UNIFIED NINE

texturing an urban seam

CONTENTS :

The 96 year-old St.Claude Bridge is the only physical connection across the Industrial Canal that supports pedestrian and bicycle access. The existing unsafe conditions do not promote connectivity between the disparate sides. This thesis imagines the future replacement of the St.Claude bridge as a new textured infrastructure that restores connectivity of the Ninth Ward by weaving its separated community, environment and industry. The bridge weaves structure, road, and path in direct response to access and safety in order to create place within a previously monofunctional infrastructure.

Jonathan Sharp
Tulane School of Architecture
Thesis Advisor: Marianne Desmarais

UNIFIED NINE

texturing an urban seam

Jonathan Sharp
Tulane School of Architecture
Thesis Advisor: Marianne Desmarais

CONTENTS :

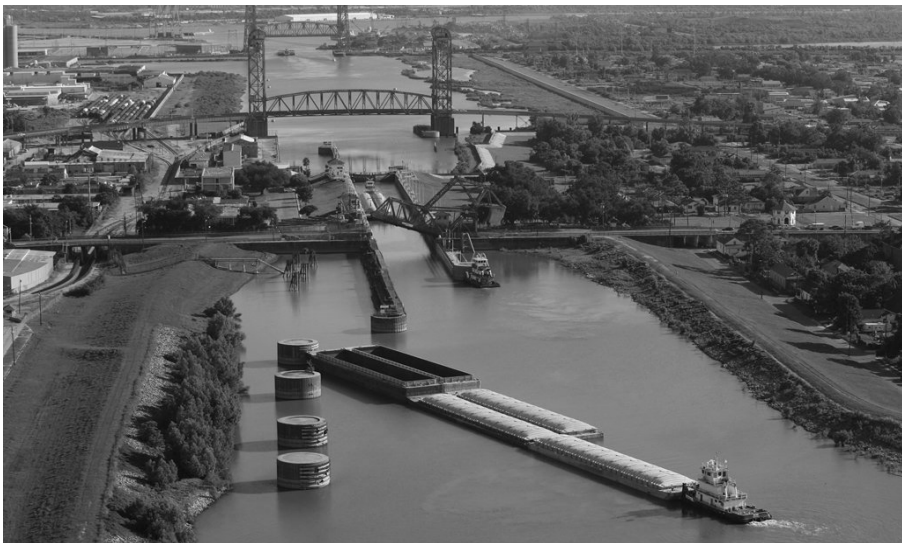


fig. 01

Aerial Photo showing area of investigation on the Industrial Canal. Shows the physical division between the Bywater to left and Lower Ninth Ward to the right. The St. Claude bridge is opening in anticipation of the approaching barge.

01 : Stan Allen is an architect and urbanist who studied under celebrated landscape architect James Corner. Allen's theories on urban design focus on the merging of disciplines in the redevelopment of infrastructure. Specifically, he urges architects to become primary agents in this Infrastructural Urbanism because of our understanding of materials and the city.

fig. 01 : Grunfeld, David. Barge traffic in the Industrial Canal. Digital image. The Times Picayune. Nola.com, 20 Aug. 2010. Web. 18 Nov. 2015.

Transforming Monofunctional Infrastructure

"Infrastructures work to move goods, people, energy and information around, establishing pathways and nodes that make connectivity possible" [01]

The potential for architects to discover the overlaps between the human, mechanical, and natural conditions of the city may allow the redevelopment of deficient infrastructure to simultaneously address other critical urban issues. What if the typical monofunctional infrastructure could be transformed into an urban experience that creates a new public landscape and enhances physical exchange?

Unify the Ninth Ward of New Orleans

In 1918, dredging of the New Orleans Industrial Canal led to the destruction of the central corridor through the historic Ninth Ward [02]. Today, the cultural and economic inequality of the Upper and Lower Ninth Ward exists as a product of deficient bridges, blighted industry, and impending levees (fig. 01). Recalling Stan Allen's fundamental definition of infrastructure, it is apparent that the Industrial Canal is inadequately supporting mobility. Through the spatial reading of the context, this proposal will identify a gap between the exisiting "goods, people, energy and information" [03].

The 96 year-old St.Claude Bridge is the only physical connection across the Industrial Canal that supports pedestrian and bicycle access. The existing unsafe conditions do not promote connectivity between the disparate sides. This thesis imagines the future replacement of the St.Claude bridge as a new textured infrastructure that restores connectivity of the Ninth Ward by weaving its separated community, environment and industry. The bridge weaves structure, road, and path in direct response to access and safety in order to create place within a previously monofunctional infrastructure.

01 : Allen, Stan. "Landscape Infrastructures." Infrastructure as Architecture: Design Composite Networks. By Katrina Stoll and Scott Lloyd. Berlin: Jovis Berlin, 2010. 39. Print.

02 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 210. Print.

03 : Allen, Stan. "Landscape Infrastructures." Infrastructure as Architecture: Design Composite Networks. By Katrina Stoll and Scott Lloyd. Berlin: Jovis Berlin, 2010. 39. Print.

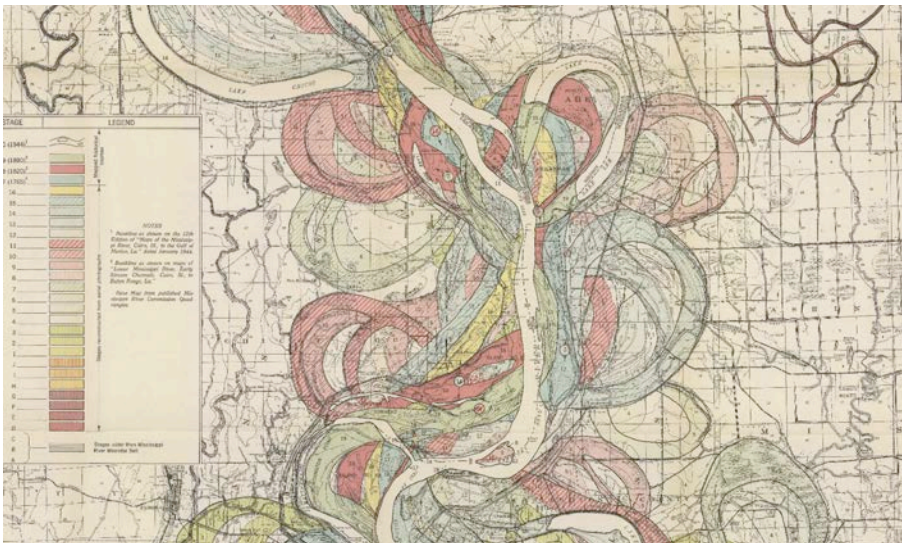


fig. 02

1954 map by Harold Fisk overlaying the varying paths of the Mississippi River over time. The variances occur as a result of the delatic system. Natural flooding of the river over time and accumulation of sediment causes land to form and divert the flow of the river.

04 : Carol Reese is an architectural historian and professor at the Tulane School of Architecture in New Orleans. Her recent book "New Orleans Under Reconstruction : The Crisis of Planning" was published in 2014 as a comprehensive documentation of redevelopment proposals following Hurricane Katrina. Additionally, it contains a range of essays relating to New Orleans culture, architecture, and nature.

fig. 02 : Fisk, Harold "Geological Investigation of the Alluvial Valley of the Lower Mississippi River," Plate 22-9. United States Army Corps of Engineers

UNIFIED NINE: texturing an urban seam

NEW ORLEANS : engineered for water

"Although the reification of New Orleans's past has contributed importantly to the city's economic health, its future prosperity demands that racism and classism that has shaped its collective history be addressed. To anchor reconstruction efforts in the quicksand of the past is to build on unstable ground" [04]

New Orleans was a city founded on connectivity. In 1825 its strategic location at the mouth of the Mississippi River made it *"the premier transshipment point before reaching open seas"* [05]. The nature of New Orleans' location within a deltaic system means it still exists within the natural ebb and flow of the Mississippi River (fig. 02). As a result, the infrastructure of the city is adapted for the movement of water.

While relatively flat in elevation, New Orleans has slight fluctuations in topography, which are both informative and problematic in regards to water management. The highest elevations of the city are found bordering the Mississippi River, thus supporting the wealthiest neighborhoods, like the French Quarter and the Bywater. [06] The development of the low-lying areas, like the Lower Ninth Ward, only happened after the invention of pumping stations and levees.

The first levee along the Mississippi River was introduced in 1724, initiating the tension between the city and nature. The levees were intended to impede the flow of water into the urban fabric. Pumping stations were invented to discharge any remaining water to Lake Pontchatrain. The collection of New Orleans's efforts to control the Mississippi River represents one of *"humanity's grandest manipulations of a natural system"*. [07] While these efforts brought thriving shipping and trade, they simultaneously enveloped the city into a sinking basin.

04 : Reese, Carol McMichael., Michael Sorkin, and Anthony Fontenot. "Introduction." New Orleans under Reconstruction: The Crisis of Planning. London: Verso, 2014. xix. Print.

05 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 229. Print.

06 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 229. Print.

07 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 207. Print.

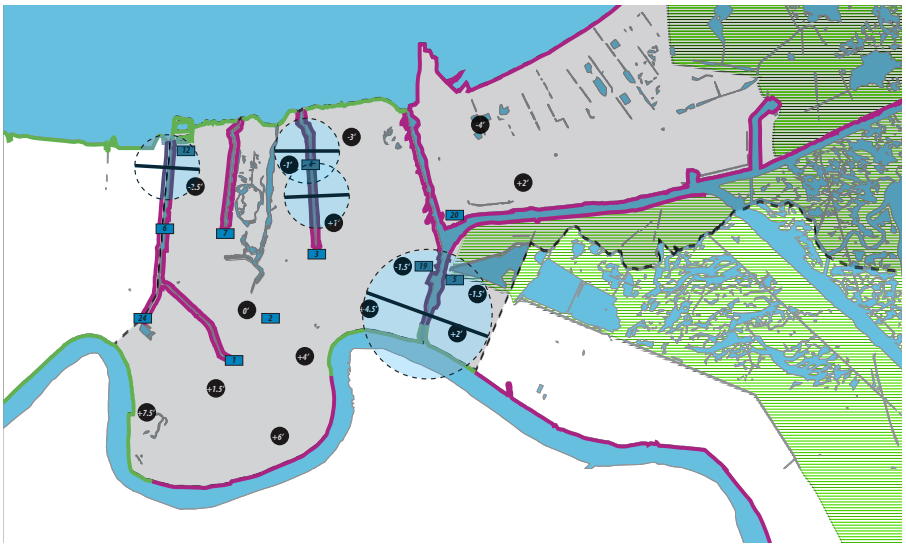


fig. 03

Map showing the existing complex water network of New Orleans and its land elevation. The purple hard lines represent concrete "hard" levees, while the green represents natural levees. The Pumping Stations are the blue boxes with their respective numbers inside. Wetlands are hatched in green and major breaches during Hurricane Katrina highlighted in blue.

08 : Richard Campanella is a geographer at Tulane University. He has built up an unprecedented base of knowledge about New Orleans that serves as an important reference. Beyond the natural geography of the region he has deconstructed and analyzed the historical, cultural, and social structures of the city. His studies are referenced numerous times in this thesis, and are paramount to the understanding of New Orleans.

fig. 03 : Original diagram by author.

By the late 1920's, the city of New Orleans was surrounded by *"a massive earthen wall"* that was the levees. [08] While they brought the residents a sense of security, there was no backup system in case water breached the levees. The Morganza and Bonnet Carré spillways, implemented in 1928, served as backup and relief from high water levels. [09] Outfall canals were another crucial addition to the drainage network. They were lined by levees and anchored by drainage pumps that discharged water from the city to Lake Pontchatrain. Finally, the Industrial Canal was completed in 1923, establishing a physical connection between the Mississippi River and Lake Pontchatrain.

By the late 1960's New Orleans became a mass agglomeration of *"floodways, spillways, and runoff channels; reservoirs, locks, dams, and weirs".* [10] This incredible complex network of infrastructure was created for the movement of water in order to support the connectivity of the city (fig. 03). With the exception of the spillways, which exist outside the immediate city boundaries, the water drainage network is mostly composed of "hard" infrastructure. The traditional engineer-driven infrastructure defined as a *"hard line that demarcates land on one side, water on the other".* [11] While providing a strong sense of security, its concrete presence in our thin, delicate soil prevents natural infiltration of water into the ground.

"[the levees] alleviate the nuisance of minor flooding but increase the risk of an occasional catastrophic deluge" [12]

The *"hard line"* [13] quality of the levees has additionally caused problems of land subsidence, flooding, and cultural separation. The Industrial Canal is perhaps the most dramatic "hard" seam within the urban fabric of New Orleans. Outdated bridges and blighted industry has hindered the mobility of its adjacent communities, revealing the deficiency of the Industrial Canal as a piece of infrastructure.

08 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 206. Print.

09 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 207. Print.

10 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 206. Print.

11. Iovine, Julie V. "Between a Soft and a Hard Place." Wall Street Journal. WSJ, 12 Nov. 2012. Web. 14 Oct. 2015.

12. Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 206. Print.

13. Iovine, Julie V. "Between a Soft and a Hard Place." Wall Street Journal. WSJ, 12 Nov. 2012. Web. 14 Oct. 2015.

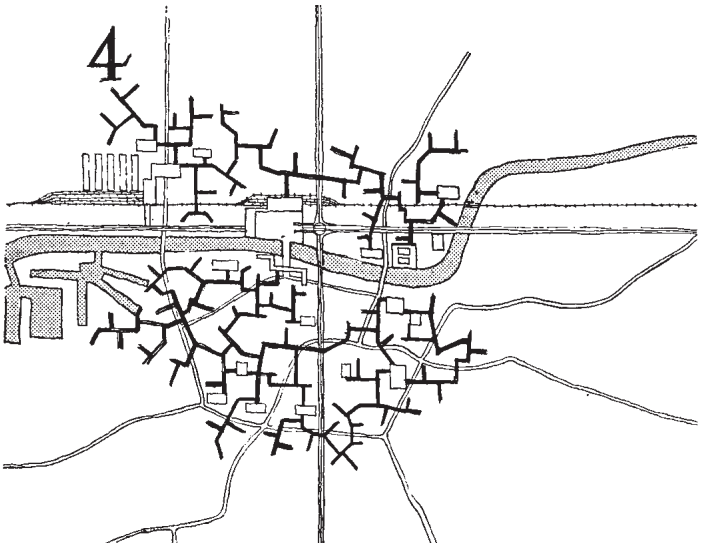


fig. 04

Diagram of first cluster city investigated by Peter and Alison Smithson in 1952. Interested in the motorway as the framework for our cities, the concept of mobility is studied here at various scales of motion. This diagram was a study in the association of various speeds of urban movement.

15 : Peter and Alison Smithson were architects and urbanists based out of London in the mid 1900's. Practicing during the rise of automobiles, they were interested in the different speeds of mobility now apparent in the modern city. Rejecting the traditional idea of the street, they argued that the automobile has disconnected the relationship between pedestrians and the motorway. Through the study of associations of movements, they produced numerous master plans and a new typology of housing.

fig. 04 : Smithson, Alison Margareth Gill, and Peter Smithson. Team 10 Primer: With Additional Reprints from Various Issues of Architectural Design. S.l.: S.n, 1966. 18. Print.

PROBLEM: deficient infrastructure

"Infrastructures work to move goods, people, energy and information around, establishing pathways and nodes that make connectivity possible" [14]

14 : Allen, Stan. "Landscape Infrastructures." Infrastructure as Architecture: Design Composite Networks. By Katrina Stoll and Scott Lloyd. Berlin: Jovis Berlin, 2010. 39. Print.

Infra - STRUCTURE

"Mobility is the key both socially and organizationally to town planning, for mobility is not only concerned with roads, but with the whole concept of a mobile, fragmented, community. The roads (together with the main power lines and drains) form the essential physical infra-structure of the community". [15]

15 : Smithson, Alison Margareth Gill, and Peter Smithson. "Urban Infra-structure." Team 10 Primer: With Additional Reprints from Various Issues of Architectural Design. S.l.: S.n, 1966. 17. Print.

Infrastructure functions as the distributor of fundamental goods such as sewage, water, and electricity, while fostering connectivity and relationships through roads, bridges, and public institutions. Systematically, infrastructure is the structure and identity of a city. Dr. Cary Siress, of Future Cities Lab, remarks that *"Strictly speaking, our most defended founding premises are hot-wired to infrastructure".* [16] As a result, infrastructure can be experienced through all levels of the contemporary city.

16 : Siress, Cary, Dr. "Of All Things... Reassemblies Staged in Place of the Global Theatre." Infrastructure as Architecture: Designing Composite Networks. By Katrina Stoll and Scott Lloyd. Berlin: Jovis, 2010. 11. Print.

"A city, if it is really a city, has a very compound rhythm based on many kinds of movement, human, mechanical, and natural. The first is paradoxically suppressed, the second tyrannically emphasized, the third inadequately expressed." [17]

17 : Van Eyck, Aldo. "Urban Infra-structure." Team 10 Primer: With Additional Reprints from Various Issues of Architectural Design. By Alison Margareth Gill Smithson and Peter Smithson. S.l.: S.n, 1966. 17. Print.

In the Team X Primer, Aldo Van Eyck, along with Peter and Alison Smithson, recognize infrastructure as the connective structure of a city (fig. 04). Written in a time where modernism was producing singular, selfish architecture, the chapter *Urban infra-structure*, prioritized the collective of society and its potential for interaction through the dynamic system of mobility.

fig. 05

Photo displaying the celebratory opening of the Industrial Canal in 1923. The photo was taken at the site of the Industrial Lock that is still present today. Completed 96 years ago, the lock is now outdated and slated for redevelopment.

21 : Situated at the mouth of the Mississippi River and Gulf of Mexico, New Orleans has always been a city of trade and commerce. The Port of New Orleans is currently the 6th largest port in the United States and facilitates the movement of approximately 6,000 vessels and 500 million tons of cargo a year. It is currently undergoing a Masterplan for 2020 that would raise traffic 2-3% and create a new cruise terminal.

fig. 05 : Persica, Dennis. "Industrial Canal: The Times-Picayune Covers 175 Years of New Orleans History." NOLA.com. The Times Picayune, 1 Feb. 2012. Web. 14 Oct. 2015.

Stan Allen describes the fundamental components of infrastructure being "*goods, people, energy and information*" [18]. Similarly, Van Eyck cites the rhythm of the city as being made of up "*human, mechanical and natural*" movement [19]. The Industrial Canal of New Orleans is a deficient infrastructure that insufficiently forms connections between these forces. How can an intervention on the canal replace the grim realities depicted by Van Eyck, and retexture the *"tyrannical"* industry, *"suppressed"* community, and *"inadequately expressed"* environment?

"tyrannical" INDUSTRY

"Envisioned for over two centuries, New Orleans finally accomplished its dream of connecting lake and river on January 29, 1923" [20]

The Industrial Canal was a highly productive site supporting New Orleans's role as a port city. It established connectivity to multiple countries and regions. The Port of New Orleans [21] proposed this infrastructure for the purpose of expanding trade activity and increasing cargo capacity.

In 1918, dredging of the New Orleans Industrial Canal led to the destruction of homes and landmarks between France St. and Jourdan Ave, the central corridor, of the historic Ninth Ward of the city. [22] Overshadowing the newly formed division of the Ninth Ward however, was the Industrial Canal's completion in 1923 as a unique addition to the city's water drainage network. It established the long-awaited connection between the Mississippi River and Lake Pontchatrain. The city celebrated the inauguration of the canal with visions of a further connected city and productive port (fig. 05). The development of industrial buildings lining the canal shortly followed in order to support large volumes of shipping and trade, erasing additional residential fabric from the, now, Upper and Lower Ninth Wards.

