

PORTFOLIO

SHARON NAHM

PROJECTS

2 **Dutchess Turnpike Plan**

planning report ft. existing conditions maps and architectural diagrams

5 **Zero Energy System**

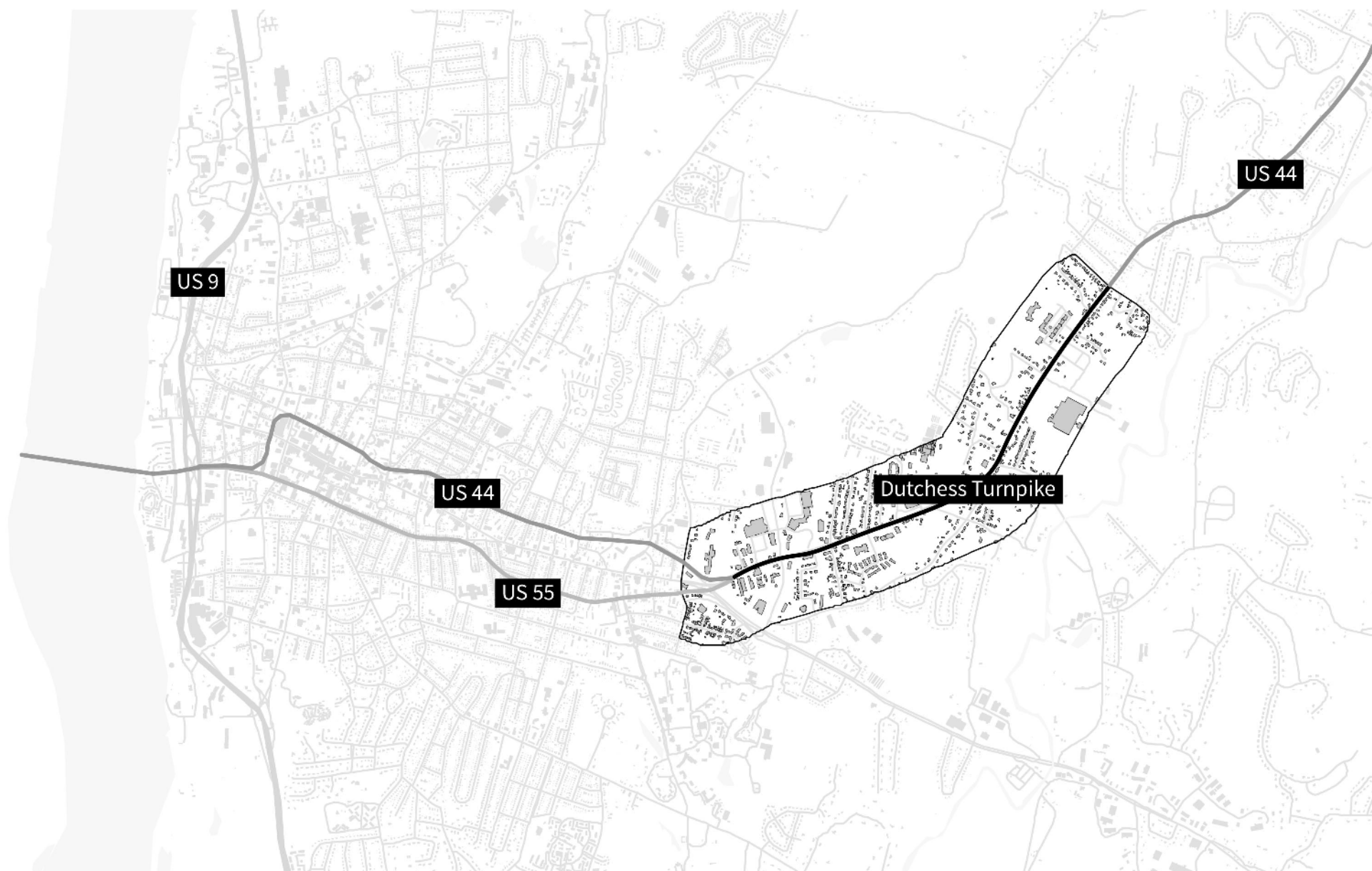
speculative design ft. architectural drawings and analytical diagrams

