01 SEEDING THE MACHMABA

Machambas as Agro-based Community Recovery

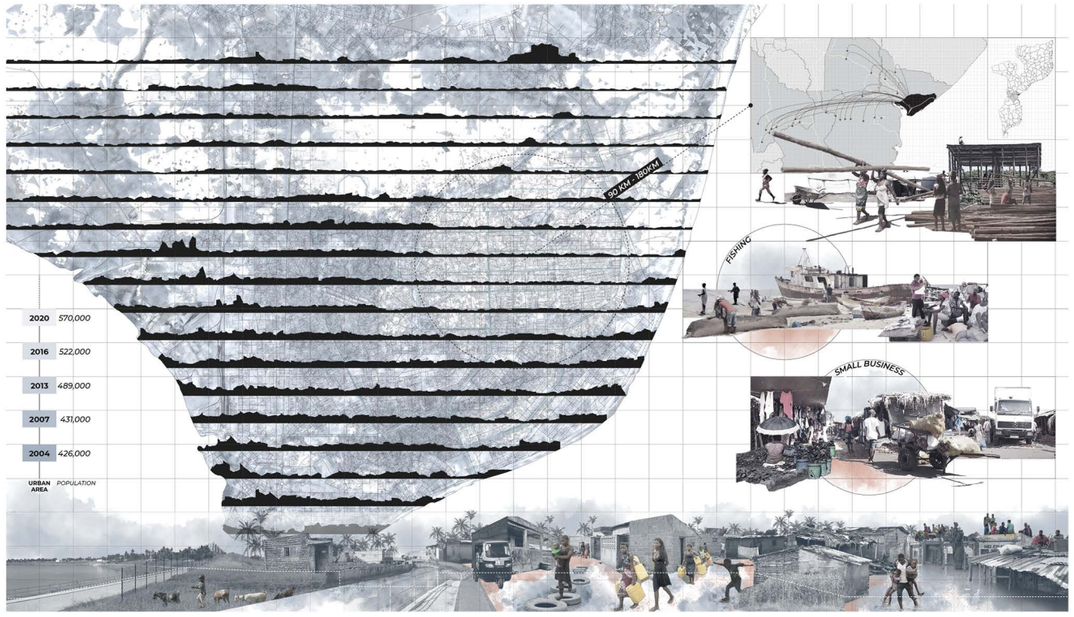
Instructor: Kate Orff

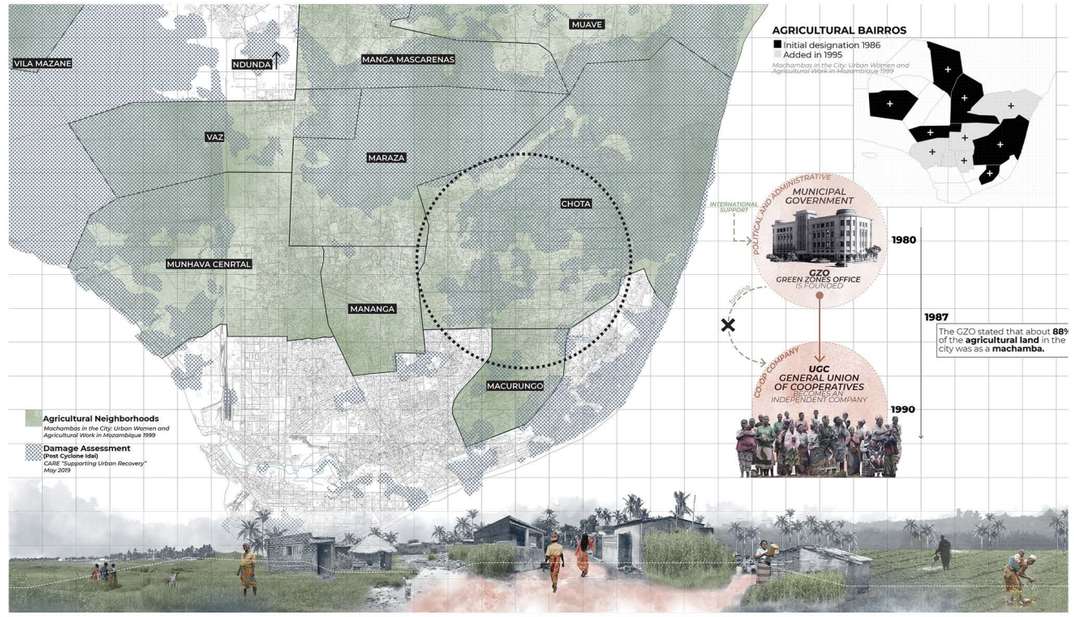
Studio Work, Columbia University
2020 Spring Urban Design Studio
Site: Brira, Mozambique

Team: Xinyue Liu, Ashwin Nambiar, Jaime Palacios Anaya, You-Chiao Wu, Ting Zhang

The city of Beira has a strong system of urban agriculture that is currently under threat. Our project understands agriculture as a flood infrastructure. This nature based and resilient agricultural network could coordinate the communities, organize the city, and be the key to recovery.

- Consolidate and organize cooperatives at a city scale
- Protect social and ecological capital
- Empower women in productive agriculture
- Diversify sources of income
- Integrate rich nature based services.



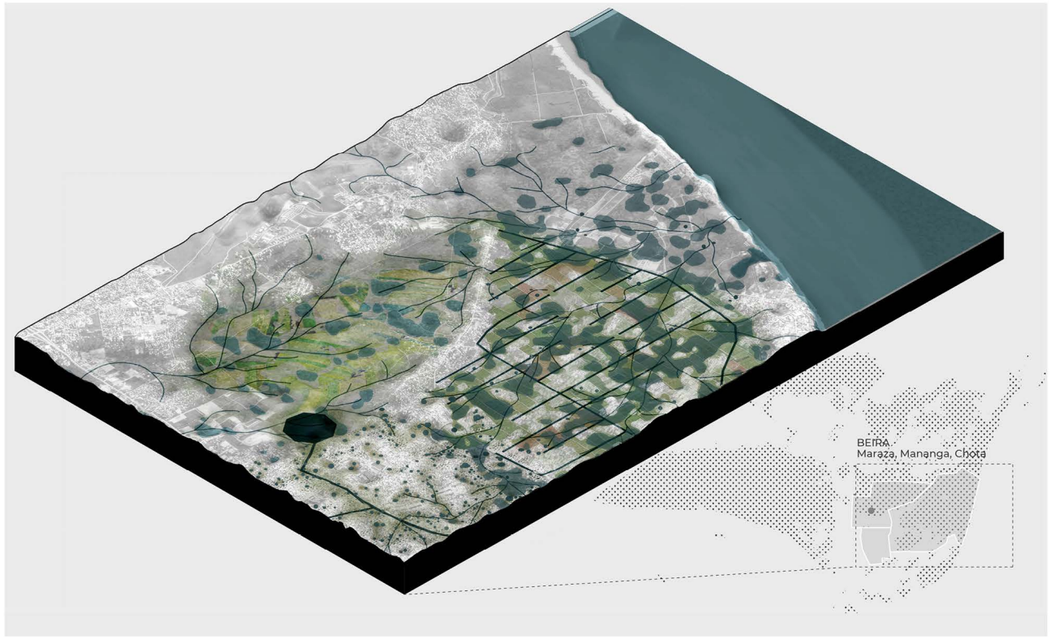


LACK OF ELEVATIONAL PROGRAMMING

"Flooding" is a consequence of unplanned sprawl into low-lying agricultural land.
The current resettlement plan disregards people's livelihoods and defines "risk zones" in the city, instead of recognizing them as assets for the city.
Need of elevational programming for future cyclones and urban growth.

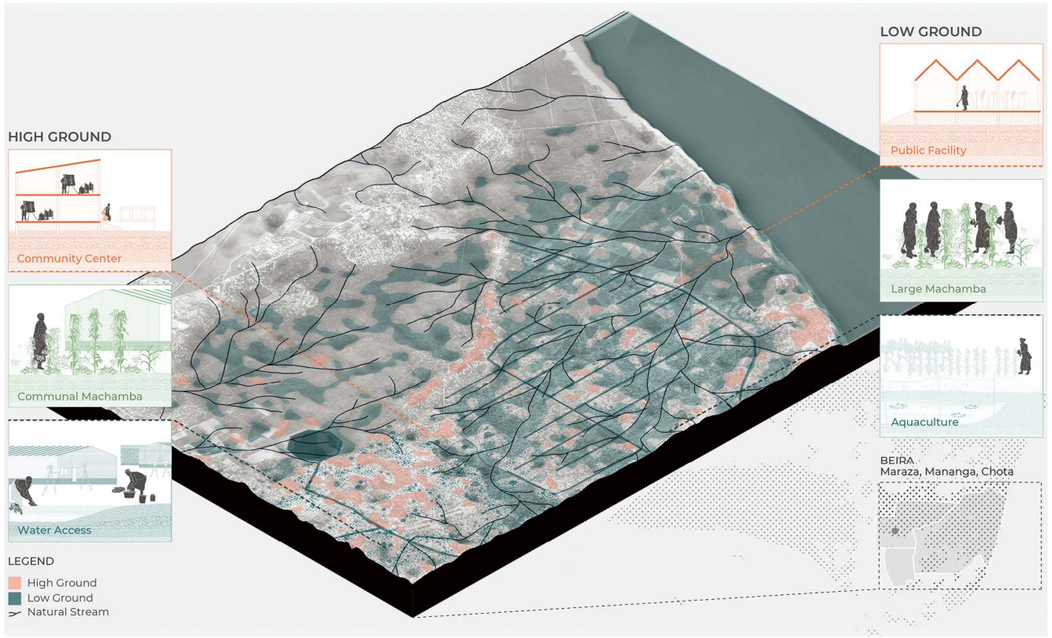
THE ROOTS OF AGRICULTURAL GROUNDS

1987 - Office of Green Zones recognized 10 agricultural neighborhoods where people organized in co-ops.
1990 - the UGC became an independent company and suffered shortages because of the lack of governmental support. Their members were disincentivized to work in the co-ops.
Since before the colonial times, the agricultural practices were embedded in the livelihoods of the people from Beira.



