- The end of the maintenance cycle occurs at the ten-year anniversary of the site's construction. **Removal of the sediment** from the wetlands bays is necessary at least annually for potential use in other areas, such as land-berm creation or at other project wetlands sites (Oberts & Rozumalski 2001). At this point, it is possible for the effecting stakeholders to reorganize a planning process to adapt the site to significant contextual changes.

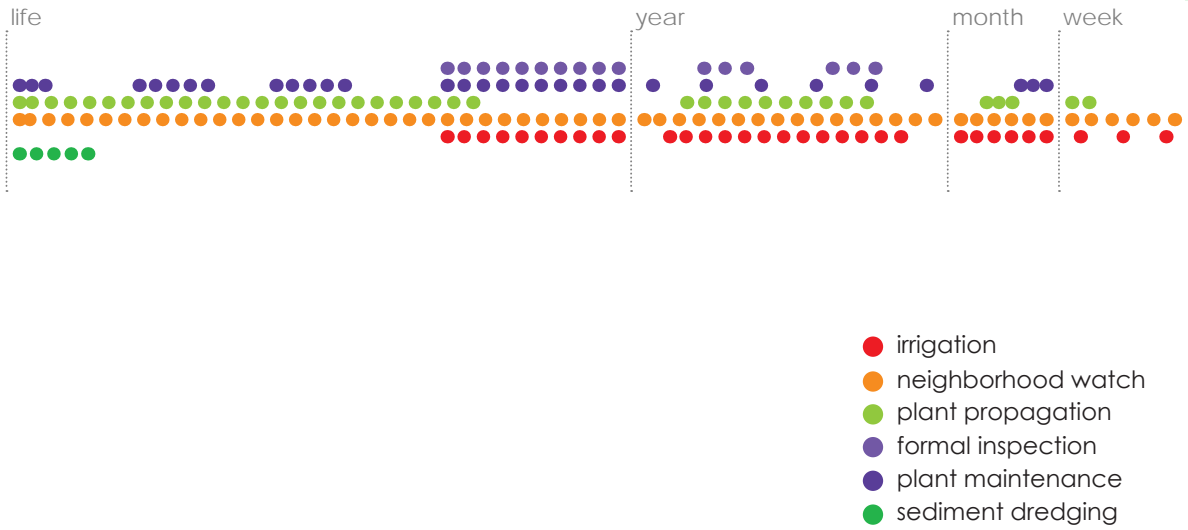


Figure 5.7
Wetlands Maintenance Timeline



conclusion



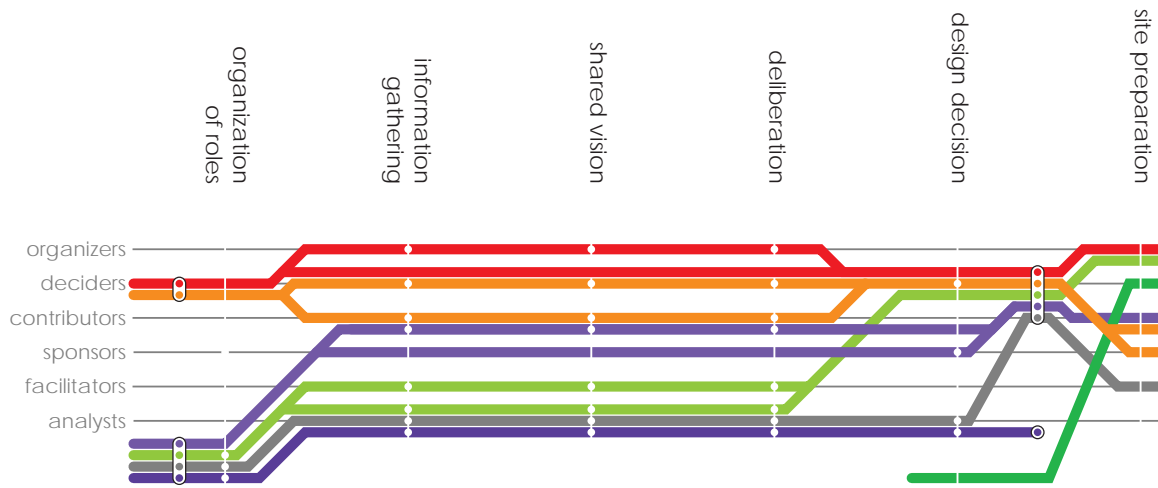


Figure 6.1
St. Roch Market

conclusions

There is always a need for a balance of power in situations such as these. The community members that live and work in these places have every right to contribute to their community, and it is our job as designers to heed that contribution and to seek to channel their priorities and conflicting desires into one unique, innovative, shared vision. In every project, there will be a power balance of some sort, but that tension can and should be productive in creating a truly resilient design. In most cases, a project cannot fall into the complete control of the citizens, and likewise it cannot be prepared by outside powers attempting to develop the project regardless of the interests and concerns of local residents. The design process must include proactive dialogue and collaboration—with community members meaningfully investing in the hard work of planning, design, implementation, monitoring, and management.