9 **The Food Production of Space**

book design ft. urban data visualizations

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DUTCHESS TURNPIKE PLAN

Planning Report

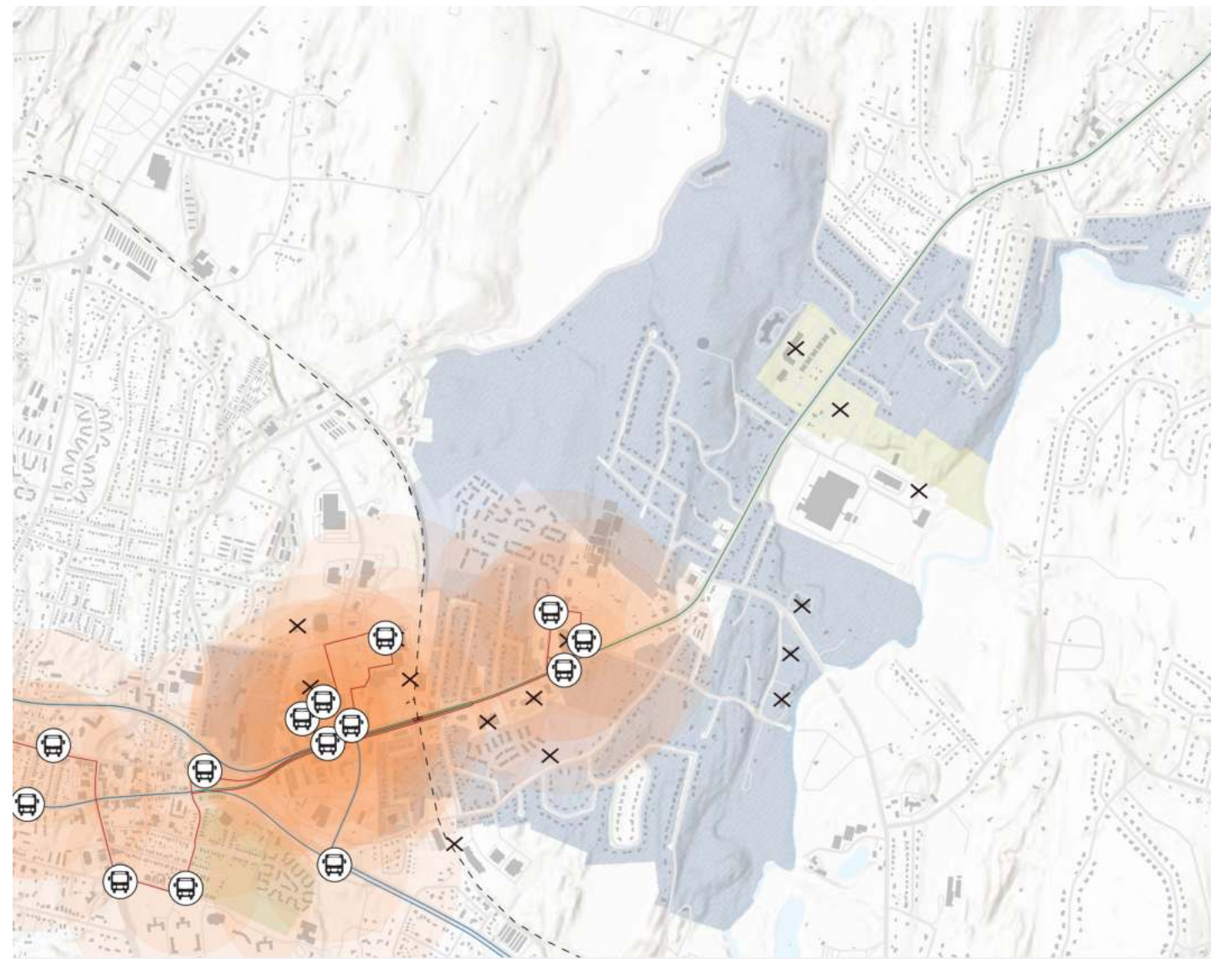
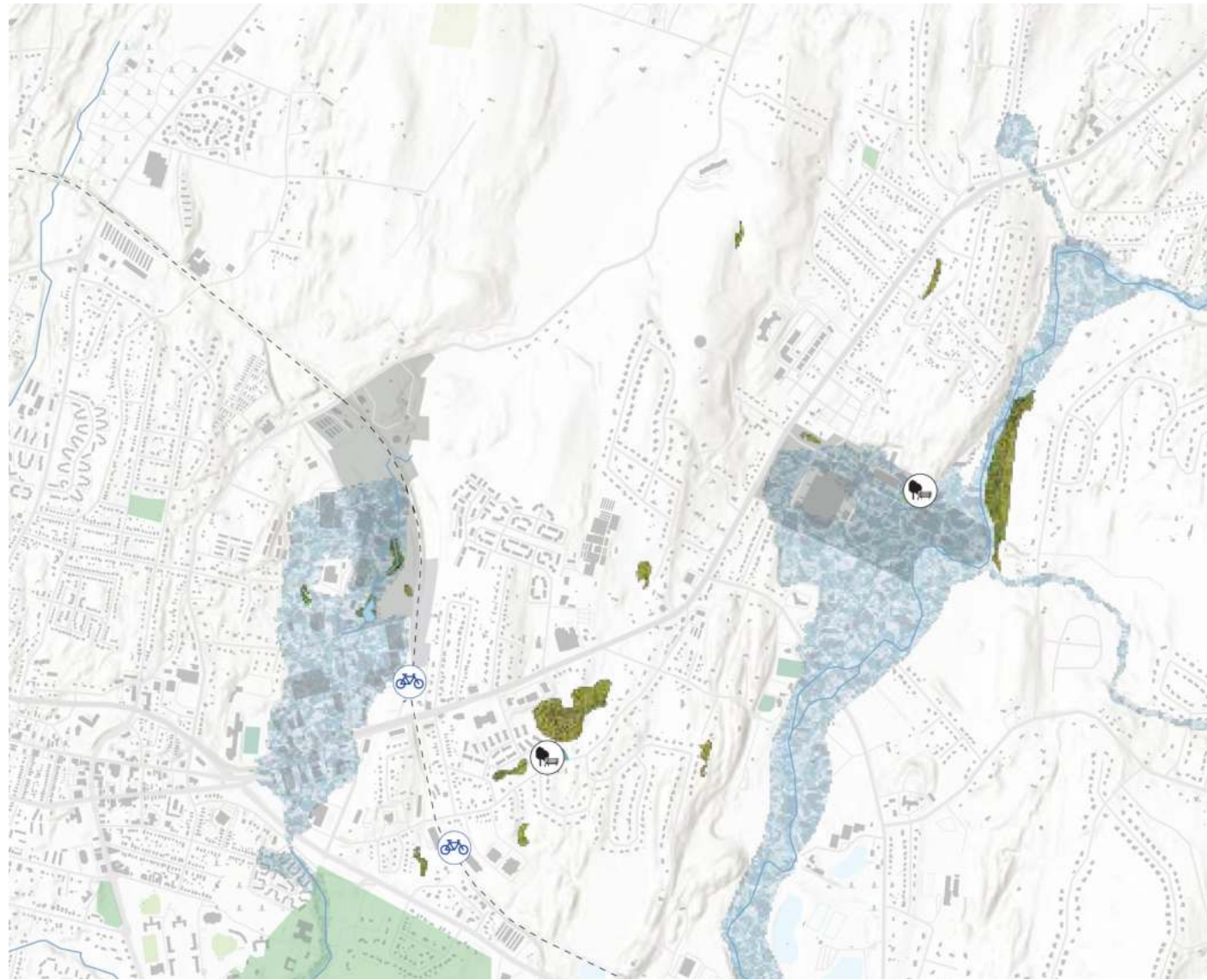
maps and diagrams for planning report designed using ArcGIS Pro, Rhino, Adobe Illustrator and Adobe Photoshop

The *Dutchess Turnpike* is an approximately 2.25 mile stretch of the New York State Route 44 highway corridor that runs through the Town of Poughkeepsie. Current use of the *Dutchess Turnpike* relies heavily on private automobile ownership. The neighborhood's land-uses can be traced to the suburbanization patterns following postwar urban renewal and IBM's mid-twentieth century establishment in the Town of Poughkeepsie.

The *Dutchess Turnpike's* car-centric conditions are ill-suited for the present demographic that reside and work within the study area. My team's research on the existing land-use and zoning, demographics, transportation, and environmental conditions demonstrated how the area is inaccessible, unsustainable, and overall poorly designed for contemporary use.

The following pages are graphic visualizations excerpted from the 123-page planning report that my team and I completed for this planning seminar. The maps on page 3 illustrate the existing conditions of the study area, with a focus on the environmental risks and accessibility concerns for community residents. The diagrams on page 4 propose street redesigns imagined with the goal of placemaking and revitalizing community in the *Dutchess Turnpike* study area.

Fall 2023
Re-envisioning Poughkeepsie Land-Use Planning Seminar
Vassar College; Instructor: Susan Blickstein
Team Members: Tianchen Zhou and Jordan Shamoun



INDUSTRIAL ZONES

This includes the I-H and I-L Zones. These zones are notable because of the environmental risk they pose.

WATER

Streams and creeks run both through and alongside the corridor. Small bodies of water are also pictured adjacent to our study area on the map.

FLOODPLAINS AND WETLANDS

Following the topographic conditions and water patterns, the floodplains and wetland areas within the study area are articulated.

GREEN SPACE

Using data acquired from open street maps, green space illustrated on this map may include public or private areas of green open space.

COMMUNITY RESOURCES

Resources include the Dutchess Rail Trail and two public parks, namely Overocker Park (west) and Creekside Park (east).

RESIDENTIAL ZONES

This includes the R-20, R-M, MHC, and ATC Zones.

PUBLIC BUS ROUTES

The Dutchess County Public Bus routes that run through our study area include Routes L, D, and E.

