Splintering Urbanism: The East River and Hudson River Waterfronts

Cornell Urban Design Studio, Fall 2013
## Table of Contents

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Introduction</td>
</tr>
<tr>
<td>9</td>
<td>Accessibility</td>
</tr>
<tr>
<td>31</td>
<td>Infrastructure</td>
</tr>
<tr>
<td>59</td>
<td>Affordability/Mobility</td>
</tr>
<tr>
<td>77</td>
<td>Intensity</td>
</tr>
</tbody>
</table>
Introduction

In the middle of the 19th century, the East River and Hudson River waterfronts were much alike. Today, they could not look more different.

A century and a half ago, the waterfronts each had piers jutting into the water, with a buzz of commercial activity supported by emerging upland neighborhoods. As the nature of shipping changed and New York City grew, one edge was rebuilt in the mid-20th century, the other at the turn of this century. Each waterfront was shaped by very different paradigms. The focus of this studio is to examine the underlying principles of these paradigms - to understand their qualities, strengths, weaknesses - and to propose a new paradigm for 21st century waterfront communities.

The East River waterfront neighborhoods, from 34th Street to the Brooklyn Bridge were almost complete erased and remade in the middle decades of the last century. The principles of modernist planning, much of it driven by Robert Moses, were embedded in the built environment through a clear separation of functions – an uninterrupted channel for circulation along the East River Drive (now the FDR Drive), superblocks of affordable housing with hospital institutions further north, a large park along the waterfront and the removal of almost all traces of the industrial waterfront.

The turn of the century Hudson River waterfront neighborhoods, from 34th Street to Chambers Street, have long erased the elevated West Side Highway, with many of the buildings now fronting a more pedestrian-friendly street. Hudson River Park, managed by the Hudson River Park Trust, has since trumped East River Park as Manhattan’s second largest park, and the area now sports some of the most expensive real estate in the City thanks to the High Line.

Why Do We Need a New Paradigm?

Robert Moses’ central control of housing, parks and transportation has now gone, leaving behind fractured oversight of the East River Waterfront. The legacy of affordable housing can be interpreted in contrasting ways - the Lower East Side has retained a far greater level of affordability over the last 10 years than the Hudson River Park area or Williamsburg, its fellow East River waterfront neighborhood, but it also has elements of entrenched poverty. Meanwhile, the post-modernist Hudson River waterfront relies on a unified, but privately-funded, conservancy to oversee the waterfront park. While the Hudson River neighborhoods are among the most dynamic in New York, the area’s premium address for global capital and the corresponding lack of affordability, combined with recent struggles of the
Hudson River Park Trust point to flaws in the principles underpinning this approach.

The challenges of oversight and affordability have emerged over the last decade. In addition, the impact of Hurricane Sandy has prompted an additional need to examine these paradigms to find ways of meeting the challenge of resiliency.

What are the Issues Shaping the Next Paradigm?

In each of following four sections of this book, a group of students has tackled an emerging issue critical to the long-term sustainability and resiliency of the waterfront neighborhoods and the wider city. These issues are:

**Accessibility** – Access to the waterfront can be approached in many ways, in terms of street crossing configurations, the nature of the paths through the upland neighborhoods, and the uses near the water’s edge that generate foot traffic. The Accessibility team has addressed the challenge of creating active, programmed paths within the public housing superblocks along the way to the East River waterfront.

**Infrastructure** – One of the issues highlighted by Sandy was that much of the City’s critical infrastructure is located on the waterfront. Moreover, much of this infrastructure is highly centralized, which can result in major electricity outages when a facility is impacted. The Infrastructure team has tackled issues of decentralizing power and heat supply as well as layering stormwater retention infrastructure with active urban uses.

**Affordability & Mobility** – The Affordability team has recognized that creating affordable living spaces in waterfront neighborhoods is not the complete solution. They have wedded the concept of Affordability to Mobility and crafted a mechanism that adds services, amenities and training opportunities in gentrifying areas to create a shared set of opportunities for new residents and the existing public housing residents.

**Intensity** – The creation of public housing along the East River waterfront separated housing from commercial and retail uses. As a result of this physical design and other less visible changes, the Lower East Side can be seen as having lost some of the vitality associated with the area in the last century. The Intensity team has developed a policy and implementation framework for revitalizing the area along Grand Street.

Through research, analysis, site visits, case studies and design, the studio teams have developed proposals that aim to establish a new paradigm for waterfront neighborhoods. While the East River and Hudson River waterfronts may never look alike again, these propositions set out ways to create a more open, resilient, equitable and vibrant city.
It is of little surprise that creating public access to the waterfront is a primary goal of urban planners and designers alike. The urban waterfront plays a significant role in shaping our impression of and engagement with the city.

Yet, accessibility is not merely about expedient routes between starting points and destinations. The experience of navigating public space and engaging with others in the public realm is vital for any urban journey. Sociability becomes the key motivator for designing for access.

Design principles for sociable space and fluid access:

- The journey is paramount in defining urban experiences. Starting points and destinations are nodes along the journey.
- Access to attractions and activities, to opportunities to meet others, to healthy food, is just as important as physical access to the water’s edge.
- Public spaces encourage convergence of people and draws upon the unique cultural and socio-economic underpinnings of local contexts.
- Land areas with various complementary activities weave together seamlessly.
- Public transit and bike options facilitate access to attractions and encourage green modes of mobility.

ac•ces•si•ble, adj. \ɪk-ˈse-se-bəl\:
- able to be reached or approached
- able to be used or obtained
- easy to appreciate or understand

so•cia•ble, adj. \sə-she-bal\:
- liking to be with and talk to other people
- involving or allowing friendly and pleasant social relations
Defining the Challenge

Checking for Universal Design

The concept of universal design provided the foundation for our accessibility project. Universal design is an inclusionary approach that seeks to accommodate all people, regardless of physical ability. Examples of universal design tactics include sound alerts at crosswalks, ramps at inclines, and flat paving. Universal design enables mobility and advances equity among people. Such design also enhances the physical realm by allowing a diversity of users in a space.

The Hudson River Park has implemented good universal design tactics at its gentle at-grade crossings, and throughout the park’s walkways and esplanades, encouraging access for all. With the FDR winding along the edge of the East River, however, the implementation of universal design standards for access points along the eastern waterfront may be challenging. Physical barriers, aside, however, there are other less tangible but just as palpable challenges to enhancing access on the water’s edge: social tensions and barriers that create urban enclaves.

From Universal Design to Sociable Access

While some upland areas may be universally accessible, they are not necessarily social to the fullest extent. Universal design principles in and of themselves are insufficient to address social tensions.

This study seeks to unearth the root challenges to access and proposes that the creation of social space is vital. By marrying the idea of sociability with the concept of universal access, we propose that spaces can encourage the convergence and become platforms for spontaneous, enjoyable and meaningful interactions.

Accessibility is about a journey: the ease of discovering and engaging with a physical and social landscape.
Modernist Legacies Along the East River and Hudson River

In considering the Hudson River and East River waterfronts in our study area, differences abound in the nature of upland urban fabric. Some waterfront neighborhoods are largely commercial, allowing for seamless integration with waterfront esplanade activities. Others areas contain more complex environments that do not lend themselves easily to the idea of fluid movement. Certain upland blocks are largely characterized by the spatial separation of functions. While such separation continues to allow for activities to flourish, confining preset activities to certain areas creates both physical and mental challenges for the new goals of seamless sociable space and ease of access.

Challenging Superblocks

The experience of walking in and around modernist public housing complexes poses particular challenges to navigating public space. This is particularly true for pedestrians and cyclists who have the opportunity to choose from multiple possible routes, the most convenient of which may weave through superblocks.

What makes superblocks difficult to navigate? The expansive design of housing campuses and the unvarying prototypes of public housing buildings can be disorienting for the unfamiliar passerby. Urban landscapes shaped by top-down design approaches leave much to be wanted in the way of social sensitivity. The experience of a fluid journey cannot be fully planned out. Space must be left open for users to define, but sensitive programming must also catalyze activity by enticing people to linger and explore the space. The task of designing for access along the waterfront is not monolithic task, but a nuanced one.
Mapping the Waterfront

The Linear Waterfront Map: Laying the Groundwork For Conscientious Design

Given the intensively pedestrian environment of Manhattan, we chose to study accessibility through the lens of pedestrians. The pedestrian experience offers great potential for sociability, as walking sets the stage for spontaneous social interaction, sparking conversation and engagement with others and the environment. The analysis of access along the waterfront therefore started with an examination of pedestrian access points.

A pedestrian access point is any crossing that provides a pedestrian connection between waterfront areas and the neighborhoods upland. On the Manhattan waterfront this necessarily involves a crossing of one of the two waterfront highways: the FDR Drive on the East River waterfront, or the West Side Highway on the Hudson River waterfront.

An analysis of crossings, ground conditions, and recreational opportunities along the waterfront shows very different conditions on the East and West sides. The west side is largely characterized by at-grade crossings at stoplights, every two to three blocks, where crosswalks assist pedestrians and bikers crossing from the city to the waterfront. On the east side, the FDR moves non-stop, and snakes above and below-grade, creating a different crossing environment. A holistic design approach to enhancing access must be sensitive to local conditions, capturing and building upon vibrant contexts. Thus we can simultaneously promote social and active spaces.
East River Access Bridges: Remnants of Modernist Rationality

The modernist separation of functions defines much of the pedestrian experience on the east side of the study area. Despite being in close proximity to the waterfront park, residential superblocks are minimally connected to the park by narrow bridges or unsafe crossings.

Current above-grade pedestrian and bike bridges suggest a lack of holistic design. They are narrow and unattractive, make use inefficient switchbacks, and do not deposit the crosser in a good location. There is potential to redesign access bridges such that waterfront communities are better united with the shoreline.
Permeability and Physical Barriers

West Side Sample
Average Block Size: 3 Acres
Access Points: 8

West side access points have been enhanced by recent redesign efforts in the Hudson River Park. Pedestrian crossings utilize universal design principles and a consistent design aesthetic. The narrow block sizes allow for the creation of numerous paths to the water’s edge, and a more seamless integration with the urban block network.

East Side Sample
Average Block Size: 4 Acres
Access Points: 4

On the east side, modernist separation of functions creates a challenging access environment around the waterfront. Superblocks create a physical and psychological buffer between upland commercial corridors and the waterfront park. In addition, FDR Drive makes it impossible to provide at-grade crossings, as there are no traffic lights.
### Transit Connectivity

In the 21st century and beyond, public transit is essential in moving people to and from the waterfront. Within a ten-minute walk of the waterfront access points, a traveler can reach a number of transit options, including train stations, bus routes, and Citi Bike stations. The public transit network connects waterfront communities with the rest of the city, and allows people who do not live on the waterfront to visit it with greater ease.

![Transit Connectivity Diagram](image)

### Permeability

Analysis of the public transit network shows deep disparity in access to the two waterfronts. The subway is particularly skewed toward the west side of Manhattan. On the Hudson River waterfront, almost every access point south of 23rd Street is accessible by subway. This contrasts starkly with the East River waterfront, where no access point north of the Manhattan Bridge is accessible by subway. Bicycle lanes and bus stops are more evenly distributed, but still more prevalent on the Hudson River waterfront.

![Permeability Diagram](image)
Manifestations of Insularity

Selecting the Study Area

To give shape to the challenge of enhancing journeys to and along the waterfront, we chose a study area adjacent to the East River Park. The East River Park has a wealth of open space and plenty of recreational fields and activities to attract people to the water. But access is lacking.