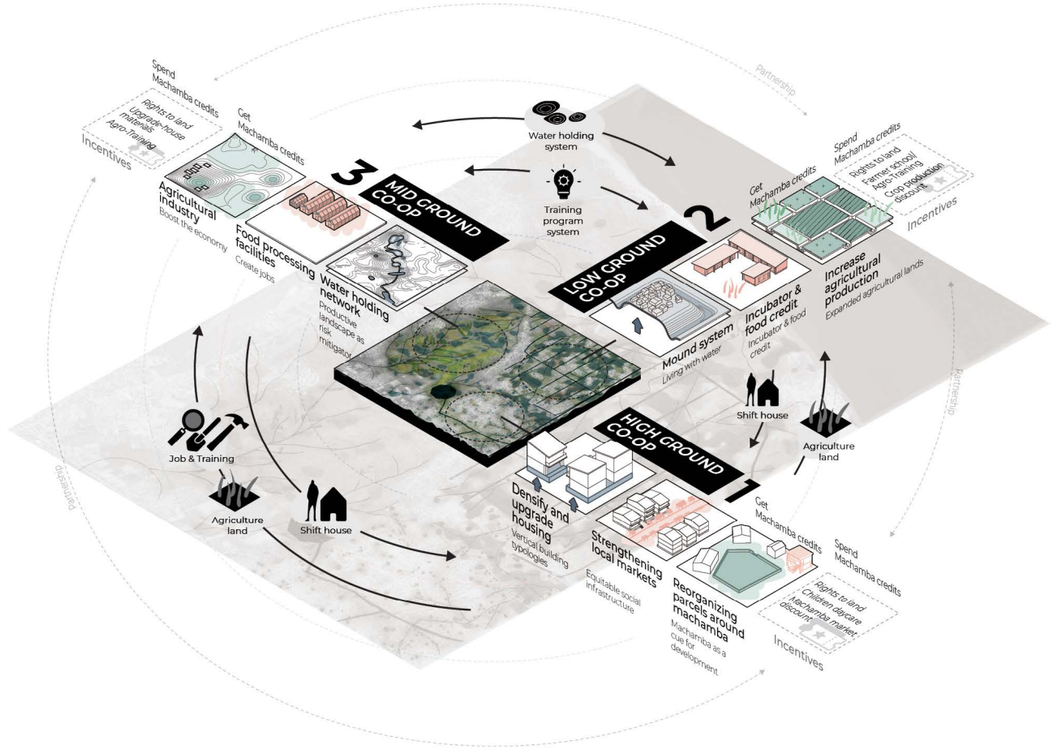
MACHAMBA AS A WATER-HOLDING SYSTEM

We see the dispersed machamba as an opportunity to become one water holding system in the whole Beira.
We identify different strategies by elevation.
Those machamba could be connected by the natural streams.



ELEVATIONAL STRATEGIES

High grounds are equipped with public programs and accommodating more people.
Low grounds are designated as productive agricultur and preventative water retention lands.
People in low grounds retreat to safe zones in the nearby highlands.



MACHAMBA CO-OPS

Based on this water-holding system we propose three community based organizing frameworks to facilitate urban transformation according to different social contexts.
The overall objective is to strategically retreat to safer zones combined with community empowerment and economic development.
High Ground Coop - Provide welfare facilities / densify housing
Low Ground Coop - Increase agricultural production and manage water holding systems.
Mid Ground Coop - Boost economy by scaling agriculture / aquaculture production.

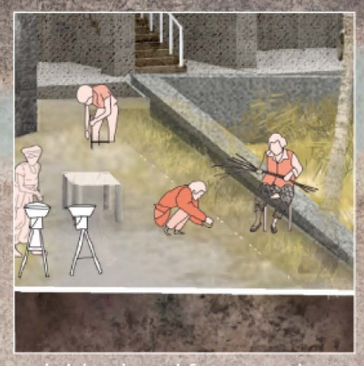
extended market

SEEDING PROJECT
community center

STAGES

1 Community center
2 Densify housing
3 Market street
4 Extend market

food storage
rainwater harvesting



neighborhood front yard
low wall as benches

SEEDING PROJECT
machamba neighborhood

STAGES

1 Neighborhood Kitchen
2 Machamba guide line
3 Ditch
4 Elevated housing

SEEDING PROJECTS

GROWING THE MACHAMBA SYSTEM

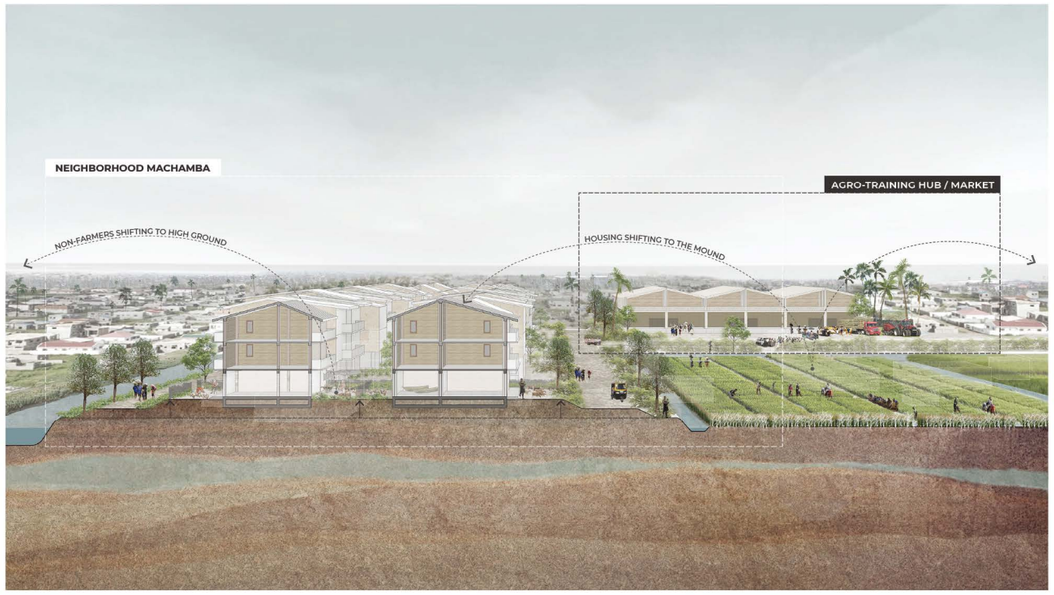
Machamba seeding project will replicate and create a water retention system. With densified housing, high ground could accommodate people from other risk zone in low ground and mid ground.

HOW THE MACHAMBA SYSTEM FUNCTIONED

Dry season-neighborhood machamba as the agricultural social space for self sufficiency

Rain season-machambas working as a water retention system

Extreme condition-Community center as the safe gathering point, providing food, emergency healthcare, boats for transportation, as well as for protecting the seeds, tools. New housing allows flooding at the ground level.



LOW GROUND

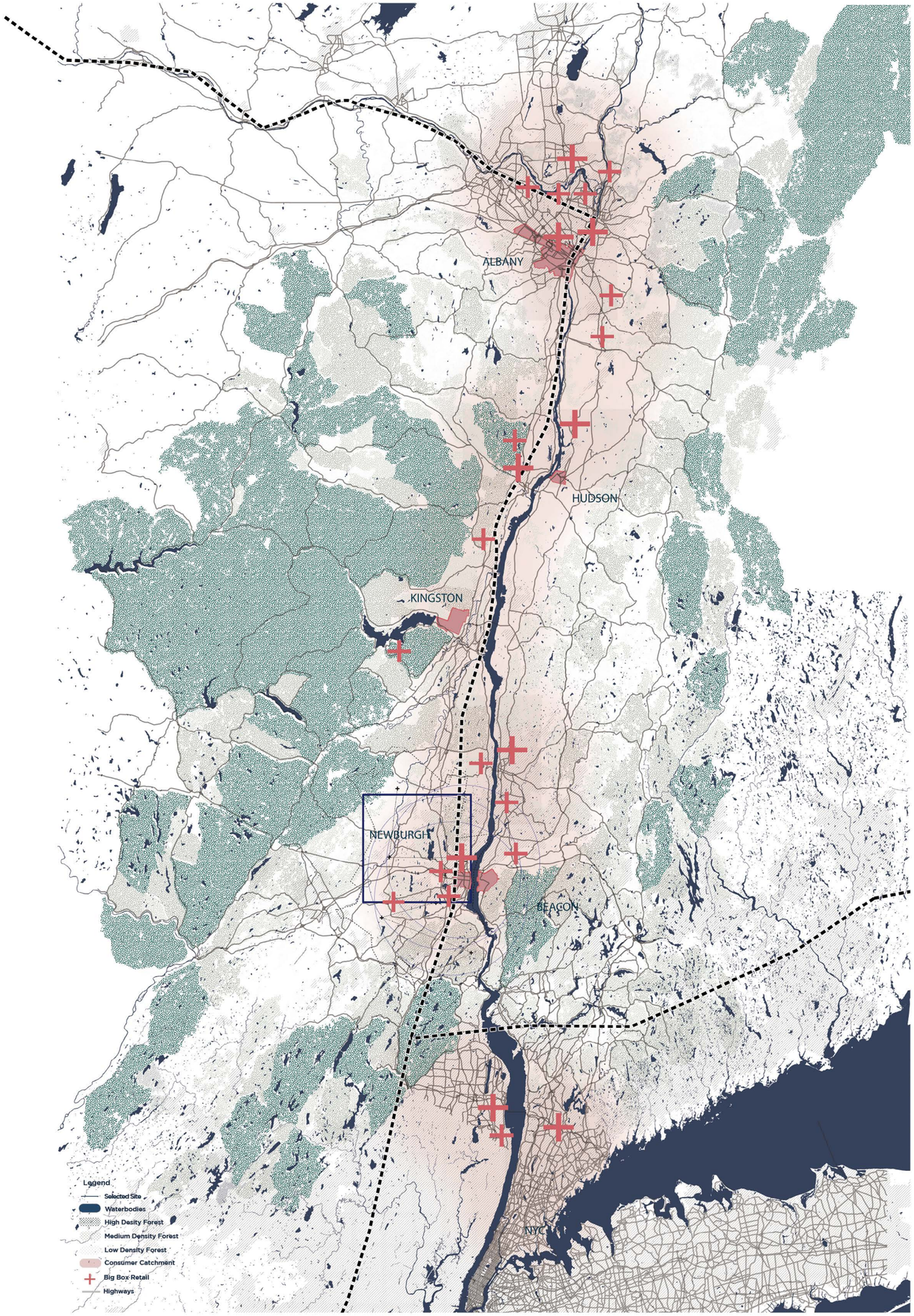
Neighborhood Machamba System - Building mounds near the existing neighborhood machamba.
Non-farmer shifted to highland
Expanding Irrigation system.
Housing with multi-purpose ground floor.

Agro-training Hub / Market - Providing agro-training, seeds, irrigation construction training / materials.
Agricultural product storage and transportation.

HOW THE MACHAMBA SYSTEM FUNCTIONED

Dry season - productive agriculture, food to schools

Rain season - fields as water retention in a city scale, canals as water transportation, network of mounds.



02 UNBOXED

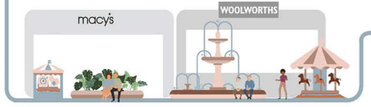
How can the Green New Deal trigger new Land management and zoning policies that fous on bio-regiona?