BUS STOPS

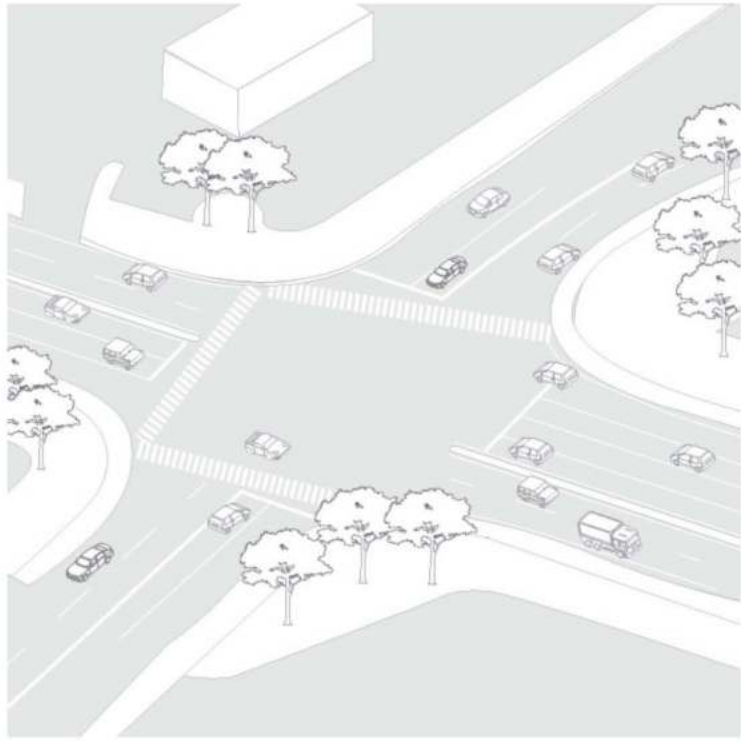
There are 14 bus stops located within our study area, defined on this map.

ACCESSIBILITY ZONES

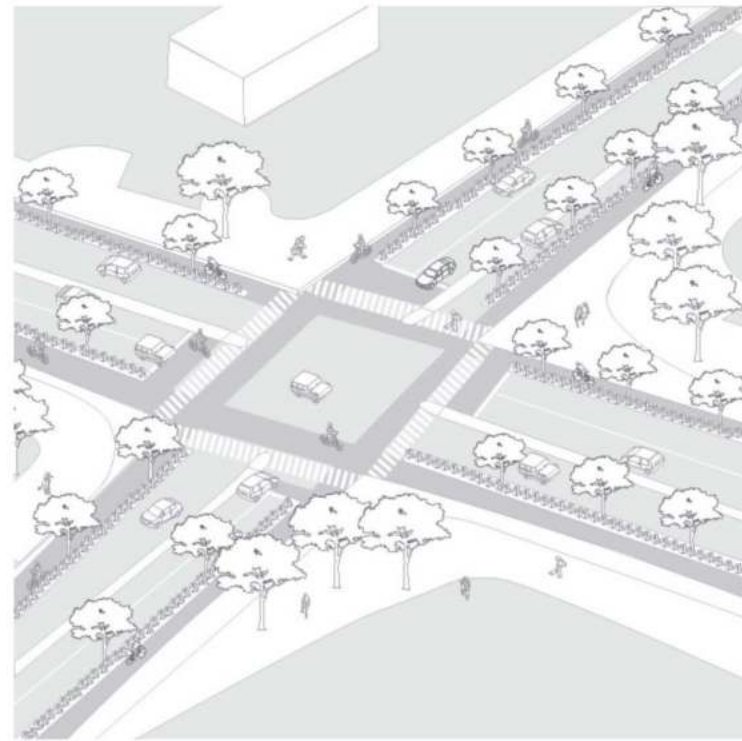
Each accessibility zone circle approximates the 5-minute and 10-minute walking distance from the bus stop.

COMMUNITY RESOURCES

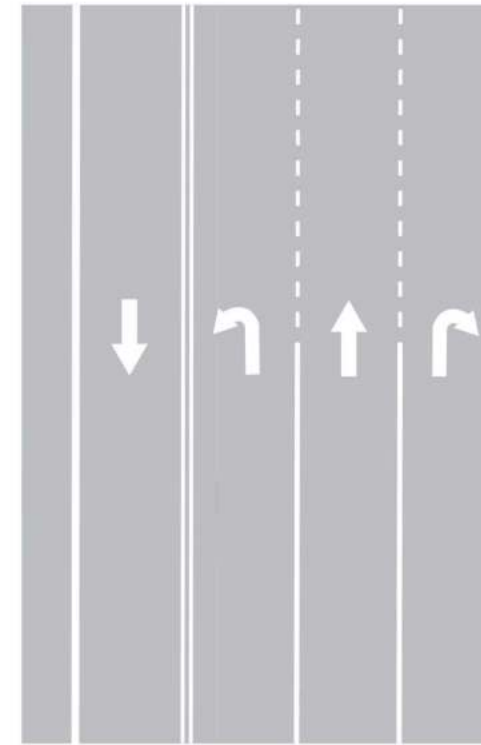
Resources include the Dutchess Rail Trail, supermarkets, pharmacies, public parks, and the Eastdale Village mixed-use center.