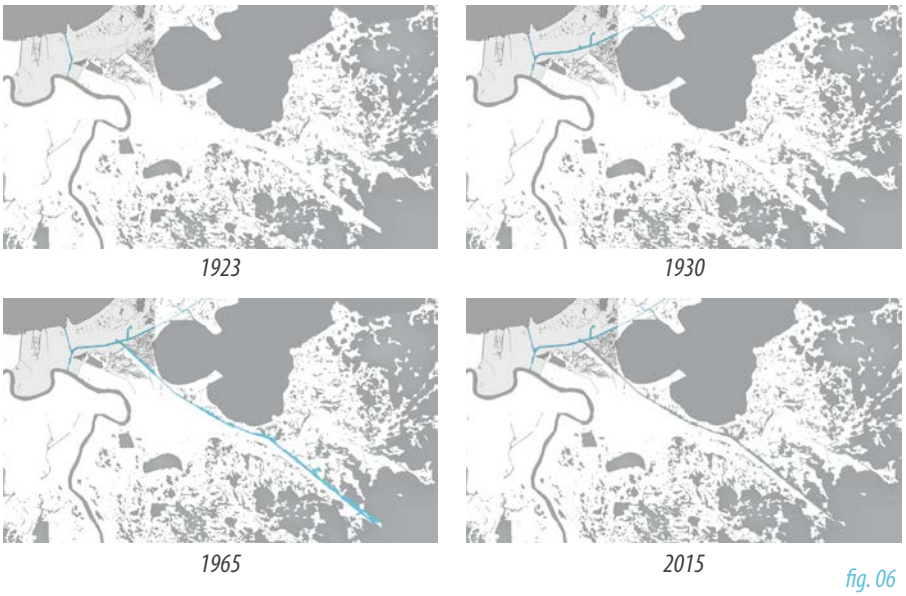
18 : Allen, Stan. "Landscape Infrastructures." Infrastructure as Architecture: Design Composite Networks. By Katrina Stoll and Scott Lloyd. Berlin: Jovis Berlin, 2010. 39. Print.

19 : Van Eyck, Aldo. "Urban Infra-structure." Team 10 Primer: With Additional Reprints from Various Issues of Architectural Design. By Alison Margareth Gill Smithson and Peter Smithson. S.l.: S.n, 1966. 17. Print.

20 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 211. Print.

21 : "Port of New Orleans : About." Port Nola : The Port of New Orleans. N.p., n.d. Web. 15 Nov. 2015.

22 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 210. Print.



Series of maps showing the series of branches added to the Industrial Canal over time. Starting in 1923 as an important connection from the Mississippi River to Lake Pontchatrain, it became a part of the Gulf Intracoastal Waterway (GIWW) in 1930 extending its reach to Texas and Florida. Finally the Mississippi River-Gulf Outlet (MR-GO) established a more direct connection to the Gulf of Mexico, only to be closed in 2009 because of soil erosion and flood risks.

fig. 06

26 : The Naval Support Activity site was originally constructed in 1919 as a base of the Army Quartermaster Corps at the joint of the Mississippi River and Industrial Canal. Converted to the Navy in 1966, this massive facility has laid empty since 2009. It is located adjacent to the Bywater neighborhood of New Orleans and stands as a blighted barrier seperating the community from the waterfront.

fig. 06 : Original diagrams by author.

In 1930, the Industrial Canal became a connective branch of the Gulf Intracoastal Waterway (GIWW). The GIWW is a network of interconnected waterways running parallel to the Gulf of Mexico from Texas to Florida. Joining the GIWW resulted in the dredging of an additional channel through the marsh, but brought increased barge traffic (fig. 06).

In 1965 the Mississippi River-Gulf Oulet (MR-GO) was completed, creating a direct route from the Industrial Canal to the Gulf of Mexico. Proposed soon before World War I, this tidewater canal would further increase efficiency of the shipping industry (fig. 06). [23]

"Local government authorities and buisness leaders met with the U.S. Army Cops of Engineers in 1943 and agreed that a tidewater canal would put New Orleans and the Mississippi Valley's vast inland waterway network back in competition with routes that utilized the Panama Canal" . [24]

The full potential of the MR-GO was never exploited however, because of a decrease in freight traffic in the 1990's. Hurricane Katrina exposed the weakness of the waterway when storm surge from the Gulf of Mexico funneled up the MR-GO, into the Industrial Canal, then subsequently into the Ninth Ward. The volume and force of the storm surge led to major breaches of the Industrial Canal's levees. This resulted in costly damage to the canal's infrastructure and the catastrophic flooding of the Lower Ninth Ward. In 2009, the Lake Borgne Surge Barrier was completed, officially closing the MR-GO for navigation and blocking future storm surge from the Gulf of Mexico (fig. 06). [25]

Today, the Industrial Canal is a dramatic seam through the Ninth Ward of New Orleans. Limited freight traffic has led to disuse and blight of its major industrial buildings, including a 25 acre former Naval Support Activity site. [26] The remaining active pieces of infrastructure are largely outdated and promoting disconnection.

23 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 212. Print.

24 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 212. Print.

25 : Carr, Martha. "Mississippi River Gulf Outlet Now Blocked with 352,000 Tons of Rock."The Times Picayune. Nola.com, 24 July 2009. Web. 15 Nov. 2015.

26 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 46. Print.

fig. 07

Photo of the typical bascule bridge that spanned the Industrial Canal in 1921. The concrete mass acts as a counter weight to balance the opening of the bridge. With the exception of the St. Claude bridge, these have all been replaced by modern lift bridges.

27 : As a result of different water levels between the Mississippi River and the Industrial Canal, the "Great Lock" was constructed to vertically displace barges. The 90 year old structure still exist today but is outdated and can't accomodate modern day barges. Funding to replace this lock with a new one north of the Claiborne Bridge have fallen short.

fig. 07 : Persica, Dennis. "Industrial Canal: The Times-Picayune Covers 175 Years of New Orleans History." NOLA.com. The Times Picayune, 1 Feb. 2012. Web. 14 Oct. 2015.

The "great lock" is used to mediate the different water levels between Lake Pontchatrain and the Mississippi River. The 90 year old engineering landmark displaces vessels vertically *"between the average-ten-foot-high river and the sea-level lake".* [27] Over time its use has diminished as barges have become too big to pass through the lock. Renovation projects to enlarge the lock have been on-going since 1953, with all proposed redevelopment plans lacking funding.

27 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 210. Print.

"supressed" COMMUNITY

"concentrated neighborhood poverty shapes everything from higher crime rates to limited social mobility for the people—and especially the children—who live in these neighborhoods." [28]

Within the interconnecting network of infrastructure, exist the culturally and socially layered problems of urban cities. One of the biggest is the reoccupation of urban centers by millenials, leading to gentrification and segregated economic inequality. Concentrated poverty is defined as *"neighborhoods or tracts where 40 percent or more of residents fall below the federal poverty threshold".* [29] In a study by The Atlantic CityLab, geographically concentrated poverty has a disturbing correlation with race and ethnicity. Their studies proved that *"One in four black Americans and one in six Hispanic Americans live in high-poverty neighborhoods, compared to just one in thirteen of their white counterparts."* [30] The resulting patchwork of social groups produces inequality rather than diversity.

The Industrial Canal is the cause for concentrated poverty in the Lower Ninth Ward (fig. 08). Post-Katrina New Orleans however, is experiencing a surge of redevelopment. Population rates have increased 12% between 2010 and 2014, adding 50,000 people, and making New Orleans one

28 : Florida, Richard. "America's Biggest Problem Is Concentrated Poverty, Not Inequality." CityLab. The Atlantic, 10 Aug. 2015. Web. 4 Nov. 2015.

29 : Florida, Richard. "America's Biggest Problem Is Concentrated Poverty, Not Inequality." CityLab. The Atlantic, 10 Aug. 2015. Web. 4 Nov. 2015.

30 : Florida, Richard. "America's Biggest Problem Is Concentrated Poverty, Not Inequality." CityLab. The Atlantic, 10 Aug. 2015. Web. 4 Nov. 2015.

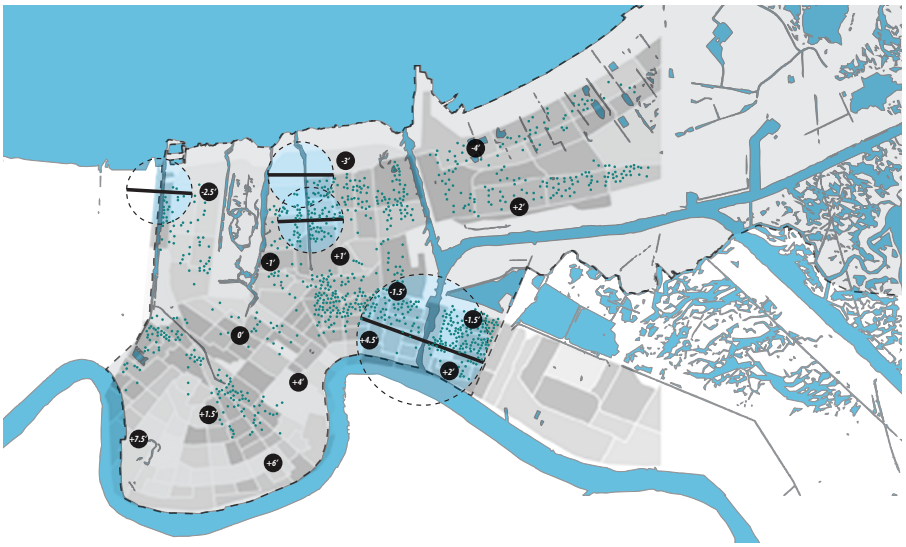


fig. 08

Diagram showing Income levels paired with blighted properties in 2011. The darkest shades of gray are the lowest income levels, while the lighter shades represent the wealthy neighborhoods. There is a high concentration of blue dots (blighted properties) in the Lower Ninth Ward.

33 : The Lower Ninth Ward experienced the most damage during Hurricane Katrina. A major breach in the Industrial Canal levee caused standing water of up to 12 feet. Homes were swept away and most residents chose not to return following the storm. Only 37% of the pre-Katrina population has returned, leaving the neighborhood desolate and lacking proper infrastructure.

fig. 08 : Original diagrams by author.

of the fastest growing cities in the United States. 40 of the 72 neighborhoods have recovered at least 90% of their pre-Katrina populations with only one neighborhood still sitting below 50%. [31]

The Bywater, the neighborhood on the west side of the canal, currently has a higher number of residing workers than before Katrina. It has seen its demographics flip and income rise 17% in the ten years following the storm. The majority of its new population being caucasian millenials.[32]

Meanwhile, just across the canal, the Lower Ninth Ward is the only neighborhood that hasn't recovered at least 50% of its population. It has only seen one-third of its numbers return and is composed of a 95.5% African American population. [33] Redevelopment of the Lower Ninth Ward is beginning, however. In 2014 there were 50% more addresses recieving mail than in 2010. In addition, 2015 has already welcomed 100 more property owners, making the Lower Ninth Ward one of the neighborhoods experiencing the most growth in New Orleans. [34] Hindering further redevelopment are the bridges spanning the Industrial Canal, most of which are outdated and unsafe.

Physical connection between the Upper and Lower Ninth Ward is limited to three bridges, only one of which allows for pedestrian crossing, the St. Claude bridge. Completed in 1919, it was the first bridge crossing the canal (fig. 07). 96 years later, the original bridge still stands with four vehicular lanes and the only pedestrian walkway connecting the disparate sides. With a total width of three feet, the path is extremely narrow and unsafe for bikers and pedestrians. With most jobs opprotunities located across the canal, in the CBD and French Quarter, it is difficult for the residents of the Lower Ninth Ward to commute to work.

A group of University of New Orleans urban planning students have started an initiative named

31 : Webster, Richard A. "New Orleans' Population Approaches Pre-Katrina Numbers, Study Shows." The Times Picayune. Nola.com, 13 July 2015. Web. 15 Nov. 2015.

32 : Adelson, Jeff. "After Hurricane Katrina, a Look at New Orleans' Uneven Recovery among Its Neighborhoods." The Advocate. N.p., 11 July 2015. Web. 12 Oct. 2015.

33 : The Data Center analysis of Local Employment Dynamics, U.S. Census Bureau.

34 : Webster, Richard A. "New Orleans' Population Approaches Pre-Katrina Numbers, Study Shows." The Times Picayune. Nola.com, 13 July 2015. Web. 15 Nov. 2015.

fig. 09

Photo of the Levee wall seperating the Lower Ninth Ward from the water of the Industrial Canal. The Claiborne bridge is protruding behind the wall. The walking Lower Ninth resident reveals the immense scale of the levee.

35 : Connect the 9 is comprised of Ninth Ward community members and UNO graduate planning students. They formed the group in 2011 to raise awarness of the dangerous condition of the St. Claude Bridge. The bridge is the only pedestrian crossing for residents of the Lower Ninth Ward to access groceries, healthcare, and jobs. They advocate for a wider walking path, more street lighting, and a lower speed limit.

fig. 09 : Tama, Mario. When the Levees Broke. Getty Images. 2005. N.p.

Connect the 9 in efforts to increase the safety and functionality of the bridge. They advocate for simple solutions such as, widening the walking path, and increased lighting, to restore pedestrian connectivity. [35] With the redevelopment of the Lower Ninth Ward already beginning, these improvements would expedite the process, while also promoting exchange between the disaparate communities.

35 : Rickard, Mary. "St. Claude Avenue Bridge Safety for Bicyclists, Pedestrians Is Studied." The Times Picayune. Nola.com, 27 May 2012. Web. 22 Nov. 2015.

"inadequately expressed" ENVIRONMENT

Infrastructure in New Orleans specifically provides connectivity through the movement of water. The collection of the city's efforts to control the Mississippi River represents one of *"humanity's grandest manipulations of a natural system"*. [36] Drainage canals, pumping stations, and levees represent the structure and identity of the city but are also contributing to its problems. With the exception of the spillways, which exist outside the immediate city boundaries, the water drainage network is mostly composed of "hard" infrastructure. The traditional engineer-driven infrastructure defined as a *"hard line that demarcates land on one side, water on the other"*. [37] Paradoxically, the resource that provides identity and commerce for the city has become publicly inaccessible (fig. 09).

36 : Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafayette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. 207. Print.

37 : Iovine, Julie V. "Between a Soft and a Hard Place." Wall Street Journal. WSJ, 12 Nov. 2012. Web. 14 Oct. 2015.

The Industrial Canal has evolved over time as one of the most dramatic "hard" line infrastructures through the urban fabric. Land was replaced for water, and shortly after made inaccessible through the development of industrial buildings. In addition, levees were built along the edge of the Lower Ninth Ward to protect from flooding, further separating community from water.

In a conversation with Carol Reese, David Waggonner, founder of the Dutch Dialogues, explains the major problem facing New Orleans today.

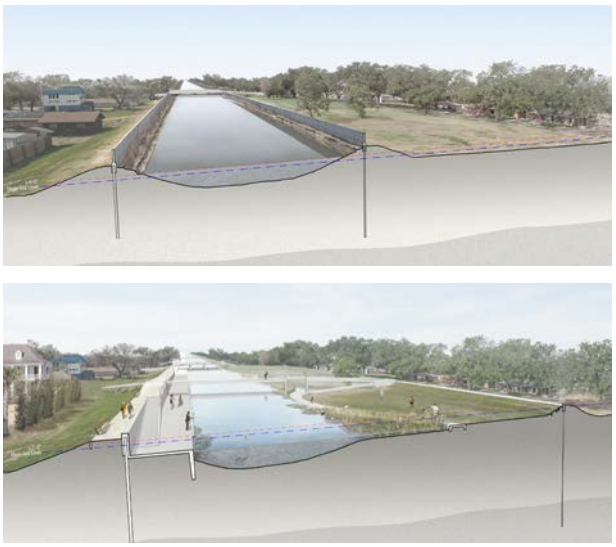


fig. 10

Renderings from Waggonner & Ball's Lafitte Blueway proposal on the London Avenue Canal. The top picture depicts the current state of the levee, while the bottom picture proposes an improved infrastructure. The bottom proposal creates a recreational waterway by removing the wall and allowing water to infiltrate the ground.

38 : David Waggonner, principle of Waggonner & Ball, has been devoting much of his career to studying and ameliorating the New Orleans drainage system. His main concern is that the city pumps all of its water out rather than capture it for productive purposes. He argues that by eliminating the levee wall and providing space for water to filter, you decrease the chance of a catastrophic breach as was seen during Hurricane Katrina.

fig. 10 : "Greater New Orleans Urban Water Plan." Waggonner & Ball Architects. N.p., n.d. Web. 20 Oct. 2015.Print.

"We are the land of dreams, but we do not acknowledge that dream element that is all around us. . . Ultimately, what we are giving up is our own economic potential. We do not accept water anywhere in the city. We simply get rid of it". [38]

Waggonner has completed numerous proposals that breach the concrete levee walls and carefully admit water into the urban fabric. The Lafitte Blueway, designed in 2013, integrates all his theories into a comprehensive plan for the redevelopment of the London Avenue Canal. The existing condition consists of "hard" levee walls seperating the canal from the adjacent residential neighborhoods (fig. 10). To return water as an accessible resource, he provided a public path along one side, while eliminating the levee wall from the other, and implementing a "soft" infrastructure consisting of wetlands and recreational green space (fig. 10). In addition, the proposal sustainably reuses rainwater by exploiting the ground as a natural filter. [39]

The closure of the MR-GO protects the Industrial Canal from future Gulf of Mexico storm surge, which caused the breach during Hurricane Katrina. As a result, the need for the levees of the Industrial Canal may be revisited. There is a unique opprotunity to allow New Orleans' most defining resource back to the public in a beautiful and productive way.

38 : Waggonner, David, III. "Ground Zero." New Orleans under Reconstruction: The Crisis of Planning. By Carol McMichael. Reese, Michael Sorkin, and Anthony Fontenot. London: Verso, 2014. 487. Print.

39 : "Greater New Orleans Urban Water Plan." Waggonner & Ball Architects. N.p., n.d. Web. 20 Oct. 2015.Print.

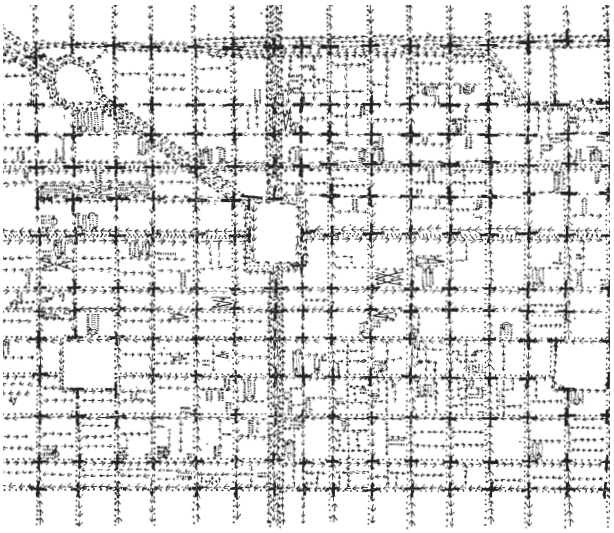


fig. 11 *fig. 12*

The diagram to the right is a study by Louis Kahn of the speed of movement through Philadelphia. Part of a larger series of urban plans, he was searching for order within the various threads of the city fabric. The diagram shares similar aesthetic and conceptual qualities found in the texture on the left.

43 : Louis Kahn made a series of urban design proposals for the city of Philadelphia between 1939-1964. Similar to his architecture, his plans were based on hierarchy and order of the city plan. Similar to the Smithsons, he was interested in the unity of the urban motorway. Through iterative diagramming, he studied the varying speeds of movement through the urban fabric. Many of the concepts discovered through these urban plans became apparent in his built work.

fig. 11 : Smithson, Alison Margareth Gill, and Peter Smithson. Team 10 Primer: With Additional Reprints from Various Issues of Architectural Design. S.l.: S.n, 1966. 29. Print.

fig. 12 : Qayyum, Ali. "20 Useful Woven and Knitted Fabric Textures." Smashing Hub. N.p., n.d. Web. 22 Nov. 2015.

