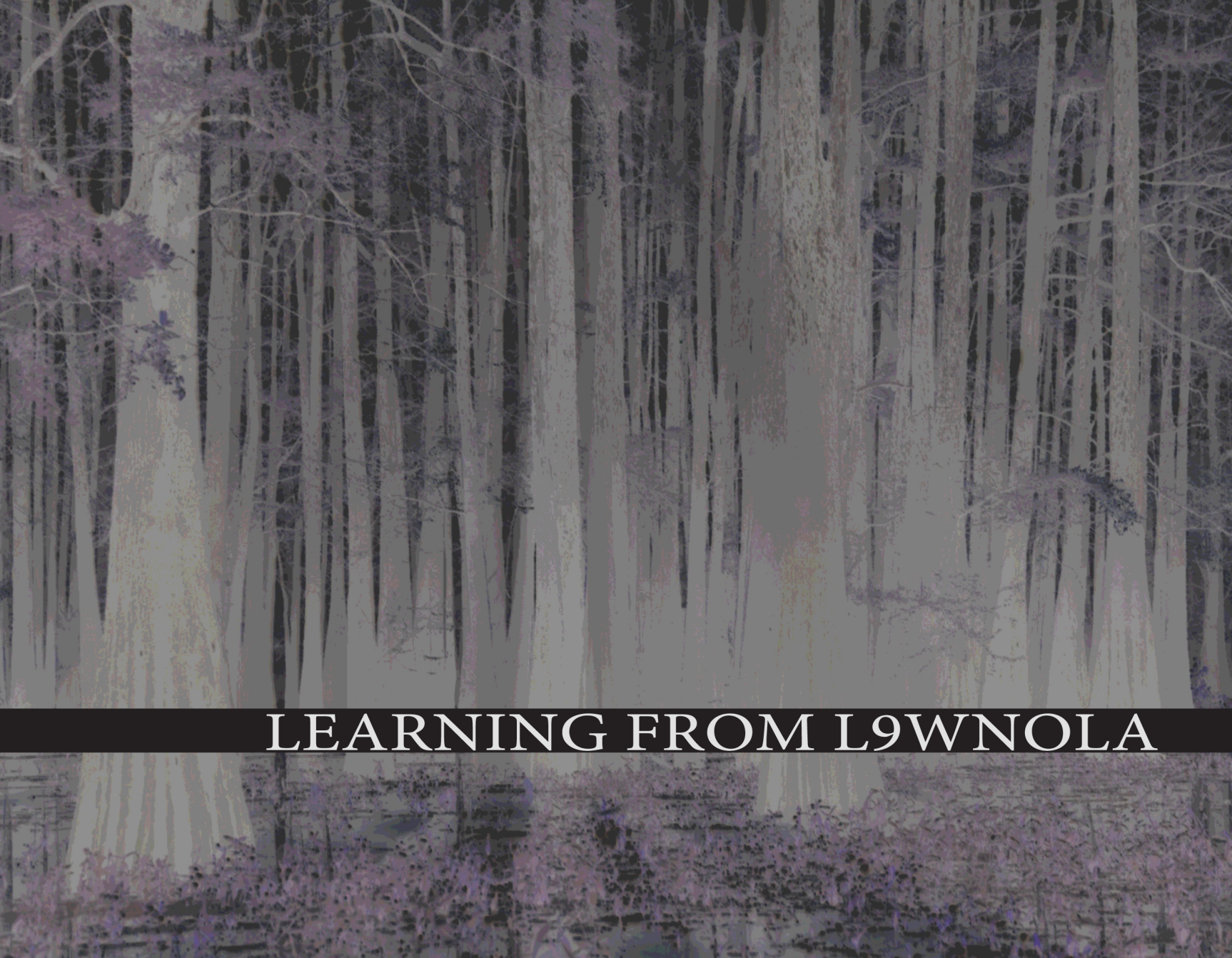
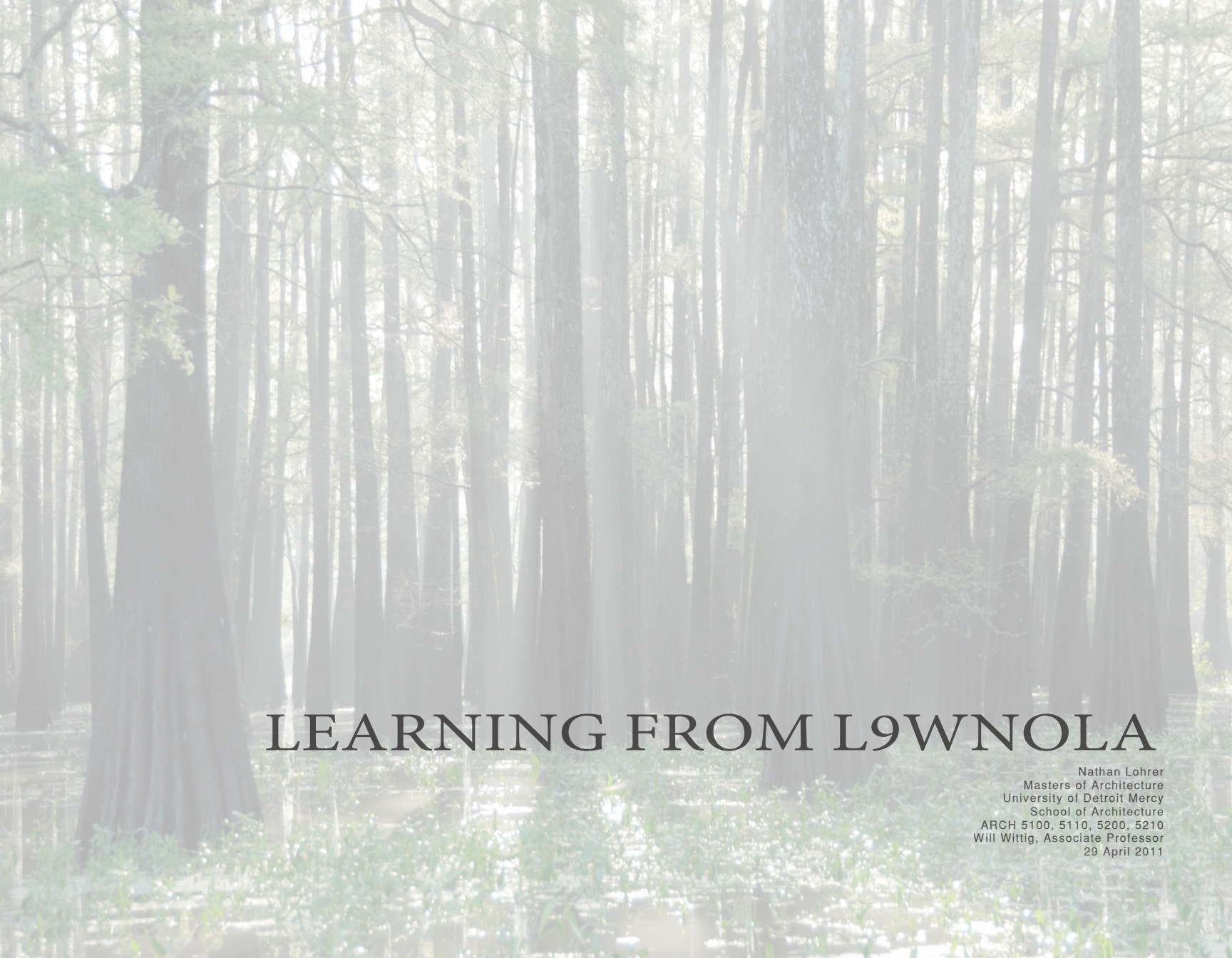

LEARNING FROM L9WNOLA



LEARNING FROM L9WNOLA

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29 April 2011

This body of work is dedicated to

My wife Rachelle, for always supporting me no matter how disconnected I became.
My son Alexander, may your generation experience less conflict than ours.
My mother Nancy and father Robert, for always supporting me in my endeavors.

Special thanks for those who aided me in crafting this body of work

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Virginia Stanard
Charles Cross
Dan Pitera
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Abstract

Throughout history traumatic events have served as a catalyst for the reinvention of the city. Through destruction cities are able to change the ways in which they function, address issues that limit growth, provide opportunity for social reform, or even change the way a community views its architecture. Although this is not always the case, many traumatic events have destroyed cities, communities, and even civilizations to the point where they are unable to recover. At no point in history were these disastrous traumatic events more common than in the past century. Due to new technologies in media, the horrors of a disaster can be seen from start to finish in the confines of ones own home, far from any real danger. Because of these new technologies we are forced to acknowledge the fact that our cities are vulnerable and fragile. If communities are to truly move forward from disaster then recovery is not the only response that needs to take place; growth needs to be nurtured.

Only through examining, comparing, and contrasting traumatic disasters, both natural and man made, can a narrative start to be told of how post traumatic growth can develop. Events such as the 1906 San Francisco Earthquake and Fires, Great Chicago Fires of 1871, and World Trade Center attacks of 2001 provide insight into the relationship between communalization and the possibility for a traumatic experience to have a positive out come. In events such as Hurricane Katrina, Buffalo Creek flooding, and Philadelphia's Move incident inappropriate responses have lead to a physical recovery, but the communities are still far from being

sustainable.

Post-Hurricane-Katrina/Rita New Orleans, specifically the Lower Ninth Ward neighborhood, shall be used as a vessel for testing theories of post-traumatic recovery scenarios. Never has any traumatic event so completely crippled a city like that of Hurricane Katrina/Rita. The mandatory evacuation of all non-essential personnel was the first of its kind. While essential personnel attempted to restore services to the area, its residents were spread throughout the United States of America, many with no family or home to go to. Even five years later the population of New Orleans is at 60% of what it was before Hurricane Katrina. The Lower Ninth Ward neighborhood is considered to be the most devastated area hit by Hurricane Katrina due to its relationship with the levee system and the MRGO water passage. It is the goal of this thesis that by learning from past traumatic scenarios a narrative can be written that starts to address the needs of a city to grow into a sustainable community following a traumatic event.

Research

Throughout history cities have been destroyed due to man-made and natural disasters. This destruction does not always spell doom for those cities, in fact in many cases the events of destruction act as a catalyst for re-invention and growth, although this takes careful planning and determination from the residents all the way up to political and social leaders. Cities take years, decades, and sometimes centuries to develop so it is no surprise that recovery from these devastating events also takes time. Disasters can change the way in which we think about our built environment therefore altering said environments in an attempt to counteract the destruction in the future. George Santayana, a Spanish philosopher and poet once said, "Those who cannot remember the past are condemned to repeat it."[1] Much like it takes a disaster to destroy a city, it takes a community to rebuild it. In cases such as San Francisco, Chicago, and New York transformative events had united the victims of the cities providing the opportunity for re-invention.

1 Santayana, George. 1905 p 284

Lisbon

In 1755 the Capital of Portugal, Lisbon was suddenly destroyed by an earthquake. The following is a description of the city before the destructive event.

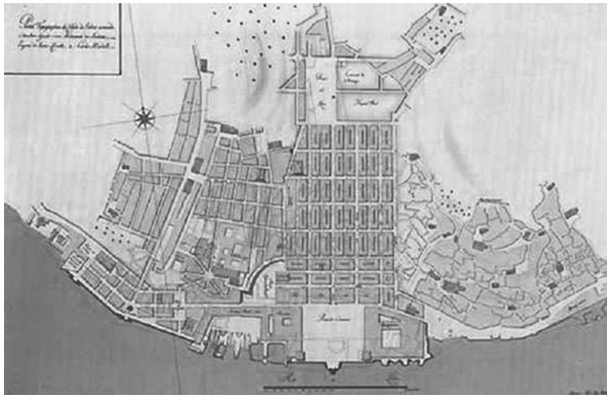
> *The ceremonial and commercial heart of the city was centered on the Royal Palace, built directly on the riverfront. On the eastern side of the palace was a large square. Merchant and retail houses stood along a series of jumbled alleyways and narrow streets constructed over alluvial landfill between steep hills. The other major urban axis was inland to the north, a large public square called Rossio. In essence, the area between these two urban public spaces, called the Baixa, formed the late medieval city. Lisbon, formerly under Muslim control, had been conquered by Christian knights in 1147 and the Moorish part of the city comprised of a series of steep, narrow alleyways built on the sharp slopes to the east of the Baixa under the walls of the old citadel, renamed Saint George's Castle after the Reconquista. By the mid-eighteenth century the city had also expanded to the hills to the west and along the riverbank. Here stood many religious establishments and the palaces of aristocracy.*[1]

The Great Lisbon Earthquake occurred on All Saints Day, November 1, 1755 and was roughly an 8.5-9.0 in magnitude on the Richter scale. Shortly following the earthquake Lisbon also fell victim to a tsunami, a towering tidal wave very rare in the Atlantic Ocean. The destruction was enormous: some fifty-five convents and monasteries were severely damaged: the riverfront quay sank and disappeared: and the Royal Palace

1 Maxwell, Kenneth. 2002. p 21

was destroyed. It is estimated that nearly 10,000-15,000 people were killed. Approxiametly one third of the city of Lisbon was totally destroyed by the quake and flood.[2]

Following the devastation the recovery effort was entrusted to Marques de Pombal due to the king fearing another earthquake in the area. Pombal quickly appointed military engineers to carry out the planning process. Of these engineers it was Manuel Maia that was appointed to create a dissertation detailing fundemnetal issues to be addressed. He observed what would be the key component for the recovery of Lisbon, the king abonded all rights to his former site of the castle therefore all other must relinquish their rights if so deamed by the planning commity. This allowed for an entire reinvention of the city where it adopted a grid plan designed by Eugenio dos Santos and Carlos Mardel.[3] The following is the description for this new plan:



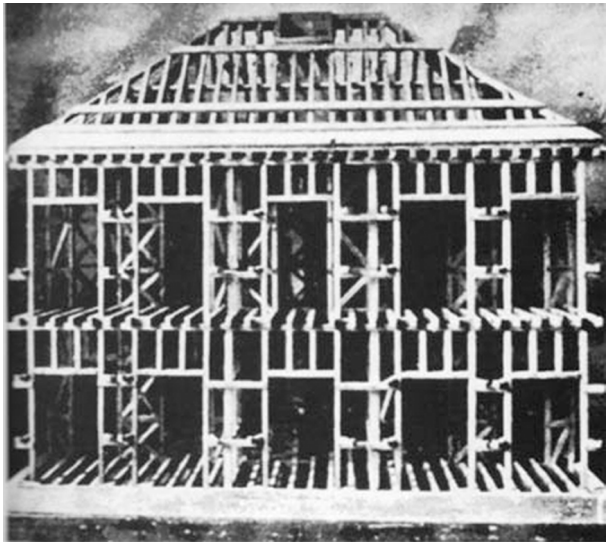
The plan substituted the old royal square with a new square of commerce, the Praca do Comercio. This waterfront square was to have identical buildings on three sides, with ground floor arcades and double pilasters. The north side was broken by a triumphal arch. Two three-story end pavilions of pedra lioz (a pseudo-marble limestone long used in Portugal), one of which was to house the merchants' exchange, anchored the east and west arcades on the river side. The arcaded facades also made use of the contrast between the white pedra lioz used for the standardized stone window frames and the colored palstered walls.

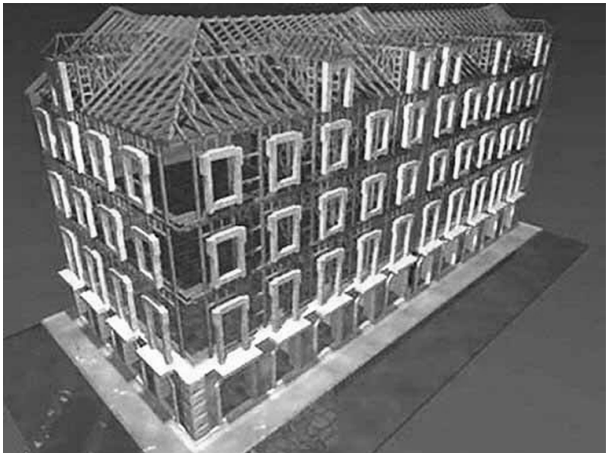
Four main streets, with cross-streets set at right angles, ran inland from the Praca do Comercio toward two newly reconstructed parallel squares of identical buildings, the Rossio and the Praca da Figueira.

2 Maxwell, Kenneth. 2002. p 25

3 Maxwell, Kenneth. 2002. p 29-30

Facing the streets, identical four-story blocks of dwellings were to be built with shops at ground level. Ochre-colored walls were framed at each end by wide-angled pilasters set flat. The buildings were surmounted by double-hipped roofs. A unit of continous architecture was thus created at the heart of the city.[4]





This re-invention of Lisbon essentially created a new city over the remains of the old. Robert Smith stated that Lisbon is the "greatest uniform architectural undertakings of the age of Enlightment."[5] This is a drastict change from the ceremonial city core before the earthquake. The essence of the new center was that it was to be a place of government, of commerce, of the customs house, and the stock exchange.[6]

Also rising out of the devastation was a new standardized architecture which would be made earthquake proof by means of a pioneering anti-earthquake flexible cage, or gaiola, formed of diagonal trusses reinforcing a horizontal and vertical wooden frame.[7] This demonstrates how architecture can start to respond to a disaster. The architecture, by being more flexible, would provide the structure more resilience if another earthquake were to strike Lisbon. This standardized construction lead to the formation of prefabricated materials that could be used in this new architecture of Lisbon. The reconstruction of Lisbon was directly related to the government's aim to stimulate an industrial artisan class in Portugal, and thereby aid Portugal's overall economic development.[8]

The reinvention of Lisbon is clearly a product of Pombal's newly aquired states power. It was stripped of any memory of what it once stood for,

4 Maxwell, Kenneth. 2002. p 31
5 Maxwell, Kenneth. 2002. p 31
6 Maxwell, Kenneth. 2002. p 33
7 Maxwell, Kenneth. 2002. p 31
8 Maxwell, Kenneth. 2002. p 34

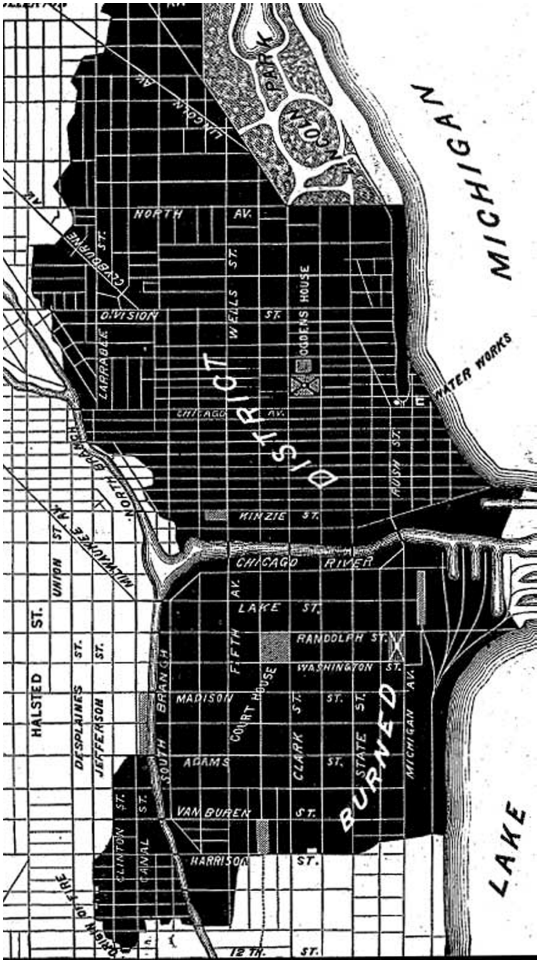
the celebration of the royal family and of the catholic faith. Pombal transformed Lisbon into an engineering marvel of the eighteenth century with its rigid plan and its technological advances in structural design of buildings to resist earthquakes. The new Lisbon also represents a social and economic reform of the city, stripping it of the presence of the royal family and religious faith, replacing it with a city intended to be a utilitarian bourgeois commercial center oriented towards economic growth and development.

Chicago

The Great Chicago Fire began on the evening of October 8, 1871, on DeKoven Street, on the city's impoverished Southwest Side, and continued unabated until extinguishing itself over Lake Michigan thirty-six hours later. Two thousand acres, 1,800 city blocks, and 18,000 buildings were destroyed; 90,000 residents were left homeless. Although less than three hundred were positively identified, many more perished, ecaporating in the fire's extreme heat and leaving no identifiable remains. [9]

Ross Miller's recount of the Great Chicago fires reminds us of how destructive a disaster can be. Following the fires what remained was virtually an uncharted urban landscape, that instead of belonging to the few families that were in the early settlements of what was to become Chicago, belonged to everyman. Former Illinois lieutenant governor William Bross, in an effort to re-invent the city into a progressive new urban landscape, would have people believe that in Chicago the increasing gap between rich and poor, rentiers and renters, landlords and tenants and such class differences are a thing of the past, this in contrast to cities such as Paris, London, and New York that were less able to transform due to their finality. In essence Chicago was a blank slate where the lines of social standings could be. Bross also points out that these horrors of October 8, 1871 provided the catalyst for this changing of the classes, essentially the nothing that remained belonged to everyone. [10]

Bross's myth of an unfinished city was an attempt to draw in investors of all social classes and rebuild Chicago as quickly as possible, rather than focusing on the quality of recovery. As the nation was going through a

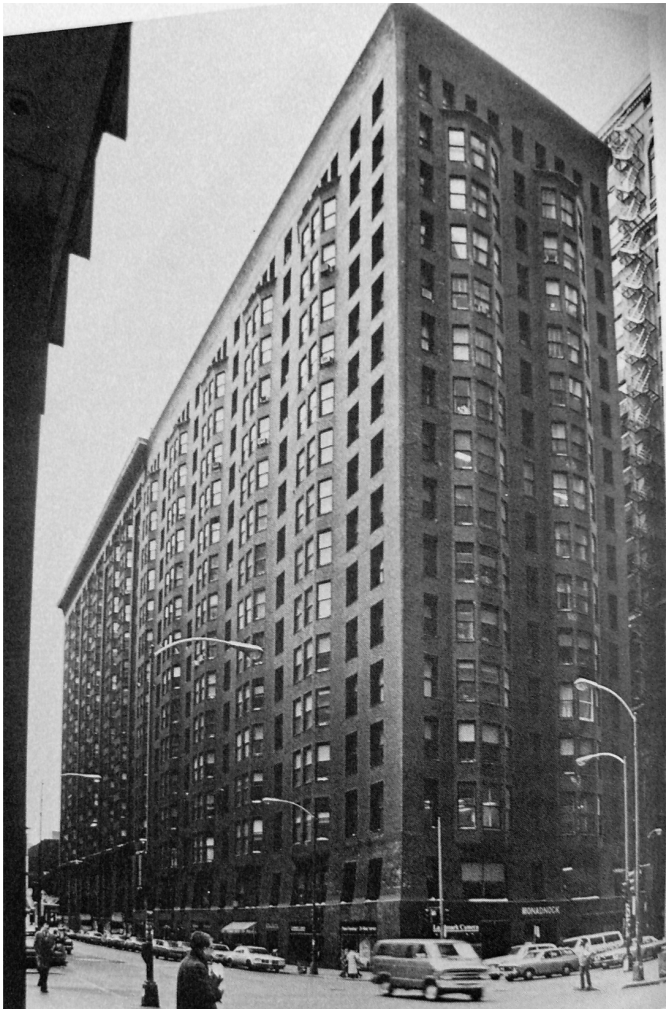


9 Miller, Ross. 2002. p 47
10 Miller, Ross. 2002. p 51

finacial crisis Bross advised that "there has not been, for the last twenty years, so good a time for men of capital to start business in Chicago as now. With few exceptions, all can start even in the race for fame and fortune. The fire has leveled nearly all distinctions."[11] Bross's idea of the reborn Chicago was a capitalist utopia where profit could be made on every street corner. In a time where the nation was struggling it was to be Chicago that had the most to offer in opportunity. Re-invention was plentiful in the newly leveled city, both for individuals and the city itself. Unfortunately this would not be the case, however the city did go through a Re-invention, just not by the working poor to whom Bross appealed. The initial rebuilding efforts by the working poor was nothing more than an attempt to bring trade back to the city and get capital flowing. Once this first stage was completed it was clear that the business men who had developed the city in the first place was who the re-invention favored. According to Miller politicians virtually re-zoned the urban core to exclude all residential buildings and sidewalks made of wood. Modern fireproofing was required for all structures, including those made of iron and masonry. The cost of new construction was prohibitive.[12] It was clear that for building to be profitable with the increased cost of land one would have to build taller and wider, therefore it was large office and manufacturing lofts that started to dominate the landscape not building for the "everyman". One of the best ways to claim land was to put up a building no matter the quality. This idea would eventually lead to the next stage of re-invention of Chicago.

From 1871 to 1873 the availability of reconstruction projects was so great

11 Miller, Ross. 2002. p 52
12 Miller, Ross. 2002. p 52



that architects raced from one project to the next.[13] For this reason little thought was given to the intial recovery effort of Chicago. However, this was not the attitude of all architects at this time. Architects such as Daniel Burnham, John Wellborn Root, and Louis Sullivan waited, studied, and developed plans for the redevelopment and re-invention of Chicago. Many of the structures being erected at this time were of poor design and even worse construction due to the quickness of erection and greediness of architects. In the reclaiming of land during this stage of re-invention the only aspect that mattered is that a building was constructed. The Finacial Panic of 1873 which halted construction and the subsequent Little Fire of July 14, 1874 provided architects such as Daniel Burnham, John Wellborn Root, and Louis Sullivan the opportunity to re-invent the city in their image.[14] If it were not for this first failure of recovery and the secondary fire the city of Chicago may have had a very different landscape today. It was the disaster of a fire that provided the catalyst for re-invention, but it was the failures that provided time for architects to develop new technologies and innovations that today can be associated with Modern architecture of Chicago.

13 Miller, Ross. 2002. p 56
14 Miller, Ross. 2002. p 58

San Francisco

At the turn of the twentieth century San Francisco was a center of world trade and finance, equal in stature to cities such as New York, London and Paris. It was the largest city on the west coast boasting a population of 350,000 and was looking to expand and grow in the future.[15] Unfortunately San Francisco faced its own challenges which included the need for a fresh water supply, rethinking the urban plan, and finally a new overall city image on par with other world-class cities.

San Francisco's architectural characteristics were unique compared to other large cities due to the fact that ninety percent of its buildings were constructed of wood. Like most western boom towns, San Francisco had grown much too quickly and without much regard to long term planning, therefore basic issues arose such as infrastructure and an architectural character which rivaled that of elite cities of the East Coast. Major issues plagued San Francisco such as street structure where major cross streets did not meet and many south of Market Street were nothing more than alleyways that breed crime. Essentially poor planning led to the creation of low income slum developments.

Many business leaders in the city at this time realized that the city required a new image and in 1904 a committee was created with the sole objective of beautifying the streets, public buildings, parks and squares of San Francisco.[16] This committee hired architect Daniel H. Burnham to prepare a master plan for the city in which he proposed great boulevards radiating out from the intersection of Market Street and Van Ness Avenue. The following is Burnham's explanation of his vision:

15 Ramroth, William G. 2007. p 102
16 Ramroth, William G. 2007. p 102-103

"The Panhandle is to meet Market Street at Van Ness Avenue, and the crossing of these three great thoroughfares naturally indicated the center of the city. Accordingly, this junction is to be a spacious concourse, from which wide thoroughfares will radiate in all directions. At this junction there should be constructed a semicircular Place having for its center the intersection of the axis of the Panhandle and Van Ness Avenue."[17]

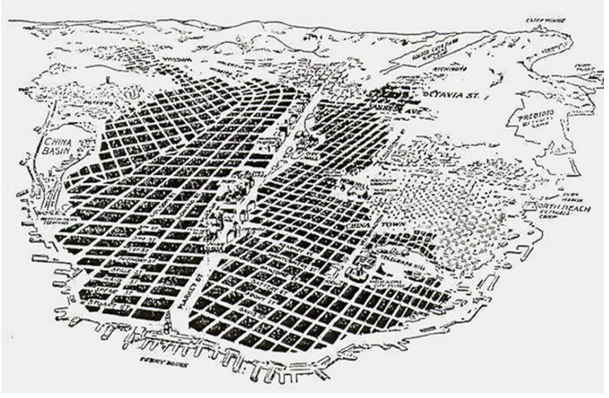
17 Ramroth, William G. 2007. p 103

Buildings, as Burnham suggests, should represent the architecture of the day and therefore he recommended the use of classical columns to be used freely throughout the city. He also proposed for the city to purchase land surrounding the current City Hall Square and construct an arcade or colonnade of regular cornice height terminated by pavilions which would extend the architectural effect of the Civic Center and impose a sense of order. Finally it was found that Burnham's plan would be unworkable with the current structure of the city and many people would be forced to give up their property for the plan to be implemented so the plan was put on the shelf.

On Wednesday April 18, 1906 at 5:13 am the earth below San Francisco began to shake and continued shaking for 48 seconds. The earthquake was extremely powerful and measured an estimated 7.9 on the Richter scale.[18] The areas south of Market Street were hit hardest because they were built on fill. Many houses in this area tilted or collapsed, crushing victims inside. Fires raged from overturned stoves, broken chimneys, and broken gas lines. It was estimated that approximately 52 separate fires were burning at once and the city had no water to fight them.

In an effort to gain control over the madness, dynamiting of buildings was used to create fire breaks. Due to the fact that many of the buildings were made of wood, this created more fires from embers that would float through the air and start to burn on roofs of adjacent buildings. The fires continued for three days and when all was done eighty percent of the city had been destroyed. Few were spared and it made no difference if you were rich or poor, everyone lost something in the destruction.

In the aftermath of the destruction many began to write San Francisco off thinking that the city should just remain in ruins and the residents



18 Ramroth, William G. 2007. p 104

start a new life somewhere else. The residents of San Francisco had other ideas and by that Sunday plumbers were in the streets repairing water, gas, and sewer lines, debris was hauled to the bay and dumped in and reconstruction was under way immediately.

On April 21 the California governor established the first government commissioned scientific committee to investigate earthquakes and made its first report in 1908 which is to this day heralded as a benchmark document for the investigation and study of earthquakes.[19]

Many different opportunities came out of the destruction of San Francisco, one of which being the planning of the city. With much of the city destroyed it was given the opportunity to recreate its plan. Daniel Burnham was once again asked to aid in the planning of San Francisco yet much of his plan was met with opposition from the public. Many refused to relinquish their land for the widening of roads that the plan called for and the San Francisco Chronicle called Burnham's plan a cobweb and reminiscent of grand Renaissance plans of days gone by.[20] Ultimately Daniel Burnham's master plan was not utilized in San Francisco but the City Hall Site did adopt his plan for purchasing land and creating a grand arcade.

Another smaller scale opportunity was recognized by the residents of Chinatown. Before the earthquake Chinatown was the most densely populated, and most dilapidated part of the city. Its old, rundown Victorian buildings, some with hardly a foundation, were mostly destroyed by the earthquake and fire.[21] With the old neighborhood of Chinatown destroyed community leaders made a decision in the

19 Ramroth, William G. 2007. p 105
20 Ramroth, William G. 2007. p 106
21 Ramroth, William G. 2007. p 107

rebuilding to make it an attraction rather than an eyesore. What was created was a whimsical Americanized interpretation of Chinese architecture. Street level restaurants and shops were fashioned to resemble the Chinese pagoda, while floors above were designed as apartments. This started the re-invention of Chinatown into a tourist attraction that is visited by hundreds of thousands of tourist every year.

Finally building ordinances were reviewed and the Building Law of the City and County of San Francisco 1906 established new regulations for the construction, erection, enlargement, raising, alteration, repair, removal maintenance, use, and height of buildings; regulating character and use of materials in and for buildings.[22] The changes made to the building codes were said to be motivated by earthquake resistance but in actuality the motivation came from aesthetics, day lighting at street level, and the dislike of tall buildings by the public and politicians. This was the last effort the city had taken in beautifying its streets and making them wider since one of the ordinances was that a building elevation could only be one and one half the size of the street it faces.

There is no question that the earthquake of 1906 helped shape San Francisco into what it is today. It is unclear if the city would have been able to make some of the changes that it did, had the earthquake not taken place. Essentially it gave San Francisco a blank slate to work with as it sought to give itself opportunities for growth. Although innovations in architecture can not be seen as in the reinvention of Chicago, steps were taken to study the effects of earthquakes through the investigation committee. The fact that earthquakes were something to be recognized as a circumstance that must be addressed for public safety is an example of a step in the right direction. To understand the environment and

22 Ramroth, William G. 2007. p 107

limitations of that environment is the first step towards making smart design reactions. Today examples of innovation in earthquake design can be seen in San Francisco but that recognition of the situation is what led to the innovations in design.

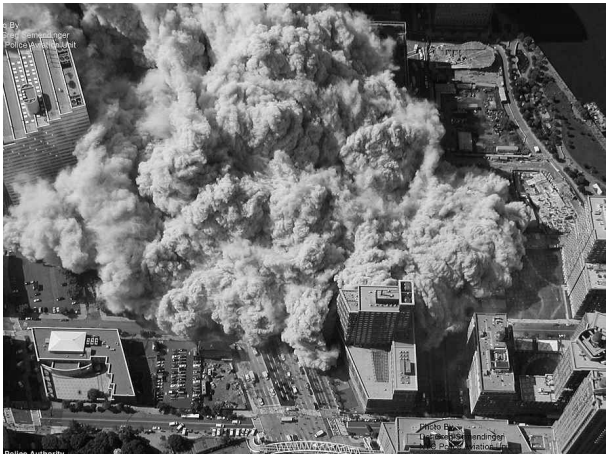
While the urban plan as a whole was not reinvented, examples of neighborhood reinventions were seen in Chinatown. Throughout the recovery of San Francisco it can be seen that the largest driving force was that of the community. Most people not living in or connected to the city had written the city off, but it was the determination and resilience of the community that led to the recovery and in some cases reinvention of the city. Had the community chosen to wait for aid they would also be making a choice, but with each choice there is a consequence and the San Francisco seen today could be very different. Had the Chinatown community members waited for plans to be finalized the chances that it would still be an attraction as it is today could have been very limited. Sometimes the mold must be broken to achieve the extraordinary and move onto growth of a community.

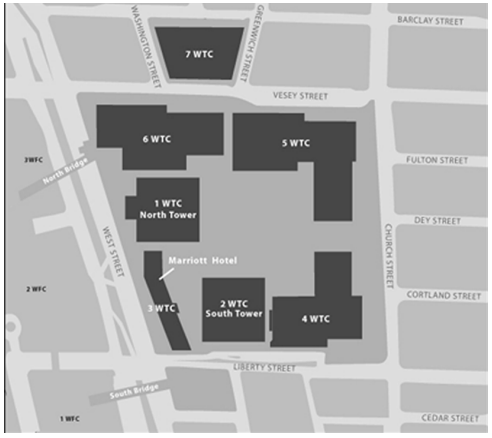
At the turn of the 20th century San Francisco was a city struggling with its own growth. The earthquake of 1906 provided the city the means to address the need for adequate opportunities for growth and fix past mistakes in the lack of long term planning of the city. It did not need an elaborate new plan such as Burnham was suggesting, it just need to be given the opportunity to make thoughtful design decisions for future growth of the city.

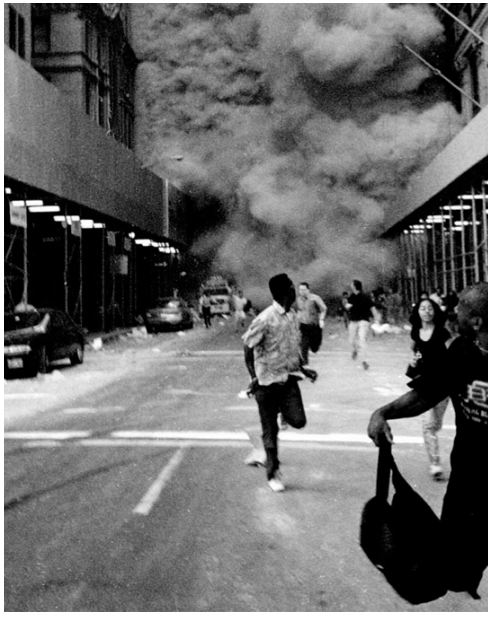
World Trade Center Attacks

There is no question that the World Trade Center attacks on September 11, 2001 were a travesty that will live on in the memories of both those directly and indirectly affected by them. The power of those memories clouds the fact that the city has been drastically changed and a new layer of sacred space has started to emerge in the urban fabric of New York City. While it is unclear how this new layer will shape the city over time, it is evident that there is a new sensitivity associated with the typology of built environment that will be proposed within this new layer of the urban fabric. What has become quite evident is that one single event has changed what was once an extremely profitable parcel in the heart of New York City, with a structure built to maximize that profit, into the first large scale memorialization that can engage the public in everyday life.

Since its early founding days the notion of separation from memorialization was proposed to promote the growth of finance and commerce in a city that was planned to become the economic and cultural center of the nation. It was apparently believed at the time that in order for economic growth to occur there could not be any links to the past. The city was essentially to become an ever progressing machine that had time and space for only the hustle and bustle of everyday dealings. The attitude almost suggests that what most cities would consider historical and cultural treasures would be considered hazardous to the operation of the city. This sense of aversion towards memorial and monuments is so engrained into the city that it is built into its structure. This aversion can be traced back to two decisions that helped determine the shape and character of New York City.







The first of these decisions came on June 20, 1790 when Tomas Jefferson, James Madison, and Alexander Hamilton made a deal to remove the United States Government from Manhattan.[23] This move allowed for the city to take on its own path without the restrictions of ceremonial spaces that would be prevalent in an official capital city. Land usage would be able to be maximized and shaped in such a way that could promote an efficient utilization of that land. Without any monuments or memorials absorbing land the city was free to plan an economical utilization of the land.
In 1811 three state-appointed surveyors published a proposal for development of Manhattan Island that expressed New York's ambitions. The plan was essentially an expansive grid of streets providing space for a million people. The following is a description of the plan and motivating factors:

Two thousand rectangular blocks (the most economical and easiest kind to build on, the commissioners noted) would be linked by 12 arrow-straight avenues and 155 parallel streets, speeding the flow of traffic up and down the island and between the rivers. The commissioners deliberately chose not to set aside any special blocks for public buildings or monuments, nor to provide any ceremonial boulevards, grand axes or focal points that might lend themselves to commemorative purposes. In their eyes, nothing should be allowed to interrupt the commercial bustle of the city, the purposeful sweep of vehicles and pedestrians along its streets and sidewalks.[24]

This proposed plan is obviously unique from prior capital cities with their ceremonial spaces, meandering streets, and designed focal points throughout. New York city was well on its way to disregard the monument, memorial, and its past so much so that it seemed intent on

23 Sanders, James. 2010
24 Sanders, James. 2010

erasing all traces of possible sacred spaces if it got in the way of growth. Throughout the 19th and 20th centuries no structure was safe from the machine of progress and growth and thus if one was to block the means for growth it would be sold or demolished. The first example of this is the Federal Hall, which is where George Washington took the presidential oath and had been home to the federal government. It turned out that the building blocked the path of Wall Street's traffic so it was dismantled and sold for scrap.[25] A second comes from Columbia College who decided that its original building sat on land too valuable for academic use and was moved while trustees sold off the venerable structure, moved uptown and called in the wreckers.[26] No structure could be saved if it was thought to be a threat to "the future" of the city.