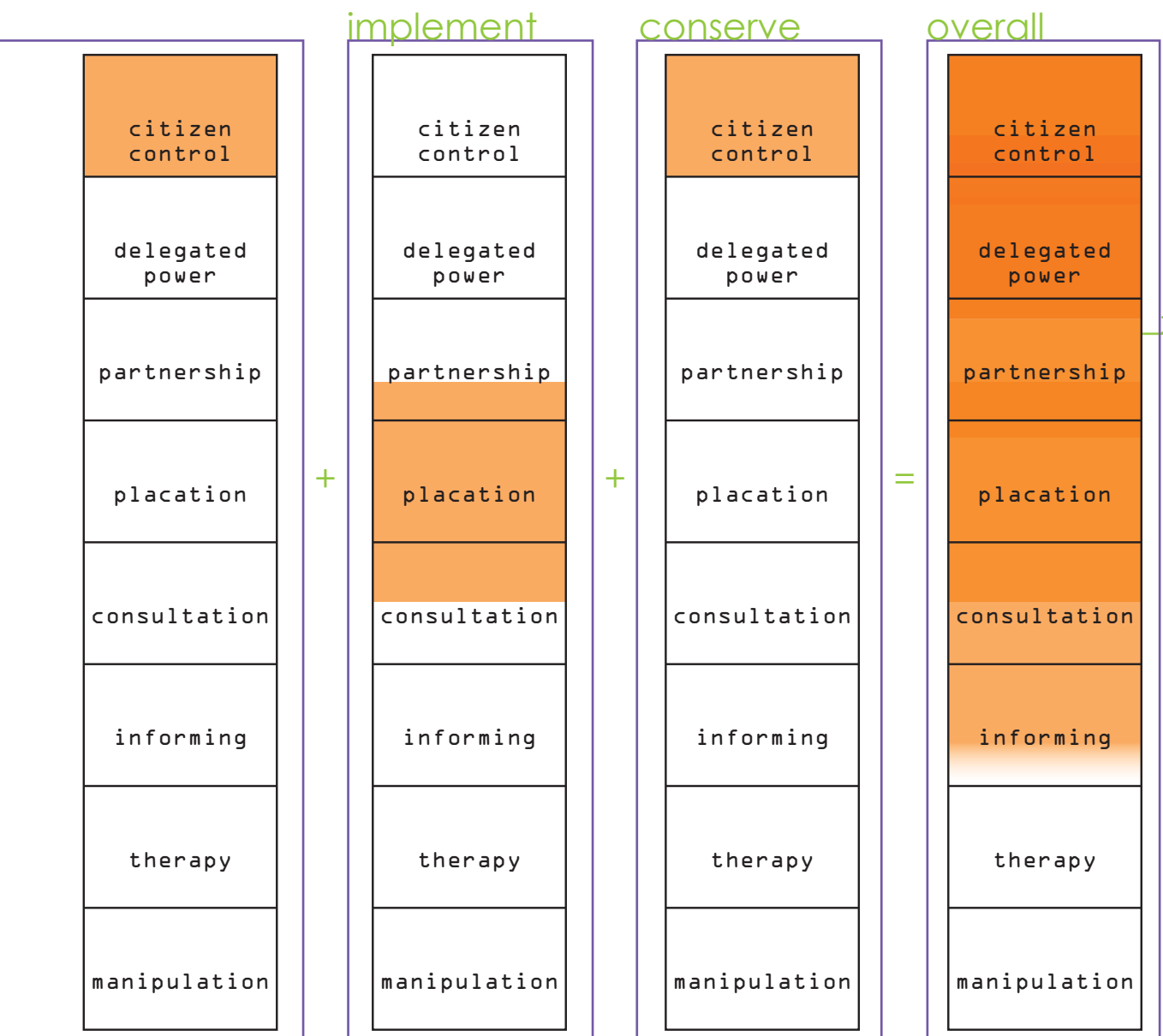
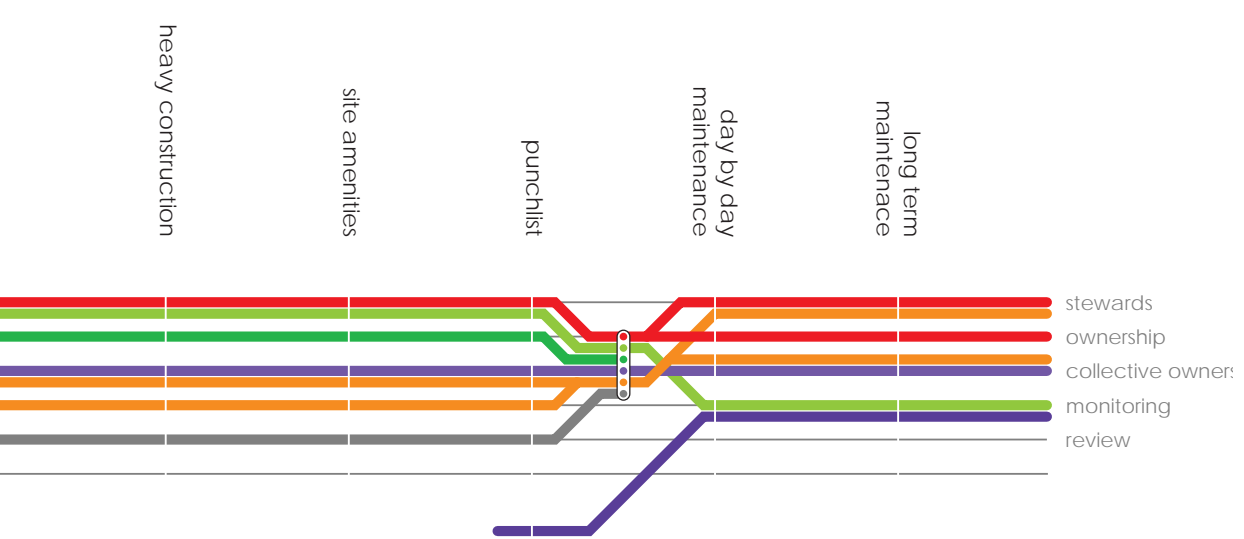
Involving the community encourages a sense of ownership and responsibility. There are a number of strategies and methods for involving the community throughout this process. The graphic on the following page illustrates the community's potential involvement and power throughout this process.



planning

citizen control	citizen control	citizen control	citizen control
delegated power	delegated power	delegated power	delegated power
partnership	partnership	partnership	partnership
placation	placation	placation	placation
consultation	consultation	consultation	consultation
informing	informing	informing	informing
therapy	therapy	therapy	therapy
manipulation	manipulation	manipulation	manipulation

Figure 6.2
Community Involvement throughout the Process



1.24 Introduction: Responding to Shock

limitations

Engaging a community almost a thousand miles away presents an interesting set of problems and limitations. To address that issue, the project took a more scenario-based character. For this project to be truly beneficial to a community like St. Roch, there needs to be a stakeholder in-house pushing the project along.

This project provides an interesting sketch of how a community can and should be involved in their public works, but it requires constant and active collaboration in the planning and design process to take place. To truly understand the benefits of a collaborative process it is necessary to exercise this process. A community can never know its true potential if it does not at least attempt an effort such as this.