The site under study consists of two superblocks managed by NYCHA as the Lillian Wald and Jacob Riis II housing developments. These superblocks lie between Avenue D and the FDR Drive, from Houston to 10th Streets. The site is a good example of modernist architecture. Both developments utilize the tower-in-the-park formula of large built structures surrounded by plentiful open space.

The design of this space engenders rigid separation of activities rather than fluid movement between neighborhoods. There is a lack of sensory cues that suggest connectivity to adjacent neighborhoods. The site’s stark design creates the sense of an isolated urban experience.

Superblock Coverage

It may seem from a transit diagram that the Lower East Side superblock is an impenetrable barrier between the waterfront and the larger grid network of Manhattan. On closer inspection, however, the superblocks are full of opportunity for movement and socialization.

A density comparison of the two block typologies reveals that superblocks have a far higher percentage of open space than the typical city block. 80% of these superblocks is devoted to green space, recreation space, and pathways, while only 20% is covered with buildings. The grid blocks by comparison are 56% covered with building surfaces, and movement along and between them is restricted to narrow sidewalk spaces.

The LES superblocks are not as impenetrable as they seem. For travelers passing by these spaces en route to the waterfront, any hesitation to enter can thus be explained as a cognitive barrier rather than a physical one.
**Fenced-Off Interactions**

The Jacob Riis and Lillian Wald housing developments are rich in greenery, with large grass lawns and mature canopy trees. Fences do little for these NYCHA spaces. Fences were built to preserve the health of the grass, but this benefit is far outweighed by the negative impact on the health of the community. Picnicking and ball-playing are not incompatible with a healthy and beautiful lawn, and in an intensely urban place like Manhattan it is important to have places where grass can be used and touched. The impact on the public realm is considerable. Movement feels enforced, and the space carries rigid, authoritarian overtones. Seemingly innocuous fences enforce perceived barriers, creating a sense that open spaces are in fact not open at all. They leave a lingering sense of social tension: of rules and restrictions.

**Forbidden Entrances**

Impersonal signage discourages visitation, and repetitive design typology stymies curiosity in the place. Entrances should draw people in, whether they are wandering the city or are coming home after a day at work.

**Open Spaces Abound, But Nowhere to Go**

Open spaces abound amid the large buildings, yet these spaces are closed off to activity or movement. Current landscaping does not make the most of NYCHA’s most valuable resource: its beautiful land.

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*Opening the landscape encourages movement and activity*
The water’s edge is rife with activities. As depicted in the linear map below, programming stretches along the waterfront, yet the kinds of programming differ. Having options and varied experiences should be encouraged, just as the unique vibe and cultures of upland communities should also be acknowledged.

In the study site, nearby commercial corridor on Avenue D, and the active East River Park offer additional variety of activities to engage in.

Long straight paths and four-way intersections may be suitable for cars moving at a fast pace or pedestrians or cyclists seeking direct routes to their destinations. Pedestrian pathways, however, should be more than a means to get somewhere. They should encourage the convergence and interaction of people.

Linear Diagram: the diversity of existing programming provides potential for social interaction both along and upland from the waterfront.
Precedents of NYCHA Interventions

Current proposals to improve public housing superblocks have often stressed reintroducing the street grid. Recently, NYCHA proposed creating streetfront retail uses within the superblocks to integrate them more with the surrounding street network. While this is an effective way to bring public life into the superblock, it deprives the residents of their privacy and open space.

There are, however, recent examples of public housing projects that expand the scope of access to encompass broader needs. San Francisco and New York, for example, have introduced broadband internet to public housing facilities. NYCHA’s WiFi access project utilizes vans equipped with WiFi, computers, printers and scanners.

NYCHA spaces, it has been established, are rich with open space and have the potential for easy access into and through the superblocks. Despite some of the physical structures that cause visitors to hesitate before entering these developments, there is a strong psychological dimension to this perceived barrier between the waterfront and the city.

By creating an inviting environment in the NYCHA blocks, these public access ways can be taken advantage of by more people. In addition, the improved public realm will be a boon for NYCHA residents, who will enjoy improved spaces for recreating, relaxing, and socializing.
Removing Fences
Landscaped Pedestrian Bridge
Houston St
E 4th St
Avenue D
Creating shared pathways
Landscaping
Proposing new bus route
The Site Plan

Accessibility

21

The Site Plan

Strategy A: Bring the Park Upland
Strategy B: Enhance Movement
Strategy C: Activate Shared Spaces

East River Park

Adding programs

Bike Lane

E 6th St

E 10th St

FDR Drive

Pedestrian Bridge

The Site Plan
Strategy A: Bring the Park Upland

The New Pedestrian Crossing

The 21st century access point is a physical and psychological connection between the park and the city blocks. With wide, landscaped paths crossing the busy FDR, the elevated bridge provides spectacular views of the park and activities within reach. Visitors can appreciate the crossing rather than being deterred and inconvenienced by it.
Living in the Park

The pathways being considered in this study constitute the front and back yards of people’s homes. Yet, at the same time, they are open to the public to traverse. How can a balance be struck to cultivate convenient and welcoming paths that are simultaneously respected as people’s homes? Our answer: provide opportunities for people to not only cross paths, but to linger and possibly get to know each other.

This plan seeks to preserve landscaped elements of the complex, and through simple redesigns generate a sense of urban parkland. This is first done by opening fenced green spaces to recreation. Secondly, strict radial pathways are broken down into gentle curvilinear forms that invite relaxed walking and recreation. Tiled patio space balances the plentiful greenery and provides a sturdier foundation for gatherings and group activities.
An analysis of Manhattan’s existing transit network reveals that the Lower East Side is heavily underserved by public transit, especially by subway. In lieu of a subway expansion along the LES, flexible and low-cost transit improvements are needed to bring people to and from the waterfront.

This plan proposes new bike lanes and bus infrastructure, in addition to an enhanced pedestrian environment, to improve access to the waterfront. Instead of dismantling the superblock and reinstating through-roads, this plan seeks to delicately open pedestrian pathways through a seemingly impenetrable space. Accessibility to the waterfront is improved, but not at the expense of local communities.
Bike Lanes

Bike lanes are expanded and formalized at 10th and Houston Streets, and a new bike lane is created at 6th Street. At 6th and 10th Streets new bicycle-friendly access bridges allow a seamless path from the inner blocks of Manhattan to the waterfront paths of East River Park. Bike use is discouraged within the NYCHA developments and along the new pedestrian paths, for the peace and safety of residents. An additional Citi Bike station is proposed at the upland end of the new pedestrian bridge at 4th St. to easily return or pick up bikes for use in the park.

Waterfront Drive

On Houston and 10th Streets, two multimodal roadways allow bike, automobile, and bus access to the waterfront. A one-way automobile loop is created from 10th to Houston Streets along the FDR. Renamed Waterfront Drive, this local road will be landscaped and will allow a single lane of through-traffic. The M8 bus route is extended to run along Waterfront Drive making stops at each new access point. New bus pull-offs allow for passengers to be discharged without halting traffic. By restricting traffic along Waterfront Drive and encouraging more travelers to ride the bus, the plan reserves more space for pedestrian and bicycle use.

Shifts in Transportation Paradigms

An intensity diagram shows expected shift in transit modes after design intervention. Because of the limitations on car access through Waterfront Drive, travel by other modes is expected to increase.
Programming for all

Creating programming around the new access points in the Wald and Riis developments requires sensitivity to resident communities; however, programming should also be versatile enough to attract visitors and passers-through. Spaces should have a “staying factor,” a mood or attraction that draws people in and encourages them to stay.

It is the hope that interactive spaces can break down undue stereotypes attributed to public housing residents or erode unwelcoming wariness of those visiting superblocks for the first time. By introducing attractive but sensitive programming, assumptions and generalizations erode as social spontaneity takes over.

Programming Interventions in Superblocks

Lower East Side Food Cooperative

In an effort to provide affordable and healthy food options in the area, this plan calls for the creation of the new Lower East Side Food Cooperative. The ground floor of one housing structure in the Jacob Riis Houses would be converted to this cooperative, as well as the ground floor of a new building to be constructed immediately adjacent. Members would have access to fresh foods at competitive prices. The food coop is located at the entrance of the superblock, visible to the street, so that it draws people in and provides a gateway to the community space.

The Sunken Market

Rivalling the Smorgasburg or the Brooklyn Flea is the new Lower East Side public market, a sensitively scaled weekend activity for people looking to enjoy fresh and prepared foods in the open air. Taking advantage of existing physical infrastructure, the sunken market occupies an amphitheater area adjacent to a green lawn in the Jacob Riis housing development.
The Lillian Wald Atrium

The Lillian Wald Atrium is a multi-purpose indoor space occupying the ground floor of one housing structure. This community space is visible to the outside and inviting to visitors. Within the atrium are seating areas and communal computers. A café and free wi-fi will make this a destination for residents to gather and work and play together. The space will be flexible and allow for group gatherings, events, and performances.

The Jacob Riis and Lillian Wald Resident Artists

One artist home/studio space is placed in each of the two NYCHA developments. The “resident artists” would live and work in these studio spaces and would produce art with the community. Artists would engage with community members, teach classes, and produce pop-up art on display around the NYCHA campus.

The Community Art Wall

Placed at the intersection of 4th Street and Avenue D, the 6-foot-high art wall integrates with the new path network to draw people into the superblock. The art wall is a culture forum, creating a sense of shared and social space. It can be reserved for formal displays of work by an artist, or can allow informal, interactive uses such as graffiti art and chalk art.

Design solutions need to take into consideration local needs, the potential for visitors, and an understanding of how various spaces offer different activities.

Park Programming

The East River Park already teems with activity, from club sports games to joggers and bikers and dog walkers. Reimagining programming in the park is mostly about invigorating and supporting the activities that already occur there.

Run.Stop

Run.Stop is a watering hole for waterfront recreationists. Equipment can be rented, bikes can be tuned, refreshments can be purchased, tools can be borrowed. Run.Stop is primarily of service to exercisers passing through the Park.

Comfort Stations

Additional rest stops would be provided in the East River Park that would function as enhanced bathrooms. Refreshments, drinking water, washing fountains, and changing rooms could all be provided to make it easier and more pleasant to spend a day at the water.
Conclusion: Waterfront Integrated

Infusing Sociability

An attractive, safe and convenient physical realm is important to the positive experience of traveling to the waterfront, but also crucial is the existence of things to do along the way.

Access implies the idea of destination, but moreover, the value of the journey itself. Waterfront accessibility should be a string of experiences carrying the traveler to the water, along it, and back.

Creating a positive experience at the waterfront is easy: the vistas, smells and sounds of the land’s edge are special enough without human intervention. But how do you enhance the experience of getting there, and replace the notion of a “commute” to the waterfront with the idea of “excursion” and “interaction”?

By placing emphasis on sociability, public spaces can be platforms for different people to engage with each other. This sets the stage for meaningful urban experiences that are not dictated by static design, but incrementally built upon and dynamically defined by people’s shared journeys.

Weaving Experiences Together

Design solutions need to produce a sense of seamlessness between the waterfront and the neighborhoods upland. This plan calls for two NYCHA housing developments to be reimagined as urban green spaces, extensions of the waterfront park. Greenery is invited to filter into the urban upland experience. The superblocks become ‘transition zones’, where the urban fabric picks up elements of the waterfront park, and the waterfront park is anticipated by the aesthetic of the surrounding blocks.

Improving spaces between public housing buildings must be an exercise in sensitive design that encourages green modes of mobility.

