El Barrio Verde
An Eco-District for East Harlem
Fall 2015 Studio Team

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In the process of developing our presentation and report, we received a great deal of support from our professor, our client, the community, and several interested individuals along the way. We truly appreciate their time and the invaluable information they provided that was vital in helping craft our vision of El Barrio Verde. In particular we would like to thank:

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Recent events indicate that our cities need to begin planning for harsher conditions. We are facing a rapid rise in global temperatures, with 10 of the warmest years in the 134-year record occurring since 2000. Violent storms like Hurricane Katrina and Hurricane Sandy claimed thousands of lives, caused billions of dollars in damage, and destroyed communities that have never fully recovered. In East Harlem, environmental improvements are especially necessary since this area is vulnerable to storm surges and flooding. However, ‘green’ rhetoric is often used as a façade for changes designed to make working-class neighborhoods more attractive to the middle class, which would accelerate gentrification and displace long-term residents. Any environmental program in this area must take into consideration East Harlem’s complex social and economic conditions, and address the needs of existing long-term residents without inadvertently encouraging gentrification.

One way to address this set of concerns—as outlined in the El Barrio Verde proposal—is to create an Eco-District that is tailored specifically to East Harlem. The Eco-District concept is a holistic approach to sustainability that takes into consideration both regional environmental issues and local concerns ostensibly unrelated to the environment. In East Harlem, many residents are concerned about unemployment and rising housing prices. Can green initiatives address these issues? Our planning studio—in partnership with Lott Community Development Corporation—created a plan that finds common ground between various complex issues that are facing the neighborhood. Rather than viewing economic development, affordable housing, and environmental resilience as unrelated issues, El Barrio Verde—informed by the Eco-District model—begins from the assumption of their commonality.
OUR PLAN IS GUIDED BY THE FOLLOWING GOALS:

1. **Sustainability**: Use environmentally friendly practices to decrease energy consumption, reduce the area’s carbon footprint, and mitigate the impacts of climate change
2. **Health and Safety**: Implement programs and infrastructure to promote healthier lifestyles and improve safety for pedestrians and bicyclists, while reducing crime rates
3. **Affordability**: Create an economically inclusive community with new green affordable housing units while creating opportunities to retain local existing affordable housing
4. **Livability**: Create a more unified community and stronger cultural district while improving opportunities for local employment

El Barrio Verde aims to address the needs and opportunities of East Harlem and works towards the betterment of the East Harlem community. The plan is grouped into the following six categories:

### I. PUBLIC OPEN SPACE IMPROVEMENTS

Based on observations and conversations with local residents, our team identified that open spaces in the area do not feel safe or accessible. Significant open space and natural resources just outside of the study area—Central Park to the southwest, the waterfront to the east, and Randall’s Island across the East River—feel disconnected from the neighborhood while many NYCHA’s open spaces are fenced off and unusable. Our recommendations for open space seek to resonate with local culture and history while improving the quality of public space, enhancing the network of community gardens, and increasing resiliency.

As part of the open space improvements, we recommend the establishment of a Botanic Cultural District that includes:
• A reconfiguration of parking lots in order to free up more space for public use
• New community gardens and parks within the NYCHA towers
• A new building for an East Harlem Community Garden Resource Center
• Playground improvements that include making open spaces accessible to the elderly
• A new building for an East Harlem Culinary Cultural Center, which will include a food museum and job training
• An extension of La Marqueta, which is an existing local cultural institution
• A new building for an urban farm called La Torre Cultiva
• A new building for a conservatory rainforest called Little El Yunque
• Two new promenades that make connections within the NYCHA campuses and extend to the waterfront: El Paseo De Las Dalias and El Paseo De Las Cebias

To further improve open spaces, we recommend the following waterfront improvements:
• Implement infrastructure to increase resiliency and recreational opportunities at the shoreline
• Conduct landscape improvements along the waterfront esplanade
• Establish a better connection to the waterfront through footbridge improvements
• Extend Thomas Jefferson Park to the waterfront by decking over the FDR Drive
• Build an educational Sustainability Center and Boathouse on an existing pier
• Set up an educational tidal power plant

2. MICROGRID DEVELOPMENT TO ENCOURAGE SUSTAINABLE ENERGY SOURCES

Establishing a microgrid within our study area’s NYCHA campuses is an important measure to ensure the resiliency and sustainability of the neighborhood, especially since much of the area is located within the city’s flood evacuation zone. A microgrid will ensure that electricity is provided to the community during power outages affecting traditional energy sources. With our plan, solar power will provide most of the power to these buildings if there is a disruption to the grid, but we also recommend supplementing this energy source with other sustainable sources, such as wind turbines.
Several issues were identified pertaining to the street network, including: insufficient lighting, lack of street trees, confusing and underutilized pedestrian pathways, dangerous conditions for pedestrians and bicyclists, heavy truck and delivery traffic, litter, crowded buses, lack of crosstown transportation, and limited access to the waterfront. To address these conditions, we make the following recommendations:

To improve safety:

- Install solar powered streetlights
- Construct pedestrian safety infrastructure at dangerous intersections, especially along 116th Street, 2nd Avenue, 3rd Avenue, Madison Avenue and 5th Avenue
- Add protected bike lanes on 112th Street and 115th Street
- Build a Woonerf (shared street) on 112th Street
- Close 116th Street between Park and 1st Avenues to make room for a pedestrian plaza

To increase connectivity:

- Expand the CitiBike program beyond 86th Street
- Establish an electric car share, The Electric Barrio
- Connect the neighborhood through The Barrio Bus shuttle service
- Extend ferry service to 111th Street
After speaking to local residents and consulting Community Board 11’s Statement of District Needs, we determined that unemployment is a large concern in East Harlem. The unemployment rate for NYCHA residents within our study area is 21%. This number is high compared to our study area as a whole (16%), East Harlem as a whole (12%), and the average for New York City (11%). The recommendations within each section of our plan focus on addressing unemployment by creating jobs and training opportunities for the local residents. We believe that the following programs will help mitigate unemployment:

- Horticultural job creation and training program in the urban farm, La Torre Cultiva
- Botanical job creation and training program within the indoor conservatory, Little El Yunque
- Implementation of a street cleaning program to address litter
- Job creation and training program for retrofitting and the construction of new housing
- Allow for green manufacturing jobs in certain zoning districts to foster the creation of green jobs
One of the many challenges facing East Harlem is housing, which is plagued by deteriorating building conditions, health risks as a result of these building conditions, and a lack of affordability due to rising rents. We identified underutilized development rights within the NYCHA campuses and on underbuilt lots as a potential opportunity to make housing improvements. In order to improve the quality and quantity of housing, our team proposes the following recommendations that focus on sustainability, affordability and equity:

Rehabilitate NYCHA Owned Properties by:
- Converting NYCHA developments into the Rental Assistance Demonstration program
- Establishing a new Transfer of Development Rights program

Rehabilitate Privately Owned Properties by creating:
- A Transfer of Development Rights program
- Affordable housing incentives
- Community facilities incentives
- Green infrastructure incentives

Create New Affordable Housing by:
- Granting non-profit developers long-term leases of NYCHA properties
- Building new affordable housing through the NextGeneration NYCHA program
- Encouraging new affordable housing on privately owned underdeveloped or vacant land through the creation of a Special Purpose District
Zoning plays an important role in our proposal for an Eco-District. Within the scope of zoning, our team has outlined three main goals: alleviate NYCHA's financial situation with respect to local building repairs, create new affordable housing while preserving the existing affordable housing stock, and encourage the implementation of green building design and infrastructure. To enable the success of the Eco-District, we recommend the creation of a Special Purpose District called the Special East Harlem Eco-District.

The Special East Harlem Eco-District will include: Special Growth Zones that focus on the transferring of developments rights, mandatory inclusionary housing, green building design standards, and the creation of bioswales
- Upzoning 2nd and 3rd Avenues by changing from a R8A Districts to a R8X District
- Creation of commercial overlays along NYCHA campuses to create consistency with the zoning north and south of these developments
- Incentivized community facility creation by allowing a portion of this space to be completely deductible floor area

East Harlem is already undergoing a transition, with luxury high-rises sprouting up across the neighborhood; it is on the verge of becoming another story of gentrification. But we believe the plan for El Barrio Verde will revitalize the community to make it a more vibrant, safe, and sustainable place to live while maintaining the culture of the neighborhood and keeping it affordable for its current residents. This will be an Eco-District model for equitable transformation, not gentrification.
EL BARRIO VERDE
We are Hunter College Urban Planning students working on a studio project in East Harlem focused on creating a greener, healthier, more sustainable neighborhood. We have studied the area to address challenges of climate change, resource scarcity, environmental justice, equity, and housing affordability. We are Julia Carey, Sofia Davila, Jason Diaz, Crystal Hunter, Nick Legowski, Diane Luebs, Matthew McLaughlin, Oria Mertah, Antti Moelsae, Mia Moffett, Maria Sosa, and Samuel Smouha with our professor Pablo Vengoechea.
East Harlem’s History
Although the cultural makeup of East Harlem has continuously transitioned over the years, it has long retained a working class character. In its early history, East Harlem was home to Dutch and French Huguenots that established a small village centered in what was mostly farmland. In 1880, the New York Elevated Railroad extended the Second Avenue Elevated line to the Harlem River and had similar plans for the Third Avenue line. This affordable form of transportation made the area very attractive for working families looking to relocate from the overcrowded Lower East Side. From the 1880’s through the 1940’s, East Harlem saw waves of new settlers moving into the area, including Italians, Eastern Europeans, Puerto Ricans, African Americans, and West Indians. But like many American cities in the 1950’s,
East Harlem experienced a mass exodus of white, middle class families. Left behind—due to restrictive racial covenants and other barriers to integration—was a largely poor and working class African American and Puerto Rican community. Concurrently, the area experienced economic disinvestment and a rapid deterioration of the tenement buildings making the area a prime target for federal slum clearance.

Today, East Harlem is a neighborhood home to many ethnic groups. While mainly a Black and Hispanic neighborhood, this area is home to a large number of Puerto Rican, African American, Senegalese, and Mexican residents and a small Italian-American community. But this neighborhood has endured more than its fair share of hardships and struggles with poverty, unemployment, crime, drug abuse, high asthma rates, and AIDS. It has also been an area that has endured waves of misguided renewal efforts in the past, most notably the construction of massive public housing projects that are central to the neighborhood and are built in the Corbusian “tower in the park” style.

**Community Profile: Demographics and Health**

Today, the population of East Harlem is largely comprised of minority groups with Hispanic and African American residents accounting for 47% and 30% of the population, respectively. Although there has been a significant increase in the number of new residential buildings, East Harlem is still an area that struggles with poverty and unemployment, making it difficult for residents to improve their conditions. NYCHA residents in our study area have an unemployment rate of 21% compared to the average 11% unemployment rate in all of New York City and the 12% unemployment rate for East Harlem. This economic struggle is reflected in the median household income for East Harlem, which is $30,430 per year compared to $52,259 for New York City as a whole; NYCHA residents have a far lower median household income of $24,619.2

Education is another area of concern, especially within NYCHA housing. East Harlem as a whole tracks consistently with the rest of New York City: 78% of residents in East Harlem have a high school degree and 32% have a bachelor’s degree or higher, compared to the overall New York City average, where 80% of residents have a high school degree and 35% have a bachelor’s degree or higher. This is in stark contrast with the education rates for NYCHA residents, where 53% of residents have graduated from high school and only 9% have obtained a bachelor’s degree or higher.3 According to data from NYCHA, there are 16,247 residents living in the NYCHA developments within our study area. Specifically, there are 6,938 families with an aver-
age family size of 2.4 and a total of 4,276 children under 18 years of age. The average rent within these developments is $464.50 per month. On average, residents of these developments have lived in public housing for 24.9 years. In 2014, NYCHA’s campuses within our study area used 22,297,310 KWH of energy; 5,901,955 therms of gas heat; and 276,591 therms of cooking gas.

Deteriorating conditions and issues of inequality predictably have an adverse affect on health, and East Harlem is no exception. This community faces:

- Higher than average rates of heart disease, obesity, diabetes, HIV/AIDS, asthma, teenage pregnancies and infant mortality, and lower than average access to healthcare
- Higher heat-related emergency room visits than other parts of NYC
- Shorter life expectancy: 10 years younger on average than other NYC neighborhoods
- High rates of childhood asthma: More than one in 10 children under the age of four are hospitalized for asthma
- High poverty rates: Almost one-third of the neighborhood lives below the poverty level, making the community more vulnerable to environmental hazards
- Susceptibility to damage from climate change: 95% of neighborhood is in a hurricane evacuation zone.

The disparity between the NYCHA developments and the rest of East Harlem is a
Housing (MIH) and Zoning for Quality and Affordability (ZQA). In short, MIH uses zoning to create affordable housing by forcing developers to use market rate units to subsidize affordable ones. ZQA is a series of changes to the zoning text that will give developers more flexibility in how they design their buildings, as a way to promote improved housing conditions. Both initiatives are controversial and are being accompanied by major neighborhood rezonings in various New York City neighborhoods, such as East New York, the Jerome Avenue Corridor of the Bronx, and East Harlem.

In this context, a group of local leaders and organizations—including our client, Lott CDC—is working on a community-driven comprehensive plan for East Harlem. Spearheaded by City Council Speaker Melissa Mark-Viverito, this plan will cover a wide range of topics including open space, culture, housing, economic development, transportation, education, safety, and the environment. The planning process included six community visioning sessions, which were held approximately once a month from June to December of 2015; members of our studio attended the sessions that covered economic development, housing, and zoning. The community’s input and response to this effort has been significant, and was reflected in the attendance of the visioning sessions. At the housing and zoning meeting in November, for example, over 150 people attended. The fact that our project coincided with this larger effort creates a unique opportunity for our plan to have a larger impact, since residents of East Harlem are actively assessing the needs and opportunities of their community and are looking for ideas.

East Harlem has also been the subject of a number of previous plans. Most recent was the 197-A plan sponsored by Community Board 11 in 1999, which had the following goals: increasing housing opportunities for all income groups, strengthening the existing retail and business corridors, rehabilitating vacant buildings, increasing educational and employment opportunities, and strengthening cultural resources and open space. Previous plans also include a 1988 document called East Harlem: A Development Strategy, prepared for the New York City Public Development Corporation by Buckhurst Fish Hutton Katz Inc., and a 1978 neighborhood plan.