This project was catered to the New Orleans street and community culture, and draws from their previous grassroots efforts. Other communities have exhibited an ability to organize such as New Orleans has, but the city seems to always take an interesting twist on collaboration, producing astonishing results, and a strong sense of community. It is especially hard for an outsider to integrate into such a tight knit community structure and produce the same types of results as those that are produced in-house. There have been past planning efforts that have neglected to sufficiently engage the community and these processes have resulted in a strong community outcry. The Bring New

Orleans Back Plan in 2006 saw some of the strongest community resistance since Hurricane Katrina. The St. Roch neighborhood was one of the neighborhoods to oppose this plan (Campanella 2008). The main opposition to the plan came as a result of the plan's recommendations to shrink the footprint of the city and erase whole neighborhoods for wetlands reconstruction.

This plan illustrated that outside design teams should take time to integrate into the community and gain their respect and trust. Designers may have a wide breadth of knowledge, but it is vital to seek community and stakeholder input, as local residents generally know the place better than anyone else. In their eyes it is a special place, despite the widely known challenges and shortcomings it may have.

Furthermore, to implement new types of programs requires excellent public and design team education. Wetlands and local food production may be viewed with skepticism due to the new issues they bring to the table and the perceived difficulty of bringing them to fruition. People may not trust urban food production because of the pollutants in the city environment, nor constructed wetlands because of their potential for vectors transmitted by mosquitoes, rats, and wildlife. However, designers can help correct misconceptions and in doing so influence people's outlook on these issues. These types of projects will be

stuck in a stand still until a higher regard for their services is realized by the community. In the end, designers must seek to really understand community

needs, concerns, and opportunities by collaborating with local community members to ever succeed in moving these programs and projects forward.

looking to the future

What makes the city such an appropriate place to test these programs is that the sheer number of vacant lots provides for endless creations and interventions in the public landscape. Related to that fact is the advent of several hundred community groups and non-profits that have come about since Hurricane Katrina. There is potential in both the empty lots and engaged builders, designers, and innovators making St. Roch and New Orleans such an exhilarating place to be and work right now.

If people can begin to be persuaded that these vacant lots are opportunities instead of problems the products will be astounding. More and more there is a need for action, regardless of the scale, to implement these projects and educate everyone involved about the necessity and prospect for on-the-ground, day-to-day environmental stewardship and appropriate practices.

New Orleans is an interesting city because of its completely different landscape from any other U.S. city. The fact that it is one of only two major U.S. cities to sit on a river delta (along with its rich history) makes it a truly unique place. However, if New Orleans is to survive into the next century there is a real need for a focus on integrating

its footprint better into the landscape. Likewise, the city is interesting because it has already witnessed the related effects of land subsidence and climate change. There is already a collective consciousness to adapt to this change, which will result in a very different future for the city. If New Orleans is to truly remain New Orleans, the community and citizens that have returned should be regarded with the utmost respect. Residents must be actively engaged in re-imagining what it means to create a sustainable city within the framework of a chaotic climate of disturbance and change. The residents truly hold the future of the city in their hands, and it will be interesting to see how they continue to respond to the shock.

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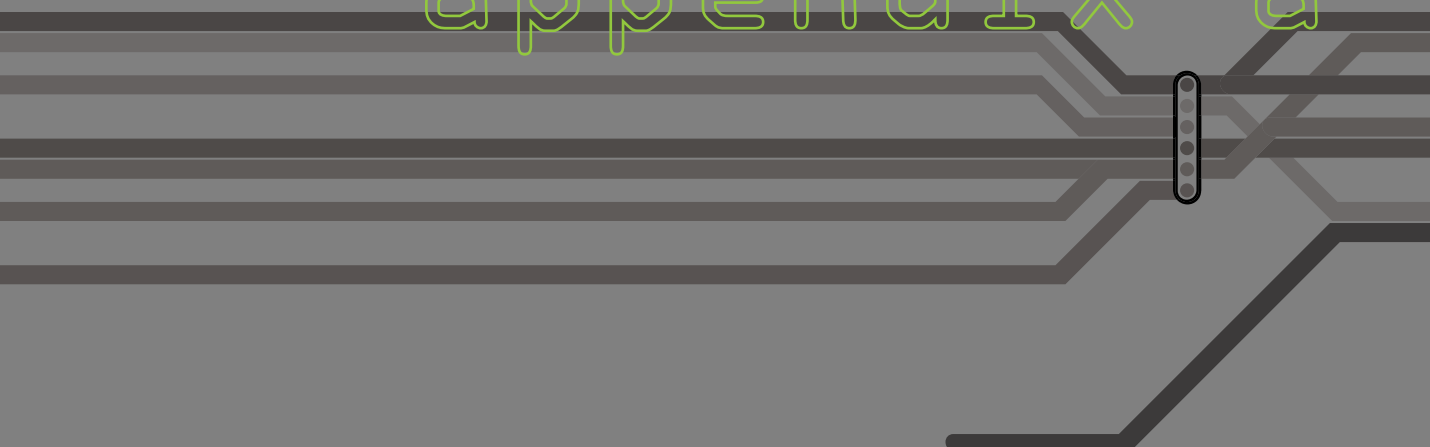
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appendix a