Studio Work, Columbia University
Instructor: Kaja, Anna, Jerome, Dragana, Justin, Liz, David, Raafi, Shachi
2019 Fall Urban Design Studio
Site: Newburgh, Hudson Vally, New York State

Team : Hala Abukhodair, Scott Guo, Xinuye Liu, Stuti Ganatra

The expansion of highways in the 1960s led to the growth of large shopping centers in the hinterlands of Hudson Valley that continue to burden the ecological and social landscape. The location and operations of big boxes along with the behavioral patterns they encourage entail a massive carbon footprint. Large portions of forests are cleared and streams and storm water ponds are canalized to accommodate these shopping centers. As these isolated stores attempt to establish an omni-channel presence, the damage that they cause to the environment, especially the watersheds, can be mitigated. This project takes the case of Newburgh to re-imagine the spatial and systemic changes that can be brought to the experience of consumption and distribution of goods and the component of recreation that is invariably associated with retail. The Green New Deal triggers this change in the script of daily lives that the climate crisis demands.

MALLS WERE FIRST BUILT IN 1860s AND CONTINUE TO FORM A SIGNIFICANT PART OF **THE SCRIPT OF DAILY LIVES**



THE FEDERAL HOUSING ADMINISTRATION AND **THE FEDERAL HIGHWAY ACT** PASSED IN THE **NEW DEAL ERA** PLAYED A SIGNIFICANT ROLE IN THE GROWTH OF THESE SHOPPING CENTERS

ON AN AVERAGE, **300 ACRES OF FORESTS ARE CLEARED** TO BUILD SHOPPING CENTERS

4 KGS OF CO_2 RELEASED FROM AN AVERAGE SHOPPING TRIP

THEIR MASSIVE PARKING LOTS OCCUPY **LARGE AREAS OF WATERSHEDS**

ENERGY IS FROM NON RENEWABLE SOURCES

75%

THE BIG BOX FORMAT CAUSES **OVERCONSUMPTION** AND CONSEQUENTLY **MORE WASTE**

THEY ARE **ONLY OPERATIONAL FOR 30 YEARS** BEFORE BEING VACATED AND LEAVING LARGE **LANDCSAPES OF BLIGHT**

THE RISE OF E COM-MERCE HAS PUSHED SEVERAL DEPARTMENT STORES TO SHUT DOWN.

SMALLER AND MORE TECH DRIVEN MODELS OF RETAIL ARE BEING DESIGNED TO COMPETE WITH E COMMERCE

IMPLEMENTATION OF **CARBON TAX** POLICIES WILL TRIGGER CHANGES IN THE RETAIL INDUSTRY.

THE GREEN NEW DEAL

CARBON EMISSISONS
HIGH WAGE JOBS
ENVRIONMENTAL JUSTICE

?

HOW CAN WE RE IMAGINE TEH FUTURE OF BIG BOXES IN THE GREEN NEW DEAL ERA?