The Complete Waterfront

Visitors, Residents, Neighbors

EAT SHOP COMMUTE LIVE LEARN RELAX GATHER INTERACT
Designing for access is designing for sociability, making spaces where people can engage with people.
A city’s success depends on the integrity of its infrastructure. In New York City, infrastructure shapes the built environment and provides essential services, such as transportation, energy, communications, water, and shelter. Without properly functioning infrastructure, the city would cease to support the 8.3 million residents, nearly 4 million workers, and 53 million annual visitors who rely on these services.

This study focuses on centralized infrastructure systems on the East River and Hudson River waterfronts: in particular, the Con Edison 14th Street Generating Station on the East Side and the entrance and exit to the Holland Tunnel on the West Side. History shows that these systems were built on vulnerable land that was undesirable for development. These vulnerabilities are becoming more apparent as the city’s population continues to grow, climate change brings stronger storms to the riverfronts, and security concerns highlight the need for redundancies in critical services. The impact of Hurricane Sandy in October 2012 was a wake-up call for New York City to improve its resilience to natural and man-made disasters.

Although these new paradigms are changing the City’s needs, it continues to rely on infrastructure established 100 years ago. New approaches to energy and transportation systems, which utilize advances in technology, are necessary to address the challenges of the 21st century. The design solutions proposed in this study recommend more decentralized systems that work with the natural environment and are layered into the urban fabric of New York City. These interventions aim to deliver necessary services while making the city more livable, vibrant, and resilient.
Vulnerable Critical Infrastructure

Critical Infrastructure in the FEMA 100-year and 500-year Floodplain

- Subway Stops
- Subway Lines and Tunnels (MTA)
- Vehicular Tunnels
- Major Arteries
- Hospitals
- Power Substations
- DEP Wastewater Facilities
- Critical Telecommunication Facilities

Legend:
- FEMA 100-year flood plain
- FEMA 500-year flood plain
- Hospitals
- Power Substations
- DEP Wastewater Facilities
- Critical Telecommunication Facilities
- Subway Stops
- Subway Lines and Tunnels (MTA)
- Vehicular Tunnels
- Major Arteries
Three Key Concepts

This study examines two Lower Manhattan sites. One is located on the West Side at the meeting point of SoHo and TriBeCa and the other is on the East Side between Stuyvesant Town and Alphabet City. While connecting to a larger urban system, these roughly half-mile squared sub-districts are distinct. Their nearby waterfronts of the East River and the Hudson River pose common challenges but topography and infrastructure create unique opportunities. Addressing shared challenges with site-specific interventions, this study demonstrates how adapting to climate change is possible across New York City and in cities throughout the U.S.

1) Resilient Decentralization

The core problem for both sides is the issue of centralization. Vulnerability occurs as a consequence of the centralization of each side’s critical infrastructure. On the West Side, the Holland Tunnel serves as a centralized form of transportation infrastructure, funneling vehicles from across the city into a single path beneath the Hudson River. At the same time, topography near the tunnel’s entrance and exit funnels a half-mile square region of storm water into a single low point.

On the East Side, the Con Edison 14th Street Generating Station is a centralized form of energy infrastructure. As a single power source supporting Lower Manhattan, it is vital to the city’s life and commerce. Breaking up and identifying alternative, decentralized solutions to these infrastructure regimes will aid in strengthening Lower Manhattan’s resilience to extreme weather.

2) Truce with Nature

The ground underlying both sites exists in a state of persistent tension. The need for additional real estate in close proximity to Lower Manhattan resulted in the development of marshland and infill, yet these areas were previously sites of water collection and drainage. In times of storms and heavy precipitation, water reappears following the path of the former marshes.

Strategies to prevent or eliminate the return of water are frequently sought in a struggle against the original ecology. However, as the problem of extreme weather becomes more common, the decision to erase the historical marshland needs to be reconsidered. Living with water is a core philosophy of the proposed interventions.

3) Layered Connectivity

Both sides contain multiple layers of infrastructure and land uses, including infill over marshland, housing and office space, essential utilities, and transportation networks. While infrastructure can be used to shape the social fabric of the city, the presence of critical infrastructure at the two sites currently exists at the expense of the social and recreation needs of the city.

The proposed interventions redesign the space with an integrated approach. By promoting intersections between different layers of infrastructure, the future visions of the sites seek to establish a harmonious – rather than conflicting–relationship among the built, natural, and social environments.
History

West Side

The history of the area around the Holland Tunnel begins with a 62-acre family farm established in 1636. Founded twelve years after the first Dutch immigrants settled Manhattan, the land was used for the cultivation of corn, pumpkins, and tobacco. Located on a bluff at the corner of today’s Jay Street and Greenwich Street is where the original farmhouse of the Bogardus family once stood (#1 on map).

By 1705, the property was under British Crown control. At this time, much of the elevated area was transferred to the Trinity Church, while the low-lying swamp portion came into the hands of the Lispenard family. The Lispenard mansion was located on the same bluff as the Bogardus home, though further north at the corner of what is today Desbrosses Street and Hudson Street (#2 on map). The Lispenards used the swampy meadow for animal grazing.

Located southeast on the Lispenard property was the city’s Collect Pond at the intersection of today’s Leonard Street and Lafayette Street (#4 on map). It was stated at the time that the meadow was constantly filled with standing water, as the area had “no natural vent.” The Lispenards were concerned by “the stagnation and rottenness of [the Collect Pond]” and argued that it was “exceedingly dangerous and of fatal consequence to all the inhabitants of the northern part of [the] City.” The Lispenards successfully lobbied the City to create a trench “into Hudson’s River as far as Low Water Mark” to help drain the Collect Pond and the broader area. At the time of the revolutionary war, bridges were built over the ditch at Broadway and Canal Street and at Greenwich and Canal Street.

Ultimately, the small hand-dug ditch was not sufficient to solve the water drainage problem. By the early 1800s, a larger intervention was needed. In 1811, the small ditch was replaced by a plank-sided eight-foot wide straight culvert leading to the Hudson River. Unfortunately, in no less than eight years the elegant tree-lined culvert devolved into an open sewer, requiring a new solution. In 1819, the canal was covered and became the 100-foot wide Canal Street of present day. Unfortunately, even after centuries of interventions, the fundamental problem of poor drainage and flooding persists to this day.

East Side

The area around the 14th Street power plant has a predominantly industrial past. Before the northern end of the neighborhood was home to Stuyvesant Town and Peter Cooper Village, and the southern end was called Alphabet City, the land was a salt marsh. In the early 1800s the marsh was drained in the interest of creating additional developable land.

In the 1800s, the neighborhood south of 13th Street was a shipbuilding hub known as the “Dry Dock District,” for the bustling East River Yards (#6 on map). After the Civil War and construction of the Erie Canal, interest in steel-hulled ships grew. This resulted in the New York Dry Dock Company experiencing a decline in demand for wooden ships. The neighborhood was soon abandoned by shipbuilders, making way for tenement houses for immigrants from Germany and Eastern Europe.
In the late 19th Century, the neighborhood was known as the “Gas House District” for a local gas distribution site and for the obtrusive, leaky gas tanks that surrounded the blocks. The district was also home to a group of criminals known as the Gas House Gang, famous for armed robbery and running brothels. The smell from the gas tanks and constant threat of violence from the gang made the neighborhood highly undesirable.

Gas tanks were removed in the 1930s but the area was still known for substandard housing. In the 1940s, in an effort to eradicate slums, then Parks Commissioner, Robert Moses, and the City Planning Commission took over the land and turned it over to MetLife for redevelopment. The Gas House District was leveled and 3,000 families were displaced when MetLife broke ground on the Stuyvesant Town and Peter Cooper Village in 1947 (#7 on map).

The Consolidated Edison East River Generating Station was erected at the site in two stages: the first in 1926 and the second in the early 1950s. The current 43,000 square foot facility takes up over four city blocks, including along the East River shoreline. Access to the East River is necessary as water from the river is used as cooling water for the plant. In 2005, a repowering project at the plant added two natural gas-fired steam generators to the electricity grid, bringing the total plant capacity to 660 MW of electricity and 5.7 million pounds of steam per hour (#9 on map).
Challenges

1 West Side Centralized Transportation Network:

The Holland Tunnel on Manhattan’s West Side ceased operation from Monday, October 29th to Friday, November 2nd. A main connection to the mainland, the tunnel’s closure resulted in 300,000 vehicle trips obstructed. Power loss resulted in the failure of tunnel exhaust fans and floodwaters impeded traffic on the road.

2 East Side Centralized Energy Distribution:

Hurricane Sandy’s inundation of Manhattan’s East Side made visible the vulnerability of a largely centralized power system. An explosion at Con Edison’s 14th Street power station occurred when floodwater from the 14 foot storm surge travelled through a conduit system to the plant’s central control cabinet. The explosion caused 310,000 customers in Lower Manhattan to lose electricity for 4 days.

3 West Side Flood-funnel:

Located in the City of New York’s Office of Emergency Management’s (OEM) second order evacuation zone, the Holland Tunnel and the surrounding blocks flooded due to elevation and the landform. Though located further inland than other Sandy flood areas, the site is distinct due to its topographic bowl form. At its lowest point it is 4 feet above sea level, while its highest edges rise to 30 feet. The Holland tunnel meets city streets along the western edge of the bowl, at 10 feet above sea level. The tunnel sits along a natural funnel leading storm water to the depression. The bowl is a natural collection point for all precipitation for a half-mile square area.

4 East Side Floodplain:

The Office of Emergency Management (OEM) identifies the area of the 14th Street Generating Station for first order evacuation in the event of a hurricane. Built atop flat infill and a former salt marsh, the site is highly exposed to the East River with an average elevation of 5 feet above sea level. Storm surge in the vicinity resulted in an average floodwater depth of 3 to 6 ft.
**West Side Wasted Space:**

The Holland Tunnel entry and exit plazas are a meeting point between heavy vehicle traffic from New Jersey’s highway system and the pedestrianism of the Manhattan grid. The landscape consists of a patchwork of Jersey Barriers, zebra pedestrian crossings, and a pedestrian overpass. The largest open space in the area is St. John’s Park. The space is wasted, as no access by foot or vehicle is possible. Formerly a glamorous public realm in front of St. John’s Episcopal Chapel, the park is now completely dedicated to its role as a traffic roundabout.

**East Side Access Barriers:**

On Manhattan’s eastern edge, the Con Edison power plant is sandwiched between residential city blocks, the FDR Highway, and a waterfront pedestrian and cycling path connecting Stuyvesant Cove Park and East River Park. Public roads previously crisscrossed the plant until the threat of terrorism closed them in the early 2000s. The pedestrian and bicycle path narrows along the plant’s cooling equipment at the water’s edge, which also prohibits access to the waterfront itself.
Study Areas in Context

**Schools:**
Sited amidst major traffic routes and dead-end streets, these elementary and middle school locations are cut off from nearby green space. School operation is also impeded by floodwaters.

**Substations:**
Serving as voltage “step down” sites, the substations on the East and West Sides were compromised by flooding during Sandy. Transforming 69,000 plus volt electricity flows to 13,000 volts, these substations transmit to hundreds of local street transformers, which create usable 120-220 volts electricity that feeds into buildings.

**Wastewater:**
Wastewater pumping stations link district wastewater to citywide treatment plants. Located below grade at Varick and 6th Avenue on the north side of Canal St, is a wastewater pump serving a 37-acre area of lower Manhattan. This pump feeds to a larger pump station on the East Side located at 12th St and Avenue D.
Public Space:
For day-to-day non-motorized commuters and recreational users, direct pathways to green space are impeded or circuitous. Navigating around is awkward, in some cases dangerous.

