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## **(data) analysis**

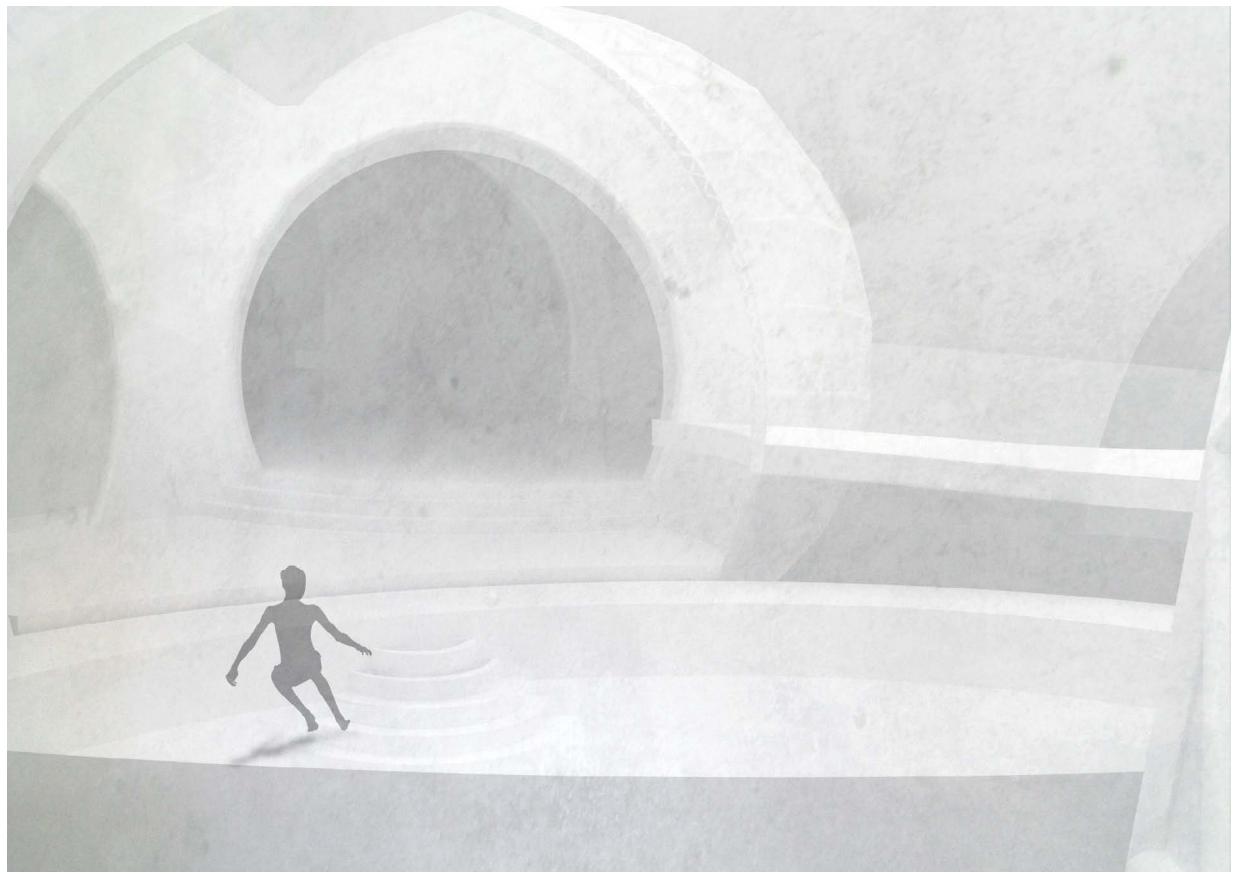
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design



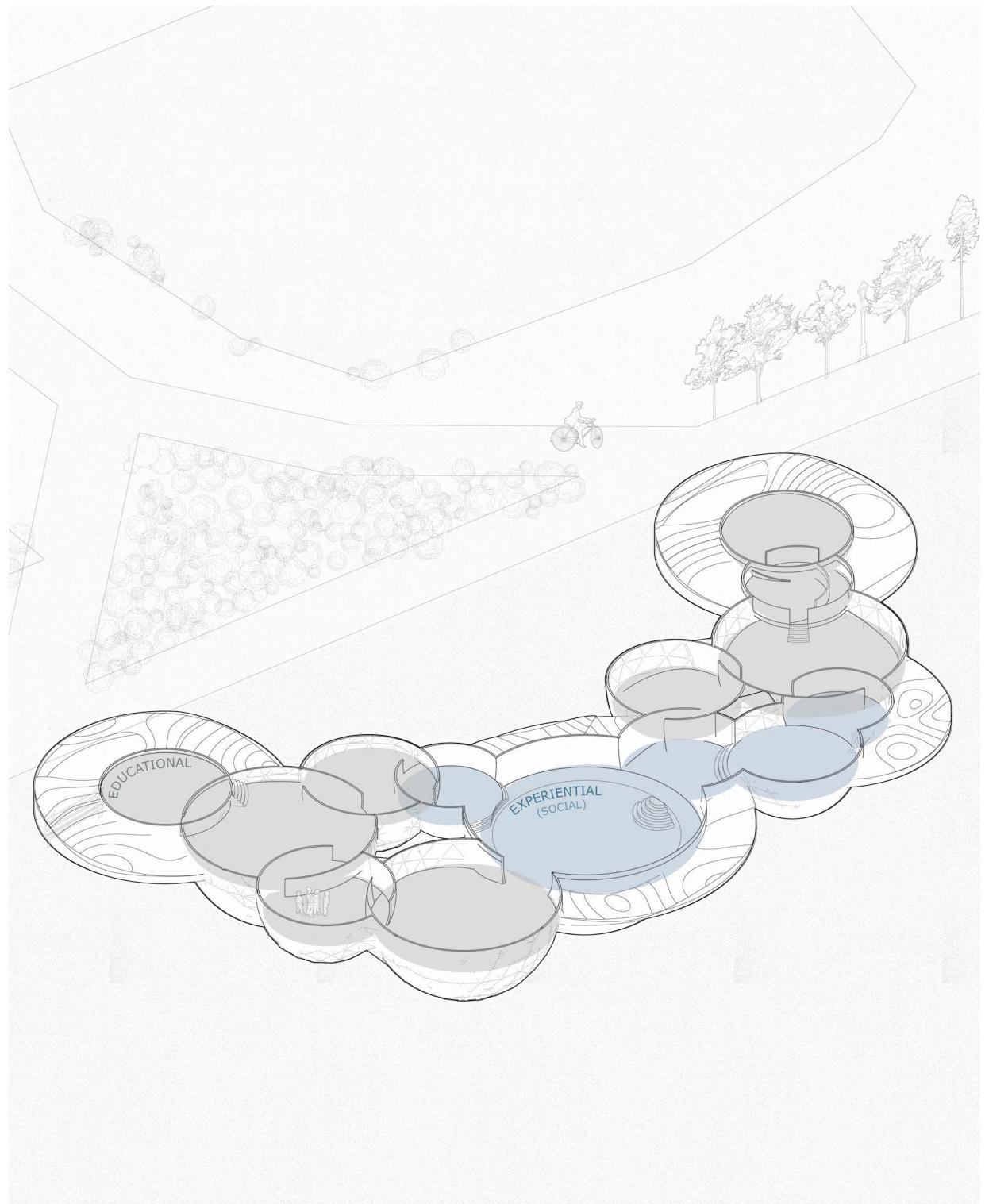
# *hydro-habitat*

## **Can architecture generate a stronger, more tangible relationship between people and water?**

The hydro-habitat treats water as both a living resource and a landscape that flows in and around it. It reexamines the existing relationship of Manhattan's eastern edge to the river bordering it and breaks down the separation between land and water. It consists of three main cores: social, educational and experiential. Educational spaces about pollution and water transform into a pool fully immersed in the East River as one moves into the project. This pool's walls filter water directly from the river, and along with a series of contours that lead out from the project, open it up to the water. The hydro-habitat is both pragmatic in its function of filtering water and sublime in the way it produces a sense of wonder about water.

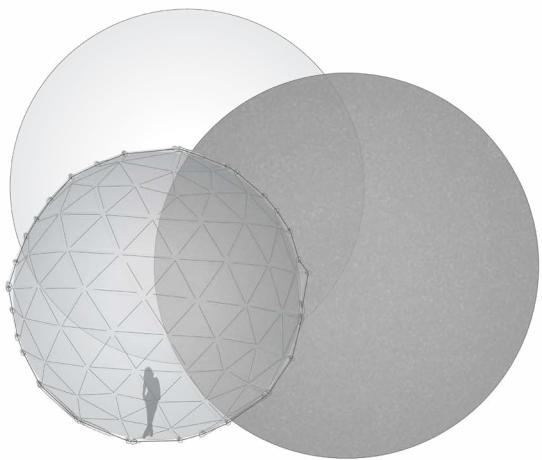
*Fall 2017. Core 1. Critic: Tei Carpenter.*



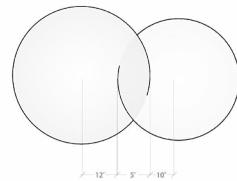


Isometric drawing showing circulation and program at 1/32" = 1' 9"