Reduce CO_2

Restore watershed

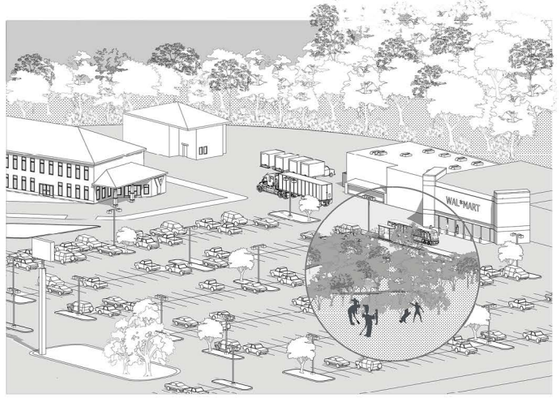
Social Justice

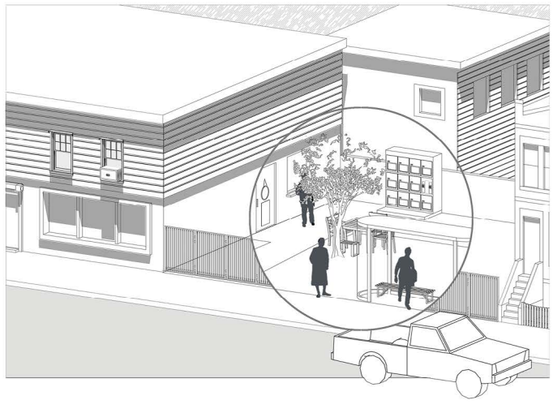
Reprogram big box

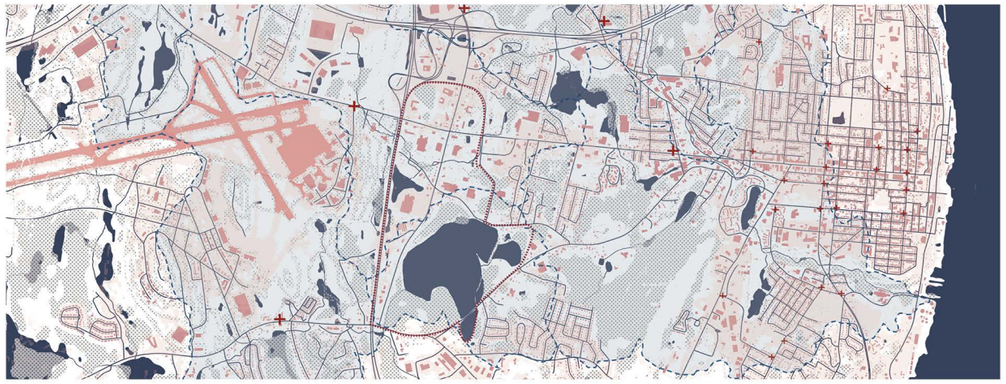
Create jobs

Re imagine new retail

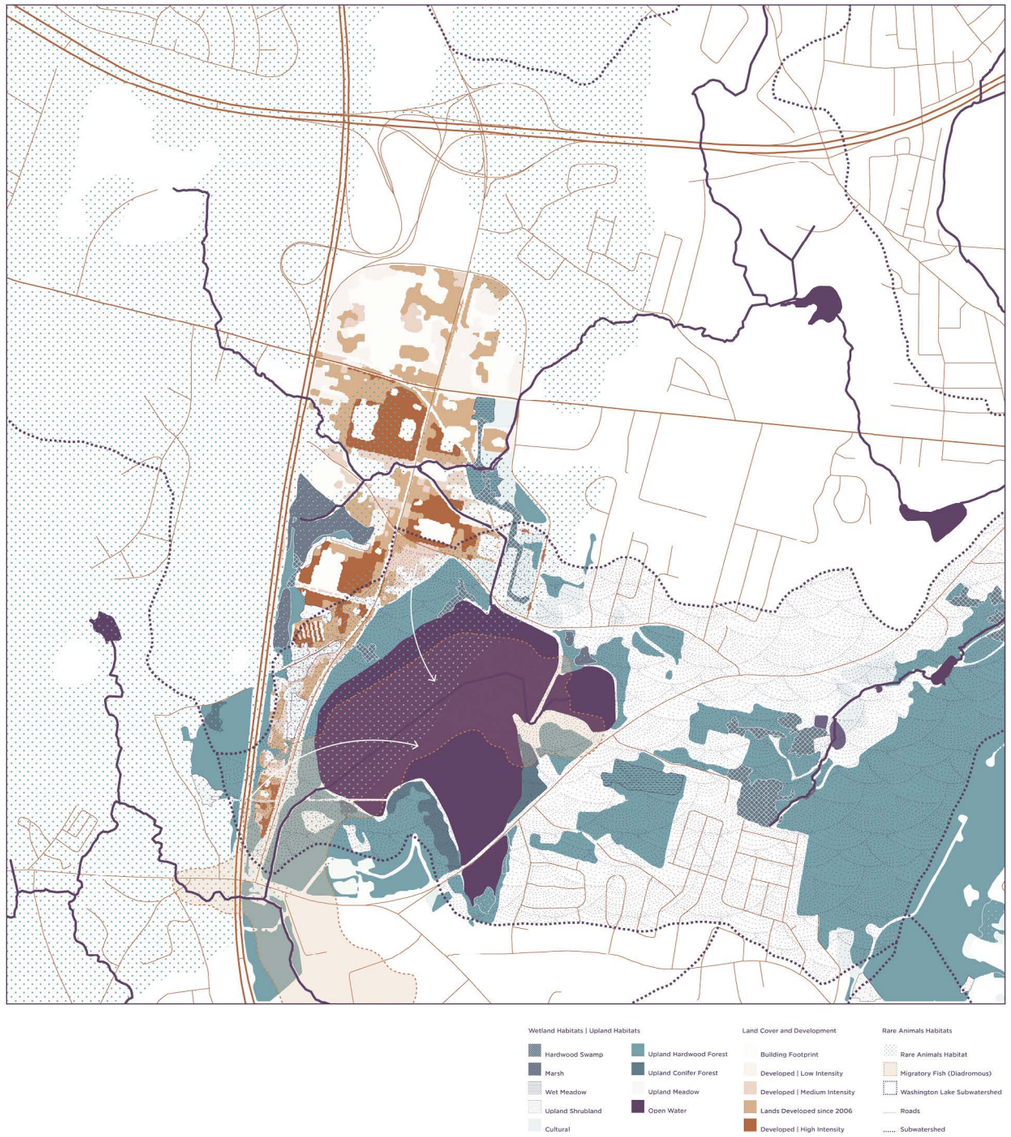
Design Goals



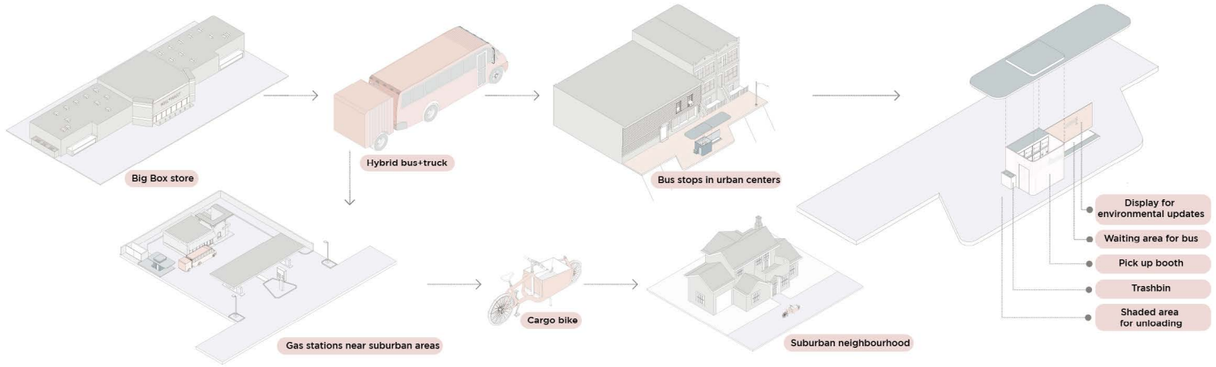




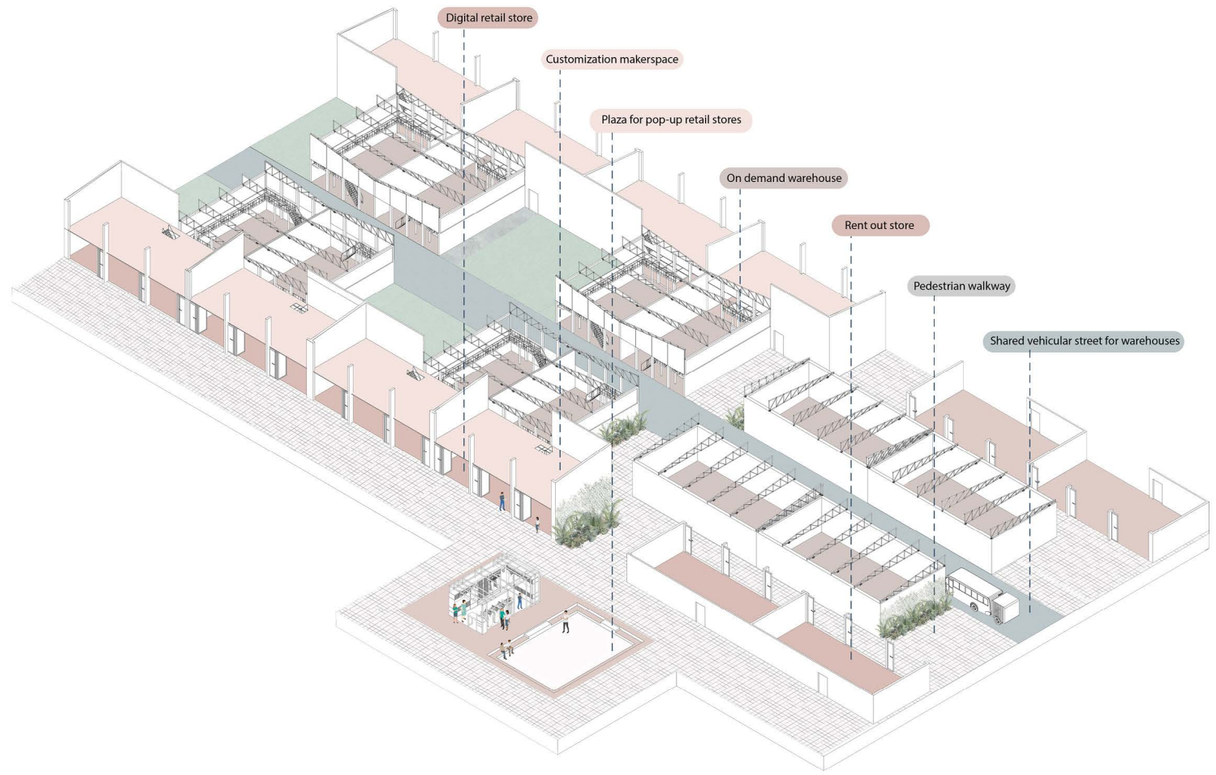
Site Map



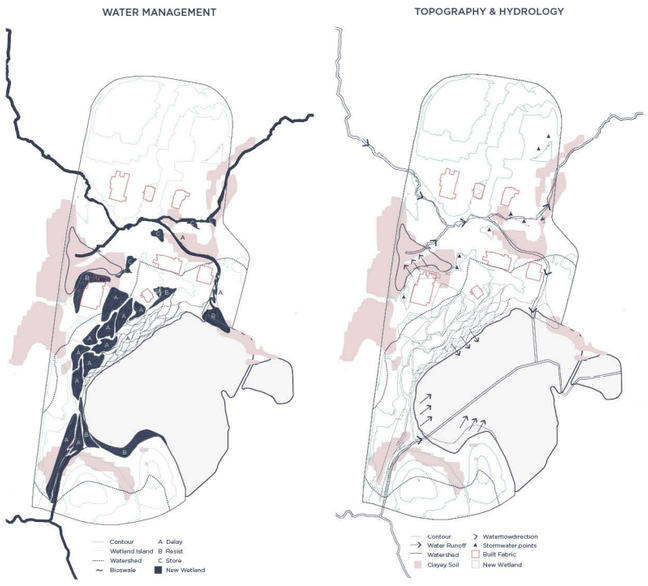
Ecological Potential

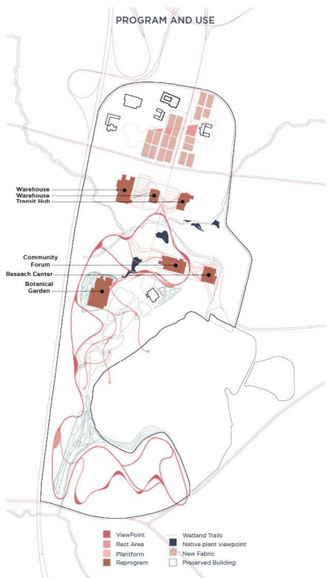


Pickup Center Systems

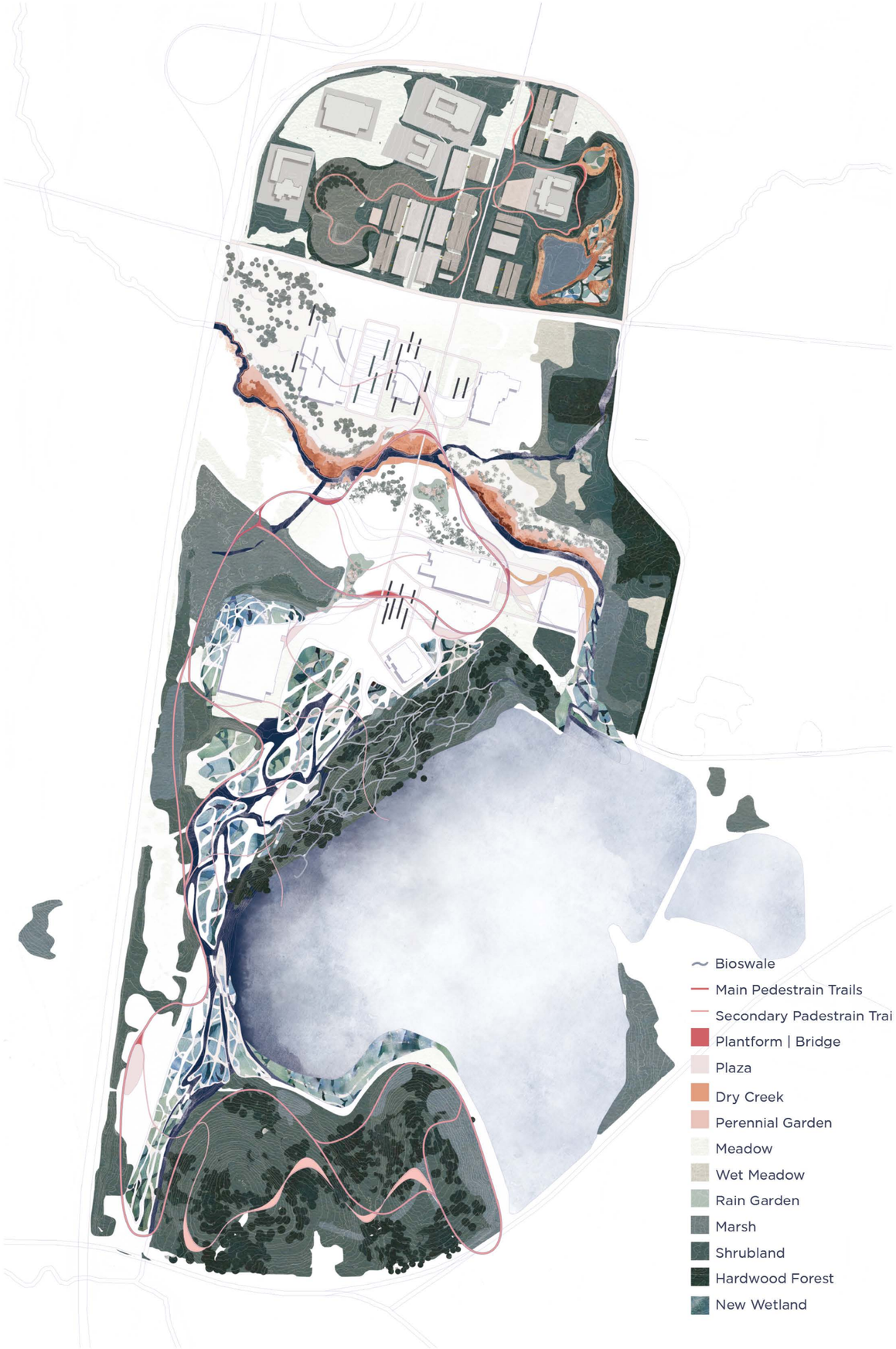


New Retail Strategy





Site Strategies

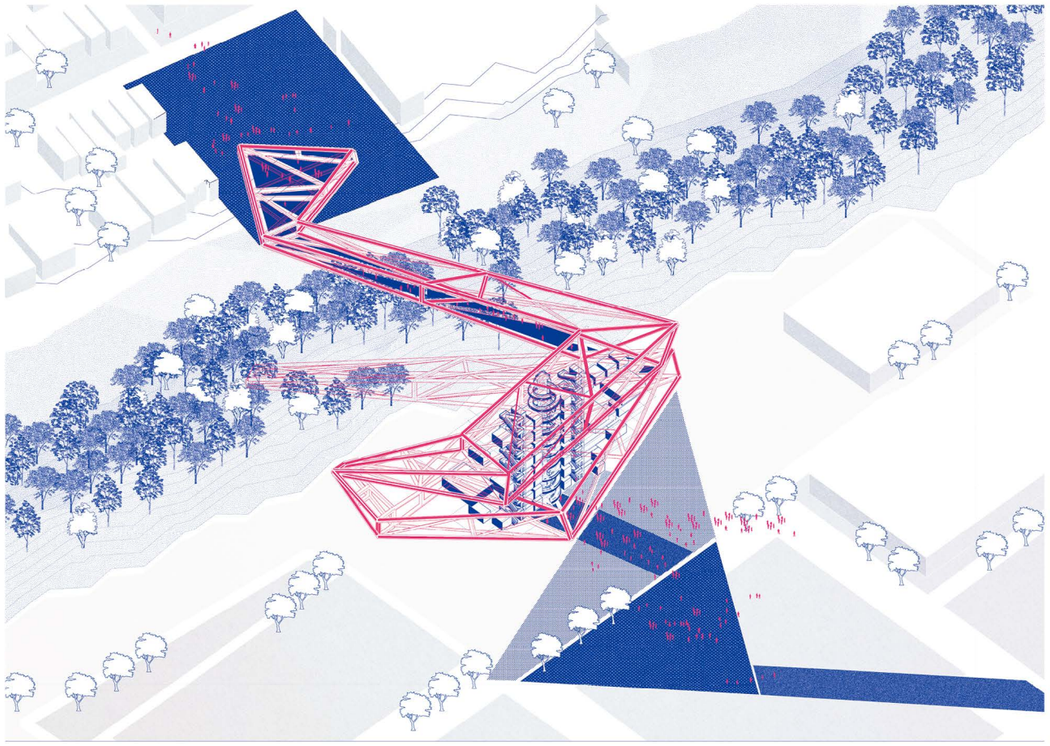


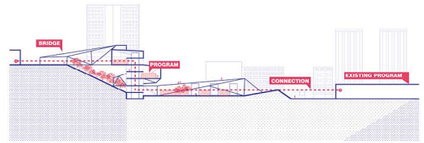
Community Forum

Botanical Garden

Transit Hub

Pickup Center in Downtown





03 THE GARNERING PALISADES