As the "future" started to become the present and the city came into maturity a strange phenomenon came to fruition; the city itself became monumental. As it evolved the city became filled with skyscrapers and suspension bridges making modern innovations into monuments that served utilitarian purposes rather than memorializing an event or person. It would be unfair to say that in this new modernized monumental city that no monuments were present and the following is how the city decided to use these monuments:

What little space was available tended to be a result of a single variation in the Commissioners' Plan: a pre-existing path was preserved, as Broadway, and allowed to meander northward, producing a series of triangular ''squares'' where the diagonal street intersected the rectilinear grid. These plots, too small to be developed, were often turned over to commemorative purposes, from the tomb of the Mexican War hero Gen. William J. Worth at 25th Street, to the figure of Father Duffy presiding over Times Square, to the

25 Sanders, James. 2010
26 Sanders, James. 2010

statue of Christopher Columbus perched atop Columbus Circle.[27]

In a sense open space became the home of monuments. This is also true for parks which have become not only recreational spaces but have taken on a secondary function of space for civic memory. But still these monuments are separated from the everyday public hustle and bustle of life and none is more obvious than the cities greatest monument which is the Statue of Liberty. The towering iron-and-copper structure is isolated from the rest of the city by a harbor and city park as not to disturb everyday life. However, a drastic event set in motion the need to create a memorial with in the heart of the city. As was stated earlier the events that occurred on September 11, 2001 added a layer of memorialization to the urban fabric of the city and it was only an event such as this that could have provided the catalyst for this change to occur. What is currently known as ground zero, or the site of the original structures that were attacked, is forever transformed into a memorial. What is still yet to be discovered is how far this idea of a new sacred space within the heart of the city will expand. In conclusion it was an event that shaped New York City into what it is today and an event that will change its path of what it will be in the future.

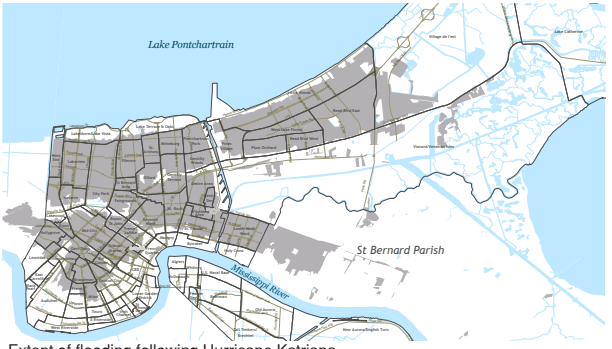
27 Sanders, James. 2010

Hurricane Katrina/New Orleans

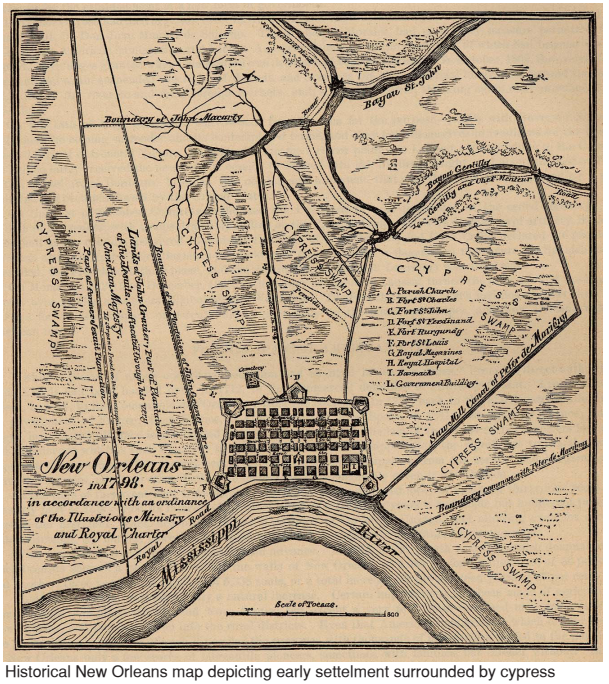
On August 29, 2005 the third most deadly natural disaster in U.S. history, killing an estimated 1,600 people, plowed through the Gulf of Mexico decimating both the built environment and lives of those living in the area. The storm flooded 80 percent of New Orleans destroying over 300,000 single-family residences, 40,000 apartments, and damaged an additional 300,000 structures.[28] Over one and a half million people were evacuated leaving tens of thousands living in a state of limbo and turmoil. This destructive disaster has become known simply as Hurricane Katrina; however it was not the storm that was the sole destructive component in this disaster. Poor planning and judgment, bad decisions, and procrastination over the course of decades setup the destructive nature of Hurricane Katrina. Generations of unplanned growth combined with an inadequate, poorly designed, managed, and engineered flood prevention system has placed mankind's fingerprints all over this disaster.[29]

Setting Up the Perfect Storm of Destruction

Since its founding in 1718 the city of New Orleans has been susceptible to hurricanes and storm flooding. The city was settled due to its proximity to Native American trading portages and the thought that it was far enough inland to be protected from hurricanes. One year after its settlement the city was put to the test while a hurricane destroyed much of it. When the city was replanned and rebuilt engineers were called upon to locate and design the new settlement. This new settlement was a 7 by 11 block



Extent of flooding following Hurricane Katriana



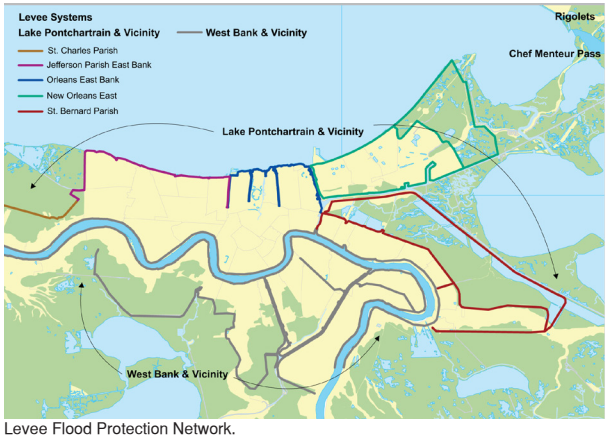
Historical New Orleans map depicting early settelment surrounded by cypress swamps.

28 Ramroth, William G. 2007. p 201-202
29 Ramroth, William G. 2007. p 202

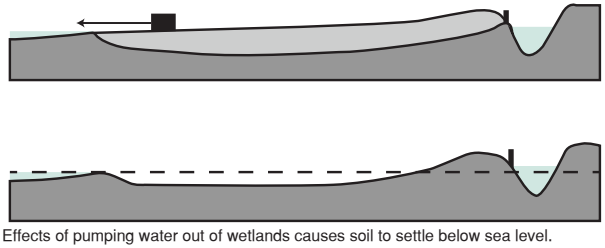
area which is known today as the French Quarter and is less susceptible to flooding than other areas in New Orleans.[30] Its location was along the Mississippi river where a natural levee had been created over time due to the seasonal rise and fall of the river and the sediment that comes along with it. Today flooding from the Mississippi River in this area is minimal to nonexistent due to the addition of flood walls added to these natural levees.[31]

The greater New Orleans area is protected by a system of about 350 miles of levees and flood walls developed in the mid to late 19th century.[32] They meander along the coast lines of the Mississippi River and Lake Ponchartrain. As the city grew and available space was getting more and more sparse areas of Lake Ponchartrain were filled in with earth to create more land for new construction. Levees and floodwalls were intended to hold off water from these new land developments and in theory make them more habitable. Along with this protection came the introduction of screw pumps which could allow for thousands of gallons of water to be removed from areas of marshland and for future removal of flood water that developed from rain and storms.[33]

While these protective elements were intended to make the land around the original settlement of New Orleans safer over time they would have the opposite effect. Before introduction of levees, floodwalls, and pumping stations the settlement had a natural protection from storm surge waters and flooding in the form of sponge like marshland that absorbed flood waters. The levees prevented water from entering the area of marshland and the water remaining in these areas was pumped out throughout the



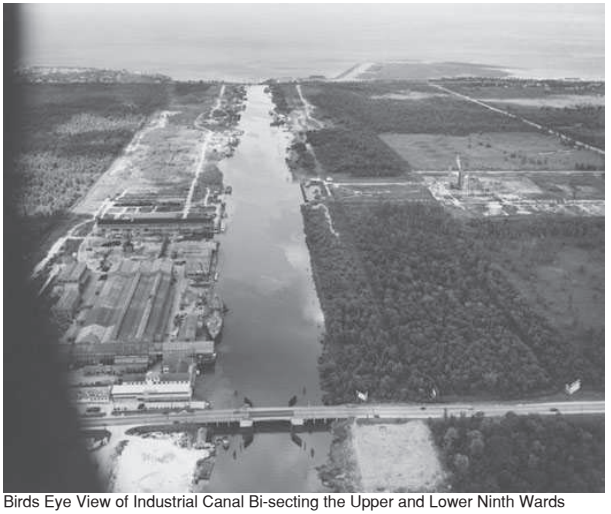
Levee Flood Protection Network.


Effects of pumping water out of wetlands causes soil to settle below sea level.

30 Ramroth, William G. 2007. p 203
31 Ramroth, William G. 2007. p 205
32 Ramroth, William G. 2007. p 203
33 Grossi, Patricia and Rober Muir-Wood. 2010

early 20th century, which dried out the marshland area killing all of the vegetation that was naturally protecting the area. Removal of water from the area also caused the soil to settle, which caused much of New Orleans to sink under sea level and below the rivers and lakes that surround it.[34] As areas developed non-porous surfaces such as roads and parking lots replaced the more absorptive areas of marshlands, but the area was still receiving water from rain and storms making it more susceptible to flooding. This was only the beginning of poor planning decisions that led to the third most deadly natural disaster in U.S. history.

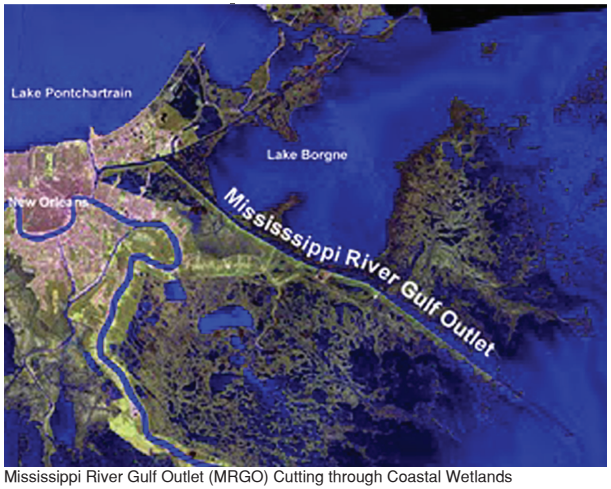
Throughout the early to mid 20th century the need for shorter shipping routes due to the industrialization of the nation led to two of the poorest planning decisions made in New Orleans history. The first came in 1920 with the introduction of the Industrial Canal which provided a shorter route from the accessible lake Ponchartrain and the Mississippi River. The canal bisected much of New Orleans, including the Ninth Ward and Holy Cross neighborhoods, which created a physical segregation from the rest of the city.[35] The segregated portion of the Ninth Ward became known as the Lower Ninth Ward. At the time of the Industrial Canals construction much of the Lower Ninth Ward was still marshland, however as the area became a center of industrial shipping the neighborhood became a desirable location for industrial class workers to settle and build homes. Thus the area was drained and developed into a neighborhood. This hydrological development would also become a funnel for storm surges creating a situation that makes the Lower and Upper Ninth Wards susceptible to storm surge flooding. This potential for destruction was not fully realized until the creation of another hydrological development



Birds Eye View of Industrial Canal Bi-secting the Upper and Lower Ninth Wards

34 Hoeferlin, Derek, Jess Garz, and Stan Strembicki. 2010

35 Ramroth, William G. 2007. p 203



Mississippi River Gulf Outlet (MRGO) Cutting through Coastal Wetlands

intended to shorten shipping routes even further.
In 1965 the Mississippi River Gulf Outlet, also known as MRGO, was completed. This canal was intended to create a more accessible shipping route from the Gulf of Mexico to the Mississippi River. Upon its completion Hurricane Betsy tore through the area bringing to light the consequences of MRGO. The canal acted as a storm surge funnel, which intensified the power of the surge, until it overtopped flood walls and levees flooding many areas that had not previously been susceptible to storm surge flooding. Over time the canal has gradually become wider and wider due to storm surges and shipping freighters causing the wetland banks of MRGO to gradually erode away. Following Hurricane Betsy the flaws in the flood protection and the new shipping routes were exposed and people began to fear the condition of water and the city's susceptibility to flooding. The population began to drop and has continued as the U.S. began to de-industrialize. Improvements to the flood protection systems in place were planned which included raising the heights and reinforcing of flood walls, but for political reasons and procrastinations the improvements were not completed when the system was again put to the test.[36]

The Storm That Changed It All

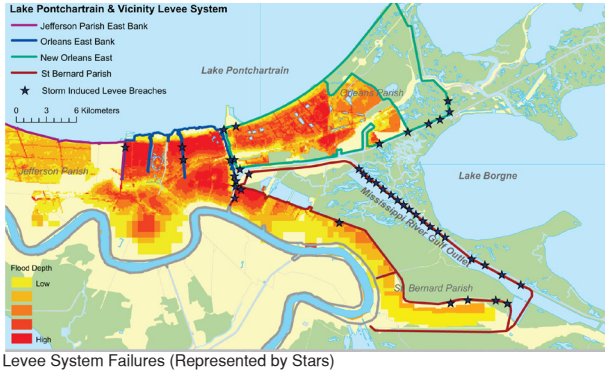
As previously mention Hurricane Katrina struck New Orleans on August 29, 2005. As the powerful storm made its way through the area media coverage was shut off until the storm had passed. As much of the nation could only watch the storm via satellite and diagrammatic progressions the residents remaining on the ground witnessed the horrifying effects of

36 Ramroth, William G. 2007. p 222-226

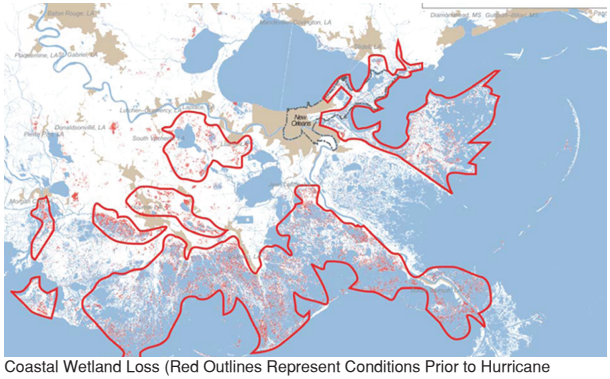
the storm first hand. The sounds of trees being uprooted, howling winds, and houses being plowed off their foundations terrified those who could not leave before the storm hit land. Residents in the Lower Ninth Ward heard loud explosions while soon after their houses were being swept away, and mant thought that the government had blown up the levees to save the remainder of New Orleans. In fact it was a barge that had been thrown against and busted through the levees by the enormous storm surge created by MRGO and the Industrial Canal.[37]

Even before Hurricane Katrina made landfall the destructive effects were starting to be realized along MRGO and in the Lower Ninth Ward. As salt water was forced up MRGO the levees protecting St. Bernard's Parish were being eroded away causing significant flooding damage to the area. As the intense waves continued they ran into the Industrial Canal slamming into the protective flood walls with intense force. Eventually these flood walls gave out as water rushed in the Lower Ninth Ward, New Orleans East, and New Orleans Metro. Along with flood storm surges from MRGO came surges from Lake Pontchartrain which overtopped the foot of the Orleans Canal, and breached sections of the flood walls along both sides of the London Avenue Canal and one side of the 17th Street Canal continuing to flood New Orleans Metro.[38]

Along with the catastrophic damage to properties and buildings came a secondary loss of coastal wetlands. If properly maintained these wetlands could have provided a natural protective barrier to the area by slowing down and weakening storm surges. However, man made innovations in hydrological control and shipping routes led to the deterioration of these coastal wetlands. As previously discussed many wetland areas were

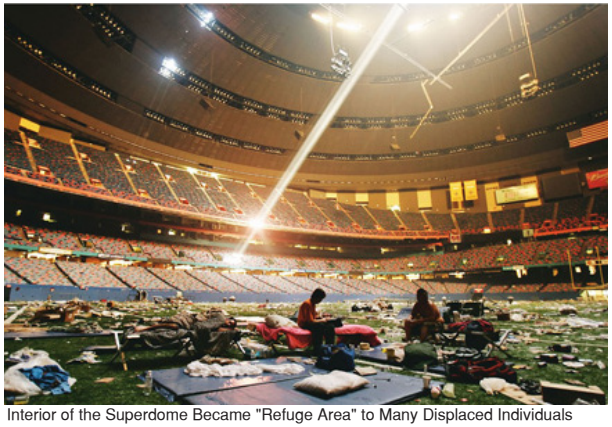


Levee System Failures (Represented by Stars)


Coastal Wetland Loss (Red Outlines Represent Conditions Prior to Hurricane Katriana)

37 Ramroth, William G. 2007. p 214-216
38 Ramroth, William G. 2007. p 214-216

Rescue Personel Working Tiredlessly Evacuating Victims from the Lower Ninth Ward



Interior of the Superdome Became "Refuge Area" to Many Displaced Individuals

destroyed to make way for development of land and by the introduction of MRGO. These innovations made interior wetland areas susceptible to flood water erosion and during the Hurricane Katrina event the quantity of wetlands that were destroyed was equivalent to the amount of wetlands that were forcast to be lost by 2050.[39] The destructive nature of Hurricane Katrina was catastrophic on the natural surroundings of New Orleans and the hazardous living conditions that have developed throughout the hundreds of years of its development. The only thing to do now is ask where does the future of New Orleans lie?

New Orleans After the Storm

Following Hurricane Katrina as members of the media started to re-enter the city the destructive nature of the storm became clear. Residents were trapped on rooftops, in attic spaces, and on highway bridges and overpasses surrounded by water with no hope of escape as rescue workers tried tirelessly to get people to safe havens. As people started to make their way towards the Superdome, which was designated as an area of refugee, it became clear the effect the storm had taken on not only the built environment but the also the human condition. As politicians and high level emergency response personnel argued over authority people were growing tired, scared, and hungry. As people started questioning when help would come to evacuate them from the city, which was now 80% covered in water, they began to do as many have done before that have felt abandoned and started taking what was needed to survive. As fear rose that gangs were forming and the city was quickly becoming a lawless society, those outside of the borders of down town were creating

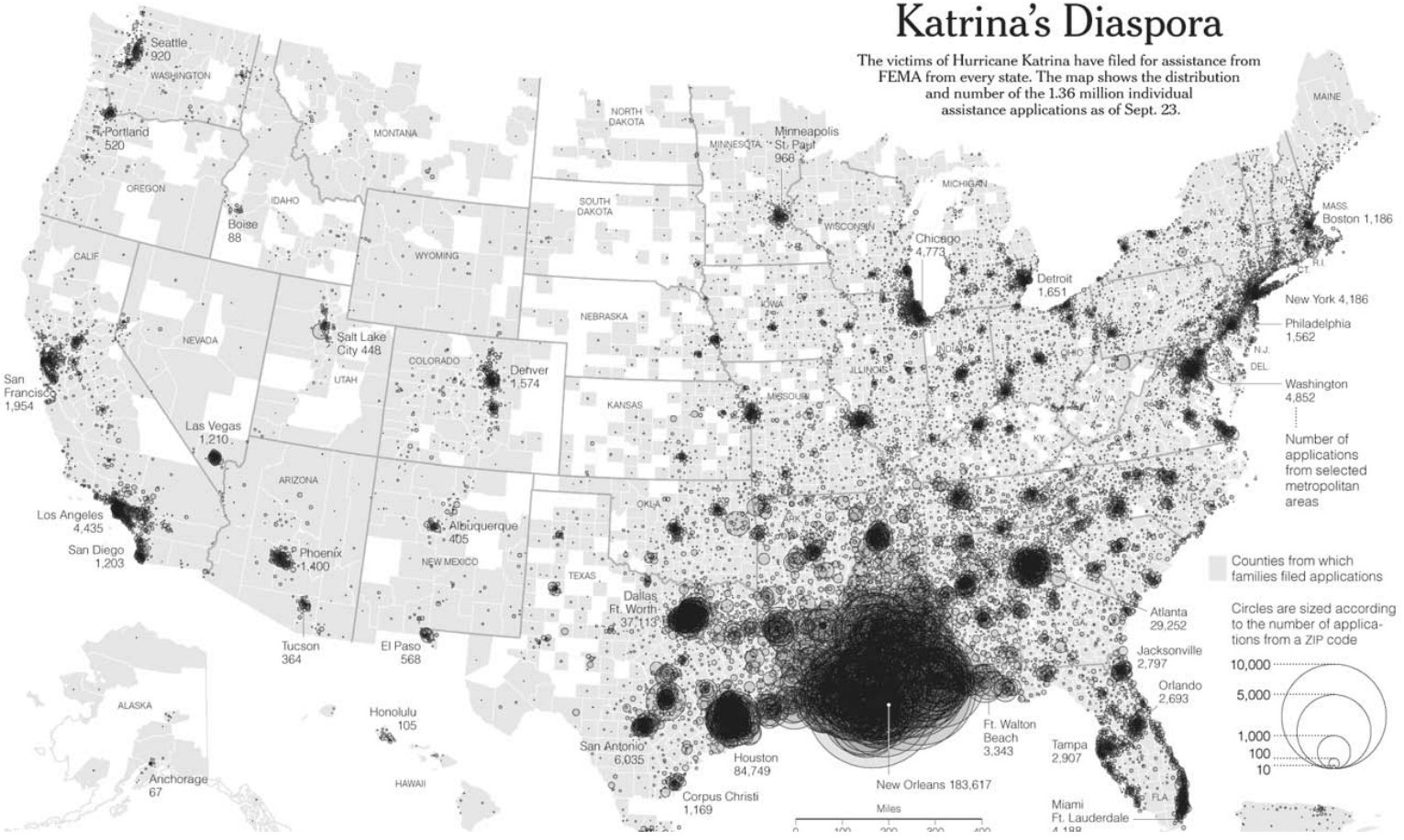
39 Liu, Amy and Plyer, Allison. 2010

vigilante groups to keep the "bad" people out. Soon the National Guard would be sent in to take back the city, all while the residents struggled to survive.[40]

Much was revealed in those days immediately following the storm. Many people, not only locally but nationally, began to loose faith in their government. Finally after days of waiting to escape the horrors of the aftermath of the storm a full evacuation of non-essential personnel was enforced, making this the first time that an entire city was abandoned following a disaster. In the examples of Lisbon, San Francisco, and Chicago people relocated nearby, while in the case of New Orleans the victims were spread all across the U.S. People were not allowed to return to their homes to assess the damage, in some cases up to years. It took nearly a month alone to remove the water from the city.

As people started to return, and planning had restarted, others still took a wait and see approach. They wanted to know how much they would receive in government and insurance aid to rebuild their homes, but this too took some time to complete. By the time money was being dispersed and opportunities provided, people had started to make new lives for themselves in the places they relocated to.[41] The population of New Orleans dropped to nearly half of its pre-Katrina levels in 2006 as a clear plan for recovery had still not been established. For a population that had been slowly declining since the last great hurricane in 1965, Katrina had provided a catalyst for migration out of New Orleans. Today the population has leveled out at 60% of pre-Katrina levels. Considering that all funding has been dispersed to those that have applied, it is at this point in time it can be said that if residents have not yet returned then they will

40 Ramroth, William G. 2007. p 220-225
41 Logan, John. 2006


Katrina's Diaspora
The victims of Hurricane Katrina have filed for assistance from FEMA from every state. The map shows the distribution and number of the 1.36 million individual assistance applications as of Sept. 23.
Seattle 920
Portland 520
Boise 88
Salt Lake City 448
Denver 1,574
San Francisco 1,954
Las Vegas 1,210
Los Angeles 4,435
San Diego 1,203
Phoenix 1,400
Albuquerque 405
Tucson 364
El Paso 568
Dallas Ft. Worth 37,113
San Antonio 6,035
Houston 84,749
Corpus Christi 1,169
New Orleans 183,617
Ft. Walton Beach 3,343
Tampa 2,907
Miami Ft. Lauderdale 4,188
Atlanta 29,252
Jacksonville 2,797
Orlando 2,693
Minneapolis St. Paul 966
Chicago 4,773
Detroit 1,651
Boston 1,186
New York 4,186
Philadelphia 1,562
Washington 4,852
Number of applications from selected metropolitan areas
Counties from which families filed applications
Circles are sized according to the number of applications from a ZIP code
10,000
5,000
1,000
100
10
Honolulu 105
Anchorage 67
ALASKA
HAWAII
Miles

not return. As some neighborhoods have reached their pre-Katrina levels, and some surpassed them, other still remains at 20% of their pre-Katrina population levels.[42] Even today many of the neighborhoods are still in shambles. For this reason New Orleans and Hurricane Katrina have been chosen as the site to be examined in this thesis. The following section will examine the recovery process of New Orleans starting with the lense of the region and moving down to the neighborhood as a series of case studies of the recovery and reinvention.

42 Quigley, Bill. 2010

Case Studies

Introduction

Hurricane Katrina has provided New Orleans with the rare opportunity of rebuilding and replanning on a more comprehensive level that few cities are provided. It has many chances to fix blighted areas and address issues of segregation. For instance one of the poorest and most segregated neighborhoods in the U.S. known as the Lower Ninth Ward has been brought to light by Hurricane Katrina. It is sad that it takes a disaster of this scale to provide the means to reinvent such a neighborhood. Unfortunately, as much talk of the recovery effort in the Lower Ninth Ward as there is, the neighborhood is still struggling to recover. One advantage of examining the Lower Ninth Ward five years after Hurricane Katrina is that an examination can be performed of the pros and cons of the planning process. The city and the neighborhood has gone through three different planning phases; The Bring New Orleans Back Plan, the Lambert Plans, and the Unified New Orleans Plan, which this section will examine to utilize strengths, and identify pitfalls or weaknesses in the plans and the neighborhood.

Bring New Orleans Back

This plan was created almost immediately following Hurricanes Katrina/ Rita and focused on the short term (2 ½ - 3 years) of getting New Orleans to a status of being able to function while providing opportunity for growth. The vision is as follows:

> *New Orleans will be a sustainable, environmentally safe, socially equitable community with a vibrant economy.*
> *Its neighborhoods will be planned with its citizens and connect to jobs and the region. Each will preserve and celebrate its heritage of culture, landscape and architecture.*[1]

The BNOB plan seeks to create a city center model for neighborhoods that fosters sustainability, and identifing the current conditions where this model will be most likely to be implemented in the short term. The plan recognizes that there will be a reduced population within the city and therefore leads to the consideration of a new approach. This new approach is as follows:

> *-Provide immediate temporary housing*
> *-Consolidate neighborhoods with insufficient population to support equitable and efficient services*
> *-Provide facilities and services to these concentrations*
> *-Subsidized housing as an asset*[2]

Within these new neighborhood center models there are certain criteria that must exist in order for them to sustain themselves and it is this

1 Wallace, Roberts, and Todd LLC. 2006
2 Wallace, Roberts, and Todd LLC. 2006

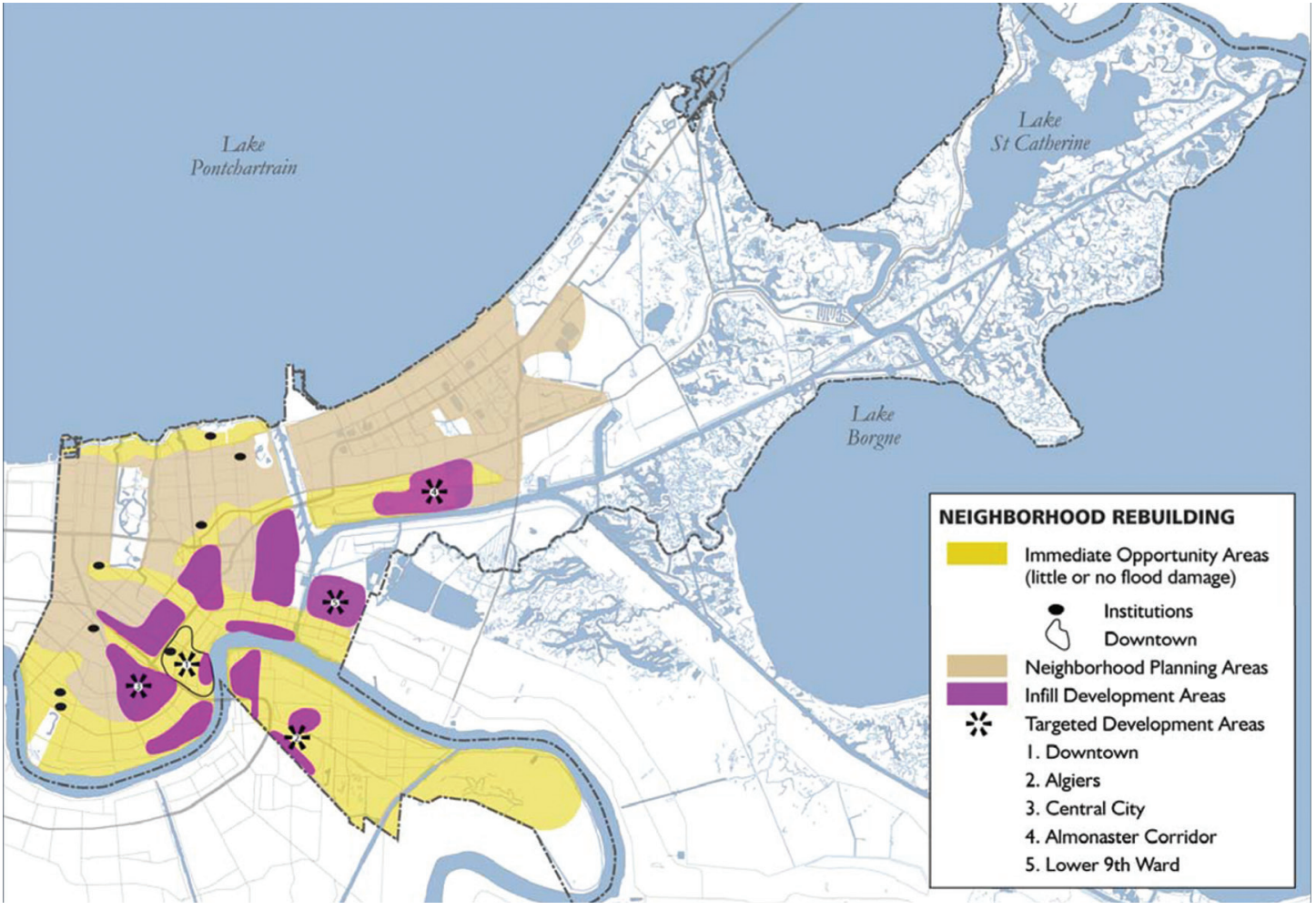


Image 1: New Orleans Master Plan by Wallace, Roberts, & Todd LLC

criteria which Wallace, Robert, and Todd LLC considers in the planning of a model of this neighborhood center.[3] All neighborhoods were split into separate planning districts and would later be assigned a planning firm.[4] The criteria that Wallace, Robert, and Todd LLC view as being key to sustaining a community post Katrina are as follows:

-Population of 5,000-10,000
-Residents commited to return
-Efficient delivery of infrastructure: roads, drainage, utilities, services
-1-2 k-8 public schools and shared high school supported by 11,000 people
-Parks and open spaces
-Connection to city by convient public transit
-Contigous relationship with at least 2 other neighborhoods
-Cultural community facilities
-Places of worship
-Health facilities
-Park and open space with an easy walk
-Reasonable Access of retail
-Access to public transit[5]

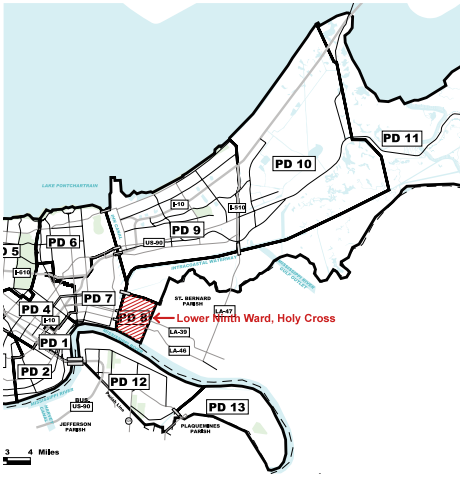


Image 2: Planning Districts created by Wallace, Roberts, & Todd LLC

If a prior existing neighborhood was to be considered undevelopable then it fell on the neighborhood planning teams to make recommendations on the new land use. Wallace, Robert, and Todd LLC identified 4 different opportunities of neighborhood rebuilding. The first being immediate opportunity zones which consisted of areas of little or no flooding, downtown commercial, medical, cultural, entertainment

3 Image 3
4 Image 2
5 Wallace, Roberts, and Todd LLC. 2006

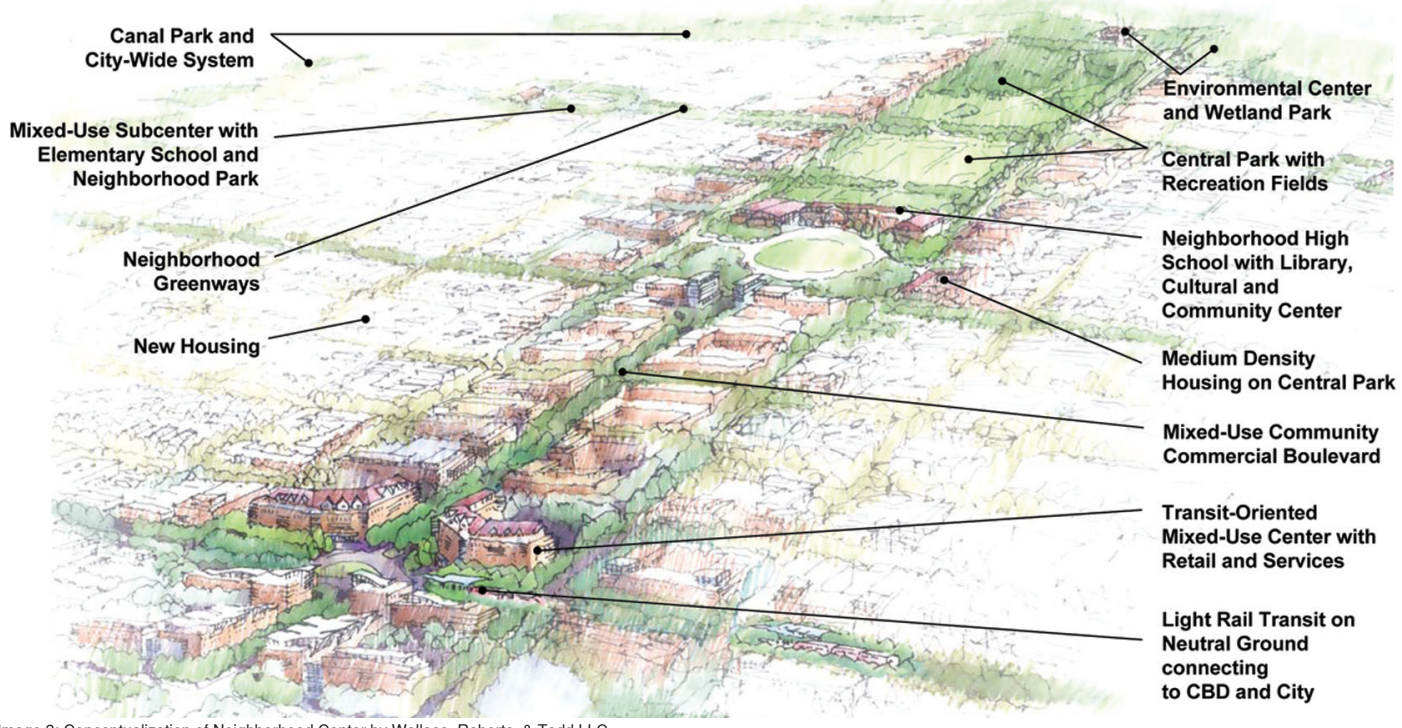


Image 3: Conceptualization of Neighborhood Center by Wallace, Roberts, & Todd LLC

and hospitality, and institutions with immediate needs. The next being neighborhood planning areas which were neighborhoods that experienced heavy flooding and heavy damage that were selected by Wallace, Robert, and Todd LLC and were to be defined by planning teams, not by neighborhood boundries that were already recognized by the residents.[6] Infill development zones are areas that were defined as: privately or publicly owned land, blighted and adjudicated properties, and underutilized sites on high ground, or those requiring demolition and clearance, that can be developed with houses, commercial and institutional uses. In these areas it was suggested that a consolidation of ownership be implemented then prepare development plans and invite developers to submit proposals.

Another consideration this plan recognizes is the location where some of the most destructive flooding occured, a neighborhood known as the Lower Ninth Ward, and desiginates it as targeted development areas as well.[7] In other areas the flooding is thought to be controlled by more internal man-made levee and pump stations and also costal wetland restoration. The plan recommends the closing of MRGO (which was initiated in early 2009); the hope being that wetlands will return and slow the pounding of Hurricanes. It may also be possible to alter the neighborhoods to control flooding that may occur. After all New Orleans is considered to be a water city and it should start to recognize that water is something the city will have to cohabitate with.

While this plan does not suggest specific design components for neighborhoods in New Orleans it does suggest targeted development

6 Image 2
7 Image 1

areas.[8] Along with this the plan begins to lay the foundation for how future plans will address more specific neighborhood designs and the boundries of these neighborhoods. The Bring New Orleans Back plans started off the extended evolutionary recovery process that could still be witnessed in 2011. As time progressed over the five years following hurricane Katrina two other phases of planning would be recognized. The first are known as the Lambert Plans, which were directly influenced by decisions drawn up in the BNOB plans, and finally the Unified New Orleans Plans (UNOP), which can be viewed as the last to date in the lineage of design proposals for New Orleans.

Site Selection and Neighborhood Characteristics

It is nessecary at this point to select a site, in order to examine and gain an understanding of the effects of a disasterous event on a neighborhood scale, prior to moving onto the neighborhood plans developed from the Bring New Orleans Back master plan. As previously mentioned some neighborhoods have reached their pre-Katrina levels, and some surpassed them. However, one of the hardest hit neighborhoods, the Lower Ninth Ward, still remains at 20% of it pre-Katrina population levels. Even today much of the neighborhood is still in shambles. Through examination of the Lower Ninth Ward (L9W) in this plan, it falls under the realm of infill development due to the massive amount of damage received following the levee breaks.[9]

In order to gain an understanding of how the L9W is currently, and potentialy, going through a reinvention process pre-exisiting conditions

8 Image 1
9 p 46

where examined through the lense of criteria set out by Wallace, Roberts, & Todd LLC for sustainable communities.[10] Even before the devestation the L9W was only at a population of just above 5,000 and approxiametly half of those were renters.[11] One can assume that many non-owners from the L9W would take this opportunity to move into another area, with possibly better living conditions rather than wait for the rebuilding of the community. This does two things; drops the population below the recommended population to sustain a viable new community development and suggests that there are not enough residents interested in returning to the neighborhood.

There were schools present in the L9W prior to Hurricane Katrina that were damaged and of those only one has been reopened and is in service, but that was not until 2007 so at the time of the plan there were no basic school services to provide for a sustainable community.