FEMA Flood Plain:
The Federal Emergency Management Agency’s published flood boundaries represent a one in a hundred chance of flooding per year.

Building Damage:
In both the East and West Sides, study areas, hundreds of individual buildings were damaged resulting in millions of dollars of repair costs.
CHP in NYC

Resiliency in Redundant Systems

In order to tackle the issue of critical infrastructure situated in vulnerable areas and prevent the losses that occurred during Hurricane Sandy, more distributed, decentralized energy generation is proposed. District-level combined heat and power (CHP), also known as cogeneration, is a viable solution for New York City. CHP plants capture the waste heat from electricity generation for useful heating and cooling.

Building multiple sources of power throughout the city offers independence from the central grid and provides redundancies in times of individual plant failure. In contrast to the failure of the Con Edison 14th Street Generating Station, which cut power for 310,000 customers during Hurricane Sandy, there are several examples of isolated district energy systems in the City that remained in operation during the storm. See the box below for New York University’s experience.

NYU CHP Plant Case Study

In 2010, New York University completed an expansion of its combined heat and power (CHP) energy system for the Greenwich Village Campus. The expansion included building a new natural-gas fired cogeneration plant in an underground vault at 251 Mercer Street. The new plant produces 13.4 MW of electricity for 29 buildings, and brings heat, hot water, and chilled water to 37 buildings on campus. The renovated block-long plaza at Mercer Street provides public green space for the community.

During Hurricane Sandy, the majority of buildings in the NYU Washington Square Campus had electricity, heat, and hot water. NYU was able to generate its own electricity and heat in order to maintain essential services and provide a safe haven for students and residents affected by power outages elsewhere. Emergency responders established a command post on campus after the storm to coordinate efforts. In addition to providing greater resiliency, the new CHP plant provides $5 million in annual energy savings to NYU and prevents an estimated 43,400 tons per year of CO₂ emissions. NYU also sells excess energy back to Con Edison when campus demand is low, for additional savings to the University.

The NYU experience shows that decentralized, CHP-powered district energy systems are sustainable, reliable, and resilient alternatives to centralized, grid-networked power for New York City. NYU’s underground plant also demonstrates that energy infrastructure can be co-located in existing public space.
Current and Potential CHP Generation in NYC

There is currently 220 MW of installed CHP in New York City. Within Midtown and Lower Manhattan, there are 23 systems with just over 37 MW of generation capacity. New York City’s PlaNYC calls for 800 MW of installed clean distributed generation by 2030, primarily in the form of cogeneration. A study conducted by Columbia University in May 2013 identifies 4,714 potential microgrid-level CHP systems in New York City, with an aggregate potential capacity of 3,042 MW. This study corroborates a 2002 Energy Nexus Group and Pace Energy Project report for NYSERDA identifying 3,200 MW of CHP potential in the Big Apple.

CHP Generates More Power in Less Space

According to the U.S. Environmental Protection Agency, the footprint required for a 10 MW CHP plant is 6,000 sq. ft., compared with a 10 MW wind farm, which requires 76,000 sq. ft., and a 10 MW solar voltaic installation, which requires 1,740,000 sq. ft. An average New York City block, which is approximately 198,000 sq. ft., could fit 33 10 MW CHP plants.

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Eastside Analysis

Removing the Power Plant

The approach to the design intervention in the East Side study area includes removing the Con Edison East River Generating Station and replacing this critical, centralized infrastructure with distributed district CHP energy systems. This approach envisions a future with cleaner, more efficient, decentralized energy, which will reduce emissions and increase resilience to disasters such as flooding.

In order to accomplish the goal of removing the power plant, the study proposes distributing the plant’s 660 MW generation capacity, which serves over a quarter-million customers in Manhattan below 39th Street, throughout this service area. Using the EPA recommended footprint size, and examples such as NYU, One Penn Plaza and Co-op City, the study identifies potential locations for CHP systems. University campuses, NYCHA housing complexes, hospitals, municipal buildings, and public parks around prime business districts were selected as potential candidates as they are already structured in a “district” configuration with mixed-use blocks and neighborhoods and have large buildings or public space that can accommodate a CHP plant.
Case Studies of Repurposing Power Plants

Retiring and repurposing old power plants can improve the natural environment and revitalize urban areas, especially as these sites are often located in prime waterfront locations. Throughout the U.S. and abroad, abandoned power stations have been retrofitted for housing, shopping, entertainment, education, the arts, park space, and other community functions.

Perhaps the most famous power plant redesign is the Tate Modern museum in the former Bankside Power Station in the Borough of Southwark, London. The museum opened in 2000, nearly 20 years after the power station closed. The Tate Modern is currently the most-visited modern art gallery in the world, with around 4.7 million visitors per year. The architects Herzog & de Meuron incorporated the existing power plant structure into their redesign. For example, with over 36,500 square feet of floor space, the Turbine Hall is used for large commissioned works. The former underground gas storage tanks have also been converted to exhibit space for live performances, video art, and other installations.

In Baltimore, Maryland, the area around the old Pratt Street Power Plant has been reinvented as Power Plant Live!, a major tourist, entertainment, dining, and retail venue along the Inner Harbor. Each year, over three million people visit the site. The building itself currently houses restaurants and retail. The Inner Harbor received a 2009 Urban Land Institute Award for Excellence, and was heralded by ULI as “the model for post-industrial waterfront redevelopment around the world.”

Concept for Intervention

District CHP systems use minimal space and can be installed throughout the city without changing the current landscape. CHP plants can be located within existing buildings, on rooftops, or underground. As illustrated in the NYU case study (see box on right), public green space can be created above vaulted systems.
East Side Intervention

Inspiration from Natural and Built Environment

FLOW

GRID

DESIGN

Marshland Hydrography
City Grid Typology
Urban Marsh
1 Urban Marsh

An urban marsh will be created at the northern edge of the site and connected via pedestrian bridge to a restored saltmarsh at the water's edge. The floodable marshland represents a truce with nature, serving as a tie to the area's historic ecology and as a protective barrier to future storms. The urban marsh will be programmed with public trails and native plantings.

2 Improved Access

Access will be improved throughout the site. 14th Street will be reopened to traffic and provide landscaped sidewalks for pedestrians to safely enjoy the street-level retail. The street will extend into a terraced, elevated walking bridge above the FDR highway to waterfront amenities. A second pedestrian bridge links the urban marsh to the waterfront to the north.

3 Distributed CHP

The new buildings and amenities for the University and throughout the revitalized neighborhood will be powered by a district CHP plant, located in the old power plant building. The CHP plant will also serve as a learning tool for the University and local public school children.

4 New University

The cornerstone of the East Side intervention is a new University dedicated to studying renewable energy and climate change adaptation. The University's CHP plant will be a learning laboratory for energy professionals across the country. The University will also improve the social vibrancy of the neighborhood and bring needed revenue to the city.

Programming:

New mixed-use developments will be implemented in the former power plant as well as a new university, primary school, hotel and residential tower. The new entertainment services range from a movie theater and a museum in the former power plant to kayaking and a dog park along the waterfront. Street level retail will cater to patrons along pedestrian-friendly streets.
Hurricane Sandy resulted in cars being unable to use the Holland Tunnel and a breakdown of TriBeCa’s wastewater pumping station. To ameliorate and shorten the duration of these troubles, it is necessary to identify the specific origins of the water that caused the problems.

Studying the site’s topography made clear the culprit causing the flooding is land form. The existing slope of streets in the TriBeCa and SoHo neighborhoods creates five drainage sub-regions. Under normal rainfall circumstances, four of these sub-regions lead water to flood the district’s lowest point at the intersection of Grand Street and Thompson Street on SoHo’s western edge.

In the case of a hurricane with accompanying storm surge, the fifth region also becomes a source of flooding. Looking closely at each sub-region’s topography, it is evident that each has a lowest street that becomes a central flood artery. Canal Street, Thompson Street, and West Broadway act like funnels channeling floodwater toward the central topographic depression on the border of SoHo and TriBeCa.
Embedded in TriBeCa’s name, “Triangle Below Canal,” is an acknowledgment of the district’s irregular form. From a broad view the district is a triangle, but it is also full of smaller triangles. When the grid of 1811 and the organic grid of earlier settlement met, TriBeCa served as an area of negotiation. Amidst TriBeCa’s blocks, small triangles of green space fill out the gaps in what would otherwise be awkwardly wide streets. In considering runoff, these green spaces can play a critical role in runoff management.

To identify promising sites for water absorption and create a floodwater management strategy, a common storm water calculation is employed. The calculation shows how much water is captured in existing green space, and how much water travels down principle flood streets to the intersection vicinity of Grand Street and Thompson Street.

Current Floodwater Distribution:
Topography and the flow direction of streets results in the largest amount of water accumulation occurring at the bottom of the depression.

Proposed Floodwater Distribution:
Floodwater is managed by a distributed system of catchment basins and green infrastructure.

“As the climate changes... the risks that New York City faces will only intensify.”
–Mayor Michael R. Bloomberg

Concept for Intervention

The principal in operation is to optimize the flood management role of open spaces. This north eastern corner of TriBeCa is full of large and small pieces of land that can be transformed into world class public spaces that also protect against flooding during times of extreme weather. It is no longer sufficient for a park to simply be a park. It must be a place of public amenities, water infiltration, and in extreme instances - a catchment basin.
West Side Intervention

The drainage strategies currently in operation for TriBeCa and SoHo are not operating optimally. The three and a half day closure of the Holland Tunnel following Hurricane Sandy did not have to occur. It is now clear that the tunnel’s vulnerability to storm surge was woefully under estimated.

The following interventions represent large and small-scale investments, which blend green infrastructure with needed amenities. While it is not possible to pick up and move 1.6 miles of tunnel infrastructure, or build 100 bridges across the Hudson River to decentralize the system, other options exist.

1 Reduce Water Flows:
Create a network of green spaces and green streets to facilitate water infiltration into soil in a distributed fashion. This requires converting non-permeable surfaces into permeable areas.

2 Redirect Drainage Flow:
Large rainfall and tidal storm surge currently result in water collecting in undesirable locations. The use of green and grey trenches is used to redirect water to travel against the topographic incline in the direction of green infrastructure and catchment basins.

3 Re-establish Marshland:
Create a useful and accessible habitat in a previously under-utilized space. By lowering the elevation at the center of St. John’s Park and establishing a marsh, this site absorbs water that collects in the area due to the historic marsh. Beautifying the park also returns its use to a place of leisure and recreation.
**Barricade:**

The most basic means of protecting the tunnel infrastructure is by making the entry and exit plazas more easily defensible. Walls built into the sides of parks and walkways serve to enhance the pedestrian and leisure experience, while also shrinking the gaps that need to be defended.

**Shift the Low Point:**

The present low point of the study area is Thompson and Grand Street. Lowering the elevation of the basketball court creates a new low point in a location that does not damage property. Sunken to a depth of 15 feet, the court serves as a significant water catchment basin during extreme weather. During fair weather it is a major basketball destination with room for spectators.

**The Halo:**

Suspended above St. John’s Park, the Halo is the centerpiece of improved pedestrian and bicycle connectivity between TriBeCa and SoHo. The Halo’s elevated walkways lift pedestrians over Holland Tunnel traffic and provide access to the new marsh in the middle of the traffic roundabout.

**Outdoor Cinema:**

Serving multiple functions, this outdoor cinema is on the surface a simple stage. Simultaneously, it serves as a catchment basin and a site of infiltration for runoff from the northeast side of St. John’s Park. The wall behind the movie screen separates the public space from Canal Street, providing a pleasant leisure space.