Programmable extensions of an existing topographical element

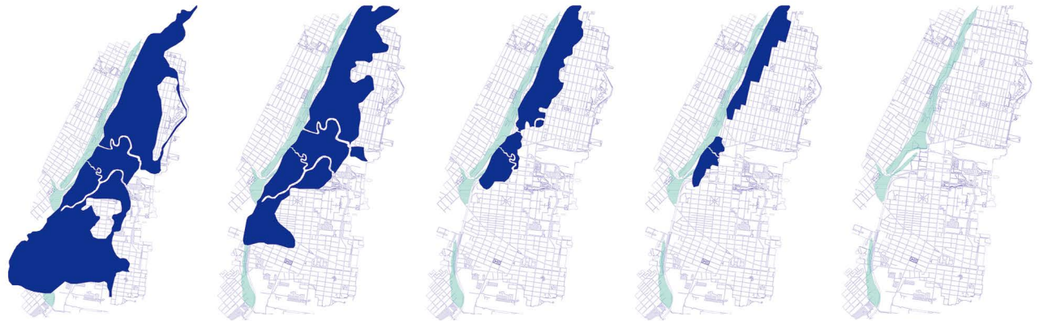
Instructor: Tricia Martin, Nans Voron

Studio Work, Columbia University
Instructor: Tricia Martin, Nans Voron
2019 Summer Urban Design Studio
Site: Hoboken, New Jersey State

Team : Hala Abukhodair, Lino Caceres, Xinuye Liu, Kuan-I Wu

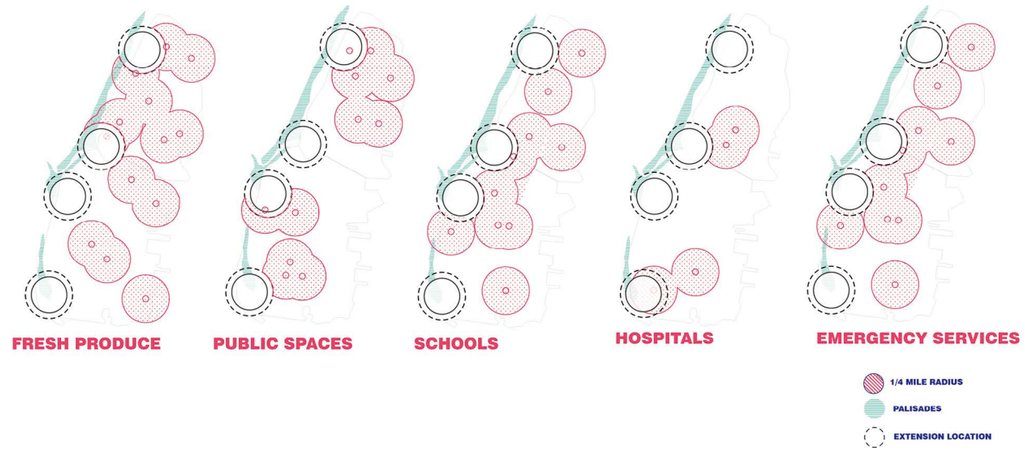
Even though stormwater events occur 4-10 times during the year, they could represent to 85% of the city budget, in direct damage to both private and public property, and due to the climate crisis, they will only become more frequent. These challenges are linked directly to the disappearance of a pre-existing marshland, due to land development. Compromising the biome's capacity to absorb stormwater, which flows away from existing pervious grounds.