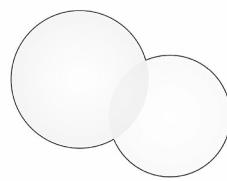
TYPOTOLOGY



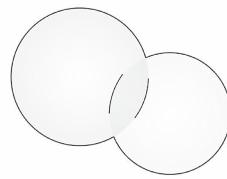
INTERSECTION

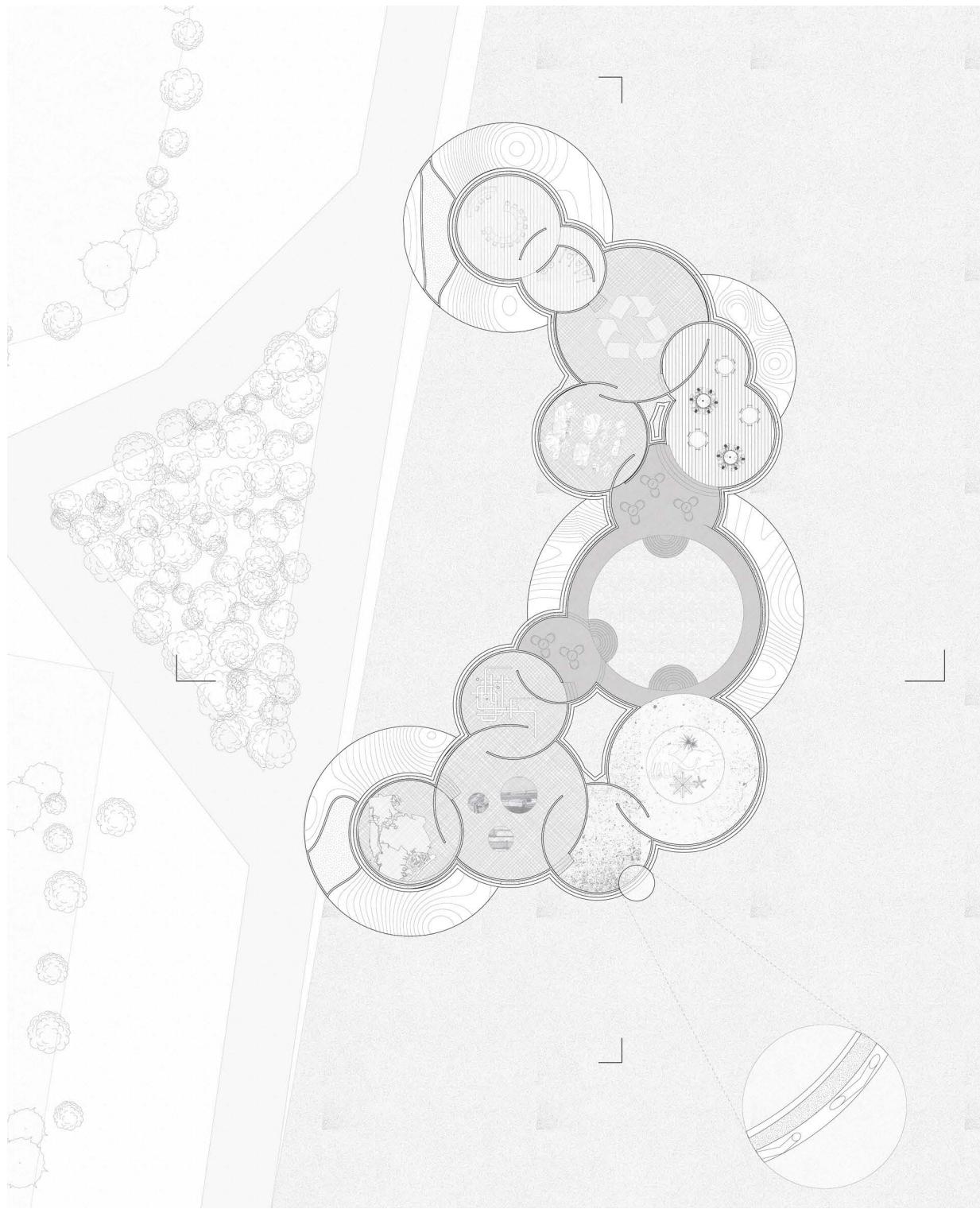


UNION

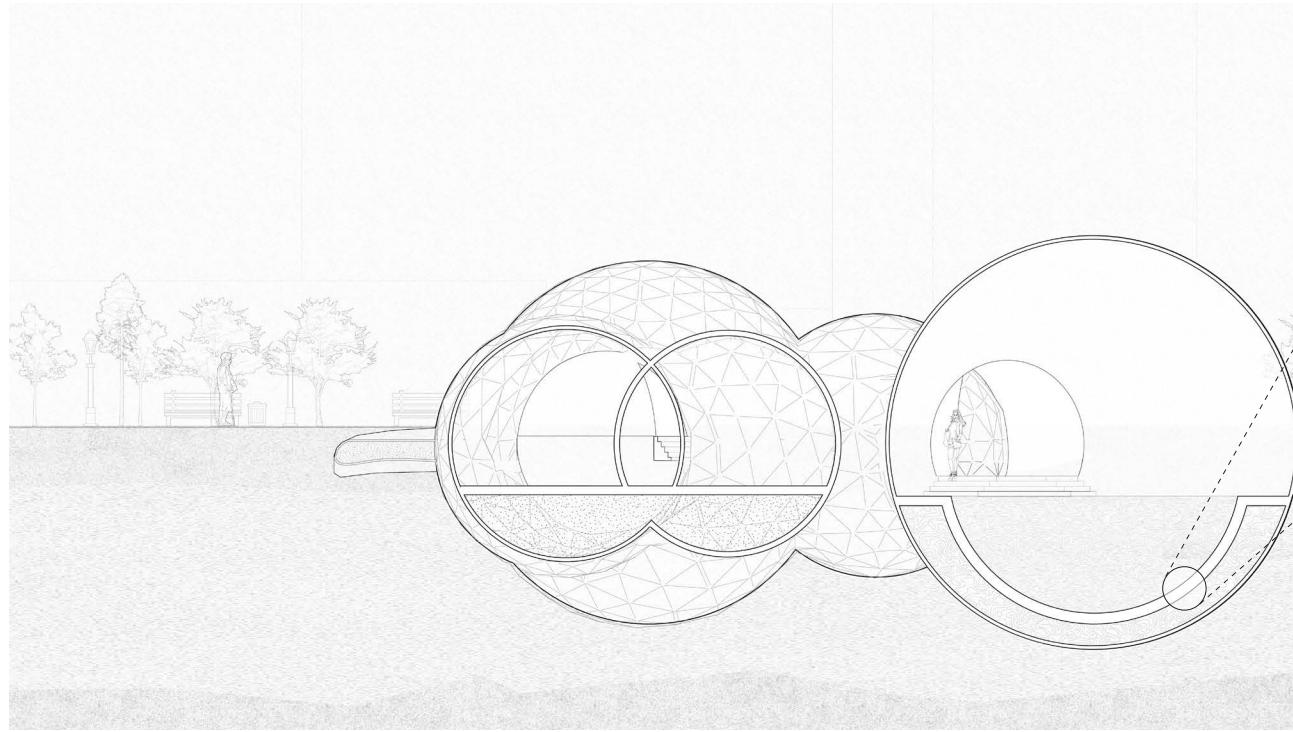
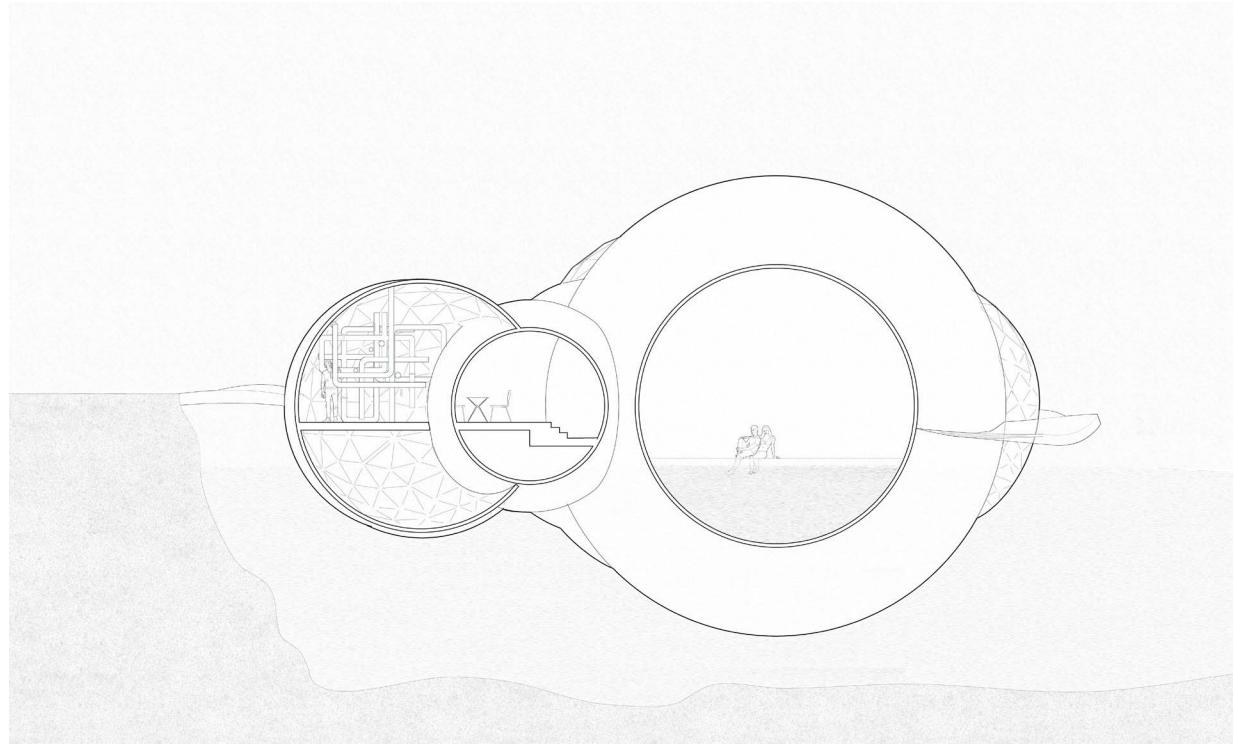