literature map

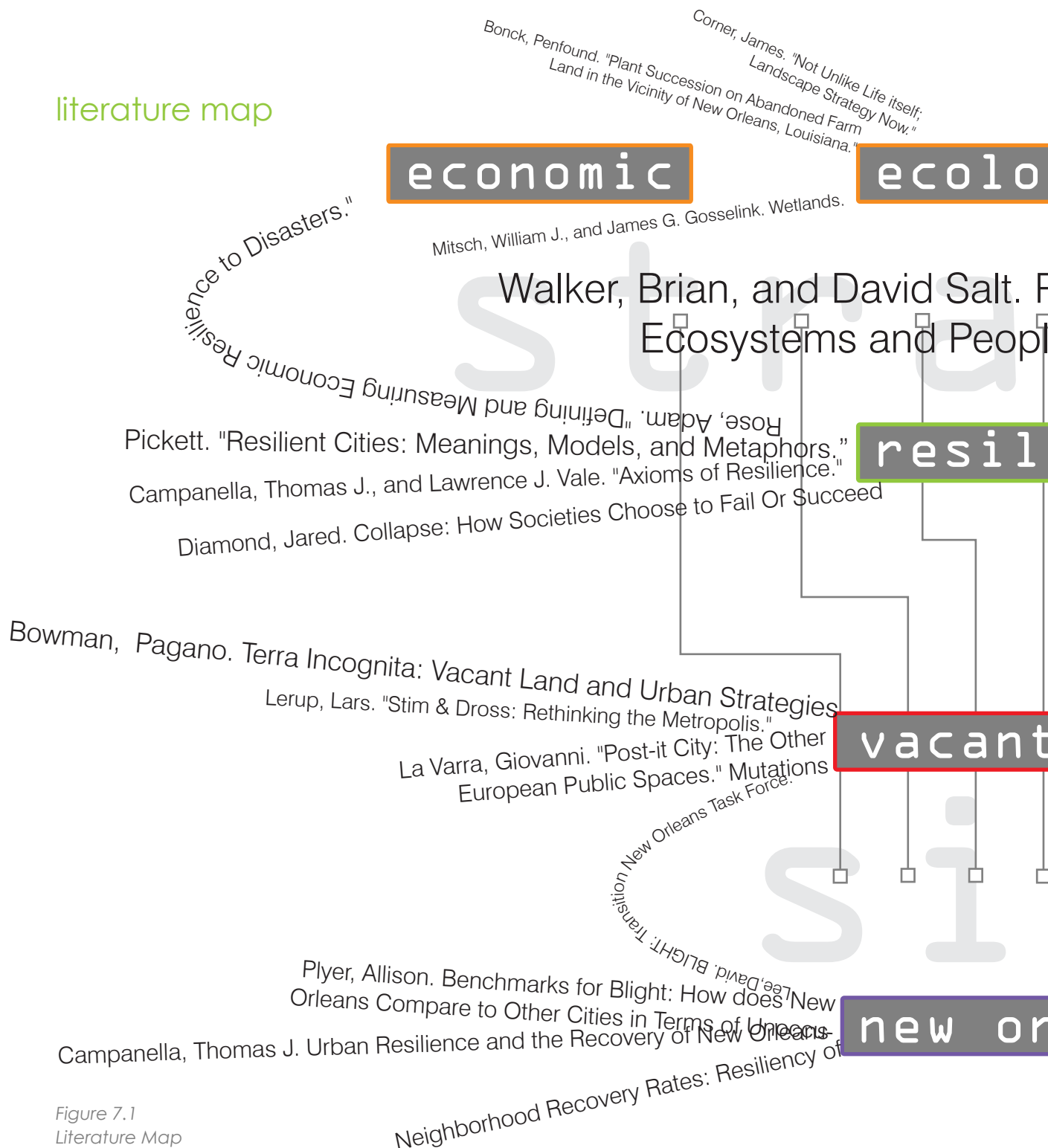


Figure 7.1
Literature Map

Ogden, Campbell. *Constructed Wetlands in the Sustainable Landscape*
Stormwater Strategies: Community Responses to Runoff Pollution

Margerum. "Getting Past Yes: From Capital Creation to Action."

gical

social

Jacobs, Jane. *The Death and Life of Great American Cities*

Cropp, Gabric. "Ecosystem Adaptation: Do Ecosystems Maximize Resilience?"

Resilience Thinking: Sustaining Life in a Changing World

ience

Urban Resilience Research Prospectus

Berger, Alan. "Drosscape."
Blomley, N. K. *Unsettling the City: Urban Land and the Politics of Property*

land

Plyer, Allison. *Benchmarks for Blight: The New Orleans Principles*

leans

Campanella, Richard. *Bienville's Dilemma: A Historical Geography of New Orleans*

Delta Urbanism: New Orleans

literature review

The following pages discuss the primary sources that the project drew from. This review notes relevant ideas from sources related to wetlands design, planning for vacant lots, and collaborative planning, design, management. The two pieces by Campanella provide important insights regarding the City of New Orleans. The literature helped the author take a more holistic view of the design process and address key issues in greater depth.

wetlands design

Wetlands, 2nd Edition, William J. Mitsch and James G. Gosselink

Mitsch and Gosselink provide a comprehensive reference for the ecology and management of wetlands. The text gives a good background of the management and study of wetlands, and describes the different types of wetlands in North America. The book gives a detailed account of the wetlands environment, the hydrology, the biogeochemistry, the biological adaptations to the wetlands environment, and wetland ecosystem development. This book was also good for learning the different types of wetlands particularly the freshwater marshes and southern deepwater swamps are discussed in some detail. Geographical extent, geomorphology and hydrology, chemistry, and ecosystem structure, function, and models for each given type of wetland are elaborated on. These discussions have helped to operationalize the types of wetlands that could be used as reference for this project, and how they will be influenced by urban conditions. There is also a detailed section on the management of wetlands and their values in communities that is of benefit for the human interaction elements of this project.

Constructed Wetlands in the Sustainable Landscape, Craig S. Campbell & Michael H. Ogden

Constructed Wetlands is a good text for understanding the potential of constructed wetlands, and their ability to integrate water renovation processes with public amenities and act as functionally pleasing elements in the landscape. It describes in detail the elements attributed to wetland functions as well as its aesthetics and how they make work in combination. Constructed Wetlands also recognizes the role Landscape Architects have taken to progress this integrative function of wetlands. This book reinforces the concept that natural systems are not only a functional approach but also a practical approach to treat wastewater because they are self-maintaining and self-organizing. They can treat heavy metals and toxic organic compounds, and they are easy to operate. This is especially beneficial to this project because it offers a framework for using ecosystem services as a practical self-sustaining approach to support human needs and services.

Wetlands Design: Principles and Practices for Landscape Architects and Land-Use Planners, Robert L. France.