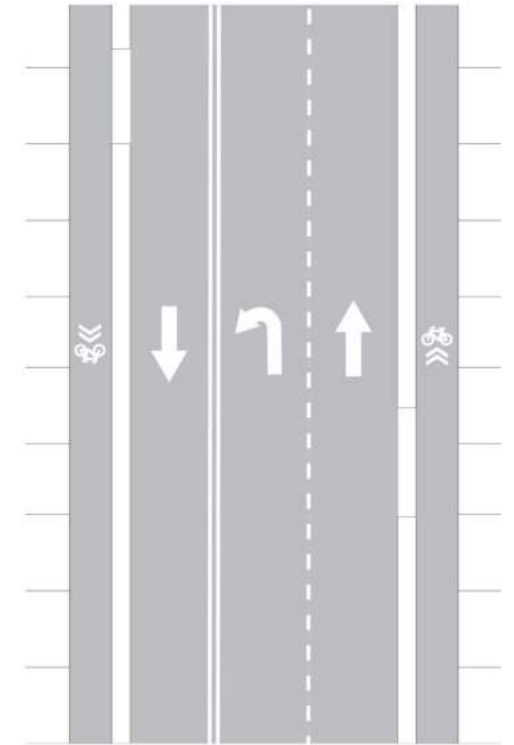
existing



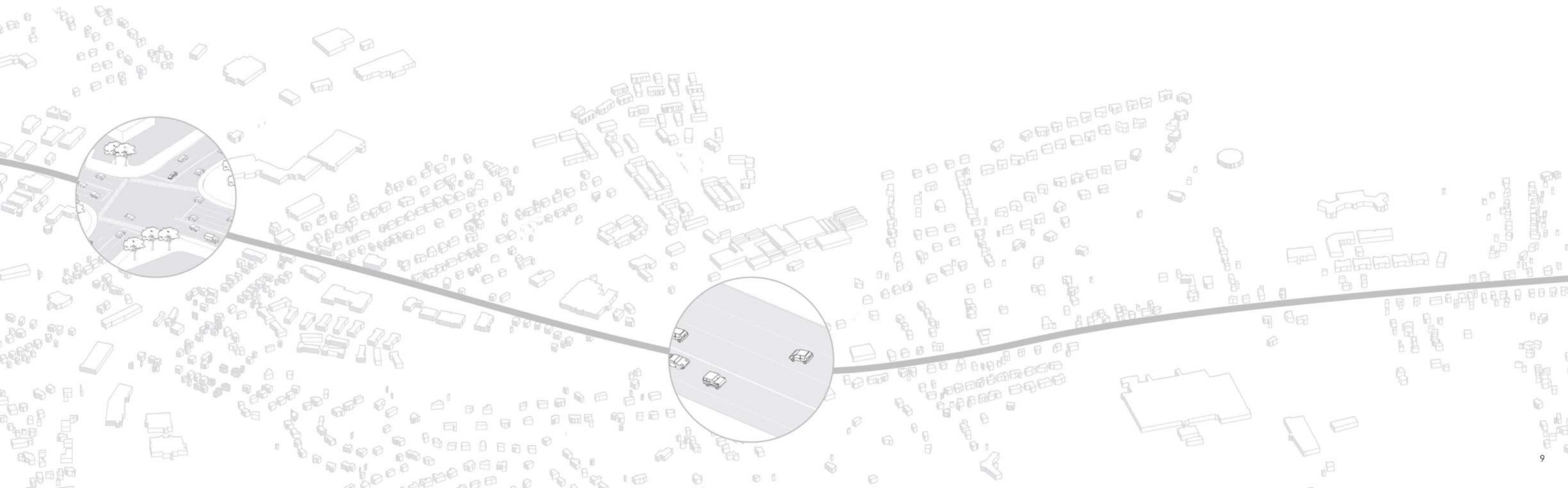
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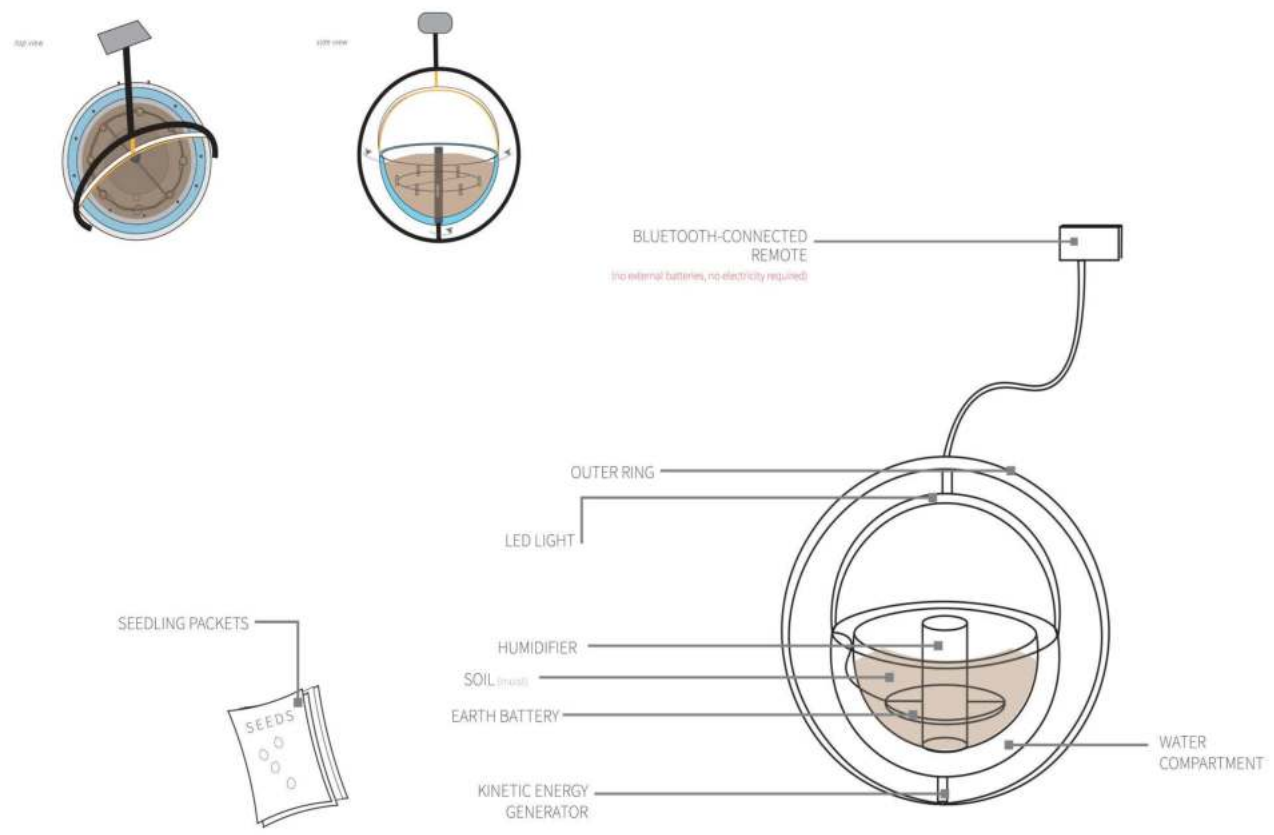


existing



modified





ZERO ENERGY SYSTEM

Speculative Design (NYCHA
Manhattanville Houses)

drawings designed using Rhino, Adobe Illustrator and Adobe Photoshop

“Zero-Energy System” is a project that I completed during a studio intensive that prompted us to imagine machinic systems that could be used to mitigate the impacts of pollutants in the face of climate change.

In the first stage of this project, I designed a machine in the form of an everyday object. Pages 5 and 6 feature diagrams explaining the mechanics of the “00photoplanter” which is a device that serves as a self-sufficient light fixture and a planter.

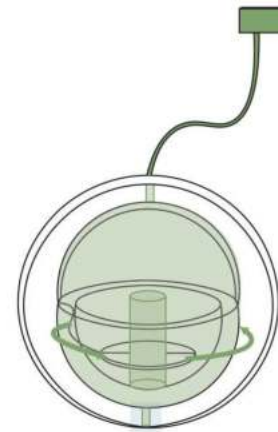
In the second stage of this project, I translated the mechanics of the 00photoplanter to a given site, NYCHA’s Manhattanville Houses, located in West Harlem, New York (pg. 7). Page 8 proposes external and internal renovations to this housing complex featuring six towers-in-the-park typology buildings. Like the self-sufficient 00photoplanter, in this speculative design paradigm, the Manhattanville Houses are transformed into a zero energy system.

Summer 2023
Introduction to Architecture
Columbia University GSAPP; Instructor: Lucy Navarro

ZERO ENERGY

The humidifier diffuses **water** using the kinetic energy generator. Energy is produced by users manually rotating the smaller planter sphere within the larger sphere.

- 1) Fill the planter with water (in the section indicated)
- 2) Program the planter in the *00photplanter app* with the appropriate watering settings.
- 3) Rotate the planter sphere whenever/ as indicated by the photplanter app to charge the watering humidifier within the 00photplanter.



What is a **KINETIC ENERGY GENERATOR** ?

The KINETIC ENERGY GENERATOR, located at the intersection of the spherical planter and its surrounding circle, uses manual rotational energy to spin the rotor shaft of a generator. The generator, in turn, converts this kinetic energy of the rotor to electrical energy, charging the 00photplanter and its internal humidifier.



ZERO SUNLIGHT

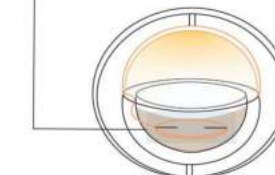
Light is produced using the LED light installed within the planter sphere. The LED light is powered by an earth battery, built utilizing the soil's natural ionic properties and a series of arranged metals.