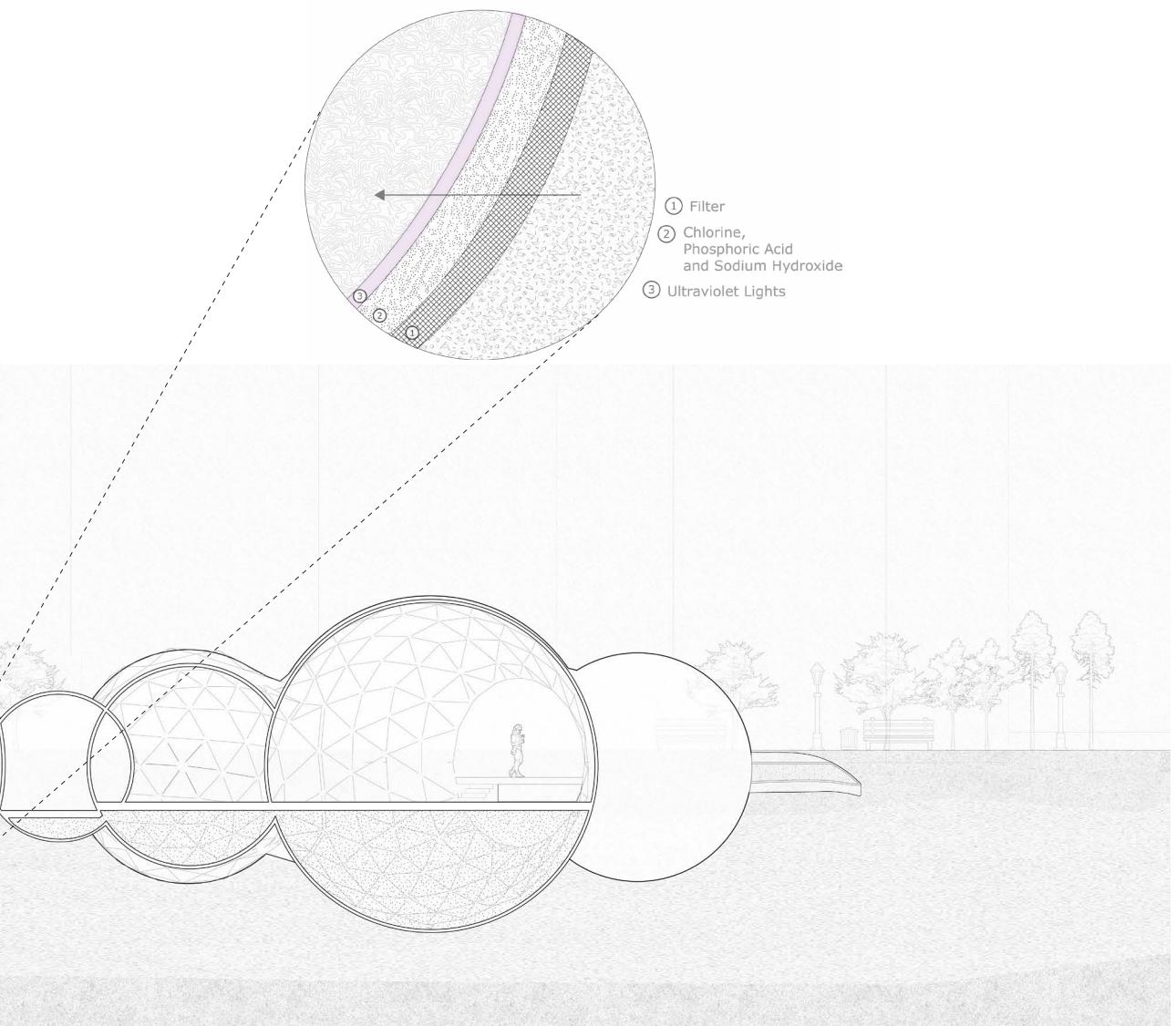
SUBTRACTION



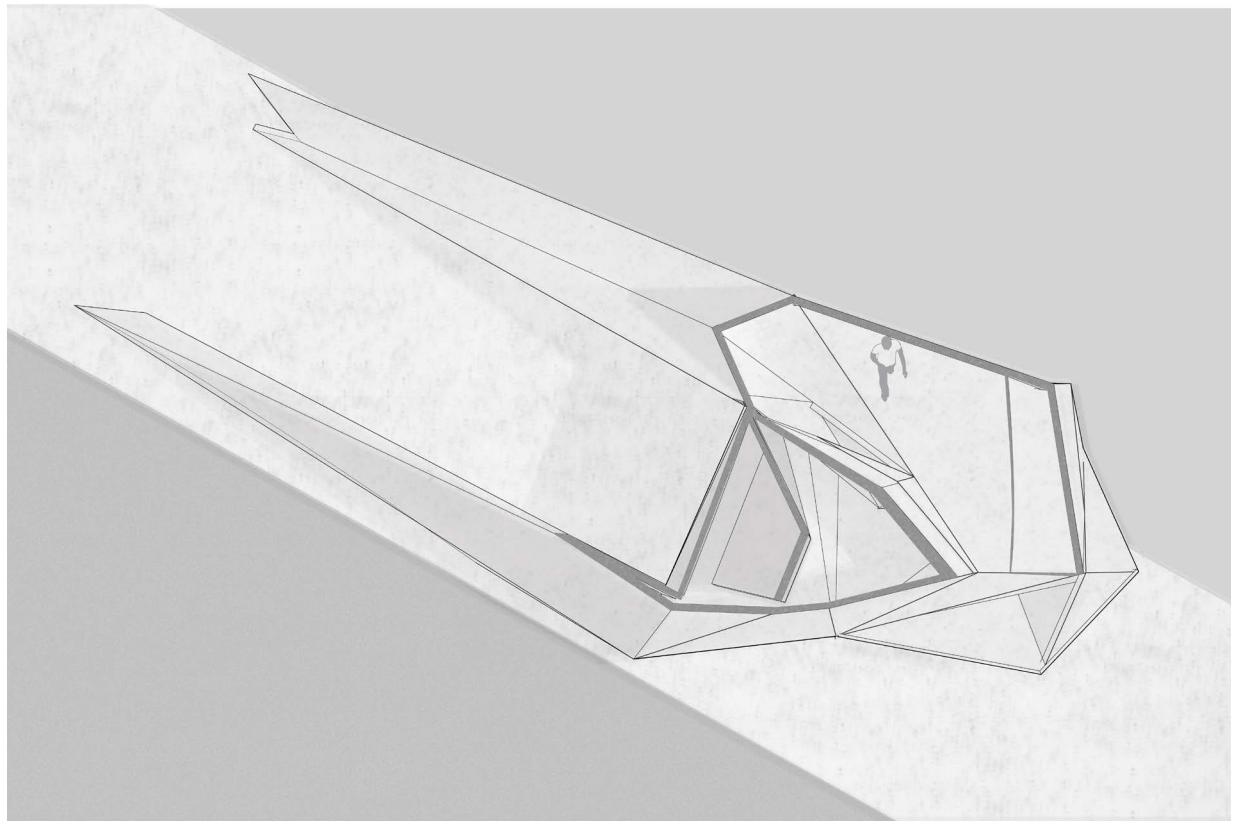


Plan showing programs and wall construction at 1/40" = 1' 11"





Bottom: Longitudinal section showing change in spaces through the hydro-habitat at 1/24" = 1' 13"

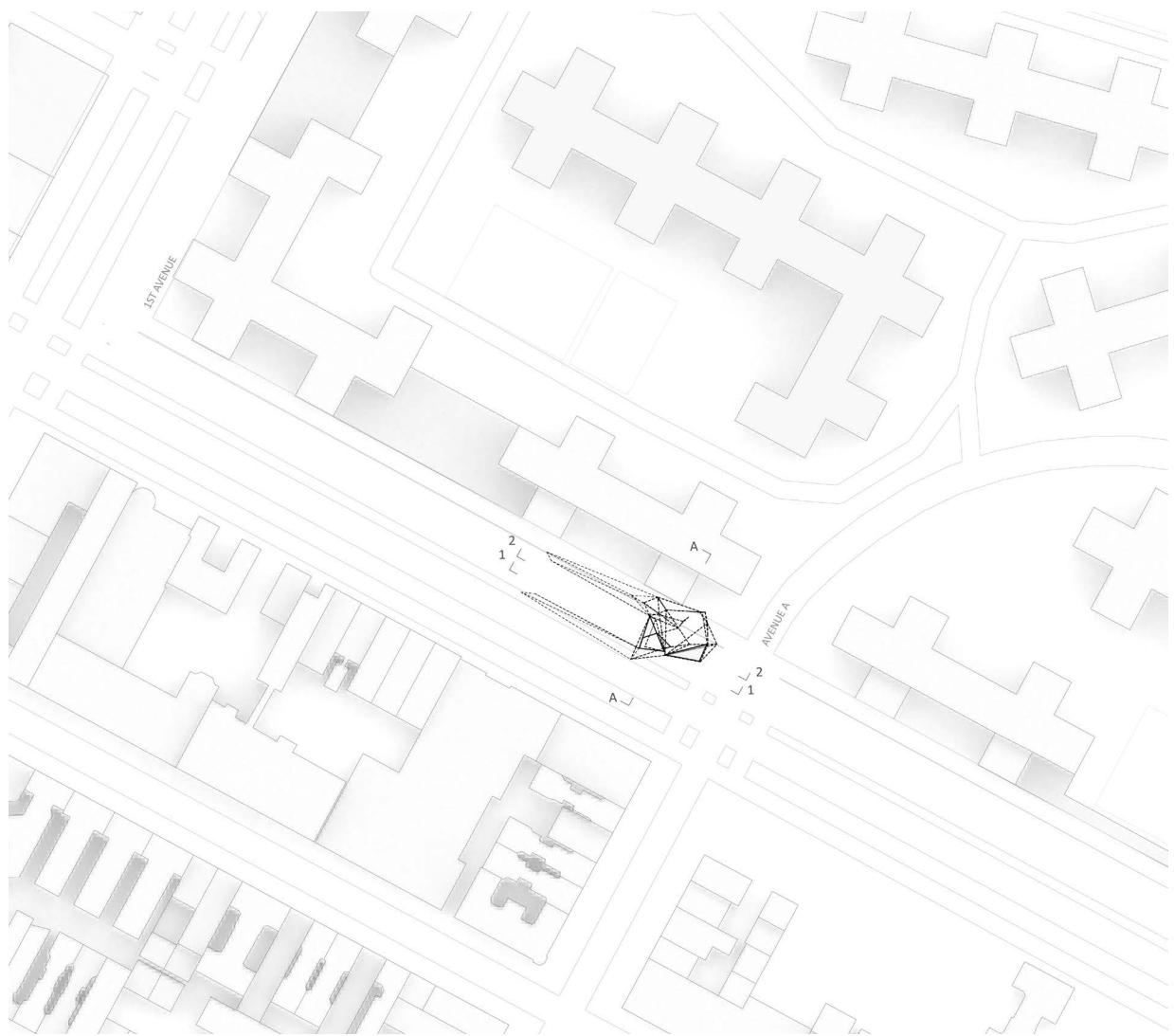


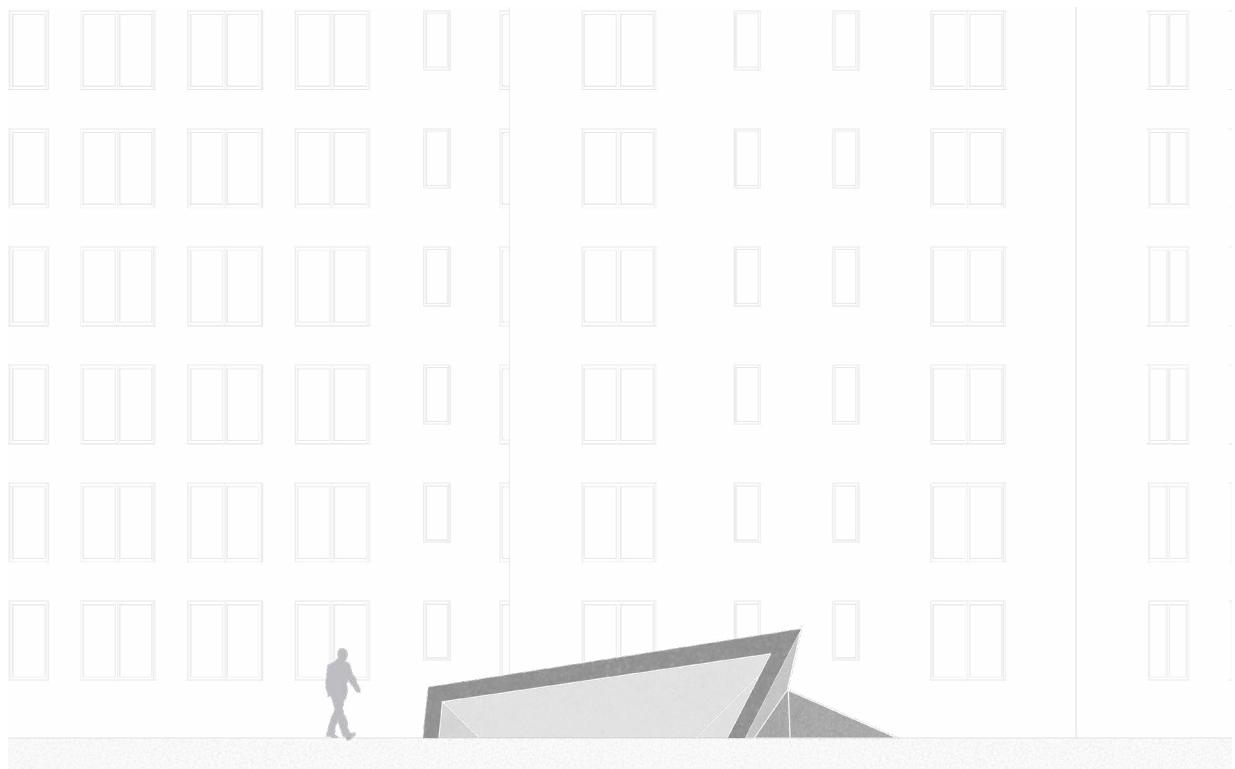
# *processional planes*

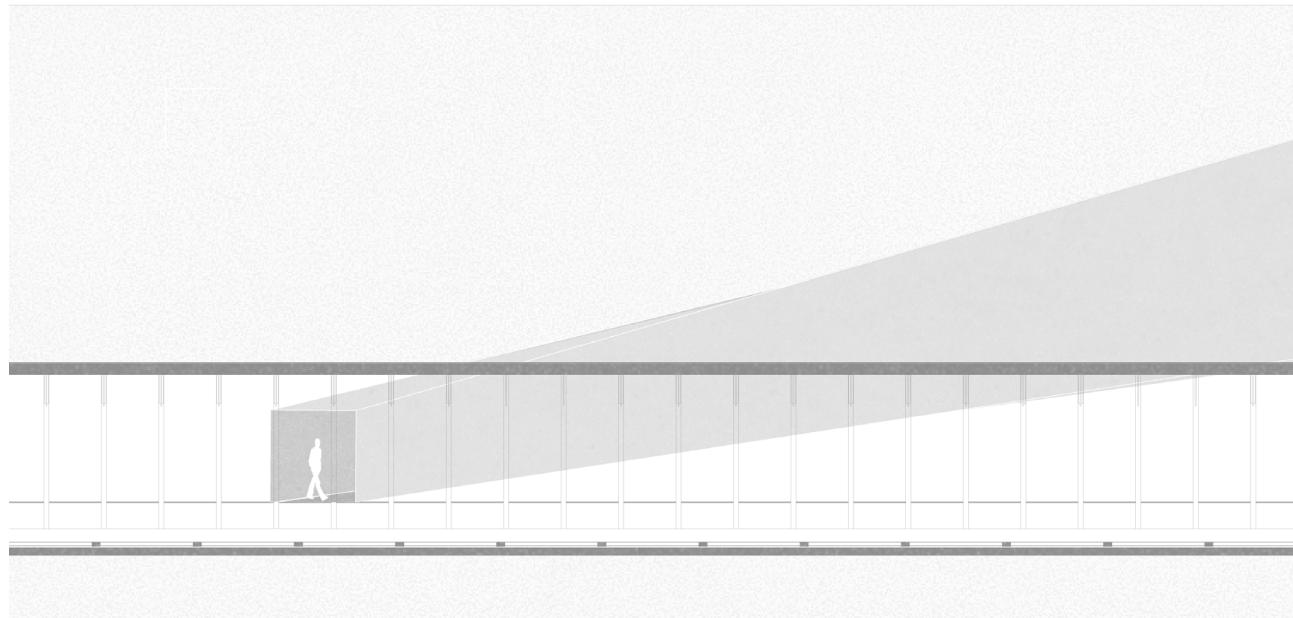
**Can light and the absence of it, as well as directionality of planes create distinct spaces with particular qualities?**