The Department of City Planning, meanwhile, is looking at major changes to the zoning code. The centerpieces of these changes are Mandatory Inclusionary Housing (MIH) and Zoning for Quality and Affordability (ZQA). In short, MIH uses zoning to create affordable housing by forcing developers to use market rate units to subsidize affordable ones. ZQA is a series of changes to the zoning text that will give developers more flexibility in how they design their buildings, as a way to promote improved housing conditions. Both initiatives are controversial and are being accompanied by major neighborhood rezonings in various New York City neighborhoods, such as East New York, the Jerome Avenue Corridor of the Bronx, and East Harlem.

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WHAT IS AN ECO-DISTRICT?

The Eco-District is a model for urban revitalization that is rooted in collaboration and social, economic, and ecological innovation. It focuses on neighborhoods and districts as the building blocks for sustainable cities. The Eco-District recognizes the complexity of sustainability and the impossibility of achieving it through singular projects disconnected from larger systems. Much like eco-systems, which consist of many smaller parts, the Eco-District is comprised of many small interventions that work together to benefit the whole.
The Eco-District also combines interventions at different scales. Global, regional, and local problems converge in any plan, but especially one focusing on sustainability. Across the globe, the climate is warming and storms are becoming more intense; in New York City, housing prices are rising and supply is struggling to meet demand; and in East Harlem, long term residents are trying to maintain their communities while creating economic, social, and cultural opportunities. How can all of these concerns be addressed? Do they need to be? In our view, they must be: if large-scale plans do not incorporate local concerns, they risk losing buy-in from the very people who must implement them. On the other hand, if neighborhood-level plans don’t address large-scale problems like global warming, they simply ignore the problem for others to solve. And global warming is not an issue that East Harlem – or anyplace else – can ignore any longer. The necessity of incorporating problems at many scales is the premise of the Eco-District and it is the essence of El Barrio Verde. This model of addressing environmental justice is most appropriate for East Harlem because of the area’s complex social and economic needs. In the face of gentrification, any environmental program in the area must address the needs and interests of long-term residents. Often, ‘green’ rhetoric is a façade for changes designed to make working-class neighborhoods more attractive to the middle class, which would accelerate gentrification and displace long-term residents. But environmental improvements are clearly necessary—especially in an area as vulnerable to storm surges and flooding. The East Harlem Eco-District can serve as a prototype for a new model of sustainable development. Addressing large-scale problems on the neighborhood level, the Eco-District returns to the global scale as an example for cities around the world to follow.
OUR STUDY AREA
We chose to focus our study area around the NYCHA properties in an effort to improve the lives of these residents and provide a healthier community for them to live in. The specific boundaries we defined are between 116th and 110th Streets to the North and South, and between the East River and Malcolm X Boulevard to the East and West.

Lott CDC selected the general study area of East Harlem due to their ongoing operations in this neighborhood, but our team was tasked with specifying the area within East Harlem to focus on for the creation of an Eco-District. Our specific boundaries were selected because we wanted to address issues of inequality that are prevalent within the NYCHA housing projects, and because this area presented the unique opportunity to act as a link between the East River waterfront and Central Park.

METHODOLOGY
Research
The studio made several visits to the site, both individually and as a group, to observe the neighborhood firsthand and detail some of the apparent issues we sought to resolve with our recommendations. These visits were integral as we were able to interact with residents, take photographs, and visualize the potential for a more environmentally sustainable community. Along with observation of the study area, the team researched topics related to East Harlem and environmental sustainability. East Harlem topics included history, culture, demographics, and cultural institutions. Environmental topics included green infrastructure and design, green zoning, and resiliency.

Out of this initial research—and along with community input—we identified topics for further research. These topics eventually became the focus of our plan: deteriorating and unaffordable housing, poorly designed open space, and unsafe streets. We split into groups based on these issues, which became the initial focus of the report.

Survey
To obtain direct input from the residents of East Harlem and gain insight on their perspective of the neighborhood’s issues and opportunity areas, our
team developed two 10-question surveys. They were largely similar, except for the last two open response questions.

We had 13 total responses with a variety of answers. But there was one thing that all respondents agreed on: open space in NYCHA developments should be used for other purposes. The most common ideas for redevelopment were cultural Institutions/community centers, community gardens, and education. This input is incorporated into the open space section of our plan in the form of a network of plant and food oriented cultural institutions. Many respondents also indicated that their favorite thing about East Harlem was the sense of community and people, and that the biggest changes they would like to see are new affordable housing and increased safety. The development of new affordable housing is a central component of our housing and zoning recommendations, and safety concerns are addressed through street improvements designed to increase pedestrian use and mitigate crime.

During the charrette, we asked attendees to participate in a group activity that would allow them to identify issues and opportunities in their neighborhood, specifically addressing the topics of health, safety and environmental sustainability. In total, we had about fifteen local residents in attendance, which allowed us to break up into three smaller groups for the exercise. This provided our team with the opportunity to gather more detailed and diverse information from the participants.

**Community Charrette**

We held our Visioning Workshop on Thursday, October 8th 2015 at the Hunter College Silberman School of Social Work in East Harlem. Prior to this workshop, we distributed leaflets throughout the neighborhood and in local schools. We informed community members that our intent was to create
a plan to address public health, open space, and sustainability in East Harlem.

We asked community members to participate in a dot exercise while they waited for the charrette to begin. This exercise included a brief description of green infrastructure elements and asked the community members to tell us how much they wanted to see these elements in their community. We also handed out pamphlets, which included educational material about Eco-Districts and a summary of our research thus far.

During the charrette, we asked attendees to participate in a group activity that would allow them to identify issues and opportunities in their neighborhood, specifically addressing the topics of health, safety and environmental sustainability. In total, we had about fifteen local residents in attendance, which allowed us to break up into three smaller groups for the exercise. This provided our team with the opportunity to gather more detailed and diverse information from the participants.
The questions asked on the survey:

- Please rate how eco-friendly you consider yourself. For example regularly recycling, composting, limiting energy/water usage, etc. (1 = not at all, 5 = very eco-friendly)
- Please rate how important sustainability and green issues are to you. (1 = not important, 5 = extremely important)
- How would you rate the quality of the parks in your neighborhood? (1 = very poor, 5 = excellent)
- How would you rate the quantity of the parks in your neighborhood? (1 = very poor, 5 = excellent)
- Do you support community gardens? (1 = in opposition, 5 = strongly support)
- How often do you drive a car? (1 = never, 5 = daily)
- How often do you take public transportation or ride a bicycle? (1 = never, 5 = daily)
- Should open space in NYCHA developments be used for other purposes? (Yes / No)
- What does an eco-friendly community mean to you? (Open response)
- What issues are you most concerned about in East Harlem? (Open response)
- What is your favorite thing about East Harlem? (Open response)
- What would you like to see changed in East Harlem? (Open response)
NEEDS AND OPPORTUNITIES

According to our charrette, the following needs and opportunities were identified:

ISSUES/NEEDS

1. **Lack of community centers/activities.**
   - There aren’t enough community centers in the area that provide opportunities for mentorship programs, and community centers that do exist have programs/activities that are cost prohibitive for lower income residents.

2. **Many areas, specifically around NYCHA housing and on 116th Street, feel unsafe and under-patrolled by NYPD.**
   - The fencing and scaffolding on NYCHA property creates dark and unsafe conditions.
   - Police officers are often from other areas and don’t understand the neighborhood they are there to protect. Officers are often unapproachable.

3. **Garbage and dog feces are a constant presence in the neighborhood.**
   - Garbage accumulates in streets and open areas around many apartment buildings leading to rodent problems.
   - Recycling bins are missing.

OPPORTUNITIES

1. **Improving safety by implementing more lighting in Thomas Jefferson Park, footbridges, and NYCHA paths, possibly with solar powered street lamps.**

2. **Removing fences in NYCHA properties to improve pedestrian circulation and open up more space for residents.**

3. **Create areas for residents to walk their dogs.**

4. **Develop programs to educate residents about hazards of littering and benefits of recycling.**

5. **Create jobs for local youth cleaning up the streets.**

The Community Board 11 Statement of Needs further identified needs in the community. The top needs, according to a survey of 1,000 East Harlem residents, indicated that 35% of respondents viewed education as their top concern, 16% viewed lack of job opportunities as their top concern, 14% viewed crime as their top concern, and 6% viewed affordable housing as their top concern.

GOALS

Informed by our research and interaction with members of the community, we developed four goals that would guide our recommendations for El Barrio Verde:

**Affordability:** Promote both the creation of new affordable housing and the preservation of existing affordable housing through a combination of zoning incentives and creative finance strategies.

**Sustainability:** Create an economically inclusive community that utilizes environmentally friendly practices and materials to maximize existing open space; encourage both the development of green affordable housing and green retrofitting of existing buildings; reduce carbon footprint and energy usage; and mitigate the impacts of climate change.

**Health and Safety:** Implement programs and infrastructure that create better open spaces, improve air quality, promote healthier lifestyles, and improve safety for pedestrians and bicyclists.

**Livability:** Create a more unified community and stronger cultural ties to its rich history through district wide improvements in community gardens, urban farming, cultural facilities and activities, and opportunities for local employment.
To address the concerns of the East Harlem residents and promote the development of the East Harlem Eco-District, our team made recommendations that address environmental justice, health, safety, and economic development. The level of monetary and temporal investment varies throughout the plan, and is detailed in the Analysis section of the report. The result is a three-tiered approach that can be developed in isolation or as part of a larger, cohesive plan that would have a greater impact on the community.
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GREEN INFRASTRUCTURE AND DESIGN

Green infrastructure and design is a method for incorporating environmental sustainability and conservation into the built environment. It is a holistic approach that uses interventions on a small scale as a way of achieving large-scale environmental goals, such as climate change mitigation and water quality improvements. In the East Harlem Eco-District, green infrastructure has a major role to play in tackling economic issues, social equity issues, and environmental justice concerns.

5 Boro Green Roof on Randall’s Island in New York City.

The East Harlem Eco-District will incorporate the following green infrastructure elements through open space redesigns, regulations for new buildings, and retrofitting:

- **Bioswales**: vegetation that collects and absorbs water runoff from sidewalks and parking lots. This treats water in a natural system, diverts storm water from storm drains, and mitigates flood risks.
- **Permeable pavement**: pavement that allows water to seep through it and reach the soil below, rather than diverting that water to storm drains.
- **Green roofs**: roofs covered with vegetation to provide insulation, absorb rainwater, and lower the urban heat island effect.
- **Ground source heat pumps**: a renewable energy source that transfers heat between the ground and pipes to allow heat from the Earth to warm the interior of a building.
- **Urban tree canopy**: carbon sinks that help reduced localized pollution while creating shade below them.
- **Planter boxes**: vegetation that absorbs carbon from the air while providing seating ledges around the plants.
- **Rain barrels**: storage tanks that collect and store rainwater that can then be reused for gardening, farming or flushing toilets.

At the building scale, we propose a three step framework be used to increase energy efficiency in the NYCHA developments:

- **Reduce energy loss in buildings through energy audits and weatherization**.
- **Ensure efficient use of fossil fuels by using lighting controls, upgrading elevators, replacing inefficient air conditioners, and tracking energy usage**.
- **Use renewable energy technologies, including solar thermal systems, photovoltaic thermal systems, and small wind turbines**.
MICROGRID

Locally generated renewable energy resources are a beneficial method for creating a more sustainable and resilient East Harlem. Renewable energy can be used to diversify energy sources, add clean energy sources, and protect the area's residents during emergency situations. As millions of people in the New York area have experienced during recent years, strong storms have the ability to disturb the city's power grid for days at a time, leaving families and businesses vulnerable to unsafe and stressful living conditions. Much of our study area is located within the city's flood evacuation zone, and thus needs improved resiliency measures as future storms become more frequent and severe.

To harness renewable local energy sources and achieve an increased level of resiliency in this area, our studio recommends the development of a microgrid system powered by renewable energy sources such as solar and wind. This system will allow a portion of our site to operate separate from the traditional grid to prevent reliance on New York City's traditional power sources. As described, this proposed system will increase resilience, as the microgrid system can “island” itself during a storm or emergency situation that could potentially disrupt the power supply for thousands of people. Specifically, we propose the development of this microgrid within our study area's NYCHA campuses since this area has substantial solar energy potential and because the long-term monetary benefits of renewable energy are direly needed by this money-strapped development. In addition, we recommend using the creation of this microgrid to bring about other environmental improvements; the required update of underground utility lines creates an opportunity to complete landscape design work, upgrade storm water retention systems, and develop geothermal heating systems. A large component of this microgrid will be energy from solar panels, since there is tremendous potential for renewable solar energy on NYCHA's rooftops. We used Sustainable CUNY's New York City Solar Map to determine the solar potential within these campuses. This Solar Map calculates this data with a computer model that processes incoming direct and diffuse solar radiation for each square meter of the city, while considering shading, sun positioning, atmospheric conditions, and latitude. Additionally, the model uses topography, available sunlight, and building

The geographic boundaries of our proposed microgrid.
shape to determine the viability of solar panels on each rooftop. Based on these calculations, solar panels in East Harlem’s NYCHA communities could generate 1,902.68 kilowatts of energy, while saving $468,201.00 in electricity bills and reducing 1,727,253 pounds of carbon emissions each year. This would have the equivalent impact of planting 4,608 trees. While this data is impressive for its environmental benefits, the capacity for solar power generation on these NYCHA buildings would not produce enough energy to meet regular energy usage needs. Solar power could provide some power to these buildings if there is a disruption to the grid, but it would not be able to fully power these campuses. Thus, we recommend complementing this energy source with other sustainable energy sources, including small wind turbines. Alternatively, NYCHA campuses could decrease their energy usage so that the solar arrays can completely support their energy needs. These deep energy reductions can come from energy-efficiency retrofits. Currently, according to NYCHA data from 2014, the Jefferson Houses use 0.71 kilowatts of energy per apartment, the Johnson Houses use 1.54 kilowatts of energy per apartment, King Towers use 12.63 kilowatts of energy per apartment, and the Taft houses use 17 kilowatts of energy per apartment; this totals 44,599 kilowatts of energy annually. Based on this data, some campuses use 20 times more energy than other campuses. By retrofitting buildings to improve the buildings’ energy efficiency, we would expect that solar power generation alone could accommodate NYCHA’s energy needs. For a detailed description of how to incentivize these retrofits, please refer to the housing section of our proposal.