SOLUTION: textured infrastructure

"Collecting multiple infrastructure systems while also responding to local, social, aesthetic, and ecological conditions produces resilient forms of urbanism that are appropriate for the given condition" [40]

40 : Stoll, Katrina, and Scott Lloyd. Infrastructure as Architecture Designing Composite Networks. Berlin: Jovis, 2010. 6. Print

Defining an Urban Texture

A texture is defined as, *"the characteristic physical structure given to a material, an object, etc., by the size, shape, arrangement, and proportions of its parts".* [41] The creation of a pattern is dependent on the rhythmic intersection, or weaving of its various threads. Inherent in a texture is the interdependency of its parts; building on each other, they provide mutual structure and support. The resulting texture is a unified expression of the disparate threads, revealing the varying grains as they weave through the surface. Mapping the respective speeds, or grains, of the human, mechanical, and natural flows of a city may begin to reveal flaws in their "*size, shape, arrangement, and proportions*". [42]

41 : "Texture" Merriam-Webster, An Encylopaedia Britannica Company, 1995. Web. 20 Nov. 2015.

42 : "Texture" Merriam-Webster, An Encylopaedia Britannica Company, 1995. Web. 20 Nov. 2015.

Team 10 references various urban studies done by Louis Kahn. [43] In an ideogram of existing traffic movement in Philadelphia (fig. 11), he diagrams the meter, or rhythmic speeds, of the urban motorway. The resulting diagram reveals the physical structure of the motorway through the kinetic associations of its different vehicles. The beautifully represented arrangement of parts may be likened to the varying grains of fabric in a texture (fig. 12).

43 : Smithson, Alison Margareth Gill, and Peter Smithson. Team 10 Primer: With Additional Reprints from Various Issues of Architectural Design. S.l.: S.n, 1966. 18. Print.

In order to translate these experiential and spatial concepts into the design of infrastructure, a multi-disciplinary approach to its implementation is required. Kai-Uwe Bergmann of BIG states, *"Architecture and architects can deal with infrastructure projects that have historically been the domain of engineers. If we work together, we can bring a certain level of urbanism, excitement, aesthetics . . . ".* [44] Engineers provide the necessary functional knowledge to detail and operate

44 : Lau, Wanda. "Q+A: BIG and One Architecture on Making the Dryline a Reality." Architect Magazine. The Journal of the American Institute of Architects, 18 Nov. 2015. Web. 22 Nov. 2015.

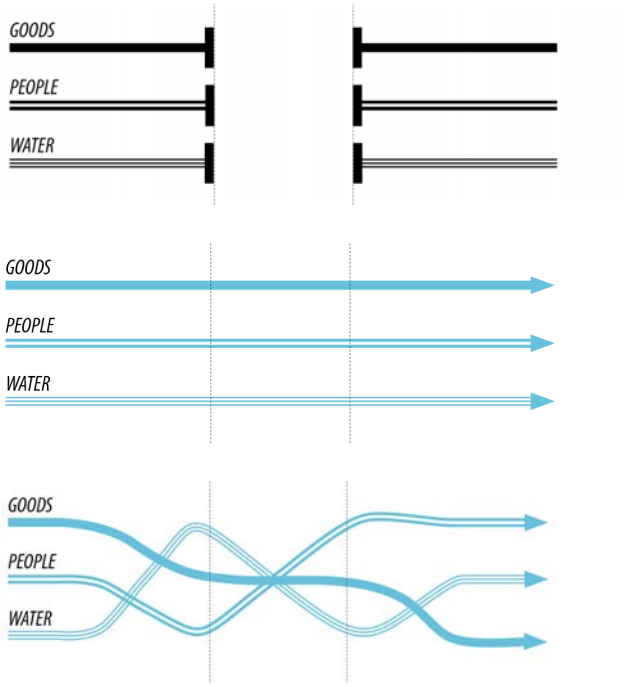


fig. 13

Concept Diagrams depicting the current disconnection of goods, people, and water (top). The middle diagram shows their simple reconnection, while the bottom diagram proposes weaving them into a unified connection.

48 : As a member of Team 10, Aldo Van Eyck shared similar theoretical beliefs to Peter and Alison Smithson. He rejected the Functionalist City where the varying elements of urban life (work, home, street) were all seperate. Instead he advocated for the Structuralist City, where the city is based on the interrelations between human, mechanical, and natural processes. This theoretical framework is still relevant today in our digital age when connections are becoming increasingly virtual.

fig. 13 : Original Diagrams by author

these, often, complex kinetic systems. However, the potential for architects to discover the overlaps between the human, mechanical, and natural conditions of the city may allow infrastructure to simultaneously address other critical urban issues.

"What is required is a new mindset that might see the design of infrastructure not as simply performing to minimum engineering standards, but as capable of triggering complex and unpredictable urban effects in excess of its designed capacity" [45]

Returning to Stan Allen's fundamental definition of infrastructure, it is apparent that the Industrial Canal is insufficiently forming connections betwen its disparate sides. Nevertheless, the existing seperation of *"goods, people, energy and information"* [46] must go beyond simple reconnection (fig. 13). Mapping the respective speeds, or grains, of the human, mechanical, and natural flows of the Industrial Canal will reveal the problem with their "*size, shape, arrangement, and proportions*". [47] Discovering a point of intervention for the strategic weaving of these threads in the urban fabric may lead to a textured, unifying connection.

45 : Allen, Stan. "Landscape Infrastructures." Infrastructure as Architecture: Design Composite Networks. By Katrina Stoll and Scott Lloyd. Berlin: Jovis Berlin, 2010. 38. Print.

46 : Allen, Stan. "Landscape Infrastructures." Infrastructure as Architecture: Design Composite Networks. By Katrina Stoll and Scott Lloyd. Berlin: Jovis Berlin, 2010. 39. Print.

47 : "Texture" Merriam-Webster, An Encylopaedia Britannica Company, 1995. Web. 20 Nov. 2015.

Implementing an Urban Texture

"These systems are to be so configurated that one evolved out of the other. A single homogenous configuration composed of many sub-systems, each covering the same overall area and equally valid, but each with a different grain, scale of movement and association-potential." [48]

This exemplary situation, described by Aldo Van Eyck, depicts a unitary whole in which the structuring systems are different but interdependent. The complexity and unity of the whole is

48 : Van Eyck, Aldo. "Urban Infra-structure." Team 10 Primer: With Additional Reprints from Various Issues of Architectural Design. By Alison Margareth Gill Smithson and Peter Smithson. S.l.: S.n, 1966. 17. Print.

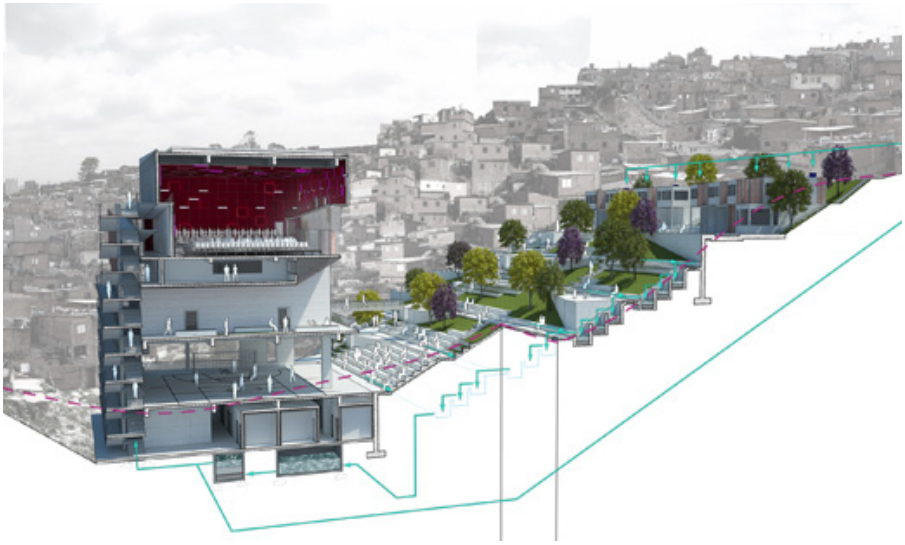


fig. 14

Sectional Perspective Rendering of the Grotao Community Center. The terraced park functions as recreation and water management. Water is filtered through the park and used throughout the building. The programp is a sports court and dance school catered towards the community.

49 : The Grotao Community Center exemplifies the necessary involvement of architects in the development of infrastructure. This new synthetic infrastructure is using the redevelopment of decaying industry as a vehicle for solving additional urban issues. With large amounts of government funding going to infrastructure, architects will need to keep chasing these projects.

fig. 14 : "Grotao Public Square." Urban-think Tank. N.p., 2014. Web. 17 Sept. 2015.

revealed in the weaving of the varying grains of the sub-systems. The Grotao Community Center by urban-think tank translates this situation architecturally, and exemplifies the fundamentals of a textured infrastructure.

This multi-functional proposal occupies a void in the heart of the Paraisopolis favela, on the periphery of Sao Paulo. The favela is interestingly located immediately adjacent to Sao Paulo's most affluent suburb, Morumbi. As a result, there is a strict division between social classes. urban-think tank identified the missing human, mechanical, and natural urban connections as: segregated communities, lack of recreation facilities, and dangerous flooding and land erosion. The Grotao Community Center fills the void in the favela through a music school and sports field tailored to the disparate community. In addition, the project is grounded in environmentally resiliant infrastructure that mitigates erosion and captures water for use on site (fig. 14).[49]

49 : "Grotao Public Square." Urban-think Tank. N.p., 2014. Web. 17 Sept. 2015.

Once completed, this project will serve as a model for the development of infrastructure by architects. By, not only, restoring the connections of *"goods, people, energy and information"*,[50] but weaving their similar functionalities, the Grotao Community Center exists as a cohesive intervention unifying the human, mechanical, and natural.

50 : Allen, Stan. "Landscape Infrastructures." Infrastructure as Architecture: Design Composite Networks. By Katrina Stoll and Scott Lloyd. Berlin: Jovis Berlin, 2010. 39. Print.

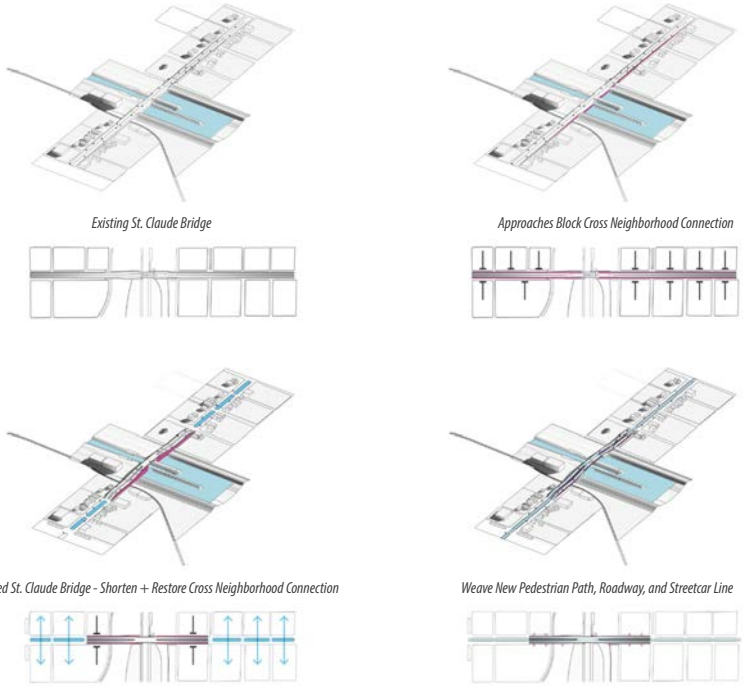


fig. 15

Axonometric Process Diagrams

53 : Karen Parsons is the Principal Planner at the New Orleans Regional Planning Commission (NORPC). A Feasibility Study began in December 2015 analyzing affordable solutions for enhancing the saftey of pedestrians and bikers on the St. Claude Bridge. This proposal for the replacement of the bridge shared similar ideas and desires. Through several interviews, Karen provided informative knowledge regarding past initiatives and future plans for the site.

fig. 15 : Original Diagrams by author

Conclusion

"The ideological structures that help rationalize the extreme control of nature are kin to the ideological structures that support the culturally rich, technologically facilitated, and socially layered city of New Orleans itself." [51]

The proposed textured infrastructure identifies a point of intervention on the Industrial Canal where there is a gap in the connection of *"goods, people, energy and information"*. [52] The cultural and economic inequality of the Bywater and Lower Ninth Ward exists as a product of various problems, including deficient bridges, blighted industry, and impending levees.

The 96 year-old St. Claude Bridge is the only physical connection across the canal that supports pedestrian and bicycle access. Mechanical problems frequently delay boat and vehicular traffic. The existing pedestrian path is not ADA accessible and reduces to 4ft wide over the canal. These unsafe conditions do not promote connectivity between the disparate sides. In addition, the approaches to the bridge stretch a quarter-mile on either side and exist as a wall through the cross grain of the neighborhood.

The New Orleans Regional Planning Comission (NORPC), along with the City of New Orleans, the Port of New Orleans and the Louisiana Department of Transportation have a 30 year plan to replace the St. Claude Bridge and enlargen the Industrial Lock to reestablish Port facilities on the Industrial Canal [53]. This thesis imagines the future replacement of the St.Claude bridge by weaving the disconnected threads between the Bywater and Lower Ninth Ward. This new bridge will restore connectivity across the canal through a safe pedestrian and bicycle path and street car line. In addition, the previously inaccessible approaches to the bridge will be reimagined as programmed community spaces. The bridge weaves structure, road, and path in direct response to access and safety in order to create place within a previously monofunctional infrastructure. (fig. 15).

51 : Murphy, Amy. "New Orleans, Nature, and the Apocolyptic Trope." New Orleans under Reconstruction: The Crisis of Planning. By Carol McMichael. Reese, Michael Sorkin, and Anthony Fontenot. London: Verso, 2014. 82. Print.

52 : Allen, Stan. "Landscape Infrastructures." Infrastructure as Architecture: Design Composite Networks. By Katrina Stoll and Scott Lloyd. Berlin: Jovis Berlin, 2010. 39. Print.

53 : Parsons, Karen. "St. Claude Bridge Feasibility Study." Personal interview. 14 Mar. 2016.

ANNOTATED: bibliography

01 : Mayne, Thom. Combinatory Urbanism: A Realignment of Complex Behavior and Collective Form. N.p.: Stray Dog Cafe, 2011. Print.

Publication outlining Thom Mayne's theories on collective form. Contains a collection of essays and projects studying the need for our contemporary cities to react to the constant flux of information and people.

02. Havik, Klaske. Urban Literacy: Reading and Writing Architecture. N.p.: Nai010, 2015. Print.

Klaske Havik is an architecture professor at TU Delft. Urban Literacy is her PhD dissertation studying the status of architecture and it's lack of emphasis on the human experience. She proposes a return to literary concepts in order to reimagine an experiential architecture. In addition, she emphasizes the ability to 'read' the city and appropriately react to context.

03. Reese, Carol, Micheal Sorkin, Anthony Fontenot, and Mike Davis. New Orleans Under Reconstruction: The Crisis of Planning. N.p.: Verso, 2015. Print.

This retrospective book by Carol Reese evaluates the planning situation of New Orleans following Hurrican Katrina. The book contains an accumulated collection of attempted and proposed urban plans, competition entries, and housing strategies. In addition, essays by various important local and national figures depict personal experiences during the pre-Katrina era, the immediate months after the storm, and contemporary New Orleans.

04. Woods, Lebbeus. Radical Reconstruction. N.p.: Princeton Architectural, 1997. Print.

Collection of essays and projects studying urban edges and peripheries. Lebbeus Woods takes an interesting stance on the occupation of an edge. He proposes containing the edge as opposed to dissolving it. His elegant essays and drawings depict an interesting theoretical framework on the architecture of disaster.

05. New Orleans Riverfront: Reinventing the Crescent. Rep. Development Plan, 2008. Web. <http://www.reinventingthecrescent.org/files/documents/Book_Full_001.pdf>.

Official phased plan, released in 2008, of the redevelopment of the New Orleans riverfront. Spanning from Mardi Gras World to Holy Cross, the proposal couples new water management strategies with recreational green space. Created in partnership with the city of New Orleans and various architecture firms (including Eskew Dumez Ripple, Michael Maltzan, David Adjaye, and Waggonner & Ball).

06. Meier, Richard Louis. Planning for an Urban World: The Design of Resource-conserving Cities. Cambridge, Mass.: M.I.T., 1974. Print.

An early text by Richard Meier following his first visits to China and Japan. He was searching for concepts to reimagine resource conservation in our cities. Through the use of theoretical situations and essays he creates a dialogue that is still relevant today.

07. Stoll, Katrina, and Scott Lloyd. Infrastructure as Architecture Designing Composite Net works. Berlin: Jovis, 2010. Print.

This book contains a series of interviews with leading architects and urban planners in the field of synthetic infrastructure. These architects are always addressing the role of designers in the redevelopment of infrastructure. Through exemplary essays and projects,this book shows the progress of infrastructural development today.

08. Campanella, Richard. Bienville's Dilemma: A Historical Geography of New Orleans. Lafay ette: Center for Louisiana Studies, U of Louisiana at Lafayette, 2008. Print.

Richard Campanella is a geographer at Tulane University. He has built up an unprecedented base of knowledge about New Orleans that serves as an important reference. Beyond the natural geography of the region, this book deconstructs and analyzes the historical, cultural, and social structures of the city.

09. Smithson, Alison Margareth Gill, and Peter Smithson. "Urban Infra-structure." Team 10 Primer: With Additional Reprints from Various Issues of Architectural Design. S.l.: S.n, 1966. Print.

Peter and Alison Smithson were architects and urbanists based out of London in the mid 1900's. Practicing during the rise of automobiles, they were interested in the different speeds of mobility now apparent in the modern city. This Primer outlines their theoretical framework through various diagrams and urban plans.

01 : GROTAO COMMUNITY CENTER

urban-think tank
Sao Paolo, Brazil 2009-2014
SEHAB : City of Sao Paolo Housing Authority

Overlays & Diagrams by author
Underlay images from:

01 : "Grotao Public Square." Urban-think Tank. N.p., 2014. Web. 17 Sept. 2015.

02 : Falcao, Jacqueline. Moradores Do Morumbi Querem Unidade Pacificadora Na Favela De Paraisópolis. 2011. Sao Paulo.

03 : Google Earth Screenshot

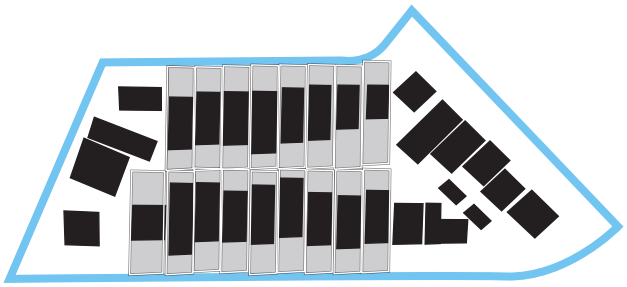
04 : "Grotao Public Square." Urban-think Tank. N.p., 2014. Web. 17 Sept. 2015.

This multi-functional proposal from urban-think tank is located in the heart of the Paraisopolis favela on the periphery of Sao Paulo. The favela is interestingly located immediately adjacent to Sao Paulo's most affluent suburb, Morumbi. As pictured below, there is a strict division between social classes enforced by a literal wall. The proposal acnowledges the lack of social infrastructure present in Paraisopolis as opposed to Morumbi and seeks to provide a productive community center for the favela.