**Programming:**

Layered on top of new infrastructure is programming. This programming is part of building resiliency into the everyday operation of the district. Making use of symbiotic relationships is essential. For instance, the TriBeCa Cinema is located across the street from the outdoor cinema. Using this proximity it is possible to establish programming agreements that serve neighborhood businesses and enliven the public realm. Further, such agreements may be used to reduce operation and management costs associated with adding new amenities. Part of the Halo is a two-story structure on its northwest edge. The building has room for a nonprofit, a café, and a seasonal ice-skate rental shop for times of year when the marsh freezes over.
A More Resilient Future

“Whenever I run into a problem I can’t solve, I always make it bigger. I can never solve it by trying to make it smaller, but if I make it big enough I can begin to see the outlines of a solution.”

– Dwight D. Eisenhower

President Eisenhower’s guidance can be applied to envision a future New York City in which infrastructure is more flexible, resilient, and integrated with the natural and social environments. The transportation and energy infrastructure systems explored in this study have served the city well since their inception at the beginning of the 20th century, but are currently facing the challenges of a 21st century that include greater impacts from climate change and increased demand from an ever-growing population. In moving towards a more resilient future, the city’s infrastructure must adapt to provide service and solutions in the broader context of sustainability.

The study on the East Side looks at the challenge of a single source of energy for over a quarter-million customers, sitting on a vulnerable location. The limitations of reliance on this single source were demonstrated during Hurricane Sandy, when thousands of lives were put in danger and millions of dollars in commerce were lost when the power went out. The intervention proposes enlarging the problem to go beyond simply protecting or “hardening” this single point with flood walls and waterproof wires, to envisioning a resilient, dispersed, district-energy system with multiple sources of power throughout the city. This future scenario also proposes solutions to improve the natural environment, such as using cleaner fuel sources to reduce emissions, and it allows for more social interactions, by expanding access to the East River waterfront and within the community.

The study on the West Side explores how a single point of transportation infrastructure connects more than 90,000 vehicles a day to the city. The closure of the Holland Tunnel during Hurricane Sandy significantly reduced mobility for those that live and work in and around the city, and this disruption also led to significant economic losses. The West Side intervention enlarges the problem to address storm resilience while building green space, improving public safety, and revitalizing an under-utilized area.

The challenges associated with infrastructure in New York City – from providing critical services, protecting the environment, supporting economic activity, and promoting the urban social fabric – are not independent and should not be viewed as such. In present times of tight budgets and significant shifts in the natural environment, solutions must be layered to address multiple problems at once. As shown in both interventions, the current vulnerabilities of infrastructure can be viewed as design opportunities to advance a number of goals that will create a more resilient, healthy, and productive New York City today and for future generations.
Integrated Runoff Management

Decentralized Energy System

Green Infrastructure Network

Infrastructure
Affordability / Mobility

Wage stagnation, increased demand for urban property, and the commodification of housing are making it nearly impossible for lower income people to live in the city without some form of financial assistance. Many of the lower income residents that remain find themselves in neighborhoods without access to the services and amenities that promote economic mobility. Recent political trends within New York City indicate that these problems will be defining issues for policy makers in the decades to come as they grapple with crafting a mechanism that adds all inclusive services and amenities to a neighborhood without displacing lower income residents. As neighborhood disparities become more apparent, the pressure to address these issues will reach a point where they can no longer be ignored. This kind of mechanism is the focus of the Delancey Depot, our proposal for an area of the Lower East Side.
As demand for an urban life surges and capital pours into central cities, it is becoming increasingly unaffordable for those residents whose incomes have not kept pace with ballooning rents and property values. Since 1967, real median household income has risen on average a meager .4 percent a year and has fallen 11 percent since peaking in 1999. In that same 45 year time period, the top 5 percent of earners have enjoyed a 67 percent wage increase in real terms.

The income inequality that has been brewing for decades is becoming more evident as the have-nots are displacing the haves. New York City represents the extreme of this trend.

This is compounded by a level of foreign investment not seen in other American cities. New York City residential property values are considered bargains in comparison to similar properties in competing global cities such as London or Paris. At the peak of the market in 2007, foreigners made up roughly 30 percent of all condo purchases in Manhattan. As developing economies continue to grow and fortunes are made overseas, the New York real estate market is likely to continue in this direction.
Affordability and Mobility: One and the Same

If affordability is being able to pay for a life that provides the resources necessary to be upwardly mobile, then it is inextricably linked to economic mobility. Affordability can’t be defined entirely with a number. Affordability is having access to services, amenities, and goods that allow someone to live a stable life. Many unstable neighborhoods are affordable in terms of housing costs. However, you are only buying a roof over your head. Everything else that is necessary for the functioning of a stable neighborhood may still be in question.

By this definition, affordability and mobility are interconnected. By having one, you have access to the other.

Challenges with Affordability

As neighborhoods become more desirable, they become unaffordable to those who are living in them. A common phenomena involves a process of artists and creative types inhabiting property in unwanted areas, the neighborhood improving from the artistic vibe, wealthier people inhabiting the now-popular neighborhood, rents rising, and the poorer residents and artists being forced to relocate. This process pushes lower income individuals and families away from job opportunities to the fringes of the city and weakens their social networks. In an attempt to establish a level of stability for these groups, governments have subsidized the creation of permanently affordable housing. This can be a safeguard against rising rents, but the nature of public housing creates enclaves that are not integrated with surrounding economies and lack the amenities that promote economic mobility.

Many of these enclaves were built by demolishing mixed use neighborhoods and replacing them with imposing superblocks full of equidistant residential high rises. The social problems that spawn from the concentration of poverty and limited resources only discourage the attention and investment needed to improve the economic prospects of the neighborhood’s occupants. These public housing campuses are often part of a broader area well served by active, mixed-use developments and employment hubs. The challenge is overcoming the barriers that impede permeation of activity and create isolated pockets of affordability. While some progress has been made in this realm, governments continue to struggle with responding to this dilemma.

“We cannot resign ourselves to the mindset that says rising inequality is a necessary byproduct of urban success.”

- Mayor Elect Bill De Blasio
In previous decades, the gentrification that swept across Manhattan did not permeate the Lower East Side the way it did areas like SoHo, Chelsea, or Tribeca. Nevertheless, over the last decade the Lower East Side has seen a dramatic shift in land values and demographics. The statistics representing this area as a whole are misleading. On the surface, it appears to be a racially and economically diverse neighborhood. However, a closer look reveals concentrations of different groups of people and stark divisions between them. The growing white population largely resides in the East Village and The Bowery, while the Hispanic and Asian residents are concentrated around NYCHA campuses and towards Chinatown, respectively. The low-income Baruch, Wald, Masaryk, and Gompers campuses adjoin the young and trendy Bowery and East Village to the east and northeast, respectively, and the desirable Co-Op Village to the south. This particular study area was selected due to multiple interesting attributes: the largest public housing complex in Manhattan being separated from the well-to-do Co-Op Village by the Williamsburg Bridge, active retail strips only blocks west of empty sidewalks, a highway blocking waterfront access, and large public-private initiatives to develop multiple vacant lots at the foot of the Williamsburg Bridge and Baruch Houses campus. These circumstances present an opportunity to use these energies for positive change. Hence, the site boundary was drawn to encapsulate each of these elements.

Lower East Side: Delancey Street

The western edge of the study area consistently draws a diverse clientele due to the presence of low and high end offerings, with barbershops adjacent to specialty boutiques. The commercial hub is located in close proximity to the Delancey and Essex Street subway station as well as the western entrance to the Williamsburg Bridge. This contrasts with the dearth of street life on the eastern side of the study area, which is virtually residential. The large swaths of affordable housing that dominate the space lack the economic base to support a wide range of retail establishments.
A closer look at some of the social statistics may help explain some of the differences between the groups. Single parent households are significantly more common in Baruch Houses than in the surrounding areas. These situations make it difficult for parents to make ends meet and give the attention their children need to succeed in school and live a balanced life. These figures also illustrate the relationship between education and income. The lower income figures at Baruch Houses are paired with low education levels, while the opposite is seen in adjacent neighborhoods.

### Baruch Houses
- **15%** single parent households
- **53%** graduated high school
- **23.8%** unemployment rate (2011)
- **5,367** Population

### Co-Op Village
- **6.4%** single parent households
- **82%** graduated high school
- **7.8%** unemployment rate (2011)
- **3,866** Population

**Socio Economic Information**

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### 2000 vs 2010

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**10 Year Changes in Household Median Income and Rent**

**Affordability/Mobility**

57
Barriers

As previously mentioned, the study area is influenced by barriers that discourage the flow of people from one area to another. The FDR has cut it off from the waterfront; and the Williamsburg Bridge has segregated the low income campuses from the market rate co-ops to the south. The stigma of public housing discourages outsiders from travelling through, and the absence of amenities gives people few reasons to linger. This problem is proliferated by the inert, empty spaces that are ubiquitous throughout the area.

Dead Space

The area under the Williamsburg Bridge has become a derelict site, currently used for storage of department of transportation equipment and supplies. The large expanse of storage under the bridge storage and supporting infrastructure has created a vacuum that segregates and isolates the adjacent communities. Additionally, the streets perpendicular to the bridge are wide, car-centric, and flanked with angled parking. Most of the buildings on the streets are set far back from the sidewalk, and large belts of parking lie adjacent to the residential towers.
A Neighborhood in Transition

The immediate area is starting to see long awaited change. NYCHA, the New York City Housing Authority, has proposed a land-lease program, which will use open space within the Baruch Houses campus to build a combination of market rate and affordable housing. The city also recently finalized a contract for SPURA, the Seward Park Urban Renewal Area, an initiative to develop 9 vacant lots west of the Williamsburg Bridge, into a neighborhood, retail center, tech incubator, & cultural destination. Underneath Delancey & parallel to the SPURA site is the proposed Low Line park. Here, there are plans to transform a former trolley depot into an underground green space that runs between Essex & Clinton Streets.

Instead of viewing this as a threat, it can be used as an opportunity to take advantage of the influx of both monetary & human capital to revitalize our study area in a way that improves the lives of the lower income people who reside there. Often when a neighborhood improves, the lower income residents that live there are forced out by higher rents and property values. In this case, many of the residents are immune to market fluctuation by living in public housing.
To create a higher quality of life and more mobility for local residents by applying a design intervention that improves their neighborhood.

Constraints

These strategies must address a number of constraints that could hinder progress. Some constraints are more tangible than others. For example, flexibility and large existing structures are physical constraints that will affect the form of anything that is to be constructed. Limited funding, gentrification, and politics are all issues that deal with more complex and unpredictable outcomes. All must be overcome to see positive change in the study area.

Limited Funding

Public money for these types of projects is more difficult to come by as cities are not bringing in enough revenue to meet their current obligations. The City of New York is not currently in a favorable fiscal situation. A low investment, high return project is necessary to attract public funding.

Large Existing Structures

The study area is afflicted by physical barriers that don’t encourage or permit development. The Williamsburg Bridge, FDR Highway, and wide streets must be taken into consideration when drafting an idea to address these issues.

Flexibility

To use space underneath the bridge, any programming must maintain flexibility that allows for the free movement of bridge maintenance and utility workers. Adding flexibility also allows for program experimentation.

Gentrification

It is paramount that any intervention serve the needs of the people in the community that need it the most. A successful project is not one that makes the area so expensive that it excludes lower-income residents from enjoying it, but one that manages to improve quality of life for all.