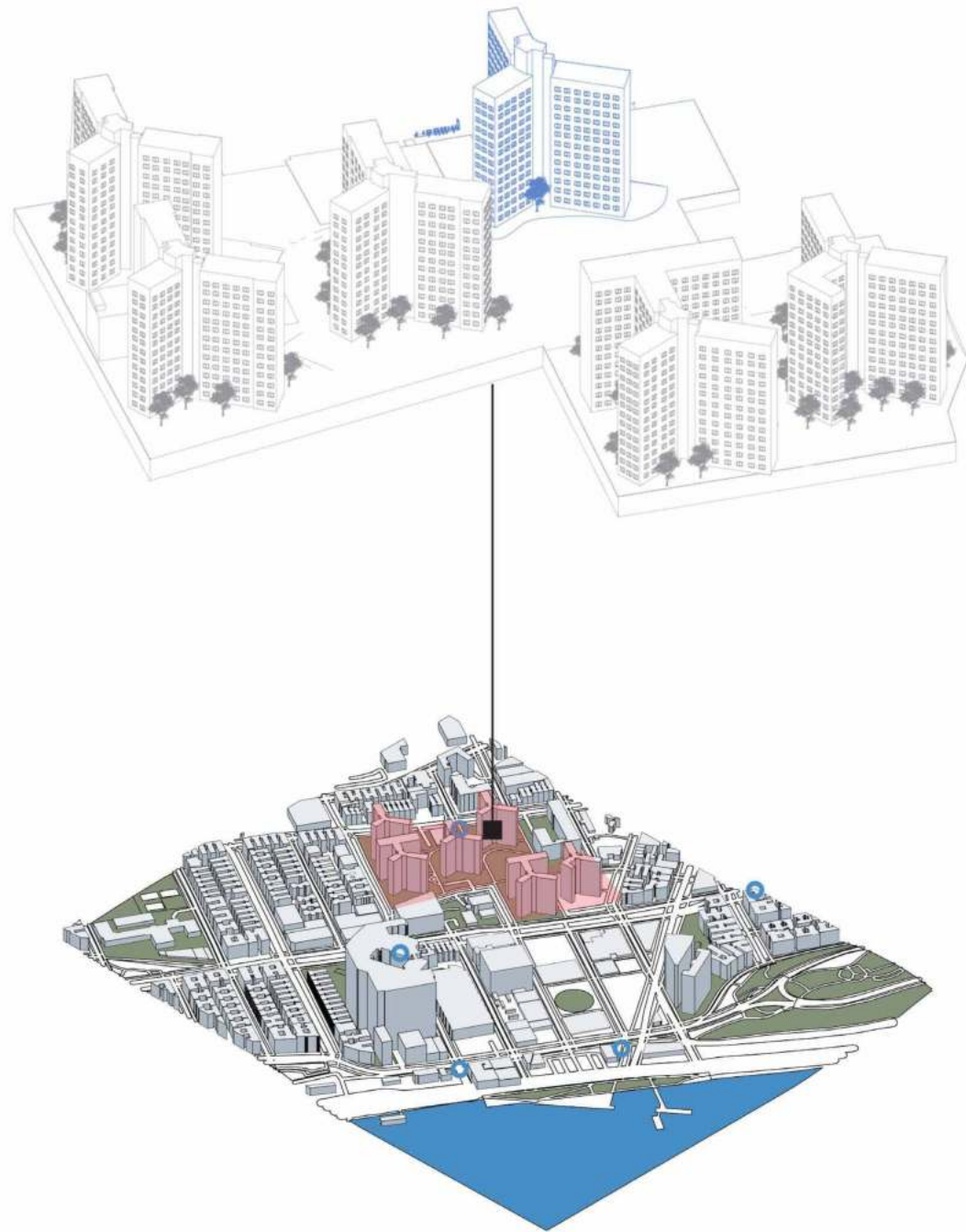
- 1) Fill the planter with moist soil (and your plant).
- 2) Program the planter in the *00photplanter app* with the appropriate light settings.
- 3) The LED light will use the earth battery to turn on/off according to your programmed settings.
- 4) Replace the soil in the 00photplanter whenever indicated by the app.



What is an **EARTH BATTERY** ?

The EARTH BATTERY, located within the spherical planter, is an arrangement of zinc and copper metals placed in series. The moist soil of the plant will act as a conductor that facilitates an electrochemical reaction. This electrochemical reaction then produces an electrical current that powers the LED light within the top of the spherical planter.





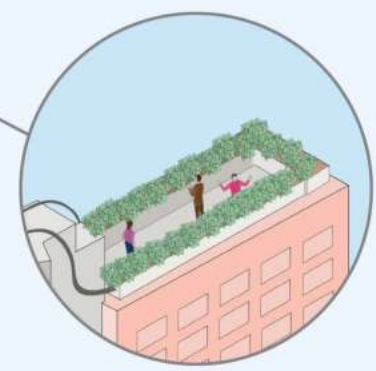
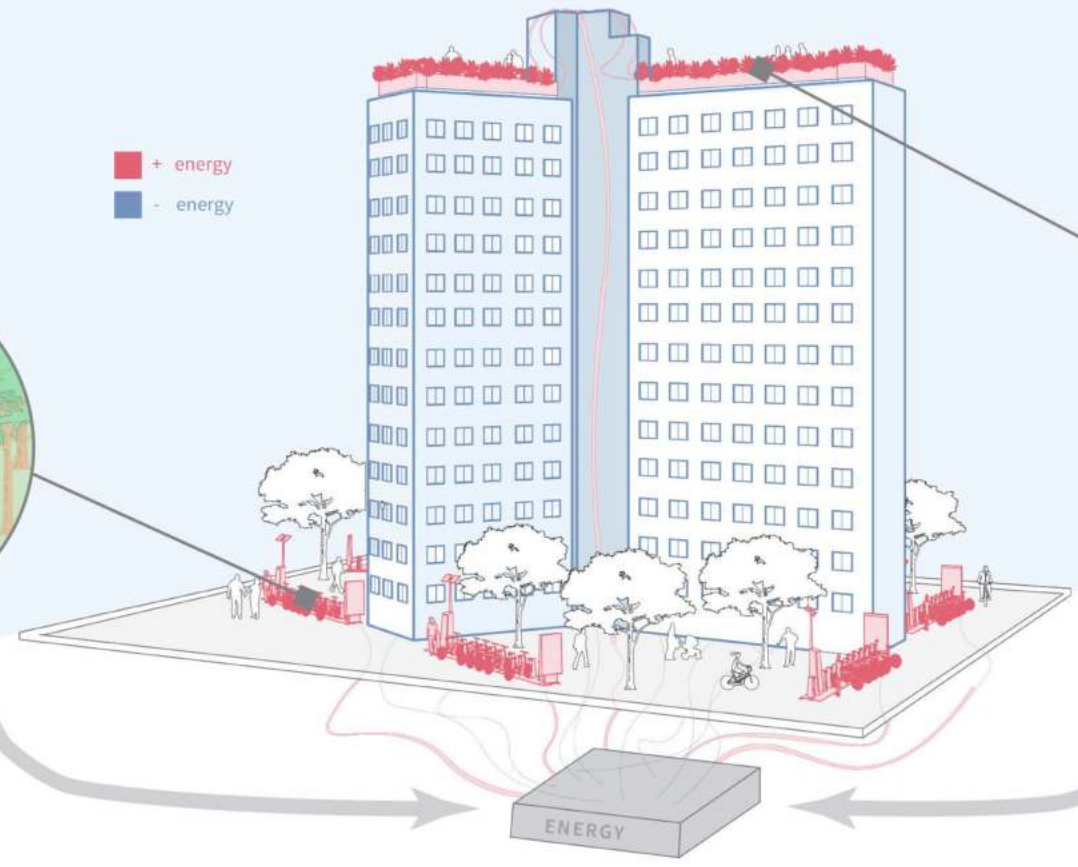
- ★ MANAGEMENT OFFICE
- ① CITIBIKE STATIONS PROPOSED ADDITIONS
- ② ROOFTOP GARDENS

■ + energy
■ - energy



① CITIBIKE STATIONS

Six modified Citibike stations will be added to the perimeter of every apartment complex (in total 36 Citibike stations). Residents can use these bikes for their everyday commutes for no charge (charges subsidized by PACT). These Citibikes are modified to capture and contain kinetic energy so that when residents park their bikes back at the apartment charging stations, the stored kinetic energy feeds into the contained generator for the apartment.