Morumbi , Sao Paulo, Brazil
Wealthiest surburb of Sao Paulo
Population : 32,281

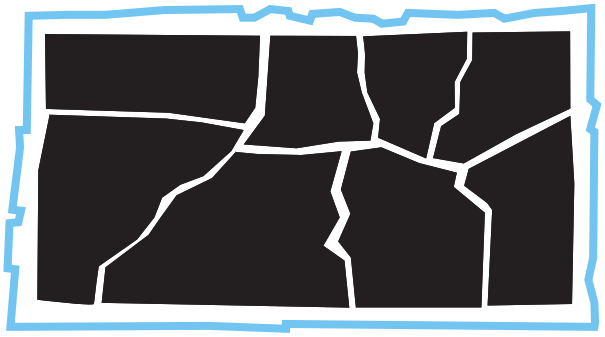
Paraisopolis , Sao Paulo, Brazil
Favela of Sao Paulo
Population : 100,000

02



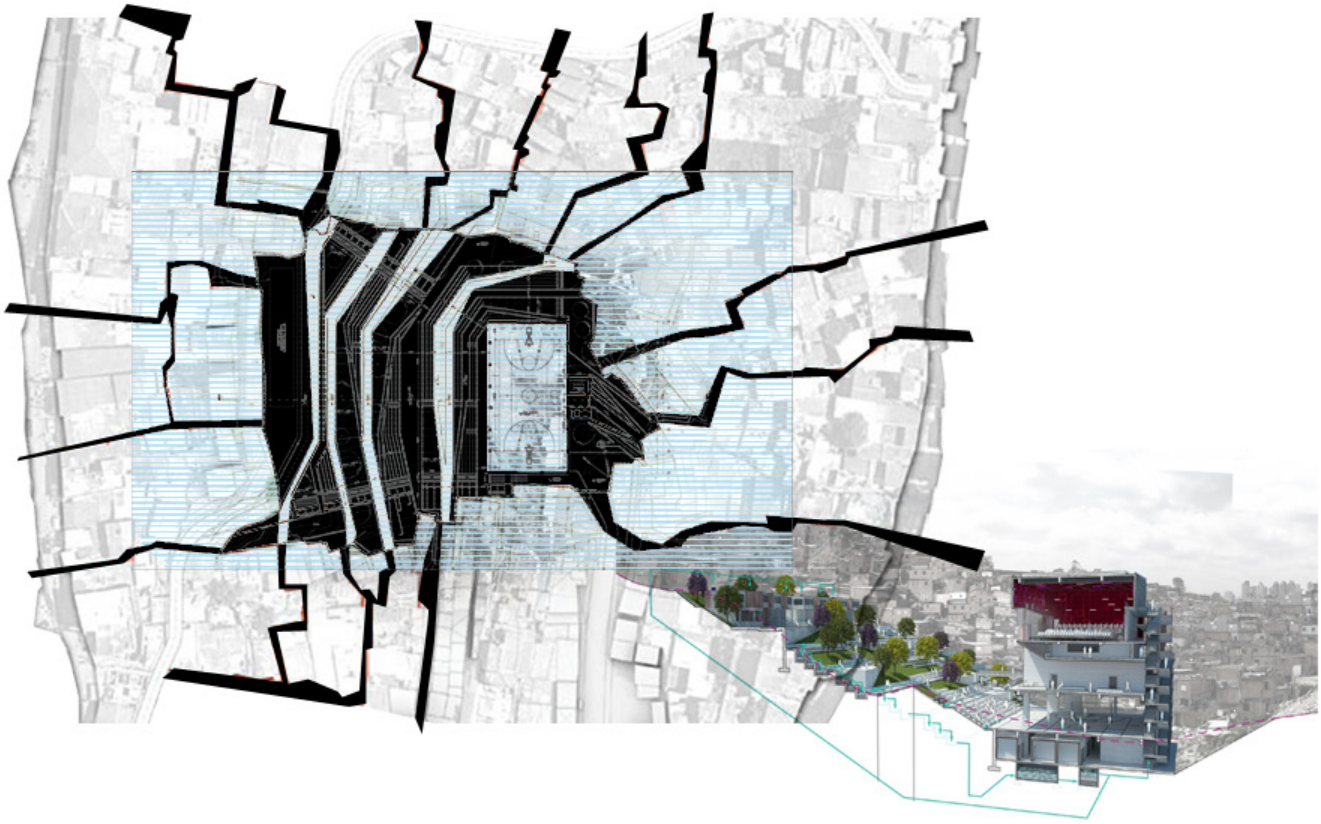
03

Typical Morumbi Block
Single Family Homes on own plot of land
Garage in frontyard & Pool in backyard



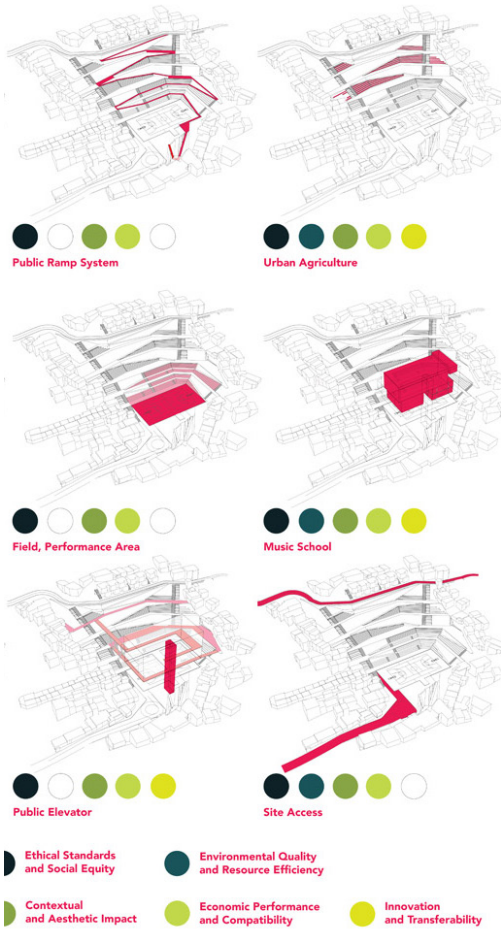
03

Typical Paraisopolis Block
Aggragated Housing Blocks
Informal Streets formed form fabric



04

Diagrammatic Site Plan showing connectivity of the proposal through the irregular grid of the Paraisopolis favela. The sectional perspective shows the sustainable water capturing system.



04

Multiplicity of Use Diagrams

04

Aerial Rendering of the Community Center

02 : TAICHUNG GATEWAY PARK

Stan Allen Architects
Taichung, Taiwan 2007-2009
Master Plan

Overlays & Diagrams by author
Underlay images from:

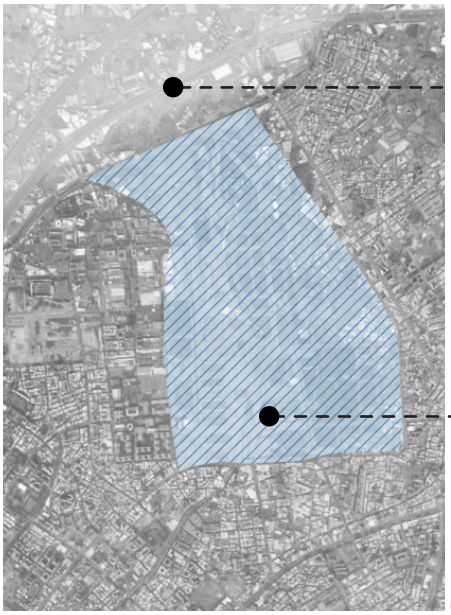
05 : Google Maps. Web. 17 Sept. 2015.

06 : Google Street View. Web. 17 Sept. 2015.

07 : "Taichung Gateway Park." Stan Allen Architects. N.p., 2009. Web. 17 Sept. 2015.

08 : Stoll, Katrina, Scott Lloyd, and Stan Allen. "Landscape Infrastructures." Infrastructure as Architecture: Designing Composite Networks. Berlin: Jovis, 2010. 44. Print.

The vacany of an abandoned airport in Taichung, Taiwan left a void in the city and organically transformed into a congested ghetto. Stan Allen writes about architects and their role in designing infrastructure as the future to urban growth. Transforming this decayed infrastructure into a new synthesis with public program, the redevelopment of this void will reconnect two parts of the city. This proposal pulls the urban fabric through the new park and establishes a transit hub, civic center, sports arena and a parc that is able to develop over time as people inhabit the project.



Daya District, Taichung, Taiwan
Mainly Agricultural
Only place in Taiwan to grow wheat

Xitun District, Taichung, Taiwan
Most populated district
Shopping center of Taichung

05

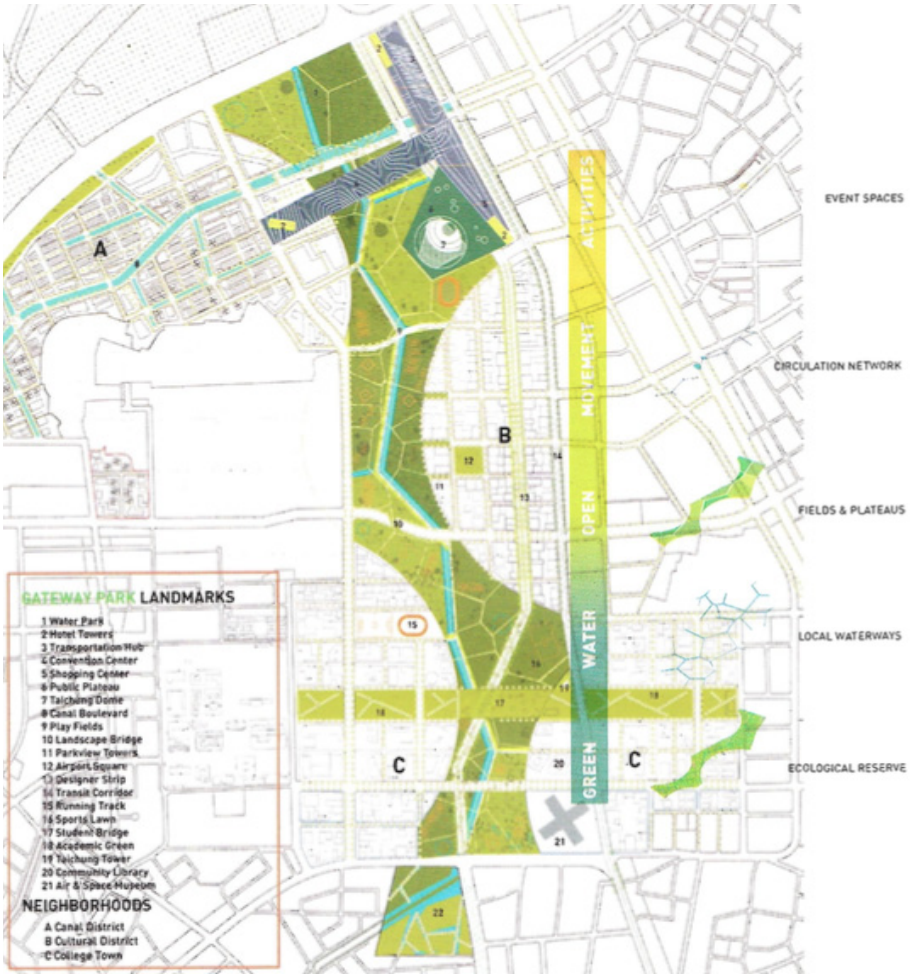
06

07

Multiplicity of Use Diagrams

07

Aerial Rendering of the Park


EVENT SPACES
CIRCULATION NETWORK
FIELDS & PLATEAUS
LOCAL WATERWAYS
ECOLOGICAL RESERVE
ACTIVITIES
MOVEMENT
OPEN
WATER
GREEN
A
B
C
C
GATEWAY PARK LANDMARKS
1 Water Park
2 Hotel Towers
3 Transportation Hub
4 Convention Center
5 Shopping Center
6 Public Plateau
7 Taichung Dome
8 Canal Boulevard
9 Play Fields
10 Landscape Bridge
11 Parkview Towers
12 Airport Square
13 Designer Strip
14 Transit Corridor
15 Running Track
16 Sports Lawn
17 Student Bridge
18 Academic Green
19 Taichung Tower
20 Community Library
21 Air & Space Museum
NEIGHBORHOODS
A Canal District
B Cultural District
C College Town

08

Site Plan

Agricultural Influence

Commercial Influence

University Influence

Irrigation System Influence

08

Diagrammatic Site Plan showing Contextual Influences

03 : ON THE MALECON

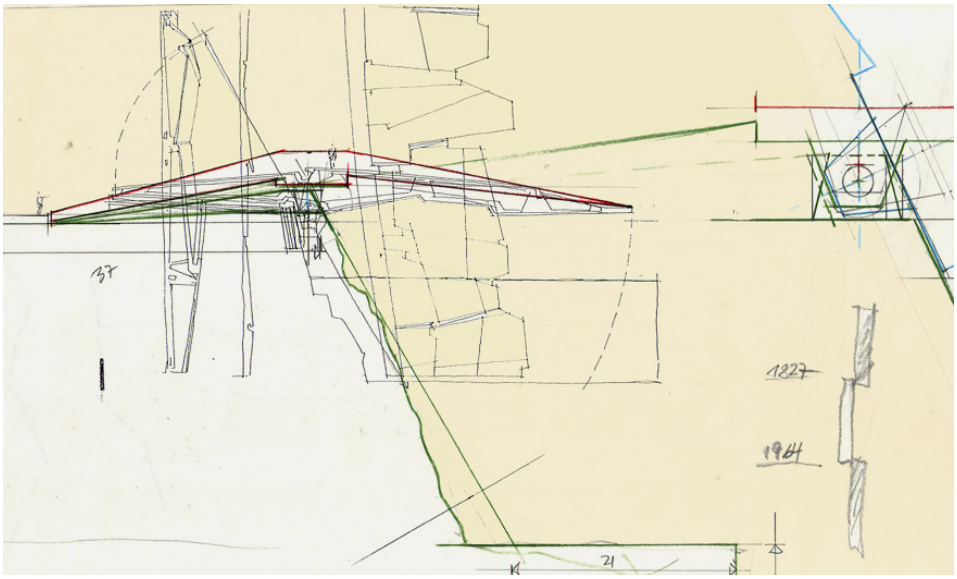
Lebbeus Woods
Havana, Cuba 1994
Speculation/Theoretical Charette

A theoretical proposal as part of Lebbeus Wood's Radical Reconstruction project series. This 6 mile coastline amelioration is a radical proposal calling for the public occupation of the edge of the Havana waterfront, while also making the platform a protection against hurricanes. Through the natural force of water force, the platform would rotate on its hinges and form a wall, protecting Havana from storm surges. The investigation is done through models and drawings of various scales.

Images from:

09 : Woods, Lebbeus. Radical Reconstruction. N.p.: Princeton Architectural, 1997. Print.

10 : Google Images



Detailed Section of Boarwalk Hinge *09*

Existing Malecon Boardwalk *10*

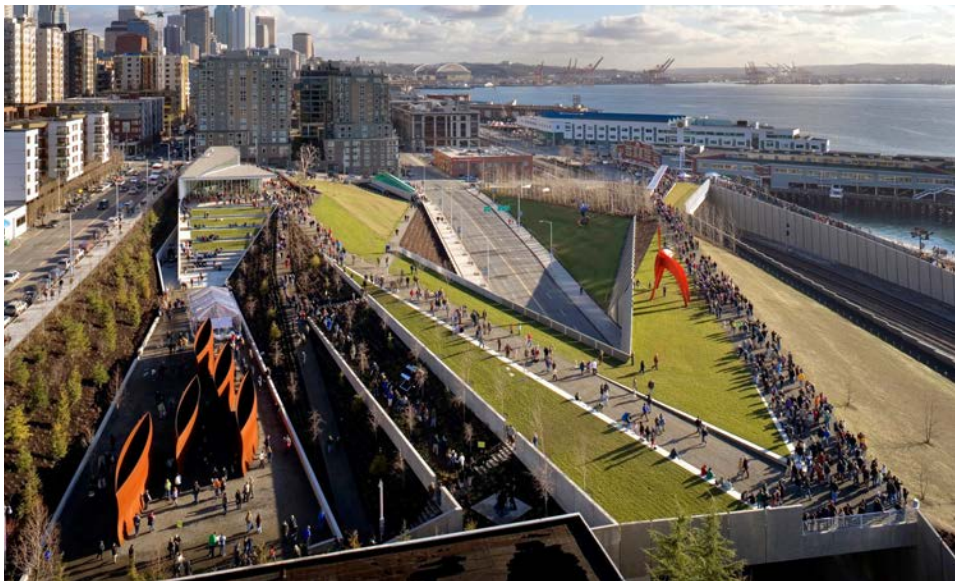
04 : OLYMPIC SCULPTURE PARK

Weiss / Manfredi
Seattle, Washington 2007
Winner of International Design Competition

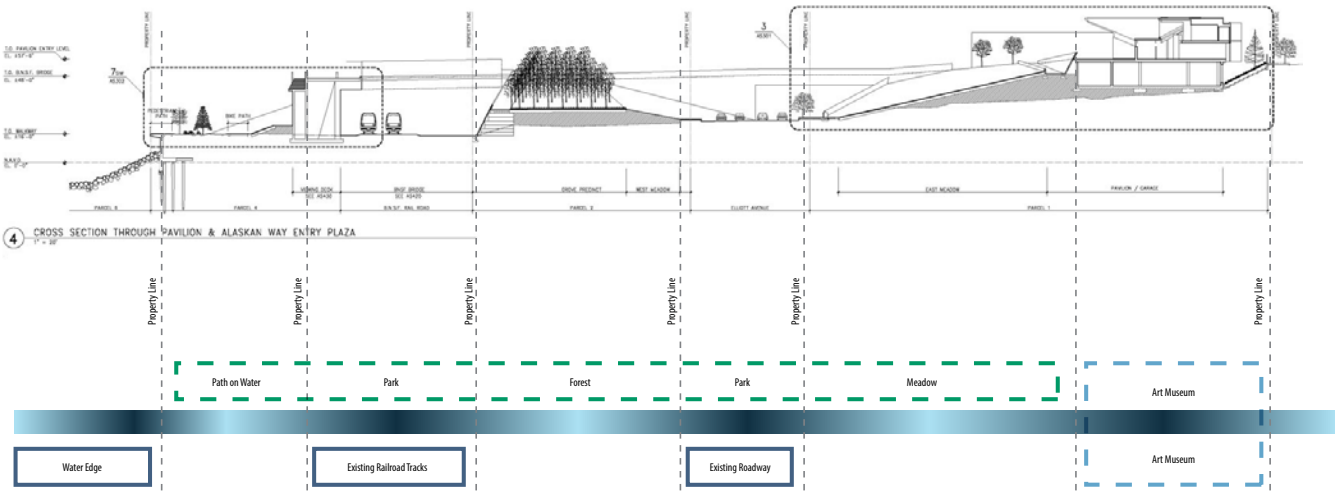
Winning competition entry that places the Seatte Art Museum and its adjacent garden on a decaying industrial site on Seattle's waterfront. The project synthesizes four contextual infrastructures with the museum: an existing roadway, existing train tracks, a public park, and water. The resulting intervention is an incredible new amenity for the city that transformed an inaccessible industrial lot to a connection from city to waterfront.

Overlays & Diagrams by author
Underlay images from:

11 : "Olympic Sculpture Park." Weiss/Manfredi. N.p., 2014. Web. 17 Sept. 2015.



Aerial Photo 11



11

05 : SIXTH STREET VIADUCT

Michael Maltzan Architects
Los Angeles, California 2014-2019
City of Los Angeles Competition Winner

The original Sixth Street Viaduct was completed in 1932,but as a result of deteriorating concrete must be demolished. Micheal Maltzan won the international competition to replace the bridge with a proposal prioritizing use by pedestrians. New bike lanes and pedestrian stairways are inserted along the ten rising concrete arches. The underside of the bridge is programmed with extensive park and recreation space.