### NYCHA Campus Communities Within Our Study Area

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<td>1,308</td>
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<td>2,957</td>
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<td><strong>Number of Buildings</strong></td>
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<td><strong>Average Annual Electricity (Kw) / Apartment</strong></td>
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<td>1.54</td>
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<td><strong>Average Annual Electricity (Kw) / Person</strong></td>
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<td>0.68</td>
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Electricity Usage at NYCHA campuses in our study area.
Red Hook will have to develop two separate microgrid systems and develop a partnership between the two utility companies. Based on the complexity of this situation and the abundance of solar energy within the NYCHA campuses, we recommend creating this system on a small scale and prioritizing the development of a microgrid only within NYCHA developments. This will create a more manageable system that has the potential to be expanded once the program is able to work effectively. In the long term, this microgrid will be able to function as a dynamic nucleus that can adopt and be expanded to accommodate the needs of other facilities in the area. When expanded on this larger scale, the microgrid will be able to accommodate the needs of vital community facilities such as hospitals, schools, and fire departments. These facilities are vulnerable during severe weather situations and do not have resilient systems in place. Connecting these buildings to the microgrid will prevent them from depending on traditional energy sources in times of emergency. In addition, providing this power to community centers can help to create “resilience hubs” where residents can access electricity and other resources during emergency situations. In regards to financing possibilities, the city has made recent announcements introducing Energy Performance Contracts to invest in energy-efficiency retrofits for NYCHA buildings through a public-private partnership model. Through this program, private companies have invested hundreds of millions of dollars to support energy-efficiency retrofits; these companies will receive financial returns from the eventual savings in utility costs. We recommend using this public-private partnership model to pay for the upfront costs for the establishment of the East Harlem NYCHA microgrid. Additional funding sources for research and implementation could be provided by the state government through NYSERDA programs, and by the federal government through Solar Power Purchase Agreements.
Many contemporary symbols of environmental stewardship, such as bike lanes and solar panels, are important to the Eco-District but may not sufficiently connect with all communities. In El Barrio Verde, we wanted to maximize buy-in from local residents and make the community feel that the project was ‘for them,’ especially since long-term residents are facing legitimate concerns regarding displacement. We chose to focus on food and flora as a way to shape new open spaces around existing cultures, create a sense of place unique to East Harlem, and create a sense of ownership among local residents. Every culture finds expression in food and every food finds its source in the environment. The major design themes in the Botanic Cultural District are based on food and plants native to or reminiscent of the regions most heavily represented in East Harlem: Puerto Rico and the Caribbean, Mexico, Senegal and West Africa, and Italy. In this way—and in line with the holistic ethos of the Eco-District—we sought to make a connection between existing cultural identities and sustainability through the medium of open space.

We also wanted to connect with residents of the many New York City Housing Authority (NYCHA) buildings in our study area. NYCHA has tended to neglect the quality of its open space in favor of cost-saving and, above all, crime-prevention measures. The primary design principle in their campuses is a version of “defensible space”—Oscar Newman’s theory that space designed to feel more private than public will see lower crime rates. As a whole, Newman’s theory is controversial, but in this instance it goes too far: these housing developments are so cut off from the public streets that they create a major barrier to connectivity. Our open space plan seeks to reconnect these campuses—which cover 80 acres from Lenox to 1st Avenues and 115th to 112th streets—to the urban fabric. By recon-

**OPEN SPACE**
necting them and building a network of exciting indoor and outdoor public spaces, we will add a valuable asset to the residents of the NYCHA buildings, increase the usability of their campuses, and reduce crime by encouraging pedestrian activity. Another major issue is resilience. As hurricanes and major storms become more common in New York City, interventions designed to address storm surges and flooding become ever more urgent. A significant portion of East Harlem—like many neighborhoods in Manhattan—is in a flood zone. Our waterfront proposals aim to decrease flooding while simultaneously providing new opportunities for recreation and environmental education.

**Open Space Primary Objectives:**
- Use public space designs to mix sustainability and the environment with existing cultural identities.
- Increase the quality of existing open spaces, particularly on NYCHA campuses, while creating a sense of place.
- Make spatial and symbolic connections between openspace within the study area and nearby parks and natural resources.
- Increase the resiliency of East Harlem.

**Open Space Secondary Objectives:**
- Identify sites for infill residential development on NYCHA properties to create more affordable housing.
- Create clean sources of energy.
- Strengthen and support the local community garden network.

We grouped our ideas into two categories:

**Botanic Cultural District Overview**
The Botanic Cultural District is an interconnection between nature, culture, and economy. East Harlem is a unique place, and this authenticity will be celebrated, preserved, and further transformed. The major interventions include: The East Harlem Culinary Cultural Center, an extension of La Marqueta, La Torre Cultiva (Urban Farm), Little El Yunque (a conservatory rainforest), El Paseo De Las Dalias and El Paseo De Las Cebias (two promenades), Microgrid on the King Towers, seven Park-gardens within the NYCHA towers, and the East Harlem Community Garden Resource Center.

**CULINARY CULTURAL CENTER AND LA MARQUETA EXTENSION**

One of the major attractions of the East Harlem Botanic Cultural District will be the East Harlem Culinary Cultural Center at Park Avenue, located in the superblock between 112th Street and 115th Street, to the left of the viaduct. This cultural center will include a museum where visitors can learn about food, cooking, and food production – emphasizing culinary traditions of locally represented cultures.

As guests enter the center, they will be exposed to the history of East Harlem, the people, and the culture, with a special focus on their food. The museum section will have artifacts, pictures, and paintings, as well as personal narratives about East Harlem’s culinary diversity, special ingredients, recipes, and artificial food models. The second level will also have a section where visitors can cook their own meal following a local chef. This center will employ chefs specializing in the food of East Harlem. Many of the ingredients will
be harvested at the nearby Torre Cultiva. A major goal of the Culinary Center is local economic development. In addition to teaching the community about food, the center will incubate local food businesses and prepare local residents for careers in the food industry. A key component will be a connection to an extended La Marqueta, which will be located across from the Culinary Center in the currently underutilized space under the Park Avenue viaduct north of 112th Street, and extending the length of half of the superblock. This extension will expand La Marqueta’s economic development work, which is currently administered by City Council Member Melissa Mark-Viverito and NYCEDC. People will continue to buy ethnic food at La Marqueta and additional space will be equipped to house local vendors and promote culinary and cultural events that embrace El Barrio’s food and culture. The culinary center will also create a partnership with La Marqueta Retoña program to revive the social and cultural elements of El Barrio through culinary events and activities for the community. The Culinary Cultural Center and La Marqueta extension will transform two neighborhood barriers into points of connection. On 116th Street, La Marqueta has already transformed the railroad viaduct—a barrier that effectively split East Harlem in half—into a place where the community comes together. The extension will continue this transformation down to 112th street. The Culinary Center would perform a similar transformation of another neighborhood barrier: the NYCHA superblocks between 115th and 125th streets, which lack street front use and present intimidating and poorly lit fencing to the sidewalk. As a result, they inhibit pedestrian movement between bustling commercial corridors on 116th and 110th streets. The Culinary Center, located in the middle of the superblock, will help transform it into a community and citywide gathering place.
Vertical farming is a form of urban agriculture where food is cultivated within skyscrapers or on vertical surfaces. Gilbert Ellis Bailey, an American geologist, conceived the term in his 1915 book Vertical Farming as a way to research different types of soils to grow crops. Since 1999, Dickson Despommier—an ecologist at Columbia University—has been working to advance urban farming with the purpose of feeding a significant amount of the population and reducing the carbon emitted from transporting fruits and vegetables to the city.

Today, the creation of such urban farming as envisioned by Despommier remains in question, and it has only been created in small scales due to substantial energy needs. However, some companies are starting to explore urban farming including Alegria Fresh in Irvine, California; FarmedHere in Bedford Park, Illinois; and AreoFarms, which uses an indoor aquaponics system, in Newark, New Jersey. Our team has focused on urban farming as an opportunity to further develop the concept with the goal of a more sustainable and economically independent East Harlem. La Torre Cultiva will be a 20 story vertical farm, museum, and aquaponics research center. Its name was chosen in Spanish to represent the large Latino population present in this neighborhood: “la torre”, or the tower, and “cultiva”, to grow or cultivate. It will cultivate for East Harlem not only crops, but economic and environmental benefits. It will produce food that will be sold to local businesses and consumers, and will be used in the Culinary Center. It will also combine agricultural research, education, and job training. The building’s four towers will contain 69,000 SF of farmable area.

In line with the Botanic Cultural District goals, it will create a vibrant public space focused on connecting people to cultur-
ally relevant plants and food. Also, like the rest of the district, a central goal is economic development, primarily in the form of job training programs in sustainable agriculture for East Harlem’s youth. The ground floor of the building will house an educational center that complements the nearby culinary center. While the latter focuses on cooking, the former will focus on the raw material itself. How do plants grow? And how can they grow inside towers in Manhattan? Most schoolchildren know the basics of photosynthesis, but this museum will help people dig deeper: what exactly is at work “behind the scenes,” so to speak, at the molecular and biological level of growing food; what are the specific challenges of growing food indoors? What technology is employed to meet those challenges? La Torre Cultiva could partner with local universities to develop these technologies. The leading academic proponent of indoor urban farming is Dickson Despommier, who teaches at nearby Columbia University. NYCHA could partner with the University by renting research space to it and other research institutions. Other local universities could also be involved including Cornell, which will soon have a biotechnology center on nearby Roosevelt Island. Could the farm feed the community? Maybe one day. On a large scale, indoor urban farming is new, as are the tools and techniques required to make it happen. One estimate is that it takes about 300 SF to feed one person (2,000 calories per day) for a year. At that rate, La Torre Cultiva could feed 920 people—a drop in the bucket for a place like Manhattan. But the farm is about more than feeding people: it will develop the techniques and technologies necessary to make vertical farming more viable on a large scale. According to experts, this will be essential as the world tries to feed an ever-growing (and increasingly urban) population with diminishing arable land.
Currently, there is very little networking between local community gardeners. Many gardeners we spoke with said that while there is an informal network of people who go to events sponsored by Greenthumb—a Parks Department office dedicated to supporting community gardens—there is little in the way of an East Harlem gardener’s community. The Greenthumb events are located throughout the city and don’t facilitate local community building. In some cases, even adjacent gardens didn’t know each other’s hours of operation. The Community Garden Resource Center would fill this gap by offering locally focused programming that would be convenient and relevant to East Harlem gardeners. In addition to serving traditional community gardens, the center would be a valuable resource to the eight smaller gardens currently operating on NYCHA land. In general, these efforts are more isolated than traditional gardens—even people living next door knew little about them and Greenthumb does not target them. Bridging this divide, as other interventions bridge the NYCHA divide spatially, is a key goal of the Resource Center. As with our other open space recommendations, the goal is not to create new open space but to use creative design and locally relevant programming to increase the value of existing open space. The Community Garden Resource Center will strengthen the quality of neighborhood gardens through workshops, events, materials, and networking. The resource center will help local gardeners share or co-sponsor events and coordinate hours of operation. Existing gardens would be a much stronger community resource by working together, and a shared neighborhood resource center will help facilitate that.

East Harlem is known for its community gardens. Along with the Lower East Side, it has one of the highest concentrations of gardens in Manhattan. Within our study area, and just outside of it, there are currently 22 gardens - many of them have long been important community assets. However, with increased development pressure they are under greater threat for redevelopment than ever before.
NEW PARKS AND GARDENS REPRESENTING EAST HARLEM CULTURES

The gardens and parks of this district will combine the diverse cultures of East Harlem through design and ornamental plants that each ethnicity represents. Currently, there are seven gardens in the NYCHA campuses within our study area. Each garden will have flowers and ornaments that are representative of a particular culture of East Harlem. The theme of each garden has been selected based on the ethnic group that is more prominent in that specific area. These gardens will be operated by the Community Garden Resource Center, with the focus on bridging the gap between the garden and community. Furthermore, each garden will have educational focal points based on the plant species of each and additional workshops for visitors and the community.

West African Garden:
112th between Lenox & 5th Avenue

Based on field visits and analysis of the demographics of the neighborhood, this area is near a West African neighborhood known as “Little Senegal,” with the Malcolm Shabazz Harlem Market nearby on 116th Street.

Caribbean Garden:
112th Street and Park Avenue

Mexican Garden:
1st Ave. and 113th Street

Central America Garden:
3rd Ave. and 112th Street

Puerto Rican Garden:
1695 Madison Avenue

More than half of the East Harlem population in each of the NYCHA developments is Latino. A Caribbean, Mexican, Central American, and Puerto Rican garden will add to the vibrant plant diversity of the Botanical Cultural District, as well as reinforce the meaning of place in the community by celebrating the various cultures of its people. East Harlem Garden: 5th Ave. around the corner of 112th Street on the north side

This garden will combine plants that are representative of each culture in East Harlem.
El Paseo De Las Dalias and El Paseo De Las Ceibas are two broad promenades that will connect the Botanic Cultural District physically. They will run from Martin Luther King Playground on Lenox Avenue to Thomas Jefferson Park on 1st Avenue. They are both named after culturally relevant plants; the dahlia is the national plant of Mexico and the Ceiba tree is associated with Puerto Rico. The promenades—or paseos in Spanish—will be planted with Windmill Palm trees, a tree that looks tropical but grows successfully and with minimal maintenance in New York’s cold climate. In the summer, dahlias and other tropical flowers can be planted. One of the major urban design issues our research uncovered was that narrow, confusing paths led to a lack of walkability and connectivity throughout the NYCHA campuses. The paths did not feel safe or secure and it is easy to get lost when travelling through them. The new promenades will be well lit, easily navigable, and wide with as few turns as possible. They will also be marked by thematic signs and educational displays that will tie the Botanic Cultural District together.