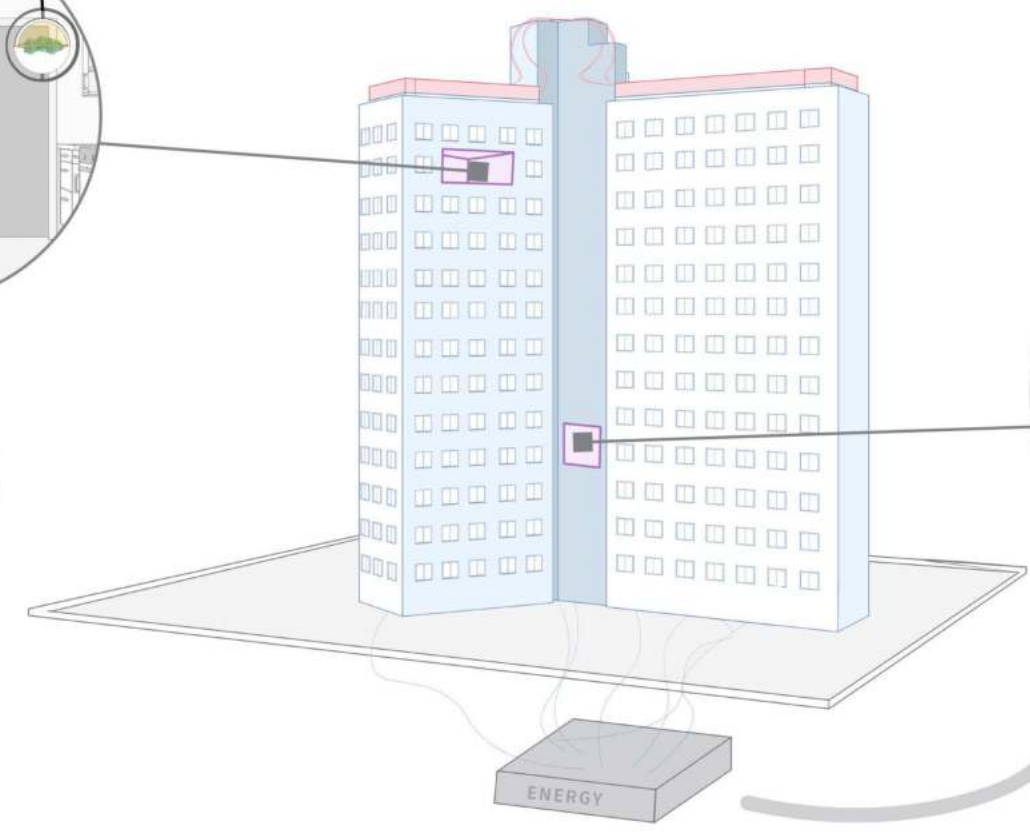
② ROOFTOP GARDENS

The roofs of all the apartment buildings (18 roofs total) will be landscaped with community food gardens. Residents can enjoy growing fruits and vegetables in this newly landscaped space. Additionally, earth battery infrastructure will be installed into the soil of every garden so that the soil of these gardens can also serve as energy-producing batteries that feed the generator contained underground the apartment complexes.



③ 00PHOTOPLANTERS

The lighting fixtures in all 1,272 apartment units will be replaced with highly efficient 00photoplanter fixtures. This new lighting system is not internally connected to the apartment's electricity system, rather it requires external charging in the apartment's 00photoplanter charging chambers (4). This modularity allows for residents to freely customize the lighting placement in their homes.



④ 00PHOTOPLANTER CHARGING CHAMBERS

Located in the central tower of each apartment complex will be 00photoplanter community charging chambers on each floor for residents to charge their 00photoplanters. When a 00photoplanter runs out of battery, residents can go to the charging chambers and exchange their 00photoplanter for a fully charged 00photoplanter. The charging chambers are extremely energy-efficient, require little maintenance, and run 24/7.