MARSHLAND DISAPPEARANCE

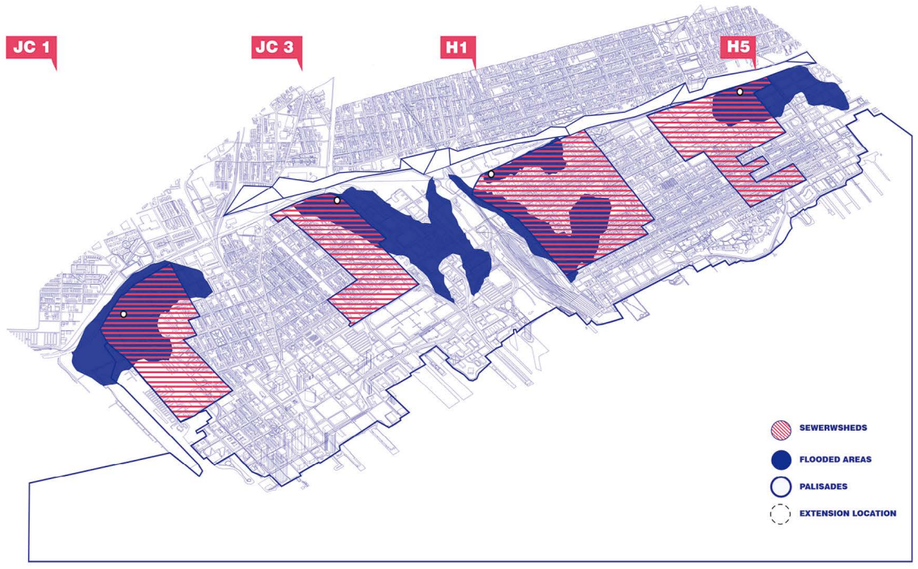


	1804	1844	1890	1910	CURRENT
JERSEY CITY INHAB.		3,072	16,303	206,433	269,969
HOBOKEN INHAB.		9,442	43,648	70,324	55,131

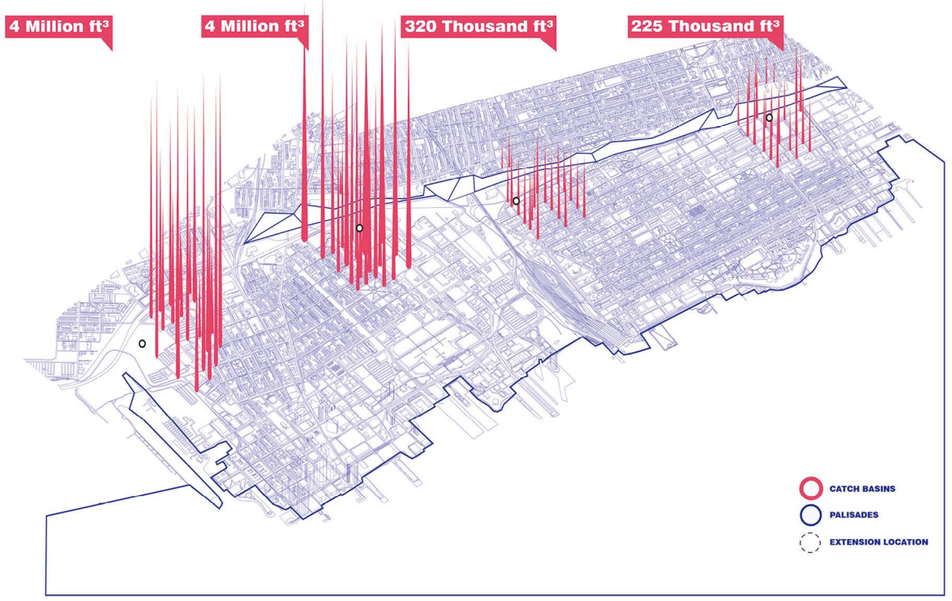
PROGRAM VOIDS

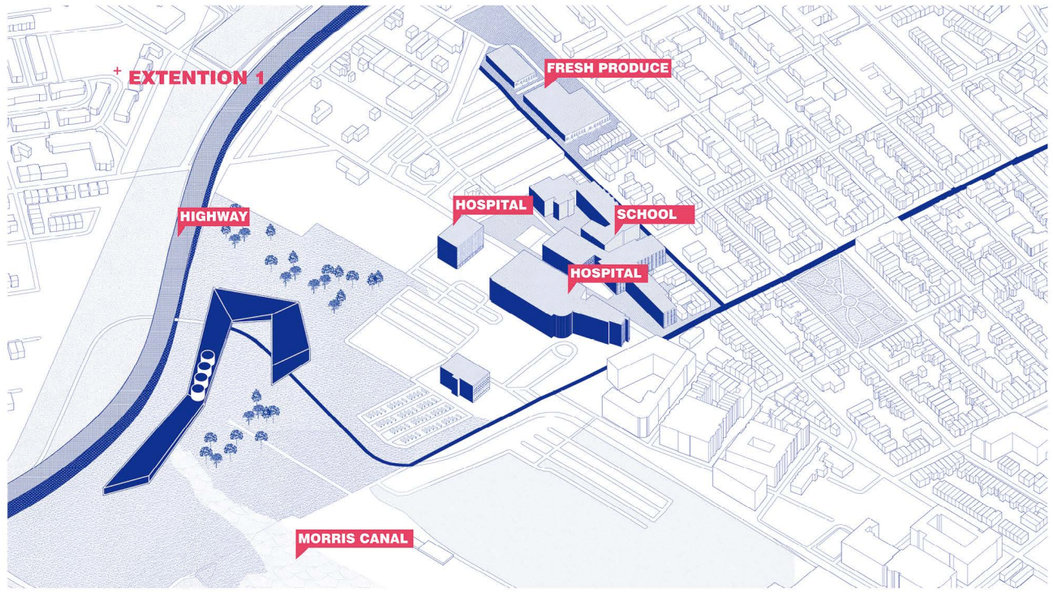


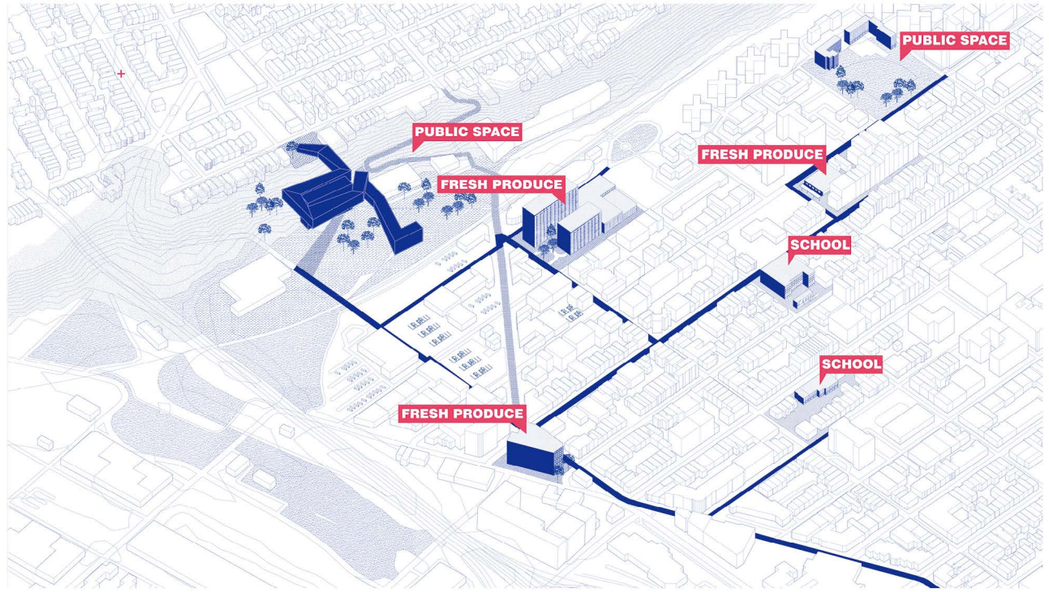
SEWERSHEDS

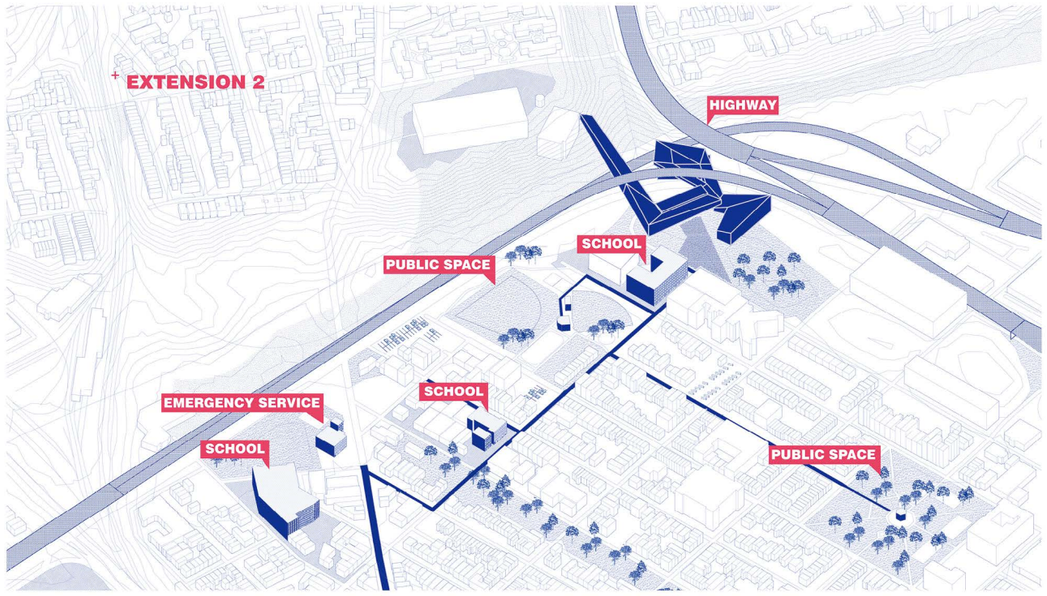


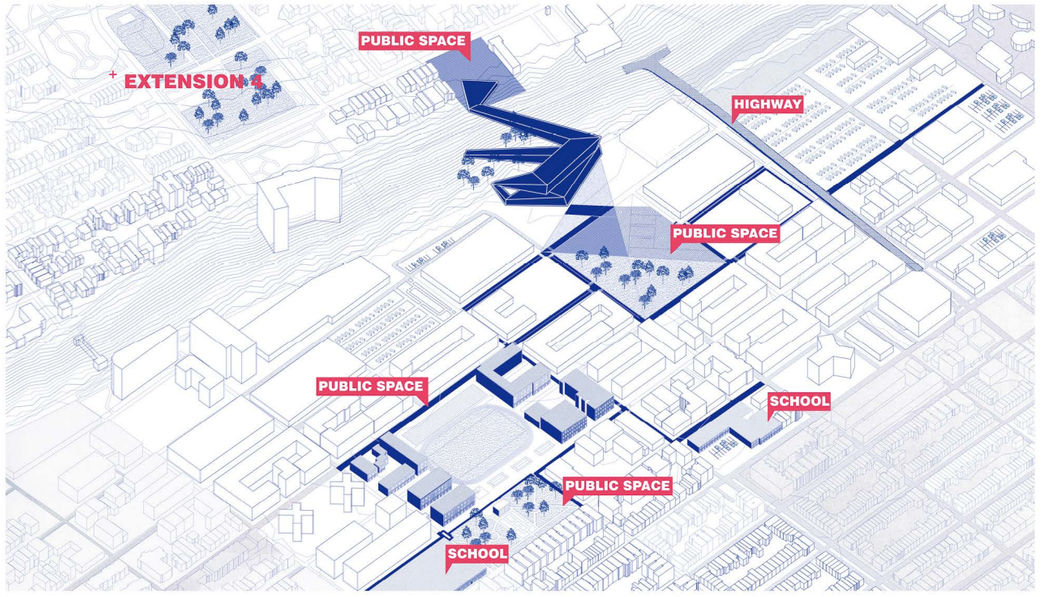
HARVESTING POTENTIAL

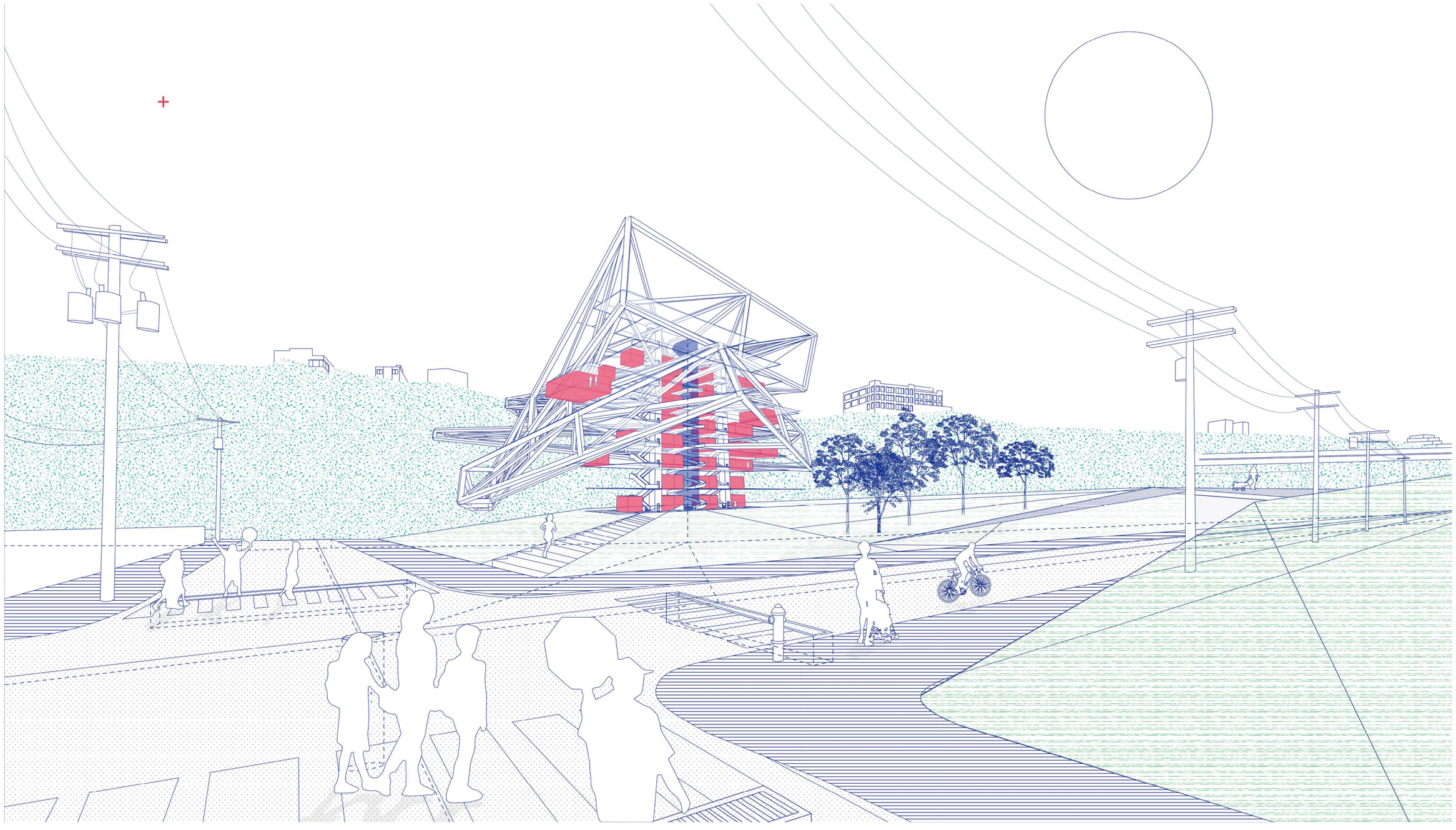


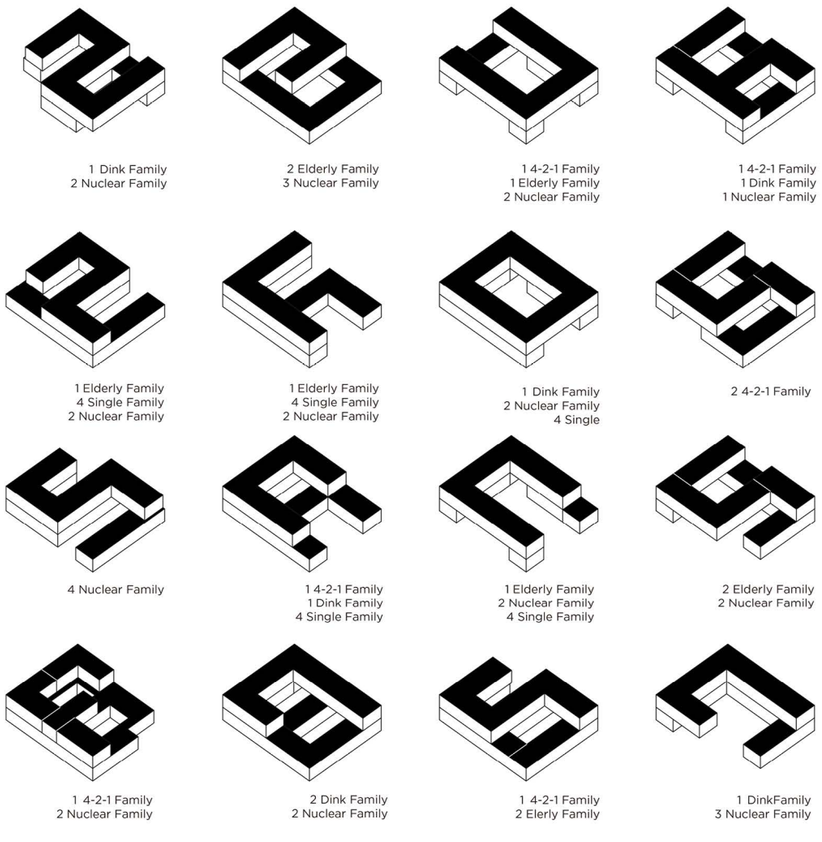

EXTENTION 1
FRESH PRODUCE