Little El Yunque will be an indoor tropical rainforest that includes plants native to Puerto Rico and the Caribbean; it will be located at the center of the Jefferson Houses between 2nd and 3rd avenues. This key component of the Botanic Cultural District is named after the famous rainforest El Yunque, which is located in the northeastern part of Puerto Rico. This new conservatory style forest will mimic Puerto Rico’s tropical environment and integrate the dynamics of a forest with the social, economic, and sustainable goals of the Eco-District. The idea of a forest conservatory emerged after studying native Puerto Rican and Caribbean flora, including unique trees such as the Tabonuco tree and the Palo Colorado tree. While these plants would not be able to survive outside, they will thrive indoors and at the same time create an exciting new public space and community asset. Little El Yunque is based on a similar project in England called the Eden Project, which was created in 2003 and is the world’s largest indoor rainforest. Like the Eden Project, Little El Yunque will serve as a visitor attraction and educational facility. Taking this one step further, Little El Yunque will have additional community assets - it will...
serve as a public space with educational and job training components. This facility will generate jobs for the community and create opportunities for training in the fields of botany, with a specialization in forestry and plant biology. Furthermore, the conservatory will have a center for tropical research and botany, and a herbarium that is accessible to students and the public. Visitors will learn about rainforest ecology, experience a rainforest environment, and discover the importance of conservation. While some might worry about the environmental impact of building a tropical rainforest in New York City, there are many examples of how this can be done efficiently and sustainably. A prime example is the tropical rainforest at the Biodôme in Montreal, which is heated by a geothermal system. Geothermal energy is a carbon-free, renewable, and sustainable form of energy that provides a continuous, uninterrupted supply of heat. In the report Geothermal Systems and their Application in New York City, the New York City Mayor’s Office of Sustainability emphasized the benefits of this clean renewable energy source and explained how geothermal systems can be implemented in different sites throughout the city. As a way to reinforce the Eco-District’s commitment to sustainable development, we recommend heating Little El Yunque with this form of green technology, along with an energy-recovery system and energy-efficient lighting. Other green components will be used in the design of the indoor forest, including an underground drainage system. This system will collect water from the site, which will be reused to irrigate the plants and maintain the high level of indoor humidity needed.

Currently, only 295 of NYCHA residents’ cars are used for commuting even though there are approximately 627 parking spaces in surface parking lots within the NYCHA campuses. In other words, only 8.1% of residents in the labor force own a car and 47% of those car owners use their cars for commuting. To free this space up for uses
that provide benefits to the entire community, we propose creating parking facilities that would be used instead of the current surface parking lots. These facilities would be located in two-level parking garages under the Community Garden Resource Center and the Culinary Cultural Center. With careful planning and some compact spaces, this could accommodate approximately 270 underground parking spaces while freeing up open space at ground level for public uses. Since these two parking garages will not be able to fully accommodate all of the vehicles in existing NYCHA surface parking lots, we are also proposing a buy-out program where residents would be given a one-time payment of $5,000 in exchange for their surface parking spots. Since car ownership is relatively expensive and most residents are not using their cars for commuting, we are expecting a buy-out program to be an economically appealing alternative to car ownership, especially with the added possibility of using the electric car share that is detailed in the Connectivity portion of our proposal. We expect that about half of the non-commuters will give up their parking spaces against a one-time payment of $5,000. However, if even only a quarter of residents are willing to give up their parking spaces, there will be sufficient parking provided for the remaining cars in the 270 underground spaces and the 200 above ground spaces that are included in the open space plan. The underground parking garage is intended to diminish residents’ fear of the loss of parking, while also creating space for community amenities. The buy-out portion of the parking plan uses monetary incentives to reduce private car usage and encourage the switch to public transportation or the electric car share.

RESILIENT WATERFRONT

Waterfront planning has become a major focal point in urban planning globally. Waterfronts are leveraged to promote excellence in urban design, economic development, and tourism. As waterfront properties are highly valued, we often see upscale residential and commercial projects that are designed to attract consumers. In East Harlem, however, we want to enhance the recreational aspects of the waterfront and make them accessible to the existing residents, while aligning with the concept on the Eco-District and thus integrating the ecology of the area and sustainable components. Because of its poor condition and inaccessibility, the waterfront in East Harlem is currently underutilized. Our initial observations were that the design of the waterfront was unattractive, the footbridge leading to the waterfront was in poor condition, and as a result, relatively few people use the resource. The citizens’ group CIVITAS has outlined potential improvements in detail during their Reimagining the Waterfront campaign. Their study began in 2012 looking at the waterfront Esplanade between 60th Street and 125th Street. CIVITAS’s East River Esplanade Vision Plan is consistent with our goals of sustainable
development, improved waterfront access, and extended waterfront public space in East Harlem. Their plan was developed with Mathews Nielsen Landscape Architects and included an extensive community outreach component. It is thus a coherent proposal for the waterfront across the Upper East Side and East Harlem, and has wide support in the community. As our initial conclusions were largely similar to theirs, we decided to build upon their research and recommendations. CIVITAS’s study identified the following issues with the Esplanade: noise, poor structural conditions, too narrow of a space, and no sense of place.12 The poor conditions derive largely from the fact that the Esplanade has not been adequately maintained since its most recent reconstruction in the 1980s.13 Additionally, the Esplanade is for a large part supported by wooden piles that are being eaten by shipworms and wood gribbles. This must be addressed in the next decade to prevent parts of the Esplanade from falling into the water.14 Within our study area, CIVITAS’s proposal includes an extension of the Esplanade, the erection of a new footbridge, improved landscaping, reinforcement of the shore- line with an ecological edge, and an extension of the Thomas Jefferson Park above the FDR Drive. Other groups have also been working to activate New York’s waterfronts, including The Metropolitan Waterfront Alliance and New York City’s Department of City Planning. In 2001, the DCP created Vision 2020: New York City Comprehensive Waterfront Plan to set the tone for future waterfront development. This document laid out blueprints for waterfront parks, esplanades, ferry services, recreational water uses, and waterfront restoration. Our recommendations are in a natural continuum with these previous works.

A resilient waterfront supports upland community sustainability, and can also build a positive connection with the public use of the waterfront. Adding resilient infrastructure further enhances the public and recreational aspects of the waterfront. The Department of City Planning’s report “COASTAL CLIMATE RESILIENCE - Urban Waterfront Adaptive Strategies” identified high and low storm surges as the most likely event-based hazards in the study area, frequent flooding due to sea level rise as a primary gradual hazard,
and gradual erosion as secondary gradual hazard. To address these concerns we recommend interventions at the shoreline. There are specific coastal interventions that are most effective at preventing storm surges and flooding in hardened shelter bay plains, which is our study area’s ecomorphology. Waterfront parks are the best measure for preventing storm surges and frequent flooding. Bulkheads and living shorelines are also seen as excellent at preventing frequent floods. For enhancing the public character of the waterfront, more aesthetic, soft improvements are beneficial. The study area’s shoreline already has a bulkhead, which can be enhanced with a living shoreline. This living shoreline would include a riprap edge at the shore, followed by a manmade wetland, and a protective living breakwater. Living shorelines help to decrease wave action, prevent flooding, enhance the shoreline’s recreational use, and provide a habitat for fish and wildlife.

ADDRESS THE CONDITION OF THE FOOTBRIDGE AND THE ESPLANADE

Local residents in our visioning workshop addressed the bridge as a safety issue in the neighborhood. At the moment, its use is limited due to its inaccessibility, lack of maintenance, unattractive design, and narrow layout. Better lighting and more foot traffic between the park and the waterfront will increase the safety of the bridge. CIVITAS recommends improving existing conditions by building a more attractive landscaped bridge. Their plan creates a symbolic link between the park and the waterfront, making the waterfront more accessible. We support this intervention, but believe that this is a long-term project that doesn’t address immediate safety concerns. We therefore recommend that preliminary low-cost interventions on the existing bridge be addressed first. This could include improved lighting, improved signage, repainting, and the addition of public art.

SUPPORT CIVITAS’S PROPOSAL FOR PARK EXTENSION OVER FDR DRIVE

A more dramatic intervention in CIVITAS’s plan is their proposal to deck over the...
FDR Drive between 111th Street and 116th Street, which would extend Thomas Jefferson Park to the water’s edge. This process has been done already between 84th Street and 90th Street, where the FDR Drive was decked over to extend Carl Schurz Park. The proposed design for the Thomas Jefferson Park extension would add 3 acres of parkland that connects East Harlem to the river. Intentionally floodable spaces can be integrated into the park extension’s design to help reduce the impact of long-term increases in flooding and storm surges upland. This would also allow the park to recover faster after a storm and help avoid costly repairs. Flood protection elements can also be integrated into the park through berms, terracing, and floodwalls to provide protection; additionally, a park extension above the FDR Drive would be above the level of most probable flood events, and an emergency management center could be built in this part of the park.  

EDUCATIONAL GREEN POWER PLANT

We recommend that the rear lot of the Manhattan Center for Science and Mathematics—a public high school between Pleasant Avenue and the FDR Drive—be converted into an educational green power plant. The power plant will be run by the school and include after-school programs, weekend programs, and training for non-students in the neighborhood. This green power plant will incorporate a range of green power technologies including solar, wind, and tidal, which is already being generated in the East River. Funding can come from the Department of Education and the New York City Economic Development Corporation. Overall, this program aims to act as an educational center that advances economic development while supporting the clean energy goals of the Eco-District.

WATERFRONT PIER SUSTAINABILITY CENTER + BOATHOUSE

A small waterfront pier at the height of 111th Street is currently fenced off from the public promenade, but could become an asset to the public waterfront. We recommend creating a Sustainability Center here as an educational installation on sustainability, climate change, water quality, and waterfront ecology. It will serve a recreational and educational
A floating boathouse will be built adjacent to the pier to provide users with the opportunity for waterfront activities, such as kayaking to Randall’s Island. This boathouse will attract residents to discover the man made wetland at the waterfront and harness the potential for recreation in this area. Both the Sustainability Center and the boathouse will be powered by solar, wind and tidal power. (Illustration: Rendering of Sustainability Center and Boathouse)

FERRY CONNECTION

Extending ferry service to 111th Street would by itself increase the public use of the waterfront and foot traffic across the FDR Drive. Please refer to the Street Network and Infrastructure section for more details on the implementation of ferry service in East Harlem.

PLAYGROUNDS

Parks are one of the few places children can go to exercise and play. Access to a safe and well-designed park, consisting of natural elements and a variety of playground equipment, contributes to the overall health of children. However, NYCHA’s current playgrounds contain old equipment, lack features that incorporate all levels of physical activities, and fail to incorporate natural elements. There are 4,276 children under 18 years of age within the NYCHA portions of our site who need access to quality playgrounds; redesigning NYCHA playgrounds into an environment that is welcoming, attractive, and of great quality will promote healthy child development for these children, as well as other children who live nearby.

REDESIGNING NYCHA PLAYGROUNDS

According to a recent University of Tennessee study, playgrounds that incorporate natural elements like colorful flowers, rocks, and trees tend to be more heavily used than playgrounds with metal and plastic equipment. Using culturally relevant plants and designs will also make the area’s playgrounds a unique community asset. Plants add textures, scents, colors, and shapes and attract wildlife. Trees will be added to these playgrounds to offer a shaded place to sit, while providing visual opportunities to experience the seasons. These trees can add an educational component to the playground, since children can learn how trees interact with the wind and rain, clean the air, and help to combat climate change. These benefits are in line with the Botanic Cultural District’s objective of helping East Harlem residents form a deeper connection with the environment. Artificial hillsides, boulders, and sand add variety and interactivity to playgrounds. Elevated sandboxes are especially beneficial since their tactility allows children to practice, develop, and enhance their fine and gross motor skills. In addition to natural elements, NYCHA’s redesigned playgrounds will incorporate a variety of play equipment that supports all levels of physical activity. Some new features that could be added to these playgrounds include: themed or brightly colored equipment, gliders, swings, climbing stations, bouncy spring playground equipment, and toddler playground equipment. Non-slip ground surfaces will be used to increase safety in these active areas. These playgrounds will also incorporate green infrastructure. Permeable pavement, synthetic turf, and bioswales will be used to capture excess stormwater. Rubber mulch will be used to conserve moisture in the
soil around the roots of flowers and shrubs, allowing the playground to reduce the frequency with which they need to be watered. Culturally relevant components and programming will also create an emotional connection and sense of place to these areas. For example, musical instruments like maracas from Mexico, panderetas (tambourines) from Puerto Rico, Bongos from Cuba and tambura (a type of double headed drum) from the Dominican Republic will be built into play structures. Additionally, programming for play spaces will include games like stickball, handball, dominos, chess, and checkers; these games are traditional pastimes for many Latino communities.

INCORPORATING NYCHA ELDERLY POPULATION INTO OPEN SPACE

East Harlem has a significant senior population; according to NYCHA, there are 3,027 persons above the age of 62 within the campuses in our study area. While there are senior centers in the neighborhood, research shows that seniors do better when they interact with individuals from all age groups. However, the same report shows that while seniors benefit from multi-generational open spaces, they may be more sensitive to feeling unsafe and will thus be far less likely to use these spaces. Therefore, in addition to redesigning play spaces to be more attractive for children, playgrounds and open spaces should work to better accommodate seniors. This creates two design challenges: determining what type of programming or physical elements will attract seniors, and ensuring that these spaces feel safe. For example, using shade to block sunlight will attract seniors but a space that feels too enclosed and unsafe will repel them. We also recommend incorporating seating that offers back support, which will mitigate lower back pain caused from sitting for long periods of time. Seating should be moveable to various offer options for where they can sit. Additionally, the open space for seniors should incorporate physical activities that help encourage social interactions and exercise. For example, group activities such as Tai Chi foster a sense of community while promoting physical health.
The street network plays an integral role in the transformation of our study area into an Eco-District. These outdoor public spaces can be dramatically transformed and improved in order to provide a safer and more sustainable lifestyle for the neighborhood residents. There is an enormous opportunity to implement the latest advances in urban design and green infrastructure that can address the key elements of our plan: job creation & education, green infrastructure, health & safety, social & environmental justice, transportation, and urban design.

Research and subsequent visits to the study area uncovered many obvious issues at the street level that we needed to address. The lack of sanitation, abundance of scaffolding, excessive street widths, lack of bike lanes, and underutilization of open space are just a few of the conditions that strike visitors travelling through the area. In addition to our own observations and the information we gathered, it was important that we interacted with the community to hear firsthand accounts of the experiences that residents were experiencing on a daily basis. Our subsequent charrette uncovered numerous concerns that were both directly and indirectly related to issues involving the street network. These conversations also revealed several opportunities for how to improve conditions and tie the neighborhood together.
It was important to our team that we capture as many issues as possible from both primary and secondary sources as a way of developing goals and comprehensively addressing as many of these concerns as possible. In no particular order of priority, we uncovered these issues as they relate to the street network:

- Insufficient lighting on many streets, in parks, and especially in the areas covered by scaffolding
- Paths and scaffolding wind through NYCHA; they are confusing, underused, and attract criminal activity such as muggings, fights, drug sales, and drug usage
- Heavy truck and delivery traffic leads to unsafe conditions for cyclists and pedestrians
- Excessive littering and dog feces in the streets that attract pests
- Buses are crowded, unsafe, and don’t provide adequate crosstown service
- Access to the waterfront is limited
- Not enough trees along the streets

Many of these issues have been the focus of previous plans. There is substantial opportunity to address these issues in an environmentally progressive way. Based on the list above and our own observations, the our team was able to identify the following opportunities:

- Increase the number of bike lanes
- Implement environmentally friendly lighting in underlit areas
- Improve safety for pedestrians and cyclists at dangerous intersections
- Plant additional trees along streets
- Develop a community run program to clean the streets
- Improve mass transit opportunities
- Provide a link between the waterfront and Central Park
- Re-imagine the street facade on NYCHA properties

Considering the opportunities above, our team outlined 5 objectives that would guide our recommendations for the transportation component of the Eco-District:

- Provide safer and more attractive streets
- Increase mobility and access to transportation
- Implement environmentally friendly infrastructure
- Provide jobs for neighborhood residents
- Improve access to and links between open spaces
SOLAR POWERED STREETLIGHTS

Several locations within our study area were lacking the necessary street lighting that is needed to improve safety and discourage criminal activity. To help rectify the situation, we recommend the installation of solar powered street lamps. Specifically, we recommend solar powered street lamps that are capable of generating and storing energy during the day so that lights can operate on this energy throughout the night. Not only do these lights provide safer street conditions, but they also operate off the grid, are not subject to power outages, and provide energy savings.