Images from:

12 : "Los Angeles Sixth Street Viaduct by Michael Maltzan." Designboom Architecture Design Magazine. N.p., 01 Feb. 2016. Web. 06 May 2016.

Rendering of Recreational Space under Bridge 12

Aerial Rendering 12

06 : SOLFERINO FOOTBRIDGE

Marc Mimram Architects & Engineers
Paris, France 1992-1999
City of Paris

This bridge was completed in 1999 as a 106 meter span footbridge crossing the Seine in the 1st arrondisement of Paris. The innovative use of prefabricated bent steel members made the form and construction of the bridge beautiful and efficient. The form was conceived to provide a new connection between the lower Quays up to the street level adjacent to the Tuileries.

Images from :

13 : "Solferino Footbridge." Marc Mimram Architects & Engineers. N.p., n.d. Web. 25 Mar. 2016.

14 : Fromonot, Francoise. Marc Mimram--Minimal Design : Solferino Bridge in Paris. N.p.: Birkhauser, 2001. Print.

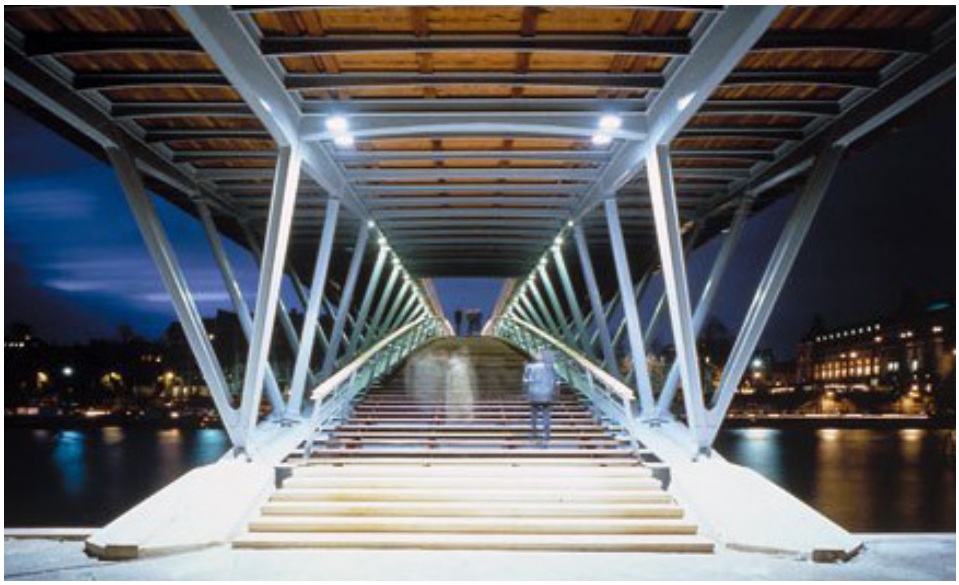


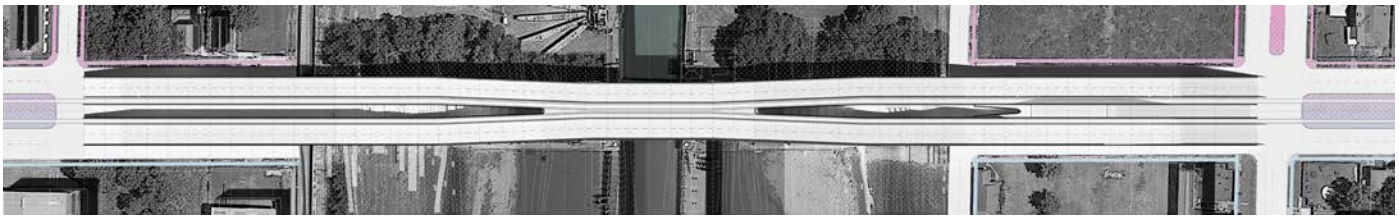
Photo of Pedestrian Connection on the Quays 13

Photo Showing Extents of Bridge 14

SUPERNINE Program Distribution

Grocery Store		Market	
Fresh Produce / Meats	2,000 sq ft	Stalls (x4)	800 sq ft
Shelf Space	2,000 sq ft	Indoor Seating	600 sq ft
Deli / Bakery / Cheese	1,000 sq ft	Outdoor Seating	1,000 sq ft
Storage / Distribution	1,500 sq ft	Service Space	250 sq ft
	7,500 sq ft		2,500 sq ft

02 : A food desert is defined as, a low income neighborhood without a supermarket within a one mile radius. After Hurricane Katrina, New Orleans was one of the largest food deserts in the country. Residents instead shop at corner food markets equivalent to gas station marts, most of which dont carry fresh produce.



Program + Path *fig. 01* *fig. 01 : Original Diagram by Author*

PROGRAM

The proposed textured infrastructure is in accordance with the 30 year plan to replace the St. Claude Bridge and enlargen the Industrial Lock as outlined by the New Orleans Regional Planning Comission (NORPC), the City of New Orleans, the Port of New Orleans and the Louisiana Department of Transportation. This thesis imagines the future replacement of the St.Claude bridge by weaving the disconnected threads between the Bywater and Lower Ninth Ward.

The St. Claude Bridge is the only physical connection across the Industrial canal that supports pedestrian and bicycle access. The new bridge will prioritize safety for non-vehicular traffic in order to restore connectivity across the canal. In addition, the proposal will accomodate the extended length of the St. Claude streetcar line as outlined in the New Orleans 2030 Plan for the Future.

The bridge weaves structure, road, and path in direct response to access and safety. The foundation of the bridge is embedded in the levee and emerges to hold the pedestrian path. The box truss of the structure will dual as the confining enclosure of the pathway and support the roadway and streetcar line above. Road and path separate to different planes to heighten safety and provide the pedestrians a closer connection to water.

In addition, the approaches to the bridge stretch a quarter-mile on either side and exist as a wall through the cross grain of the neighborhood. The previously inaccessible approaches to the bridge will be reimagined as programmed community spaces. The greatest commonality between the disparate communities is their presence in a food desert. [02] With only two major supermarkets in a 5 miles radius around the site, residents of the Ninth Ward would benefit from a convenient location to buy fresh local produce at affordable prices.

01 : Allen, Stan. "Landscape Infrastructures." Infrastructure as Architecture: Design Composite Networks. By Katrina Stoll and Scott Lloyd. Berlin: Jovis Berlin, 2010. 39. Print.

02 : Harlan, Becky. "Making Groceries" in a New Orleans Food Desert." National Geographics. N.p., 28 Aug. 2015. Web. 15 Nov. 2015.

01 : WHOLE FOODS MARKET GOWANUS

Gotham Greens Grehouses
Gowanus, Brooklyn, New York City, New York 2014
Whole Foods Markets

Overlays & Diagrams by author
Underlay images from:

01 : "Whole Foods Market Gowanus." Yelp. N.p., n.d. Web. 27 Oct. 2015.

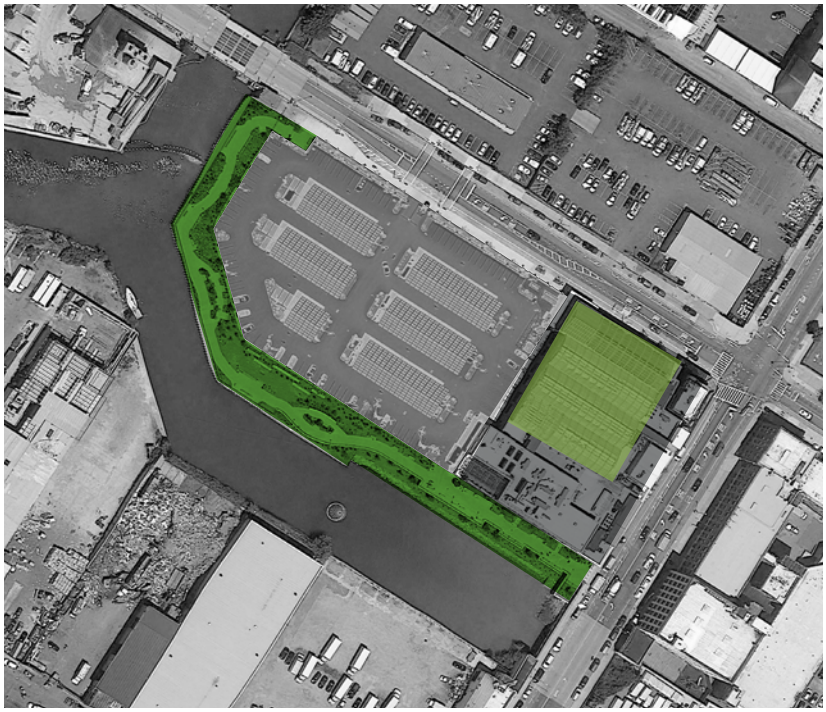
02 : Google Earth. Web. 27 Oct. 2015.

The first Whole Foods in Brooklyn was completed in 2014 and is part of a larger plan to redevelop the neighborhood adjacent to the Guwanus Canal. This unique Whole Foods has a 20,000 square foot greenhouse on the roof supplying all the fresh produce for this store and three other stores in NYC. Gotham Greens is an urban farming company specializing in hydroponic greenhouses on rooftops in New York. They install the greenhouses and manage the entire farming process. This is the first example of a farm being directly adjacent to its equivalent supermarket. The result is fresh produce being grown hyper-locally, reducing CO2 emmisions of trucks delivering produce everyday.

Exterior View *01*

Exterior View *01*

Interior View of Greenhouse *01*



02

Site Plan

Program Distribution

	Whole Foods Grocery Store	
	Main Public Space	25,000 sq ft
	Offices	7,000 sq ft
	Distribution/Storage	7,000 sq ft
		40,000 sq ft
	Hydroponic Greenhouse	
	Cultivation Space	18,500 sq ft
	Offices	500 sq ft
	Mechanical Space	1,000 sq ft
		20,000 sq ft
	Waterfront Park	30,000 sq ft
	Parking	87,500 sq ft

Gross Square Footage	177,500 sq ft

02 : MARKATHAL ROTTERDAM

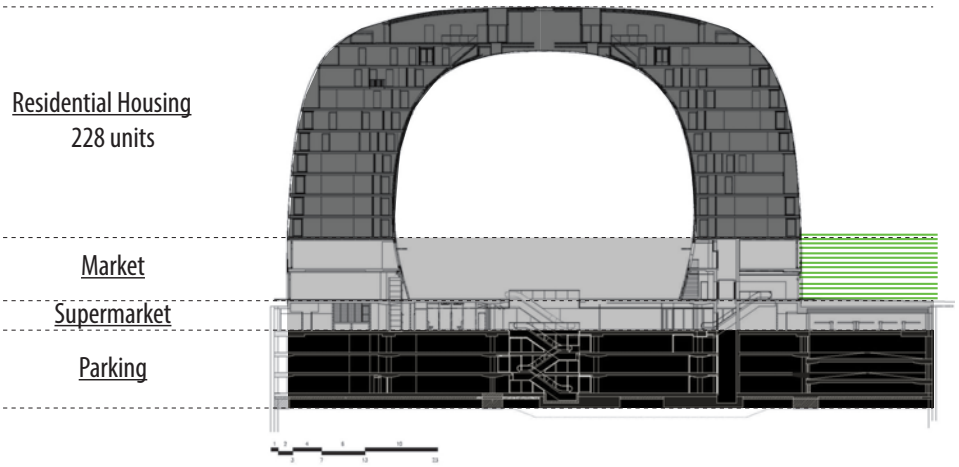
MVRDV
Rotterdam, The Netherlands 2014
City of Rotterdam Competition

Overlays & Diagrams by author
Underlay images from:

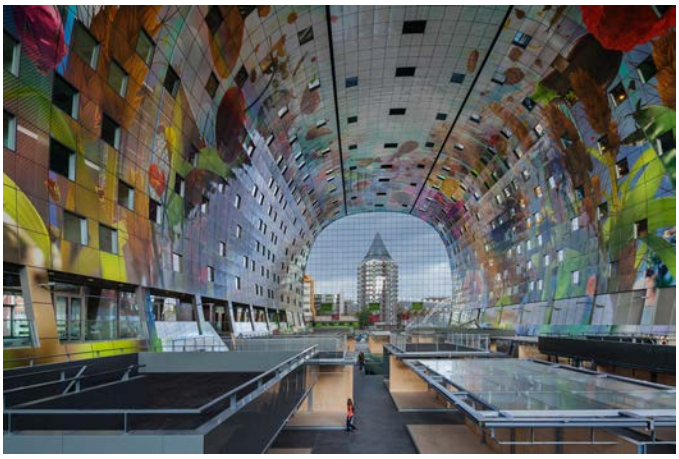
03. "Markthal Rotterdam : MVRDV." ArchDaily. N.p., n.d. Web. 25 Oct. 2015.

04. "Markathal Rotterdam." Domus Web. N.p., 17 Oct. 2014. Web. 25 Oct. 2015. Print.

The first covered marketplace in The Netherlands stands on a historical site adjacent to a public plaza and open air market. The market is enclosed and wrapped by 220 residences. There is a supermarket on the first underground level and a parking garage extending four levels below. Markethall is a new driving economical force within the city, with rentable commercial also available on the public level. The form and circulation is a critique on traditional covered marketplaces that are usually compressed and dark. MVRDV states, "Markthal with its daily fresh food market, shops and apartments, creates coherence and connections in the neighbourhood which will reach a new centrality."

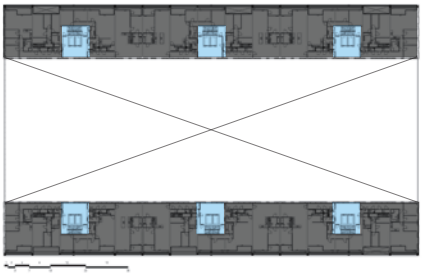


Sectional Program Diagram *03*

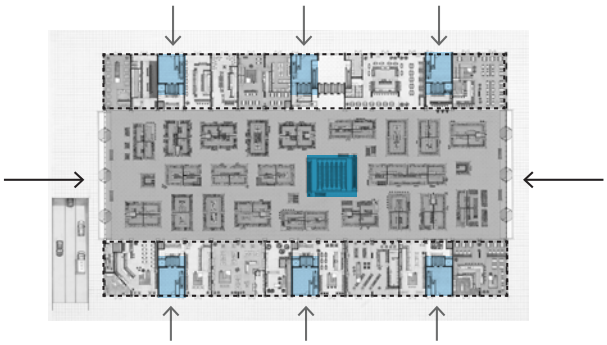


Interior View *03*

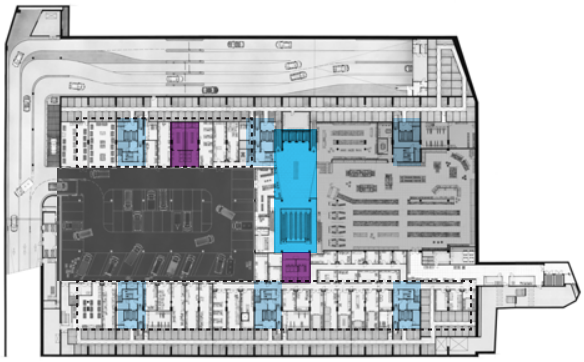
Exterior View *03*



Floor Plan +6 *03*



Floor Plan +1 *04*



Floor Plan -1 *04*

Program Distribution

Floor Plan +6

Residences (12 units)	22,000 sq ft
Secondary Circulation	800 sq ft
Total of Floor	30,000 sq ft

Floor Plan +1

Market	40,000 sq ft
Rentable Commercial	22,000 sq ft
Main Circulation Core	1,500 sq ft
Secondary Circulation	800 sq ft
Public Entry	
Residents Entry	
Total of Floor	75,000 sq ft

Floor Plan -1

Grocery Store	20,000 sq ft
Offices	15,000 sq ft
Restrooms	1,500 sq ft
Parking Lot (x50 spots)	15,000 sq ft
Main Circulation Core	4,000 sq ft
Secondary Circulation	800 sq ft
Total of Floor	75,000 sq ft

Gross Square Footage	750,000 sq ft

03 : TAIPEI FLOWER MARKET & TRADE CENTER

H.P Cheuh Architects & Planners
Taipei City, Taiwan 2012
Taipei City Government

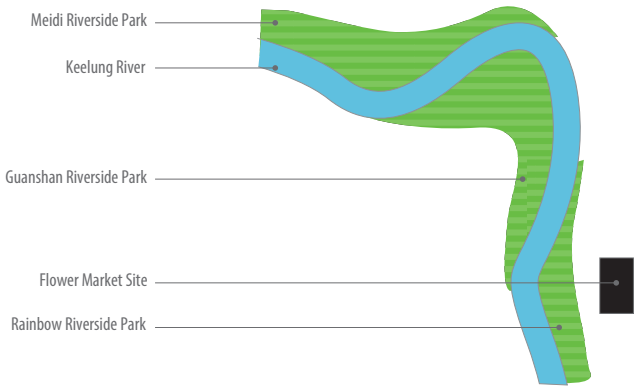
This new icon in the city of Rotterdam is an unprecedented public amenity for the city. The first covered marketplace in The Netherlands stands on a historical site adjacent to a public plaza and open air market. The market is enclosed and wrapped by 220 residences that all have views to both the outdoors and the market below. In addition, there is a supermarket on the first underground level and a parking garage extending four levels below. Markethall is a new driving economical force within the city, with rentable commercial also available on the public level. The form and circulation is a critique on traditional covered marketplaces that are usually compressed and dark.

Overlays & Diagrams by author
Underlay images from:

05. "Taipei Flower Wholesale Market, Taiwan International Flower Trade Center Large site for cut flowers market. / H.P. Chueh Architects & Planners" 10 Mar 2014. ArchDaily. Accessed 25 Oct 2015.

Keelung River, Taiwan City, Taiwan

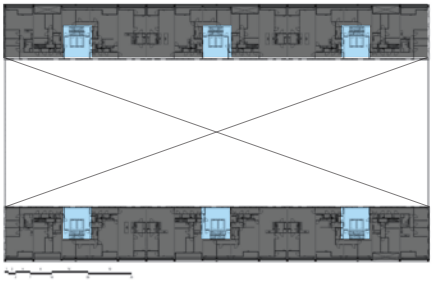
Similarly to New Orleans, Taiwan is located on a delta and is subject to flooding and heavy rain. However, Taiwan City has done a remarkable job at managing their waterfront property. Instead of a majority of land bordering the main Keelung River being industrial, there are parks flanking most of the river. In addition, the floodwalls are overgrown with moss and blend into the parks.