This book illustrates and reinforces many key principles made by the two previous books. This book is especially useful for designers because it synthesizes a wide body of scientific works into an easy to read text for a designer. In one chapter, it focuses on the site-specific principles of wetlands for stormwater treatment, which will be of beneficial use when considering it on a site-specific scale.

resilience thinking

Resilience Thinking: Sustaining Ecosystems and people in an ever-changing world, Brian Walker & David Salt

This book by Brian Walker and David Salt offers an overview of thinking in a resilient framework as compared to the more popular approach of sustainability. It takes key strategies such as multi-scalar approaches, ideas of modularity and adaptability, and especially the services that ecosystems can provide, both functional and aesthetic and applies them to real world scenarios. Resilience thinking makes some key assumptions on the way things develop currently. First is that optimization and increased efficiency can be detrimental to sustainability when they are considered apart from the system as a whole. Secondly, everyone exists in a social system, which intricately links to the ecological world. In this sense, we all exist in socio-ecological system, which means that one change to either domain will ultimately affect the other. Third, these socio-economic systems do not react in a predictable manner, but exist in alternate stable states. Shocks and drivers can push them across these thresholds between stable states. Fourth, resilience is the ability of a system to absorb disturbance, to undergo change and retain essentially the same function, structure, and feedbacks. A resilient socio-economic system has a greater capacity to avoid unwelcome surprises in the face of external disturbances and thus a greater capacity to continue to provide us with the goods and services that support our quality of life. Lastly, resilience is not necessarily concerned with the speed of recovery, but the ability to recover from a shock or change.

Environmental Land Use Planning and Management, John Randolph

John Randolph's book focuses on the explanation of land use planning and management as it is happening in today's society. Randolph's book looks at current plans, designs, programs, and analytical approaches, that have been developed by government agencies, private designers and developers, land trusts, and non-profits to illustrate planning methods. The book has two parts; Part I, "Environmental Land Use Management," introduces concepts in collaborative environmental management, land conservation, environmental design, government land use management, natural hazard mitigation, and ecosystem and watershed management. Part II, "Environmental Land Use Principles and Planning Analysis," focuses on land analysis methods in GIS, soils and slope analysis; assessment of stormwater and quantity and quality, land use and groundwater protection, ecological assessment for vegetation wetlands, and habitats, and integrated analytical techniques like land suitability analysis. This book is especially helpful in demonstrating how to collaborate on a given project, the elements of a given collaboration, the overarching objectives, the critical components, the stakeholders' involvement, and the techniques and tools for community participation. Along with a summary of the collaborative process, Randolph describes several other land use processes in management and analysis. In particular, the section identifying techniques and approaches to natural hazard mitigation is extremely helpful, especially for assessing potential floodplain damage and approaches to mitigating or avoiding that hazard. In addition, a section on the benefits of urban forests and wetlands is helpful in supporting wetland and rain-garden creation in places such as St. Roch.

New Orleans

Bienville's Dilemma, Richard Campanella

Bienville's Dilemma gives an overview of the dilemmatic history that is New Orleans. It discusses eight different time periods of the city's development. These time periods follow New Orleans' own evolution from a pristine landscape first explored by European explorers to Bienville's decision to site New Orleans, up to its ongoing recovery from Hurricane Katrina. The eight sections of the book are as follows: Forming the Landscape, Settling the Landscape, Urbanizing the Landscape, Populating the Landscape, Manipulating the Landscape, Humanizing the Landscape, Devastating the Landscape, and Restoring the Landscape. Along with these sections, there is a great in-depth timeline of New Orleans that lists key dates, events, and stages in the city's history. Overall, Bienville's Dilemma is a great text for getting a better understanding of how the landscape and people have made New Orleans into the interesting place that it is today.

Delta Urbanism, Richard Campanella

Delta Urbanism is a good adjoining text to Bienville's Dilemma, and is similar in format. The text is setup in episodes, similar to Bienville's Dilemma. It examines the Mississippi delta, and other deltas in the world, discussing ways to keep them healthy. Of the key points to take out of this text is the idea Louisiana Senator Mary Landrieu makes in the preface, in which she praises the Dutch for their ingrained principle to live with the water instead of fight it. Along with this point, Campanella shares a list of lessons from living in the Mississippi delta. Some of the lessons that may be applied to this project include: deltas are great places to live, deltas need freshwater and sediment, we should strengthen levees but avoid

building new ones, soft edges may protect better than hard ones, raising houses individualizes flood protection, and legal issues complicate restoration efforts.

vacant land management

Drosscape: Wasting Land in Urban America, Alan Berger

Drosscape lists eight strategies for designing with leftover landscapes, or un-managed land. Drosscapes examines processes of deindustrialization, and how the principles of Drosscapes can be applied to urban areas. Identifying vacant areas as interstitial spaces and opportunities for drivers in a community are a key point of this master's project. Drosscapes defines a process that could drive how the St. Roch project operate in the real world. Drosscapes defines the process as an unknown client approach, instead of typical client-consultant methods, it is more prone to identify ideal clients in a community to drive the project. This is relative to this project, as the project seeks to identify key stakeholders in the community instead of waiting for outside developers to come in.

conclusions

Together these sources helped inform the methodology and design decisions. They also shaped the project into its final product and serve as good jumping off points for future researchers.