Politics

In order to secure public funding and approval by city hall, local municipal representatives and decision makers must support the project. To support the project, their constituents must support the project. Issues of cost, traffic, and maintenance must be framed in a way that does not dissuade people from supporting the project.

Strategies

Increase Services and Amenities
Provide programming that addresses gaps in services and amenities for all area residents.

Enhance Connectivity
Expand accessibility and link the site to a broader area in Manhattan and the other boroughs for better connections to job opportunities. This will also increase the number of people who choose to visit the area.

Integrate Disconnected Neighborhoods
Create a space that stitches disjointed areas by creating a seamless transition between them for a more integrated community.

Create a Pedestrian Friendly Environment
Expand pedestrian spaces to enhance the success of the programming.

Increase Street Activity
Create a space that draws a wide range of people to the area both day and night to improve neighborhood security and enhance the success of the programming.
Communities can select programs they wish to see in their neighborhood.

The selected programs can be delivered by a rail system.

The empty space can be used for diverse programs selected by the local community.

The empty space can be also used for special events. The containers can be assembled in a way that allows for larger, more contiguous spaces. Flexibility is also necessary for ongoing bridge maintenance.

This concept uses shipping containers as the building blocks of the entire development. Shipping containers are inexpensive, playful, and flexible. As seen in other cities such as Mexico City and London, shipping containers can be used to accommodate an array of uses. This includes schools, cafes, bars, housing, retail, and even a travelling theater. This particular concept will include community service centers, a hostel, market outlets, cafes, bars, art galleries and studios, and co-working space.
Utilizing Dead Space

The empty spaces that segment the neighborhood can be reconceived as areas that can be activated with the appropriate mix of programming. The surrounding area has an extensive network of underutilized spaces, including widened streets for parallel and perpendicular parking, as well as expansive parking lots and inaccessible green space in the Baruch Houses and co-op campuses. When combined, this network of space becomes ripe for development. This concept applies a combination of using programmed shipping containers and enhancing pedestrian infrastructure to maximize the area’s potential. Empty property of this magnitude is uncommon and valuable in Manhattan. This intervention attempts to use these tracks to make the area more cohesive.

Under the Bridge

The space directly under the Williamsburg Bridge is used by the Department of Transportation (DOT) as storage space for equipment and vehicles. Shipping containers are scattered haphazardly throughout the site for storage of everything from manhole covers to Citi Bikes. Much of the space is fenced off, and passage under the bridge is only possible through a limited number of cross streets. Large pillars, which support the bridge deck, run the length of the space.

Residential Campus

The residential buildings near Williamsburg bridge are separated into superblock campuses that are full of inaccessible and underutilized open spaces. The buildings are distanced from each other leaving vacuous space between. Baruch Houses has large towers that are set back far from the street, with winding pedestrian paths that pass through fenced off green spaces.

Delancey Street

Delancey Street is separated into two one-way streets, traversing on the north and south sides of the Williamsburg Bridge. The wide streets receive limited thru traffic, and are lined on both sides with angled or perpendicular parking.

Parking Lots

There are multiple parking lots that surround these residential campuses. They are often filled below capacity and create an unsightly void that
This idea aims not to gentrify the neighborhood, but to utilize human capital. These programs will not only draw crowds and invigorate this area with positive activity, but will be allow for the sharing of knowledge and skills amongst residents and tenants.

For example, incentivized by rent vouchers, entrepreneurs in the co-working space can teach technical and entrepreneurial skills classes, artists can offer artistic classes to people of all ages, and hostel guests can volunteer time for maintenance or clean-up of the area. All of these program elements can enhance the job opportunities of area residents by teaching them the skills needed in today’s job market and can allow Delancey Depot to operate at minimal cost.

### Jobs skills & Training
As the job requirements in today’s market become more technical in nature, job seekers should equip themselves with the emerging tools and technology skills.

### Mentorship & Tutoring
Mentorship and tutoring services can assist parents whose kids are having trouble in school or just need extra guidance and life skills.

### Arts & Crafts
Low income neighborhoods often do not have outlets that allow for artistic expression and education. These classes can add much needed capacity and instruction in the surrounding area.

### Site Cleanup
Site cleanup is not limited to tenants. Inspired by the growing “voluntouring” trend, the hostel will offer discounts on room rates and food & drink vouchers for guests who volunteer to assist with Delancey Depot site maintenance event cleanup.

### Maximizing Human Capital

<table>
<thead>
<tr>
<th>What</th>
<th>Who</th>
<th>Where</th>
<th>Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job/Skills Training</td>
<td>Office, Co-Working Tenants</td>
<td>Community Facilities, Incubator Space</td>
<td>Rent vouchers</td>
</tr>
<tr>
<td>Entrepreneurship Training</td>
<td>Office, Co-Working Tenants</td>
<td>Community Facilities, incubator Space</td>
<td>Rent vouchers</td>
</tr>
<tr>
<td>Youth Mentorship Program</td>
<td>All Tenants</td>
<td>Community Facilities</td>
<td>Rent vouchers</td>
</tr>
<tr>
<td>Tutoring Services</td>
<td>All Tenants</td>
<td>Community Facilities</td>
<td>Rent vouchers</td>
</tr>
<tr>
<td>Art &amp; Craft Classes</td>
<td>All Tenants</td>
<td>Galleries, Studios, Community Facilities</td>
<td>Rent vouchers</td>
</tr>
<tr>
<td>Site Cleanup</td>
<td>Hostel Guests, All Tenants</td>
<td>Delancey Depot Area</td>
<td>Room discounts, meal or drink discounts, rent vouchers</td>
</tr>
<tr>
<td>Ecology Education</td>
<td>Farmers Market Tenants</td>
<td>Community Center</td>
<td>Rent Vouchers</td>
</tr>
</tbody>
</table>
The first step of this intervention is to make moderate changes to the surrounding infrastructure. The cross streets under the bridge will be closed and integrated into the rest of the space. Sidewalks will be widened by utilizing the large amount of parking on both sides of Delancey, Pitt, and Columbia. The street grid will also be reinstated through the Baruch Houses and Gompers Houses campuses, increasing circulation throughout the site.

The Delancey Corridor

Basic infrastructure changes will create a new and improved corridor along Delancey. Motorized traffic will be substantially reduced through the removal of a lane of traffic. Additionally, a bicycle lane separated from car traffic will increase bike access to the site. Pedestrian space will be expanded through the removal of angled parking on both sides of the street. This will also allow for the DOT storage area to be substantially widened, from 110 feet to 190 feet, to accommodate the new rail system and programing.
Connecting the Site
Beyond the Waterfront

To connect this area beyond lower Manhattan, East River Ferry service will be added to the waterfront closest to the eastern entrance of the pedestrian bridge. Existing ferry service to Manhattan is limited; access is limited to the financial district and east midtown. The creation of this ferry terminal would provide a critical waterfront connection to other areas in Manhattan, Brooklyn, and Queens. In many instances increased ferry service would dramatically reduce travel time to other waterfront areas of the city. The proposed ferry expansion would connect Delancey Depot to the key emerging areas including DUMBO, the Brooklyn Navy Yard, South Street Seaport, the Domino Sugar development, and Stuyvesant Cove.

To the Waterfront

To offer a more inviting connection to the waterfront, a new pedestrian bridge will be added at the eastern end of Delancey. The bridge will include key programing and Delancey Depot branding to draw people to the site. A pedestrian bridge will not only increase flow of people through the site, but will reduce the confining effect of the FDR, which separates the site from East River Park.
The market is comprised of long-term and short-term tenants. The long-term tenants operate during normal business hours while short-term tenants will operate during special events. The space offers the flexibility to have farmers markets 2-3 days a week and flea market products 7 days a week. The goal with the market is to maintain a steady flow of people to the area. Tenants will be eligible for rent vouchers by completing a certain number of service hours. This could include entrepreneurial courses or art classes, for example. To ensure a supply of affordable fresh produce in the neighborhood, the FRESH Program will be housed in a collection of these containers and open 7 days a week.

The 60-bed hostel will be comprised of single dormitories, group dormitories, and a central gathering space. The hostel serves as a constant draw of people and activity to the site at all times of the day. Vouchers for room rentals, and free food and drink can be offered to guests who volunteer at Delancey Depot. Volunteer work could consist of site cleanup and event help.

Outdoor, gallery, and studio space will be available for artists who are priced out conventional exhibition and workspace. Artist space is interspersed in clusters throughout the project. Rent vouchers will be offered to artists who provide art classes to local residents and provide aesthetic enhancements to the site and shipping containers. A recording studio will also serve the local music community with designated time for aspiring musicians in the subsidized housing complexes.
Co-working space will be available in several fixed facilities, as well as, moveable containers throughout the market. Establishing a Delancey Depot co-working space fills a need for flexible and cheap rental space in lower Manhattan for entrepreneurs to develop their business ideas. This is perhaps the greatest opportunity to expose local residents to the expertise needed to help create greater economic mobility. These entrepreneurs can receive rent vouchers by providing entrepreneurial and job training and tutoring to eligible local residents.

Container bars, cafes, and restaurants will be interspersed throughout the space; many will cluster next to larger open spaces to allow for cafe seating and to create a visible hub of activity. These clusters are adjacent to the hostel and co-working space. Tenants can receive rental vouchers by providing jobs, culinary training, and discounts on food for local residents.

While residential structures are not within the scope of this program, developers would be incentivized to provide affordable housing and design their buildings to compliment the Delancey Depot concept.

Community facilities will consist of many flexible facilities that can serve multiple functions. These functions will have a focus on education, job training, child care, community events, and recreational offerings. Many of the programmed activities, including educational courses and job training, will be taught by tenants and vendors. The containers will be concentrated around Baruch Houses and certain areas under the bridge. The success of this project in many ways ties to the successful integration of previously absent services and amenities.
24/7 Activity
The programming was selected and designed in a way that would create a consistent flow of people in the area. This diverse mix of programs draws people from morning to midnight. The community facilities, food and drink establishments, and the hostel draw people all day, while the co-working space, art galleries, and market stalls draw people during more specific times. The constant buzz of activity will attract a greater number of people as Delancey Depot becomes more well known.

Weekday Activity
The weekday activity is more fragmented and erratic. Crowds will come in spurts as people move between work, school, errands, and dinner. Cafe and Bar activity will generally occur later at night. Entertainment activities will have fewer activation hours.

Weekend Activity
Weekend activity is more steady and leisurely. More emphasis is placed on entertainment attractions like art galleries and special events. Cafe and bar activity will occur throughout the day. Special events will draw large crowds, and more people will come from the waterfront.
**Phase 1**
Phase 1 of Delancy Depot involves making the appropriate infrastructure changes to maximize the potential of the concept. Delancy will be reconfigured to allow for more container and sidewalk space. The rail will be set in place to accommodate container movement, and the pedestrian bridge will be constructed.

**Phase 2**
Phase 2 consists of building the fixed container structures. The larger structures anchor the development & sit in a predetermined location. The community will be engaged in the design process. A pilot program will allow the community & project managers to see the dynamics of layouts.