Parks and open spaces exist but are in poor condition and an upgrade of the facilities are advised. Prior to Hurricane Katrina devastating New Orleans, plans for new park systems were being developed for the L9W.[12] Unfortunately the L9W only has one relationship with another neighborhood in New Orleans which is the historical neighborhood of Holy Cross. Due to the shipping canal connecting the Mississippi River with the Gulf Outlet slicing between the upper and lower ninth wards the two neighborhoods are disconnected from the rest of the Parish.[13] On the other hand, the neighborhoods create the entrance way from St. Bernard Parish. The community centers that exist are dated and in need of an update, but opportunities do exist

10 p 44
11 Stull and Lee, 2006
12 Stull and Lee, 2006
13 p 30

Between the two neighborhoods there are plenty of places to worship as they are known for their many religious establishments.
The local Health Clinic is in need of a major upgrade as it is run out of a prior residence. A sign on the front of the building suggests that security is a problem as they do not carry any narcotics.
Retail opportunities exist along St. Claude but are not being utilized. Also the sidewalks are either non-existant or non-traversible in some parts of the major corridors. This begs for an upgrade to the infrastructure of the major corridors at a minimum.
In conclusion that even at the time of conception of this plan certain liberties were taken to consider the L9W as a targeted development area. From the rules laid out in this plan neighborhoods such as the L9W should have been considered less of a priority in the redevelopment phases. However, the neighborhood was chosen which started the long process of reconceptualizing the L9W. Whether or not this, or any other, plan will help to make the neighborhood a viable energetic environment again remains to be seen. To gain a better understanding of the impacts that ideas developed in this plan will have on the neighborhood and to investigate how other architects have chosen to interpret these ideas, an examination of the evolution of planning for the L9W is carried out in the following sections.

Lambert Plans

The Lambert plans where developed as a direct reaction to the Bring New Orleans Back plans and should be recognized as phase 2 of that planning process. The Lambert plans are a series of neighborhood master plans utilizing the planning districts, defined in the BNOB plans. Lambert Advisory LLC was the project management firm tasked with assigning planning firms to each planning district. Stull and Lee Architects were chosen to develop the plans for the L9W. As part of the city wide comprehensive planning process Stull and Lee Architects were tasked with "Working with neighborhoods to assist them in developing revitalization plans that are thoughtful, can be implemented, and formed into a citywide recovery and improvement plan for submission to the State of Louisiana and the federal government."[1]

The goals set out by Stull and Lee Architects included providing restoration to the existing housing stock and developing new approaches to infill and mass produced homes for those of medium to low income, viable options to restore the working class opportunities, much needed retail ameneties, and building off past master plans developed that may still be relevant. Stull and Lee Architects found it to be a neccessity to have an acticve participation from the neighborhood residents in order to preserve the character of the neighborhood while creating a progressive yet viable plan for the L9W.[2]

In an effort to include the residents in the planning process of the L9W Stull and Lee took a three step approach to planning which included:

1 Stull and Lee, 2006
2 Stull and Lee, 2006

1) Analysis of Existing Conditions where base maps were prepared, data on the conditions of the neighborhood was gathered, informal interviews with community leaders and residents were carried out, previous planning reports and efforts were researched and other tasks were carried out in order to develop an understanding of the community.

2) Define issues and opportunities to create plan options.

3) Create/develop neighborhood plans and the identification of proposed projects and needs. [3]

Upon completion the plans developed were presented to community leaders for approval. The remainder of this section will examine the approaches taken in an effort to understand strengths and weaknesses of this plan.

3 Stull and Lee, 2006

Housing

The housing reconstruction plan is divided into four different groups that include:

Intensive new construction- *Zones were no dwellings survived. Within these zones street patterns could be adjusted and parcels consolidated to allow new uses to be introduced into neighborhoods, such as parks (defined by the green box) and community centers (defined by the puple mass in the upper right corner). Housing would be oriented around these new uses that become focal points and amenities to the neighborhoods.*[4]

Primarily new construction- *Zones that have retained few restorable parcels, however enough remain to maintain the exisiting street patterns and character of the neighborhood. Many vacant parcels are available that could allow adjustments and consolidations for larger single family homes (defined by the magenta mass on the left) or duplexes (defined by blue masses through out) while still following neighborhood patterns.*[5]

Limited restoration- *Zones that have retained a critical mass of pre-existing housing (defined by yellow masses). These zones are to retain their existing parcel patterns and vacancies can utilize single family homes, or multi-family homes (both defined by blue masses) where adjacent parcels can be combined to create larger parcels (defined by tan parcel). Alternative uses could be examined on streets carrying higher traffic volumes*[6]

High restoration- *Zones that have greater number of existing structures that can be restored under the new FEMA guidelines (defined by yellow masses). The few vacancies that exist could be developed with infill housing of existing compatible style (defined by*

4 Image 4
5 Image 5
6 Image 6

Image 4: Example of changes that can occur in Intensive New Construction Zones

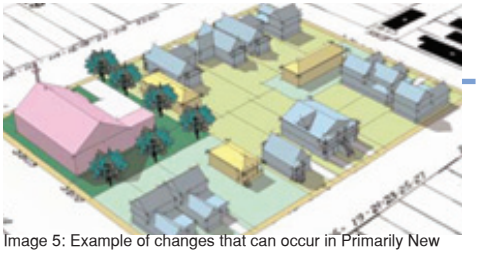


Image 5: Example of changes that can occur in Primarily New Construciton Zones

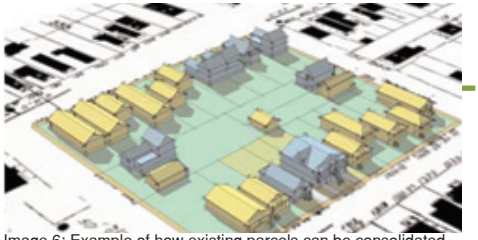


Image 6: Example of how existing parcels can be consolidated to create new housing typologies in the L9W.

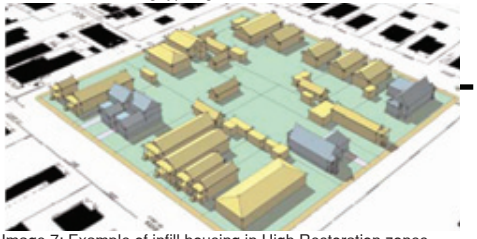


Image 7: Example of infill housing in High Restoration zones.

Image 8: Stull and Lee Architects Master Plan Locating Housing Interventions

blue masses) or distributed to adjacent parcels utilizing the Lot Next Door Program, which allows residents to maintain a vacant lot for a minimum of five years at which time they could claim ownership of that parcel.[7]

This plan explores a range of responses to damage produced by Hurricane Katrina in the L9W. Stull and Lee respond to the wants of the community, but they do not explore what the community may need. It would stand to reason that a lesson could be learned about the vulnerablitly of the neighborhood lies in the Intensive New Construction and Primarily New Construction areas and alternative uses other than housing could be explored. For example many of the parcels in the High and Limited Restoration areas were vacant homes or empty lots prior to the destruction caused by Hurricane Katrina, so a recommendation for relocating residents to these areas and developing an alternative use for the remaining area could be a viable opportunity.

7 Image 7

Building Off Previous Master Plans

Stull and Lee Architects recognized the lack of adequate options for quality shopping and limited public services and aims to rectify this by adopting the city center model developed in the BNOB plan.[8] The location of this new city center model is along North Claiborne Street, the middle arterial road carring moderate to large amounts of traffic, depending on the time of day. It would also be located adjacent to the Hurricane Katrina memorial located in the oversized median of North Claiborne Street and within proximity to the existing middle school/library creating a sequence of city services that could feed off from each other. These key components combined together offer and amenities to the neighbohood that could attract new residents to the area creating a renewed interest in the revitalization and sustainability in the neighborhood.[9] The neighborhood center would include:

> *-a mixture of public facilities and commercial space (overall rendering)*
> *-higher density housing (offset from street adjacent from school)*
> *-state of the art high school (upper left corner)*
> *-little city hall with police and fire substations (lower right corner)*
> *-Retail activity: supermarket, pharmacy, hardware store (between high school and little city hall)*[10]

While it will bring some sophistication to the neighborhood the locationof the city center seems to be slightly arbitrary. A more thoughtful location may be within the neighborhood, possibly in the

8 p. 42
9 Stull and Lee, 2006
10 Image 9

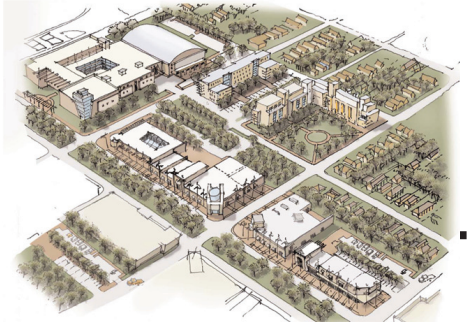


Image 9: City Center Model Redering Generated by Stull and Lee Architects

Image 10: Real life examples of City Center Models provided by Stull and Lee Architects

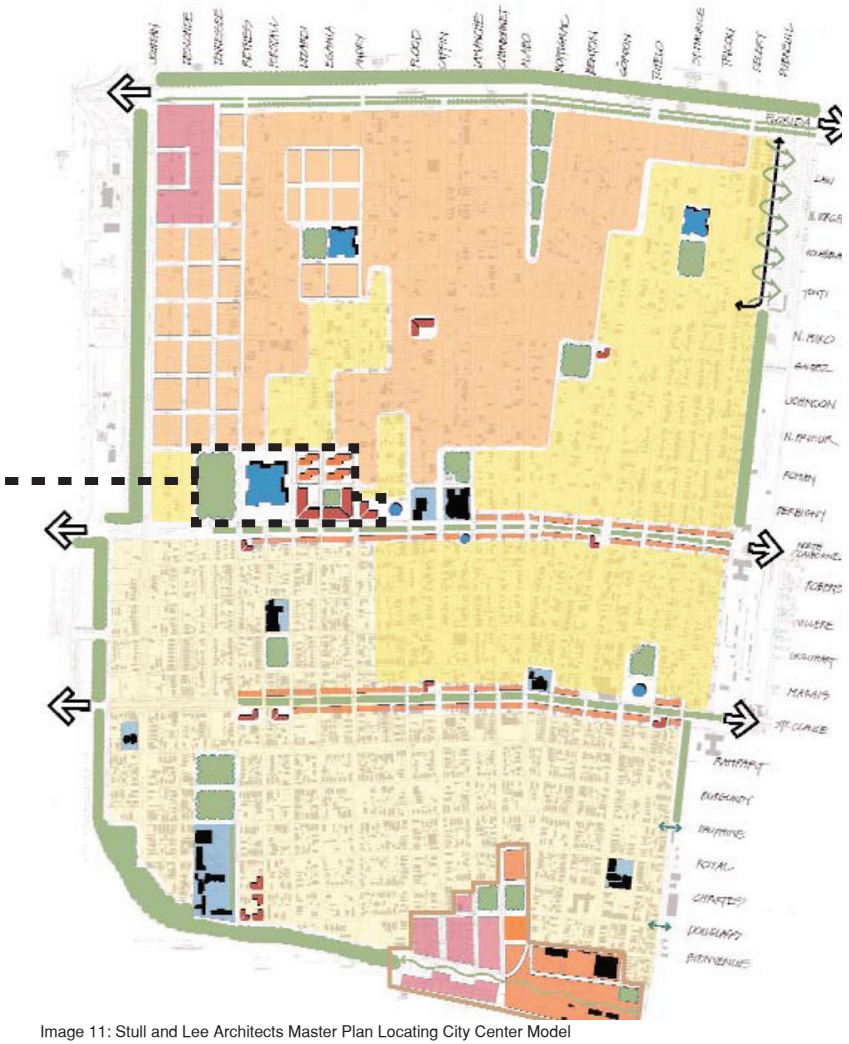


Image 11: Stull and Lee Architects Master Plan Locating City Center Model

primarily new construction zone, encouraging a vertical axis to develop a relationship between the L9W and Holy Cross. As the two neighborhoods currently border one another they do not have any interactions happening. By providing anchor points within the neighborhoods a spatial relationship can start to develop between the two unifying them together, while pulling visitors into the neighborhoods.

There is no question that this city center model can provide a level of beautification to a struggling neighborhood, as can be seen in the example in image 10. However to think that it will solve all the problems of the neighbhood is slightly naive. The idea that enough people will return to support such development at that time would have been understandalbe from a community leaders point of view, but the architect/ planner must realize that until a realistic understanding of the amount of people that would inhabitat a neighborhood is realized good intentions can quickly turn into pipe dreams.

North Claiborne Avenue Commercial Corridor

Stull and Lee recognize St. Claude and N. Claiborne as the main arteries of the L9W with N. Claiborne being the center of the L9W Neighborhood. As the public face of the neighborhood, it is the principal accessway into the neighborhood and is the most visible part to the outside world.
N. Claiborne Avenue is also a major east west circulation corridor and carries a high volume of regional traffic. As a result it is not the best location for low-density residential uses. Recommendations for housing located on N. Claiborne should be midrise with public space or retail on the ground floor, or alternatively higher density housing such as attached town houses or other multifamily alternatives.
Finally, N. Claiborne has a very broad neutral zone. Landscape improvements particularly street trees would dramatically change the neighborhood's public image with enhanced visuals along a grand boulevard entryway.[11]
Many of the suggestions made here by Stull and Lee are dead on and would become a much needed asset to the community, both locally and regionally. As the gateway to the Central Business District both North Claiborne Avenue, and St. Claude Avenue serve a high volume of traffic daily. This traffic could be enough to sustain the recommendations made by Stull and Lee without the full return of residents to the L9W, contrary to the other recomendations that have been examined so far.
It is simple to visualize the reinvention that could be generated by promoting commercial activity along these corridors, transforming them from non-traversable paths into pedestrian oriented developments. Of course some adjustments to Stull and Lee's plans would be needed to

Image 12: Existing condition of Claiborne Avenue Provided by H3 Studio

Image 13: Rendering visualizing the commercial corridor of North Claiborne Avenue provided by Stull and Lee Architects

11 Stull and Lee, 2006

Image 14: Stull and Lee Architects Master Plan Locating Commercial Corridors

provide these environments. Instead of just providing street trees along the median of Claiborne Avenue, a relocation of the streets to narrow the median and provide on street parking to create a buffer between traffic and pedestrian would greatly improve experience of the neighborhood. This is portion of the plan is most definately a condtion that could be developed and utilized in future plans due to it's ability to be sustained by outside influences.

Light Industry

Stull and Lee Architects traced the L9W Neighborhood's decline to the closing of industries based along the Industrial Canal and the resultant loss of jobs, a situation felt by many cities in the late twentieth century. With changes in manufacturing and the evolution of light industry – manufacturing and product processing facilities mostly related to high tech have evolved and do not produce the negative environmental effects of traditional industries – this use is now seen as being far more compatible with residential uses.

The northwest corner of the L9W presents an opportunity for development of light industrial uses. It is an area that was leveled by Hurricane Katrina and would allow land assembly without need for relocation. New light industrial development could be designed to buffer the residential areas of the Lower Ninth from the impacts of heavier industrial activity on the other side of the Canal.[12]

This area is also on the Florida Street corridor with direct access to truck routes, and would thereby allow redirecting of truck traffic away from the neighborhood. It would provide replacement facilities for the industrial uses currently along the Canal that would be lost due the construction of the new locks. And most importantly it would provide jobs for the L9W residents.

Stull and Lee Architects recognize that the community is rightly concerned about how much light industry is located in this Jourdan Street area to prevent the perception that the L9W north of Claiborne Avenue should be redeveloped as an industrial park. Their proposed plan would dedicate approximately six blocks of the neighborhood's 325

12 Image 14

Image 16: Examples of Light Industrial Building Typology provided by Stull and Lee Architects.

Image 14: Stull and Lee Architects Master Plan Locating Light Industrial

blocks nearest Florida Avenue and the Canal to provide 360,000 square feet of light industrial space with the potential of providing 1,000 jobs. Examples of how these facilities might be designed are shown in the images on the facing page. By variations in building massing, window sizing, use of color, landscaping and facade designs, these building types can be designed to complement nearby residential uses.[13]

Even though this recommendation is providing a solution to an existing problem of career opportunities, it is creating another. It was suggested that light industrial requires more of a technical understanding of manufacturing, however many of the residents of the L9W have only a high school diploma or less. Unless the new light industrial park is coupled with a training center to provide residents of the L9W with the neccessary education, it becomes unclear how it would benefit the neighborhood.

13 Stull and Lee, 2006

Conclusion/Critque

This plan separates the two neighborhoods in the planning district and treats them as entirely separate entities. Although, in actuality these two neighborhoods are entirely dependent on each other. The two neighborhoods relate to each other in such a way that they are one. They both share the situation of being isolated from the rest of the city due to the canal placement. If one neighborhood is to thrive then the other would inherently do the same, but also on the other side if one neighborhood is struggling then the other also follows suit. It is expected that both neighborhoods would be planned in a manner that both would be considered as one and fostering sustainability through a unification.
The second critique is that this plan makes the assumption that populations in the area could once again reach upwards of 27,000 persons. It is unlikely that either neighborhood will reach the population of its prime, and if assumed so would only be setting the neighborhood up for more failure and decay. A comprehensive way of looking at the planning of populations would be to look at alternative land use in the northern area designated as intensive new construction and primarily new construction. As nearly half of the residents that were present in the L9W before hurricane Katrina were renters it can safely be assumed that they have found other means of residence and will not be returning, to assume differently would be negligent and inappropriate.
The way that Stull and Lee Architects are handling the redevelopment of the corridors is done in a thoughtful manner that would encourage commuters to possibly stop and enjoy some time in the neighborhood. It could also start to act as a catalyst for the development of the corridor

within St. Bernard Parish as well. As it stands right now the only visual cue you get that you are entering New Orleans Parish is the Jackson Barracks which acts as a brick and mortar barrier that separates the two Parishes. A situation that can start to soften the divide and start to offer a comforting interest in the neighborhood is definately needed. The problem again though becomes the fact that the population may never reach the levels that are need to support such developments. Other opportunities needed to be explored.

The neighborhood center seems to be a theme that is being carried out in the two plans and in this case it could be an assest to the L9W. The location on the other hand seems to be haphazardly placed, and other sites should be considered, especially if the center is to house the new high school with sporting venues. With all of the destruction and blight a more central location off of the main strip seems like a more feasible location. This decision could start to activate other areas and streets that may have had problems with redevelopment.

Finally the idea of creating jobs in the area is a necessity, but light industrial may not be the best solution. As stated by Stull and Lee most of the new light industrial is more on the higher tech spectrum but the demographics of the people living in the area are more of a low tech nature. If the new companies that moved in would create training situations and agree to hire a percentage of people in the neighborhood then maybe that could work but that may not be feasible. On the other hand if the light industrial park was designed with a training center in mind that could act as a catalyst for neighborhood residents to obtain the training needed. Other programs for this area should be explored as well such as the possibility of sustainable industries.

Unified New Orleans Plan

The Unified New Orleans Plan is by far the most comprehensive and detailed plan to date which was developed in January 2007 by H3 Studios. The plans vision and goals are to improve the Lower Ninth Ward with good streets, better services, parks and open spaces and transportation connections, while seeking to be sensitive to the reconstruction of the neighborhoods heritage and using sustainable design principles in order to encourage affordability and innovation in the design of new building types.[1]

H3 Studio presented 3 scenarios to the community that include REpair, REhab, and REvision. Upon presentation of the scenarios a 4th option emerged in the form of REhab + which was developed with comments considered from community members. This new plan allowed for 100% resident return and build out, accessible productive landscapes, linked schools as 24/7 active hubs, mixed-use and multi-performance corridors, transit/pedestrian oriented mobility, category 5 hurricane and flood protection, and safe walkable, clean neighborhoods.[2]

This plan focused on protection from floods and hurricanes, regional transit nodes, attaining economic recovery, sustainable recovery, and educational recovery. Those components are as follows:[3]

> *-Hurricane Flood protection – improve current manmade flood protection, add natural flood buffer by restoring the Bayou Bienvenu, any rebuilding to be done must be elevated above flood level, and all structures should be designed to a minimal wind load of the area.*

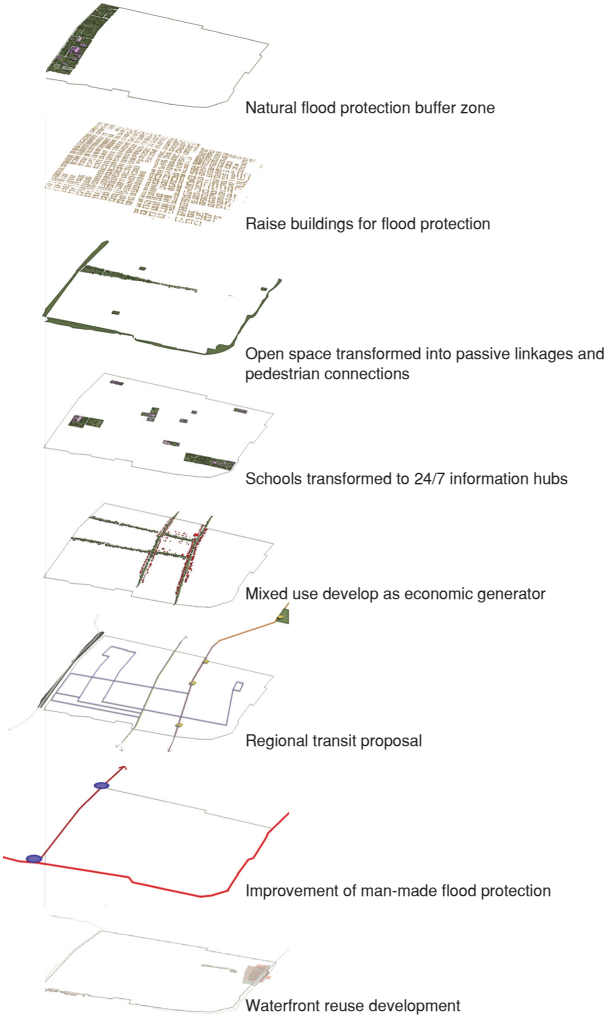


Image 1: Comprehensive Plan (Provided by H3 Studios)

1 H3 Studios, 2007
2 H3 Studios, 2007
3 H3 Studios, 2007

-Regional Transit – recommend city wide mass transit along main corridor supported by bus and pedestrian/bicycle access and storage facitlities.

-Economic Recovery – Provide mix use districts within district, some suggestions of vacant lands – productive landscapes: gardens, wildflower soil remediation lots, tree farm, sustainable nursery production, market farms and greenhouses, aqua farms & fisheries, edible landscapes throughout entire area on public and private property.

-Educational Recovery – Utilize schools as 24/7 active information hubs for programming, training, peer counseling safe havens, and after hours learning. Expand school grounds to incorporate community playgrounds playsports, active recreation fields, and activities, active living programming, and community gardens for education income and goods. Open space, avenues, boulevards and neutral grounds become passice linkages and pedestrian connections for schools, neighborhoods, biodiversity of habitat.

-Water Front reuse development – Eventual community planned waterfront node providing indoor and outdoor venues for special events, businesses, citywide events, residential, kiosks, boating, water taxi.[4]

4 H3 Studios

Housing

Rebuilding that occurs within the more flood prone areas should ensure passive survivability through elevating habitable space above flood level and providing electricity and water systems that are not dependent on vulnerable infrastructure. All development and rebuilding should incorporate strategies that meet standards for hurricane resistance. Minimum design standards created by American Society of Civil Engineers are located in the International Residential Code and must be utilized in all restoration and new construction.[5]

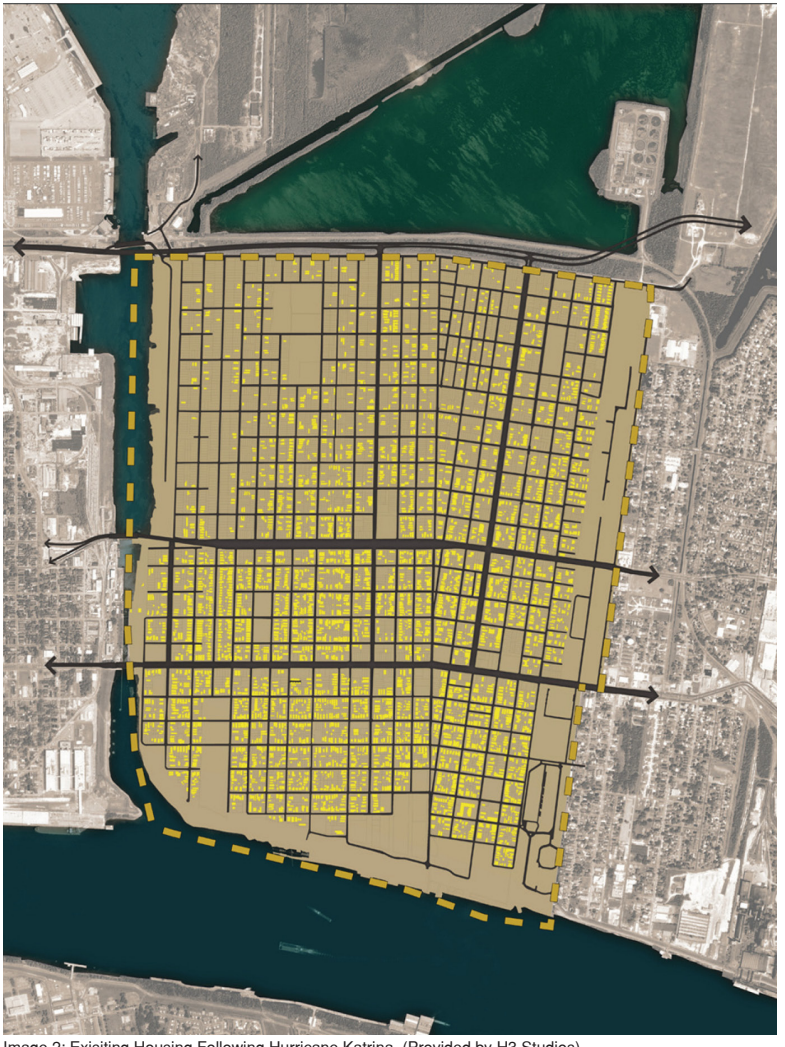


Image 2: Exisiting Housing Following Hurricane Katrina. (Provided by H3 Studios)

5 H3 Studios, 2007

Image 3: Site section and housing relation to sea level. (Provided by H3 Studios)

Image 4: Depiction of flooding threat of housing at shown elevation and recommended safe zone above gradient zone. (Provided by H3 Studios)

Accessible Productive Landscapes Linking Educational Facilities

Open space, avenues, boulevards, and neutral grounds become passive linkages and pedestrian connections for schools, neighborhoods, and biodiversity of habitat. Consider land as an economic benefit to the District as an income generator. Productive landscapes include: gardens, wildflower soil remediation lots, tree farm, sustainable nursery production, market farms and greenhouses, aqua farms and fisheries, and edible landscapes throughout the entire area on public and private property.[6]

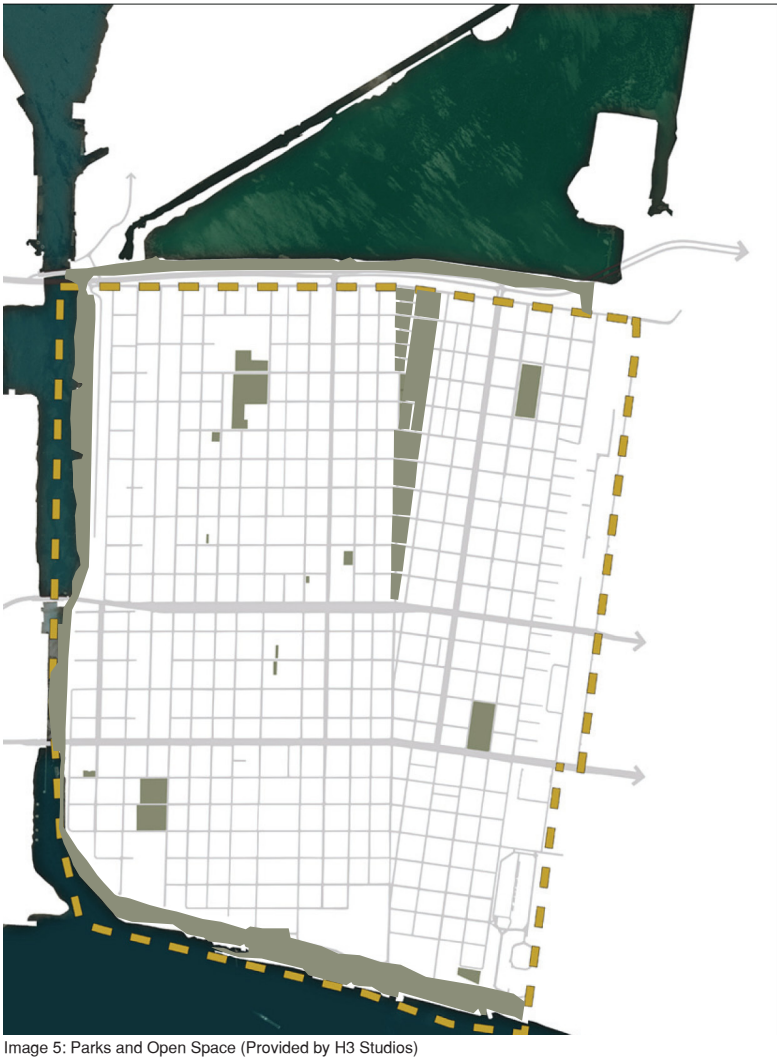


Image 5: Parks and Open Space (Provided by H3 Studios)

6 H3 Studios, 2007

Image 6: Transformation of blighted abandonded street into pedestrian friendly safe walkable streetscapes. (Provide by H3 Studios)

Linked Schools as 24/7 Active Hubs

Utilize Schools as 24/7 active information hubs for programming, training, peer counseling, safe havens, and after hours learning centers. Expand school grounds to incorporate community playgrounds, playsports, active recreation fields and activities, active living programming, and community gardens for education, income, and goods.[7]

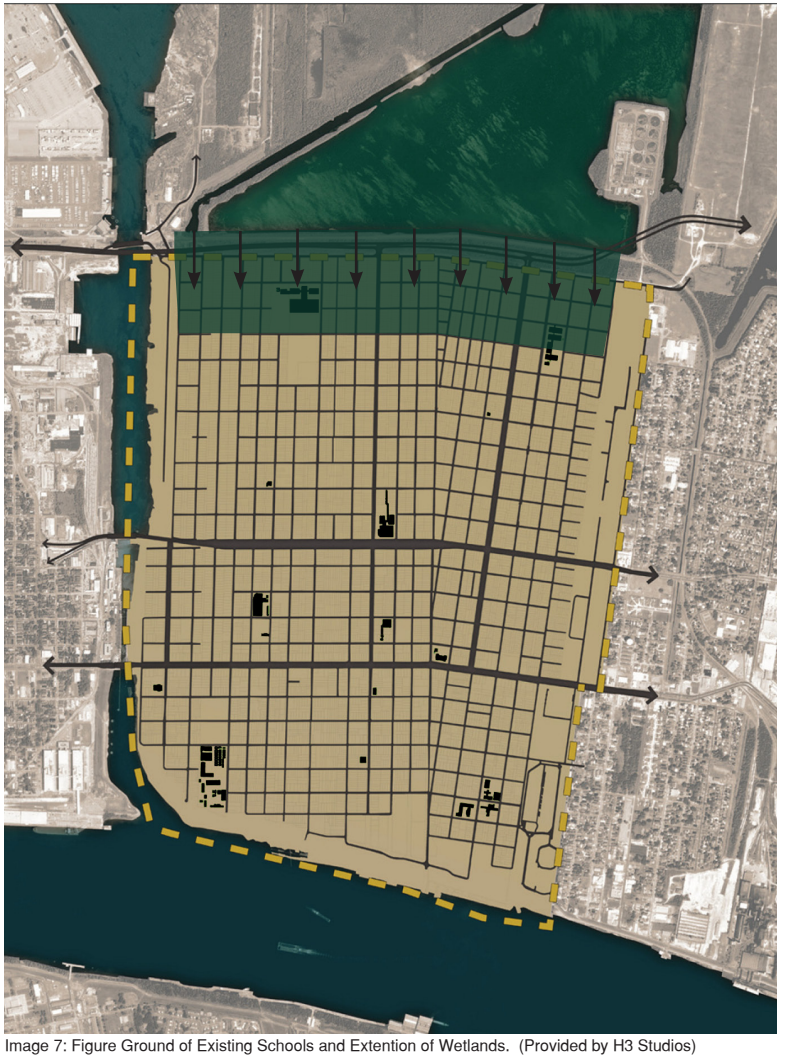
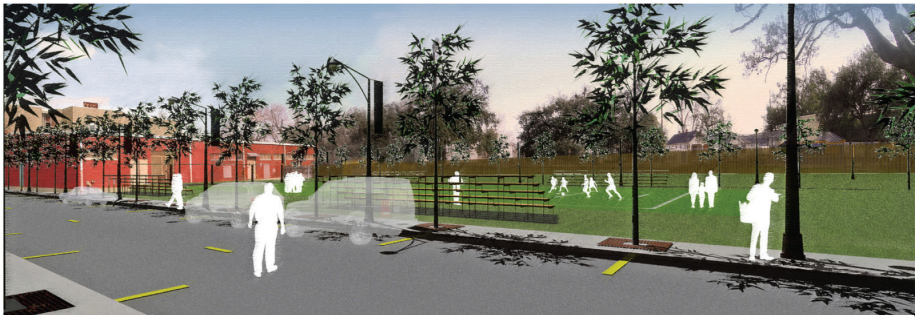


Image 7: Figure Ground of Existing Schools and Extention of Wetlands. (Provided by H3 Studios)

7 H3 Studios, 2007

Image 8: Upgrading of school facilities (Provided by H3 Studios)

Image 9: Creation of connection of educational facilities and surrounding natural wetlands (Provided by H3 Studios)



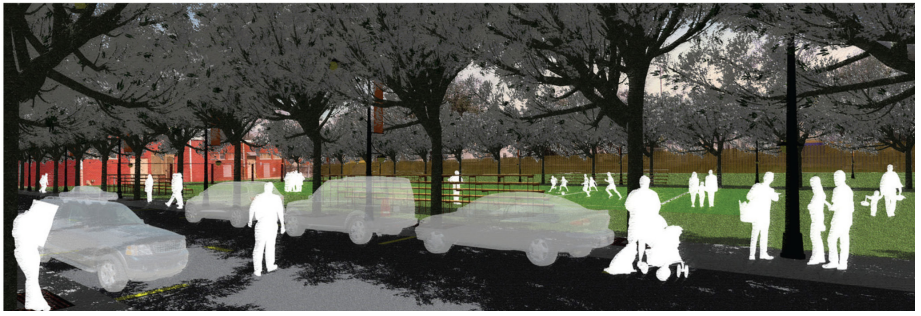


Image 10: Transformation of School Expansion (Provided by H3 Studios)

Mixed-Use Multi-Performance Corridors

A top priority project advocated by the Citywide recovery plan, multiple District recovery plans and greatly supported by citizens, is the revitalization of the Claiborne Avenue Corridor throughout the City and Region. Recent approval of the extension of the Inner-City Urban Corridor Overlay District to include S. Claiborne Ave. between Earhart Blvd. and Napoleon Ave. sets forth the potential to promote urban design goals that support a harmonious relationship between commercial uses and the surrounding residential neighborhoods. In addition to the highest priority corridor revitalization of Claiborne Avenue, St. Claude Avenue requires high priority revitalization through the District. The recovery project proposes that a specific Overlay District be created for N. Claiborne and St. Claude Avenues with concentration between Caffin and Tupelo through businesses loans, incentives, design guidelines, transit nodes, and commercial initiatives.[8]

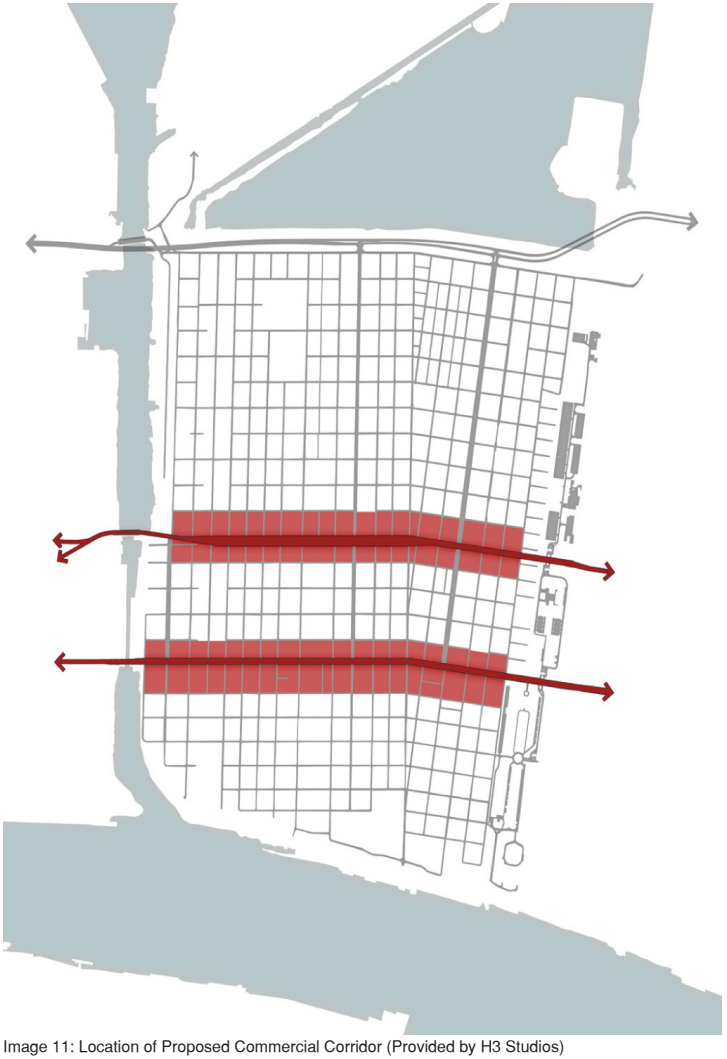


Image 11: Location of Proposed Commercial Corridor (Provided by H3 Studios)

8 H3 Studios, 2007

Image 12: Provide mixed use corridors within the District which will offer opportunity for:
- Employment
- Services
- Residential
- Transit Oriented Developments Around Nodes
- St. Claude and Claiborne to become a mix of residential, commercial, and retail services

(Rendering Provided by H3 Studios)

Image 13: Transformation of Claiborne Avenue (Provided by H3 Studios)

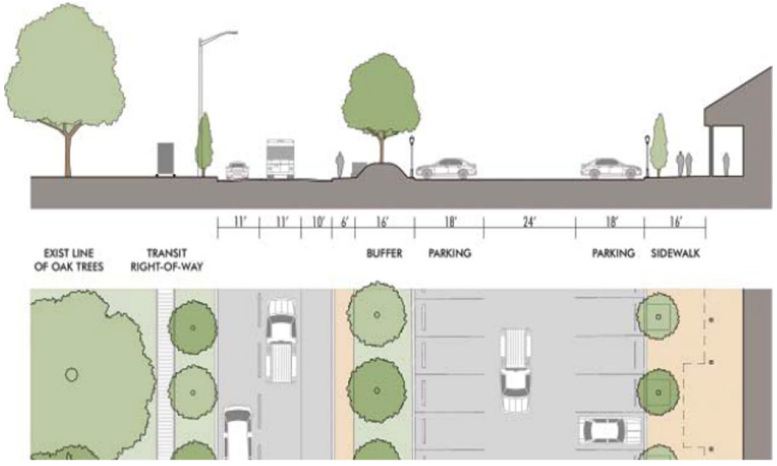


Image 14: Street Plan and Section of St. Claude Avenue (Provided by H3 Studios)