glossary

- Resilience – the ability of a system to absorb disturbance and retain its basic function and structure. Specified Resilience – Resilience to disturbances that you are aware of. General Resilience – resilience to disturbances that you have not even thought of. (Walker & Salt 2006)
- Temporary Wetlands – Areas that are wetted longer than a typical rain garden but shorter than the allotted time to allow mosquito and vector reproduction. They are not as highly functional as a wetland but serve the purpose of stormwater treatment. The term is typically shortened to wetlands throughout the book (Author).
- Stakeholders – those affecting change as well as those being affected by it, also known as actors. (Randolph 2004)
- Collaborative Environmental Planning and Management – Collaborative planning uses stakeholder involvement couple with scientific basis to produce holistic and proactive approaches that integrate a wide array of solutions. (Randolph 2004)
- Collaborative Learning – Through community, trust, openness, and responsibility, groups are able to rise above initial perceptions to learn from one another and develop creative solutions. (Randolph 2004)
- Thresholds – Levels in underlying controlling variables of a system in which feedbacks to the rest of the system change. (Walker & Salt 2006)
- Adaptive Cycles – A way of describing the progression of social-ecological systems through various phases of organization and function. Four phases are identified: rapid growth, conservation, release, and reorganization. The manner in which the system behaves is different from one phase to the next with changes in the strength of the system's internal connections, its flexibility, and its resilience. (Walker & Salt 2006)
- Adaptability – the capacity of actors in a social-ecological system to influence the system's trajectory (relative to threshold) and the positions of thresholds (Walker & Salt 2006)
- Ecosystem services – the unmarketed and unquantifiable values, such as life support, regenerative, and cleansing services provided by nature (Walker & Salt 2006)



appendix b



site selection flowchart

The following flowcharts give a step by step process for selecting sites for both community gardens and temporary wetlands. The flowchart is an example for effecting stakeholders to pick appropriate sites given their program use. The flowchart was developed using GIS and based on the literature and precedents. It is the actual framework used for selecting the two given sites in the presented design process.

community garden suitability criteria

Proximity and visibility to daily uses allows the site to integrate into the daily lives of the community. Visibility promotes a level of safety by allowing openness and creating a defensible space (Zelinka 2004).

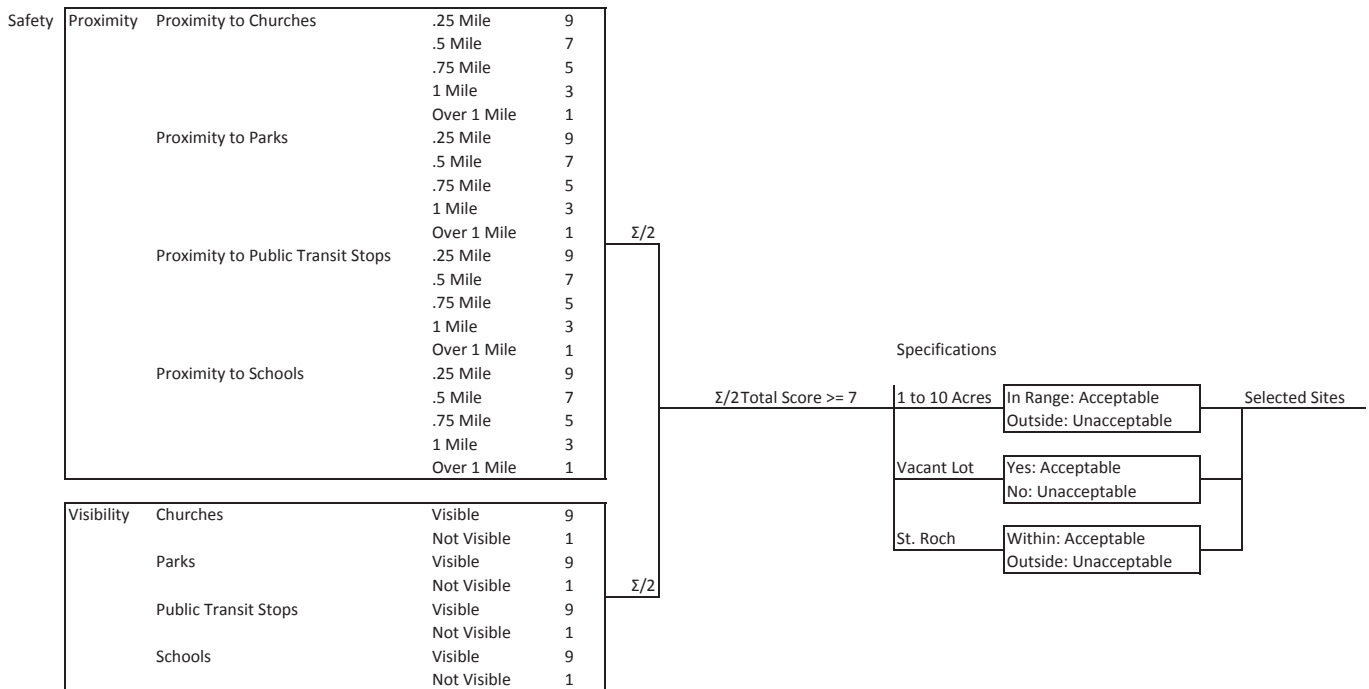


Figure 7.2
Community Garden Site Analysis Flowchart

Site Selection Criteria

9	Most Suitable
8	
7	
6	Moderate
5	
4	
3	Least Suitable
2	
1	

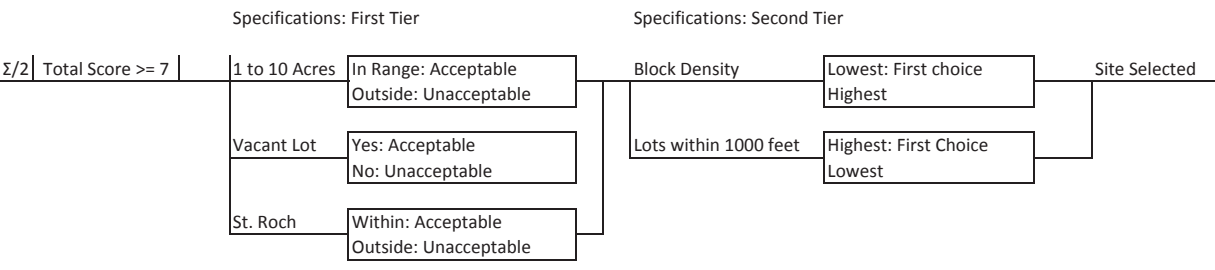
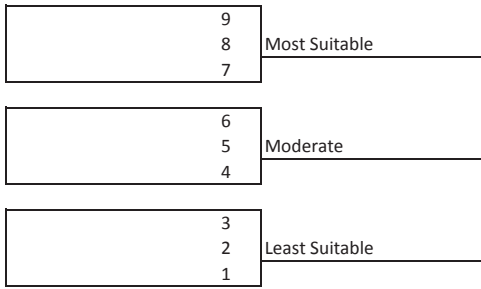
wetland suitability criteria

This is not an absolute set of criteria, but a jumping off point for the community to identify potential sites for pocket wetlands.