HIGHWAY
HOSPITAL
SCHOOL
HOSPITAL
MORRIS CANAL

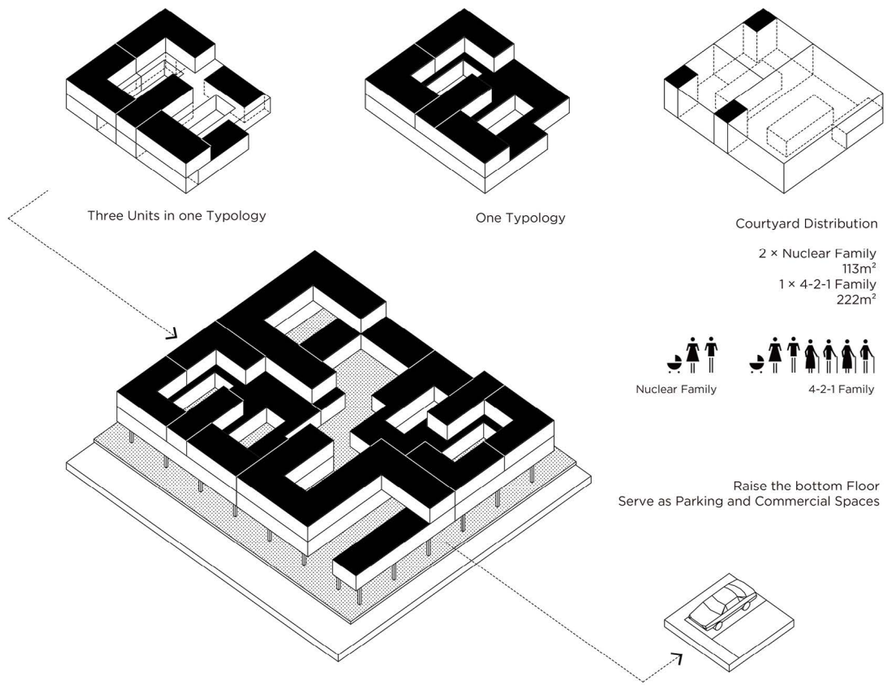

PUBLIC SPACE
PUBLIC SPACE
FRESH PRODUCE
FRESH PRODUCE
SCHOOL
SCHOOL
FRESH PRODUCE


EXTENSION 2
HIGHWAY
SCHOOL
PUBLIC SPACE
EMERGENCY SERVICE
SCHOOL
SCHOOL
PUBLIC SPACE


EXTENSION 3
PUBLIC SPACE
HIGHWAY
PUBLIC SPACE
PUBLIC SPACE
SCHOOL
PUBLIC SPACE
SCHOOL





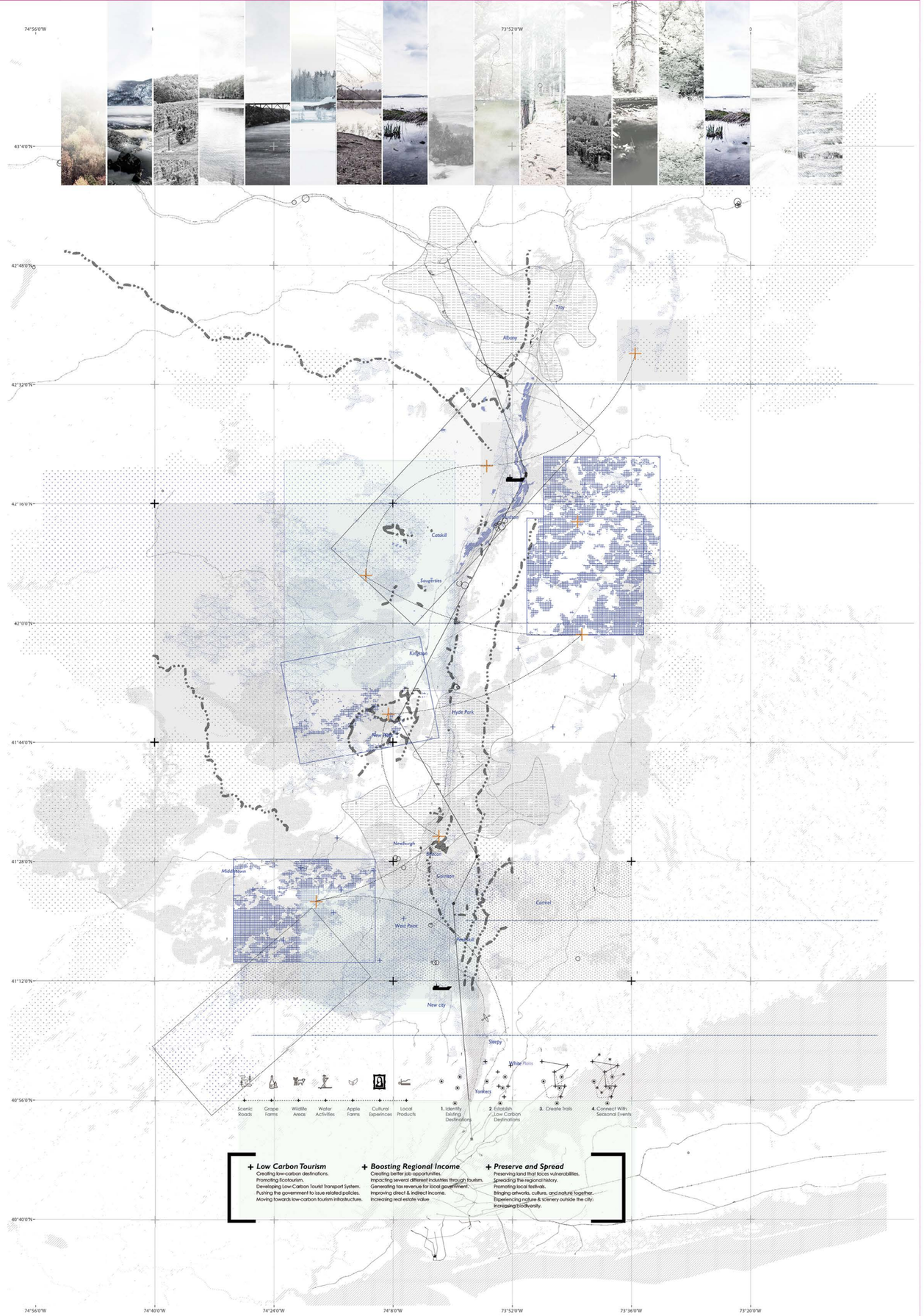


04 SHIKUMEN HOUSING

Typology Transformation

Fabrics and Typologies, Columbia University
Instructor: Richard Plunz
2019 Fall Seminar
Site: Jinan District, Shanhai