PEDESTRIAN SAFETY INFRASTRUCTURE

Pedestrian safety was as major concern for residents in East Harlem since there are many busy corridors that cut through the neighborhood, resulting in several intersections that have become increasingly dangerous. To address these community concerns, the Department of Transportation has designated certain intersections and corridors in this neighborhood as “Vision Zero” corridors under their initiative to bring pedestrian deaths to zero in New York City. These intersection and corridor designations are for areas in which high numbers of pedestrians have been killed or seriously injured. The Vision Zero pedestrian Action Plan for Manhattan designated 1st, 2nd...
and 3rd Avenues as Vision Zero priority corridors and the intersection of 116th and Lenox and 116th and Madison as Vision Zero priority intersections.

Crash data from the Department of Transportation further illustrates the lack of pedestrian safety in this area. As shown in the accompanying graphics, the intersections along 116th Street, 2nd Avenue, 3rd Avenue, Madison Avenue, and 5th Avenue have had a substantial number of serious accidents involving pedestrians. The most dangerous street is 116th Street; every intersection on 116th Street between Lenox Avenue and 1st Ave has had at least 30 persons killed or severely injured between 2009 and 2013.

To address these dangerous conditions, we will reduce lane widths to shorten pedestrian crossing distances and create pedestrian refuge islands to provide safe places for pedestrians to stand while waiting to cross.

PROTECTED BIKE LINES ON 112TH AND 115TH STREETS

Both 112th and 115th streets are excessively wide, measuring approximately 50 feet in width. Excessively wide travel lanes give this street a highway-like feel and encourage drivers to speed and weave around double-parked cars; this creates dangerous conditions for pedestrians and cyclists sharing the roadway.
This excess road space presents an opportunity to install protected bike lanes while keeping the same number of travel lanes for vehicles. These bike lanes will run the length of our study area to the east and west and will provide safe protected space for cyclists while calming traffic speeds. As part of this plan, we recommend using bioswales as a way of separating the bike lanes from vehicular traffic on 112th Street. These bioswales will filter toxins out of rainwater, address residents’ concerns over lack of plants in the area, reduce local flooding, and reduce the stress on the sewer system that causes contaminated sewage overflow events. Additionally, we will use these barriers as a location for installing solar powered streetlights that can better illuminate the roadways and the bike lanes.
The Woonerf, or shared street, concept is one that has been gaining a lot of attention, both in the U.S. and internationally. The concept relies on the fact that drivers will reduce speed and proceed with more caution if they know that the street is shared with both pedestrians and bicyclists.

To date, it has been implemented most successfully in Europe but is beginning to make strides in America, with the first US woonerf being implemented in Seattle’s Bell Street Park. There, 4 blocks were transformed into a 56,000 square foot shared street.\textsuperscript{21} We propose bringing this concept to East Harlem on 112th Street, between 3rd and 1st Avenues. This is an ideal location to test the concept because it is a less heavily trafficked corridor and leads directly into Thomas Jefferson Park. This woonerf can act as a gateway to the park and make the street more of a recreational resource for the residents. Woonerfs are beneficial because of their accessibility; people who use wheelchairs can traverse these spaces with ease because the pedestrian area and roadway are on the same level.

To address this sentiment, we recommend transforming 116th Street between Park Avenue and 1st Avenue into a pedestrian plaza. Specifically, we propose extending sidewalks into the existing street to allow room for pop-up shops, benches and trees. We recommend leaving two lanes open in the center of the street to allow bus transportation down the length of this commercial area.

During our charrette, we heard multiple residents say they would like to see a pedestrian plaza installed in the neighborhood.
cial strip, but this street would be closed to vehicular traffic between 8:00 am and 12:00 am; between 12:00 am and 8:00 am, trucks will be permitted so that they can make deliveries to the businesses along this corridor.

This method of creating a plaza with bus lanes has been used in other areas of the United States with success. Denver's 16th Street operates in a similar fashion, closing the street to vehicular traffic with transportation needs being served by a free shuttle bus that runs the length of the pedestrian mall. The concept is even being used in New York in Brooklyn's Fulton Mall where the length of the mall is dedicated to buses, delivery trucks, and emergency vehicles. This pedestrian plaza will be a great asset to the community and will be a driver of economic development by improving 116th Street's standing as a shopping destination. It would attract more pedestrian traffic to support existing businesses and create more space for vendors to sell goods on the street. Further, we recommend that the city install permanent shop fixtures along this corridor. These can be leased as a way of generating revenue that can be used to maintain the plaza's additional amenities and infrastructure. These permanent fixtures will have white panels on all sides, which will provide a canvas for local artists to express themselves and will provide a space for culturally relevant artwork. These shopping fixtures will also incorporate a green component on their roofs.

The 116th Street plaza will include bike racks, benches, and bus stops to link to our later proposed Barrio Bus and to take advantage of the additional space. The bus stop will be topped with solar panels to create energy for lighting at the bus stop. The plaza space will include a substantial amount of moveable seating to facilitate social interaction and make the space appropriate to fit the needs of group interactions. Planters will be used to add greenery to the area and will be surrounded by ledges that have appropriate dimensions for comfortable seating. The waste management system will include Bigbelly trashcans, which are solar powered trash receptacles that can detect when they are full and communicate with maintenance crews to coordinate efficient trash pick-up times. Additionally, the sidewalks and the bus lanes will be made of permeable pavement as a way to promote sustainability.

In order to make this vision a reality, we would encourage the East Harlem Merchants Association to create a Business
Improvement District (BID) for the 116th Street commercial corridor. This BID can then partner with the Department of Transportation in the creation of the 116th Street plaza and subsequently manage the space upon completion. This agreement will allow the BID to collect the revenue from the newly constructed kiosks and pop-up shops along the extended pedestrian areas. That money can then be used to finance the maintenance and cleaning that will prevent the plaza from falling into disrepair. Additionally, the BID can then apply for special grants that can be used to finance other aspects of our plan.

CONNECTIVITY
A key to creating a vibrant and sustainable community is providing residents with a convenient and reliable system of transportation that is composed of several interrelated transit modes. The ability to move people efficiently and effectively—while utilizing environmentally friendly modes of transportation—is crucial to the success of the East Harlem Eco-District. To achieve this, we propose the following:
EXPAND CITI BIKE BEYOND 86TH STREET

Currently, the Citi Bike program only extends as far North as 86th Street. To take advantage of our increased bike lanes, we recommend extending the program up to 125th Street to improve East Harlem access to affordable transportation. It is important to consider not only the location of the bike share locations, but also the quantity of docks to make the extension a true part of the network and provide equal access to all residents in our study area. To accommodate these considerations, locations were chosen based on three criteria: proximity to existing public transportation, proximity to bike lanes (both existing and proposed), and proximity to open space. We contend that the expansion of the Citi Bike program—in addition to clearer information about the discounted annual $60 membership for NYCHA residents—will increase ridership in the area and will help link residents with other forms of mass transit.

ELECTRIC CAR SHARE: THE ELECTRIC BARRIO

We propose the creation of the Electric Barrio car sharing system that will allow East Harlem residents to rent cars for short or extended periods of time. Car sharing systems can reduce the need for...
residents to own cars if they are not using them for daily commutes. Additionally, car shares are a way to reduce the financial strain of owning an automobile, which is especially beneficial in this area that struggles with unemployment and poverty. The Electric Barrio fleet will be fully electric and will be parked at charging stations within existing parking lots. Many of these parking lots are on NYCHA property, but we also plan to lease spaces in existing private lots. The stations will be attached to the grid—or microgrid in the case of NYCHA parking spaces—but will also be supported by solar energy captured by photovoltaic panels installed on top of canopies covering the parking spaces for increased efficiency. While there are existing car sharing systems in New York—the most popular being ZipCar—there is not a system that utilizes a fully electric fleet. But there are similar systems already in exist in other cities, most notably the Autolib in Paris. Launched in 2011, the Autolib currently operates 3,300 electric vehicles out of over 1,000 charging/parking stations across the city. To date they have over 150,000 members and boast that between 2013 and 2014, overall vehicular registration of electric vehicles rose 50%, signaling that this system has helped encourage the adoption of electric cars for those who still prefer to travel in private vehicles.22

THE BARRIO BUS

To address concerns over lack of crosstown transportation options, we suggest creating the Barrio Bus, which will link parks, residential areas, and transportation hubs. These buses will be free of charge, operate independently of the MTA, and be hybrid or fully electric vehicles. We believe the shuttle can be funded in part by our plan to charge permitting fees to kiosks, food trucks, and stands in the 116th street proposed plaza space. The loop will run in a rectangle that largely serves as an East/West connection to existing subway lines, Thomas Jefferson Park, and Central Park. We envision the primary riders of the Barrio Bus will be residents of the local community, especially those living in NYCHA developments since the route is designed to encircle NYCHA housing. The intention is to encourage the underserved portion of the community to use this free resource. This new line of transportation will greatly increase access to the B, C, 2, 3, 6 and future 2nd Avenue Subway lines. Additionally, this will be a great asset for those visiting the Eco-District and will encourage them to explore the new amenities we are proposing for this neighborhood. Originally, we had considered a partnership with the big box shopping center on 117th Street that has occupants such as
Costco, Best Buy and Target. However, we want this shuttle to support the existing small businesses and be accepted by the community. We thought these objectives would be hindered by creating a partnership with retailers that have long been accused of driving mom and pop stores out of business. As an alternative, we recommend having the Barrio Bus operate with funds from special grants secured by the proposed 116th Street BID.

**FERRY TO 111TH STREET**

Ferries are an integral part to our plan to link residents and provide better connectivity to mass transit. The Economic Development Corporation (EDC) is already planning on expanding the current ferry system, which presents an opportunity for East Harlem to influence this plan.

In its current state, the EDC plan proposes a new ferry line that would connect Soundview in the Bronx with Manhattan at East 90th Street, East 62nd Street, and Wall Street. East Harlem is ignored in this proposal, but we feel that a ferry station can be added along this line with relative ease. We propose creating a ferry station at East 111th Street. This location is adjacent to Thomas Jefferson Park and is already served by a pedestrian bridge that connects the waterfront to the surrounding neighborhood. CIVITAS’ plan for an enhanced pedestrian walkway over the FDR and our waterfront recommendations at that location will further increase its attractiveness as a ferry stop.

While physical improvements are being made to the neighborhood, it is important to also consider how to improve the lives of the residents economically and provide opportunities for employment for current residents. According to NYCHA and 2010 Census data, there is a 12% unemployment rate in our study area and there is a 21% unemployment rate specifically within the NYCHA developments. In addition to addressing the high unemployment rate, the proposed jobs creation and training program will help to foster a sense of local pride since workers will be maintaining, protecting, and rebuilding their neighborhood and thus creating a better place for their families.

By hiring local residents as part of these initiatives, this jobs creation and training program decreases the amount of money flowing from the community to private companies and contractors; instead, local jobs will funnel some of this money back into the pockets of local unemployed individuals. This program will also help to alleviate some of the distrust harbored by the community against the City, since it currently appears that local changes are occurring without considering local needs. By employing currently unemployed East Harlem residents and paying them a fair wage, we can show the community that we are committed to improving their lives.
As a way of curbing unemployment while improving aesthetics and cleanliness in this neighborhood, we will create a jobs program that would hire local residents to maintain the cleanliness of the streets, sidewalks and NYCHA pathways. This program will be based on an existing program in San Francisco. This street cleaning employment program currently operates by hiring low-income or homeless individuals for periods of up to 4 months as a way to help them rejoin the workforce. Part of the program requires them to attend training programs that include resume writing, interview techniques, job search strategies, and basic computer skills, in addition to the maintenance skills they learn on the job. The sanitation job creation and training program in our study area will be modeled after this existing program as a way to employ residents and provide the community with cleaner streets.

To further decrease unemployment while increasing neighborhood safety, we recommend the creation of a security-based job creation and training program. Locally, this type of program already exists in NYCHA’s Astoria Houses development. Their job creation and training program is designed to combat the 47% unemployment and underemployment that exists in their development. This program created a security firm for their neighborhood that is run by a not-for-profit institution and hires NYCHA residents as security guards. This program encourages residents to buy a share of the company and one year after the program is created, the company will be handed over completely to these workers. This is a way to employ community members while giving them an opportunity to gain experience with running a business.
To combat unemployment, while also working to rehabilitate deteriorating NYCHA buildings, we recommend the creation of a job creation and training program that incorporates building rehabilitation in NYCHA. This job program will work off of the Project Labor Agreement, which was created on January 1, 2015 as a way to speed up capital repairs in NYCHA facilities. This agreement involved collaboration between NYCHA, the Building and Construction Trades Council (BCTC) of Greater New York, and affiliated unions. As part of this agreement, NYCHA and BCTC signed a ‘Memorandum of Understanding’ to provide NYCHA residents with union jobs and training through apprenticeship and pre-apprenticeship programs. Additionally, BCTC agreed to reserve 10% of new apprenticeship class space to NYCHA residents and agreed to work with employment advocacy groups to recruit NYCHA residents. While we find this agreement to be a positive step forward, we propose that more class space be reserved for NYCHA residents in the apprenticeship programs. We also propose that at least 25% of the construction workforce hired to complete the retrofits be NYCHA residents, giving preference to residents that reside in the development where the work is being done. We also propose to create a transparent, publicly available timeline for training through the construction phase as a way to ensure that NYCHA residents will realistically be prepared to work when projects are beginning.
In addition to issues related to climate, health, and access to quality public infrastructure, the availability of safe and affordable housing is an environmental justice issue that plagues East Harlem. In many cases, working class Hispanic and African American residents do not have access to the same quality of housing as middle-class white individuals. This inequality has important implications for the community, since East Harlem’s population primarily consists of minorities.