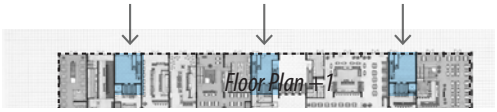


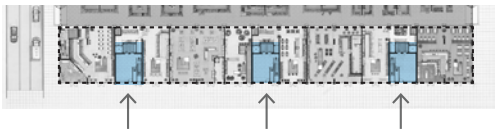
Site Diagram *05*

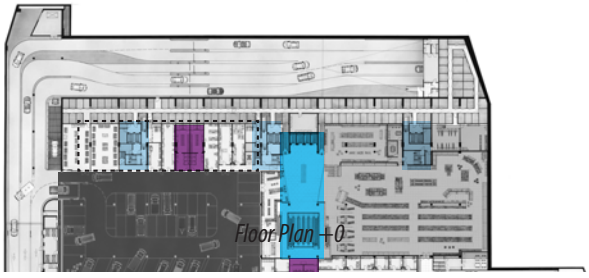
Exterior View *05*

Aerial Rendering *05*









Program Sizes

Floor Plan +1

Flower Market	22,000 sq ft
Plant Market	30,000 sq ft
Community Auditorium	15,000 sq ft
Parking	40,000 sq ft
Park	25,000 sq ft
Total of Floor	77,000 sq ft

Program Sizes

Floor Plan -1

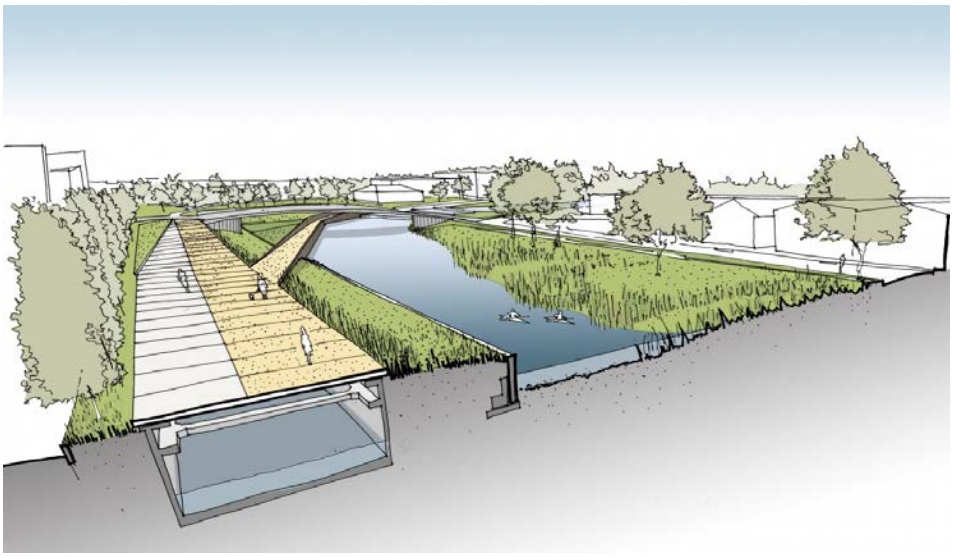
Flower Market	45,000 sq ft
Plant Market	30,000 sq ft
Distribution Area	30,000 sq ft
Loading Area	13,000 sq ft
Park	65,000 sq ft

Gross Square Footage	260,000 sq ft

04 : LAFITTE BLUEWAY

Waggonner & Ball
New Orleans, LA 2013
The Greater New Orleans Water Plan

This proposal integrates David Waggonner's theories into a comprehensive plan for the redevelopment of the London Avenue Canal. The existing condition consists of "hard" levee walls seperating the canal from adjacent residential neighborhoods. Rather than render the water inaccessible, they provided a public path along one side while eliminating the levee wall from the other side and implementing a "soft" infrastructure consisting of wetlands and recreational green space. By dissolving the levee wall and providing space for water to filter, you decrease the chance of a catastrophic breach as was seen during Katrina.



Aerial Rendering 06

Site Plan (Normal Condition) 07

Site Plan (Flooded Condition) 07

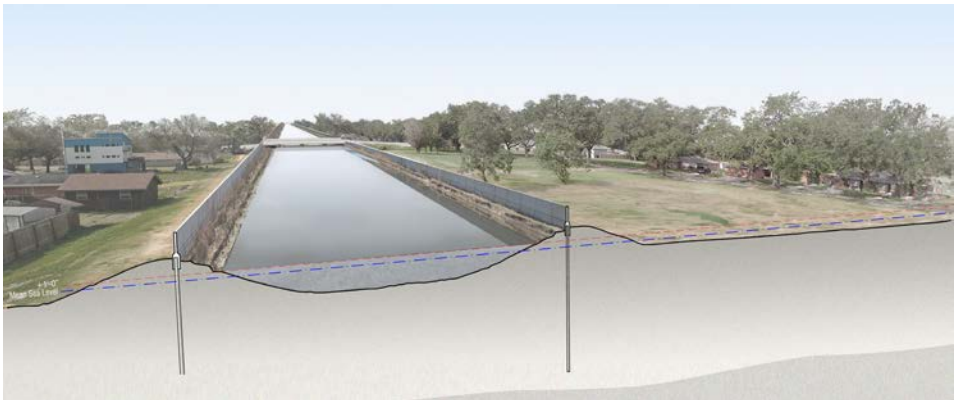
Images from:

06. "Greater New Orleans Urban Water Plan." Waggonner & Ball Architects. N.p., n.d. Web. 20 Oct. 2015.Print.

07. O'Neil, Lorena. "Why Doesn't New Orleans Look More Like Amsterdam?" The Atlantic. N.p., 2 Sept. 2015. Web. 23 Oct. 2015. Print. 5.

Existing Condition

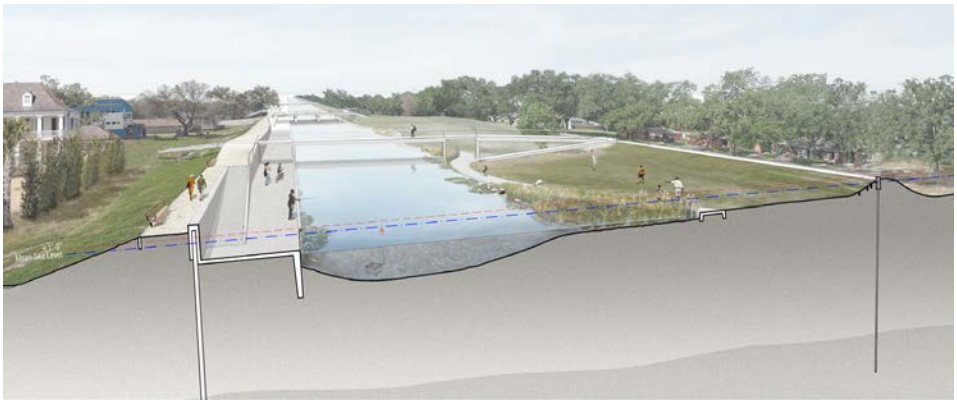
Characteristic of most canals in New Orleans. Water is blockaded by concrete levee walls. The neighborhoods occupy the space behind the walls. This results in no water access, and noability for water to infiltrate the ground.



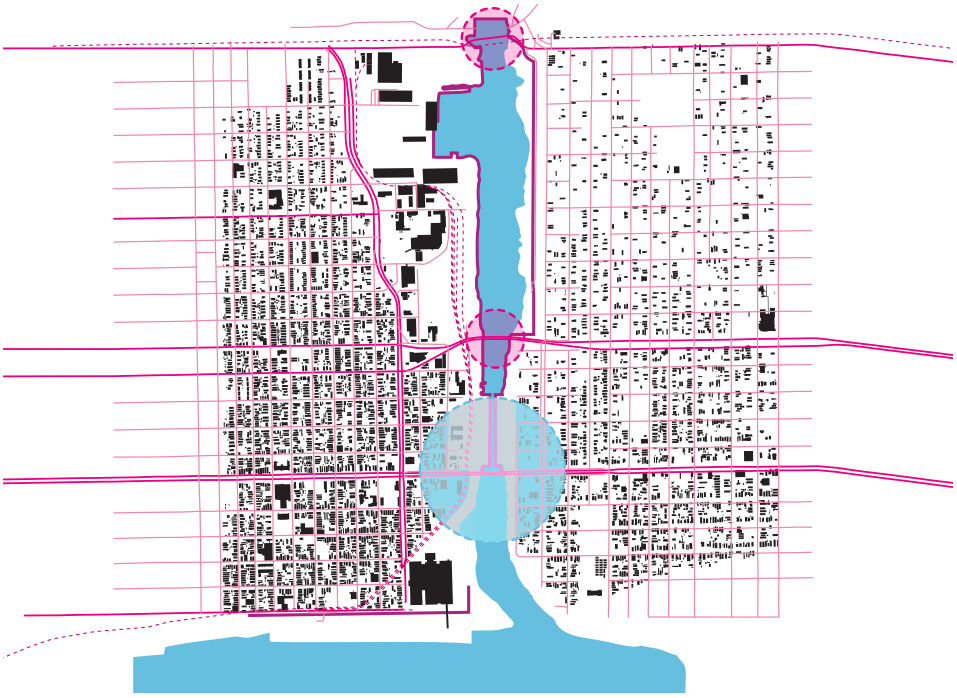
06

Proposed Condition

Levee wall is pushed back and dissolved by the newly created wetland, on one side, and accessible boardwalk, on the other. The deeper canal and wetland allows water to infilatrate the ground, reducing massive volumes of flood water. In addition, the water is now accessible to the public, creating a much needed amenity in New Orleans.



06



Existing Transportation Network

03 : The Lower Ninth Ward experienced the most damage during Hurricane Katrina. A major breach in the Industrial Canal levee caused standing water of up to 12 feet. Homes were swept away and most residents chose not to return following the storm. Only 37% of the pre-Katrina population has returned, leaving the neighborhood desolate and lacking proper infrastructure.

Diagram Key

Major Roadways
Minor Roadways
Railroads

Physical Connections

St. Claude Bridge

SITE: st. claude bridge

The proposed textured infrastructure identifies a point of intervention on the Industrial Canal where there is a gap in the connection of *"goods, people, energy and information".* [01] The cultural and economic inequality of the Bywater and Lower Ninth Ward exists as a product of various problems, including deficient bridges, blighted industry, and impending levees.

The 96 year-old St. Claude Bridge is the only physical connection across the canal that supports pedestrian and bicycle access. Mechanical problems frequently delay boat and vehicular traffic. The existing pedestrian path is not ADA accessible and reduces to 4ft wide over the canal. These unsafe conditions do not promote connectivity between the disparate sides. In addition, the approaches to the bridge stretch a quarter-mile on either side and exist as a wall through the cross grain of the neighborhood.

The Bywater, the neighborhood on the west side of the bridge, currently has a higher number of residing workers than before Katrina. It has seen its demographics flip and income rise 17% in the ten years following the storm. The majority of its new population being caucasian millenials.[02]

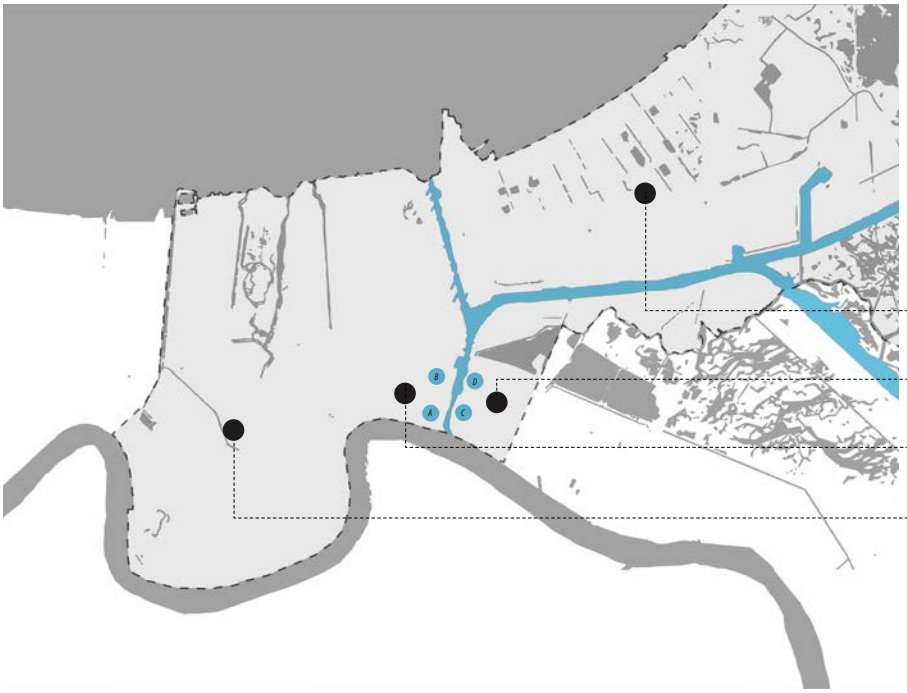
Meanwhile, just across the canal, the Lower Ninth Ward is the only neighborhood that hasn't recovered at least 50% of its population. It has only seen one-third of its numbers return and is composed of a 95.5% African American population. [03] Redevelopment of the Lower Ninth Ward is beginning, however. In 2014 there were 50% more addresses recieving mail than in 2010. In addition, 2015 has already welcomed 100 more property owners, making the Lower Ninth Ward one of the neighborhoods experiencing the most growth in New Orleans. [34] Hindering further redevelopment are the bridges spanning the Industrial Canal, most of which are outdated and unsafe.

01 : Allen, Stan. "Landscape Infrastructures." Infrastructure as Architecture: Design Composite Networks. By Katrina Stoll and Scott Lloyd. Berlin: Jovis Berlin, 2010. 39. Print.

02 : Adelson, Jeff. "After Hurricane Katrina, a Look at New Orleans' Uneven Recovery among Its Neighborhoods." The Advocate. N.p., 11 July 2015. Web. 12 Oct. 2015.

03 : The Data Center analysis of Local Employment Dynamics, U.S. Census Bureau.

DEFICIENT INFRASTRUCTURE



Map Highlighting Industrial Canal

Diagram Key

New Orleans East

Lower Ninth Ward

Bywater (Upper Ninth Ward)

Orleans Parish

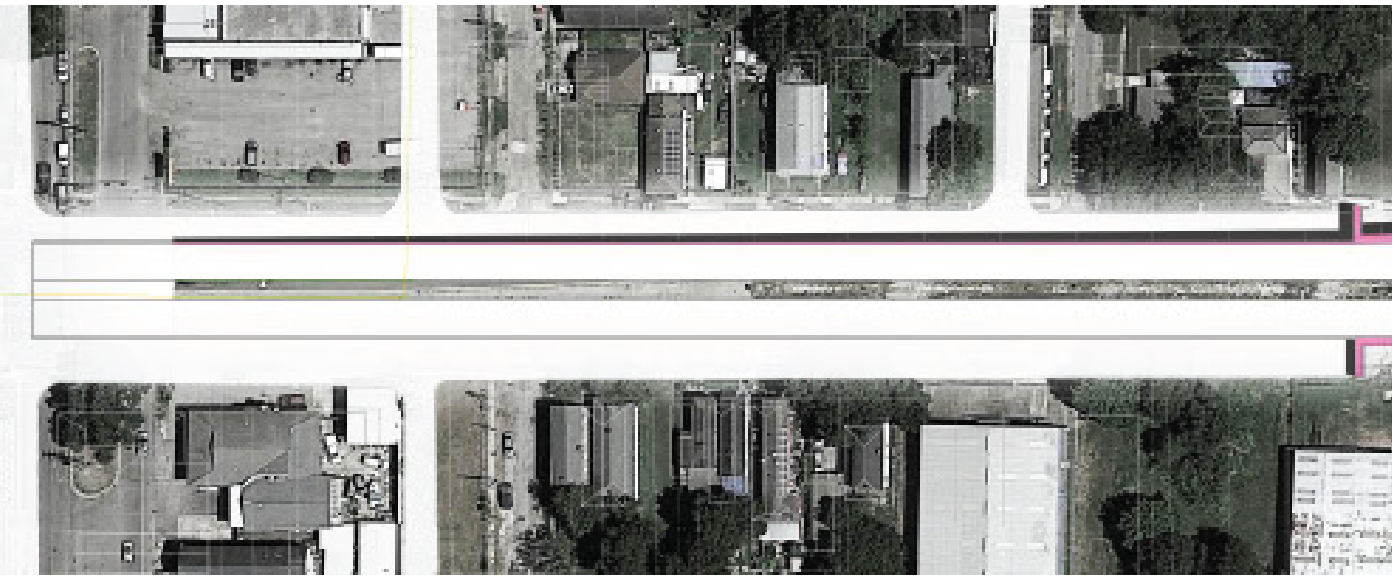
A *Aerial View looking towards Lake Pontchatrain*

B *Aerial View looking over Claiborne Bridge*

C *View of St. Claude Bridge on Pedestrian Walkway*

D *View from Lower Ninth Ward after Katrina*

EXISTING ACCESS



Site Plan : Bywater Approach

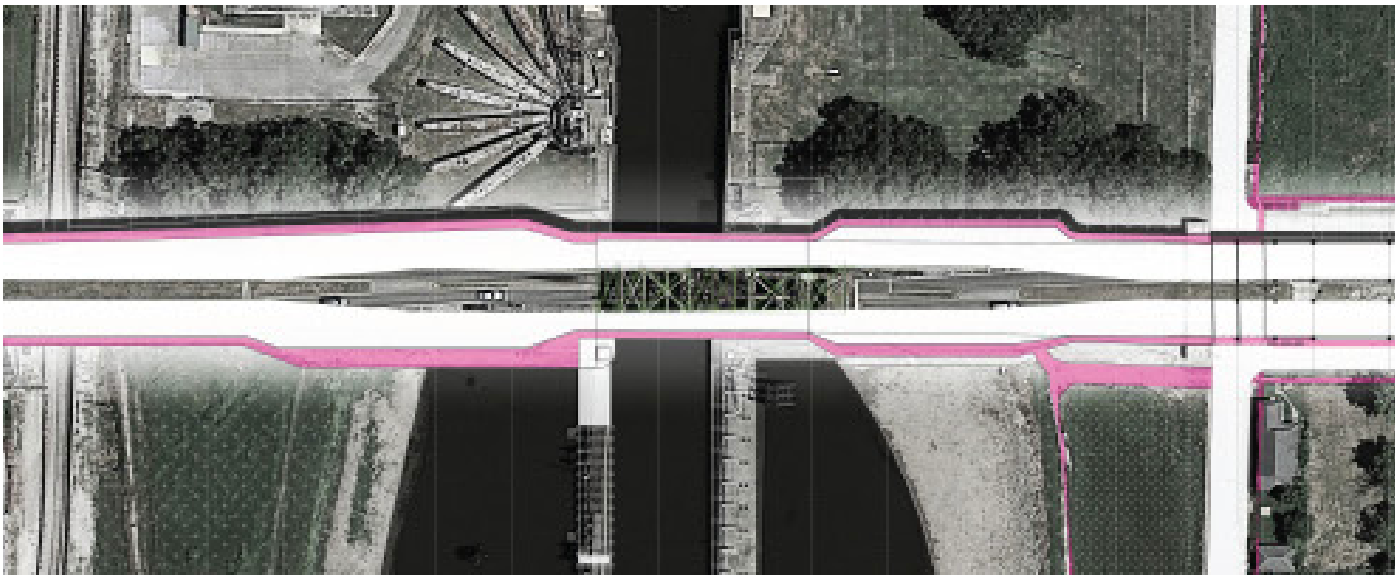
A Aerial View looking towards Lake Pontchatrain

B Aerial View looking over Claiborne Bridge

C View of St. Claude Bridge on Pedestrian Walkway

D View from Lower Ninth Ward after Katrina

EXISTING ACCESS



Site Plan : Over Industrial Canal

A Aerial View looking towards Lake Pontchatrain

B Aerial View looking over Claiborne Bridge

C View of St. Claude Bridge on Pedestrian Walkway

D View from Lower Ninth Ward after Katrina

EXISTING ACCESS

Site Plan : Lower Ninth Ward Approach

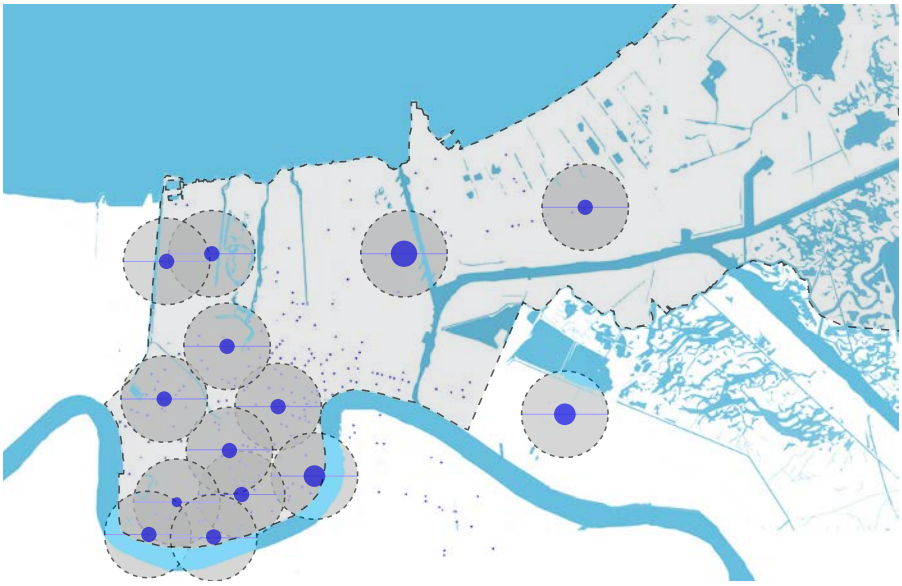
A Aerial View looking towards Lake Pontchatrain