**Phase 3**
Phase 3 will integrate the market, cafes, art space, and community facilities. It will be based on community input and observations drawn from the pilot program. This layout is not fixed; alterations will be made as needed. The general orientation, however, is designed strategically and will be the basis for future configurations.
1. SPURA
2. PS 140
3. PS 142
4. Delancey St
5. Delancey St
6. Sculpture Garden
7. Mixed-use Residential
8. Community Facility/Education
9. Art Studios
10. Mixed-use Residential
11. Luther Gulick Playground
12. Event Park
13. Community Facility
14. Hostel
15. Residential/Community Facility
16. Co-working/Community Facility
17. Residential
18. Co-working
19. Pedestrian Bridge
20. East River Ferry
21. East River

LEGEND

Affordability/Mobility

0' 60' 140' 300'
Delancey Depot is designed in a way that reflects the unique needs and nuanced characteristics of the surrounding area. While the specifics of this concept cannot be blanketed onto a similar neighborhood, the underlying principles behind it can. This includes making an inviting pedestrian environment, increasing street activity, integrating disconnected neighborhoods, removing physical and mental barriers to the area, and increasing services and amenities to help improve the lives of the neighborhood residents.

There are numerous opportunities throughout New York City, and the nation, to transform underutilized spaces. NYCHA alone has 324 developments across the city. Many of these exemplify the “tower-in-a-park” design, the misguided modernist principle that sought to concentrate life in buildings and away from the street. The attempt to address issues of poverty and affordability ended up isolating the community, and hindering the social structures necessary for progressive development. The Delancey Depot concept can be applied more broadly to many of these sites. It has the potential to revitalize these campuses by filling the voids, literal and figurative, left by previous generations, thereby changing what it means to live in an affordable neighborhood.
What is intensity? How can we measure it? Is it bad or good for our neighborhoods? How can we increase or decrease intensity of a place?

Guided by these questions, this project starts from redefining and measuring urban intensity, then proceeds to a proposal of an alternative planning paradigm that will help bring intensity to places lacking it. The proposed planning paradigm is a combination of interrelated zoning regulations, participatory planning mechanism and urban design guidelines.

The main goal of this project is to explore innovative planning interventions that will encourage higher urban intensity, create a more vibrant street life, and enhance civic participation. Our framework is based on the idea of creating a nexus between mixed-use FAR and public accessible open space which will both create new financial avenues and reclaim, redesign, and re-programmed the public realm.

This concept is tested in the Grand Street East neighborhood, home to many Cooperative Housing projects. The main incentive is created through a new zoning paradigm that allow Co-ops to have bonus mixed-use development along the street if they provide public access to their currently exclusive green space. This framework sets out a new conversation on how planning can become more flexible and participatory to achieve the desirable intensity goal.
What is **Intensity**?

**From Density to Intensity**

Urban planners most of the times use standard metrics. They measure density by the number of dwelling units or people per unity area of land. But what do measures like average building FAR or population per acre feel like to residents or visitors of a neighborhood? How do places in which we live and work measure up and compare? Can objective, numeric measures really reflect the “urban-ness” of a place?

**Intensity**

The quality or state of an intense urban environment – high concentration of a diverse range of land use programs, human activities, and urban experiences. The magnitude of vibrancy in a defined spatial unit in both physical and social aspects.

Intensity draws from the rich social and cultural life, the different kind of activities that take place in a city and builds upon the potentials opened by denser areas, mixed-land uses, thus allowing with improvements and additions to the public space and circulation networks.

In order to unpack these complex issues around land uses, demographics, transportation, land cover, built density and social activities this project starts from defining intensity and exploring what it means for a place to be intense or unintense.

We propose to understand intensity as a multi-layered concept, illustrated in the diagram below.
Seeking an Alternative Definition

In the first part of our project, we examined the different layers that represent intensity for the Manhattan’s waterfront and we end up with an analysis of the built environment and the urban activities, as they are represented through the social media.

At the second part of the project, we take the neighborhood along the east end of Grand Street (Grand Street East), one of the main areas that lack both built and social intensity. At the same time, this area presents many opportunities because of its interesting history and the model of Cooperative Housing.
Why do places have different levels of intensity?

Along Grand Street, urban experience changes dramatically from west to east. As building gets higher, driveway grows wider, active street frontage becomes fragmented and programs monotonous, the feeling of “urban-ness” fades. The tower-in-the-park typology does give the east end of Grand Street more light, air and open space; but it also brings down the intensity level to the point where there is almost no vibrant street life.

The following analysis shows how intensity is affected by five major factors of the built environment.

1. Building Footprint
From west to east, buildings grow taller yet on smaller footprints. Many co-op housing towers also retreat from the street, leaving large underutilized spaces in-between such as parking lots or passive green spaces.

2. Mixed-use
All mixed-use buildings along Grand St. are shown on the right. As the density of these buildings decreases from west to east, the intensity level decreases significantly.

3. Active Frontage
From west to east along Grand St., street level retail becomes less common and active frontages much less continuous, which contributes to a decrease in intensity.

4. Green Space
Green spaces can affect intensity in both directions. If they are publicly accessible and actively used, they add to intensity; whereas those with only aesthetic function or controlled by only certain group of people (e.g. Co-op) bring down intensity due to their limited usability.
5. Street Design
Besides the building and land use typology differences, how street level spaces are designed, programed and used also contributes to intensity level.

Interestingly designed functional artwork is fenced off from children who might be in playing with it.

Benches are placed outside the fenced lawn, facing the wide driveway.

Existing ground level retail in front of Co-op towers is often large pharmacies with minimum street interaction.
How could intensity be lost in time?

Tenement Period

Intensity was brought to Grand Street as immigrants came to New York City seeking a better life. From 1800 to 1880, buildings that had once been single-family dwellings were increasingly divided into multiple living spaces to accommodate the rapidly expanding immigrant population, i.e., tenements. Living spaces on Grand Street were compact, population density high. The streets were packed with business activities and social interaction.

Intense, vibrant, and affordable as it was, tenement living brought growing concerns among residents, reformers, and city government because of its overcrowdedness and substandard living condition. However, private capital was reluctant to go into affordable housing development due to lack of profitability.

Cooperative Housing Period

After the establishment of Limited Dividends Housing Companies Act in 1926, unions started to utilize its incentives to construct housing for their workers in Lower East Side, clearing of tenements and erecting cooperative housing towers.

These large scale developments improved residential condition for working class immigrant families. But they also created impermeable superblocks, exclusivity of space, separation of uses, and an inward-looking communal lifestyle, all of which contributed to lower intensity.
Market Conversion of Co-op Housing

In the past, to maintain affordability, cooperative ownership meant shares had to be sold back to board for original amount of money when apartment is sold, then resold to buyer of moderate means for same amount. But this system phased out in 2000 in favor of market rate prices and private ownership.

As a result of this private market conversion, residents of Co-op housing now cover a wider spectrum of age, income and ethnicity, who also demand a different set of services and amenities around them.

Moving Forward

Today, the neighborhood has a mixture of Co-op superblocks and limited number of low-rises with ground floor retail spaces. The lack of active street level uses on most blocks means eastern Grand St lacks the vibrancy of Grand St. in SoHo and Chinatown/Little Italy.

Since intensity itself is no longer associated with overcrowdedness and poor sanitation, we propose to leverage planning tools to bring it back to the neighborhood as a means to achieve a level of density and mixed use that can generate convenience and vibrant street life.

Evolving Neighborhood

There is a nexus between the social and physical structure of a neighborhood. The evolving social structure of Grand Street shaped and reshaped the physical structure of the neighborhood, leading it through continuous transformations.

Moving forward, the physical structure of the neighborhood, including the building typology and spatial allocation of uses, needs to evolve and keep up with the changing social structure.

Diagram: Nexus between Social & Physical Structure

1947
Hillman Houses, sister project of Amalgamated, was planned and built.

1950 - 1959
After lull in 1930’s depression and 1940’s WW II, 1950’s sees construction of three large additions to Co-op Village, demolishing huge part of street grid and tenements on eastern Grand St

1997-2002
All Co-ops in Co-op Village vote to change ownership from limited profitability to market rate, greatly altering unified dynamic of residents

Present Street Scenes
How can intensity be brought in to places lacking it?

Our analysis shows that the lack of intensity around Grand Street East has deep roots in the historic changes of the social structure, built environment and needed land uses. While modernist planning paradigm and Co-op living solved many urgent urban problems at the time, we argue that the pre-existing conditions like overcrowdedness and poor sanitation that called for modernist planning has become history; recent changes in the demographic and social composition of the neighborhood are creating new conditions that call for a new planning paradigm.

By leveraging the right planning tools, including zoning regulations, facilitating mechanism and design guidelines, intensity can be brought into places that are in need of it.

**Concept**

The following diagram illustrates how we envision planning can alter form, function and meaning of Grand Street East neighborhood to create a more intense urban environment.

**Form**

The form of a place is constructed by essential urban elements, e.g. building typology. Places with human-scale and pedestrian-friendly forms tend to create more vibrant street life and higher level of intensity.

**Function**

Functions are the uses of a place. The spatial mix of a diverse range of functions is essential to intensity.

**Meaning**

Social organization and interpersonal interaction are closely related to the meaning of a place. How and where these social activities happen is essential.

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**Tenement Period**

**Co-op Period**

**Planning Objectives**
Form, function and meaning are three main elements that construct a place. As the conceptual diagram below illustrates, planning provides different tools that affect all three elements, which then in turn shapes places.

We envision our alternative planning paradigm to shape places via:
- Fusion Zoning: Regulating only building size, density and the way land should not be used.
- Block-based Planning Mechanism: Establishing and facilitating decentralized, participatory, and interactive planning processes.
- Design Guidelines: Recommending design strategies that enhance street level urban experience.

By enhancing cohesiveness of the built environment, allowing more flexibility in the spatial mix of uses, encouraging active uses of open space and strengthening civic participation, intensity can be brought back to the neighborhood.

Form
Le Corbusier’s “light and air” and Jane Jacobs’s vibrant “street life” blended.

Function
Live, work, trade and play co-located.

Meaning
Public realm expanded. Block-based participatory planning process established.

A diverse but cohesive community that makes decisions collectively
An Alternative Zoning Model: Fusion Zoning

Limitations of Conventional Zoning

Zoning provides specific and detailed control of the type and intensity of land use within carefully defined districts or zones. It is a precise technique and can be applied to regulate density, use, and other factors that protect the health, safety, and welfare of the city’s residents.

When land use regulations are still necessary, conventional zoning sometimes can be highly inflexible as a way to plan and shape growth and it does not always fulfill the needs of the modern cities. Principles and methods of land use planning, transportation, policies and economic development are changing, as are social norms and demographics. Furthermore, conventional zoning does not always address or set guidelines for urban design and architectural quality.

In New York City, since the establishment of the 1961 Zoning Resolution, new approaches have been continually developed to deal with issues and opportunities that emerge as the city grows and changes. Different combinations of incentive zoning, contextual zoning and special district techniques have been used to make zoning a more responsive and sensitive planning tool. Major concern is to be able to increase flexibility while addressing a range of goals as diverse as New York City’s neighborhoods.

Our Approach: Fusion Zoning

Rather than having zoning districts of just one component, Fusion Zoning is a combination of separate and independent zoning components, as uses not allowed, site, and bulk characteristics. Each of these components can then be combined to create a “Fusion” Zoning district.

Fusion Zoning is not prescribing a strict list of allowed uses as conventional zoning codes do; rather, it only specifies incompatible uses that are not allowed. In addition, Fuzion Zoning boundaries are not restricted by the underlying zoning districts’ boundaries. A fuzion zone may or may not encompass the entire underlying zoning district. Likewise, a fuzion zone can cover more than one zoning district, or even portions of several underlying zoning districts.

This provides a flexible approach to zoning, while preserving the basic standards that code users are familiar with. It has the effect of a series of overlay districts, so it is more complicated than conventional districts.

The new model of Fusion Zoning aims for:
- Adaptability
- Flexibility
- A performance-based system
- A community based system
To allow comparison between the existing zoning model and the proposed new paradigm, the following summary table of Grand Street East neighborhood is laid out.