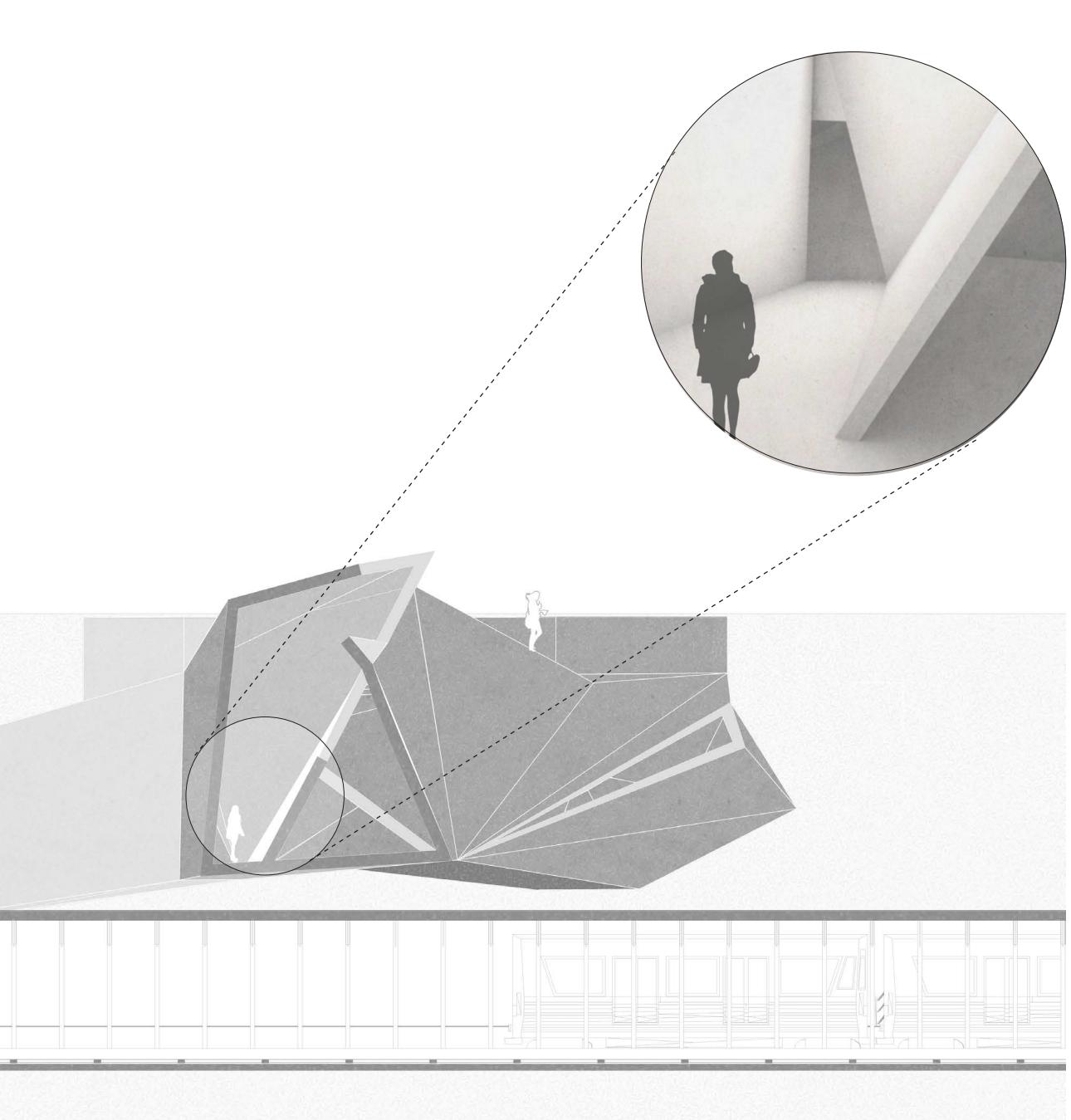
Moving through the project is akin to going through a maze and discovering unexpected spaces. The formal language of folding planes and peeling away layers generates apertures for light and movement. The ground plane transforms to become the roof and then the wall. Modulation of this system creates some narrow and bright spaces, and some wide and dark spaces. The dark spaces begin from ground level and lead into the bright spaces close to the subway. Only through the bright spaces can you proceed to the subway platforms. It has a minimal shape above-ground that hints at what is to come, and a complex shape below ground.

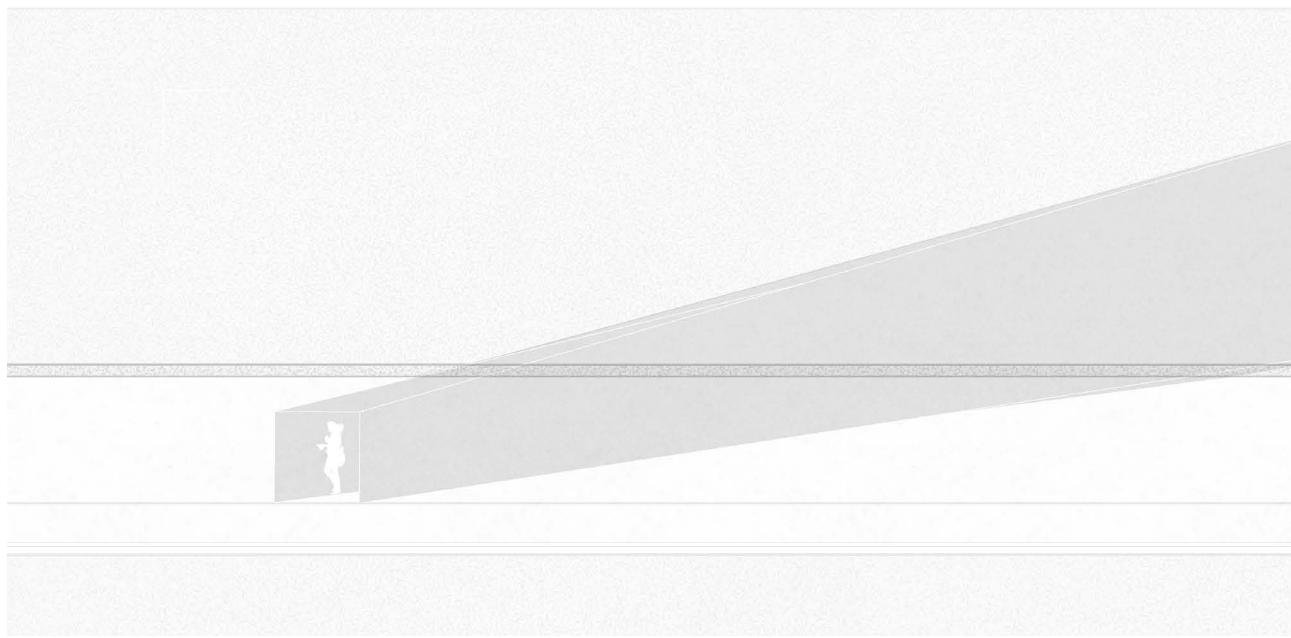
*Fall 2017. Core 1. Critic: Tei Carpenter.*