Environmental Conditions	Hydrology	FEMA Floodzone	100 Year Floodzone	9	<div style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px; margin-bottom: 5px;">Σ/6</div> <div style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px;">Σ/2</div>
			500 Year Floodzone	5	
			Outside 500 Year Floodzone	1	
		Duration of Katrina Flooding	September 18 to 21	9	
			September 14 to 15	7	
			September 12 to 13	5	
			September 10 10 11	3	
		Proximity to Drainage Canal	Before September 9	1	
			Fronts Canal ROW	9	
			.25 Mile	7	
			.5 Mile	5	
		Depth to Water Table	1 Mile	3	
	Over 1 Mile		1		
	1 Foot to Water Table		9		
	2 Feet		7		
3 Feet	5				
	Over 3 Feet	1			
Soil	pH Level	Under 6.8	9		
		6.8 - 7	5		
		Over 7	1		
	Permeability	Very Poor Drainage	9		
		Poor Drainage	7		
		Moderate Drainage	5		
		Good Drainage	3		
	Very Good Drainage	1			
Social Conditions	Proximity	Proximity to Parks	Inside .25 Mile	9	
			Outside Walking Distance	5	
Density	Population Density	4200 People/Sq. Mile	9		
		8400 People/Sq. Mile	7		
		12600 People/Sq. Mile	5		
		16800 People/Sq. Mile	3		
		21000 People/Sq. Mile	1		

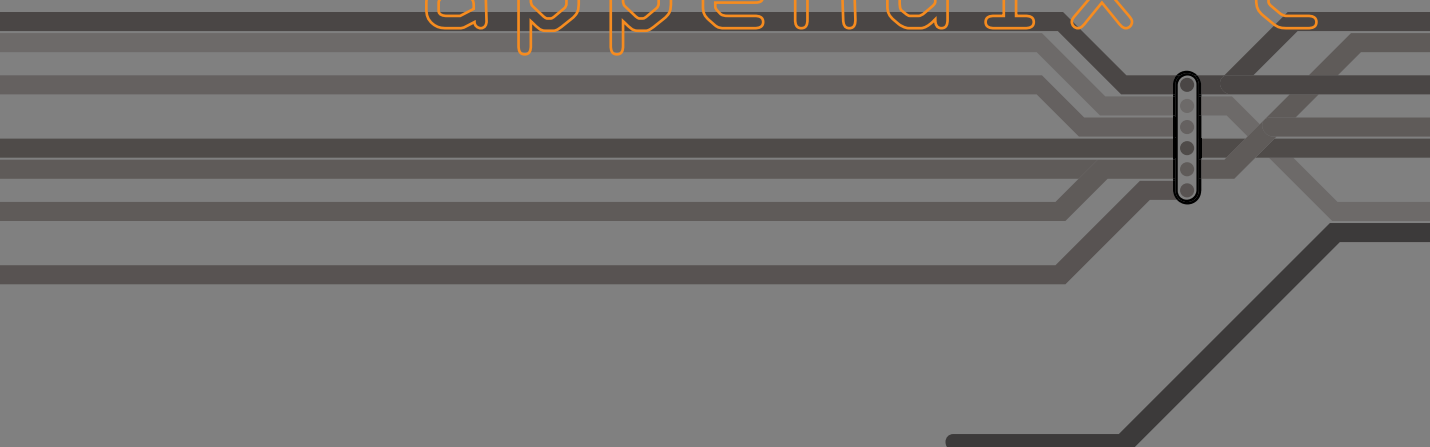
Figure 7.3
Wetlands Site Analysis Flowchart

Site Selection Criteria





appendix c



precedent study

Philadelphia Green introduction

Project Name: Philadelphia Horticultural Society's Philadelphia Green

Site Location: Philadelphia, PA

Design Organization: Philadelphia Green

Client: Various Community Groups

Date Designed and Built: Ongoing

Project Background: The Philadelphia Green Program operates under the Philadelphia Horticultural Society (PHS 2010). PHS has been operating for 182 years in Philadelphia with the mission to “motivate people to improve the quality of life and create a sense of community through horticulture” (PHS 2010) Philadelphia Green began in 1974 as a grassroots effort to plant more neighborhood vegetable gardens. The program has grown from individual vacant lots to neighborhood parks to large-scale city center parks. The core concept that drives PHS and Philadelphia Green is its call for volunteering—“the act of getting together with other gardeners of all backgrounds and working the soil” (PHS 2010).

Since Philadelphia Green's inception over thirty years ago, there has been a significant sign of renewal in the

social, economic, and ecological environments. It operates by way of the partnerships with residents, community groups, government, and businesses (PHS 2010).

Rationale for Selection: Philadelphia Green was chosen because of their ability to embrace the community through creative outreach programs. This outreach allows them to reach a large sample of their communities. They have been instrumental in illustrating the potentials of vacant lots and forgotten neighborhood parks, as well as streetscapes, three areas that need to be address in St. Roch. They also illustrate practical approaches to planning and design in impoverished urban settings.

Goals + Process

Under the Green City Strategy, PHS and Philadelphia Green have set the following goals for their urban greening program (PHS 2004):

- Develop and preserve community green space
- Plant trees
- Create green streetscapes
- Revitalize parks and public spaces
- Reclaim abandoned land
- Provide long-term landscape management
- Support open space planning
- Build community capacity

Process: For a typical vacant lot, Philadelphia Green starts by identifying the owner of the parcel. If the owner is unknown, Philadelphia Green offers an array of through city departments to acquire stewardship or outright ownership to redevelop the parcel (PHS 2010).