THE FOOD PRODUCTION OF SPACE

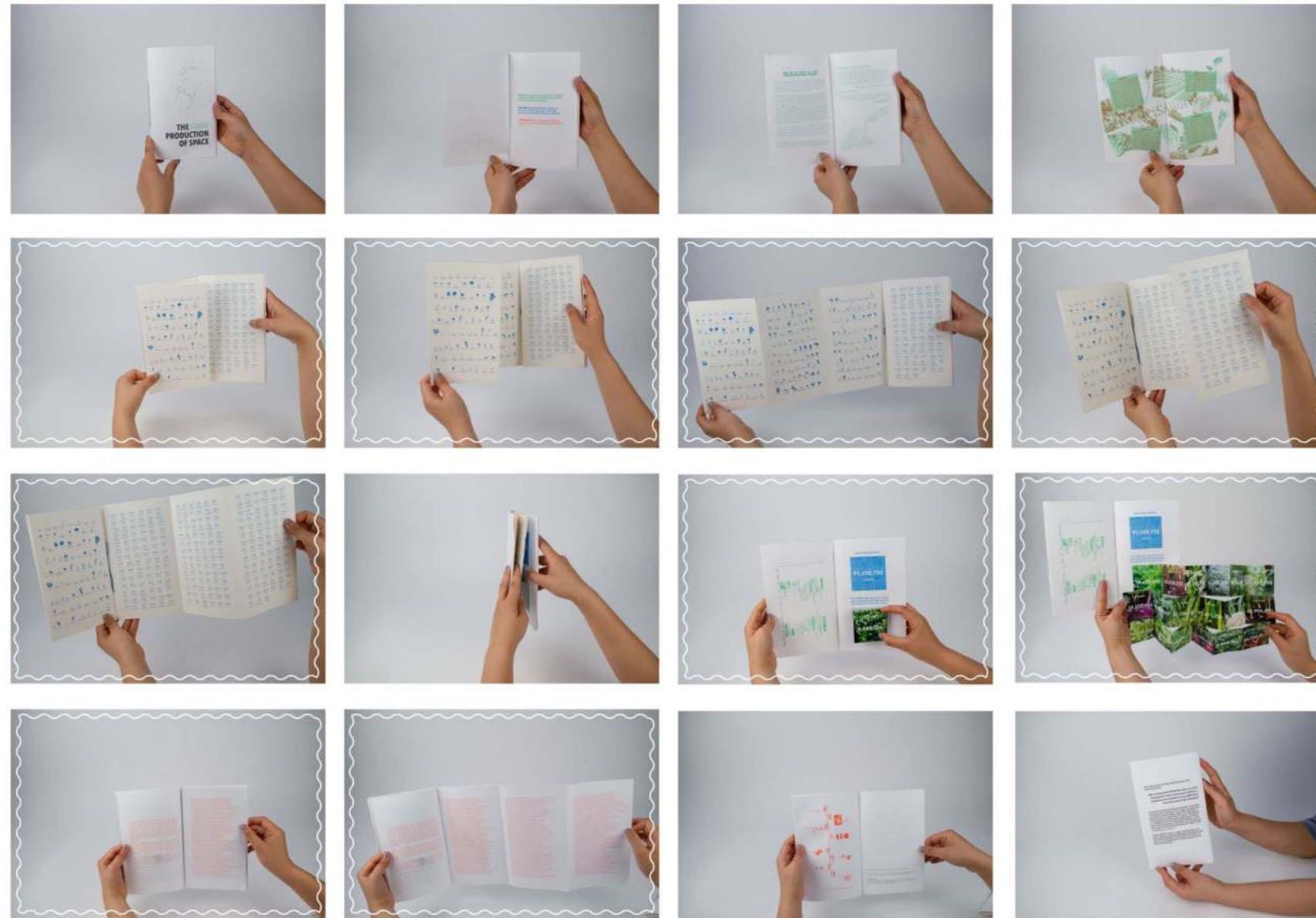
Urban Design Inventory

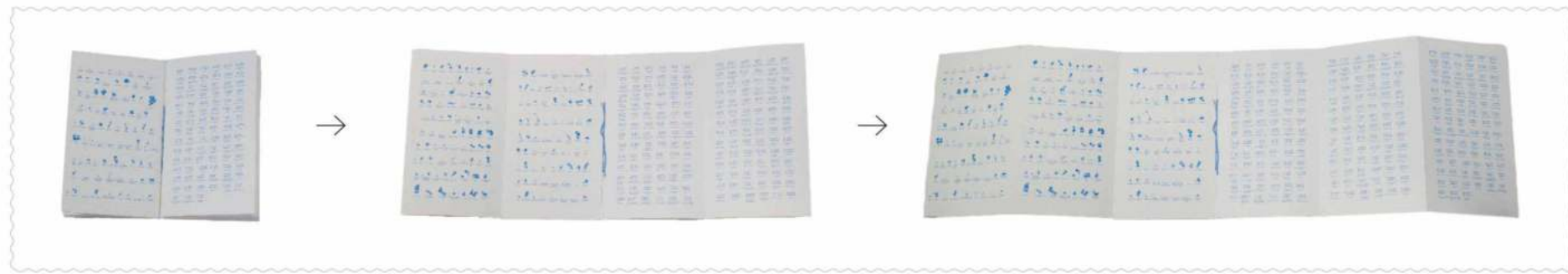
data visualizations designed using ArcGISPro, Adobe Illustrator and Adobe Photoshop

“The Food Production of Space” is an 11-book edition of interactive booklets that my team and I designed and published for my design workshop seminar. In these booklets, we sought to create a rich manual of information about NYCHA open space, provoking readers to think about the community histories of NYCHA open space, and, considering this knowledge, imagine the future possibilities of NYCHA open space.

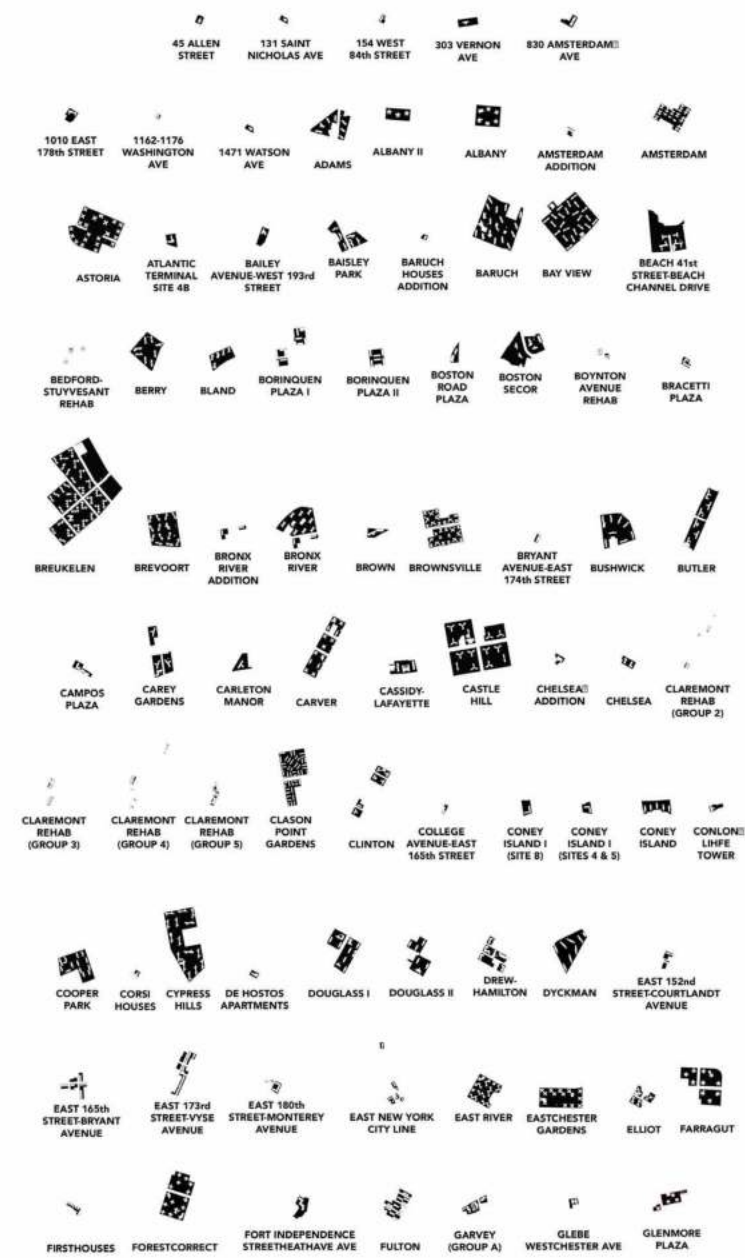
I led our team in the research direction and design, particularly focusing on the research for the “conceived” section of the booklet. In this section, we produced quantitative data visualizations of NYCHA open space and the growing potential of edible perennials in this open space. Page 10 features a comprehensive inventory of every single NYCHA development, extracted as open space shape layers from ArcGIS Pro. Page 11 features a growing season calendar of select crops that we found to be suitable for the climate of New York City, alongside an unfolding collage of information displaying the total quantity of each crop that could be produced in ideal conditions considering the total amount of NYCHA open space that we calculated.