In the report “How New York Lives: An Analysis of the City’s Housing Maintenance Conditions,” New York City Comptroller Scott Stringer used data from the triennial Housing and Vacancy Survey to illustrate the huge discrepancy in the quality of housing available to different socioeconomic and racial groups in New York City. This report also breaks down the rates of maintenance deficiencies—including heating equipment breakdowns, peeling paint, holes in interior walls, holes in ceilings, water leakage, and presence of mice or rats—in Rent Stabilized and Market Rate housing for neighborhoods throughout the city. According to this report, East Harlem has the fifth highest rate of building deficiencies out of the 55 neighborhoods, with an average of two deficiencies per housing unit. The poor quality of buildings can be linked to a wide range of negative health conditions including respiratory infections, asthma, lead poisoning, and mental health issues. Water leaks from broken pipes - along with cracks in the building - create damp and cold conditions, which lead to mold. Mold is a major indoor contaminant and is associated with health issues ranging from asthma, to anxiety and depression. Internal and external cracks allow points of ingress for rats and insects, which further exacerbate asthma,
cause other respiratory illnesses, and trigger allergies. Lead exposure, particularly among children, can cause permanent neurodevelopmental damage leading to speech problems, impaired hearing, reduced IQ, and aggressive behavior. It is also associated with physical health issues like kidney damage, difficulty conceiving, and slow body growth. Additionally, winters in New York City with an unreliable heat source or a drafty apartment with water leaks, dangerous mold, or pest infestations creates a great deal of stress for inhabitants.

Poor building conditions are also energy inefficient. The failure to retrofit buildings for energy efficiency—or the failure to repair them up to modern efficiency standards—has worsened air quality and added to additional utility costs to already rent-burdened tenants.

According to a report documenting New York City’s housing affordability crisis released by Comptroller Scott Stringer’s office, there was a 44.6% increase in the average rent in East Harlem between 2000 and 2012. Census Microdata shows rents increasing from $658 to $952 in 10 years.26 According to a 2012 RPA study, there are 40,500 rent regulated units in East Harlem; 14,700 are public housing units, 9,900 are rent-stabilized units,
and 15,900 are “other” regulated housing units. However, rent regulated apartments are not regulated for an indefinite period of time. Of these rent-regulated units, 31% are set to expire between 2010 and 2040. With affordable housing options becoming more and more limited, East Harlem must address this issue head-on.

NYCHA

Since the 1970’s, the federal government completely altered the way that it developed affordable housing. President Nixon placed a moratorium on the development of public housing in 1973 and under Gerald Ford, federal affordable housing policy moved toward privatization - with its Housing Choice Voucher program (Section 8) and with the creation of the Community Development Block Grant. The Housing and Community Development Act of 1978 placed the responsibility of developing affordable housing into the hands of not-for-profit developers and Section 8, which provides assistance to eligible low- and moderate-income families to rent housing in the private market. Eligibility for this voucher program is based on a family’s gross annual income and family size. The moratorium on public housing construction is still in place and funding continues to be scarce, since it was slashed significantly during the Reagan Administration.

New York City Housing Authority (NYCHA) is the oldest and largest public housing authority in the United States. It was created in 1934 with the mission to provide “decent and affordable housing in a safe and secure living environment for low- and moderate-income residents throughout the five boroughs.” As of March 1, 2015, NYCHA’s Conventional Public Housing Program has a total of 177,666 apartments in 2,553 residential buildings within 328 developments throughout the City, serving 175,747 families and 403,917 authorized residents.

Currently, NYCHA has a $1 billion deficit due to a combination of public divestment and chronic mismanagement. Lack of funding from the State of New York has also contributed to NYCHA’s decline. In fact, the state has not contributed to NYCHA’s operating subsidies since 1996. This funding shortage has led to poor conditions in many developments. In 2014, Comptroller Scott Stringer reported that NYCHA’s housing conditions were rapidly deteriorating. His reported analysis showed the following conditions in NYCHA apartments:
• Broken and missing windows increased 945% from 2005-2011
• 79% of apartments had some kind of deficiency in 2011
• Water leaks were documented in nearly ⅓ of NYCHA apartments
• 36% of apartments had rodent sightings in 2011
• 26.6% of apartments experienced heating equipment breakdown
• 28.7% of apartments required additional heating through space heaters, which consume a significant amount of electricity
• 30.8% of apartments had cracks or holes in interior walls or ceilings
• 39.2% of apartments had broken plaster and peeling paint

The antiquated layout and design of NYCHA developments, specifically those in our study area, also leave much to be desired. Site surveys, research, and interactions with local residents revealed that NYCHA campuses in East Harlem are in deteriorating conditions and are in need of prompt rehabilitation and retrofitting. For example, scaffolding has been present in our study area’s NYCHA developments for years without proper explanation for the never-ending construction. Additionally, there is chronic illegal dumping throughout the area. The existing poor fencing layout and poorly lit areas isolate NYCHA buildings and create disconnected, unsafe spaces. As a result, many of the large open spaces within the campuses are underutilized, and some even serve as illegal dumping sites.

Given these circumstances, NYCHA has had to turn to unconventional funding sources. These include charging administrative fees for distributing Section 8 vouchers, using private investment for retrofitting plans, and developing Section 8 housing with private partners. Most recently, the agency released NextGeneration (NextGen) NYCHA, which is the authority’s 10-year strategic plan that will, among other things, lease vacant land within its properties to developers. These developers will then produce 50/50 affordable/market rate housing in that space. The goal is to provide NYCHA with much needed income and fund a long list of repairs and maintenance within their property portfolio. NextGen NYCHA has been generally better received than the previous mayor.
Michael Bloomberg’s proposed plan to build additional 20/80 affordable/market rate buildings within NYCHA campuses; however, there are still large concerns among NYCHA residents, activists, and public officials. Their concerns about the privatization of public housing and the integration of market rate units into the developments have led a significant number of NYCHA residents to hold public rallies. Residents have also been vocal in their opposition to the plan in public meetings held by NYCHA and elected officials.

Over the last decade or so, NYCHA has been making piecemeal efforts to retrofit its buildings. In 2010, NYCHA partnered with the New York Power Authority (NYPA)—the public organization that supplies their power—to install upgraded controls and lighting, energy efficient boilers, a new natural gas service, and instantaneous hot water heaters. While this would have been a great opportunity for NYCHA to retrofit many of its properties for efficiency, this partnership only included work in two developments, none of which were located in East Harlem.

Earlier this year, NYCHA, the City of New York, and the U.S. Department of Housing and Urban Development (HUD) released an initiative to cut down on energy costs through retrofits. On April 9, 2015, NYCHA announced that they would spend $100 million on much needed upgrades with a goal of reducing greenhouse gas emissions. The plan intends to save tens of millions of dollars and create 500 jobs. The funding would come from Energy Performance Contracts (EPCs), which are agreements with private companies that invest in future energy savings. NYCHA will hire an Energy Services Company (ESCO) that will reduce utilities use across 89 properties and seek a monetary return through energy costs saved. Subsequent RFPs will hire more ESCOs until eventually all NYCHA properties are covered. Hiring an ESCO means that NYCHA will not have to pay any upfront costs; the ESCO will implement the retrofits and then guarantee energy savings. HUD justified the need for this arrangement by citing that utility costs for water, electricity and heat have increased by 64% over the last 10 years even though consumption has only gone up 9% at NYCHA developments. While EPCs are increasingly popular in the clean energy sector, finding backers for $100 million projects is challenging, and research has failed to determine if any backers for this project have been secured since the RFP was issued in April 2015. Also, since HUD and NYCHA are not guaranteeing the loan and NYCHA has a history of mismanagement, possible investors may not be interested in this investment. Related, since the
$100 million for retrofits will be difficult to secure, the program is currently limited to 89 developments; the other developments will only be retrofitted if this first alliance with EPCs is successful. Unfortunately, due to the lack of transparency—another flaw with this program—we were unable to find many additional details about this project.

On October 1, 2015, the City Council’s Committee on Public Housing held a hearing regarding the lack of transparency in NYCHA’s hiring of contractors. The hearing, which included testimonies from Comptroller Scott Stringer and Committee Chair Councilman Ritchie Torres, called for greater oversight and accountability. The hearing was brought about due to a poor construction job on the King Towers development in our study area. Contractors hired to repair the clogged roof drains that were causing severe flooding in many apartments below. Despite numerous resident complaints, NYCHA did not address this problem until a Daily News story broke four months later. Our research also discovered that tenants in the DeWitt Clinton NYCHA development within our study area sued NYCHA in June 2014 for failing to address a backlog of repairs that stretched for years. It is highly probable that this is only one of many lawsuits or official complaints against NYCHA that resulted from its lack of proper building maintenance.

**NEIGHBORHOOD OPPORTUNITIES**

**Underutilized Development Rights**

Based on site surveys, data analysis of the study area, and additional research, we found that many blocks within our study area have a significant amount of unused development rights. Areas with an especially high amount of unused FAR include 2nd Avenue, 3rd Avenue, and the NYCHA superblocks. The character of 3rd Avenue is particularly unique; it contains many underbuilt lots, but also a variety of mix-use buildings that have active ground floor retail, with vacant and boarded up residential upper floors - there is also some light manufacturing uses present. This presents an opportunity for the neighborhood: the avenues can be built up as-of-right and NYCHA could use a transfer-of-development-rights program to generate funding for maintenance and retrofits. This is detailed further in the Zoning section of this plan.

**Not-for-Profit Developers**

There are a number of not-for-profit developers in East Harlem—such as Lott CDC—that have strong community ties and have been able to gain the trust of local residents through their work in creating and preserving quality affordable housing. As affordable housing developers, they are pivotal in helping to achieve neighborhood equity and sustainability. They also have the ability to build various types of housing that address the needs of the community; currently there is a lack of different types of affordable housing in East Harlem. Additionally, not-for-profit developers are willing to build quality affordable housing for seniors and community facilities for the neighborhood.

Currently, the Northern Manhattan Collaborative (NMC) provides a partnership between five not-for-profit affordable housing groups based in Harlem: Lott CDC, Hope Communities, El Barrio Fight Back, Youth Action, and Manhattan Valley CDC. This initiative is sponsored by Enterprise Community Partners, a large affordable housing advocate and financing group. The general purpose of NMC is to coordinate activities between organizations, optimize efficiencies, achieve sufficient scale to reduce costs and redundancies, foster an environment of general collaboration, and facilitate the sharing of best practices. To date, no major projects have resulted from the NMC,
but it is still in the early stages. This larger group may be able to more effectively preserve and develop affordable housing in the neighborhood—especially in the face of increased market-rate development pressure.

RECOMMENDATIONS

Our housing recommendations aim to address existing neighborhood challenges and conditions, while keeping in mind the neighborhood opportunities and the overarching Eco-District approach to our plan. Our three primary objectives set forth in analyzing and addressing housing are as follows:

- Rehabilitate and green retrofit deteriorating and vacant buildings on both NYCHA and privately owned land
- Develop new affordable housing on both NYCHA and private underutilized land
- Level the playing field for community-based not-for-profit developers by implementing policy solutions and zoning changes that facilitate the development of NYCHA infill, the rehabilitation of deteriorating buildings, and the creation of new affordable housing in underutilized spaces.

We recommend that the NYCHA developments within our study area be converted into the Rental Assistance Demonstration (RAD) program after making necessary adjustments to the way RAD is operated and managed.

Currently the RAD program, with HUD approval, allows public housing authorities to transfer units from the conventional public housing program to a project-based Section 8 program. This provides access to federal funds and low-income housing tax credits that cover the costs of building rehabilitations and allow for preservation and improvements in public housing units. However, these funds only cover a percentage of the rehabilitation costs, which means public housing authorities need to fund the remainder by either mortgaging the units—which the Section 8 transfer allows—or finding private developers to partner with. As it is currently structured, RAD requires a one-for-one replacement of units, and gives voucher priority to existing residents.

There is controversy surrounding the RAD program, however. While it provides extra federal funding sources that could be used for rehabilitation and green retrofitting—in addition to long term financial and physical stability of the housing units—many people fear the step it takes towards privatizing public housing. There is also fear that conversion will result in the breakdown of the current tenant power structure. NYCHA has come under criticism because there was very little transparency of the conversion of six NYCHA properties to the RAD program in 2014. In fact, only one of those properties is displayed in the RAD Initiatives section of the NYCHA website.40 The RAD RFP is not even listed there, which creates questions about the process of choosing developers to partner with. Right now, it is very unclear what type of developers NYCHA is going to partner with in the developments that have thus far been slated for RAD.

Given the mistrust and lack of transparency that continues to surround NYCHA and the chronic issues with its organization and management structure, if the RAD model is adapted as-is in New York City, it would not change the underlying institutional issues. Therefore, we recommend that the RAD program require a new manage-
ment structure for NYCHA developments, which will work exclusively with not-for-profit developers to assure the preservation of affordable housing and address concerns of the privatization of public housing. We propose that in order to qualify for a RAD conversion, in addition to HUD’s current program requirements, NYCHA would be required to cede control of the development to a not-for-profit developer through a long-term 99 year lease. The not-for-profit developer would be selected through a transparent public process and would be responsible for management, rehabilitation of existing buildings, and possible construction of new affordable housing units on underutilized sites within the development. The not-for-profit will then be able to use federal funding currently available through RAD, or partner with private developers through a community informed RFP process. As part of the RAD agreement, the not-for-profit developer would also be required to meet green retrofitting guidelines for rehabilitation projects.

We also propose a system that gives tenant associations a voice in selecting the not-for-profit developer. The current RAD program guidelines state that Tenant Associations will still operate after the conversion, but they are not clear as to whether or not the Tenant Associations have a say in the process. We recommend that the Tenant Association and the not-for-profit developer reach a contractual agreement before the RAD conversion is finalized.

Keeping in mind the financial and operational restrictions not-for-profit developers face individually—as well as the massive size of the NYCHA developments within our study area—the proposed RAD conversions would be more feasible through a partnership of various neighborhood not-for-profits developers, such as the Northern Manhattan Collaborative.