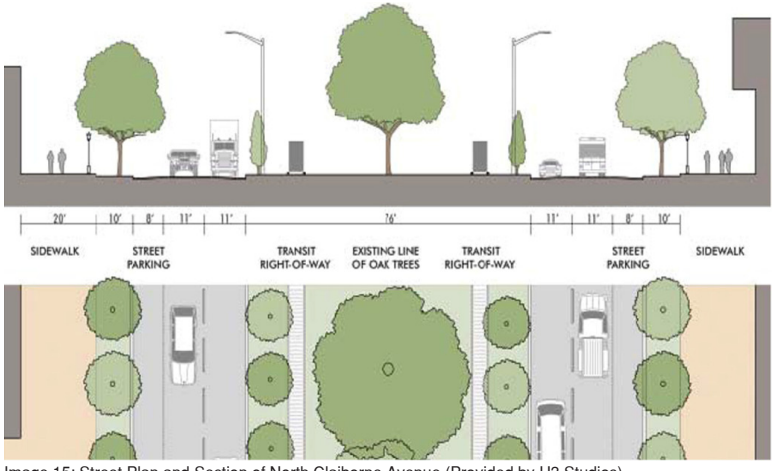


Image 15: Street Plan and Section of North Claiborne Avenue (Provided by H3 Studios)

Transit/Pedestrian Oriented Development

There are three components to this proposal: transit routes, vehicle, and nodes. The district is currently not served by mass transit systems to pre-Katrina levels. Reinstating basic mass transit services, combined with multi-modal transportation nodes for citizens (those enabling safe and efficient transition between mass transit and personal modes) will assist in the return of the
district population. This project has both short and long term components. Project components include:

- *Institute appropriate Pre-Katrina Bus Service Routes, especially those that service St. Claude and N. Claiborne Avenues, with connections to downtown New Orleans and St. Bernard parish. Ensure that all bus and express lines are fully operational by the end of 2007*
- *In order to provide a more cohesive public transit service, this project would review routes in the existing transit system and potentially add, extend or refine routes where needed to benefit riders and maximize efficiency of the overall transit network. The routes should be reviewed at regular intervals as recovery occurs.*
- *Replace the existing vehicles with smaller, quieter and more envi ronmentally responsible buses which would be more appropriate to the scale of the city streetsand cause less damage to the buildings.*
- *Identification of key nodes, e.g. transit connections/intersections, would provide orientation points and have the opportunities to become economic development opportunities.*[9]

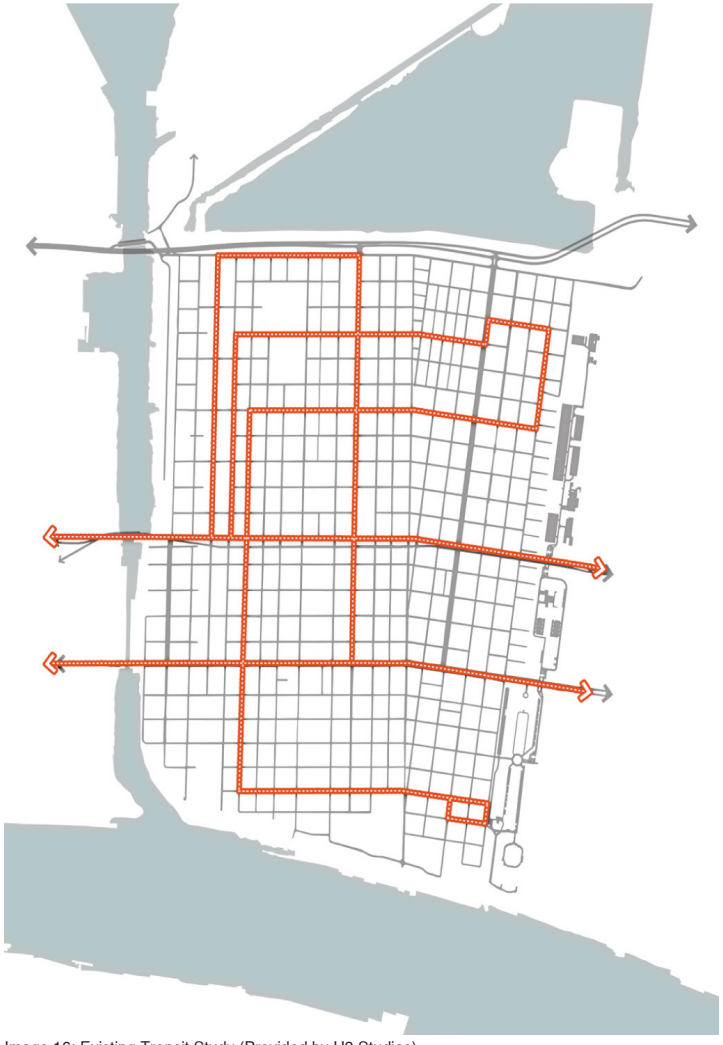
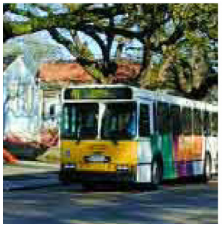


Image 16: Existing Transit Study (Provided by H3 Studios)

9 H3 Studios, 2007

Image 17: Transformation of St. Claude Avenue (Provided by H3 Studios)



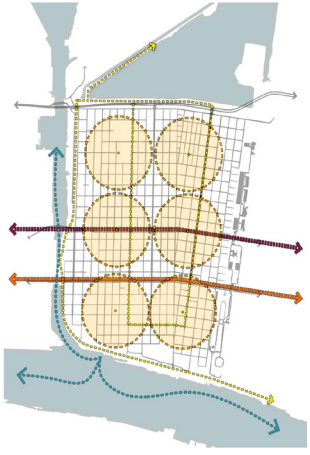


Image 18: Study potential for light rail inter-modal systems through the city along N. Claiborne Avenue, linking to Jefferson and St. Bernard Parishes as part of an evacuation route and system. Develop these connections to link District 8 to major employment centers, downtown and the proposed light-rail system to the airport. In addition, study the inclusion of St. Claude Avenue within the district for the proposed Desire Streetcar line. Include potential for both continuation of the line into St Bernard Parish. Also consider other modes of transportation such as water taxis and bicycle and pedestrian routes. (H3 Studios, 2007)

Flood Protection

Planning District 8 requires Category 5 hurricane flood protection and that this level of protection be achieved as soon as possible. A holistic approach to flood protection must be developed including regional and coastal wetland restoration; raising and armoring of all levees; improvements to pumping capacity and any other actions as a result of further study. [10]

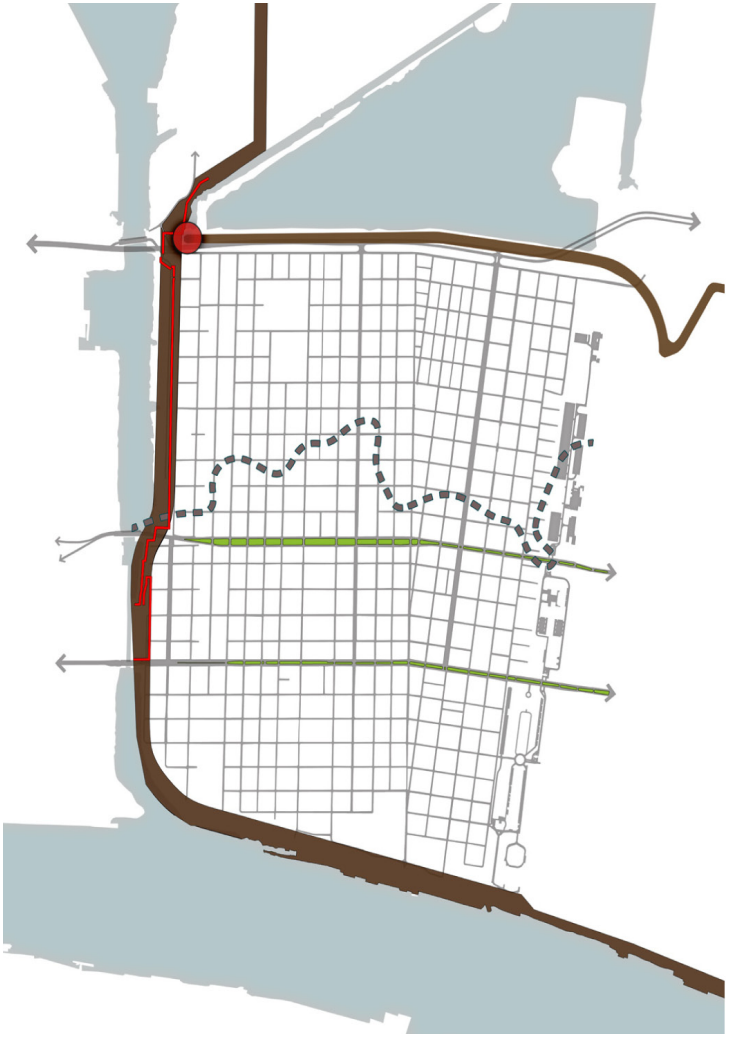


Image 19: Existing Flood Protection Characteristics (Provided by H3 Studios)

10 H3 Studios, 2007

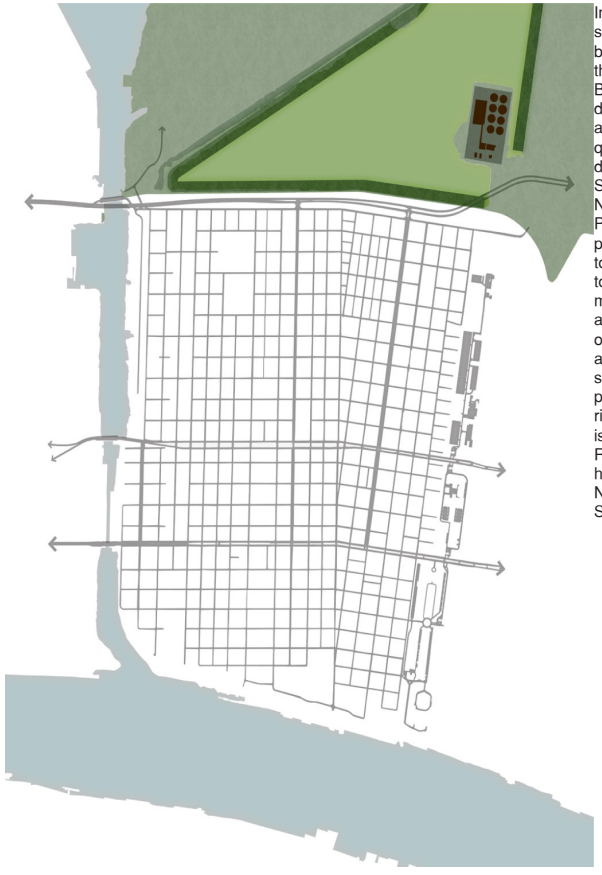
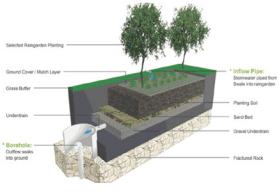
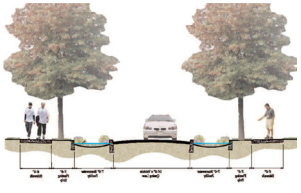


Image 20: Buffer and strengthen the natural boundaries of district: through the restoration of Bayou Bienvenue while developing congruent natural amenity to ensure a higher quality of life for residents of the district and the city. The Sewerage and Water Board of New Orleans and St. Bernard Parish Government jointly propose a regional project to use Bayou Bienvenue to assimilate treated municipal effluent to restore approximately 10,000 acres of critical cypress wetlands and provide improved storm surge and flood hurricane protection. Currently nutrient rich effluent from both parishes is discharged to the Mississippi River where it contributes to the hypoxia, or dead zone in the Northern Gulf of Mexico. (H3 Studio, 2007)

Image 21: Develop an incentive program to facilitate the creation of a variety of types of rain gardens. Study the potential forexisting and new public and private open spaces to be used. The incentive program will cover the entirety of the District for all private sector initiative; however, additional higher incentives need to be provided in high and moderate risk zones. The incentive program should be based upon the typical 50/50 cost sharing infrastructure programs and must offer technical assistance. (H3 Studio, 2007)





Waterfront Economic Recovery Development

Eventual community planned waterfront node providing indoor and outdoor venues for special events, businesses, citywide events, residential, kiosks, boating, water taxi, etc.

Areas Include:
Port of New Orleans
Mississippi Riverfront Levee Park
Delery Park/Playground
New Park on Gordon Bayou Bienvenu
Industrial Canal [11]

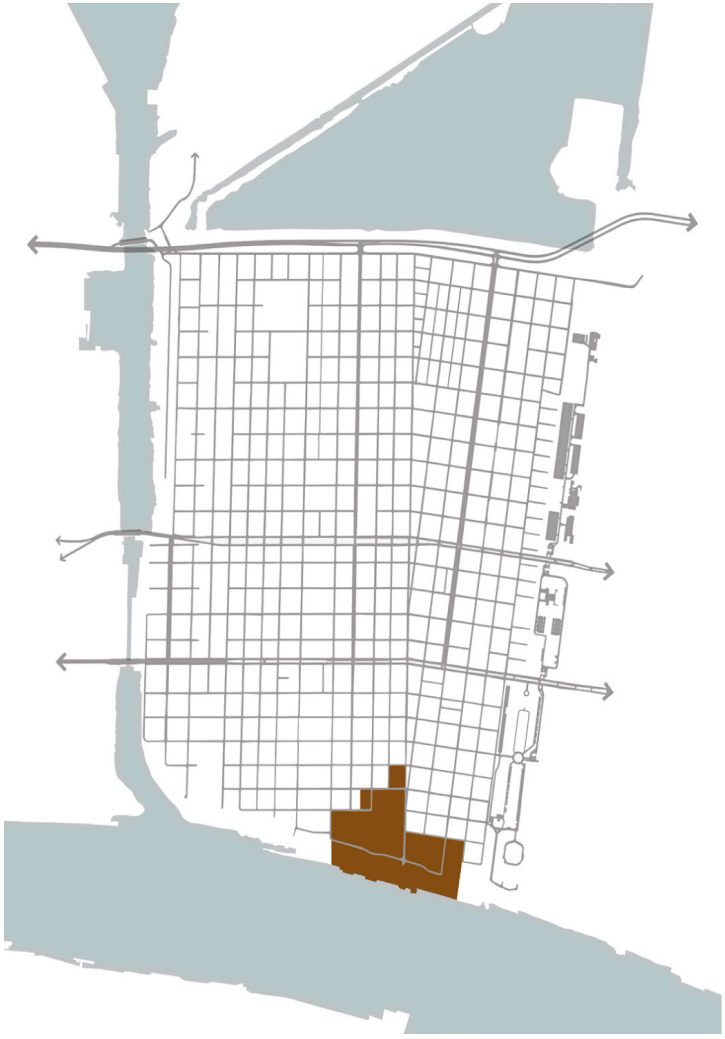


Image 22: Riverfront Development Opportunity (Provided by H3 Studios)

Conclusion/Critque

11 H3 Studios, 2007

Image 23: Transformation of Mississippi Riverfront (Provided by H3 Studios)

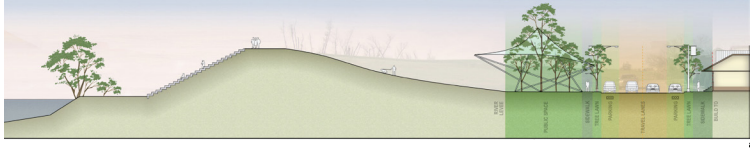


Image 24: Proposed Section of Transformation of Mississippi Riverfront (Provided by H3 Studios)

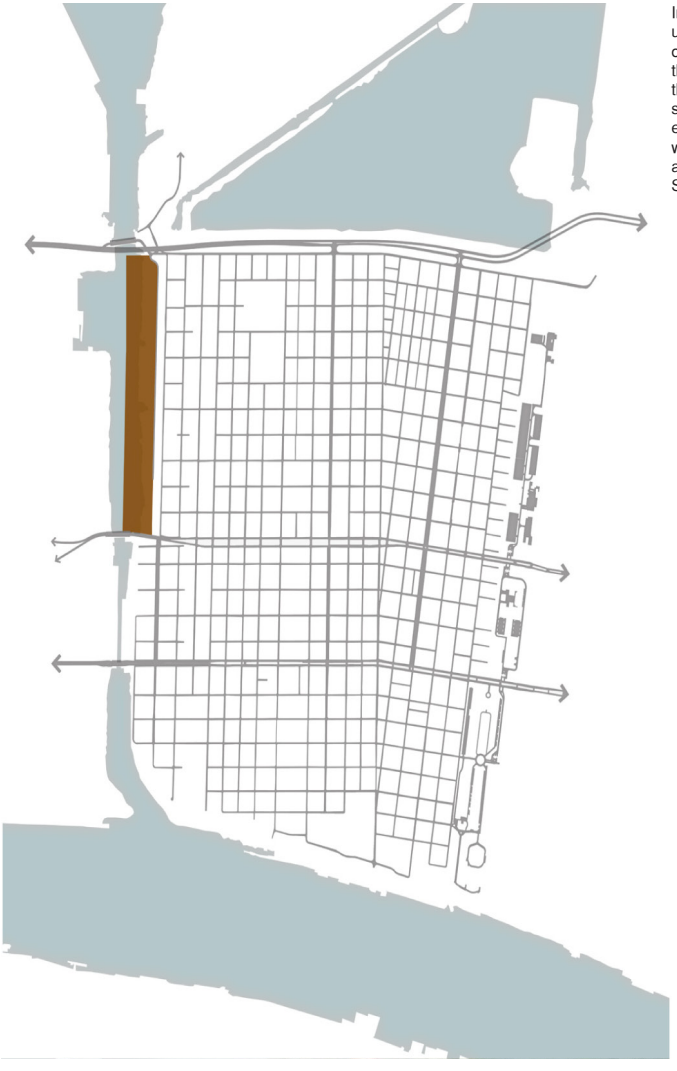


Image 25: Investigate uses for the land on the water-side of the Industrial Canal that will establish a sustainable employment center with community approved uses. (H3 Studios, 2007)

This plan differs from the previous two plans in the fact that it does not suggest any type of city center, but it does start to offer natural solutions to land use. Early on it was suggested that everyone be allowed the opportunity to return, but how long should that be allowed to be offered especially with road home grants being issued. As reassessing the L9W five years after Hurricane Katrina and Rita it seems relevant that we can start to assume that people will not be returning. This plan suggests the use of incentive programs for utilization of adjacent parcels in the Lot Next Door program where the vacant land can be purchased first by the homeowners in the area or neighborhood organization for use as a community site. This can start to offer the opportunity to create the linkages between educational facilities and make nature walks for the community.

This scenario takes a much more natural approach where the other two plans focused on how to build out the environment. It still gives suggestions on how to build but it side steps the fact that it is calling for a 100% resident return. The alternative land use is going to play a key role in the redevelopment of the L9W.

The plans mixed use development along the main corridors are similar to the prior plan but it seems to suggest working around the current residence conditions rather than assuming other options may exist. It does offer a more holistic view of how to intigrate natural flood control with the use of rain gardens and creating a natural asthetic.

It seems like they would have liked to assume that the neighborhood would not reach its pre-katrina populations but had their hands tied due to the community planning committee. This plan is less dependent on the fact that people return and therefore hold more validity if we are

looking to reevalutate the plans. It does however suggest alternative land uses in the old industrial districts in the area, which seems like a needed action. With the closing of the MRGO canal and new locks installed at the mouth of the canal at the Mississippi River the canal will need to be thought of in different ways. These plans start to address the land next to the canal but never really addresses what is going to happen to the canal itself. The hope is that it will be able to naturally restore itself to the state it was in before it was dredged out for industrial use. As ships will not be frequenting the canal a redesign of the dated bridges may be in order so that more reliable transit, possibly regional, can be utilized.

Thesis Paper

What ever doesn't kill us only makes us stronger. This may be true for humans but for cities and the built environment what ever destroys them provides the opportunity to make them stronger safer environments to live. Destructive disastrous events provide the opportunity to gain knowledge about the natural and built environment that can inform designers, planners, and architects how to create safer more natural designs that celebrate characteristics of both the built and natural environments. These opportunities can be utilized to create holistic approaches to creating stronger cities and neighborhoods. They also provide the opportunity for existing cities and neighborhoods to evolve and transform themselves to provide for growth. Throughout history cities have been and always will be subject to threats from various disastrous events; the lack of knowledge about these threats have led to the destruction of cities. This thesis explores both effective and ineffective forms of response to these kinds of events and attempts to learn from the tendencies of these responses. Understanding the act of urban design that occurs in these moments of intensity also serves to illuminate principles of urban design that are also prevalent during normal times of planning. The goal of learning from these examples is to create a set of criteria that can be used both in post-disaster recovery as well as during times of "normal" urban development.

In an effort to understand how disastrous events can influence the design and character of cities and neighborhoods various events that have transformed urban fabrics will be examined in this section. The goal of this examination is to establish precedence and explore methods taken to transform hazardous living conditions into safer well informed built environments. Events chosen to study are the 1755 Lisbon earthquake,

the Great Chicago Fire of 1871, and the 1906 earthquake and fire that destroyed much of San Francisco.

Lisbon, Portugal

Located at the northern shore of the estuary of the Tagus River is the port city of Lisbon, Portugal which has played a crucial role in Portugal's trade industry following the establishment of colonial outposts in Asia, Africa, and the Americas. It had developed throughout the ages in an organic flowing series of narrow streets and steep hills formed of alluvial landfill. The city played host to the Portuguese monarch as the commercial and ceremonial center was located adjacent the Royal Palace up until 1755 when the city was swiftly leveled by an earthquake, setting the stage for a new city to be built on an old site.[1]

On November 1, 1755 an earthquake with approximately an 8.5 – 9.0 on the Richter scale struck Lisbon causing extensive damage to the city. Many of the buildings crumbled as many of the buildings were not designed to withstand the forces exerted by the earthquake. Approximately fifty-five convents and monasteries were severely damaged, the riverfront quay sank and disappeared, and the Royal Palace was destroyed. It was estimated that 10,000 – 15,000 people were killed during the destruction as many people were attending church services at the time of earthquake. At the time of the earthquake Dom Jose I and wife Maria Anna Vitoria were not in the city, yet the king was so terrified that the royal family did not return to the city and took up residence on the hill above Belem. This lack of leadership by the Portuguese monarchy led to the minister Jose de Carvalho e Melo, better known as Marques de Pombal

1 Maxwell, Kenneth. 2002. p 21

to take the lead on the recovery.[2]

Portugal is not considered a high risk area for earthquakes yet there have been very large earthquakes in the city area usually occurring in approximately two hundred year intervals 1344, 1532, 1755, with the latest occurring in 1969. As imagined the city was ill-equipped to cope with the destruction that an earthquake brings. As previously mentioned at the time of the event, Lisbon had been a rather ancient well defined city. It was a ceremonial city with its commercial heart centered on a Royal Palace built directly on the riverfront. On the eastern side of the palace was a large palace square. Merchant and retail houses stood along a series of jumbled alleyways and narrow streets constructed over alluvial landfills between steep hills. These conditions and the lack of innovative earthquake proof construction methods led to the destruction of the city. However, this would not be the end of the city of Lisbon, in fact the event created a new beginning for the city.[3]

As mentioned previously Marques de Pombal was to become the new social power and lead the recovery efforts. The Lisbon of the late eighteenth century is indeed the product of Pombal's use of state power to create a radically transformed city out of the ashes of the great catastrophe of November 1, 1755.[4] Pombal saw the opportunity to reinvent Lisbon to be a center of economic growth and modernization of Portugal. The first and possibly most radical intervention emerging out of the new plan involved a total reinvention of the city's core with a complete overriding of previous street patterns and property lines. The essence of the new center was that it was to be a place of government, of commerce, of the

2 Maxwell, Kenneth. 2002. p 25-28
3 Maxwell, Kenneth. 2002. p 25
4 Maxwell, Kenneth. 2002. p 39

customs house, and of the stock exchange.[5] Legislation was passed in May 1758 to provide for the assessment of reallocation of property rights. Land owners were compensated accordingly and those constructing new buildings were granted loans with great rapidity. The second intervention was to create standardized design criteria for new construction. This served two purposes, the first being to use construction methods that were considered to be earthquake proof by means of anti-earthquake flexible wooden cages set on piles of green pine topped by cross-hatched pine staves and mortar pads. The second purpose this served was to create a need for prefabricated stone facings, uniform ironwork, and uniform cut lumber, which can be directly linked to the governments aim to stimulate the economy by creating an industrial artisan class to create these materials. In essence the new plan for Lisbon was designed to be a utilitarian bourgeois commercial city oriented toward economic growth and modernization. Following the destruction, Marques de Pombal and the entire city of Lisbon was provided the opportunity to change the future of the city, due to both the physical destruction and the abandonment of the prior political leadership.

Prior to this event the city would not have been able to make the changes that it had due to the presence of the royal family. Following the event much of the city was leveled and the royal family feared another earthquake and chose not to return. For this reason people were expected to give up their rights to land ownership to make way for a reallocation of street structure that followed an orthogonal layout. With the abandonment of ceremonial spaces, such as the palace, came the opportunity to create spaces centered on commerce and government. As decisions were quickly made the residents had no choice but to comply

5 Maxwell, Kenneth. 2002. p 33

and evolve with the city. Those choosing to adopt this new structure were compensated with government grants and loans to aid in the reinvention of Lisbon. Through embracement by the residents and the decisive decision making by leadership the city of Lisbon was able to transition from a traditional ceremonial city into a modern urban model of government and commerce.

Chicago, Illinois

Slightly over a century later Chicago, Illinois was provide the same opportunity as Lisbon, yet it took a much different approach in its reinvention. In 1830 Chicago was a settlement of approximately 100 people and continued to grow and expand. By 1837 the city was officially incorporated and throughout the 1840's it grew rapidly. The following 40 years saw the expansion of America's westward migration, which Chicago would take every advantage of growing to approximately 300,000 people.[6] Like most rapidly growing cities at this time Chicago buildings were constructed mainly of the quick and easy balloon framing style structure. While this allowed Chicago to expand quickly, it also provided the circumstance that would lead to its complete destruction.
On October 8, 1871 a fire started in Chicago that would change the city forever. When all was said and done 300 Chicagoans lost their lives, 100,000 residents were homeless, and approximately 20,000 buildings were destroyed, including most of downtown.[7] The fire may have had a devastating impact on the built environment, but it also provided a regenerative opportunity for the city. Historian Ross Miller wrote in The

6 Ramroth, William G. 2007. p 38
7 Ramroth, William G. 2007. p 43

Great Chicago Fire: "The fire was the modern city's great generative event. On the most basic level it was palpable demarcation between Chicago's past-frontier boom town-and its future."[8]

The fire not only provided the city's built environment with the opportunity for change, but it provided politicians the opportunity to attract new capital. William Bross, former Illinois lieutenant governor, argued that the new Chicago would provide, unlike finished cities such as London, Paris and New York, the separation between working class and upper class to be blurred. Essentially everything in the path of the flames had been destroyed and the nothing that remained belonged to everyone.[9] What he wasn't saying was that he was attempting to bring capital back into the city as quickly as possible. In fact the working class, who Bross appealed to, was prohibited from owning businesses or living downtown. In fact it was the city's established architects that had the most to gain from a timely rebuilding.

The fire revealed just how shoddily Chicago had been built. In the immediate aftermath it was possible to come to the conclusion that cheaply ornamented and hurried architecture could have been the difference between a simple accident and one of the nation's greatest urban disasters. In its booming days many of the buildings erected in Chicago were balloon framed due to its speed and ease of construction. The 1850's saw a move toward brick-bearing walls with wood-framed floors, while more pretentious buildings used Athenian marble and cast-iron fronts, which were then considered to be fire proof. Contrary to these claims throughout the 1850's and 1860's many fires broke out in the city and many buildings were lost. As there were currently no building

8 Miller, Ross. 2002. p 58
9 Miller, Ross. 2002. p 51

codes fire resistant construction came from the request of the owner. Unfortunately what was considered to be fire-resistant construction was not, and this lack of fire-resistant construction provided the conditions for this disaster to occur. It was the man-made environmental condition that would eventually lead to the destruction and eventual rebirth of Chicago.
Almost immediately following the Great Chicago Fire of 1871 the city began to rebuild. In those early days the opportunity for capital was available for whoever had the means to take it. The easiest way to claim ownership of land was to erect a structure as quickly as possible, so the initial recovery attempts took a quantity over quality approach. Between 1871 and 1873, so much capital was available for the rebuilding that architects raced from one project to the next.[10] As recovery continued little consideration was taken to fire-proof buildings and once again the city was being shoddily built. Architects and politicians asked nothing more than the illusion of permanence from builders. The only obstacle standing in the way of Chicago repeating the mistakes of the past was the economic panic of 1873 which stopped construction cold.
It was around this same time when architects such as Daniel Burnham and John Wellborn Root started to emerge onto the scene. For these new architects employment came slowly which allowed them to step back from the madness, study and develop plans by learning from the mistakes of the past. This waiting process was much longer than they could have imagined and it was not until nearly a decade later that a new opportunity presented itself in the form of a secondary mini fire which destroyed much of the newly constructed Chicago.[11] Owners of these newly vacant lots started selling to professional land traders with the intent of owning

10 Miller, Ross. 2002. p 56
11 Miller, Ross. 2002. p 58

as much of a three-acre block as possible. These new largely consolidated lots led to the opportunity of a transformed built environment that houses the innovations in Chicago that we see today. These innovations did not come with the initial recovery effort but rather it was developed over time following the initial recovery failure and secondary fire.
Recovery from the fires started quickly and without a great amount of understanding of the conditions that led to the disaster. For this reason Chicago was forced to relive the event, although on a smaller scale, shortly after the original. It was not until an understanding of the characteristics of the urban context that led to the disaster was realized that innovations, building codes, and zoning ordinances could be developed that led to the creation of less hazardous environments. While Chicago did not benefit from a quick recovery other cities were able to take advantage of a hasty recovery, such as San Francisco in 1906.

San Francisco, California

By the turn of the 20th century San Francisco had become a center of world trade and finance, nearly equal in stature to New York City, London, and Paris.[12] Much like Chicago, San Francisco was a boom town that had grown very quickly Unfortunately the planning of the city, like most early western settlements, had been a distant thought until the 20th century.
At this time the city was looking to expand and grow, but to do so it first needed to address conditions that arose from the unplanned development of the city. The city was provided this opportunity when devastation struck in 1906.

12 Ramroth, William G. 2007. p 102

On April 18, 1906 the earth beneath San Francisco began to shake and continued for 48 horrifying seconds. The quake sent residents scattering out of their homes only to return and continue on with their morning rituals, that is as long as they were not located south of Market Street. Many of the houses built on fill tilted or collapsed, crushing victims inside. Fires from overturned stoves and broken chimneys started and water and gas lines below the liquefied bay mud broke, igniting fires from escaping gas. At one point 52 fires were burning in San Francisco with no water to fight them. In an attempt to cut the fires off and stop them from spreading fire breaks were used by using dynamite to destroy buildings. As in other cities, prior to the San Francisco fires, dynamiting buildings made of wood only succeeded in starting more fires from spewing flaming lumber. It was three days before the fires were successfully extinguished, leaving approximately eighty percent of the city with nothing but charred remains. The earthquake and fire together destroyed nearly 28,000 buildings and left 250,000 people homeless. The victims of the disaster took up residence in temporary tent cities established in Golden Gate Park and John Daly's hill south of San Francisco.[13] The devastation sustained in those three days can be attributed to the lack of knowledge of San Francisco's predisposition of susceptibility to earthquakes.

While there was knowledge of earthquakes in the region with the city experiencing them throughout the 19th century, lack of innovative flexible structure design and use of rigid brick and mortar and wood construction provided conditions for disaster. Prior earthquakes and fires in 1865 and 1868 caused people to question the techniques used to construct new buildings, yet in those recoveries these inquiries were ignored and the same brittle construction techniques used to protect against the spread

13 Ramroth, William G. 2007. p 104-105

of fires were the same techniques that made the buildings susceptible to earthquakes. Yet still it was not the construction type that was the instrumental factor contributing to the destruction of San Francisco as much as the location of buildings. As previously mentioned the areas sustaining the greatest damage were south of Market Street which had been composed of poorly compacted earth used to fill in the bay for expansion of the city. This fill, dubbed "made ground", would go through a process called liquefaction during an earthquake in which it settled quickly due to the back and forth motion caused by the earthquake.[14]
It was construction on this fill coupled with the lack of innovative techniques used to allow buildings to give and flex with the forces exerted by earthquakes that led to the destruction and subsequent opportunity for reinvention of San Francisco.
As previously mentioned San Francisco's story of recovery was that of quickness. What wasn't explained was the role that the public would play in the rebuilding of the city. The fires were extinguished on a Friday and on that Sunday plumbers were in the streets repairing gas, water, and sewer lines while debris from the quake was removed and dumped into the bay. As much of the city was a blank slate the opportunity had arisen to reevaluate the feasibility of implementation of an earlier master plan developed by Daniel Burnham, which addressed the street structure and overall urban plan of the city. Public dissention halted implementation of the new plan as businessmen and landowners threatened to sue if their land was take in order to widen streets. The San Francisco Chronicle called Burnham's master plan a cob web and too reminiscent of the grand Renaissance plans of days gone by.[15]

14 Ramroth, William G. 2007. p 100-101
15 Ramroth, William G. 2007. p 106

The cities second attempt to address past mistakes and poor planning came in the form of a revised building ordinance named the Building Law of the City and County of San Francisco 1906. The revised ordinance established design criteria dealing with horizontal loads experienced in earthquakes, but the lack of knowledge of how earthquakes affect buildings led to illogical design criteria. As engineers had little experience in calculating horizontal loads caused by earthquakes, buildings surviving the earthquake and designed with specific wind loads were used as examples. Masonry buildings, which were generally the most affected by the quake, were unaffected by the new requirements due to the fact that they were generally not as tall as steel buildings. Height to street width ratio was also an illogical new earthquake design criteria developed by the new ordinance due to the fact that earthquake loads are not affected by the width of the street. In large part the proposed ordinance was motivated more by aesthetics, daylighting at street level, and the general fear and dislike of tall buildings rather than the consideration of future earthquakes.[16] The lack of knowledge of how San Francisco's natural environment affects its built environment had led to development of design criteria that was illogical and raised questions of what the political powers were attempting to accomplish. New innovations in earthquake design are still being developed today, while in San Francisco conditions still remain that have not been addressed such as the "made ground" south of Market Street where the disaster began. Despite the motivation of policy makers and politicians, San Francisco, through the rigorous work ethic of the victims, was able to rebuild itself.

Another city currently finding itself informed of its natural environment

16 Ramroth, William G. 2007. p 108-110

following years of flooding is that of Dallas, Texas. Fortunately the city of Dallas was able to realize the potential of embracing its natural environment prior to a catastrophic event destroying the city such as San Francisco.

Dallas, Texas

In early 2005 the city of Dallas was presented with a comprehensive land use plan that envisions the transformation of the Trinity River Corridor created by HNTB Corporation. The Trinity River Corridor has always represented the greatest challenge and greater opportunity to redefine the City of Dallas. For years, the Trinity River has been a barrier within the community, separating northern and southern Dallas. Utilizing an extensive public participation process, the Trinity River Corridor Citizens Committee fulfilled its charge from the Mayor and City Council to develop a vision of what the Corridor could become.[17]

One of the major objectives for the Trinity River Corridor Transformation is to reconnect North and South Dallas. Historically, the river has been regarded as serving a strictly utilitarian purpose; to move flood waters through the city. This attitude caused the river to be a dividing line in the city that has persisted through the decades. In this plan the river is refocused as an amenity to the city that creates a bond between the two halves of the city. A series of gateways and pedestrian pathways create physical connections throughout the two halves of the city, while other overlook points, nature observes, and recreational activities can create experiencial connections.[18]

17 HNTB Corporation, 2005
18 HNTB Corporation, 2005

Another major objective of this plan is to establish the Trinity River floodplain as the front yard of the city. In the past, the Trinity River floodplain has been a forgotten and neglected back yard while Dallas focused its attention on growth in other parts of the city. Its amenities should be the impressive foreground in views of the Dallas skyline; they should also be the neighborhood front yard where local children play and adults enjoy nature.[19]

Several concepts contained in this plan help achieve this objective such as development facing the river, new mixed use communities, removal of barriers to the river, and the connection of old river channels with the main river via levee's and gates to offer floodplain –level access. Public improvements along the river such as amphitheater, boat launches, forests, and horse parks provide choices for entertainment, education and enjoyment. Major plazas, restored and revitalized natural ecosystems, lakes varying in size, and areas of solitude and contemplation all create destination throughout connected by trails offering people the ability to explore these spaces in a unique fasion.[20]

While this plan does not respond to the scale of destruction that prior studies have, it does challenge the way planners, designers, and architects react to the natural environment. It suggest that a relationship can be created that engages and celebrates the natural environment rather than ignoring and building around the natural environment. This plan seeks to create a harmonious relationship between the build and natural landscape while engaging an urban characteristic that has been ignored for decades. For Dallas this means looking back on itself and developing land that has been considered undesirable in the past. Unlike other examples of cities

19 HNTB Corporation, 2005
20 HNTB Corporation, 2005

developing around water the Trinity River plan seeks to allow the water to engage the community and vice versa. New Orleans is an example of one of these cities that have chosen to separate itself from the natural condition of water. Overtime this separation has created a hazardous condition for the city of New Orleans.

New Orleans, Lousiana

There is no doubt that New Orleans is a manifestation of slightly over a century of hydrological innovations created to remove water from an environment to promote manmade development and population growth. As the city of New Orleans grew throughout the 19th and 20th centuries technologies were introduced to make land more readily available for development. As seen in San Francisco, with the "made ground", manipulated ground tends to react in unexpected ways and cause undesirable conditions. Much of the early settlement of New Orleans was surrounded by undevelopable marshland. As the city grew hydrological innovations were introduced to remove water from the marshlands and transform it into developable land. During the development of these innovations little was known about the advantages that these natural conditions provided and how draining them would affect that environment. One of those advantages was that marshland created a buffer zone between the developed area and storm surge flooding resulting from hurricanes. This was a crucial component of the natural safety features of New Orleans as it is obviously at risk from hurricane storms, yet this was not the only condition threatening New Orleans. The city historicaly had a steadily increasing population up until 1965

when it reached its peak at nearly half a million people. Since that time the city has been slowly loosing residents. Some left following Hurricane Betsy which flooded much of south eastern New Orleans, and yet others left with the deindustrialization of the city. Many people simply started moving to suburban areas to escape city life. Those remaining within the city are racially, economically, and in some cases physically segregated. What is known now is that the city is experiencing a massive amount of blight that was only amplified by the disastrous event that occurred on August 29, 2005.

As millions witnessed one of the most destructive events in American history take place from their living rooms via their television sets, tens of thousands were experiencing an unthinkable horror. On August 29, 2005 Hurricane Katrina plowed a wide path of destruction flooding 80 Percent of New Orleans, a city of approximately 180 square miles with a population of half a million. It destroyed over 300,000 single family residences, 40,000 apartments, and damaged an additional 300,000 structures.[21] It is clear that the event rattled the city to the core and tested the resilience of its victims, yet it was not only the storm that caused the damage suffered by its victims.