Team : Scott Guo, Xinuye Liu



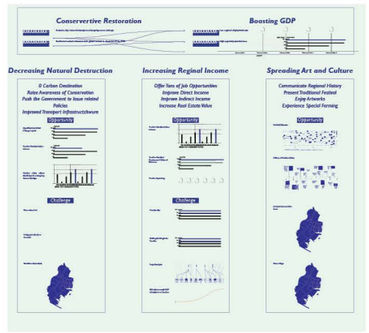
05 RECAPTURING TOURISM

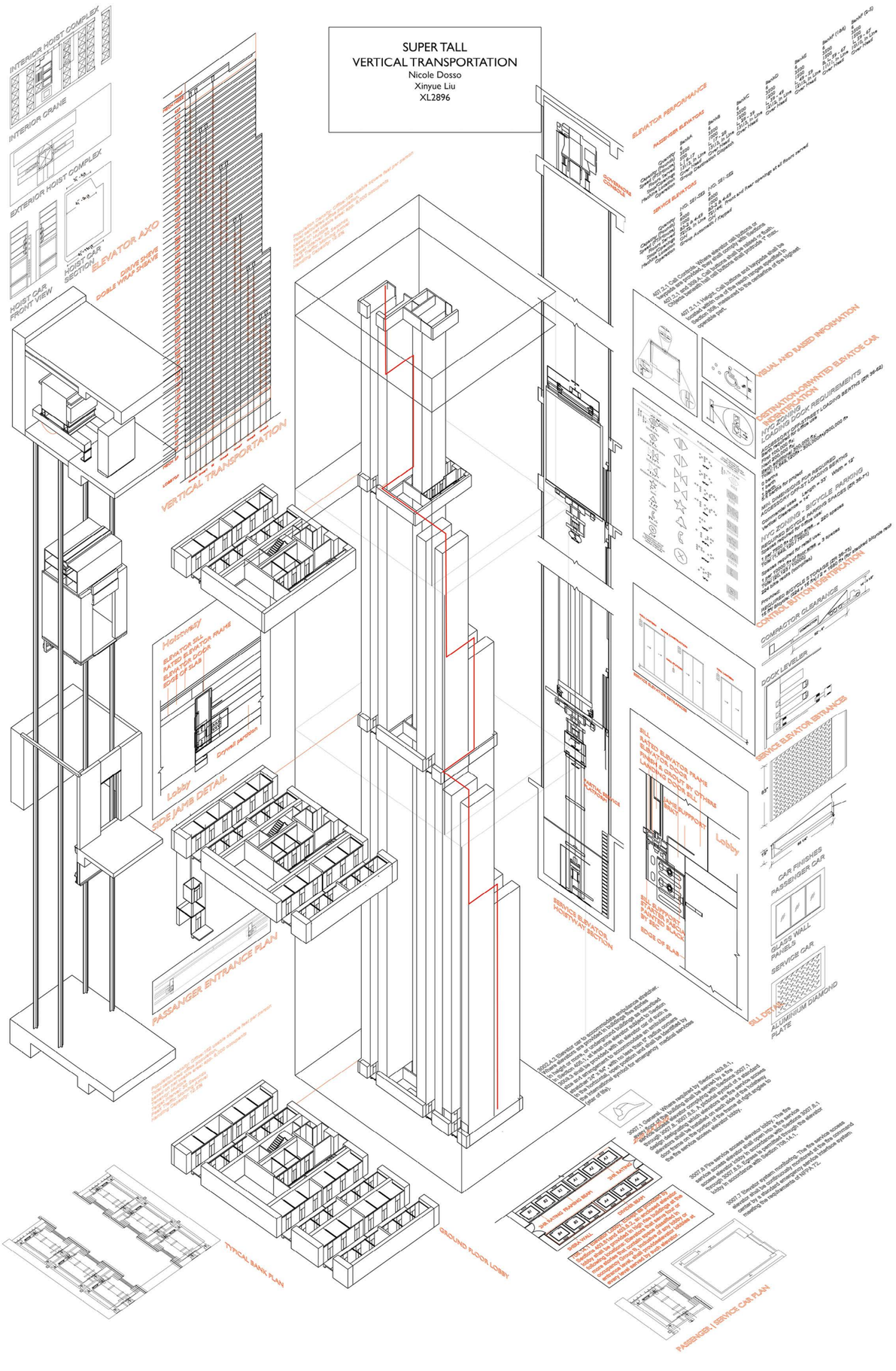
Through the untapped resources

Instructor: Kaja, Anna, Jerome, Dragana, Justin, Liz, David, Raafi,Shachi

Studio Work, Columbia University
2020 Spring Studio
Economy system

Group work: Hatem, Xinyue, Aliv, Shuo



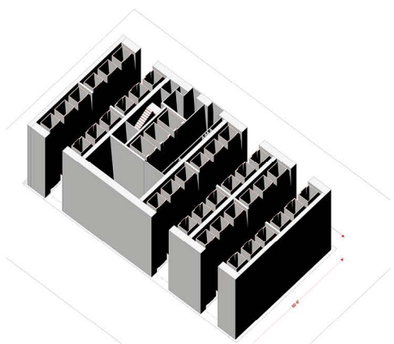


06 VERTICAL TRANSPORTATION

How do users circulate? How can we design and build smarter?

Instructor: Nicole Dosso

Super tall, Columbia University
2020 Spring Seminar
Site: Manhattan
Individual work



07 POST-COVID19 URBANISM

How can we mitigate infection risk when the city starts to open back up?

Instructor: Luc Wilson

Algorithms and Urbanisms, Columbia University
2020 Spring
GIS & Grasshopper project
Site;Manhattan, New York
Group work: Guangwei, Xinyue, Yuxin

APPLYED STRATEGY

Citywide Analysis

Stable
Safe Urban area/Daylight/Tree
Uncrowded
Pops/ Vacant Land/Open & Outdoor Recreation/Lot Front
Accessible
Subway station /Bus station/Uber Drop off points
Social
Retail Area/Commercial & Office/Residential FAR/Population density/complaint/ WIFI

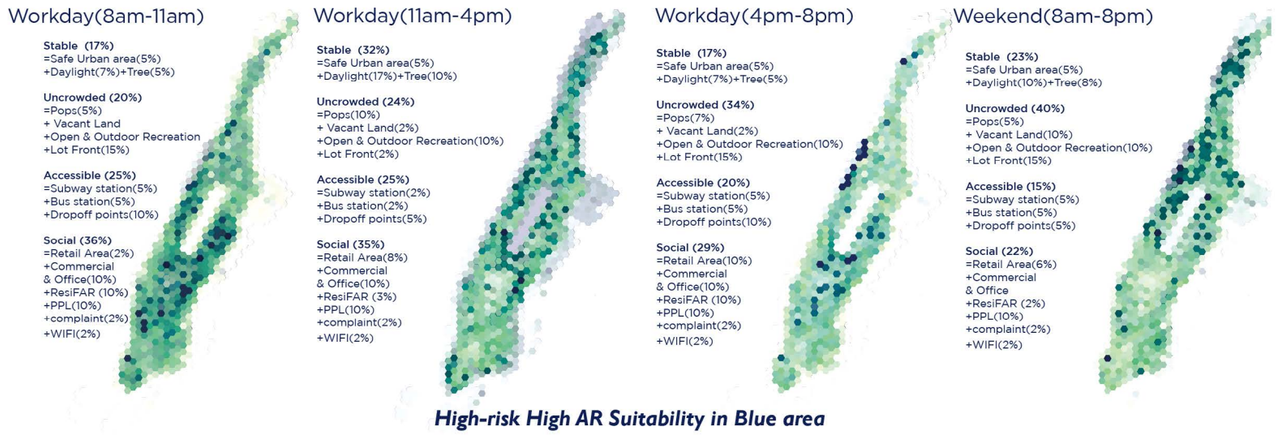
+

Neighbourhood Analysis

Bryant Park
Uber drop off, Land use, BuiltFAR, Sunlight
East Village
Uber drop off, Land use, BuiltFAR, Sunlight
Columbus Circle
Uber drop off, Land use, BuiltFAR, Sunlight

Mitigate risk and facilitate social distancing by Predict areas of high crowdedness

AR SUITABILITY FOR COVID-19 RISK EREA BY TYPICAL TIME CONDITIONS



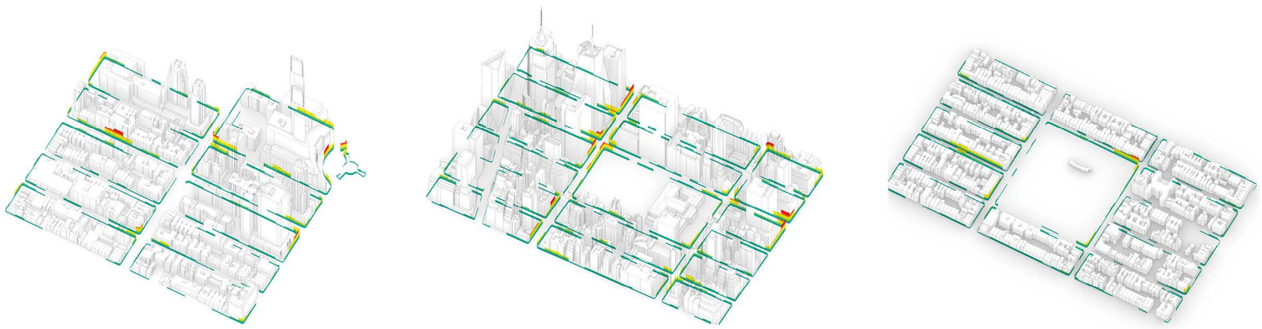
High-risk High AR Suitability in Blue area

TOLICY TARGET

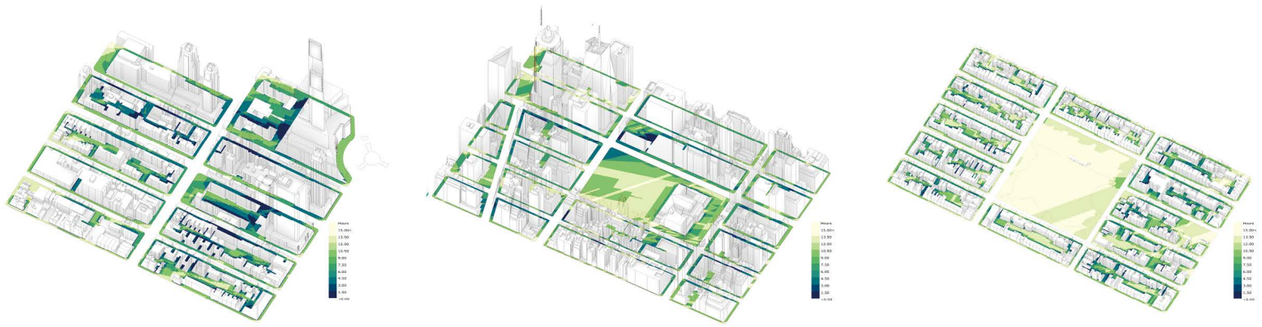
NEIGHBOURHOOD ANALYSIS

Columbus Cirle *Bryant Park* *East Village*

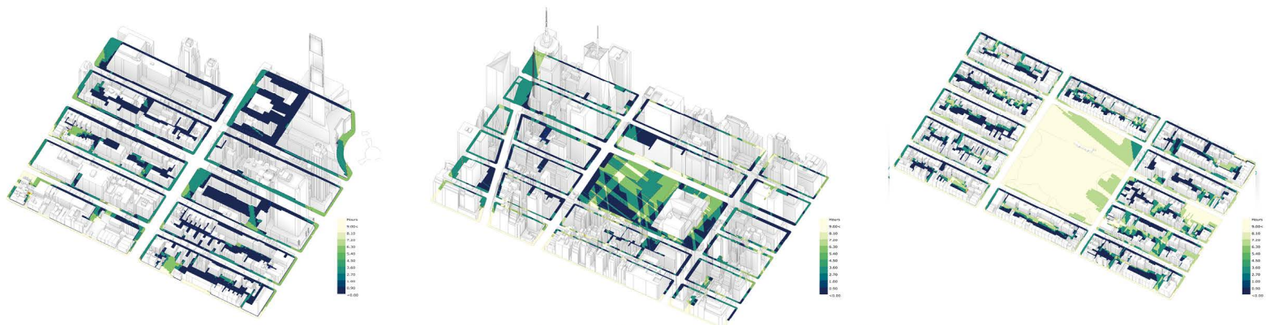
Uber Drop Off | Land use



Safety Score = Land Use Index *(5-Dropoff Points/Side Walk Width)
High risk in red areas (high drop off frequency)



Safety Score = Summer Sunlight Hours/3
Summer High risk in shadow area



Safety Score = 5-Winter Sunlight Hours/2
Winter High risk in sunlight area

APPLIED STRATEGIES

City:
Calculate and Predict areas of high crowdedness under specific conditions eg: Week Day + Commute Hours + Rainy (In Progress)

Uber/Lyft/Taxi Dropoff point suggestion for drivers
Real-Time Pedestrian Navigation indicating sidewalk segments that need to avoid

AR Developer:
Use the data to update the model
Put commercial programs on recommended points to benefit and attract pedestrians

AR APP

In google map, the user could turn on the alert of covid-19. Then the prediction of unsafe area is shaded in google map. In AR mode, the app could alter the user when current area is high risk, and suggest the user to turn left/right for safety.

CITYWIDE STRATEGIES