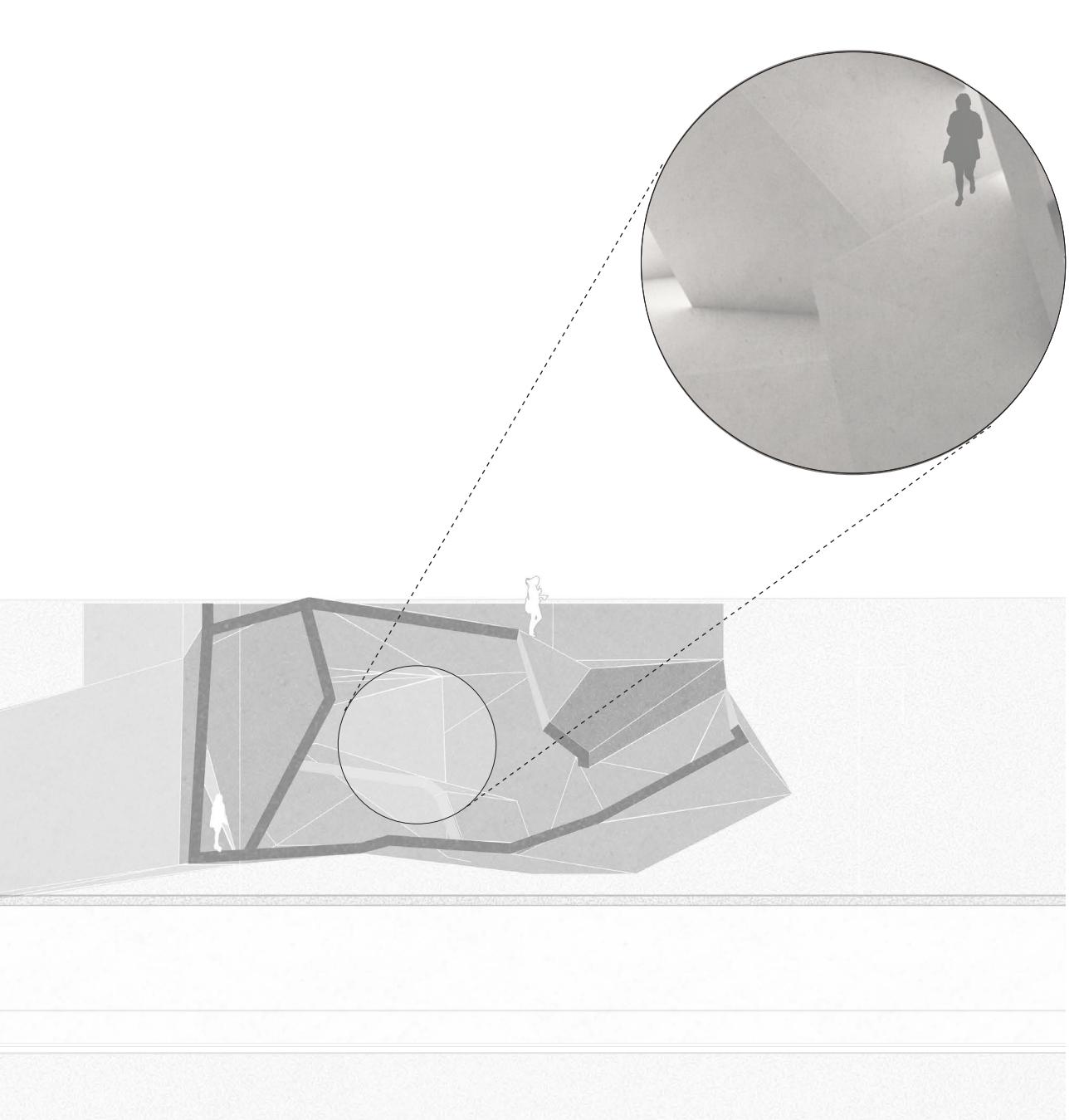


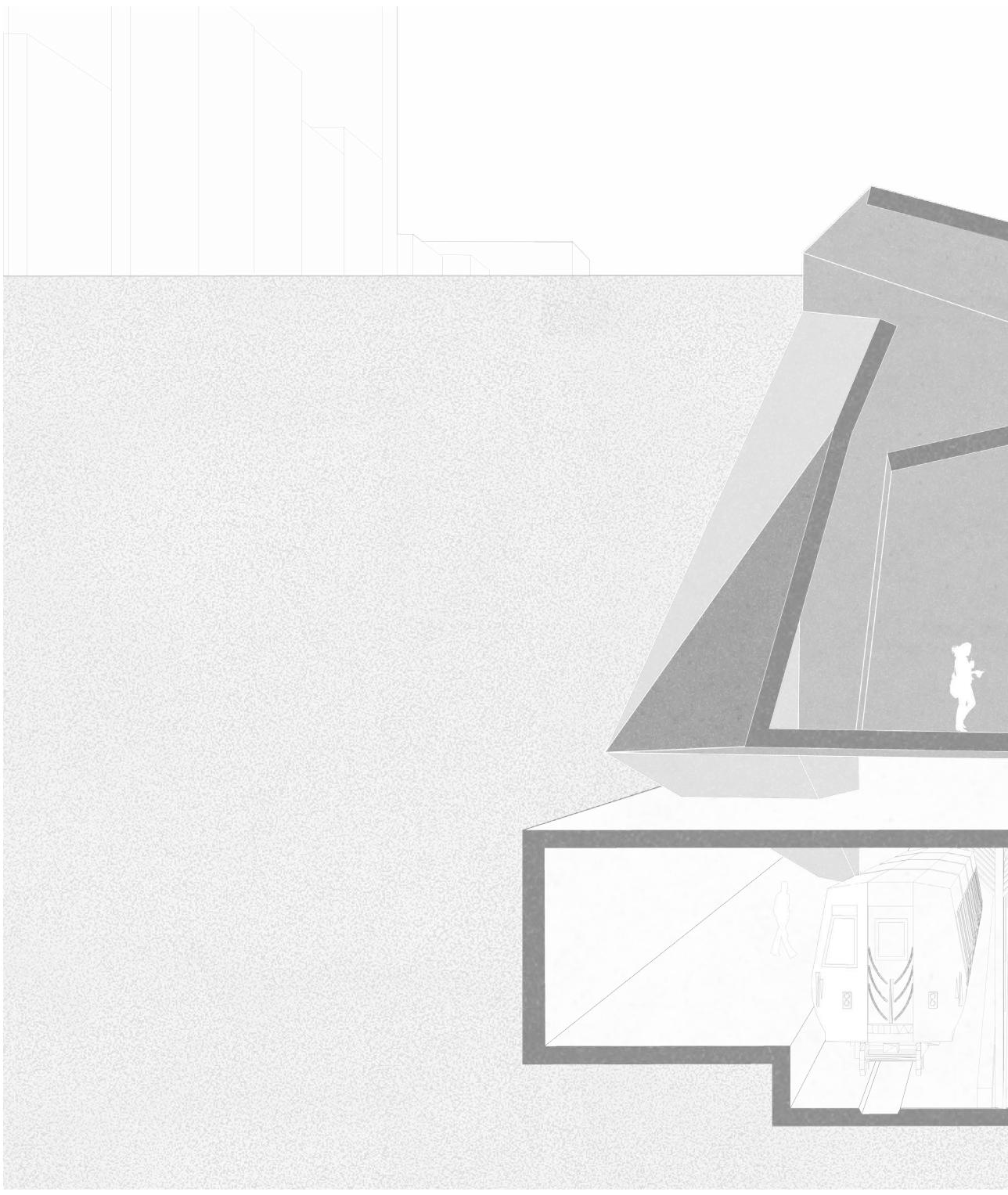


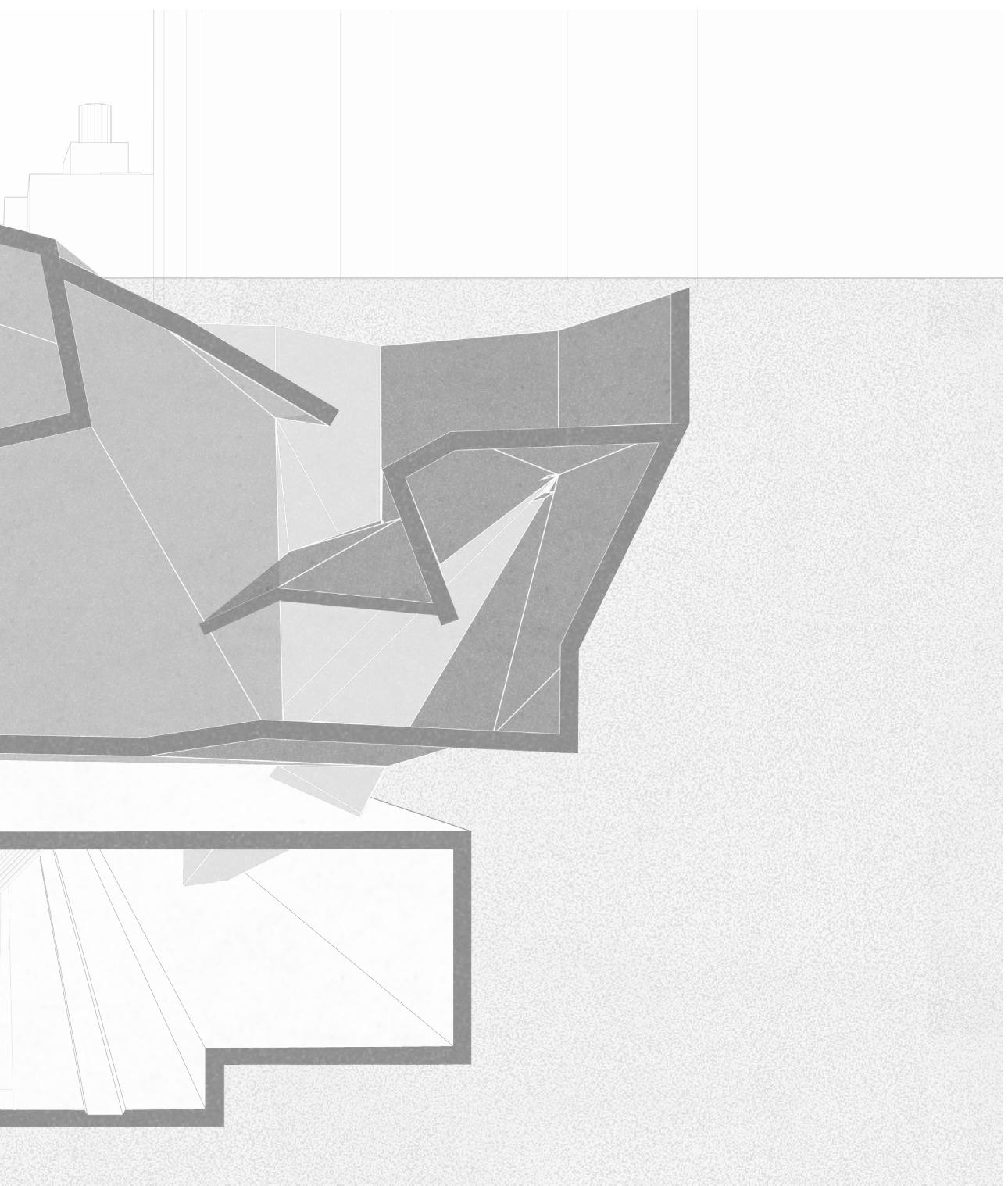




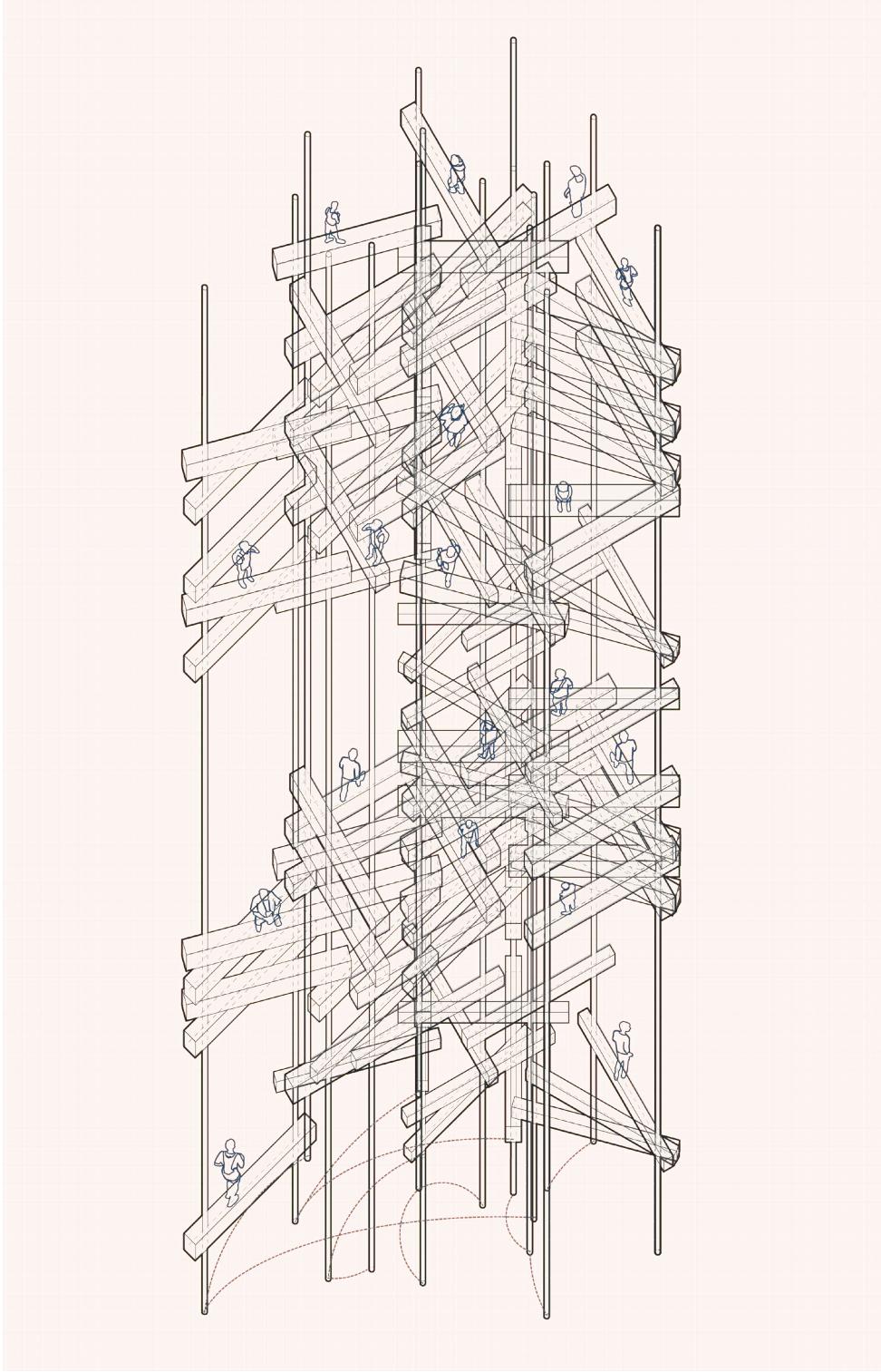








Cross section through subway entrance showing spaces created via folding 23

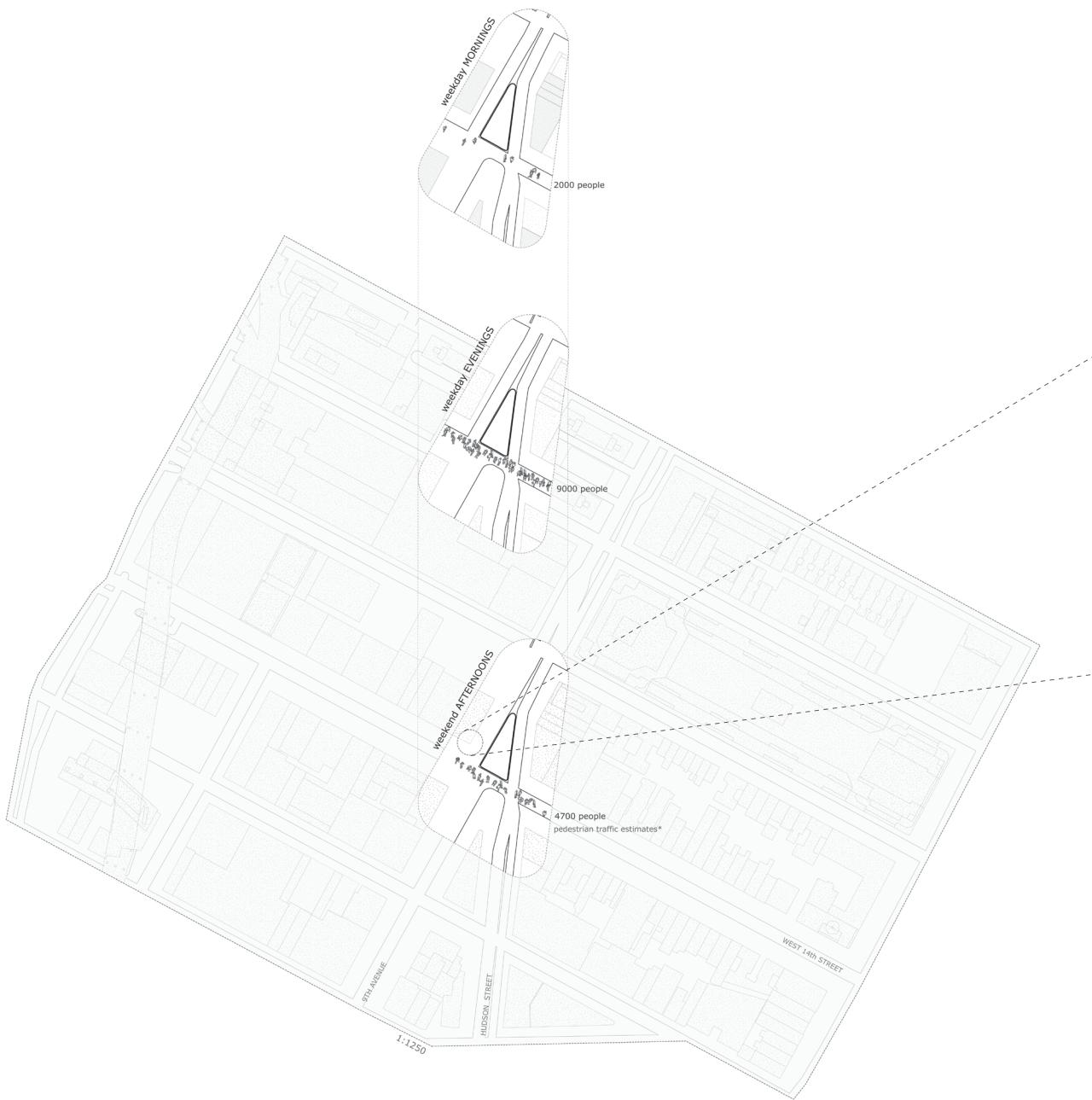


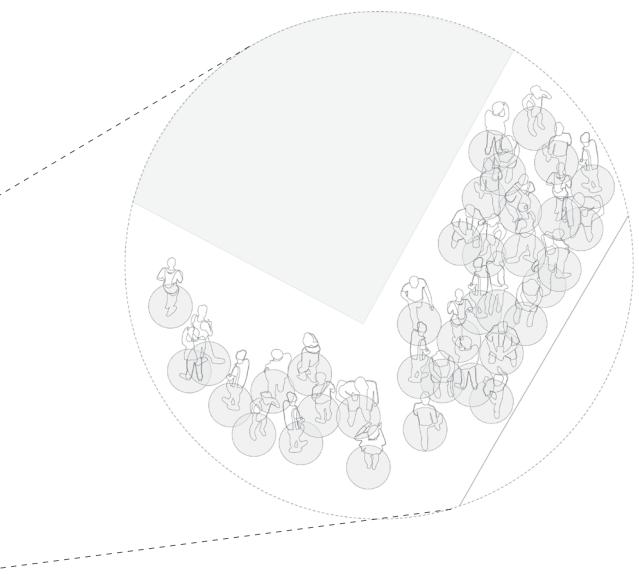
# *deconstructed jenga*

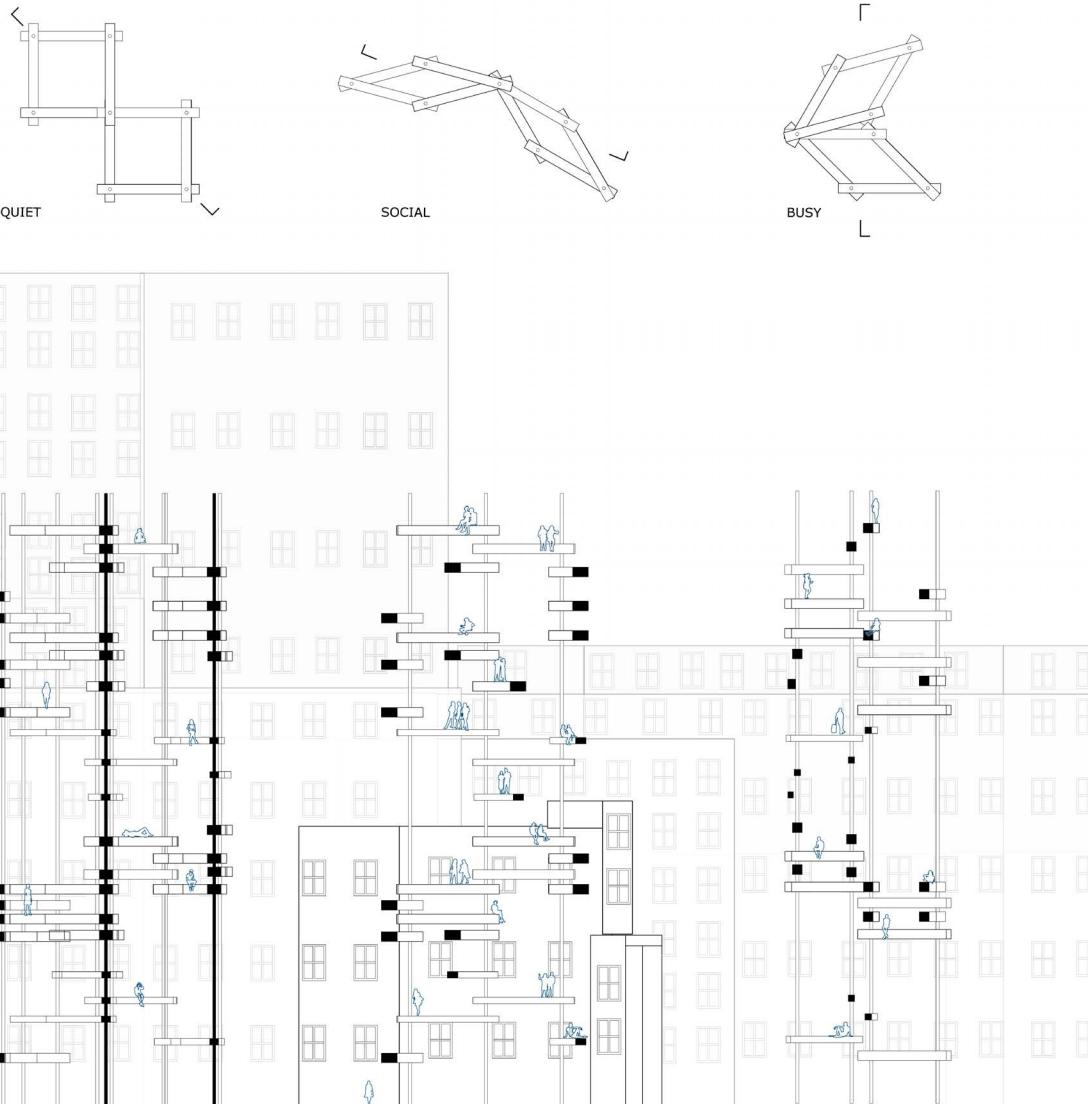
**How do bodies traverse space, and how does the movement of time complicate this?**

This conglomeration of surfaces and volumes responds to both the density of people and activity level over time. At quiet times, the intervention would rotate and shift such that the platforms would form enclosed and isolated spaces suitable for introspection and repose. At social times, the platforms would intersect to form a