<table>
<thead>
<tr>
<th>Zoning District</th>
<th>Uses</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R7-2</strong></td>
<td>Medium-density apartment house districts, low apartment buildings on smaller zoning lots and taller buildings with low lot coverage on larger zoning lots (50% min required parking, Open Space Ratio: 15.5–25.5).</td>
<td>Max 3.44 FAR</td>
</tr>
<tr>
<td><strong>R8</strong></td>
<td>High-density apartment house districts, mid-rise 8-to-10 story buildings to much taller narrower buildings set back from the street on large zoning lots (40% min required parking, Open Space Ratio: 5.9–11.9).</td>
<td>Max 6.02 FAR</td>
</tr>
<tr>
<td><strong>C2-5 Overlay</strong></td>
<td>Commercial overlay mapped along streets that serve the local retail needs of the surrounding residential neighborhood, and are found exclusively throughout the city’s lower- and medium-density areas, and occasionally in higher-density areas.</td>
<td>2 FAR</td>
</tr>
</tbody>
</table>

As indicated on the zoning map, the majority of the site is zoned as R7-2 and R8 Residential. There is also a small portion of the site zoned with commercial C2-5 overlay.
The Fusion Zoning Code

Two interdependent land use categories are proposed: Mixed-use Overlay (MU) and Urban Green - Open Space (UG). The two are linked with a FAR Bonus mechanism, requiring that neither can be utilized without the other.

New Land Use Category 1: Mixed Use Overlay (MU)

MU Mixed Use Overlay
Mixed Use Max Height: 33ft

In order to encourage mixed use which in turn brings more intensity into the area, we propose a new "Mixed-Use Overlay" that allows for a greater flexibility in the spatial mixture of different land uses. All new mixed-use development within these overlays would be required to line up with existing buildings in order to maintain a continuous building frontage and allow necessary vistas/access points to the Urban Green spaces (UG) with minimum width of 25 feet.

The Mixed-Use Overlays designated in the zoning map below is built upon and beyond the existing Commercial Overlay (C2-5), allowing mixed use more widely while also encouraging the formation of a more continuous mixed-use streetfrontage along Grand Street.

Under the Fusion Zoning model, zoning codes only state the "Uses Not Permitted" in the Mixed-use Overlay, instead of prescribing all allowed uses.

Uses Not Permitted:
- Uses with negative environmental/sanitary impacts or consequences on the wellbeing of the residents
- Noise non-compatible uses (Allowable Sound Levels: 42 decibels as measured from inside nearby residences)
- Uses that produce hazardous/medical/toxic wastes
- Uses that require high parking requirements
- Others: Auto-repairs, Gas stations, Funeral Homes, Motels, Hotels, Event Venues, Stables

Additionally, uses that require large continuous floor plates (such as large banks, mega-stores, large super-markets) are not allowed on the groundfloor.

<table>
<thead>
<tr>
<th>Width in Feet at StreetLine</th>
<th>Max Building Height through Bonus Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Stories</td>
</tr>
<tr>
<td>50 feet</td>
<td>3 floors</td>
</tr>
</tbody>
</table>

Fusion Zoning Map
The Mixed Use Overlay designation does not automatically allow new mixed-use development. Instead, those development rights/mixed-use FAR can only be utilized in pair with the second new land use category: Urban Green/Open Space.

**New Land Use Category 2: Urban Green - Open Space (UG)**

In order to realize the Mixed-Use Overlay designation into new development, new publicly accessible space has to be provided on the same block. In most cases, this exchange mechanism is specifically designed for Co-op Housing occupied and owned superblocks.

The Urban Green - Open Space (UG) designation reserves open space that is currently privately owned by Co-ops but can be opened up to allow public access and programming, if the Co-op chooses to utilize the FAR Bonus mechanism. Those new public space created via this process is Co-op Owned Public Space, whose quality determines how much mixed-use FAR bonus the block is allowed.

**Characteristics that Measure the Quality of the Co-op Owned Public Space:**

- **Time of operation**
  The schedule of operation of the park for the public

- **Programming**
  The programs that the Co-ops will organize to take part in the urban green-open space

- **Size**
  The size of the urban green-open space devoted to the public

In that way the Co-ops have the freedom and responsibility to decide what kind of open space they will provide to the public and how much new mixed-use development they need on their block. This process is further facilitated by a participatory mechanism: block-based Planning, which will be elaborated later (see page 18 – 19).
Imagining Planning Outcomes

By providing new public spaces to the public, we want to ensure that the Grand Street East will become more open and people will be able to socialize and meet their neighbors. This FAR - Open Space exchange mechanism will encourage the Co-ops to break through exclusive communalism and embrace the whole community while securing new financial source.

In addition, the existent public spaces are lacking of comprehensive design, programming and interesting elements. With the new proposal the residents and visitors of the area will be able to make use of new well-designed, well-programmed, and expanded open spaces in order to socialize, stroll, relax, enjoy and interact.

Design Guidelines for Public Space in Urban green - Open Space (UG)

The design of these new open spaces should:
- Be open and inviting
- Be easily seen and read as open to the public
- Convey openness through human-scale design elements
- Enhance pedestrian circulation
- Be oriented and visually connected to the street
- Provide sitting

If well-designed and programed, these new open spaces will increase the economic value of the area and will have a positive impact in the old and new businesses located in the district.

Urban Green - Open Spaces open to the public and with interesting programs will add recreational and social (through the social interactions that will be formed in the space) value to the neighborhood. The goal is to increase intensity through spontaneous interactions that occur along a busy Grand street, where there are variety of uses attracting different groups of people.
An new continuous mixed use street-front (1-3 Floors) will cover the needs of the residents for different uses and will provide new interesting destinations for the visitors.

Sections representing the differences before and after Fusion Zoning.

**Existing Street Section:**
Clear differentiation of public and private space, unprotected bike-lines, streets designed for cars not pedestrians and lack of continuous street front.

**Street Section after Adopting Fusion Zoning:**
Creation of a continuous mixed use street frontage, expansion of the public realm, protected bike lines and more space for the pedestrians.
Making it Work: Block-based Planning

Why Block-based?

Requiring Co-op housing to open up their privately owned green space by zoning can help create a continuous public realm for the neighborhood, for people who live here as well as visitors. However, making it work needs proper facilitating mechanism.

This alternative form of community participatory planning is proposed based on the rationale that every Co-op Housing block has its own social and physical characteristics and land use needs; therefore the residents of each block should have the autonomy to decide how they want (or do not want) to utilize the FAR bonus mechanism the city is proposing.

The following map shows two different types of enclosed co-op owned green spaces. Block-based planning acknowledges the difference and recognizes why different Co-ops might decide to allow different levels of public access in their green space.

This map demonstrates that block-based planning is a more fine-grained participatory approach, because the basic planning unit is a block instead of a community district.
Public Space Provision in Exchange of FAR Bonus

When a Co-op provides a high quality Co-op Owned Public Space of appropriate size, programming and open hour, they will get more FAR on their site for new mixed-use development. On the other hand, if residents in a Co-op come to the consensus that they neither want to make their enclosed green space more publicly accessible nor need new development on their site, they may choose not to participate at all.

But for the Co-ops that are interested in participating, they can approach City Planning with a new development plan they envision for their site under the Fusion Zoning Code and a plan/design for their Co-op Owned Public Space. City Planning will then review their two plans, and decide how much FAR the Co-op should receive.

The diagram below illustrates such weighing concept.

Type A: Fenced Passive Lawn

Type B: Residents-only Recreational Space
What if this empty lawn could be made into an open and well-programmed Co-op Owned Public Space...

**Defining Co-op Owned Public Space**

Modeled after the successful New York City POPs (Privately Owned Public Space), Co-op Owned Public Space is the space owned by a Cooperative Housing that allows all people to have access to it (at certain times) and (the allowed) activities within it in exchange of certain development right bonus. The size of the bonus corresponds with the quality of the space provided.

All Co-op Owned Public Spaces are managed by a collaborative organization named “Co-op Owned Public Space Committee” that is composed of representatives of each participating Co-op, local businesses, and residents that do not live in Co-op housing.

The mission of the Co-op Owned Public Spaces is to:
- Enable cooperative housings to be financially more self-sustaining
- Help create a continuous/uninterrupted public realm in the city

**What is the Process of Block-based Planning?**

1. **Form Your Block Planning Team** - Each Co-op Housing forms its own block-based planning team that equitably represents all residents.

2. **Start Planning Your Block** - Block Planning Team organizes the residents and other stakeholders to decide how much new development, what kind of mixed uses to have and what type of Co-op Owned Public Space to provide on your site.

3. **Submit Your Block Plans to City Planning** - Submit your plan to Department of City Planning.

4. **Discuss with Department of City Planning** - Discuss your plan with Department of City Planning and finalize your plan.
To balance autonomy with neighborhood cohesiveness, block-based planning efforts must comply with the following two rules:

- **Rule of Collaboration**
  - Rule of Collaboration requires that the each block planning team communicate and plan with blocks with similar characteristics. The map below identifies three pairs of collaborative block planning teams.

- **Rule of Adjacency**
  - The Block Planning Team has to include one representative from each of the adjacent residential block on Grand St. (Solid arrows)
  - In addition, representatives from adjacent blocks outside the Grand St. Corridor, and non-residential blocks have to be invited to critique the plan. (Dashed arrows)
Phasing by Design: Showcasing Intense Urban Experience

The implementation of the previously elaborated mixed-use bonus mechanism and the block-based planning policy largely relies on active civic participation.

Although many Co-ops have voiced their interest in finding new financial avenues to help cover the growing maintenance cost of their buildings and infrastructure, it will not be easy for them to make immediate changes without knowing the possible outcomes.

Therefore, it is important to utilize streets and existing public space to first showcase to Co-op organizers, residents and other stakeholders how it feels like to be in a more intense urban environment. This would help foster awareness and enthusiasm for participation.

Therefore, we propose a phasing strategy. There will be three main phases for implementation:

1. Redesign & reprogram streets & existing public space
2. Pilot projects in interested Co-ops using temporary structures
3. Mobilize wider participation & more permanent construction

Phase 1: Intensify Existing Public Space
Redesign & reprogram streets & existing public space to bring in intensity

- Using street paving to signify the old urban fabric

- Redesigning pedestrian- and bike-friendly streets

- Creating pop-up cultural or leisure centers to fill in underutilized in-between spaces

- Building a new urban history & planning center to raise awareness and build capacity for block-based planning

Phase 2: Trial-and-Error
Pilot projects in interested Co-ops using temporary structures

Assuming some Co-ops will be more interested than others and would like to undertake a pilot project on their land, they can try out the new planning system by putting in temporary, movable, or even modular structures for new mixed-uses (e.g. cafes, restaurants, offices for small businesses, etc.) on Co-op land and opening up part of their green space to allow public access.

This trial and error period will help both the residents and the city figure out what works and what not before putting down large capital investment and implementing anything permanently.
Phase 3: Full Implementation
Mobilize wider civic participation & more permanent construction

When enough interest in participation is built up and adequate practical experience gained during the piloting phase, City Planning can help Co-ops to conduct more formal and regulated implementation.

We envision the proposed Fusion Zoning, block-based planning and design guidelines will create an intense, interesting and enjoyable corridor.
Bibliography

Introduction
Page 4: Photographs by Albert Vecerka, Esto Photographics

Accessibility
Page 13: (Text and image of architectural blocks)


Page 21: (Image of St. Nicholas House infill)


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