B Aerial View looking over Claiborne Bridge

C View of St. Claude Bridge on Pedestrian Walkway

D View from Lower Ninth Ward after Katrina

CONNECTION OF GOODS



Network of Grocery Stores (2012)

Diagram Key

- Orleans Parish
- Supermarket
- Neighborhood Corner Store
- One Mile Radius of Supermarket

Diagram Key

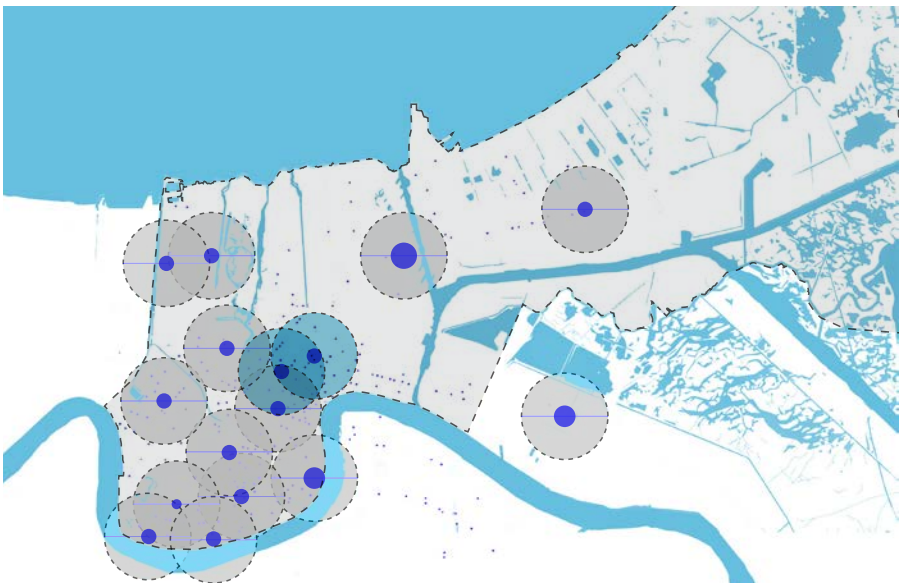
Orleans Parish

Supermarket

Neighborhood Corner Store

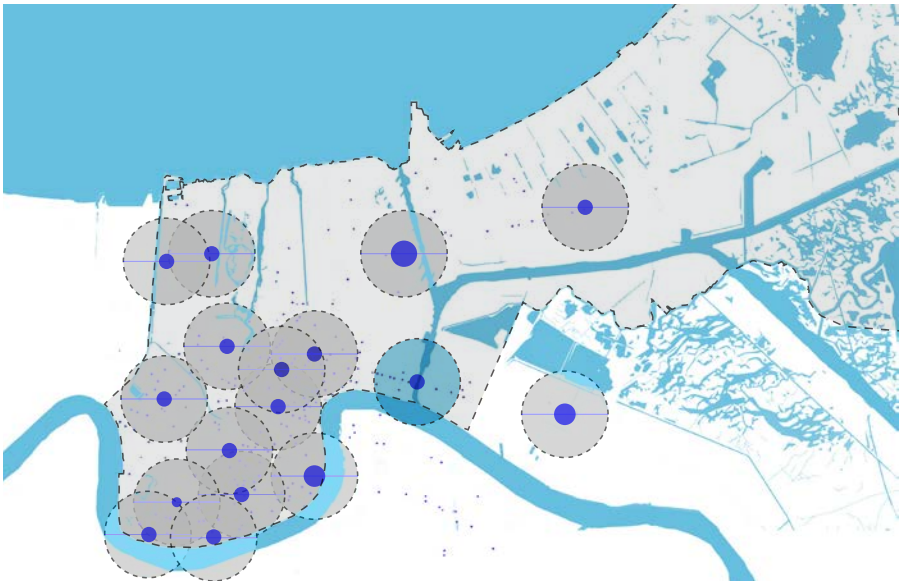
One Mile Radius of Supermarket

Recently Opened Supermarket



Network of Grocery Stores (2015)

CONNECTION OF GOODS



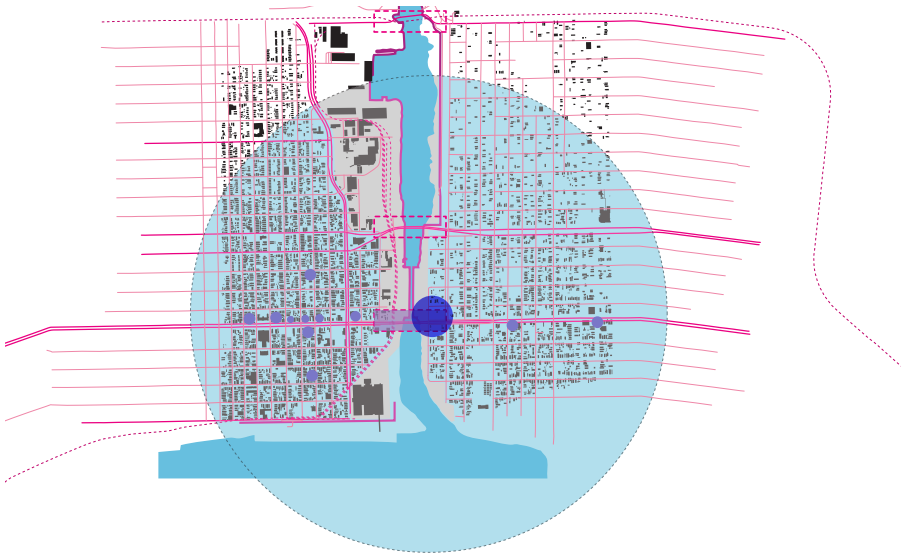
Network of Grocery Stores (Proposed)

Diagram Key

- Orleans Parish
- Supermarket
- Neighborhood Corner Store
- One Mile Radius of Supermarket
- SUPERNINE proposal

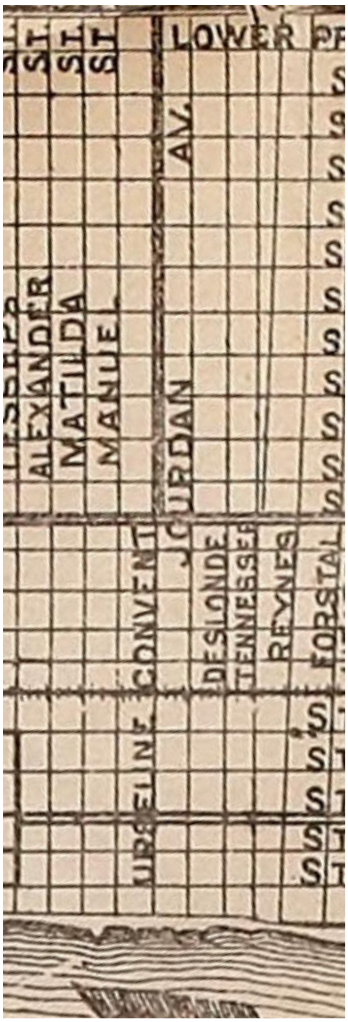
Diagram Key

- *Orleans Parish*
- *Supermarket*
- *Neighborhood Corner Store*
- *One Mile Radius of Supermarket*
- *Major Roadways*
- *Minor Roadways*
- *Railroads*
- *SUPERNINE proposal*

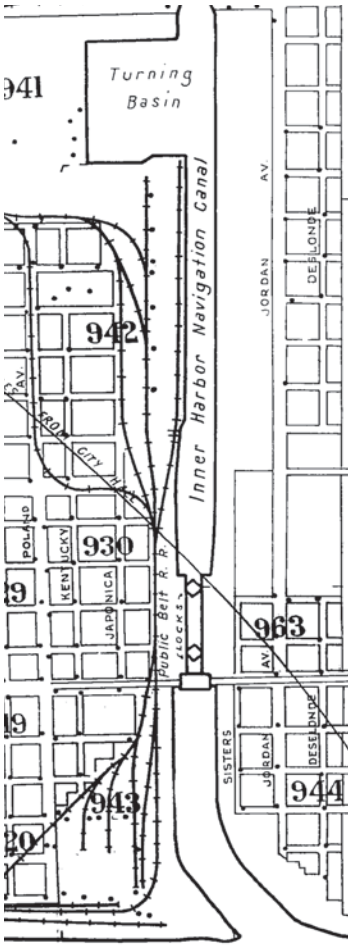


Nework of Grocery Stores (Proposed)

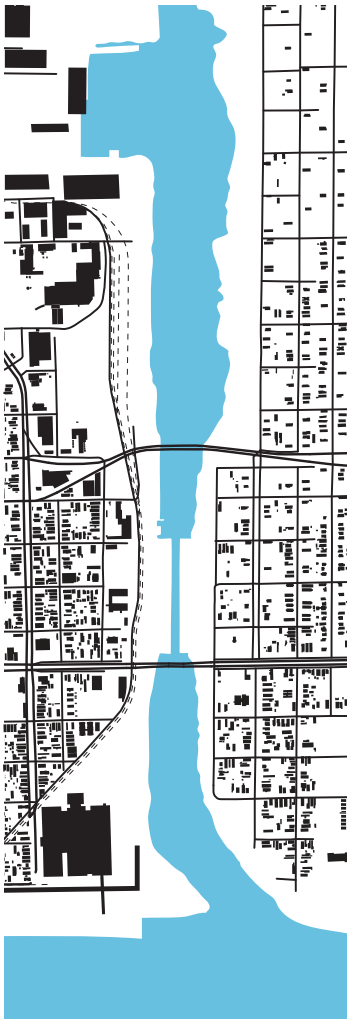
CONNECTION OF PEOPLE



Street Grid in Ninth Ward 1902



Street Grid in Ninth Ward 1939



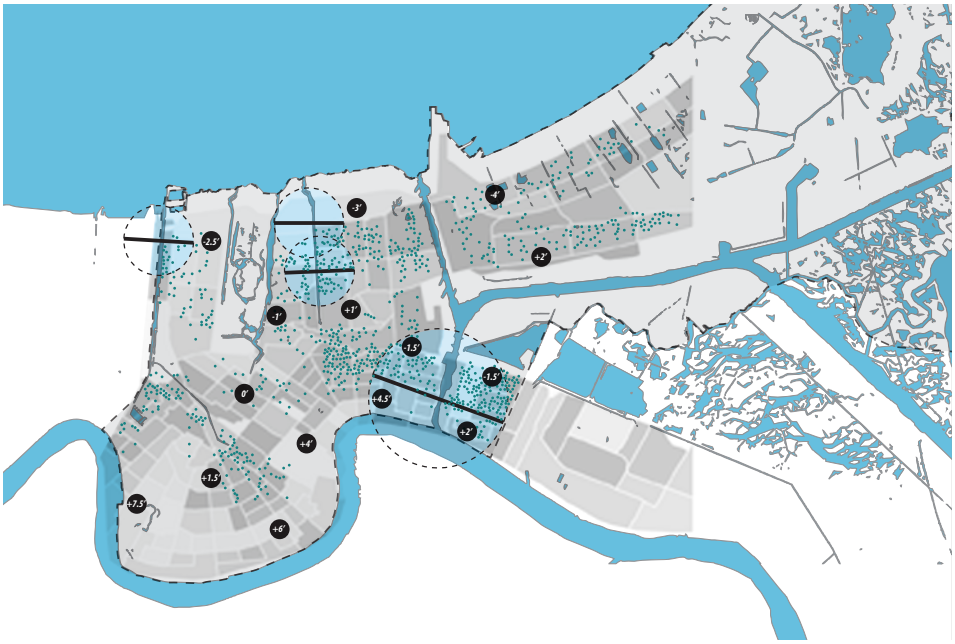
Street Grid in Ninth Ward 2014

Branley, Edward. "NOLA History: Backatown and the Evolution of New Orleans Neighborhoods." GO NOLA. N.p., 4 Nov. 2013. Web. 24 Sept. 2015.

"New Orleans, LA" 1939. Sanborn Fire Insurance Maps, Louisiana.

Aerial View of Industrial Canal

CONNECTION OF PEOPLE



Demolished Blighted Properties (2011) & Median Income

Diagram Key

Median Family Income

- *Less than $30,000*
- *$30,001 - $45,000*
- *$45,001 - $60,000*
- *$60,001 - $75,000*
- *$75,001 - $110,000*
- *$110,001 - $140,000*
- *more than $140,000*

Demolished Blighted Properties (2011)

Katrina Levee Breaches

Diagram Key

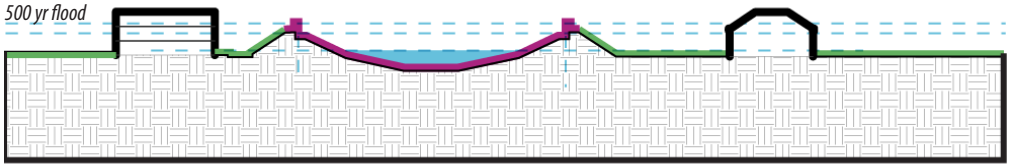
Major Roadways
Minor Roadways
Railroads

Corner Store
Neighborhood Mart

Physical Connections

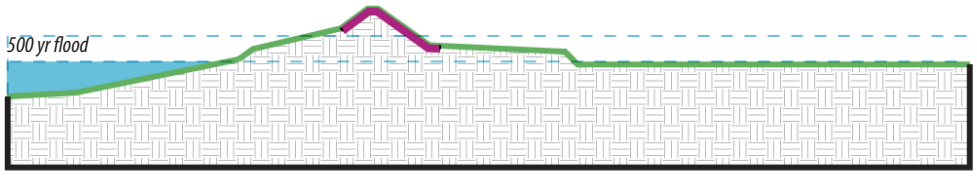
Existing Transportation Network

CONNECTION TO WATER



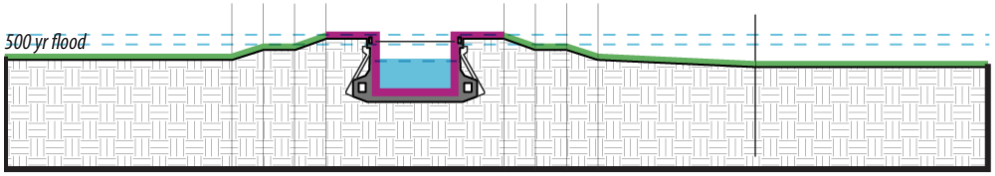
+15'
+0' elevation

17th Street Canal



+15'
+0' elevation

Carrollton Mississippi River Levee

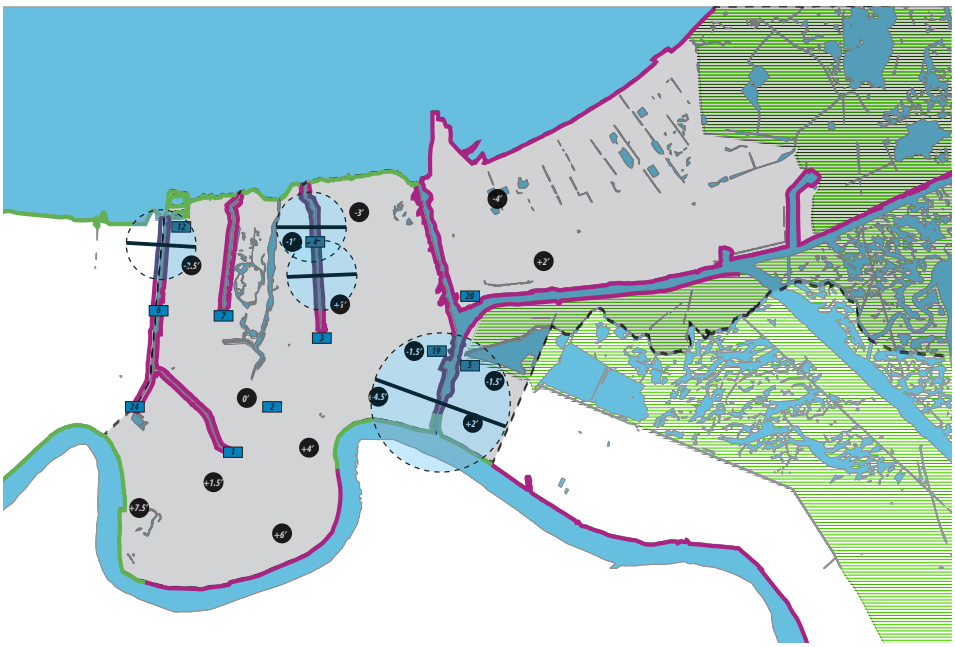


+20'
+0' elevation

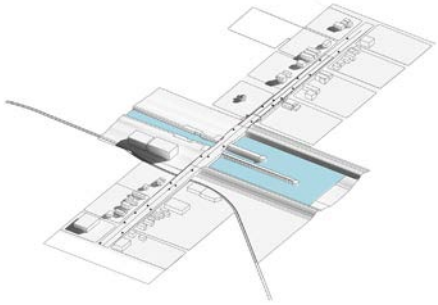
Industrial Canal

Diagram Key

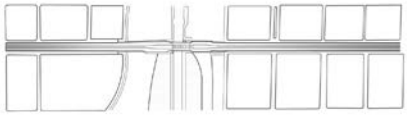
- *Concrete "Hard" Levee Walls*
- *Grass "Soft" Levees*
- *Pumping Stations*
- *Wetlands*
- *Orleans Parish*
- *Land Elevation*
- *Katrina Levee Breaches*

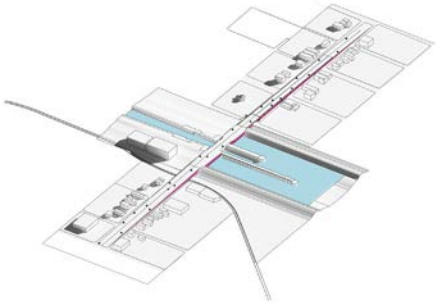


Existing Water Network

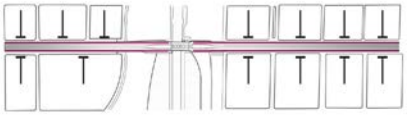


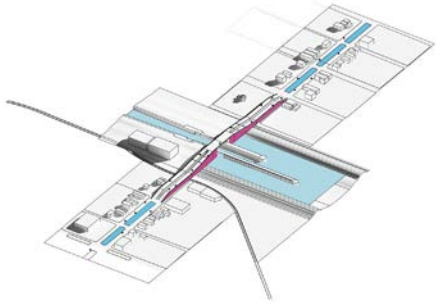
Existing St. Claude Bridge



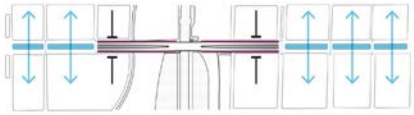


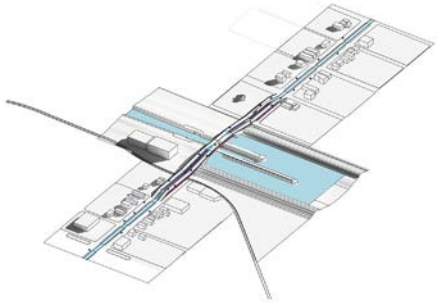
Approaches Block Cross Neighborhood Connection