collapsed space suitable for group configurations. Finally, at busy times, the intervention would expand to create a combination of free spaces and individual configurations.

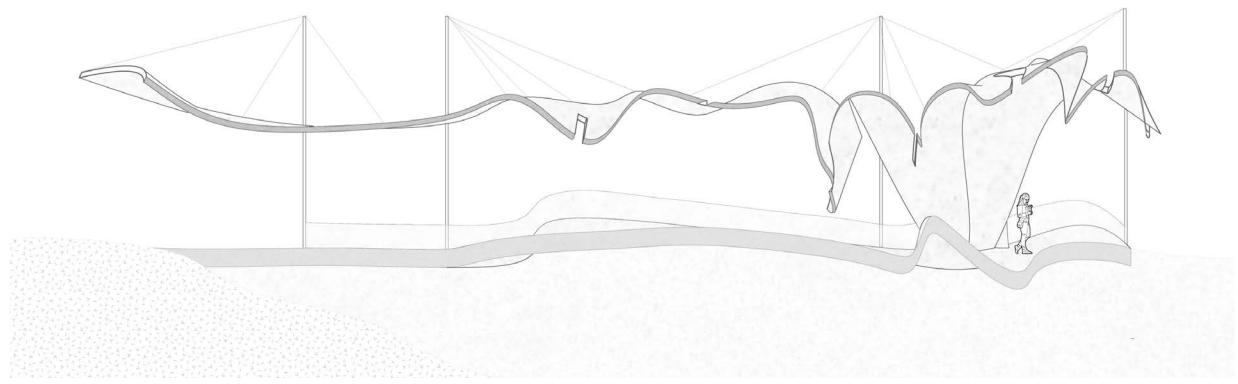
*Fall 2017. Core 1. Critic: Tei Carpenter.*









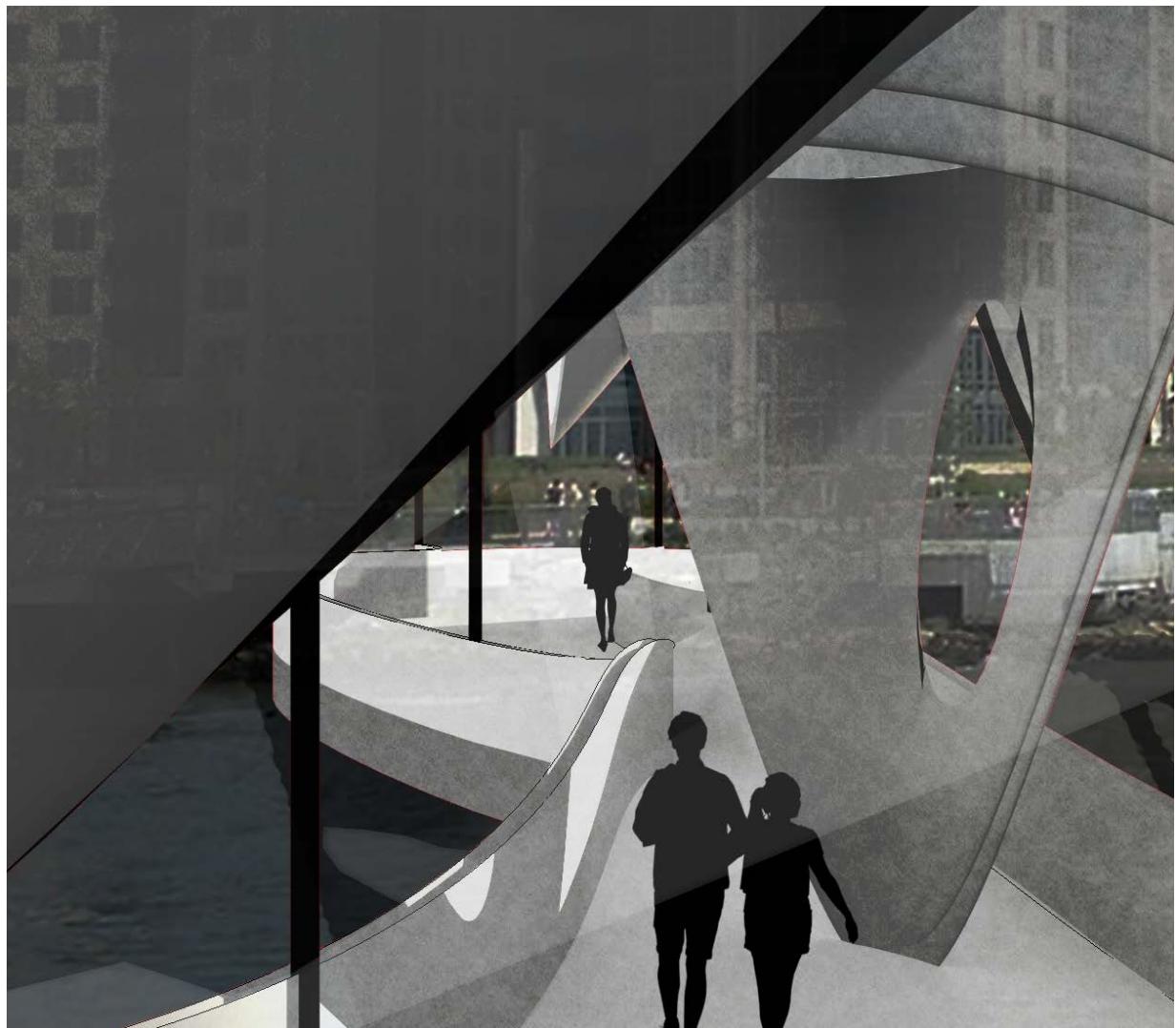


# *blurring boundaries*

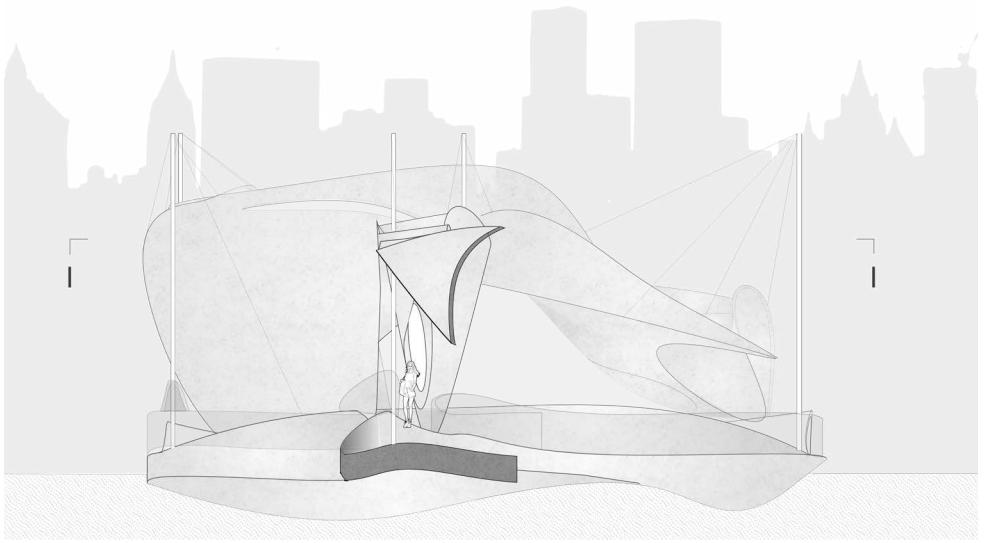
**This reinvented bridge and gangplank  
stems from the question: can one  
smoothen the transition from land to sea?**

This proposal for New York City's East River Ferry at N 5th St, Brooklyn extends the threshold between the land and the sea. It does this by mirroring the shift from stability to instability when moving from land to the sea through undulations in the roof and floor and selectively constricting wind channels through the roof.