Spring 2024
Design Workshop
Vassar College; Instructor: Tobias Armbrorst
Team Members: Melah Motani and Sarah Tung





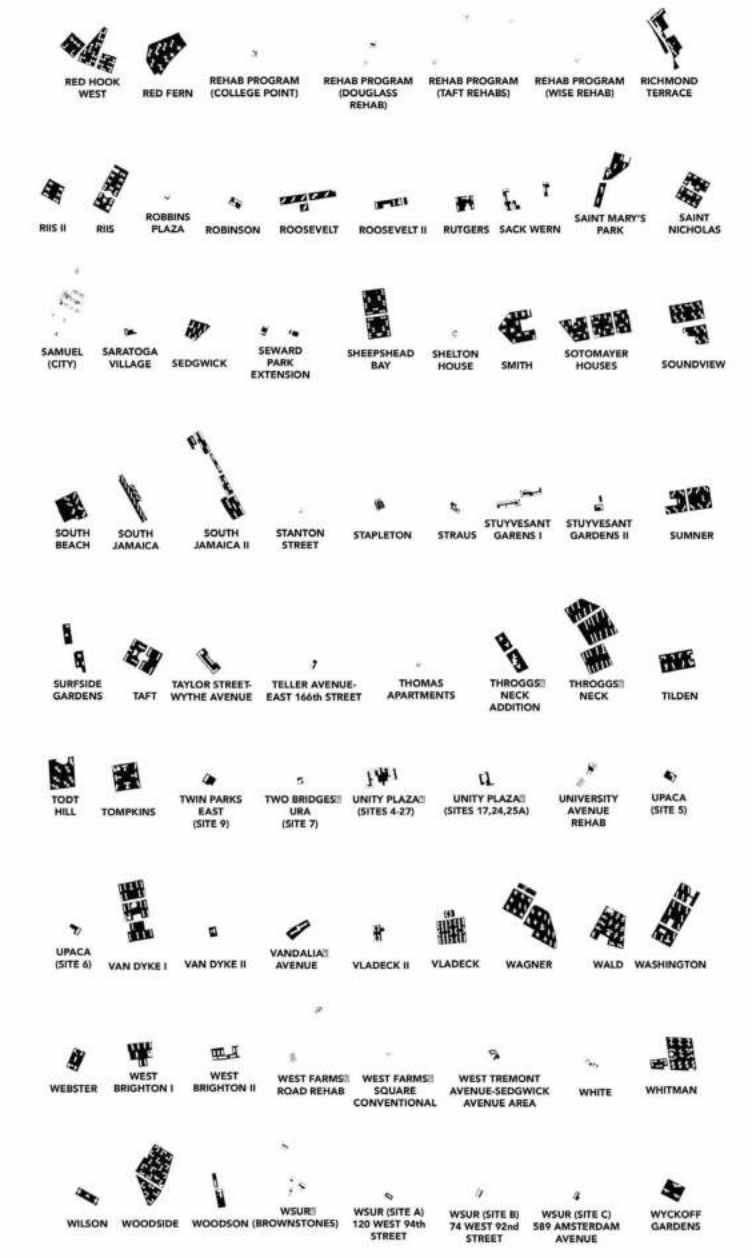
45 ALLEN STREET-GLENMORE PLAZA



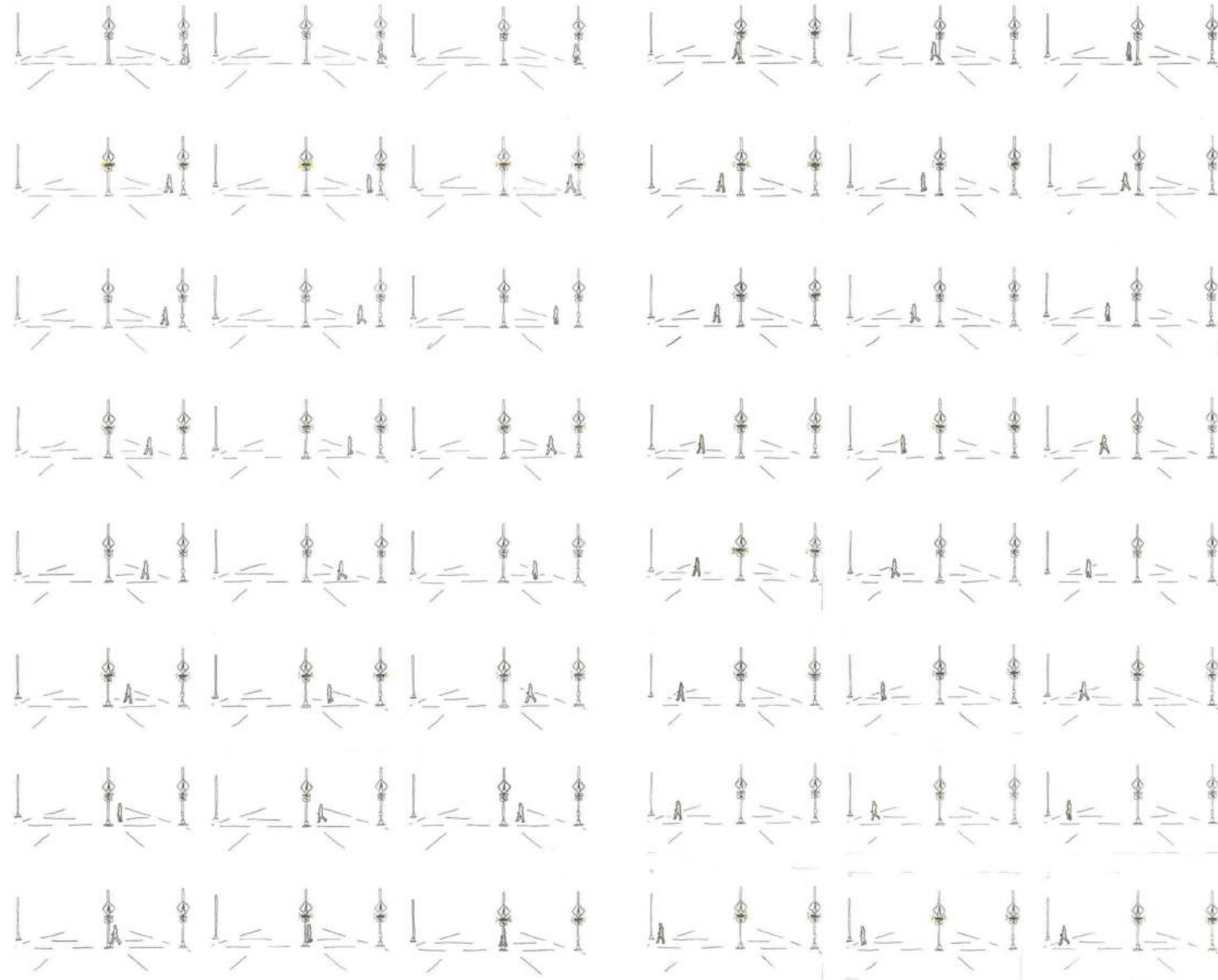
GLENWOOD-RED HOOK EAST



RED HOOK WEST-WYCKOFF GARDENS







MOVEMENT ANALYSIS

architectural representation exercise

ink on vellum hand-drawings

How can a 3D dynamic movement be represented using a stationary, 2D medium?

This was a question that I sought out to solve with this exercise, taking the everyday movement of my walk to class as my case study. Page 12 features a sequence of individual stop-motion frames, documenting the movement of my walk while page 13 breaks down the context of the movement in maps and analytical diagrams.

Fall 2023
Architectural Design 1
Vassar College; Instructor: Tobias Armbrorst



● = FLASHING STOP sign
○ = Streetlight