In the immediate aftermath, thousands of New Orleanians were left helplessly stranded on rooftops, bridges, freeway overpasses, and in the New Orleans Superdome as local, state, and federal government officials procrastinated, made excuses, argued, and played political games, illustrating their lack of preparedness and apparent insensitivity to the misery of tens of thousands affected by the disaster. Over one and a half million people were eventually evacuated. Tens of thousands were left

21 Ramroth, William G. 2007. p 201-202

living in a state of limbo and turmoil.[22] This marks the first time in history that a city had called for a full evacuation of all non-essential personnel leaving much of the city a ghost town. For nearly a month after Hurricane Katrina, most of New Orleans remained underwater. For much of this time, New Orleanians were forbidden to return to their houses. Flood waters contained toxic chemicals, oils, gasoline, human and animal waste, and dead bodies.[23] Many victims during this time were spread throughout the nation and had no choice but to start picking up the pieces and making new lives for themselves, while others took a much different approach.

Most New Orleanians took a wait and see attitude. They waited to see how the Corps of Engineers did in rebuilding the levees. They waited to see what the City of New Orleans so-called "rebuilding plan" would involve. They waited to see how much insurance money they would get, waited to see what their neighbors did, and waited to see what another hurricane season would bring.[24] U.S. Postal Service statistics recorded 160,000 relocated households from Orleans Parish after the storm. Of those, 17,000 households were relocated to other domiciles within Orleans Parish, and 21,000 households were relocated to the greater metropolitan area. Over 2/3 of relocations were outside of the state. The most common sites of relocation were Houston, Dallas, and Atlanta.[25] Perhaps the biggest unanswered question is whether former residents will ever return. Part of that is related to safety assurances, and civil engineers are debating how well New Orleans can be protected from a future hurricane, and whether some modifications can help: higher and stronger

22 Ramroth, William G. 2007. p 202
23 Ramroth, William G. 2007. p 217
24 Ramroth, William G. 2007. p 220
25 Logan, John. 2006

levees, closing the Mississippi River Gulf Outlet (a shipping canal that may have contributed to the flooding), raising ground levels, restoring wetlands, and replacing canals with culverts.[26] As considerations for creating a safe environment are being developed current conditionsand their ramifications on the environment, must be evaluated to ensure the effectiveness of new innovations.

Current flood protection and hydrological innovations developed over the past one hundred fifty years to keep water separate from the built environment ironically have created the conditions that have put New Orleans at risk of everyday flooding and extraordinary storm surge. From the middle of the 19th century, developers eyed the marshland that fringed the city to the north. Recognizing that pumps would be required to keep these areas from flooding , a series of three drainage channels were cut running south from Lake Pontchartrain into which water could be pumped. The beginning of the 20th century saw Chief Engineer of New Orleans, A.B. Wood, develop giant electricity-powered screw siphon pumps to remove flood water from the city. The original pump houses were situated at the southern end of the channels that passed into Lake Pontchartrain and remained in place and in use at the time of Hurricane Katrina.[27] This innovation did three things well; removed water from wetlands that allowed for development, caused soil to settle creating the current condition of New Orleans lying below sea level, and the destruction of wetland as a protective buffer zone from storm surge flooding. While these innovative developments in the late 19th and early 20th centuries created the exact conditions they were trying to prevent, the need to create shorter shipping routes led to the conditions

26 Paulson, Amanda. 2005
27 Grossi, Patricia and Rober Muir-Wood. 2010

that devastated many of the neighborhoods in southeast region of New Orleans, including one of the most devastated neighborhoods of the Lower Ninth Ward.

As the industrialization of America became the back bone of the economy, New Orleans became a major port city along the Mississippi, and the need for shorter shipping routes arose. In 1923 the shipping channel named the Industrial Canal was constructed along the eastern edge of the city. This canal connected with the varying height of the river through locks of the Inner Harbor Navigation Canal, which were only large enough to take the barge traffic of the time.[28] Not only did this provide shorter routes to the Mississippi River, but it also physically segregated neighborhoods such as Holy Cross and the future Lower Ninth Ward. The flooding experienced in the Lower Ninth Ward and St. Bernard Parish originated from the Industrial Canal, yet there was one other crucial component that played the largest role in the storm surge flooding.

In 1965, to circumvent the restriction of the locks, the U.S. Army Corps of Engineers completed construction of the Mississippi River Gulf Outlet (MRGO) shipping channel, providing a shorter route form New Orleans to the Gulf of Mexico.[29] To environmentalists, MRGO is a disaster. Besides destroying large portions of wetlands to build it, it constantly erodes additional wetlands. Saltwater from the Gulf flows up MRGO, killing freshwater marsh vegetation growing along its banks, further exacerbating the environmental disaster. In destroying wetlands, MRGO has also destroyed nature's speed bumps, decreasing the ability of wetlands to slow down hurricane winds and reduce storm surges. Worse than that,

28 Grossi, Patricia and Rober Muir-Wood. 2010
29 Grossi, Patricia and Rober Muir-Wood. 2010

MRGO has formed an expressway for storm surges.[30] If residents of New Orleans are to regain a sense of security, efforts will have to be made to restore the destroyed natural flood protection elements. Due to blight throughout New Orleans, especially in the Lower Ninth Ward, that has been amplified by the disastrous event the city is provided the opportunity to explore alternatives to typical hardscape built environments.
The advantage of examining a post-disaster event five years after recovery planning has started is that failed attempts can be examined to utilize strengths while avoiding the weaknesses. The recovery planning in New Orleans had gone through three official phases, each evolving from the last. The first of these plans started almost immediately with the development of the "Bring New Orleans Back Plan", which examined location of immediate neighborhood redevelopment and the need to examine the viability of hydrological elements.

Bring New Orleans Back (BNOB)

The Bring New Orleans Back plan was developed by Wallace, Roberts, & Todd LLC in October of 2005. In it they examined ways of creating a comprehensive flood and storm water protection system with multiple lines of defense to protect the city which include; perimeter levees, pumping gates, internal levees with separate pumps, and coastal wetland restoration. Environmentally speaking what this plan starts to do effectively is examine the restoration of coastal wetlands as a viable flood protection element. It also examines the use of levees along MRGO and the Industrial Canal coupled with the closure of these two storm surge super highways, the idea being to protect the remaining wetlands from

30 Ramroth, William G. 2007. p 208

further erosion. However, the plan does not celebrate or allow the natural element of water and wetlands from engaging the city which is what made the city a protected habitat early in its development. Wallace, Roberts, & Todd LLC seem to ignore the fact that the city was built on drained wetlands and continues to recommend the hardscape development of these areas.[31]

Post-Katrina New Orleans was examined in this plan to locate target development areas, which are essentially concentrated community developments. A set of criteria that must exist for this to be a viable option for development was created by Wallace, Roberts, & Todd LLC. This criterion included;

-Population of 5,000-10,000
-Residents commited to return
-Efficient delivery of infrastructure: roads, drainage, utilities, services
-1-2 k-8 public schools and shared high school supported by 11,000 people
-Parks and open spaces
-Connection to city by convient public transit
-Contiguous relationship with at least 2 other neighborhoods
-Cultural community facilities
-Places of worship
-Health facilities
-Park and open space with an easy walk
-Reasonable Access of retail
-Access to public transit.

31 Wallace, Roberts, and Todd LLC. 2006

In their plan for these immediate development areas a key element of neighborhood centers emerged that would be located along major transit lines to connect them as hubs throughout the city. These Neighborhood Centers would contain mixed use corridors with retail on the ground level, dense housing structures, schools, neighborhood facilities such as fire and police stations as well as town halls, and planned open space and parks. As Wallace, Roberts, & Todd LLC start to locate these immediate areas of redevelopment at least one of their recommendations can be called into question, which is the Lower Ninth Ward. This area does not meet any of the criteria laid out in the plan. While a specific design for the Lower Ninth Ward was not created from the BNOB plans it did provide recommendations that can be seen in future master plans. Therefore it became necessary to study these plans in an effort to understand the evolution of planning in New Orleans.[32]

Lambert Plans

As previously mentioned the Lower Ninth Ward was one of the hardest hit areas by Hurricane Katrina storm surge flooding and was utterly destroyed. To this day the neighborhood remains at a population of 29 percent of it pre-Katrina population. For these reasons examining the struggling neighborhood became a desirable condition for this thesis. As time has progressed and the neighborhood has yet to make a full recovery many plans have been developed and suggested yet this thesis will only examine the official plans. The first stage of the evolution of neighborhood planning came with the development of the Lambert Plans. Previously developed planning districts in the Bring New Orleans Back

32 Wallace, Roberts, and Todd LLC. 2006

plans created a series of thirteen planning districts. The Lower Ninth Ward and Holy Cross neighborhoods were located in the eighth planning district. The first official plan for these neighborhoods was created as a set from the Lambert plans. These were a direct evolution of the previous Bring New Orleans Back plans, and included the use of the neighborhood center. This plan by Stull and Lee Architects, which was developed in 2006 when victim return rates were still unknown, was being driven by the assumption that there would be a full return of residents. The plan effectively addressed needs of the neighborhood such as employment opportunities and commercial development opportunities. Where the plan fell short was in the environmental development. It seemed to totally ignore the component of water or wetlands, but to be fair, as a direct evolution of the Bring New Orleans Back Plan those issue were addressed on a regional scale. While this neighborhood plan focused on socio-economic issues another plan developed nearly one year later starts to address both socio-economic and environmental issue related to the Lower Ninth Ward.[33]

The Unified New Orleans Plan (UNOP)

The Unified New Orleans Plan is a set of neighborhood plans developed in close collaboration with urban planners and neighborhood leaders. The plans are intended to be a comprehensive set, creating recovery plans for each neighborhood planning district developed in the Bring New Orleans Back plans. (The eighth planning district was created by H3 Studios in 2007). The Goal of the plans was to create a healthy sustainable community based on a carbon-neutral transit-oriented neighborhood

33 Stull and Lee Architects. 2006

integrated into a productive landscape. This plan effectively examines techniques for utilizing existing strong socio-economic components of the neighborhood such as schools, waterfront conditions and high traffic corridor development. It also makes connections with utilizing empty blighted spaces to reintroduce environmental conditions such as productive landscapes.[34]

At the time of this plans development it was starting to become clear that people would not be returning to the Lower Ninth Ward in the numbers that were once expected, yet in working with the neighborhood leaders that was one of the design criteria that had to be met. As the neighborhood was struggling to recover, new and innovative ways of thinking about the strengths of the neighborhood needed to be developed and H3 Studios started that thinking. A strong element of the neighborhood existed in its schools and community centers. As they were not being utilized H3 studios examined the opportunity to transform them into 24/7 accessible information hubs providing training, peer counseling, safe houses, and after hours learning centers. They also examined the transformation of high traffic low density development into Transit and Pedestrian Oriented Developments utilizing light rail, foot paths and bike routes. These developments would also provide employment opportunities, services, and dense residential. Along the riverfront they examine the opportunity to provide community services and dense residential out of vacant industrial buildings. All of this created a new socio-economic component to the neighborhood. In addition to creating these hardscape developments they also examined ways in which they could introduce softer environmental components into the

34 H3 Studios. 2007

neighborhood.[35]

This is the first official plan examining the opportunity to reintroduce environmental features into the neighborhood itself. H3 Studios examines open spaces, avenues, boulevards, and neutral grounds being used as passive linkages and pedestrian connections for schools and neighborhood features creating bio diversity throughout the neighborhood. These spaces could start to be considered as an economic benefit to the community using them to create gardens, tree farms, aqua farms, fisheries, edible landscapes, market farms, and greenhouses. H3 Studios also examined the opportunity to make connections with the schools and the existing wetland areas, and the opportunity to create a tourist component with nature walks through these wetlands. These design components create opportunities for the natural environment to be reintroduced into the neighborhood and utilize the environmental designed components as socio-economic catalysts. However the plans are still reliant on a full return of residents to the neighborhood. Until there is a plan developed that separates itself from the past the neighborhood will not be able to redevelop and recreate itself and focus on the future.[36] As mentioned before there are advantages to examining a post-disaster event and plans for recovery after those plans have had the opportunity to be implemented. Strengths and weaknesses can start to be identified in order to avoid pitfalls and utilize effective components of each plan.

Conclusion

As a final analysis of effective and ineffective post-disaster response

35 H3 Studios. 2007
36 H3 Studios. 2007

techniques examples can be pulled from each example previously provided. Ineffective tendencies in our responses to nature are often caused by a lack of knowledge of how the built environment will react to the environment and vise versa. In San Francisco the city and county officials created a new building code that was said to be motivated by its predisposition to earthquakes when in reality it was more likely motivated by aesthetics, daylighting at street levels, and the general fear of tall buildings. At the time it was clearly unknown how buildings would react in the event of an earthquake. In New Orleans it is becoming more and more clear the role that wetlands play in providing a protective buffer around the city, but as the city found it needed room to expand it did not examine ways in which the built environment could work with the wetlands and rather opted to remove the wetlands altogether creating its susceptibility to flooding today.

Ineffective tendencies in socio-economic responses to disastrous events can be seen in Chicago following the Great Fire of 1871. Politicians, in an effort to use the event as a catalyst for growth, attempted to attract all classes of people stating that the destroyed Chicago belonged to everyone and not just the upper class rich. This was said to try and get capital flowing back into the city as quickly as possiblehen in all actuality the downtown area that had been destroyed was off limits to residence and religious facilities which filled the street before the event. Rather it was the office spaces and warehouses that were large enough to utilize the open spaces provided by the destruction of the fire and those buildings belonged to business men and upper class landowners.

In Lisbon and Chicago appropriate responses in hazardous conditions can be witnessed through the attempts to specifically build in reaction to

the events that destroyed the city. In Lisbon a standardized architecture and reallocation of streets and zoning have allowed the city to evolve from a ceremonial city into an urban design focused on celebrating commerce and finance. While in Chicago new innovations in fire protection, material usage, construction techniques, building codes, and the consolidation of parcels to allow for new building typologies to be developed were in direct relation to the fires that destroyed the city. Finally, successful socio-economic response can be seen in Lisbon, San Francisco, and at least in theory in New Orleans. In the case of Lisbon the city was given the opportunity to make the transition from a traditional ceremonial city to a modern city focused on economic and cultural growth. The standardization of built elements in the city led to the need of an industrial artisan class that provided a catalyst for economic generation. In San Francisco the residents of the city took the lead on rebuilding the city which catalyzed the working class, while other neighborhoods were able to reinvent their image. In direct contrast to San Francisco the residents seem to be the ones standing in the way of a progressive plan for development, especially in the Lower Ninth Ward. Throughout the official plans for recovery in the Lower Ninth Ward the trend seems to be that an optimistic view of returning residents is holding back the potential for alternative uses in the neighborhood to be utilized in transforming its character. Despite this, strategies have been suggested to utilize the massive amounts of blighted and open space left over by decades of population decline and Hurricane Katrina. As architects, planners, and designers the responsibility to create progressive concepts falls on them, and to many times unrealistic predictions restrict those concepts from developing.

Those attempting to create a recovery plan following a disastrous event must take into consideration what type of event has destroyed the city and the events leading to its predisposition to the disaster. Without knowledge of how the natural or built systems work the city will always suffer the wrath of disastrous events. Also with destruction of the built environment on this scale an opportunity is provided for cities and neighborhoods to reinvent themselves. In many cases these events can also provide an excuse to address other underlying issue that could be causing cities and neighborhoods to fall into decay. This to should take into consideration the knowledge learned from the disaster which can play a role in redefining cities and neighborhoods.

In many cities throughout history the built environment has been predisposed to disastrous natural events (although in many cases the disaster has been shown to actually be exacerbated by man-made elements). These events provide opportunities to learn from and counteract these predispositions saving further destruction and havoc. If the built and natural environment can not coexist in a harmonious holistic state then the man-made environment will always be at risk to natural destructive events. Not only do these events provide the opportunity to learn how to design in a more holistic manner, they also provide the means for cities and neighborhood to create new images for themselves. The events provide the means for reinvention, reshaping, and reorganizing the built environment to coexist with the natural while allowing for evolution of the city or neighborhood to provide growth.

Site Analysis

Characteristics of the L9W

As previously mention one of the advantages of examining the site of a disastorous event five years after it has occured is being able to study how the victims and city has reacted to planning following the event. This section will examine characteristics of the site as it exists in 2010. A variety of components make up the defining features of the L9W which have seen drastic transformations within the last five years since Hurricane Katrina. The analysis approach taken was to examine these components through the lense of a SWOT analysis, which identifies strengths, weaknesses, opportunities and threats to the community. The key characteristics examined were as follows:

-Flood Protection: including levees, pumping stations, flood walls and typical natural flood plains.

-Community Facilities: inlcuding schools, community centers, learn ing centers, and parks.

-Commercial Activity: examine artierial roads for possiblility of in creased commercial activity.

-Blighted and Adjucted Parcels: Prior to Hurricane Katrina the L9W had a substantial amount of blight from decades of decline of population that was only amplified following the event.

-Agencies Attempting to Transform the Neighborhood: Non-profit organizations such as Make It Right and Global Green are providing opportunities and the means to create a renewed interest and building typology within the neighborhood.

Community Facilities

Following Hurricane Katrina many Community Facilities such as schools, community centers, and recreational centers were severely damaged and closed down until renovations could be completed to bring the facilities back to a safe operating standard. Unfortunately some of these facilities were demolished causing the loss of vital High Schools and Community Centers.

While only Martin Luther King Jr. Elementary school has been reopened, other schools still remain and can be utilized as learning centers and/or community centers. Recreational centers that play a vital role in aiding to keep children off the streets and out of crime have been lost and need to be replaced. As the Lower Ninth Ward attempts to reinvent its image crime prevention is a key role and providing children with an alternative to that crime is the role that recreational centers play.

While some of these facilities have been lost forever some still remain and can start to serve as much need functions for the community. The rehabilitation of these facilities are not only vital to the future of the community but also to its past and its memories.

Image 1: Abandonded Basketball Court is all that Remains of Old High School

Image 2: Underused Abandonded Park

Image 3: Renovated Operational Middle School

Image 4: Lack of Welcoming Public Entrance

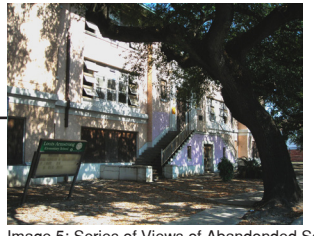


Image 5: Series of Views of Abandonded School

Economic Stimulus

The Lower Ninth Ward was developed for its proximity to the canal while industry was still the main economic generator in the US. Following the de-industrializaion of the US, like many other areas built on industry the neighborhood lost its value and housing prices plummeted. Today these industrial zones stand vacant. A use must be found for these zones as they are on high value land next to water.

The two arterial roads that run thru the Lower Ninth Ward serve as commuter routes to the Central Business District and St. Bernard Parish. Following Hurricane Katrina these high traffic corridors have become vacant and under-utilized. The opportunity for re-development is present as is a secondary connecting corridor along Caffin that creates a connection between Holy Cross and the Lower Ninth Ward unifying the two neighborhoods as one. Commuter transit is present and needs to be utilized as an asset to the community, as many use mass transit as their primary form of transportation. More walkable transit oriented development will play a large role in the economic re-invention of the Lower Ninth Ward.



Image 6: Series of Abandonded Homes Along Claiborne Avenue



Image 7: Series of Obstacles Along Pedestrian Paths on Claiborne Avenue

Image 8: Abandonded Church Along St. Claude Avenue

Image 9: Abandonded Retail Alonge St. Claude Avenue

Make It Right/Global Green

Organizations such as Make It Right and Global Green are providing high design sustainable housing at a minimal cost to Holy Cross and Lower Ninth Ward residents. The goal of the programs are to show that sustainable housing can be for everyone not just the wealthy. It also helps provide homes to people who wish to return to their neighborhood.

The New Orleans economy is reliant on the tourism industry and prior to Hurricane Katrina the Lower Ninth Ward was not a highly visited site. However following the hurricane people immediately started visiting the neighborhood to witness the devastation. The residents of the neighborhood felt that people needed to witness the devastation for themselves and show that there was much work to be done.

Projects like Make It Right and Global Green continue to draw tourists into the neighborhood informing people that the work to be done is far from over while highlighting the importance of sustainable design. These projects start the conversation of how to re-invent the Lower Ninth Ward as an informative neighborhood, but they only examine local issues where a more regional or global conversation can be started.

Image 10: Series of Make It Right Homes Designed by Various Architects

Image 11: Global Green Homes and Sustainable Functions

Blighted & Adjucted Properties

Prior to Hurricane Katrina blighted and adjucted properties were a problem in the Lower Ninth Ward, but the problem has been magnified following the storm. Holy Cross has minimal amount of properties that are considered to be blighted or adjucted. Most of these properties can be absorbed by the community or neighboring properties with the Lot Next Door program which allows them to maintain the property for upwards of five years and gain ownership.

In between Claiborne and St. Claude is the opportunity to provide infill construction for families wishing to move back to the neighborhood but would also like to remain out of the danger zone.

The northern section of the Lower Ninth Ward is where the problem area lies. Drastic measures need to be taken and alternative uses for land must be explored. It is unlikely that this area will ever reach a population that it once maintained. Relocation of current residents must be considered as there are insentive programs for residents to move out of a high risk and into a low risk zone. Plans to date have considered a full return but the longer time goes by its more likely that residents are not returning.

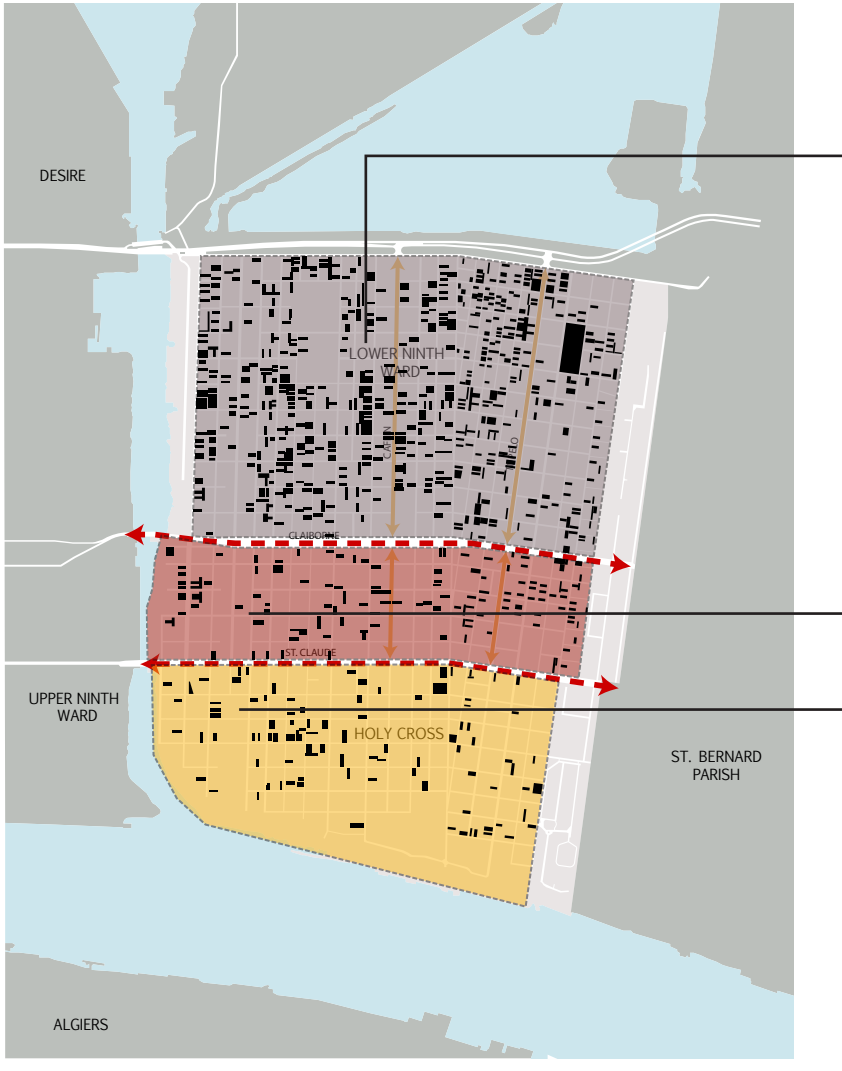


Image 12: Abandonded Home Transformed from Structure to Sculpture.

Image 13: Blighted Abandonded Homes Adjacent to Active Park

Image 14: Abandoned Home to the Left and Infill Opportunity Between Occupied Homes

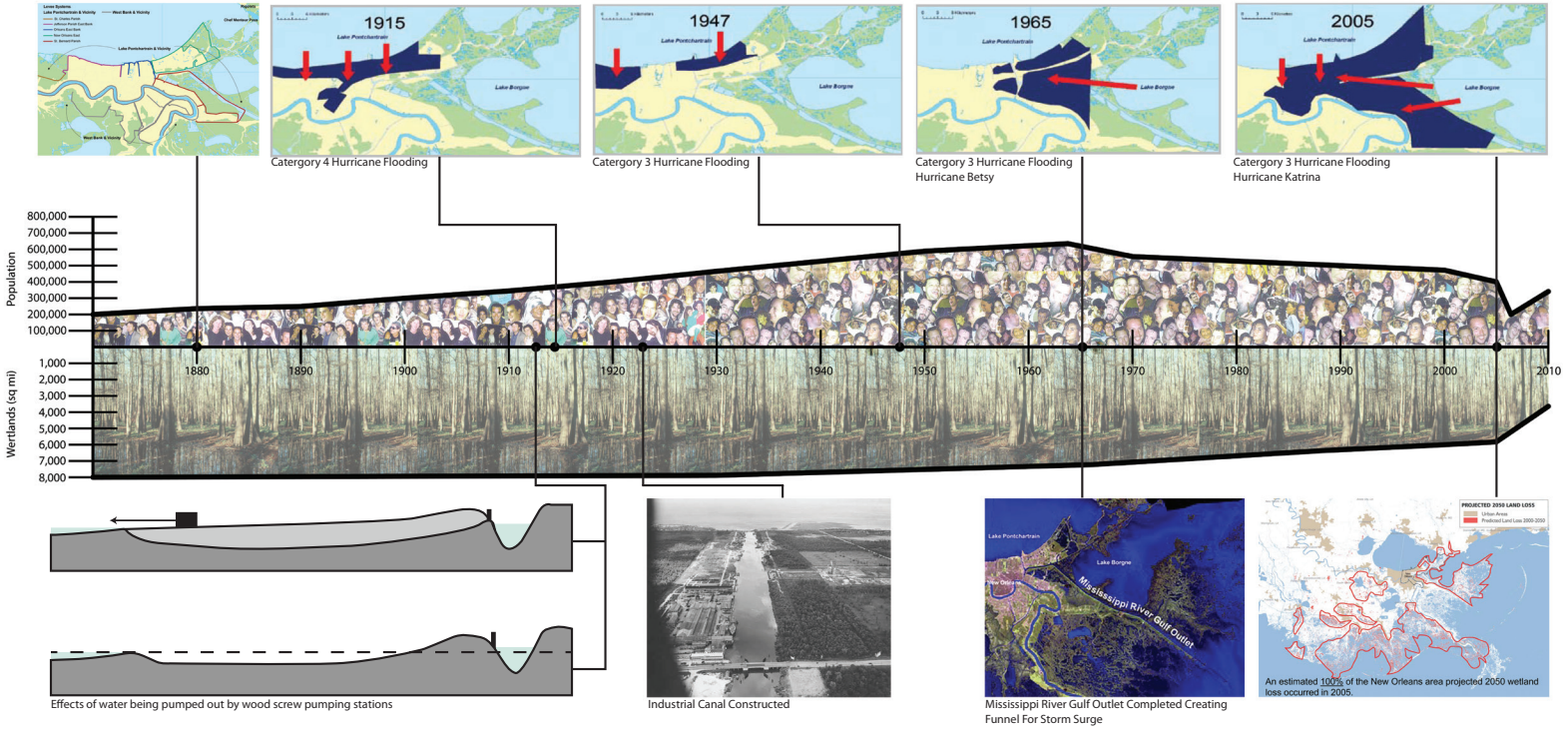
Flood Protection

During Hurricane Katrina water surge from the Mississippi River Gulf Outlet over topped and broke through the levee and flood wall of the northern portion of the Lower Ninth Ward. Part of the reason this happened is due to dredging of wetlands to create MRGO, which in the past acted as a buffer of storm surge water. Since Hurricane Katrina MRGO has begun to be closed.

With the development of wood screw pumping stations the Lower Ninth Ward (which was previously cypress wetland) was able to be developed. This once wetland acted as a sponge for flood water and would keep flooding near the river to a minimum. Much of the damage suffered in Hurricane Katrina was in this once marsh land, which has been identified as a danger zone for flooding.

Finally the canal flood protection was considered by many, including the Army Corps of Engineers, to be insufficient in the event of a large scale storm such as Hurricane Katrina.

Previous to man-made flood protection, neighborhoods such as Holy Cross received much less destructive flooding due to the natural buffers of wetlands. Over time and in the effort of development these natural buffers were destroyed and replaced with inadequate man-made flood protections. In an effort to return the environment to its natural state consideration must be taken to examine the regeneration of natural flood protection in conjunction with the current man-made protection.



Effects of water being pumped out by wood screw pumping stations

Industrial Canal Constructed

Mississippi River Gulf Outlet Completed Creating Funnel For Storm Surge

Diagram examining the relationship of population increase and innovations in hydrology control to coastal wetland loss.

Design Process

Schematic Design

Early on in the design process the SWOT analysis of L9W neighborhood community characteristics previously developed back the backbone of decisions to be made. Abstracted mappings were created from the data collected from the SWOT analysis.[1] These mappings were examined and started to be overlayed upon one another and re-examined to gain an understanding of the spacial characteristic that could be developed within the L9W. Using these spacial relationships a series of conceptual plans were developed to begin to ask how the L9W could be transformed by utilizing its vast area of threating space as positive space. The concepts developed began to ask a series of general questions that are as follows:

How can water become a celebrated characteristic within the L9W?

Can productive landscapes offer a viable opportunity to utilize negative spaces?

Can connections, both physical and implied, be created to offer a stronger relationship between the L9W and Holy Cross?

Can the attitude towards water in the L9W be changed or altered and begin to provide amenities to the neighborhood?

How can the current hydrological control elements begin to be challenged in a thoughtfull way?

1 p 114-124

Blighted/Adjucted Properties Study

Clusters of blighted and adjucted properties were mapped to visually determine possible areas of future development for wetlands and productive landscapes. Possible connections were also mapped to create a network of interlocking systems.

Fig 1

Parks/Naturally Open Space Study

Parks and naturally open properties were mapped to visually determine possible areas of future development for wetlands and productive landscapes. Possible connections were also mapped to create a network of interlocking systems.

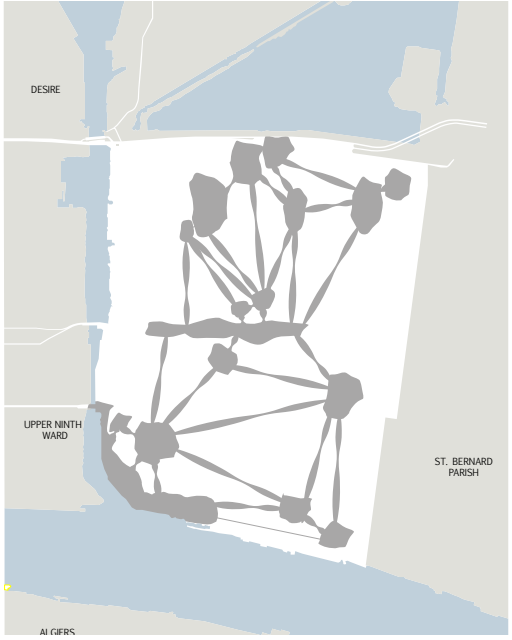


Fig 2

Vacant Industrial Properties Study

Vacant industrial properties were mapped to visually determine possible areas of future development for wetlands and productive landscapes. Possible connections were also mapped to create a network of interlocking systems.

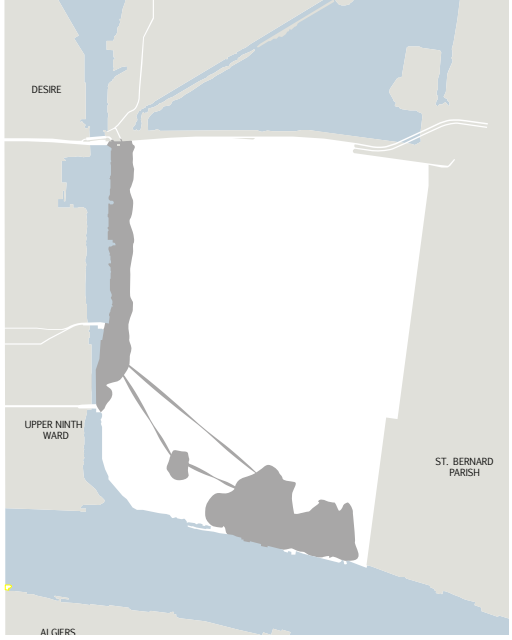


Fig 3

Community Center Study

Existing conditions were mapped to visually determine possible areas of future community center development. Possible connections were also mapped to create a network of interlocking systems.

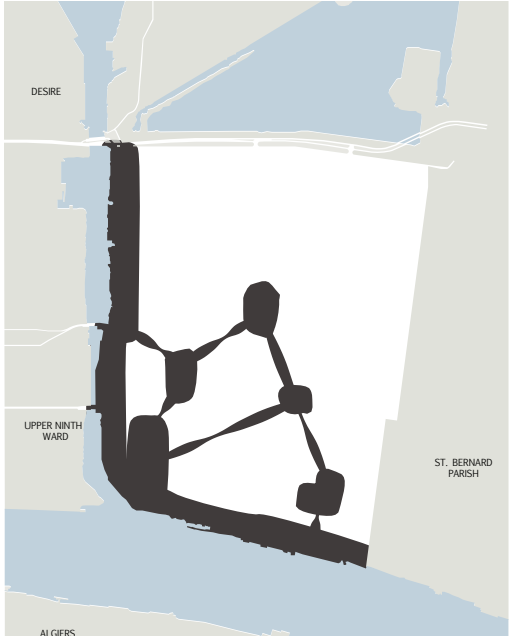


Fig 4

Economic Generation Study

Existing conditions were mapped to visually determine possible areas of future economic commercial space development. Possible connections were also mapped to create a network of interlocking systems.

Fig 5

Transit Study

Existing conditions were mapped to visually determine possible areas of future transit development. Possible connections were also mapped to create a network of interlocking systems.

Fig 6

Concept 1: Breaking Down the Walls

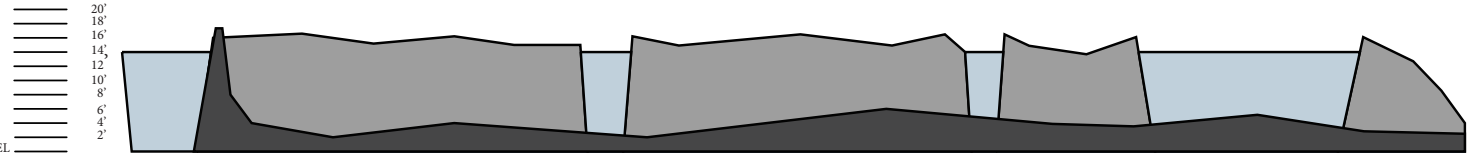
This plan begins to challenge to use of the current existing flood protection by removing them, raising the elevation of land and allowing the water to flood the neighborhood. The areas that get submerged are chosen by overlaying the three maps on the facing page and locating large concentrations of blighted, abandonded, and open land.

The section on the facing page explores the existing and designed elevations. Earth is brought in to raise concentrations of strong exisiting conditions above the existing water elevations of the Mississippi River and Industrial Canal creating a series of islands.

The islands were then designated as community development spaces, residential development concentrations, or concentrations of economic opportunity. The design introduces the amenity of a waterfront culture for recreational activities. These physical transformations can begin to challenge the existing attitude of fear of water into a characteristic that can be embraced and engaged by the community.

The plan also suggests using natural features, in the form of cypress farms, as flood protection as well as providing economic oppotunities through tree harvesting. By reintroducing these native characteristics to the neighborhood a reinvention can be observed.

Fig 7: Conceptual Mapping Study 1



IFig 8: Site Section

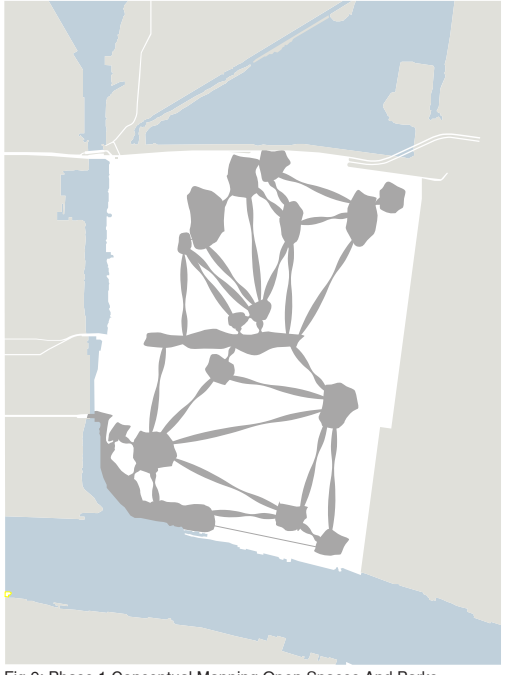


Fig 9: Phase 1 Conceptual Mapping Open Spaces And Parks

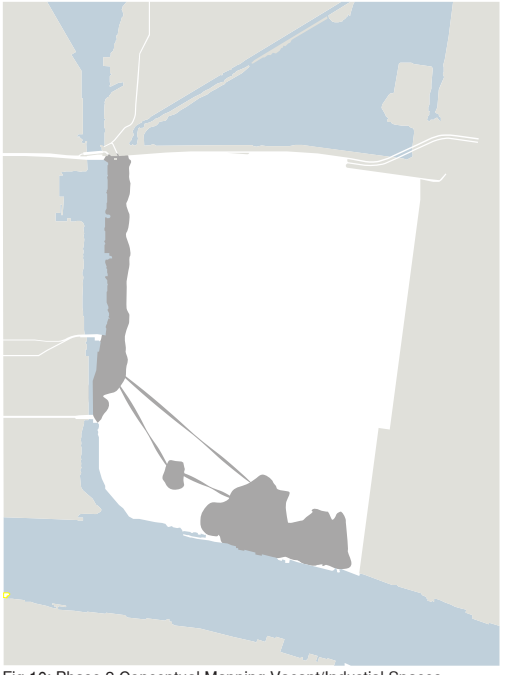


Fig 10: Phase 2 Conceptual Mapping Vacant/Industial Spaces

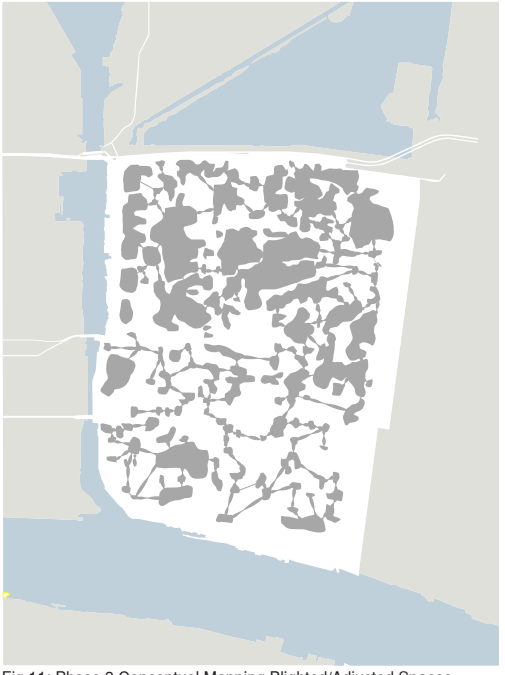


Fig 11: Phase 3 Conceptual Mapping Blighted/Adjucted Spaces

Concept 2: Reintroducing Water as an Amenity

This plan examines the overwhelming abundance of blight and vacancies throught out the L9W and seeks to implement alternative uses for these spaces. These intervention areas were determined by the previous study maps developed. Combined consentrations of threating cluster areas were found to be desirable for the interventions.