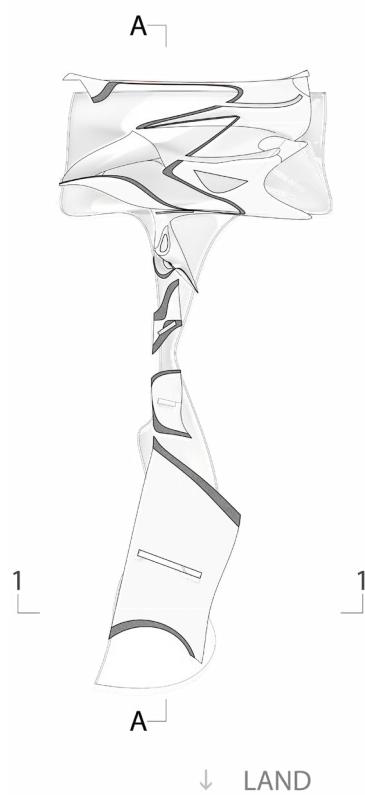
*Fall 2014. Architectural Design 1. Critic: Leah Meisterlin.*





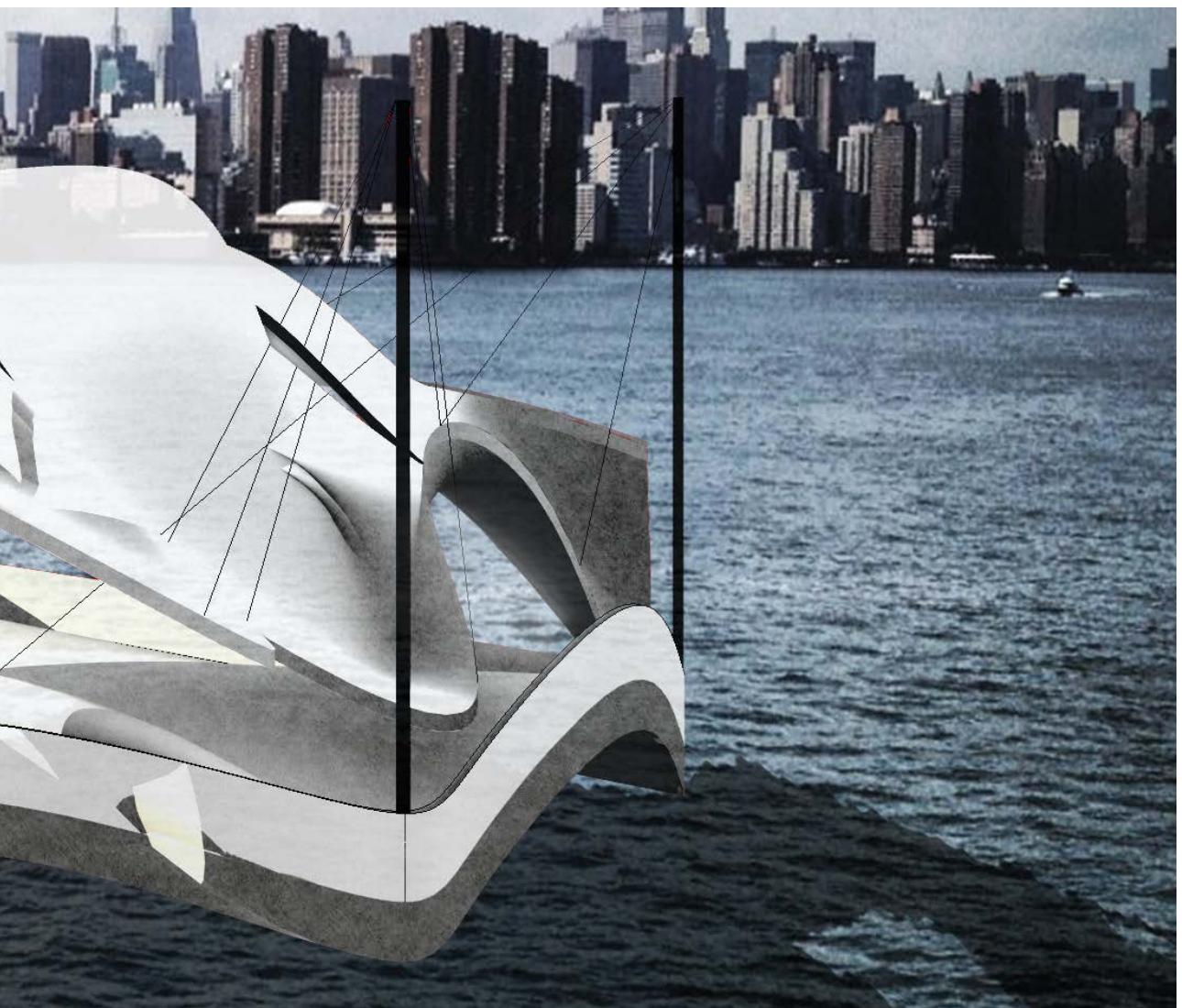


↑ EAST RIVER

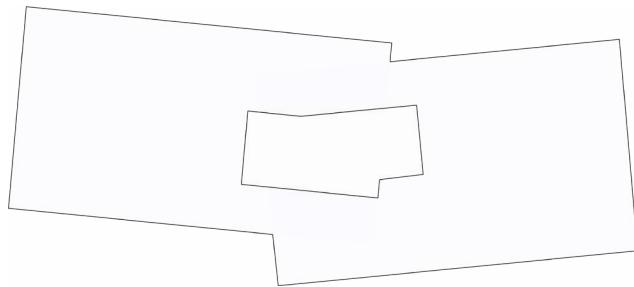
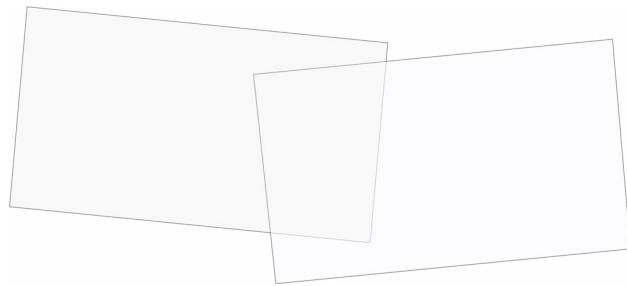


↓ LAND





View towards land showing relatively low instability 37



# *library\*\*\**

**How can we create space that is both specific and adaptable, and allows students to immerse themselves in one pursuit or many as they see fit?**

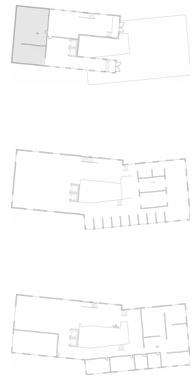
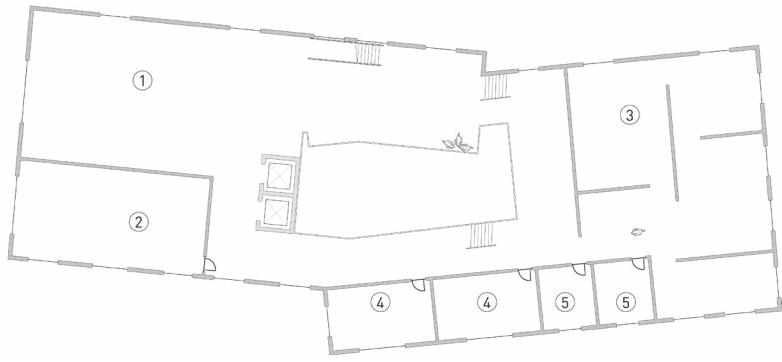
Taking cues from students' re-purposing of Barnard College buildings, this proposal for a new library features flexibility through open floor plans and dispersed relaxation spaces visible through openings in and outside the building. A central void joins academic programs in the building's right to social programs in its left.

*Spring 2015. Architectural Design 2. Critic: Brad Samuels.*



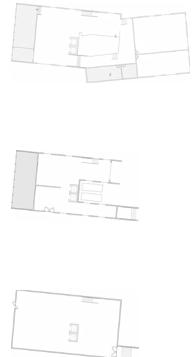
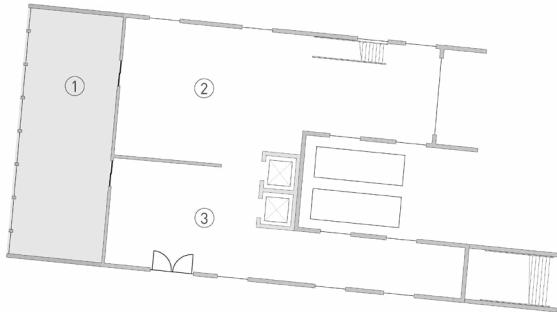
3rd floor