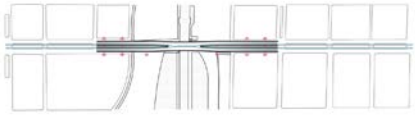


Proposed St. Claude Bridge - Shorten + Restore Cross Neighborhood Connection



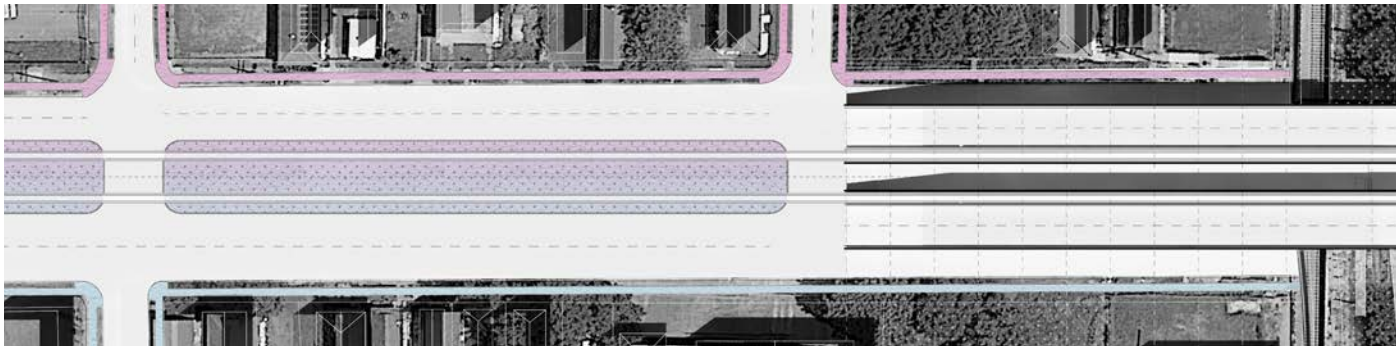


Weave New Pedestrian Path, Roadway, and Streetcar Line

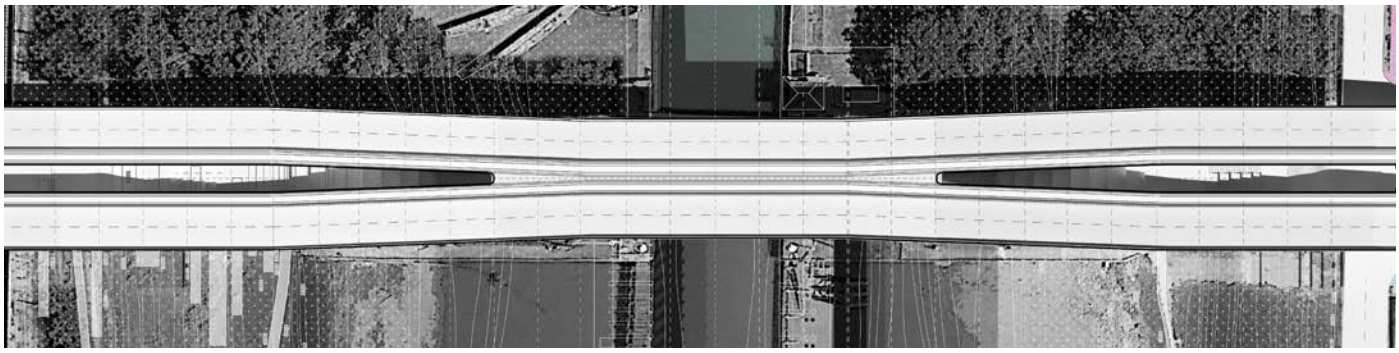


PROPOSAL : st. claude bridge

Site Plan



Detail of Site Plan



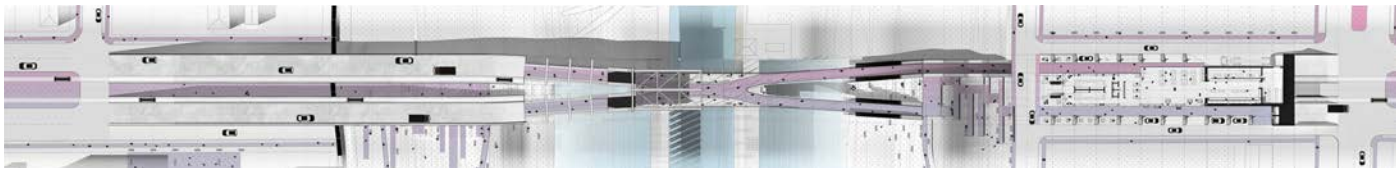
Detail of Site Plan

Rendering : Pedestrian Path in Bridge

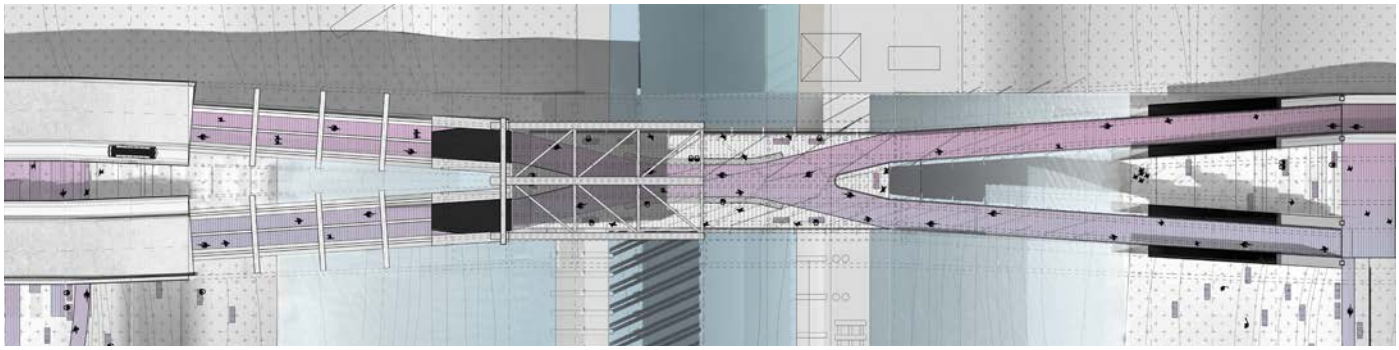
Rendering : Levee Park

Rendering : Outdoor Seating of Market

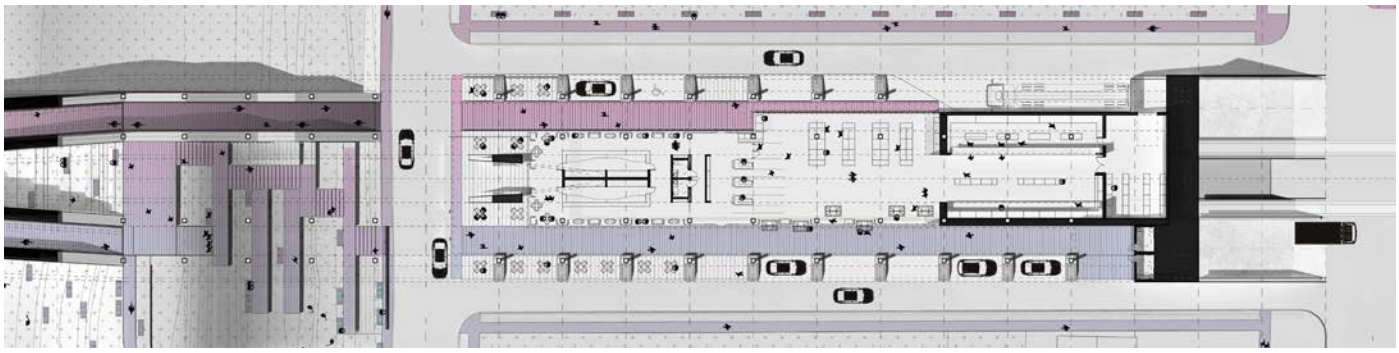
Rendering : Grocery Store



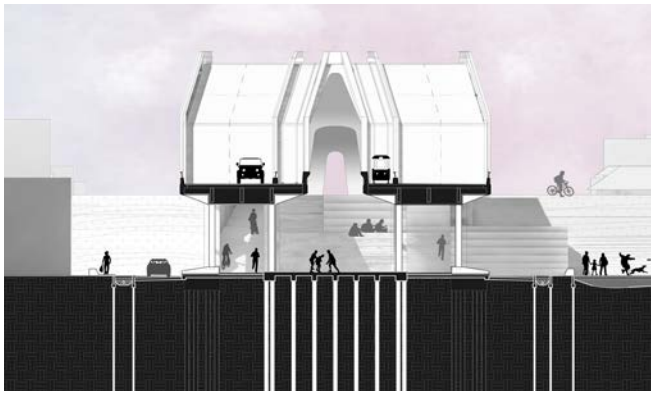
Ground Plan



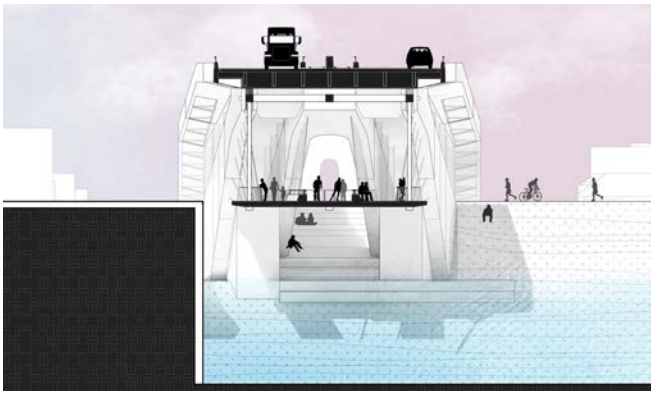
Detail of Ground Plan



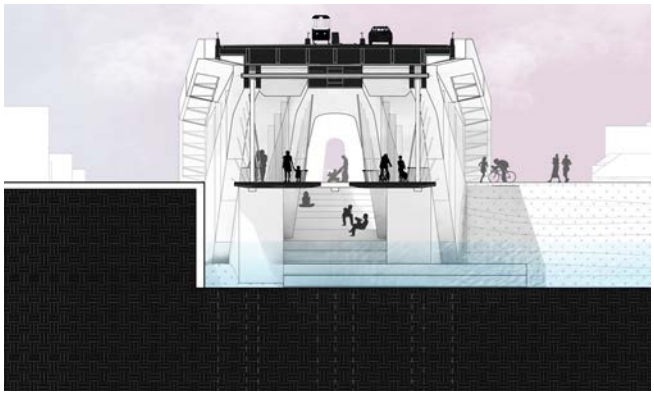
Detail of Ground Plan



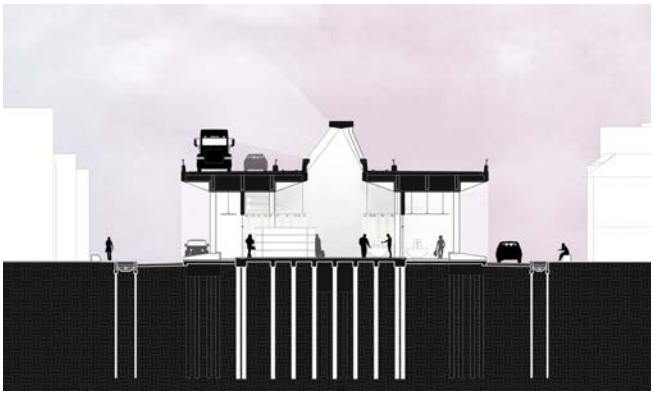
Short Section : Bywater



Short Section : Bridge

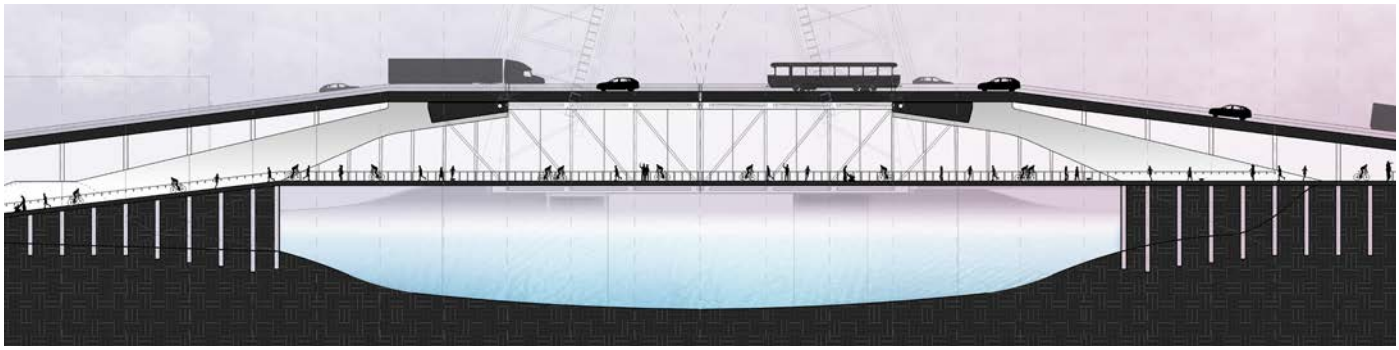


Short Section : Bridge Operable Hinge

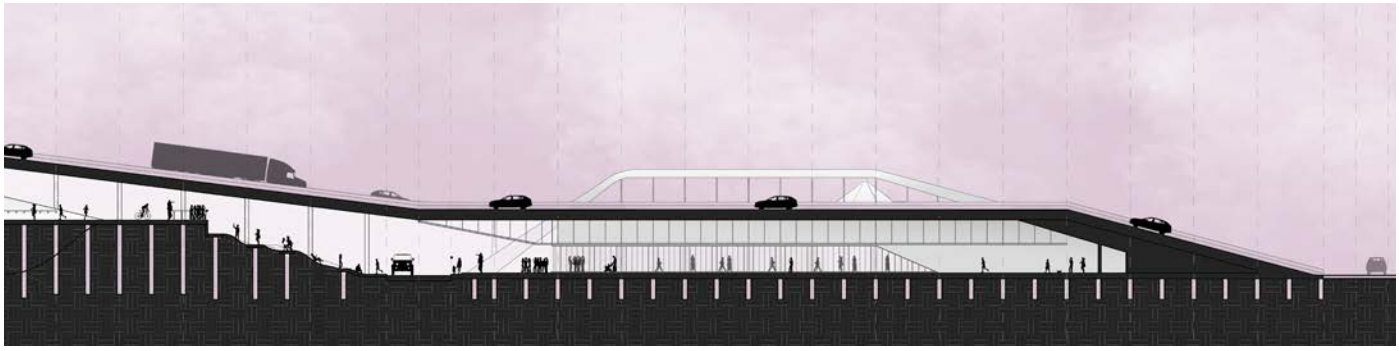


Short Section : Market

Long Section

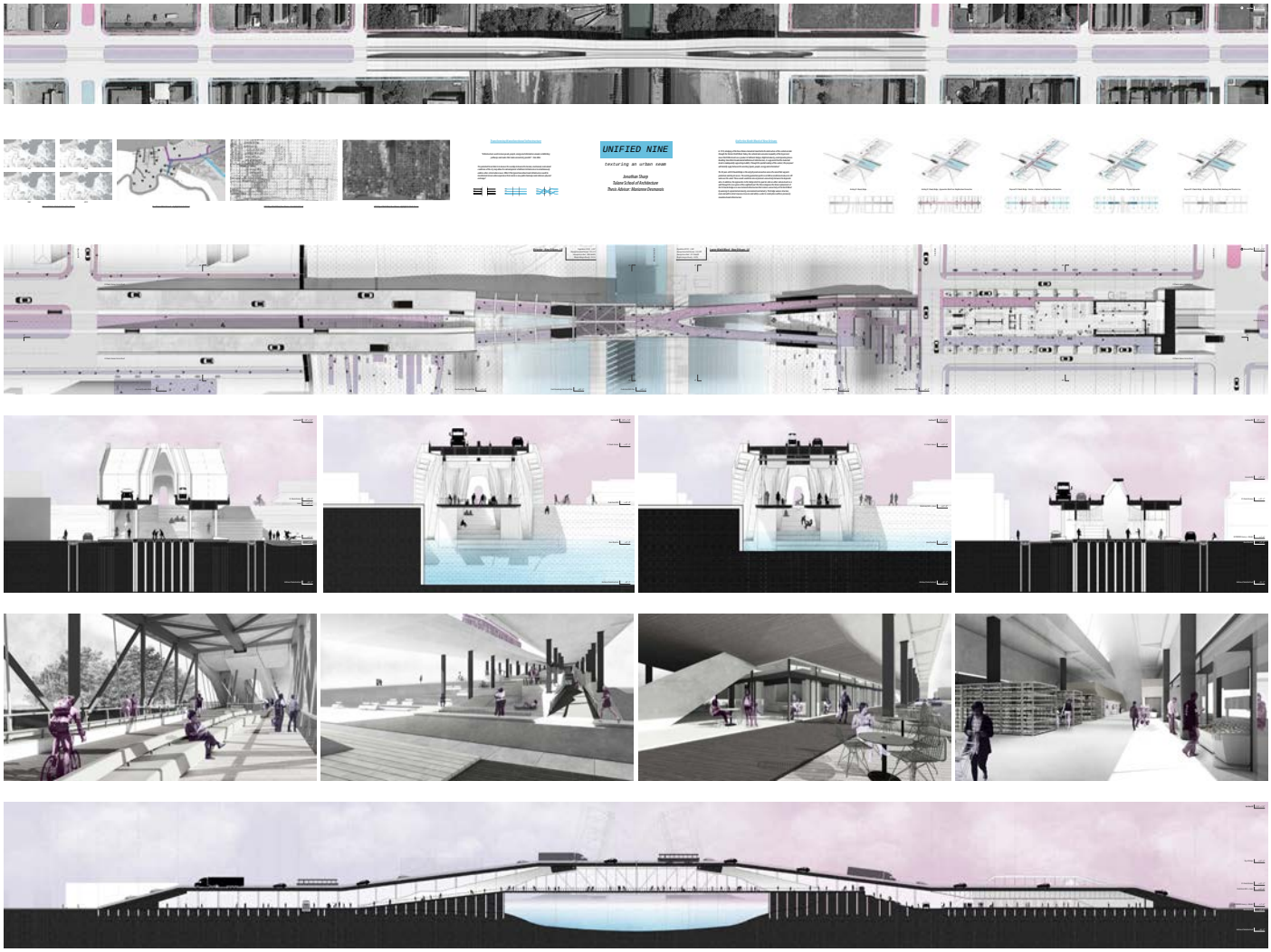


Detail of Long Section



Detail of Long Section

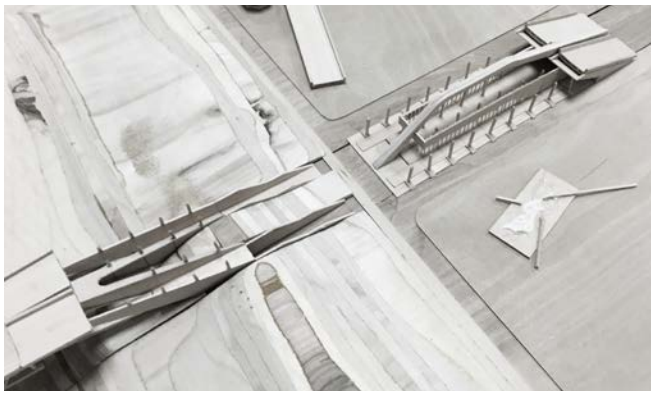
Final Model


UNIFIED NINE
texturing an urban swath
Jonathan Sharp
Tulane School of Architecture
Thesis Advisor: Marianne Dumesnil

Final Board

Final Model : Process

Final Model : Process



Final Model : Process

Final Model : Process

Final Review