**TRANSFER OF DEVELOPMENT RIGHTS**

We recommend that NYCHA change its financing strategy for rehabilitations in order to meet maintenance demands, bring buildings to code, and address health and safety conditions. As part of the Special East Harlem Eco-District we are proposing in the zoning section of our plan, NYCHA will be able to transfer underutilized development rights from their properties to receiving lots along 2nd and 3rd Avenues. The revenue gained from the sale of development rights will come with a mandate that it may only be used to rehabilitate the buildings within the site from which the development rights are taken. The revenue will also be used to build community facilities or other facilities related to the Eco-District, such as the La Torre Cultiva component of the open space portion of our plan.

**REHABILITATION OF PRIVATELY OWNED PROPERTIES**

Through zoning mandates and incentives in the Special East Harlem Eco-District, we aim to encourage the rehabilitation of deteriorating and vacant privately owned properties within our study area, specifically along 2nd and 3rd Avenues. Such incentives include but are not limited to a Transfer of Development Rights program, affordable housing incentives, community facility incentives, and green infrastructure incentives. There are also a number of financial programs to monetarily support building retrofits, such as HPD’s Multifam-
family Housing Rehabilitation Program\textsuperscript{42} and the Green Housing Preservation Program.\textsuperscript{43} Collectively, these programs will encourage rehabilitation on privately owned property.

**NEW AFFORDABLE HOUSING**

To facilitate the creation of new affordable housing in East Harlem, we recommend granting not-for-profit developers long-term, 99-year leases for NYCHA properties. This would give the selected not-for-profit developer the right to build on underutilized NYCHA land. The lease agreement would require the not-for-profit developer to build green, permanently affordable housing. The not-for-profit will be able to finance the new affordable housing construction through traditional means, in partnership with other not-for-profit affordable housing developers (i.e. Northern Manhattan Collaborative), or in partnership with private developers through a community informed RFP process. Under the lease agreement, any revenue generated from the new housing units will be required to be used for the maintenance of the existing and new buildings within the development site.

Additionally, we recommend building new affordable housing units on underutilized NYCHA land through the Next-Generation NYCHA program. However, we propose the following modifications to the program: require that the revenue generated by the new housing units be used for building maintenance, site maintenance, or the construction of community facilities within the NYCHA development where the infill is taking place; require a community informed, transparent public process for selecting a developer to partner with; when choosing developers, give priority to neighborhood based not-for-profit developers; require the creation of 100% permanent, green affordable housing units that target lower AMIs and give priority to current NYCHA and East Harlem residents.

The NYCHA developments within our study area (King Towers, Taft Houses, Johnson Houses, and Jefferson
Houses) have a total of approximately 3,700,000 square feet of available floor area. As part of our Eco-District, we are proposing infill in two of the four developments—King Towers and Taft Houses—which will generate approximately 270,000 square feet of affordable housing. In addition to this space, NYCHA still has unused floor area in their developments, which they will be allowed to transfer to receiving lots along 2nd and 3rd Avenues as part of the zoning portion of our plan. However, this can only be done under the condition that any payment earned from the sale of development rights can only be used for either building rehabilitation within the site from which the development rights are taken or for the construction of new community facilities related to the Eco-District.

As another method for encouraging the creation of new affordable housing, we recommend incentivizing the development of new affordable housing on privately owned underdeveloped land through zoning changes. The proposed zoning changes involve the creation of a special purpose district, zoning mandates, and zoning incentives aimed at encouraging the construction of green, permanently affordable housing units within our study area. Specifically, these measures would encourage new affordable housing on properties along 2nd and 3rd Avenues, which we are designating as Special Growth Zones. The zoning portion of our plan includes a transfer of development rights program, mandatory

Via Verde in the Bronx: A green affordable housing development that we based our green building guidelines on.

affordable housing, green building design requirements, zoning district changes, and incentives to develop community facilities; these changes are detailed in the following zoning portion of the plan.
<table>
<thead>
<tr>
<th>NYCHA Development Name</th>
<th>Lot Area (sf)</th>
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<th>Available Floor Area (%)</th>
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**NYCHA’s Available Development Rights in our Eco-District Area**
Zoning law, in its simplest of terms, regulates land use across the city and has the ability to shape buildings, blocks, and whole neighborhoods. Since there is no established overarching Comprehensive Plan or analogous planning tool to guide development, the City of New York relies primarily on its Zoning Resolution to dictate how development within the City boundaries looks, feels, and functions. In certain cases, zoning can be used as a tool to preserve historically significant buildings or encourage rapid physical and economic development.

Most recently, the Department of City Planning (DCP) has been researching new ways to utilize the zoning resolution as a tool for creating new affordable housing. The product of this research is their proposed Mandatory Inclusionary Housing, and Zoning for Quality and Affordability zoning text amendments. Mandatory Inclusionary Housing requires that developers set aside a percentage of new developments for housing that will be permanently affordable to families making 80% or 60% of Area Median Income (AMI). Zoning for Quality and Affordability is a broader package of zoning changes that relax certain building restrictions—including parking minimums and minimum unit sizes—thus allowing developers to build more affordable housing. Mandatory Inclusionary Housing (MIH) and Zoning for Quality and Affordability (ZQA) are both currently undergoing the City's Uniform Land Use Review Procedure (ULURP). The outcome of the review procedure will determine if this text will become law.
Despite their good intentions, the ZQA and MIH proposals have received opposition throughout the beginning stages of the ULURP process. Many Community Boards across the City—including East Harlem’s Community Board 11—have voted them down. The proposals have been poorly received mostly due to the plan’s assumption of a one-size-fits-all approach to planning, its inadequate delivery of actual affordable units both in price and units created, its apparent disregard for communities’ previous efforts to establishing contextual districts, and its changes to parking minimums. In regard to East Harlem—a neighborhood that would be greatly impacted by the ZQA and MIH programs—our team believes that other zoning changes could be made to better address the needs of this community.

In pursuit of the Eco-District’s goals within the limits of zoning, we investigated ways in which zoning can create new affordable housing and preserve existing affordable housing while incorporating green technology, building design, and infrastructure into new developments. We also found it important to design a zoning plan that will encourage the development of community facility spaces, since the lack of community spaces was identified as an issue during our charrette. In addition to holding our own charrette, we worked to identify the community’s needs through intensive research, land use surveys, site surveys, interviews with residents and community organizers, and participation in community-led visioning sessions. Our recommendations include an increase in the following: affordable housing, green technology, community facilities, resiliency, disaster mitigation, and access to well-planned open and recreational spaces.

In order to achieve our goals, we determined that the best plan of action is that a special purpose district—called the Special East Harlem Eco-District—to be amended into the City’s zoning resolution. The new special purpose district will include a set of zoning district changes, as well as the formulation of new zoning text amendments intended to encourage affordability and green building design. Through a strategically constructed special purpose district, East Harlem can become a more equitable, livable, healthy, safe, and environmentally conscious neighborhood.

As previously stated, the goals of the East Harlem Eco-District within the scope of zoning are as follows:

- Create new affordable housing and preserve the adequately maintained existing affordable housing sites
- Incentivize the incorporation of green technology, building design, and infrastructure into new developments
- Utilize zoning to help alleviate NYCHA’s financial burdens, especially in regards to local building repairs and improvements
- Encourage the preservation of community facility spaces
- Improve connectivity within the neighborhood

In order to achieve these objectives through zoning, we recommend the construction of a new special purpose district, which will include:

- The implementation of “Special Growth Zones,” which will have unique regulations regarding affordability, the transfer of development rights, and green building standards
- Zoning changes and modifications
- A set of district-wide zoning mandates and incentives

The combination of these zoning tools are aimed at improving the existing conditions of the neighborhood, while being careful to not drastically alter the community to the point where current residents can no longer afford to live there.
CURRENT ZONING
A majority of East Harlem—including all of the NYCHA campuses within our study area—is zoned as R7-2. This zoning district allows for a maximum floor area ratio (FAR) of 3.44 and a height that is governed by the sky-exposure plane. R7-2 districts typically result in 4- to 5-story walk-ups, which are typical building types in this neighborhood’s midblocks. Despite having a moderately low FAR, our analysis of current built density found that each NYCHA campus owns hundreds of thousands of square feet in unused floor area. After analyzing the development rights of King Towers, Taft Houses, Johnson Houses, and Jefferson Houses, we found there to be a combined total of 3,738,175 square feet of unused floor area.

Along many of the avenues that cut through East Harlem, there are significant increases in bulk allowances. Much of 2nd and 3rd Avenues are zoned as R8A, which is a contextual district with a maximum FAR of 6.02 and a height maximum of 120 feet. Though these districts allow for greater densities and building heights compared to the rest of the neighborhood’s R7-2 Districts, the built landscape within the R8A districts are severely underdeveloped along 2nd and 3rd Avenues.
In addition, there are commercial overlay districts that run down every avenue from 1st Avenue to 5th Avenue, but are abruptly cut off where the NYCHA campuses are located. On the street level, the absence of commercial storefronts between 112th and 115th Streets along the NYCHA super-blocks creates a feeling of noticeable division for pedestrians walking north or south across the neighborhood. The disconnect in commercial activity to the north and south of the NYCHA campuses creates a noticeable fissure on these streets.

**OUR ZONING RECOMMENDATIONS:**

**THE SPECIAL EAST HARLEM ECO-DISTRICT**

We propose the creation of a Special Purpose District called the Special East Harlem Eco-District (SEHED). This special purpose district will be bounded by Malcolm X BLVD to the West, 110th/112th Street to the South, 1st Avenue to the East, and 116th Street to the North.

The following subsections will explain in detail each component of the SEHED, including:

1. **The Special Growth Zones**
   - Transfer of development rights
   - Mandatory Affordable Housing
   - Green building design requirements
   - Bioswales

2. **Zoning District Changes**
   - R8A to R8X
   - C4-4D extension
   - NYCHA campus commercial overlay districts

3. **Community Facility Use Incentives**

**THE SPECIAL GROWTH ZONES**

We recommend the creation of Special Growth Zones (SGZ) as a way to encourage the sale of NYCHA’s underutilized development rights, while encouraging the creation of new affordable housing units, the maintenance of existing affordable housing units, and the inclusion of green building design components in new construction.

We propose the creation of SGZ in the R8X and C4-4D Districts along 2nd and...
3rd Avenues. We recommend 2nd Avenue for a growth corridor in anticipation of the development of the 2nd Avenue subway line. Based on the principles of transit-oriented development, increased density and development are appropriate for an area with increased transit access. We recommend 3rd Avenue for a growth corridor because of the amount of vacant, abandoned, and unkempt buildings in this area. Making this avenue a growth corridor will encourage the redevelopment of these sites. Furthermore, we decided not to include 1st Avenue as a candidate for the SGZ because of its proximity to the waterfront. Development on 1st Avenue would be contradictory to our proposed measures of waterfront resiliency.

**TRANSFER OF DEVELOPMENT RIGHTS**

Much of the Special Growth Zone recommendations are centered on the utilization of a proposed transfer of development rights (TDR) program. Greatly influenced by the Special Lower Manhattan District, where unique strategies using TDR helped preserve the South Street Seaport, the
SGZs will incorporate similar strategies to better enable NYCHA to sell their unused development rights to developers. For the Special East Harlem Eco-District (SEHED) TDR program, ‘giving sites’—or sites that are selling their development rights—must be located within the boundaries of the Special East Harlem Eco-District, and may transfer development rights to any site located within any of the four Special Growth Zones. It is not necessary for the giving and receiving sites to be adjacent. Only properties within the Special Growth Zones may participate as ‘receiving sites.’ Zoning lots located within the Special East Harlem Eco-District that are outside of the Special Growth Zones are not eligible receiving sites; these lots may only be giving sites. To prevent this program from creating significantly out-of-context development, we recommend placing a cap on the amount of development rights that can be transferred to a receiving site. All receiving sites within the Special Growth Zones will thus be limited to the purchase of a maximum of 1.2 FAR per development. Further, we recommend that any transfer of development rights that involves the sale of NYCHA’s floor area should have additional regulations. Specifically, any payment earned by the sale of development rights from a NYCHA property must be placed into two specific funds: one where funds may only be used for NYCHA rehabilitations and the other where may only be used to improve or create community facility spaces within the SEHED. Each individual sale of development rights will be dispersed accordingly: 20% of earnings reserved for community facility projects and 80% reserved for NYCHA rehabilitations within the same development that sold its air rights. For example, if NYCHA’s King Towers sells 10,000 square feet of floor area for $100,000, $20,000 would go towards community facility improvements within the SEHED and $80,000 would go towards building rehabilitation within King Towers.

We believe these special TDR allowances and incentives will help preserve and maintain the physical character of this East Harlem neighborhood, while channeling capital into financially strapped properties that are in poor condition. Since development rights can be sold from anywhere in the SEHED, non-NYCHA buildings can also reap the benefits of this TDR program; this is beneficial since other non-NYCHA properties between 110th and 116th Streets were also found to be in disrepair.
Since property owners within the Special Growth Zones will be receiving enormous advantages through our proposed TDR allowances, we recommend additional regulations that would guarantee affordability components in all new developments. Specifically, we recommend that a set amount of affordable housing units to be required in all new developments within the Special Growth Zones. Our affordable housing model was inspired by the Department of City Planning’s Mandatory Inclusionary Housing text amendment, but is modified to better accommodate the needs and incomes of our study area. Our model proposes that all residential developments of at least 10,000 square feet be required to set 25% of all units at 60% of the average median income (AMI), another 25% set at 80 AMI, 30% set at 100 AMI, and the remaining 20% set no greater than 165 AMI. Therefore, through these designations, 50% of the units in each new development will target low-income households, 30% will target middle-income households, and no more than 20% will target upper-income households. We believe that these AMI distributions better represent the needs of the community without discouraging development altogether.

**GREEN BUILDING DESIGN STANDARDS**

To align with the Eco-District’s goals, we recommend zoning regulations that require green building design techniques in all new developments within the Special Growth Zones. Specifically, new developments must be constructed up to equivalent standards as those laid out by the Leadership in Energy and Environmental Design (LEED) in their Silver Certification rating. We decided that the Silver certification was most appropriate for the Special Growth Zones because while the lowest LEED
standards are not stringent enough, it can be costly to implement green building design techniques. To make a positive impact while preventing high building costs from deterring development, we believe that the Silver rating is the right balance.

However, the LEED certification application process is costly, thus making participation either difficult or undesirable for both for- and not-for-profit developers. In order to resolve this issue, we propose the establishment of an East Harlem Eco-District Authority to establish, monitor, and evaluate green building design codes, which we recommend be required in the SGZs and be created based on LEED Silver standards. Funding for the authority can be provided by a percentage of all TDR transactions that occur within the Special East Harlem Eco-District. In addition to this responsibility, this Authority will also be tasked with overseeing and monitoring all other components of the East Harlem Eco-District.