This plan seeks to collect rain water through out the entire neighborhood and allow it to pool in the blue zone designated in Fig 12. This area would act as a large scale wetland retention area that would slowly release water into the earth. For aesthetic purposes it was found to be desirable for the area to be fully saturated throughout the entire year, so interventions were made to utilize the fresh water from the Mississippi River.

The site section diagram in Fig 13 suggest that by using a series of locks and levees that cut through the extent of the neighborhood, a supply of water can be provided. The location, depicted in Fig 12, of this intervention was along a major vertical boulevard that would create a physical connection between the L9W and Holy Cross.

Fig 14 begins to examine how the large medians along the major arterial roads within the L9W can collect water and redisribute it to the suggested wetlands through a series of culverts. Greenways are suggested along these major streets

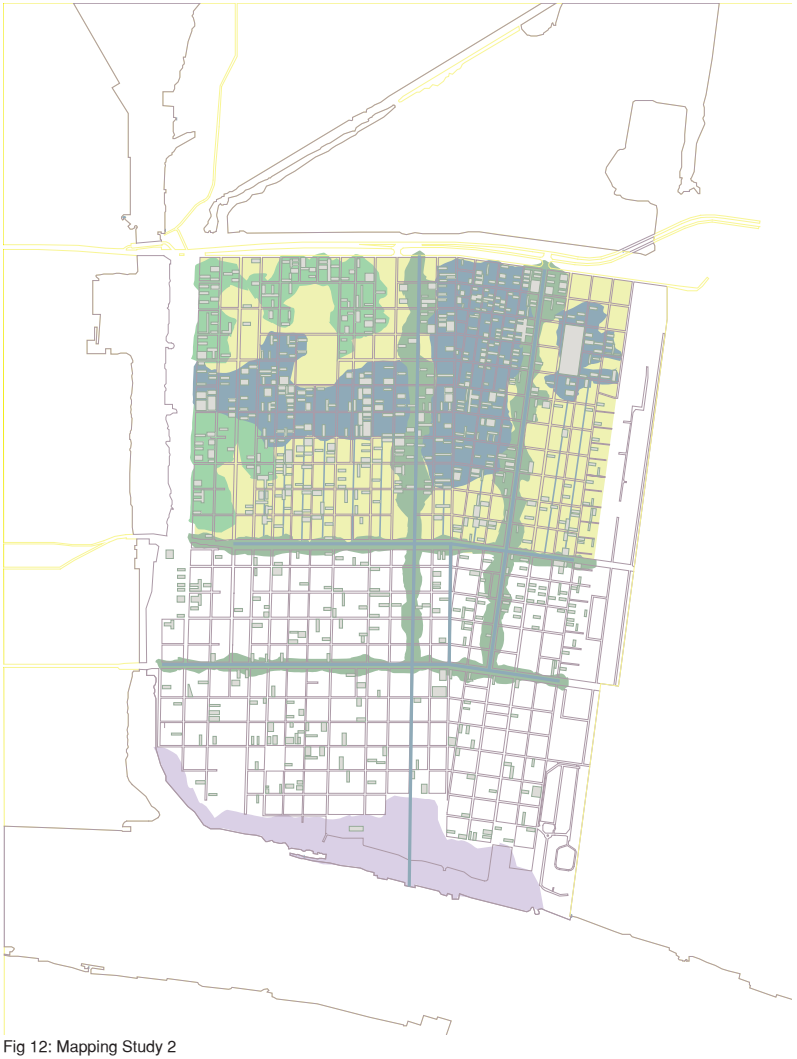


Fig 12: Mapping Study 2

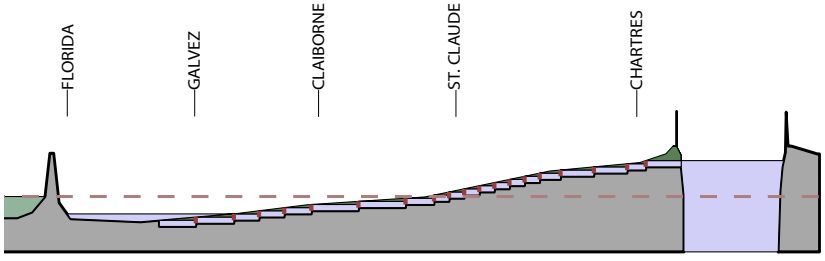


Fig 13: L9W Site Section Diagram

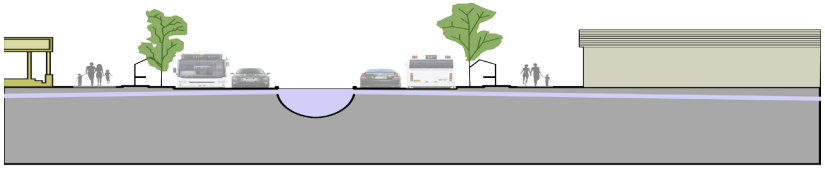


Fig 14: Claiborne Avenue Street Section

in an effort to create a pedestrian friendly atmosphere where the element of water can begin to be celebrated rather than feared.

In similar fashion to the previous concept plan the suggestion of a cypress forest along the Industrial Canal levees and the northern border of the L9W are depicted to provide an element of flood protection in the event of over flooding or storm surge. While it is not expected to provide full protection, the function of the thought is that wetlands are natural buffer zones protecting inland settlements from storm surge damage.

This conceptual plan begins to suggest ways of thinking about how water can be used to make physical connections and create a sense of movement throughout the neighborhood. It also suggests ways of thinking about how water can engage the neighborhood in a manner that it can be celebrated as a design element rather than a nuissance that is kept seperated by levees and floodwalls.

Concept 3: Mitigating and Harvesting

This plans examines opportunities for harvesting natural elements that have been previously explored. Through the introduction of productive landscapes the L9W is transformed once again into a neighborhood that embraces the characteristic of water. Interventions included in this concept include wetlands, rain gardens, water tank farms, fisheries, and cypress tree farms. This plan also begins to explore the provided opportunities of introducing alternative natural flood water mitgation and better management practices, and relationships that can be developed for interventions offered by previous plans for the L9W.[2]

In figure 15 wetlands are located througout the L9W as offering an opportunity for collecting rain water and slowly releasing it into the ground. This concept would cut down on the amount of water that need to be pumped out using the pumping station while providing the opportunity for the neighborhood to return to its natural state. Rain gardens are located as secondary mitigation techniques and could be connected to a harvesting system that collects, purifies, and stores the water for later uses. Foresteries and fisheries are suggested as economical opportunities to the communities. With the absencse of any real industrial employment market, which is what the L9W was built on, alternatives must be provided in order to attract people

2 p 50-78

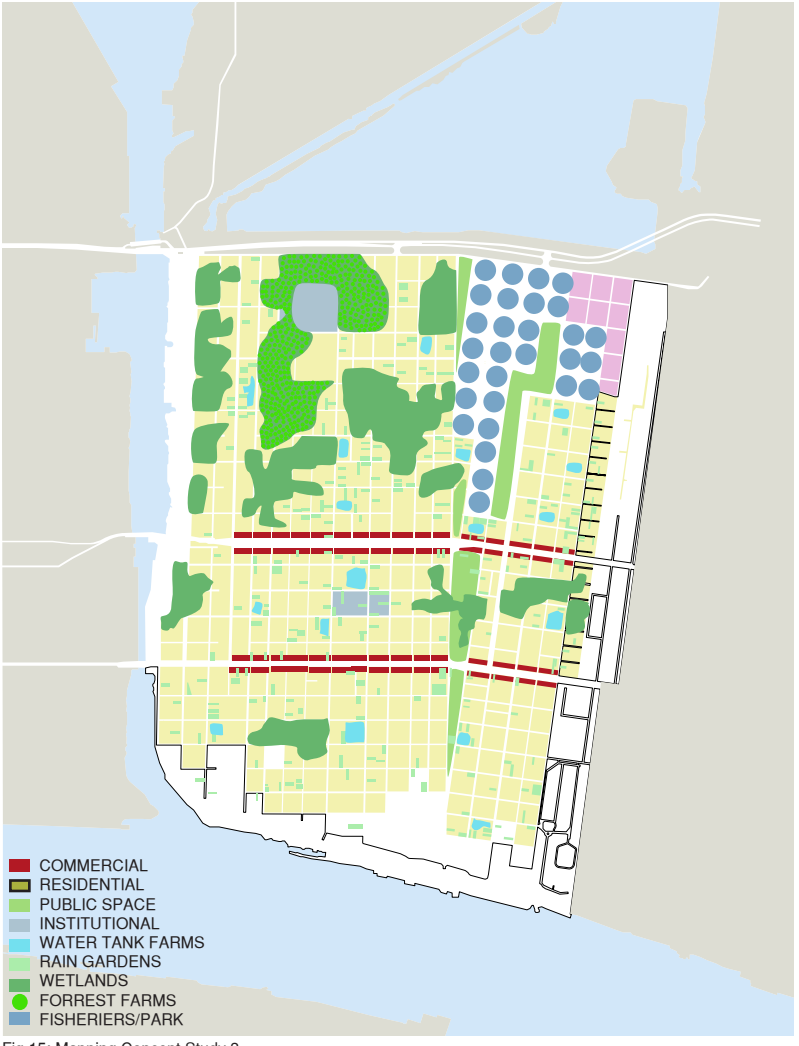


Fig 15: Mapping Concept Study 3

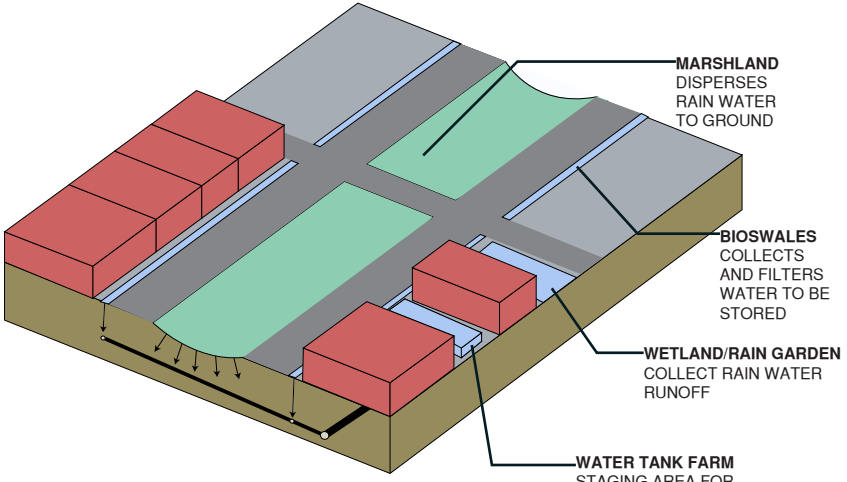


Fig 16: Transforming Arterial Roads Into Water Harvesters

Image 1: Cypress Tree Characteristics

back to the neigborhood. In an effort to reconnect the neighborhood with the rest of the city institutional spaces are suggested that would directly linked with local and regional universities as satelite research centers examining the effects of wetland interventions on the neighborhood. As suggested in previous plans the main arterial roads would be transformed into commercial/ mixed use corridors.[3]

Figure 16 examines the condition of the commercial corridor as productive landscapes are combined into the scheme. The oversized medians could become marslands collecting water and dispersing it into the ground. The edges of the streets are lined with bio-swales that create a buffer between the oversized pedestrian sidewalk and the boulevard condition of Claiborne Avenue or St. Claude Avenue, and connects to a large system of rainwater harvesting collecting and filtering runoff water. While vacant space are reclaimed as either Water Tank Storage Farms or other productive landscapes such as smaller localized wetlands or rain gardens.

Image 1 suggests that along with economic value that cypress forests provide through harvest, they also provide secondary flood protection by obsorbing up to 440 gallons of water per day, challenging the existing flood control options.

3 p 56-57, 69-73

Concept 4: Bringing It All Together

In this plan ideas and processes developed in the previous 3 concepts are combined and built upon to create a comprehensive transformative conceptual design for the L9W.

Figure 17 combines the abstract threat study maps with a series of abstract neighborhood strengths maps.[4] These are overlain one another to begin locating, in a logical manner, areas of interventions. These maps are then combined with the topography map in figure 18 to locate low lying areas where hydrological interventions would likely occur. Finally, as can be seen in figure 19, areas are examined where water interventions and hardscape interventions are examined. Typical relationships between soft and hardscapes were challenged as the two began to encroach on one another blurring the edge conditions that are naturally developed. This plan's concept is to challenge the way architects, planners, and designers engage natural softscapes and man-made hardscapes.

This plan also challenges the development of the community by creating a secondary vertical axis that connects the L9W and Holy Cross neighborhood. Anchoring the corrior on the north is an ecological center that encroaches onto the adjacent wetlands, while the southern anchor point is a waterfront development zone. A sense of movement between the two is created with a canal

4 p 130-131

Fig 17: Final Combined Study of Existing Conditions

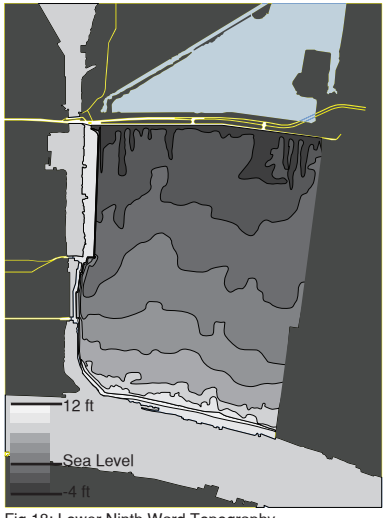


Fig 18: Lower Ninth Ward Topography

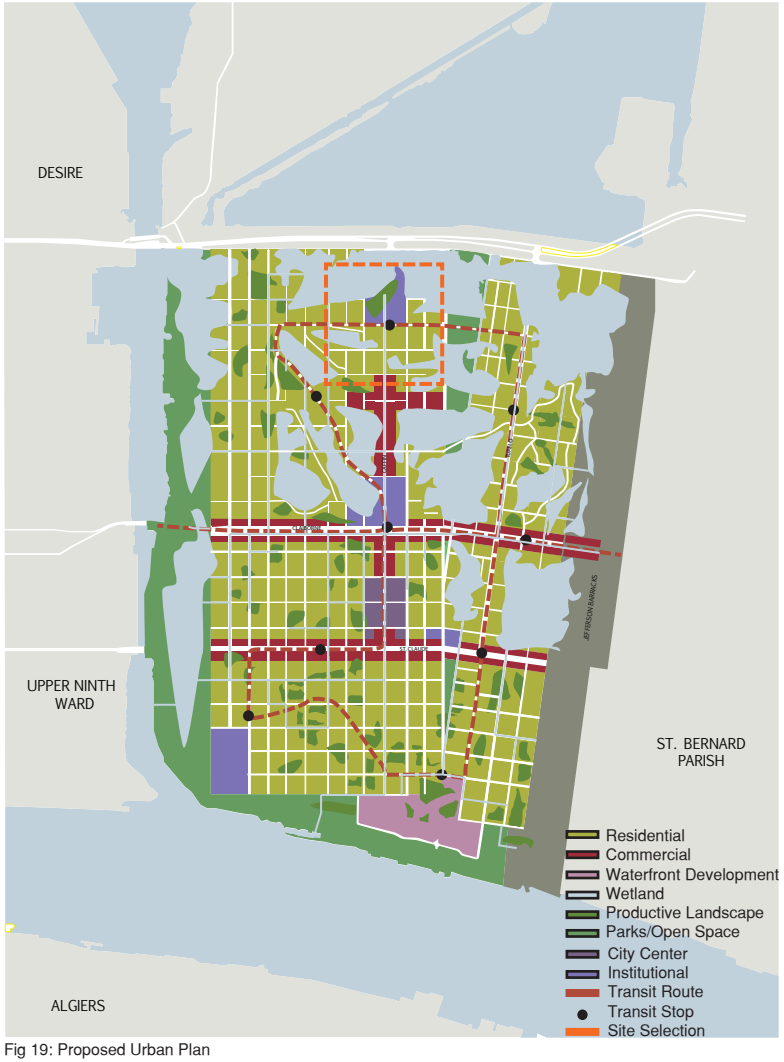


Fig 19: Proposed Urban Plan

running the length of the combined neighborhoods. Lining this new corridor condition are town houses, commercial developments, schools, and a central located municipality zone inspired by the city center idea developed in the BNOB plans.[5]

Conclusion

Although many of the programs are overly optimistic in this proposal the main overriding ideas of natural flood mitigation and its integration into the built environment are areas to developed in the following sections. While developing the current proposal for flood water mitigation natural hydrology was never considered, making much of the proposed mitigation unrealistic. Moving forward to further develop mitigation techniques, examination of the current natural hydrology will drive the design process. Up to this point it had always been assumed that an architectural development would arise from this thesis, however in its evolution this thesis will focus on the urban proposal more than a traditional architectural proposal. This will allow for the development of a natural comprehensive flood water mitigation system throughout the L9W and Holy Cross neighborhoods.

5 p 42-49

Design Development

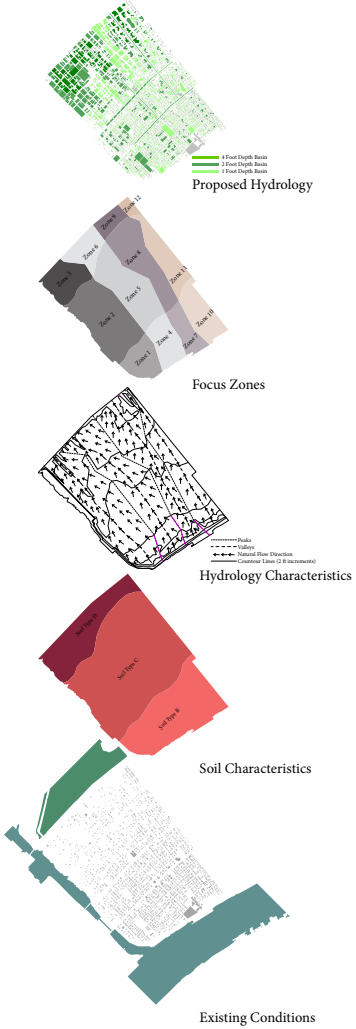


Fig 1: Urban Hydrology Characteristics

Hydrology Development

This section focuses on design development of a new hydrology system based on observations of existing hydrology conditions from the L9W. In this phase of development previous studies of community space mappings are combined with the natural hydrological characteristics of the environment.[1] Conditions such as soil types, peaks and valleys, and natural water flow are examined and subdivided in to separate study zones using these existing characteristics. Using these zones, along with rainfall data collected, estimations of produced runoff were calculated to size water retention areas throughout the L9W and Holy Cross. Using these retention areas as flood water mitigation, the need for pumping during rainfall storms would no longer be necessary. Introducing this new mitigation technique into the neighborhood would increase awareness of water as a natural element that must be integrated into the current environment, rather than segregated from it.

In an effort to retain as much of the existing conditions of the neighborhoods as possible, the deeper retention areas were targeted within areas that were heavily devastated by the effects of Hurricane Katrina's storm surge. Other medium depth retention areas were designated in blighted areas throughout the neighborhoods, as a proposal to integrate storm water mitigation with residential housing. Finally smaller retention swales were placed in areas that still remained in tact and more densely populated. It is the intention of this proposal to create an environment in which both the natural softscape built environment and the hardscape built environment can coexist to challenge current practices pertaining to softscape vs. hardscape design.

1 p 128-129

Containing the Flood

Upon estimating the amount of runoff water produced vs. the amount of runoff water the proposed storm water mitigation system can hold, it was found that a substantial amount of volume of storm water still remained. Therefore the next course of action was to intervene within the less densely populated area of the northern portion of the L9W. As discovered from the initial investigation of natural water flow, this area was also the low lying area of the neighborhoods in which water would naturally collect. For these two reasons it became logical to place larger deeper retention areas within this area. These zones would be designated as flood plains, and therefore would be undesirable areas in which to construct new hardscape environments. This entire area would not be saturated full time, rather water would be allowed to fill the flood plains in heavier rain periods and slowly release into the ground. As these areas become undesirable for typical construction, alternative program uses are explored and developed. On the other side areas on higher ground with surviving structure are now less susceptible to the natural flooding as it is now concentrated in one area. Diagrams on the facing page examine how concentrating storm waters in the proposed areas can create safer conditions in areas currently susceptible to storm water flooding.
In an effort to keep an aesthetic appeal to the proposal, canals connecting the Mississippi River to the saturation zones are introduced to ensure water levels remain at a minimum during dry seasons. Aside from its functional purpose the canal also creates a new axis running perpendicular to the two existing boulevard axises, creating a new relationship between the L9W and Holy Cross.

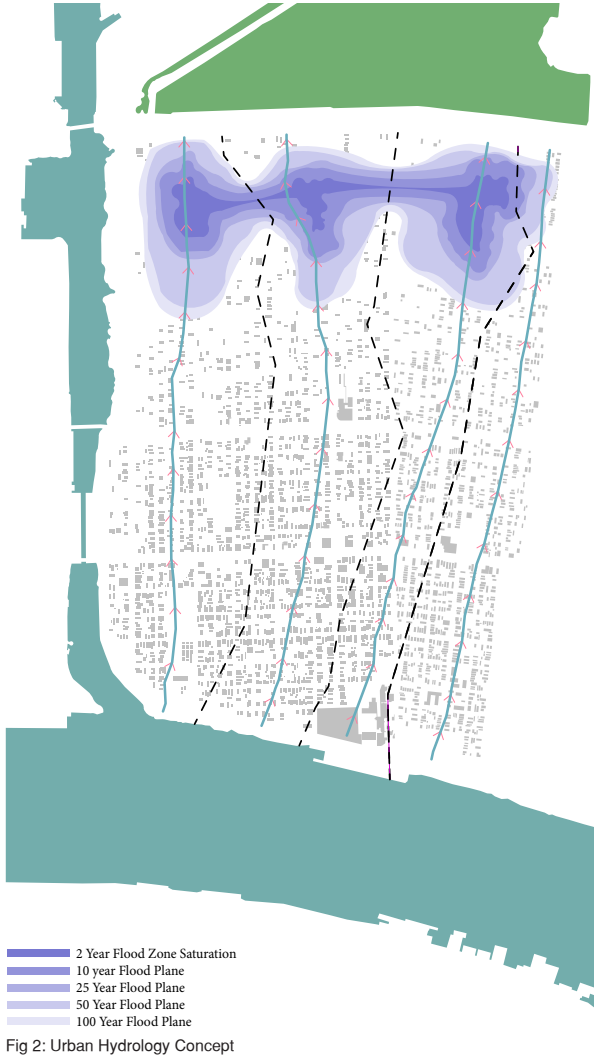


Fig 2: Urban Hydrology Concept

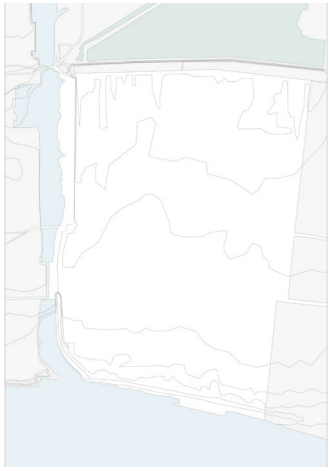


Fig 3: Existing Topography

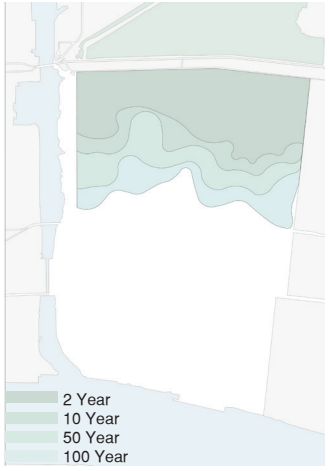


Fig 4: Existing Design Flood Plains

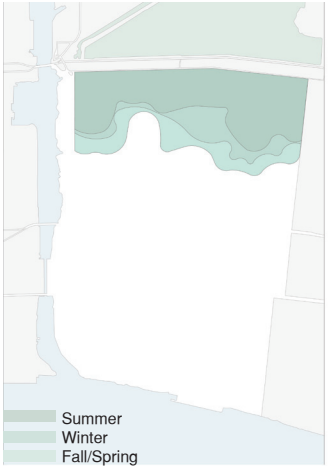


Fig 5: Existing Seasonal Flood Plains

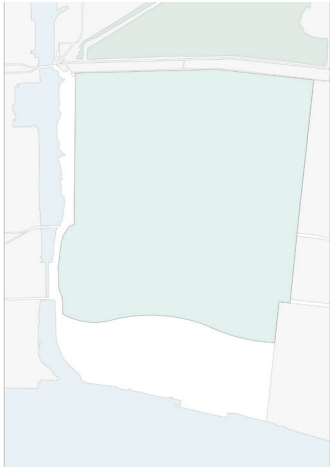


Fig 6: Existing Storm Surge Flood Plain

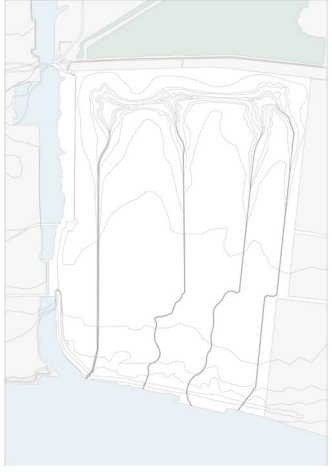


Fig 7: Proposed Topography

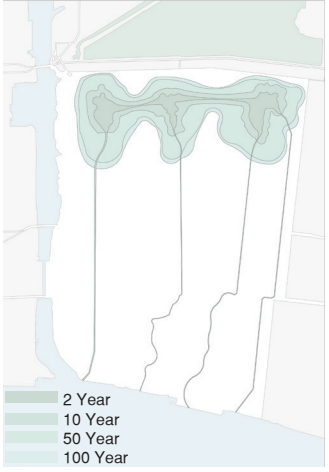


Fig 8: Proposed Design Flood Plains

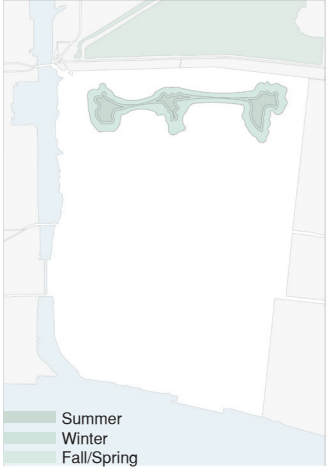


Fig 9: Proposed Seasonal Flood Plains

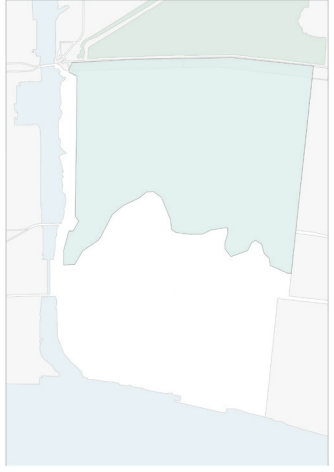


Fig 10: Proposed Storm Surge Flood Plain

Concept Proposal

Based on the previous community characteristics and neighborhood hydrology studies conducted, decisions for placement of water retention areas and designated wetland developments were performed. New zoning typologies are being introduced into the neighborhood that are creating opportunities to blend together the proposed natural softscape with the existing and proposed constructed hardscape elements. These interventions are challenging the current trends related to development of hardscape built environment and natural softscape environments by suggesting that the two can coexist simultaneously, rather than being segregated from one another.

To examine these new zoning typologies and their spatial relationships an area of the neighborhood was enlarged. Figure 12 demonstrates how the proposed interventions can begin to transform the neighborhood and provide new amenities. A transitional language is suggested that designates the northern portion of the plan as fully engulfed in vegetation and saturation, while the portion between Claiborne Avenue and the vegetated area becomes a mixture of hard and softscapes. The area of Claiborne Avenue and below are developed as hardscape interventions, where the boulevard condition is strengthened by creating a public commercial arcade style pedestrian oriented development. Infill development below Claiborne Avenue is suggested in combination with storm water mitigation interventions that are designated on the Urban Plan. Finally the existing and proposed characteristics are examined in Figure 13 to reveal that flood conditions have been concentrated in designated areas, creating a safer less susceptible flood condition throughout the remaining development areas. The spaces laid out in focus plan are further examine through conceptual renderings on the following pages.

Fig 11: Conceptual Natural Storm Water Mitigation System With New Zoning Typologies

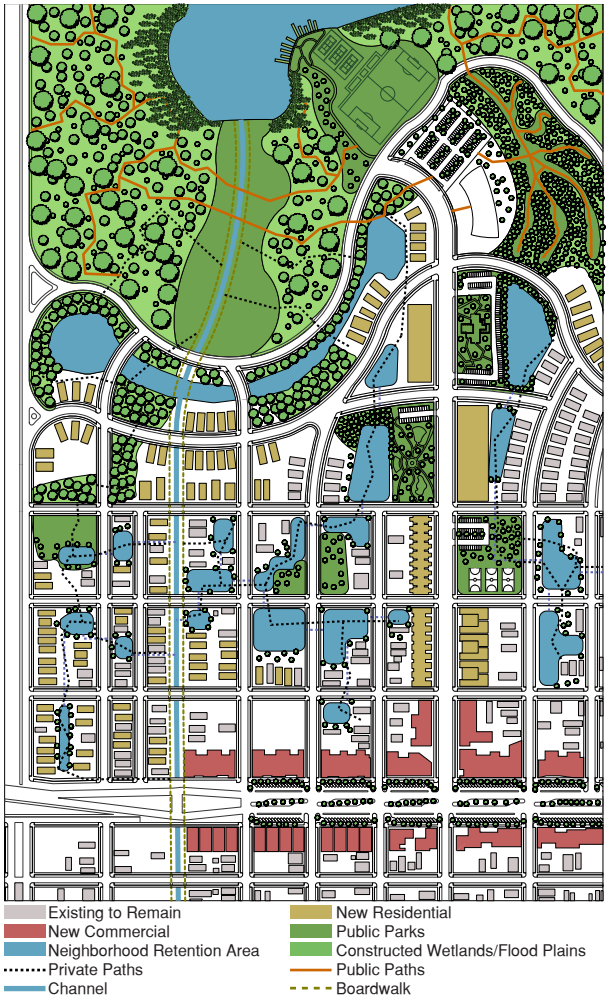


Fig 12: Conceptual Proposal for Integrating Water Based Elements Into Neighborhoods

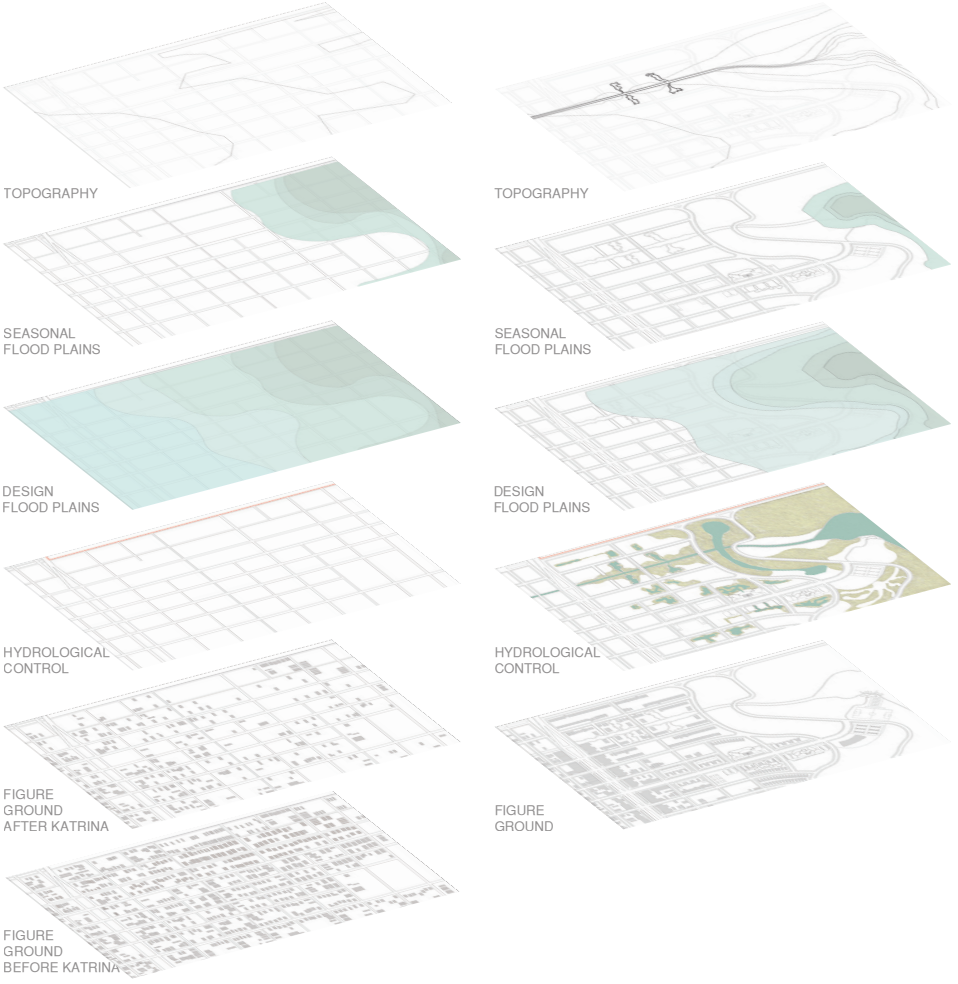


Fig 13: Existing vs. Proposed Neighborhood Hydrology Characteristics And Its Effects On Flood Plains

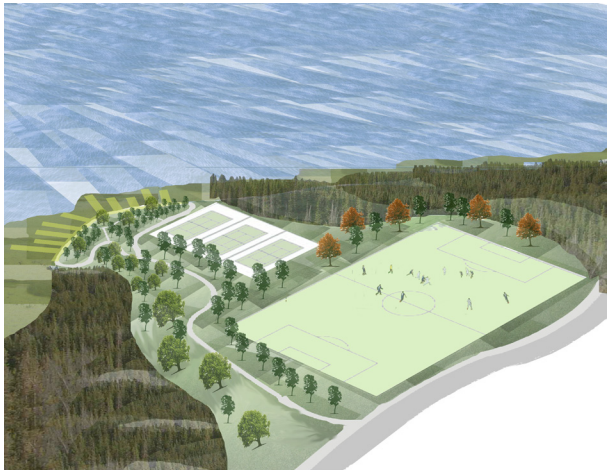
Private Neighborhood Conceptual Visualization

Between the heavily vegetated flood plains to the north and the hardscape pedestrian oriented commercial development to the south, lies the proposed private neighborhood. Within this neighborhood interventions such as wetlands and canals are proposed which provides the area with new amenities. The intermediate neighborhood wetlands proposed supply the neighborhood with a softer nature preserve typology that can provide serene views and walkable pathways that meander throughout the neighborhood as informative nature walks. These wetlands provide both a recreational element to the residents and an interactive informative educational element to visitors of the area. These neighborhood wetlands are being assumed to be saturated with standing water at all times. It is also assumed that a certain amount of storm water will be absorbed into the immediate area creating a marshland effect. As a flood mitigation element they will be able to retain storm water runoff for a short period of time as it filters through to the canal system and into the larger retention areas.

The canal's primary function is to collect storm water runoff from the neighborhood wetland/retention areas during heavy storm periods, and supply river water to the retention area during dryer periods throughout the year. It is planned that the canal, as an aesthetic element, will be saturated full time either by storm water runoff or by the Mississippi River. The canal will run through the neighborhoods and be coupled with a boardwalk promenade creating another recreational amenity to the community. Small scale watercraft such as kayaks, canoes, and paddle boats would be allowed within the canal and be able to access both the wetlands to the north and the Mississippi River to the south creating a new recreational water culture.

Img 1: Neighborhood Wetland Conceptualization

Img 2: Canal Conceptualization



Img 3: Flood Plain Parks Conceptualization

Img 4: Wetland Pathway Conceptualization

Constructed Wetland/Flood Plains Conceptual Visualization

The areas most heavily damage and most susceptible to future floods located in the northern low lying areas of the L9W are to be transformed into designated flood plains and wetland reserves. For this reason the areas will become undesirable for human habitation development. Alternative program developments were explored for this area to break up the edge condition that could begin to occur in the wetland development. The development of landscaped parks and recreational fields are proposed, due to their ability to be easily regenerated following a storm flood scenario. This also allows residents and visitors to access the flood plains as usable space and breaking into the edge condition, rather than being segregated by a tree line. The parks would also allow access to the wetland retention area for use by both visitors and residents.

The heavily vegetated wetland areas of the flood plains would be provided with suggested pathways and nature walks, creating the opportunity for people to engage with the wetlands as a recreational element. They would provide new habitations for wildlife in which people young and old could gather to enjoy and learn about nature first hand. These pathways would be maintained and monitored by the nearby ecological center, which acts as a gathering station for visitors such as students, researchers, nature enthusiasts, etc. Hiking and cross country running paths would also be provided to provide residents and visitors with a serene viewful landscape to enjoy.

Constructed Public Space Conceptualization

Claiborne Avenue is one of the two major roads running through the L9W and Holy Cross. It acts as the public facade of the neighborhood and therefore should be treated as such. The proposal for this boulevard is to create a commercial arcade pedestrian oriented development. The moderate speed thru traffic moving through the neighborhood is separated by a service street and parking for the commercial developments. The median acts as a swale collecting storm water runoff and slowly dispersing it into the ground and feeding the water retaining plant selections. The intention for transforming the boulevard into a commercial corridor, rather than a boulevard lined with residential development, is to provide an amenity to the both the residents and commuters traveling from the suburbs to the Central Business District. Proposed secondary access streets entering into neighborhoods are lined with duplex multi-family style housing and public park areas. The parks act as buffer areas between wetland developments and the public hardscape developments. Through the placement of these parks the wetlands are allowed to encroach on the public realm of the neighborhood, but never fully engage it. For this reason the park areas become important design elements within the urban context which provide a link between the softscape wetlands and the hardscape public developments.

Img 5: Claiborne Avenue Conceptualization

Img 6: Neighborhood Park Conceptualization

Conclusion

The neighborhood research conducted early in this thesis has found that the L9W has had a decreasing population since 1965, which was only intensified by the events of Hurricane Katrina. It was found that it would be unlikely that residents would return to the neighborhood, especially in areas heavily hit by the storm surge, and alternative land uses would need to be explored. Throughout this section hydrological interventions in the form of natural storm water mitigation techniques have transformed the L9W from a neighborhood threatened by blight and low population density into a progressive neighborhood which seeks to integrate its original natural state with its current man-made characteristics.

These interventions have led to a series of new land use types, whose spatial relationships have only begun to be explored. The overall natural hydrological control system has provided a variety of new amenities to the neighborhood which can be used to attract new residents. As new land uses are further defined and quantified in the program section of this thesis their spatial relationships need to be examined in more detail in order to create a natural softscape system that can be fully integrated into a hardscape development. Through this integration the current edge condition between softscape and hardscape can be blurred, creating a series of new space typologies which challenge the current hardscape development vs. natural softscape spacial relationship practices within the L9W.