Figure 7.4
Norris Square Perspective



Figure 7.5
Norris Square Perspective of Museum Lot

Carroll Park



Figure 7.6
Carroll Park Location



Figure 7.7
Carroll Park

Location: 58th & Girard Ave. Philadelphia, PA

Type: Neighborhood Park

Programs: (per Jost 2010)

- Site amenities replacement
- New Playground
- Entry Garden
- Spray Pad
- Summer Camps
- Summer Concerts
- Community Pride Celebrations
- Movie Nights

Management Strategies: Initially a set of individual community members cleaned up the park on a weekly basis. Once the rubble was cleared, the city provided lawn maintenance during the park's planning stages and continued use (Jost 2010).

Participating Partners: Individual Community Members (Jost 2010).

Cliveden Park



Figure 7.8
Cliveden Park



Figure 7.9
Cliveden Park Location

Location: Chew Ave. Philadelphia, PA

Type: Neighborhood Park

Programs: (per Jost 2010)

- Farmer's Market
- Flexible Open Space and Tree Cover
- Stormwater Demonstration
- Individual Raingardens
- Youth Music Educational Programs
- Park Patrols
- Natural Wetland
- Field Days

Management Strategies: A group called Kids Care and Friends of Cliveden Park were formed to take stewardship of the park. Kids Care was the original group to form because of a lack of care or maintenance for the park. Friends of Cliveden Park followed after as an advocacy group for the Park (Jost 2010).

Participating Partners: Friends of Cliveden Park Kids Care, Bank of America, Philadelphia Department of Environmental Protection, Philadelphia Water Department (Jost 2010).

conclusions from Philadelphia Green

A study done by the Wharton School at University of Pennsylvania was a large scale investigation to see the effects of greening investment in the New Kensington neighborhood. The study found that community investment in greening has led to increased home values of up to 30% (Wachter 2004). New street tree plantings can lead up to a 10% spike by themselves (Wachter 2004). The neighborhood's New Kensington Community Development Center has partnered with Philadelphia Green to address and stabilize vacant lots in the neighborhood and surrounding areas.

The methodology for analyzing the neighborhood was based on the hedonic regression analysis. The analysis provides a predicted value at which the property will sell (Wachter 2004). This methodology relates to the properties relationship to neighborhood amenities, public investments, and disamenities. With these criteria, the transaction price at the time the property is sold is also taken into account, to give a baseline of the status of the neighborhood. The results also combine features of the house to equation such as the aesthetics and home features. The findings emphasize vacant lot management as well as proximity to transit as the most important factors in the home value increase (Wachter 2004).

The study lists four types of transformations that take place to stabilize vacant lots.

- *Stabilized Lot*: lots cleared of trash and debris, planted with lawn and trees, and then maintained by NKCDC and the community.
- *Urban Agriculture and Horticultural Retail*: lots cleared of trash and then used to produce vegetables and sell plants.
- *Community Gardens*: lots used entirely for aesthetics and recreation or passive activities.
- *Sideyards*: a lot transformed to a personal garden for an individual homeowner or group of homeowners (Wachter 2004).

program application to St. Roch

Figure 7.10 illustrates the programs synthesized from the Philadelphia Green precedent study and applies them to the St. Roch neighborhood parks, streetscape, and vacant lots. This initial programs list was used to generate ideas for the selected project sites.

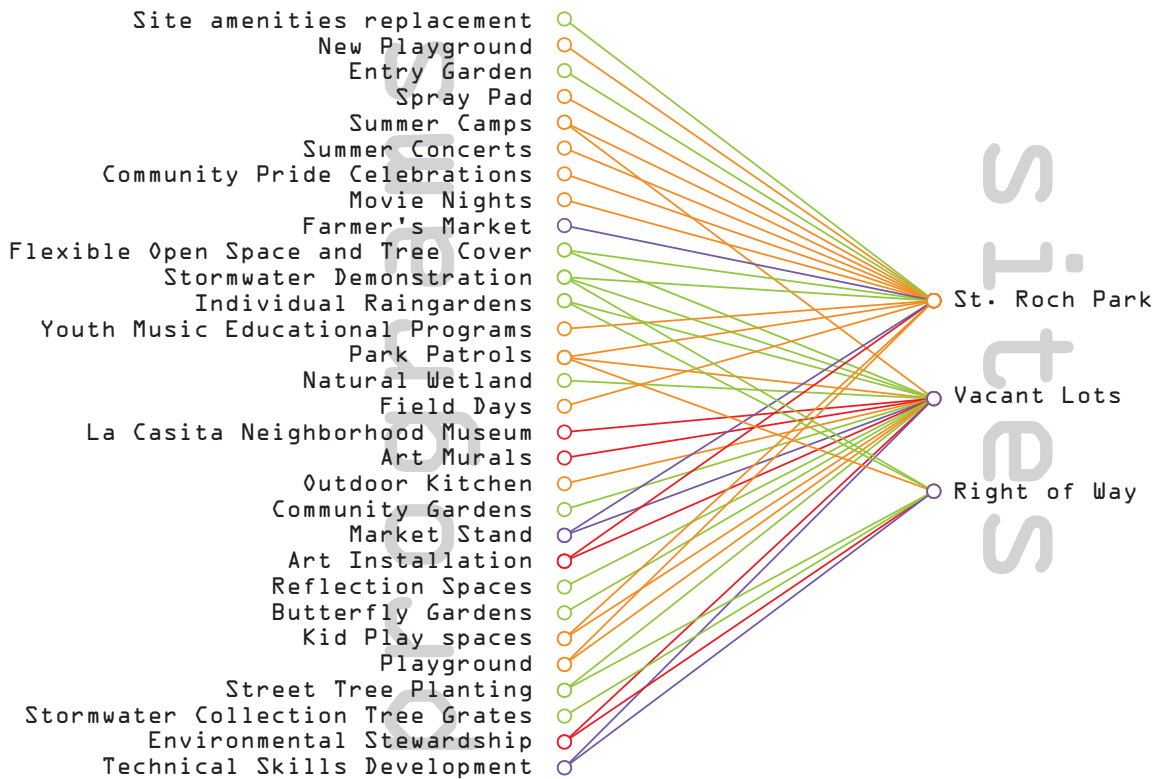


Figure 7.10
Programs Application to St. Roch