BIOSWALES

In addition, we also recommend that all new developments within the Special Growth Zones be required to install bioswales to help mitigate the adverse impacts of storms and climate change. As was seen during Hurricane Sandy, the City’s infrastructure is lacking in flood resiliency and sewage overflow. Further, the City’s combined sewer overflow system is outdated and inadequate in moments of severe flooding, which leads to water pollution and contamination. Resolving these problems through separate sewer system conversions or by installing retention basins would be costly and has physical limitations. Instead, we recommend addressing resiliency problems by requiring the creation of bioswales, since they provide an effective alternative that is not as costly and can be easily implemented in the existing streetscape.

The proposed bioswale regulations will be similar in structure to the existing street-tree planting regulations in the zoning resolution. Specifically, we recommend that all new developments located within the Special Growth Zones be required to install one 10-foot long bioswale along the street frontage bordering the develop-
opment site. Corner lots will be required to install two 10-foot long bioswales; one will be required on each street front bordering the development site, or where it is most appropriate. Developers may be exempt from installing bioswales on their streetfronts in cases where street and sidewalk dimensions create layout conflicts. We anticipate that the installation of bioswales may not be physically feasible in some locations due to curbcuts or ADA sidewalk requirements; in such events, we propose that developers who are unable to install bioswales on their sites will be required to pay a fee into the a new fund for green infrastructure projects within Community Board 11. This fund would be used for, but not limited to the creation of bioswales. The fee amount will be based on the average cost of bioswale materials and installment.

**Special East Harlem Eco-District Regulation Exemptions**

Regulations pertaining to affordable housing, green building design components, and bioswales will be waived for developments that either contain less than 20,000 square feet of total floor area, or can prove a hardship.

**ZONING DISTRICT CHANGES**

We also recommend making several zoning changes and alterations. Within the Special East Harlem Eco-District, we plan to a) rezone the R8A Districts found along 2nd and 3rd Avenues to R8X Districts, b) extend the C4-4D commercial district found on 3rd Avenue north to 124th Street, while also allowing for select forms of light, ‘green-oriented’ manufacturing uses, and c) place commercial overlays along the sections of avenues adjacent to the NYCHA campuses.

**R8A TO R8X**

In order to attract development to the Special Growth Zones without disrupting the context of the neighborhood, we recommend rezoning these R7-2 and R8A areas within the SGZs to R8X. With the same 6.02 FAR allowance as the SGZ’s former R8A District, there will be relatively few differences in these zoning districts. The only real difference between these two contextual districts is that the R8X district allows for an additional 30 feet in height over R8A’s 120 foot building height limit. Allowing buildings to reach 150 feet within the SGZs is important when it comes to incentivizing developers to participate in the Special East Harlem Eco-District’s aforementioned TDR program; the extra three floors of potential residential space goes a long way, while still only moderately altering the physical landscape of the neighborhood. This new zoning district will still maintain this area’s contextual identity, however, which is an important asset to the residents of East Harlem. Though upzoning the SGZs to an R9 or R10 district would be better at attracting developers, this has the potential for too many negative impacts throughout the community. R9 or R10’s lack of a building height cap would inevitably lead to unwanted, out-of-context building designs. As such, we believe that the aforementioned R8X zoning district will be most appropriate for the SGZs and we recommend that the area be rezoned as such.

**C4-4D EXTENSION**

Additionally, we recommend extending the C4-4D commercial district that is currently found on 3rd Avenue from 115th Street north to 124th Street. Currently, the
C4-4D district stretches from the NYCHA campuses to 122nd Street, while a smaller C4-4 District stretches along 3rd avenue between 122nd and 124th Streets. The C4-4D District's equivalent residential district is R8A, so it fits into the Special Growth Zones quite nicely in terms of FAR allowances. This change will make only a minimal alteration to the zoning map, since the C4-4 District in contention spans only two blocks; however, the rezoning from a non-contextual C4-4 to a contextual C4-4D District is crucial in maintaining appropriate building types within the neighborhood, especially in lieu of the Special Growth Zone's proposed TDR allowances. Without a contextual district, there would be no rigid height limit in this area and developers could potentially construct uncharacteristically tall, out-of-context buildings. However, with a contextual district such as a C4-4D, there will be a building height maximum. As a result, any new developments will be restricted to a building envelope that more appropriately sits within the context of the surrounding neighborhood.

To ensure consistency with the SGZ's goals, we recommend modifications of the existing C4-4D District regulations. First, we recommend changing the maximum permissible height from 120 feet to 150 feet. This will keep the height regulation consistent with that of the rest of the SGZ Districts. Second, we recommend that this special C4-4D District within the SGZ allow for select types of light, 'green-oriented' manufacturing uses. Permitted light manufacturing uses will include solar panel parts-assemblage plants and recovered lumber furniture workshops. Allowing green-oriented manufacturing uses in this area aligns with the Eco-District’s values and will create jobs in the community without allowing heavy manufacturing, which would be a nuisance to neighboring residents. Ideally, this green-oriented mixed manufacturing/commercial district can be later replicated in other boroughs as a way of encouraging green technology development throughout New York City.

NYCHA CAMPUS COMMERCIAL OVERLAY DISTRICTS

In order to reconnect the north-south divide caused by the lack of commercial overlays along the sections of Avenues adjacent the NYCHA campuses,
we recommend filling these gaps with C1-4 or C1-5 commercial overlay districts; C1-4 or C1-5 will be chosen based on which overlay is currently existing on each avenue. Though not all of the added commercial overlay districts will result in commercial infill on the NYCHA campuses, this will allow for such opportunities in the future.

COMMUNITY FACILITY USE INCENTIVES

According to participants at our charrette, this East Harlem neighborhood does not have a sufficient amount of community facility spaces. Specifically, there are not enough childcare or senior care facilities despite the demand for these spaces. In order to incentivize developers to build community facilities, we recommend that for any development within the Special East Harlem Eco-District, 350 – 1,000 square feet of community facility space will be completely deductible floor area. For example, if a particular zoning lot is permitted a total of 50,000 square feet of floor area, and the development reserves 1,000 square feet for community facility uses on that lot, then that same zoning lot is permitted to build up to a new maximum of 51,000 square feet. This zoning incentive will be particularly useful when developing the proposed cultural community facilities described in the open space portion of this plan. Overall, this special floor area exemption will help increase the number of much-needed community facilities within this East Harlem neighborhood.

Childcare facilities are much-needed in the study area
Implementing an Eco-District will be no simple task, especially with the amount of red tape; political and economic interests; and budget concerns that exist in New York City. Our plan is also very intensive, with many complex projects intertwining as part of one, transformative neighborhood. That being the case, it will be necessary to create an authority than can oversee and guide this process.

Responsible for tying all of the disparate parts of the Eco-District together will be one overarching body: the East Harlem Eco-District Authority. This authority would oversee programming in the Botanic Cultural District, would regulate FAR transactions in the Eco-District special zoning area, and would administer the street and transportation improvements outlined in this plan. Its staff would be chosen by a board of directors drawn from existing non-profit and public agencies currently active in the area, which could include individuals from Harlem Community Development Corporation, East Harlem Community Development Alliance, Community Board 11, NYC Eco-Districts, and the Northern Manhattan Collaborative.

This would be modeled after the Battery Park City Authority, which is a state authority that functions as a public-private partnership. With the East Harlem Eco-District Authority, however, the state will partner with the many East Harlem non-profits and community development corporations instead of a private entity.
In order to effectively evaluate our recommendations and start developing a strategy for implementation, we first needed to establish criteria to assess each recommendation in a uniform system. This led us to identify 3 key criteria to consider: time, costs, and potential impact.

Within each of the criterions, we needed to establish a consistent system for rating each recommendation in a way that was useful and would allow us to organize them intuitively. For time, that meant setting parameters around a ranking system based on estimated duration of the project from commencement to completion. This would help us identify “tiers” of projects that could be sorted from shortest to longest in terms of time to implement. For the shortest projects, those taking less than 3 years to complete, we assigned the recommendation a value of 1. Recommendations that would require more time, between 3 and 5 years, were assigned a value of 2. Finally, for those recommendations taking the longest time, more than 5 years, were assigned a value of 3. Take for example our recommendation of expanding Citi Bike north of 86th Street. This is a recommendation that we believe would take a shorter amount of time because the technology and system already exist. It would simply require the community to provide input on station locations and the installation of the docks, therefore we assigned it a 1. On the other end of the spectrum, rehabilitation and retrofitting NYCHA housing with energy efficient materials would be an extremely long and cumbersome process, so it was assigned a value of 3.

Our second key criterion, cost, was handled in a similar manner as time. We needed to
establish parameters for the evaluation of each recommendation so we could organize them in order from least expensive to most expensive. The least expensive recommendations were those that would require less than $1 million to complete and would be assigned a value of $. Recommendations projected to be moderately expensive were those we estimated would cost between $1 million and $10 million, and would be assigned a value of $$. The most expensive recommendations would be those estimated to cost more than $10 million and therefore assigned the highest value of $$$. Similar to time, projects that were on a smaller scale were those assigned a value of $, such as the development of new community gardens. Those that would require a significant investment from either public or private funds, such as the development of the micro grid, were given a value of $$$ as costs would total more than $10 million.

Our third criterion, impact, is the most subjective of the three, as we collectively had to determine how much of an impact a recommendation would have on the community. As one can imagine, some of our ideas worked in support of other recommendations while some of the larger ideas were those that could truly transform the neighborhood. This can be somewhat difficult, as our team had to essentially agree on which components were more important than others. Nonetheless, we were able to assign impact values to our recommendations in 3 tiers, as was the case with cost and time. Recommendations that we see as less impactful were assigned 1. Those that would be moderately more impactful on the community were assigned a 2. Finally, our recommendations that would have the most impact would be assigned a 3. One of our recommendations we saw functioning in more of a supportive role would be the implementation of solar powered streetlights. These streetlights are really just one aspect of a larger plan to make streets safer and more attractive while also implementing environmentally friendly infrastructure. But considered in isolation, this recommendation would not have much of a measurable impact on the community, so it was given a value of 1. Alternatively, the construction of new affordable housing on NYCHA land would have a huge impact on the community in several ways, and thus, was assigned a 3.

Once all of our recommendations had been assigned a value in all 3 criteria, we needed to determine the best way to make this information useful. Time, cost and potential impact rankings could be valuable information separately, but we wanted to find the best way to organize all this information to establish a phased approach to implementing our ideas. After some discussion, our team agreed that time was the key criterion we needed to use in order to organize our recommendations while retaining cost and potential impact as supporting data for evaluation. This way, stakeholders could understand our phased approach is a method for implementation that would install new resources and infrastructure in East Harlem gradually over time.

Cost and impact still play a crucial part in understanding how we evaluate the recommendations and how they all tie together. As expected, we see there is a natural correlation between time needed to implement, estimated cost, and the impact we believe each will have on East Harlem. Projects that require more time and money to implement are those we believe will have the most drastic, positive impact. Our projects that we foresee having a lower impact are still important, but work to support our bigger ideas for the community, and therefore require less time and resources.
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<td>Waterfront Pier Sustainability Center + Boathouse</td>
<td>3</td>
<td>$</td>
<td>2</td>
</tr>
<tr>
<td>Rehabilitation of NYCHA developments</td>
<td>3</td>
<td>$</td>
<td>3</td>
</tr>
<tr>
<td>Construction of new affordable housing - NYCHA owned land</td>
<td>3</td>
<td>$</td>
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</tr>
<tr>
<td>Construction of new affordable housing - HPD land</td>
<td>3</td>
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<tr>
<td>Microgrid Development</td>
<td>3</td>
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<tr>
<td>Closing 110th between Park and 1st Ave</td>
<td>3</td>
<td>$</td>
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<tr>
<td>La Torre Cultiva</td>
<td>3</td>
<td>$</td>
<td>2</td>
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<tr>
<td>Park Extension on top of FDR</td>
<td>3</td>
<td>$</td>
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<tr>
<td>Shoreline Redesign</td>
<td>3</td>
<td>$</td>
<td>3</td>
</tr>
<tr>
<td>New and Renovated Playgrounds and Recreation</td>
<td>3</td>
<td>$</td>
<td>2</td>
</tr>
</tbody>
</table>
East Harlem is a neighborhood that is already in transition. New luxury high-rises are beginning to sprout up among the aging brownstones and NYCHA towers. Understandably, residents are afraid that they are going to be priced out of the area and their homes will be razed to make way for expensive new condos and high-end shopping malls. But we don't believe this disruptive transition has to happen. Our plan aims to revitalize the community to make it a more vibrant, safe, and sustainable place to live while maintaining the culture of the neighborhood and keeping it affordable for its current residents. Our final recommendations were created with these best interests of the community in mind.

El Barrio Verde will address affordability by promoting both the creation of new affordable housing and the preservation of existing affordable housing. This will be accomplished through a combination of zoning incentives and creative finance strategies. It will introduce sustainable practices by creating an economically inclusive community that utilizes environmentally friendly strategies and improves the functionality of existing open space.

It will encourage both the development of green affordable housing and green retrofitting of existing buildings to reduce this neighborhood's energy usage and overall carbon footprint. This plan also takes measures to mitigate the local impacts of climate change and sea level rise.
Our Eco-District will also improve health and safety by implementing programs and infrastructure that improves existing open spaces, improves local air quality, promotes healthier lifestyles, and create safer paths for pedestrians and bicyclists.

We will promote livability and create a more unified community through the celebration of cultural ties to East Harlem’s rich history. District-wide improvements in community gardens, urban farming, cultural facilities, pedestrian pathways, bicycle paths, and improved public transportation will all help to create a more vibrant community.

It is our contention that our recommendations—guided by our aforementioned goals—will create El Barrio Verde: an Eco-District that can become a model for equitable transformation, not gentrification.
Executive Summary

Community Profile: Demographics and Health

Existing Efforts and Plans

Needs and Opportunities
**Open Space**

18. 6 Simple Ways to Incorporate Nature Into Your Playground. www.slideshare.net/pdplay/natural-playground

**Street Network**


**Job Creation/Training**

Housing


40. New York City Housing Authority. NYCHA’s Commitment to Repair & Preserve Public Housing. NextGen NYCHA. http://www1.nyc.gov/site/nycha/about/nycha-rad.page

**Zoning**

**Green Infrastructure and Design**
4. NYSERDA’s NY Prize: http://www.nyserda.ny.gov/All-Programs/Programs/NY-Prize
THANK YOU FOR READING