Program

Program Summary

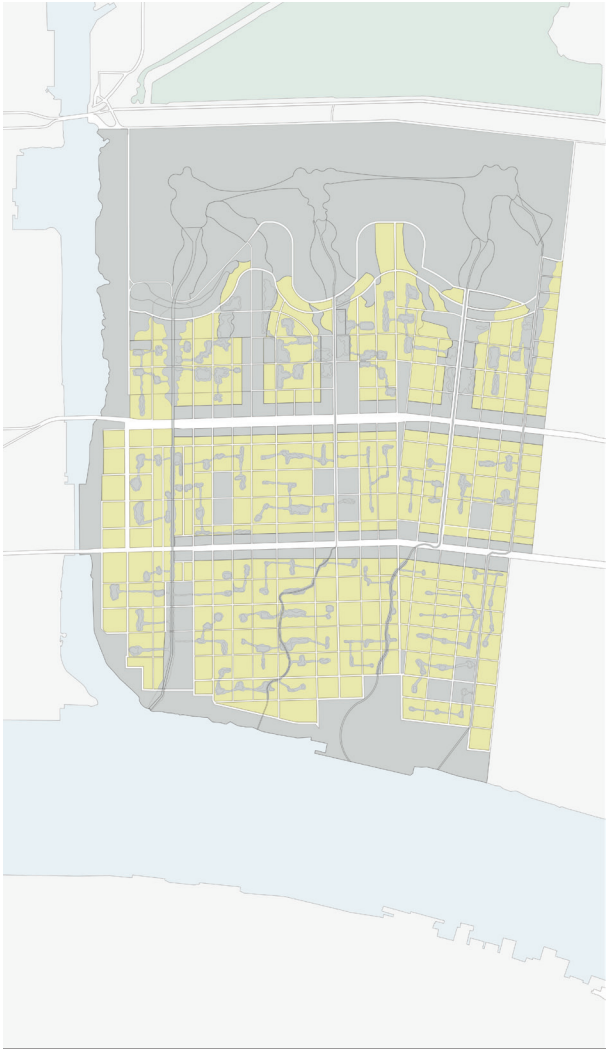
It has been stated and demonstrated througout the research presented in this thesis that catasrophic events inform architects, designers, and planners of flaws and hazardous conditions in the built environments. These events also provide the opportunity to reinvent these environments to ensure that similar catastrophic events that occur in the future do not have the same destructive nature. It has been demonstrated that ill informed man-made conditions have led to the creation of hazardous environments. New Orleans, the site studied in this thesis, is no special case.

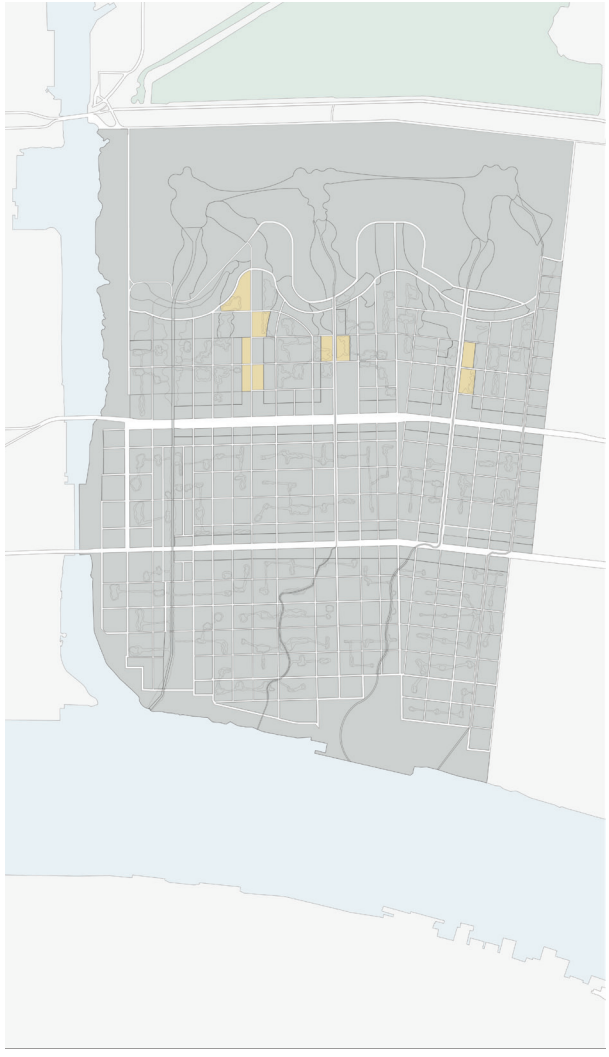
Hydrological innovations have caused the city of New Orleans to fall below sea level by removing water from the earth and decimating much of its natual landscape. This landscape would have provided the city and its neighborhoods with a natural protective barrier that could have mitigated much of the destruction caused by hurricane storm surges. There is no doubt, had engineers and designers understood the implications of their actions, that New Orleans would have a drastically different landscape today that embraces its natural features.

Interventions taken in this thesis will challenge the way architects, designers, and planners think about creating built environments in relationship to natural surroundings. In paticular the L9W becomes a test site for revitalizing the natural state of wetlands in areas that are suseptible to flooding. In doing so it removes people from these dangers zones and creates a condition in which flood zones can be created to mitgate seasonal rain water and flooding. The spatial relationships between these softscape interventions and the built environments are blurred at the edge conditions as this thesis challenges conventional spatial thinking related to wetlands.

Program Quantitative Summary

Single Family Residential: In an effort to retain the character of the neighborhood these areas will consider renovating homes when fit. Any infill will be influenced by existing building typology exisitng within the neighborhood.
Lot Size: 3,900 ft^2
Pecentage of Neighborhood: 40%



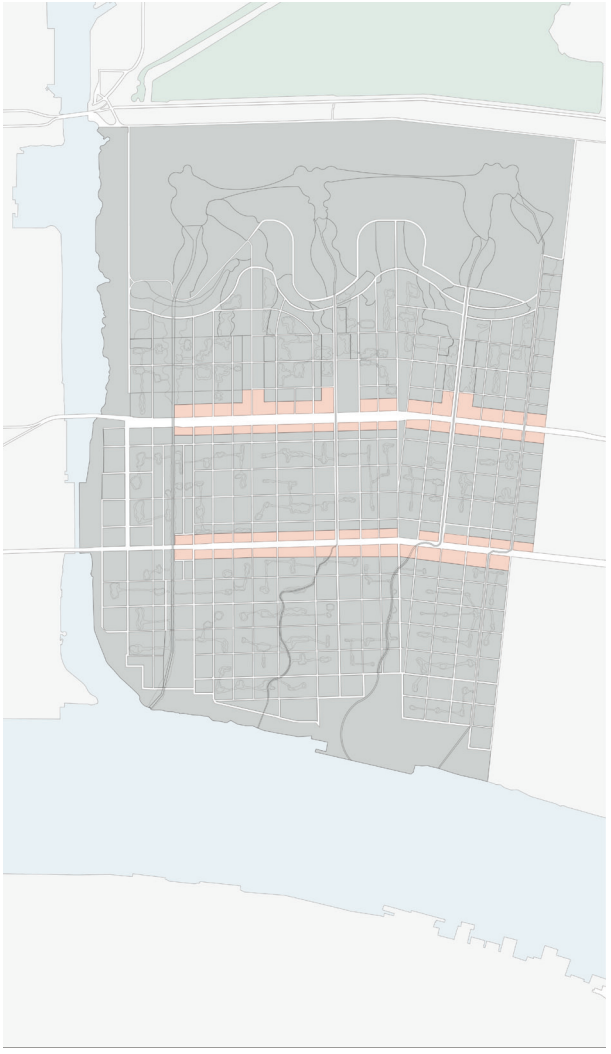


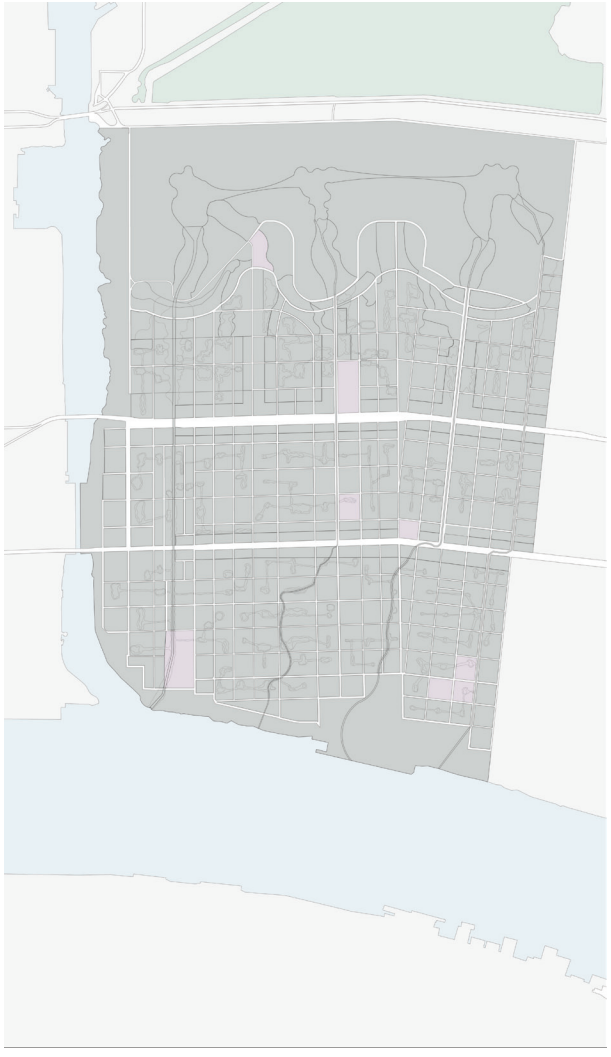
Medium Density Residential (Townhouses): These spaces will be designated as multi-family housing developments and face a secondary axis that acts as a dense residential face on a semi-public street. Existing lots will be combined to create the neccessary space required for these developments.
Lot Size: 3,900 ft²/unit
Pecentage of Neighborhood: 2%

Dense Pedestrian Oriented Commercial Development: These areas are intended to transform the public face of both the L9W and Holy Cross neighborhoods and create an experience of progression into an urban domain. As these two neighborhoods are the gateway to the Central Business District from St. Bernard Parish, this experience becomes a much needed amenity to the neighborhoods. The spaces will also begin to offer the residents of the two neighborhood viable options for visiting retail establishments.

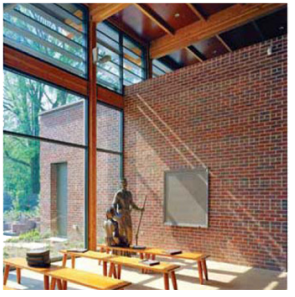
Lot Size: 95,200 ft^2

Pecentage of Neighborhood: 5%





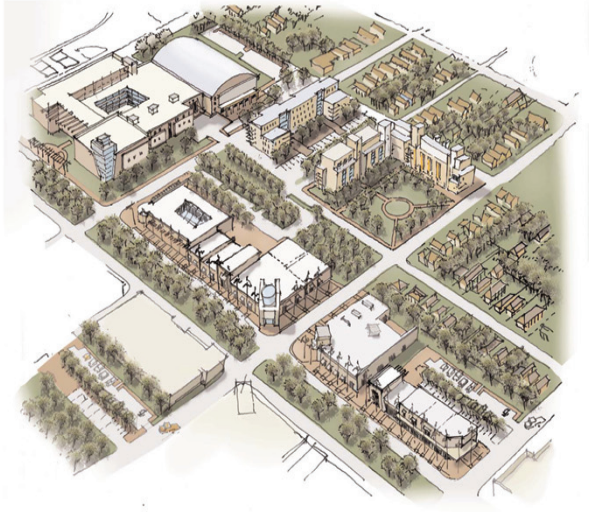
Intitutional (24/7 training/learning facitlities): Under used and abondoned educational facilities left in the aftermath of Hurricane Katrina will be transformed into training/learning hubs through out the neighborhoods providing the community a much needed asset.
Lot Size: varies, depending on existing conditions
Pecentage of Neighborhood: 1%

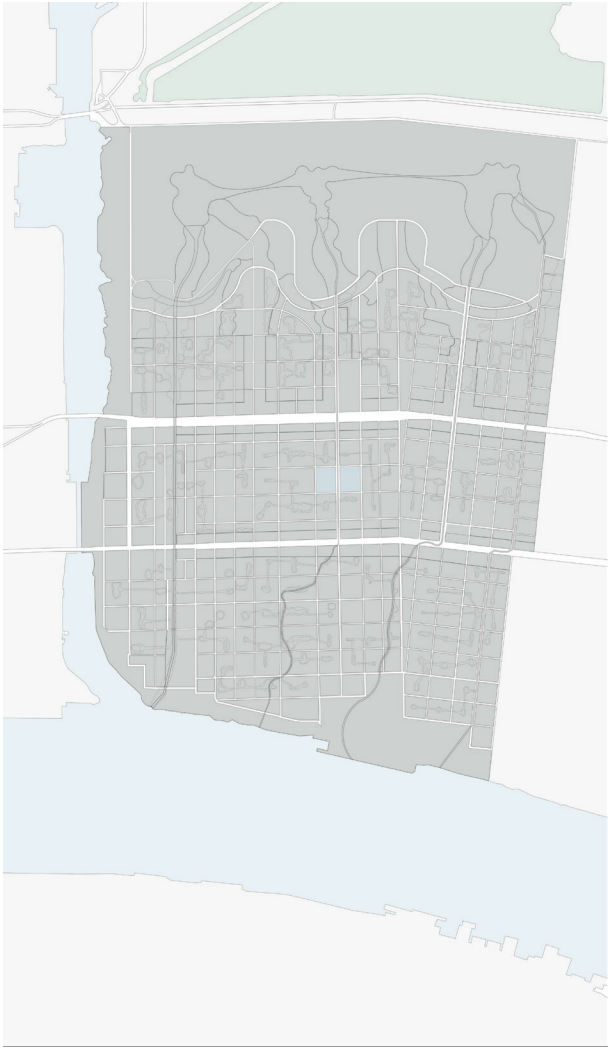


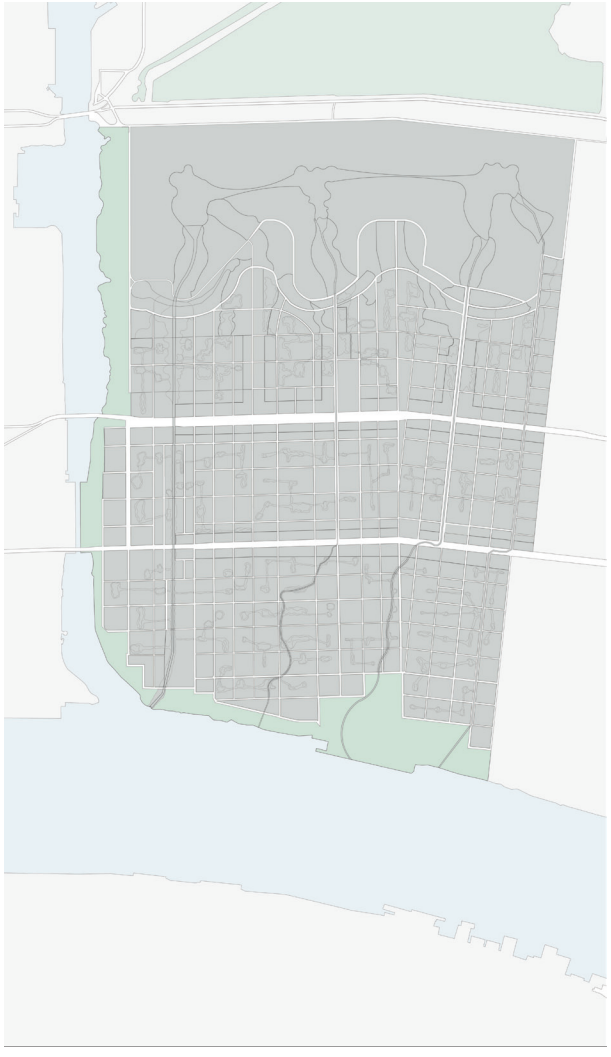
Municipality Services (City Center Development): A much needed development of local city services such as fire, police, and mini city hall will be housed in this zone. The L9W and Holy Cross have been without basic city service for decades creating an even larger segregation from the Metro New Orleans. By re-introducing these services it will present the community with a sense of security and connectedness the rest of New Orleans.

Lot Size: 416,100 ft^2

Pecentage of Neighborhood: 1%



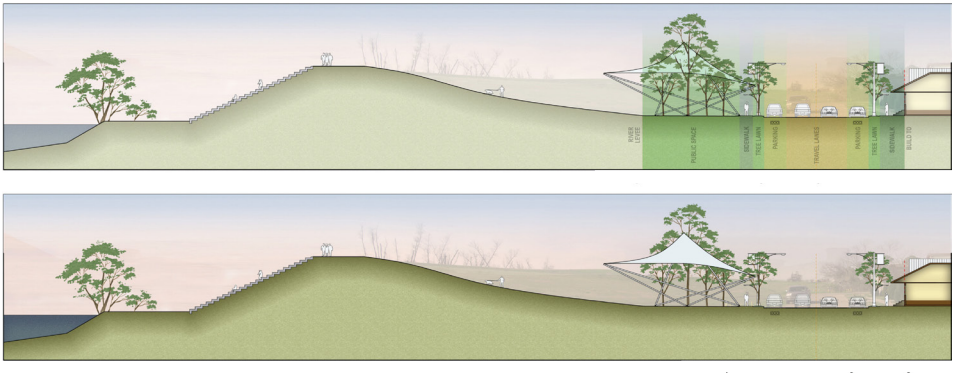




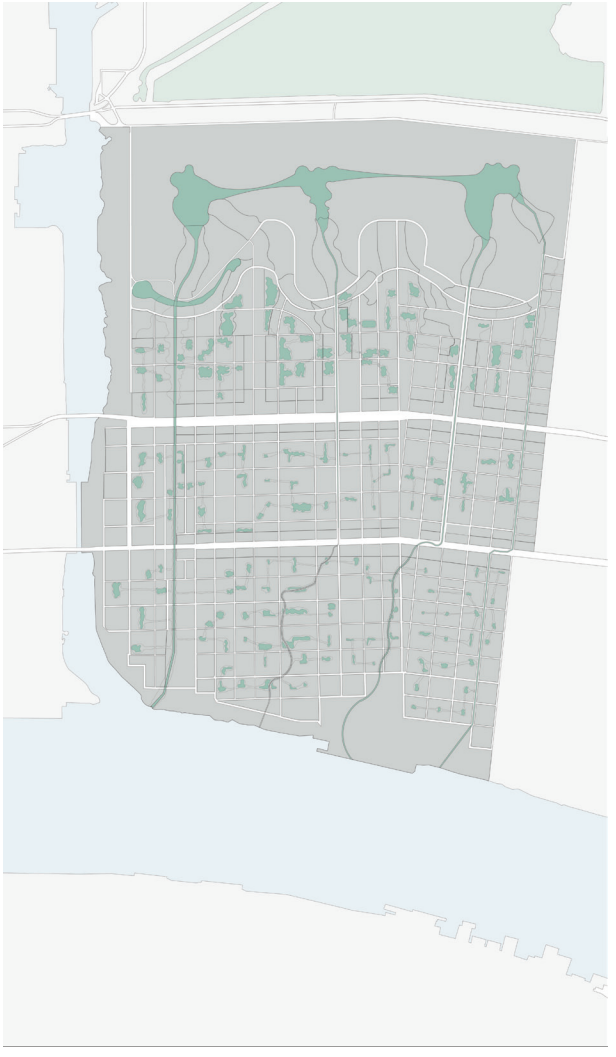
Waterfront Development: Large open areas along the Mississippi River Levee provides the opportunity for public space to be developed creating a celebration and engagement with the river. A promenade park that follows this open space and up the Industrial Canal will begin to activate these once under utilized spaces. Also vacant industrial zones will be re-used as dense multi-family housing, community center, and safe haven in the event of a disastor and evacuation.

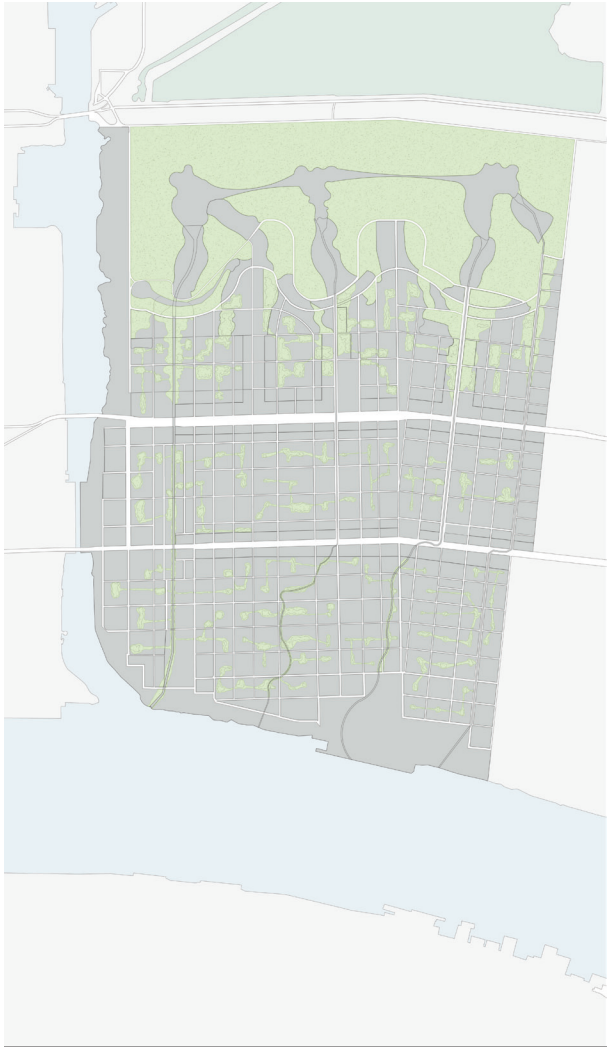
Size: 2,400,000 ft^2

Pecentage of Neighborhood: 10%



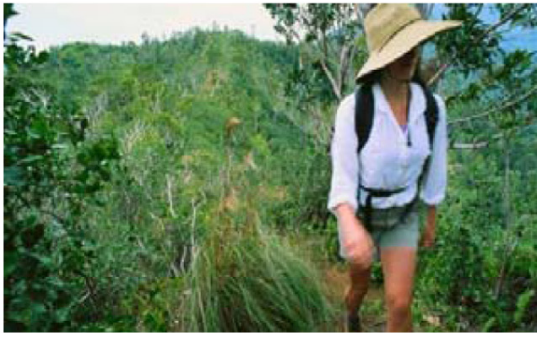
Saturation Zones: Desiganated areas used to retain storm water and release it slowly into the earth. As an aesthetic decision these spaces will be connected with the Mississippi River through a series of canals that will feed river water into these areas in periods of drought.
Size: 1,400,000 ft^2
Pecentage of Neighborhood: 10%





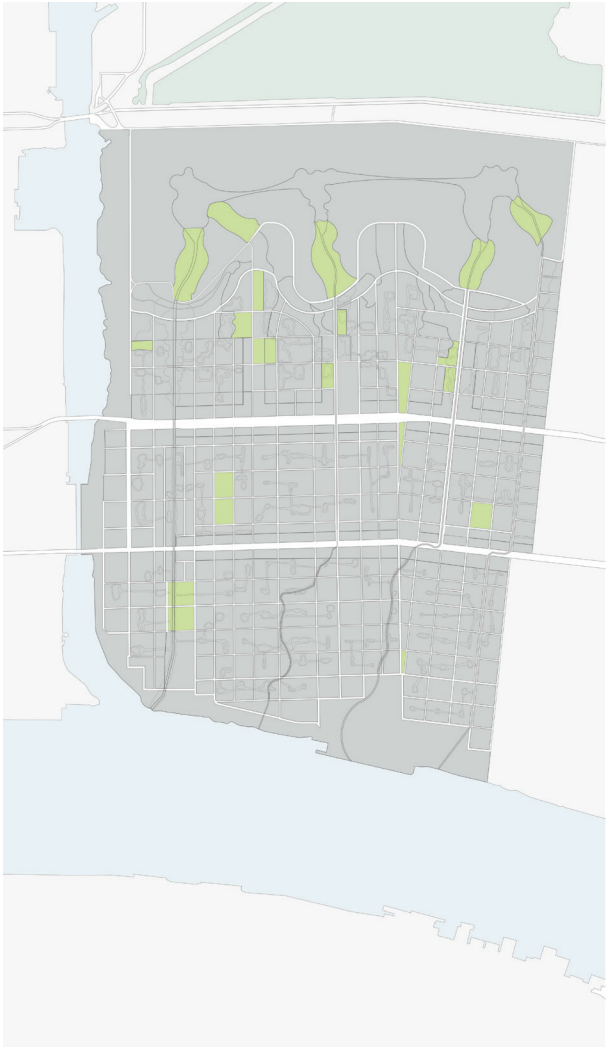
Flood Plain/Wetland Development: Development in this zone will be kept to a minimum in an effort to allow this portion of the neighborhood return to its natural state of wetlands. In the event of flooding all storm water will be filtered into this zone and therefore is not privy to typical development.
Size: 9,800,000 ft^2
Pecentage of Neighborhood: 15%

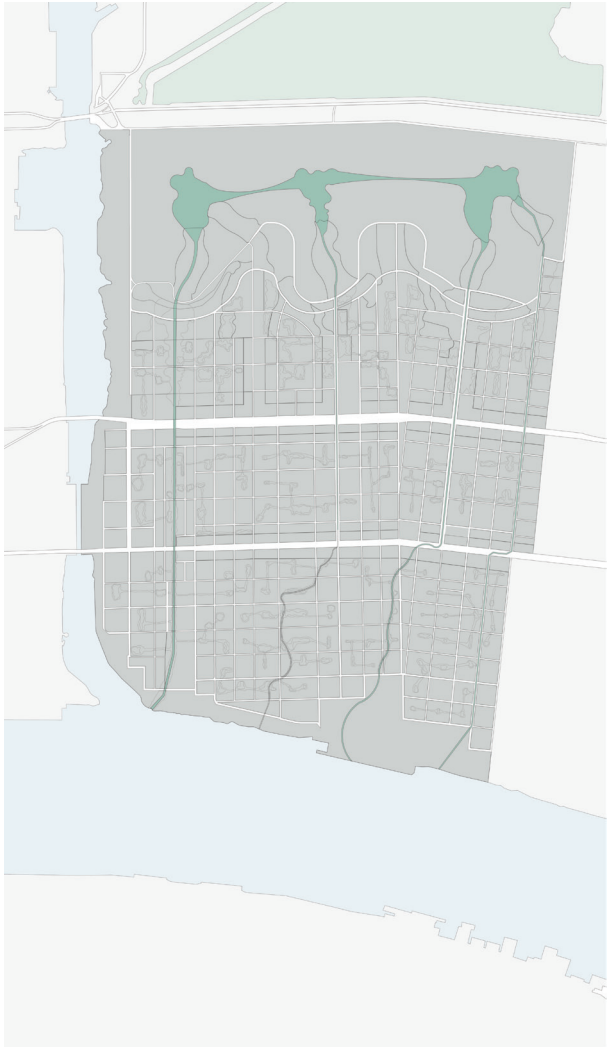
Neighborhood Wetlands: These spaces are intended to create a public space within the neighborhood blocks that provide an amenity to the residents. These are not intended for use of people outside the neighborhoods. They also collect storm water and either release it into the ground, or in periods of extreme flooding transfer the water through a series of channels to the main canal feeding the saturation zone. These space are the intial zones to collect water in the event of moderate to large storms.
Size: Varies
Pecentage of Neighborhood: 5%



Flood Plain/Park Developments: In an effort to engage the flood plain in dryer periods a series of landscaped parks will allow public activities to take place. These spaces will be connected through a series of paths and trails that meandor throughout the revitalized wetland areas allow the public to engage nature and soften the edge condition of built vs. natural.
Size: Varies
Pecentage of Neighborhood: 5%

Public Parks: These spaces provide a landscaped buffer between the untamed natural growth of the wetland and the public face of the neighborhoods. As areas of natural wetland penetrate out into the neighborhoods it has become necessary to provide a transition space that can become functional and still be able to allow engagement by the public.
Size: Varies
Pecentage of Neighborhood: 1%



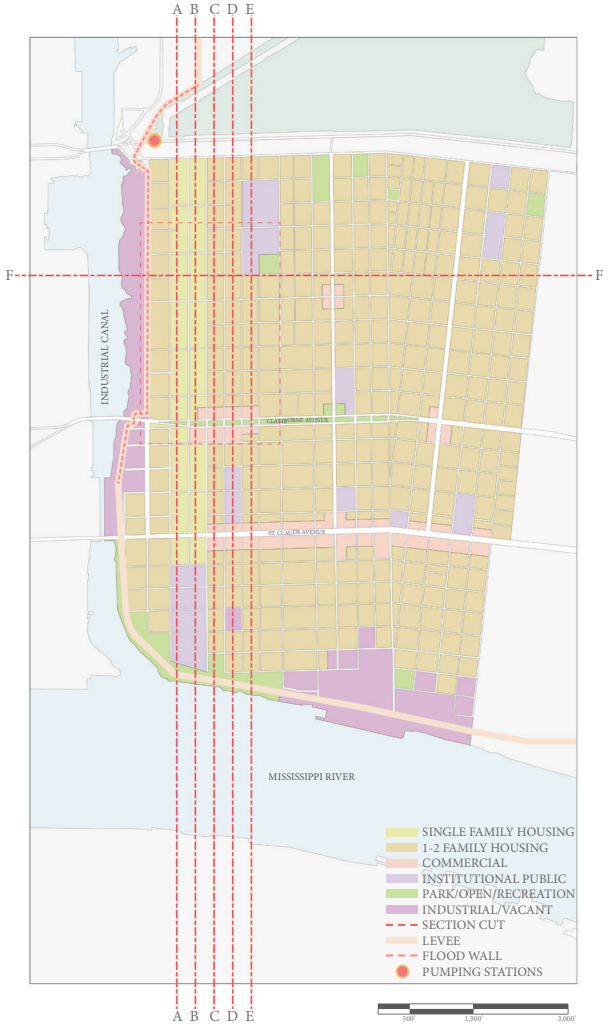


Canal Promenade: This intervention provides the neighborhood with a sense of movement from south to north. This complementary to the existing east/west movement provided by the arterial roads in the neighborhood. Through water collection from neighhborhood wetlands and the Mississippi River the canal becomes supply line feeding the saturated zone and the flood plain wetlands. The movement of water if further demonstrated by providing the addition of a boardwalk along the canal. This creates the ambiance of a public way that engages residential zones throughout the L9W and Holy Cross. This also further strengthens the connection between the two neighborhoods unifing them as system that feeds off each other, much like the system designed to collect and disperse water; the promenade can also act as a collector and disperser of people.
Length: 7,000 Linear ft
Pecentage of Neighborhood: 5%

Final Proposal

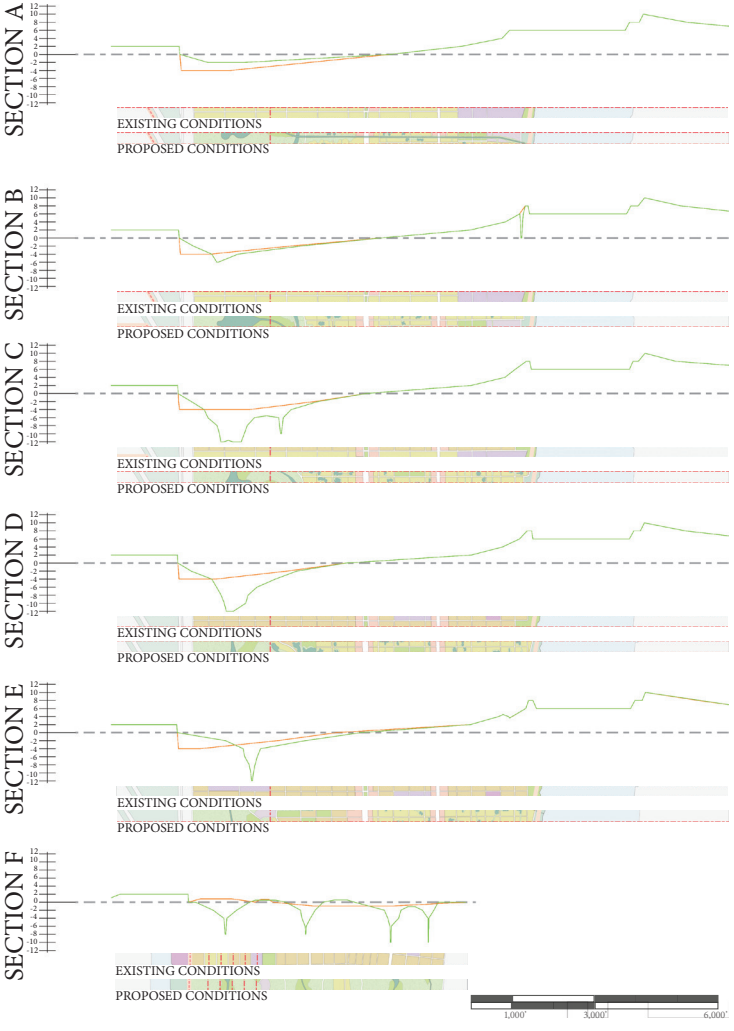
Introduction

The final design proposes an intervention of natural storm water mitigation techniques while returning the L9W to its natural state of wetlands. These interventions are blurred into the existing characteristics of the neighborhood by taking advantage of the large amount of blight and open space created over decades of population loss and decay. They are then further introduced by designing them as interactive amenities that can provide a new culture to the neighborhood. While creating the new master plan for the L9W, much thought was given on techniques to change the current attitude of separation of built environment and water. Through the reintroduction of water as a design element into the L9W, the fear of water can be altered to an understanding that within this particular environment the separation of built and water can lead to much more hazardous living conditions. It also demonstrates how the interventions can be more than just flood water mitigation techniques by providing both recreational and educational elements into the design of the system.



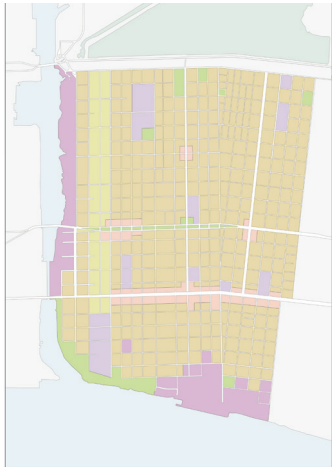
EXISTING URBAN ZONING PLAN

PROPOSED URBAN ZONING PLAN

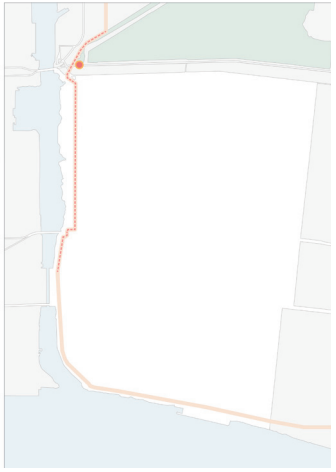


Storm Water Mitigation

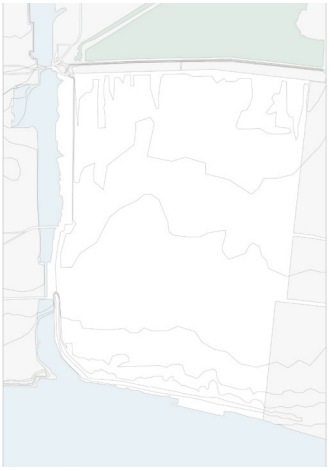
The urban plans and sections demonstrate techniques used to collect and contain storm water runoff into naturally low lying areas of the L9W. Retention ponds throughout the L9W and Holy Cross are used to collect storm water runoff which feed into the canals running to the larger flood wetland retention areas to the north of the neighborhood. The sections demonstrate what areas of the neighborhoods are being affected by the interventions and how containing the storm runoff into a designated area will alter flood plains transforming the remaining neighborhood into a safe zone less susceptible to storm flood conditions.



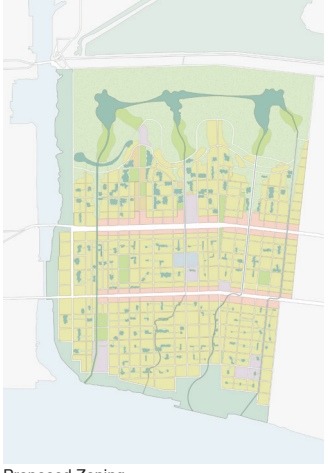
Existing Zoning



Existing Hydrology Control



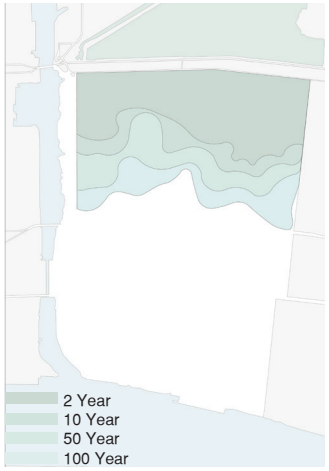
Existing Topography



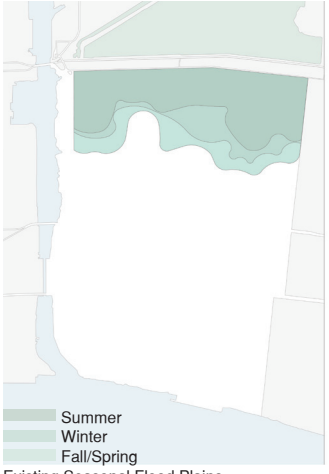
Proposed Zoning

Proposed Hydrology Control

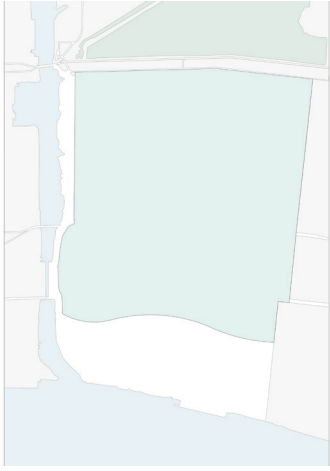
Proposed Topography

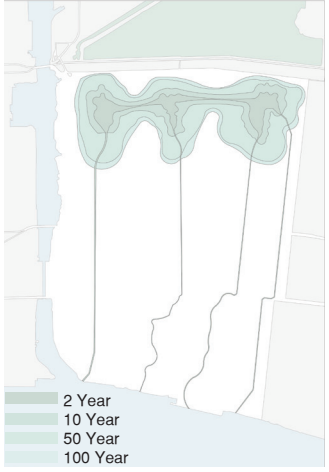


Existing Design Flood Plains

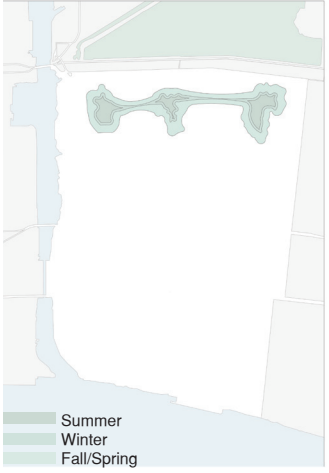


Existing Seasonal Flood Plains

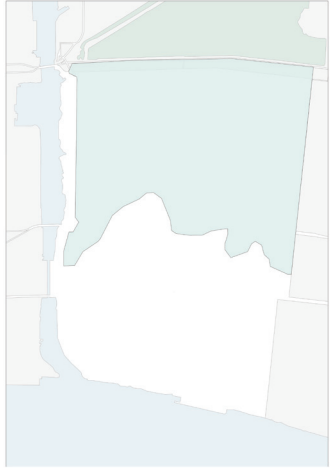

Existing Storm Surge Flood Plain

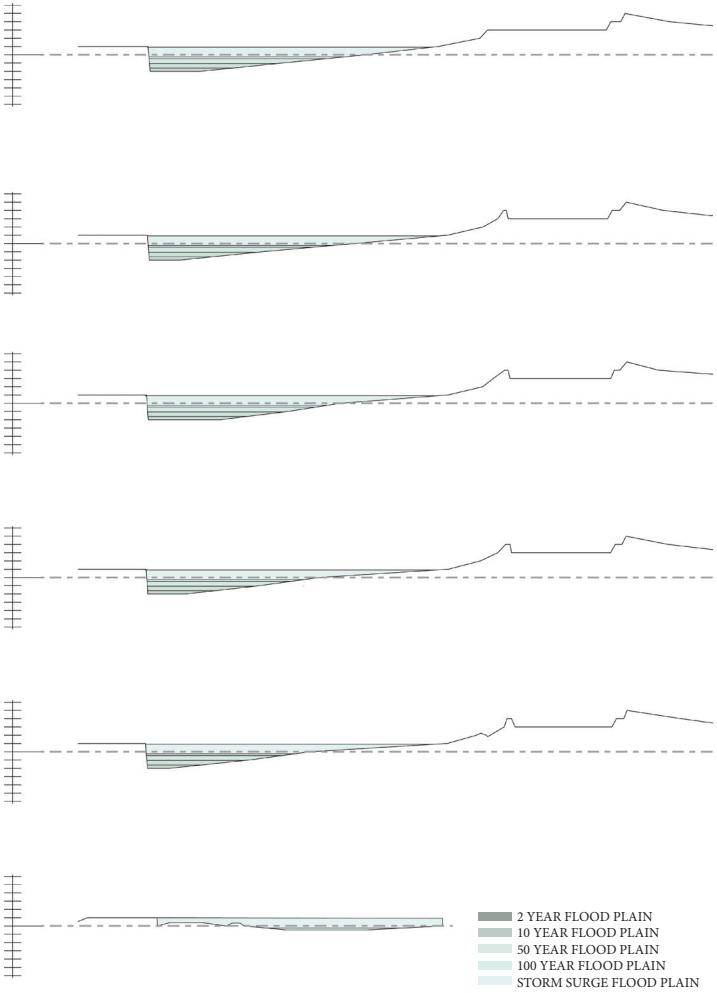


Proposed Design Flood Plains

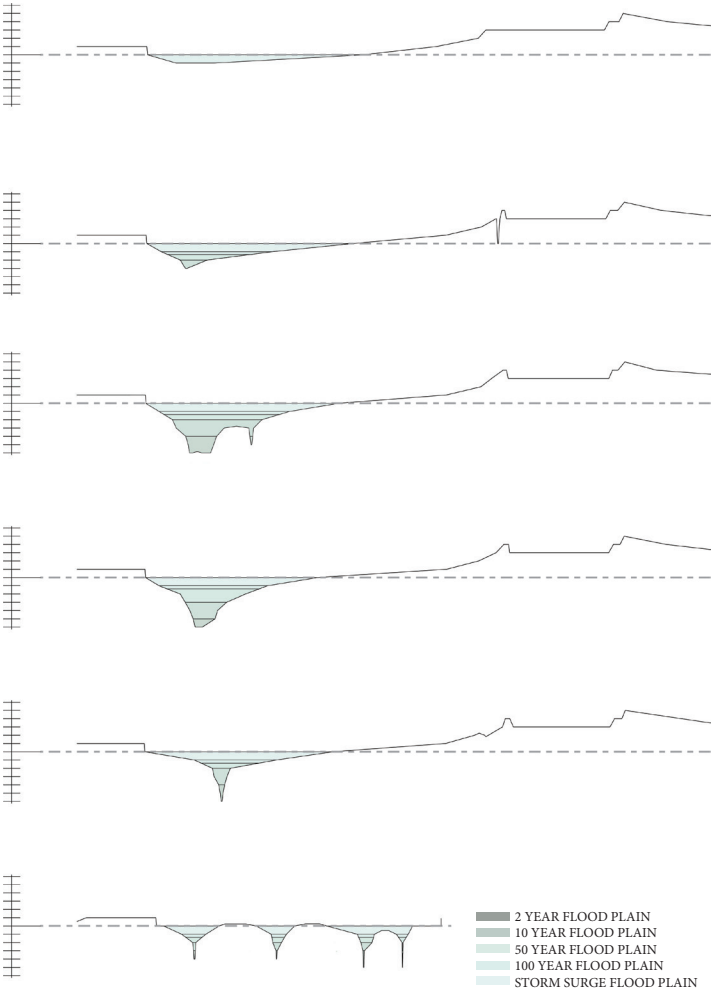


Proposed Seasonal Flood Plains

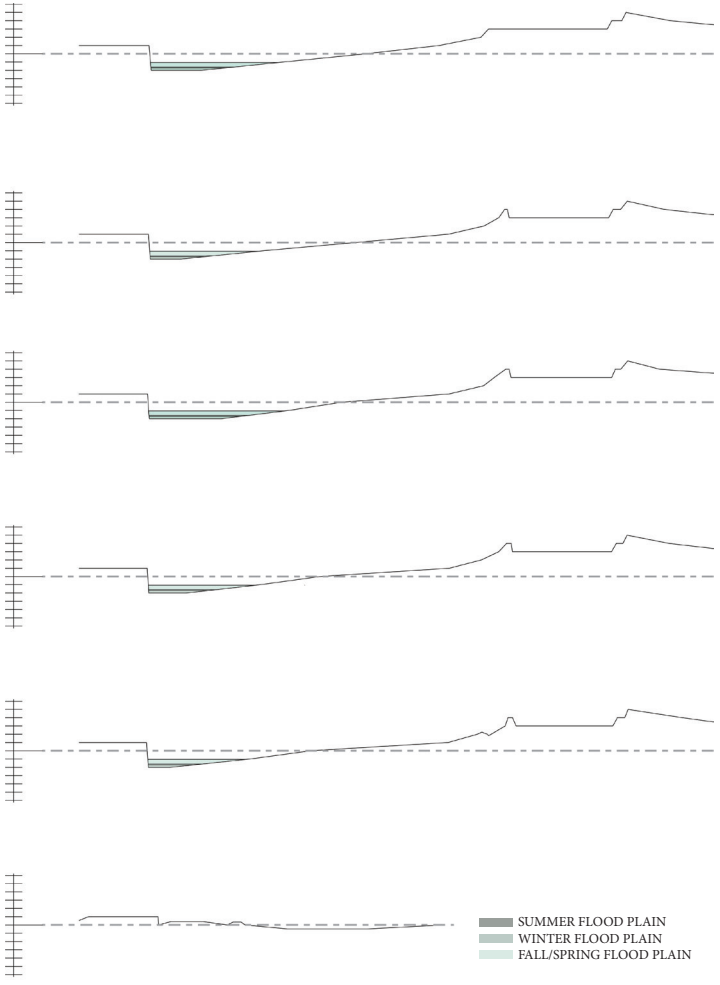

Proposed Storm Surge Flood Plain



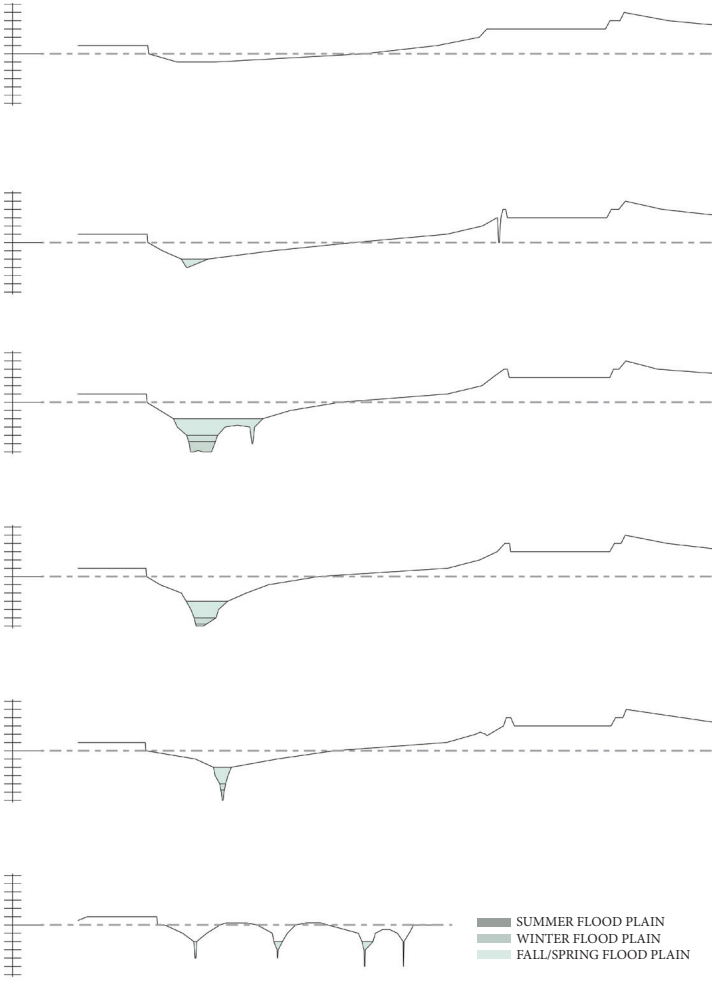
EXISITING DESIGN FLOOD PLAIN SECTIONS



PROPOSED DESIGN FLOOD PLAIN SECTIONS



EXISTING SEASONAL FLOOD PLAIN SECTIONS

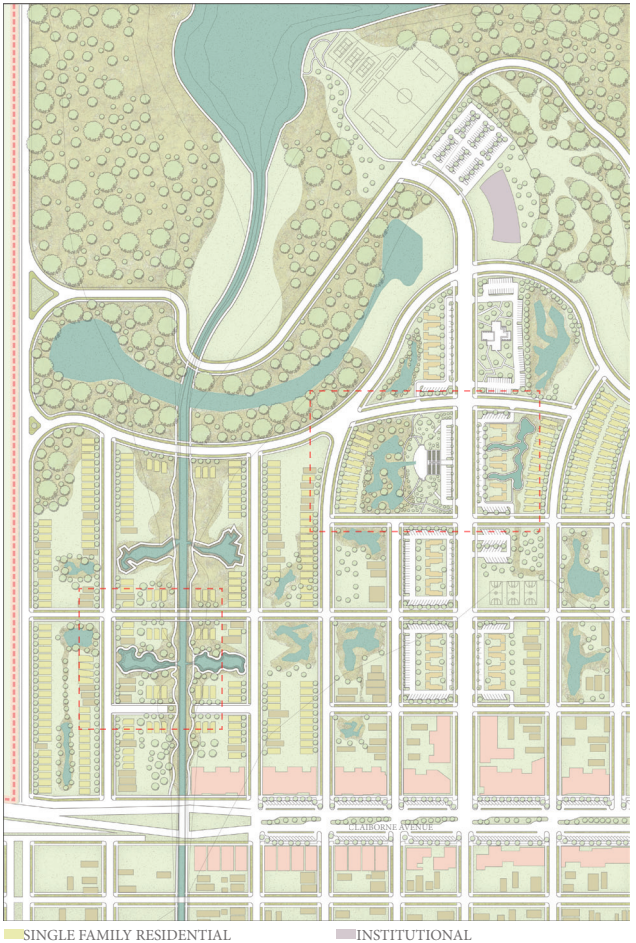


PROPOSED SEASONAL FLOOD PLAIN SECTIONS

SINGLE FAMILY HOUSING REMAINING
1-2 FAMILY HOUSING REMAINING
COMMERCIAL REMAINING
SINGLE FAMILY HOUSING DESTROYED
1-2 FAMILY HOUSING DESTROYED
COMMERCIAL DESTROYED

150' 300' 600'

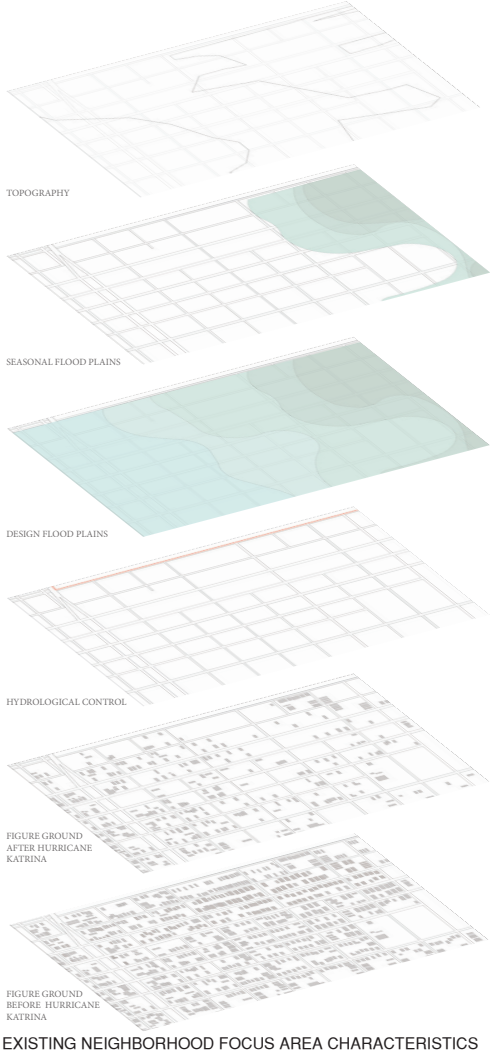
EXISTING NEIGHBORHOOD FOCUS AREA



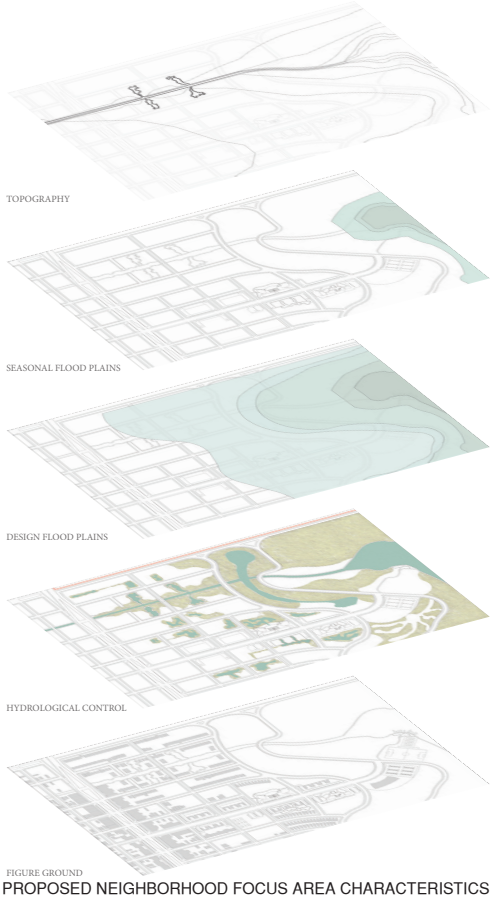
SINGLE FAMILY RESIDENTIAL
1-2 FAMILY RESIDENTIAL
RESIDENTIAL TO REMAIN
COMMERCIAL
INSTITUTIONAL
RETENTION POND
WETLAND
PROPOSED DETAIL SITES

150' 300' 600'

PROPOSED NEIGHBORHOOD FOCUS AREA



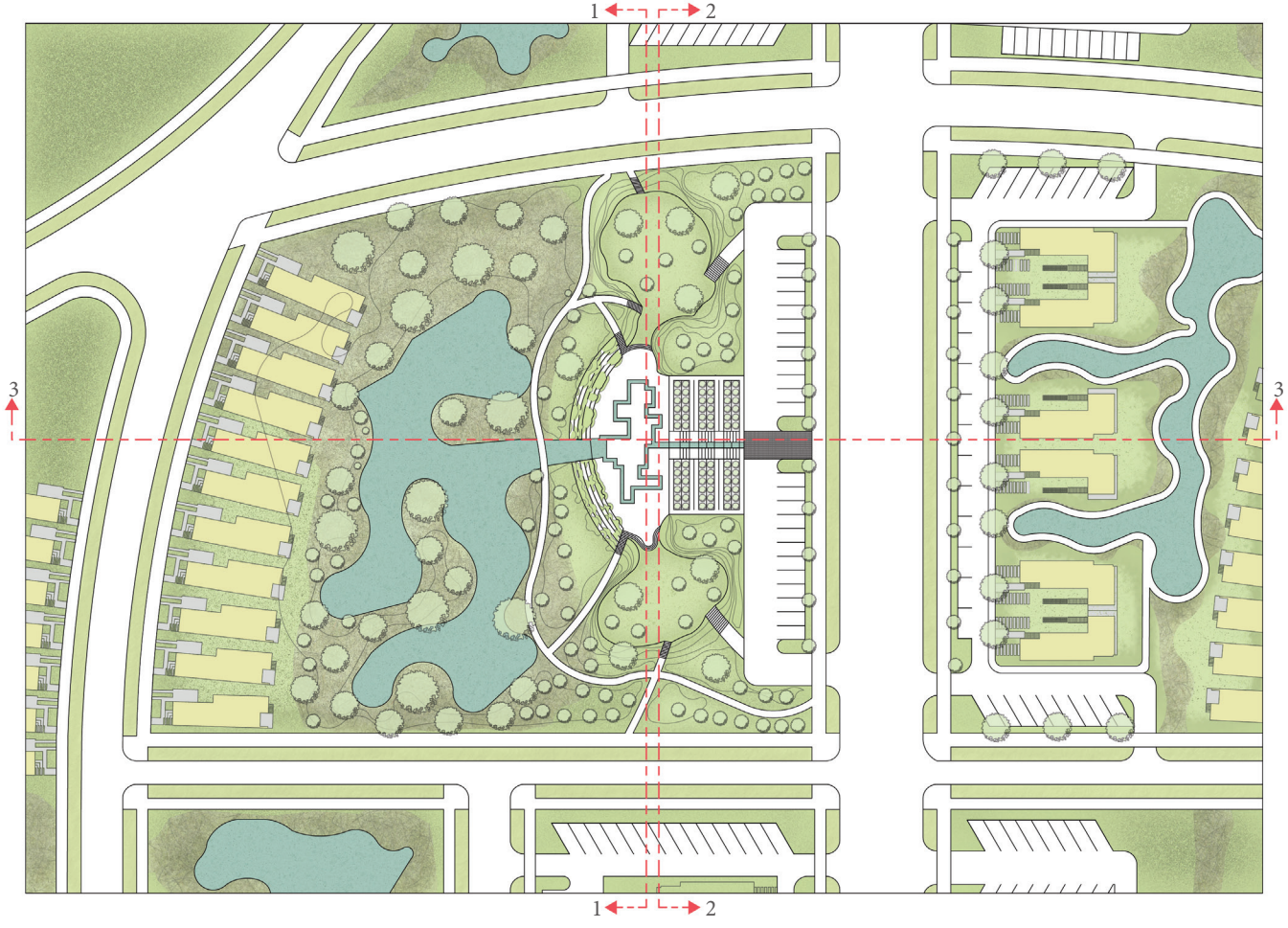
EXISTING NEIGHBORHOOD FOCUS AREA CHARACTERISTICS



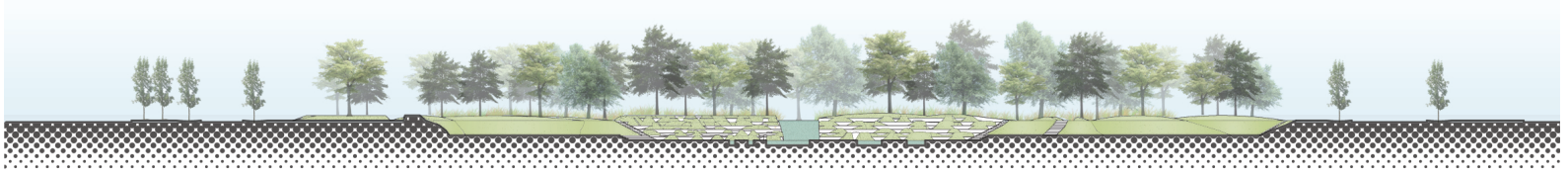
PROPOSED NEIGHBORHOOD FOCUS AREA CHARACTERISTICS

Blurring the Edge

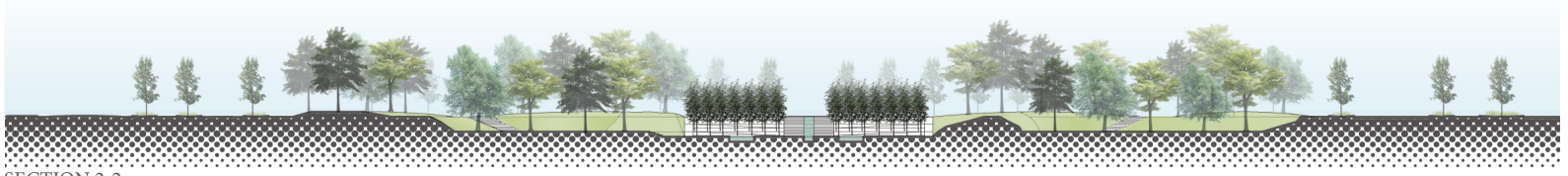
The remaining plans, sections, and renderings examine how the proposed mitigation system can provide amenities to the community by providing both recreational and educational components of wetland interactions. Edge conditions of softscape and hardscape are challenged and blurred as it is not always clear which is the more dominant condition. Through the combination of these two conditions a spacial typology begins to emerge that is neither hard nor soft and it becomes a condition that mankind must cohabitate with.



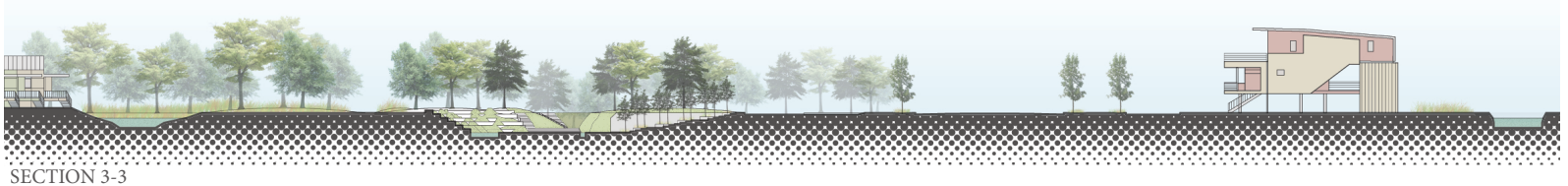
SITE 1: RELATIONSHIP OF WETLAND TO PUBLIC SPACES



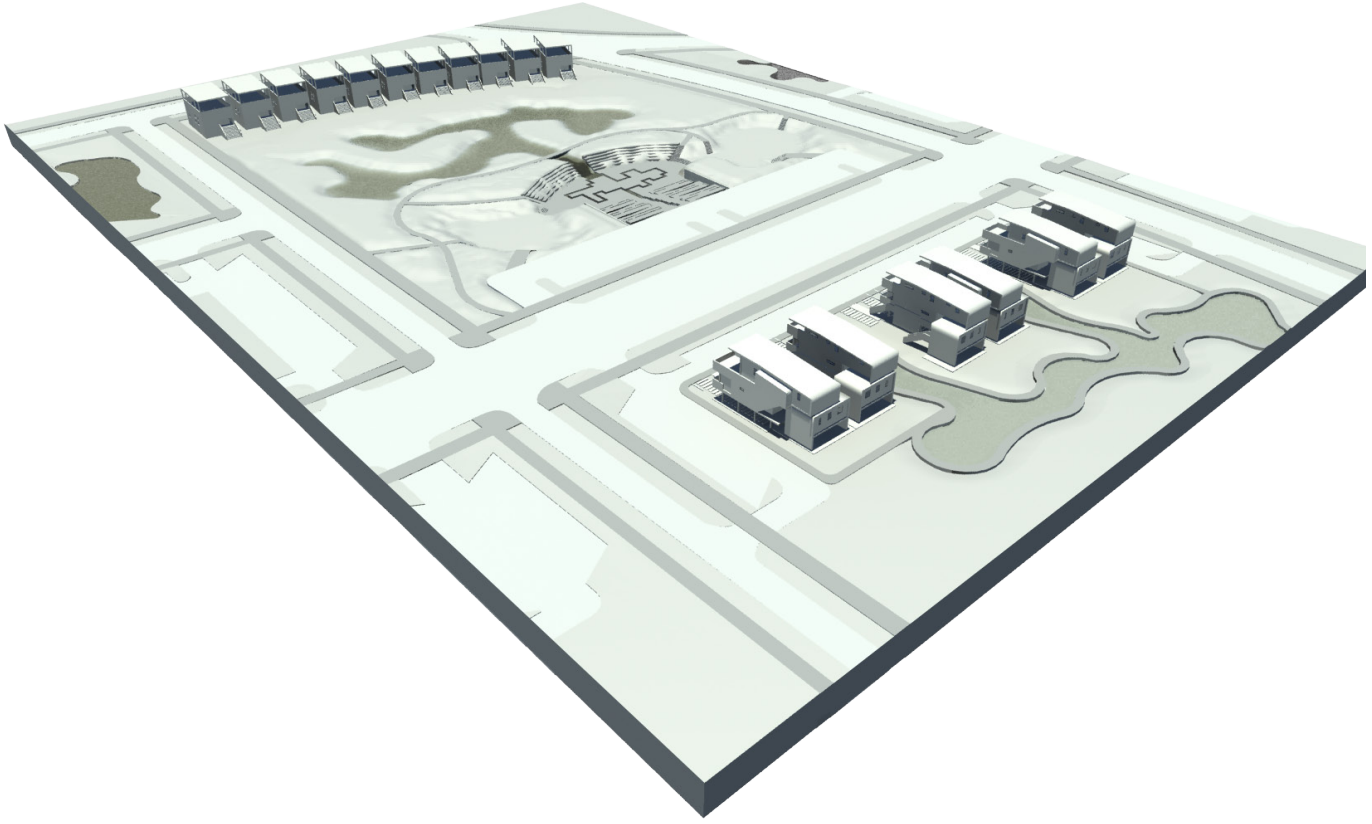
SECTION 1-1



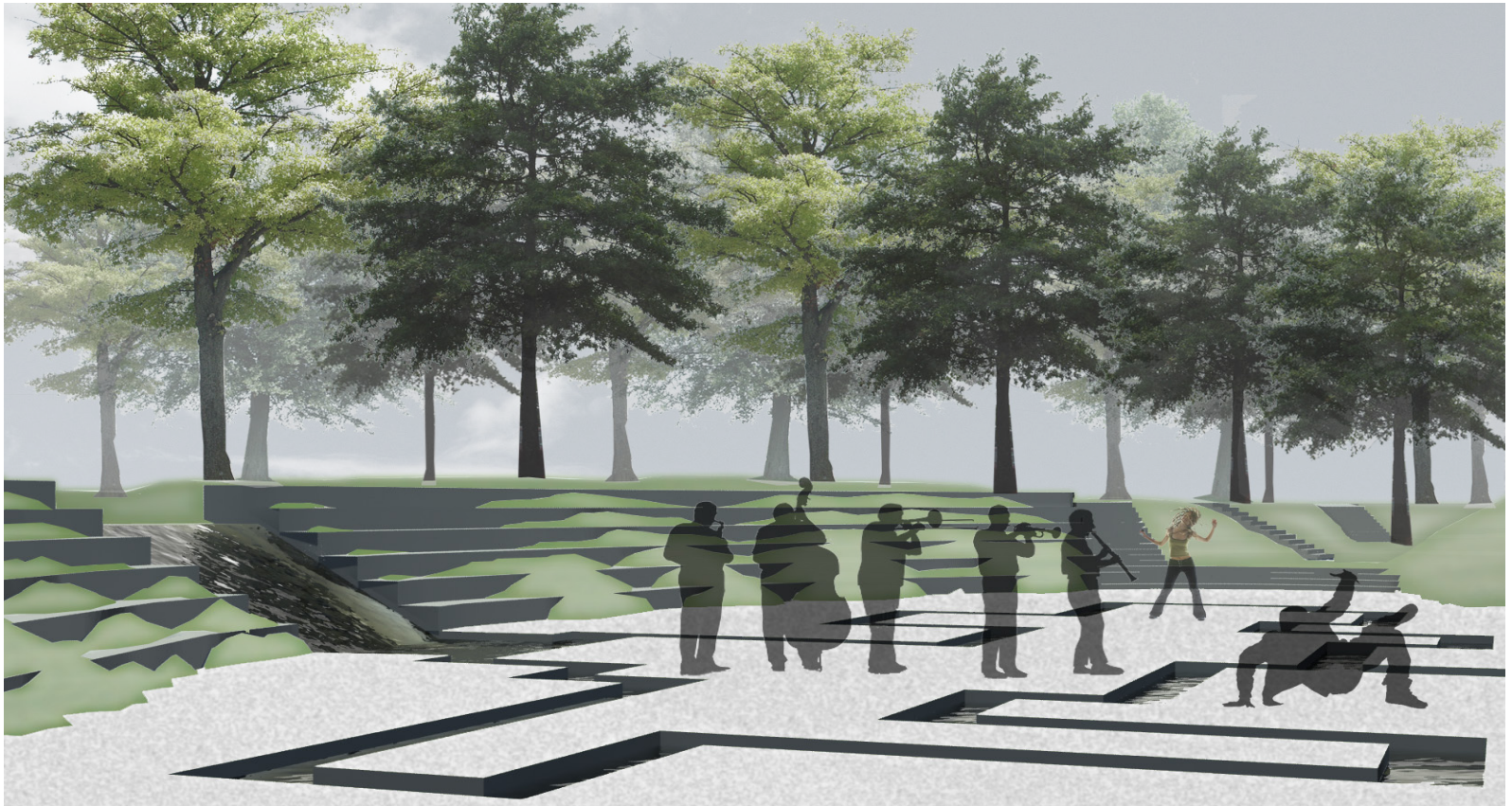
SECTION 2-2



SECTION 3-3

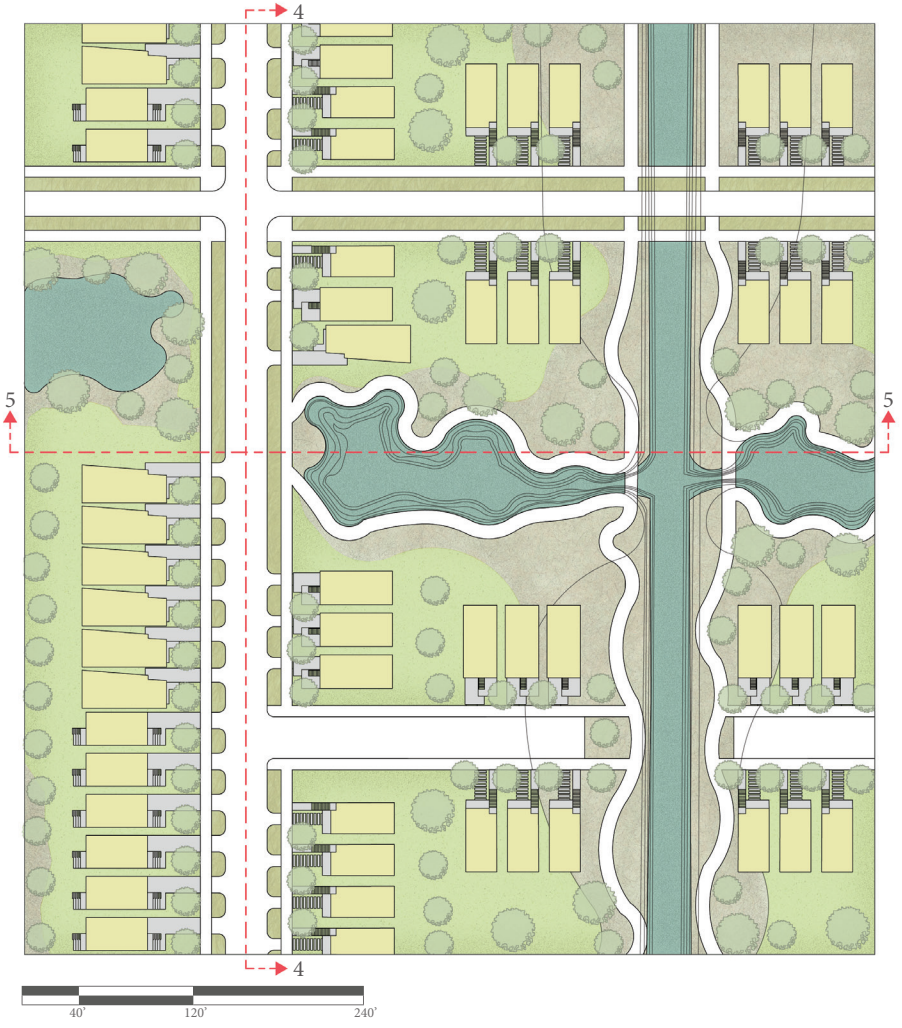


OVERALL PUBLIC SITE MODEL

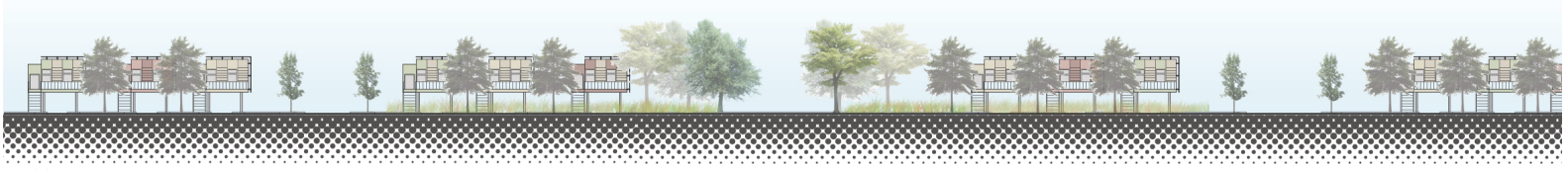


PUBLIC PERFORMANCE SPACE BUFFERING WETLAND FROM PUBLIC STREET

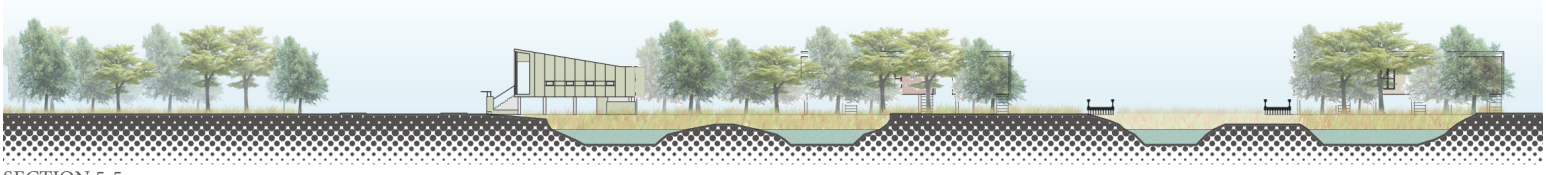
TOWNHOUSE/WETLAND RELATIONSHIP



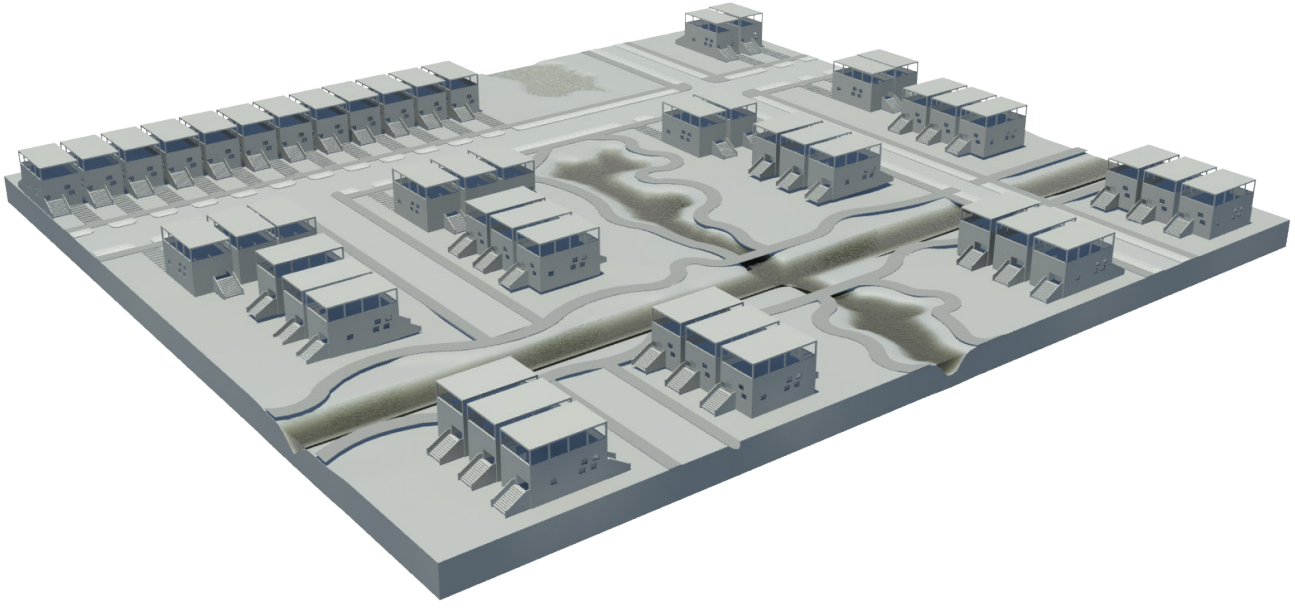
SITE 2: RELATIONSHIP OF WETLANDS TO PRIVATE SPACES



SECTION 4-4



SECTION 5-5



OVERALL PRIVATE SITE MODEL

PRIVATE RESIDENCE RELATIONSHIP TO WETLANDS/RETENTION PONDS

CANAL/BOARDWALK PROMENADE

Conclusion

As an academic exercise this thesis has taken the position that catastrophic events do not destroy cities, neighborhoods, and communities, yet they inform designers, architects, and planners how to make them stronger and safer. Using post Katrina New Orleans and the recovery process of the L9W as a case study this thesis has demonstrated how informative design can transform and reinvent communities and neighborhoods. The proposal developed demonstrates how the reintroduction of wetlands can not only provide natural flood mitigation approaches, but also provide amenities to a neighborhood that has been on the decline for decades, and nearly destroyed by a catastrophic event. The informed design decisions made in this proposal has reinvented and created the opportunity for the Lower Ninth Ward neighborhood to become a stronger safer community.

If anything is to be learned from this thesis, as an academic exercise, it is that designers, architects, and planners must not wait for a catastrophic event to take place to make strong informed decision. Rather those decisions need to be made in the initial less hyper planning periods of initial design, and then maybe these events would be less frequent and catastrophic.

As a real life master plan proposal this thesis does not take into account many limiting factors. Among these factors are budget, grassroots, politics, and outside design influences to name a few. For this reason many of the proposals are optimistic in thinking that they could actually be accomplished. These same issues generally limit and alter less optimistic urban master plans. To create an urban proposal that is built out as proposed is a very difficult task due to the amount of variables that are introduced into such a vast area. It can then be assumed that these same variables limit the recovery plans following a catastrophic event, which could be the reason why areas like the Lower Ninth Ward struggle to ever fully recover.

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