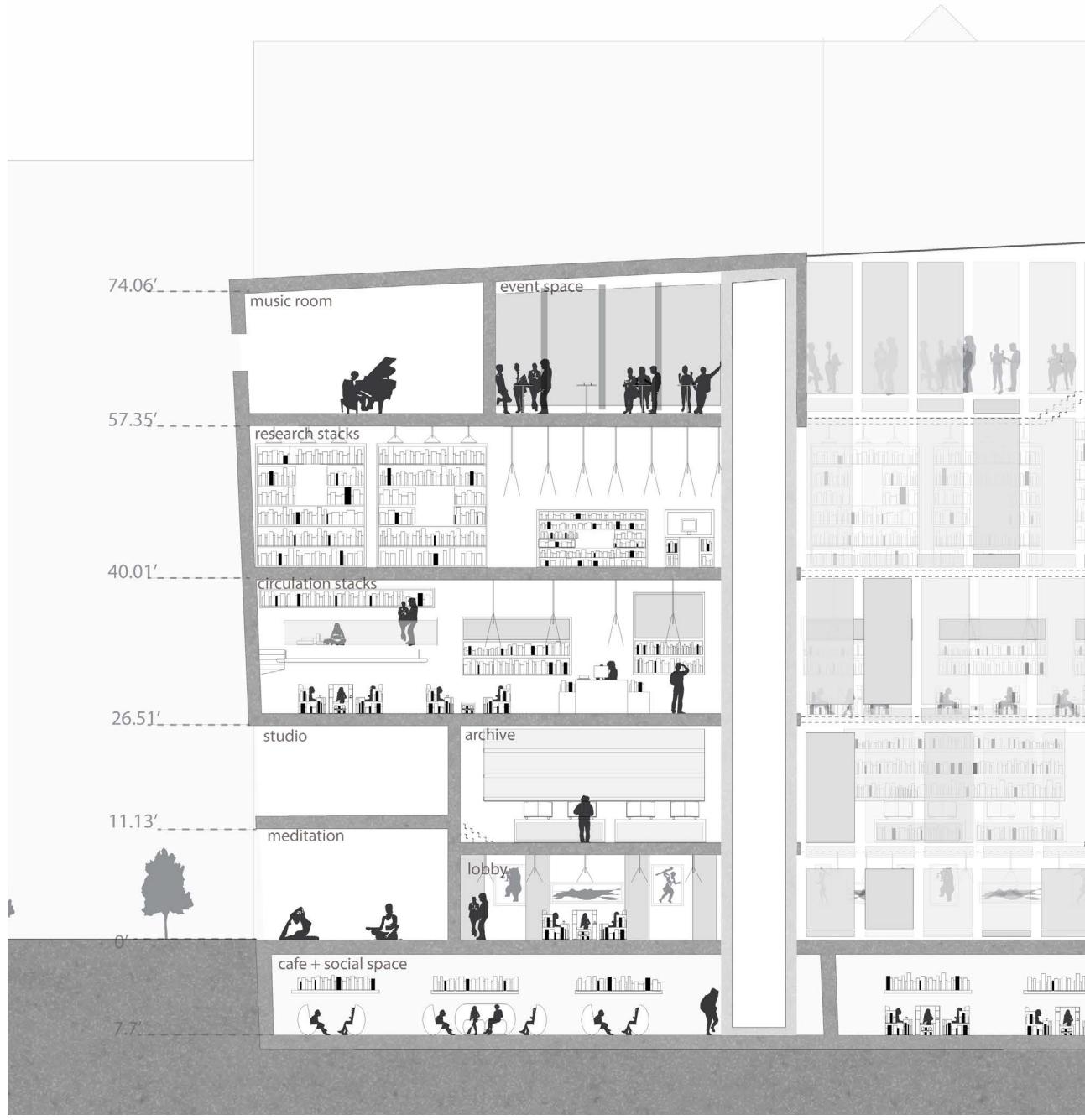
- ① circulation stacks
- ② administrative
- ③ main reading rooms
- ④ small classrooms
- ⑤ group study

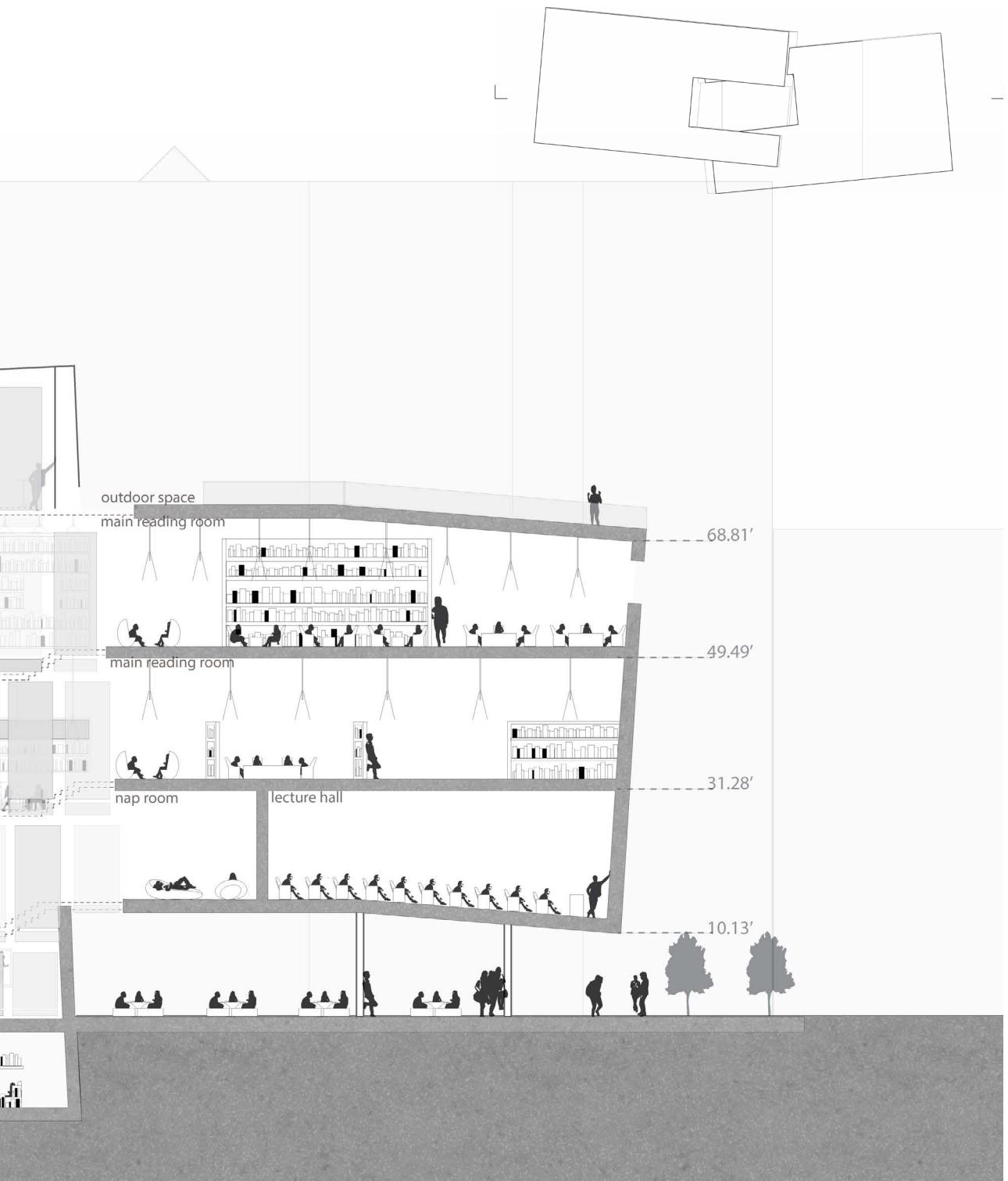


1st floor

- ① meditation
- ② gallery
- ③ lobby



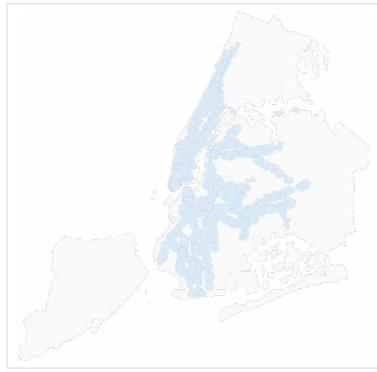
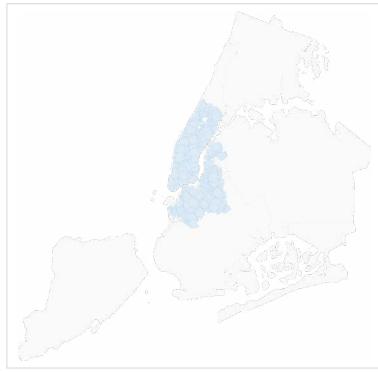




Cross-section showing social, academic and hybrid spaces 43



**(data) analysis**



# citi bike accessibility

## **How accessible is New York City's Citi Bike network? Who benefits from it?**

This evaluation of the Citi Bike network looks at its accessibility to New York City residents based on two different proximity metrics. The first is a service area from half a mile from Citi Bike stations, and the second is accessibility via subway stations thirty minutes away from those Citi Bike stations. Analyzing Citi Bike as a bi-modal transportation option illustrates that the system is rather robust, but is not accessible equally across age and race. Minority populations are less likely to have access to Citi Bike than white populations. Younger populations are also more likely to have access, but this is on par with New York City's relatively young population.

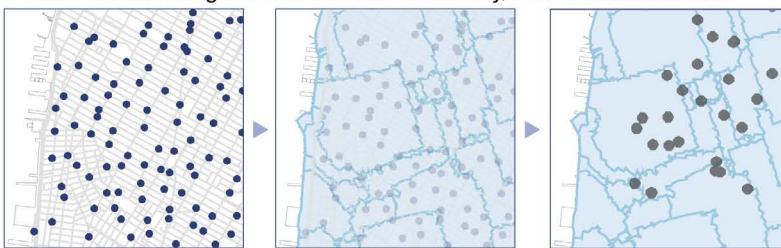
*Spring 2017. Introduction to Geographic Information Systems.  
Taught by Leah Meisterlin. In collaboration with Joan Zhang.*

## Network Analysis

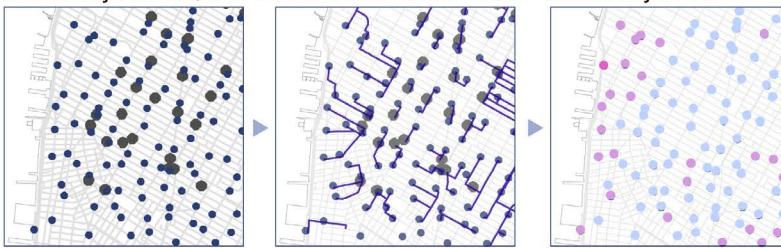


● Citi Bike station  
● Subway station  
— Pedestrian street  
— Subway line

If I want to travel using both Citi Bike and the subway, how convenient is that?



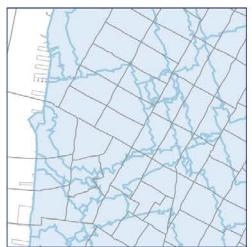
If I dock my Citi Bike, how far do I have to walk to the nearest subway station?



If I park my Citi Bike at any station, which subway stations can I walk to at a comfortable distance? How far can I travel along that subway line in thirty minutes?



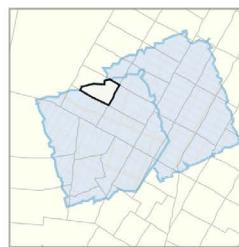
## Demographic Analysis



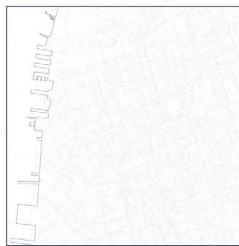
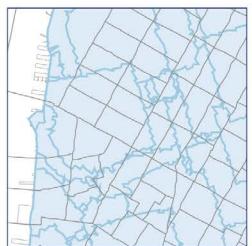
Half-mile service area from Citi Bike stations  
New York City census tracts



Half-mile service area from subway stations accessible to Citi Bike stations via thirty minutes on a subway line



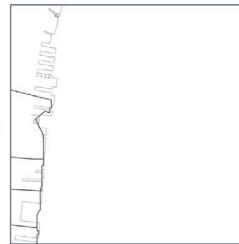
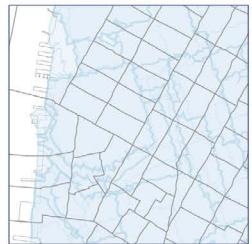
If I have immediate access to Citi Bike stations, what are my likely characteristics?



What if I have indirect access via subway stations?

REPEAT FOR  
ACCESSIBLE  
SUBWAY SERVICE  
AREA

If I have no access to Citi Bike stations, what would be my likely characteristics?



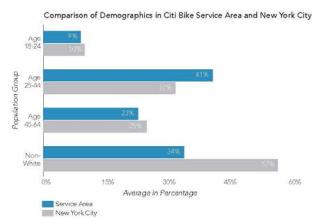
## Findings: Demographics

The four maps below show age and racial demographics in areas with immediate access to the Citi Bike network. Each blue dot represents the range of percentage of certain population group in the corresponding service area.

The age group with the largest population in the Citi Bike service area was people aged 25 to 44 years old with a 41% share of the population. Interestingly, the average of the 18 to 24 year old population was on par with the city-wide average, while the 45 to 64 year old population had a slightly larger

average. The 25 to 44 year old population had a slightly lower average than that of New York City.

Here, the average non-white population was 34%. This is comparatively lower than the city-wide average of 56.7%. This non-white population was concentrated in Manhattan's Chinatown and two Bridges neighborhoods, as well as Brooklyn's Crown Heights and Bedford neighborhoods. Neighborhoods further uptown in Manhattan had a significantly lower proportion of the non-white population.



## Findings: Accessibility

The Citi Bike service area spans from midtown Manhattan to north-west Brooklyn and the southern tip of Queens in Long Island City. This is unsurprising, and correlates to the distribution of Citi Bike locations in New York City.

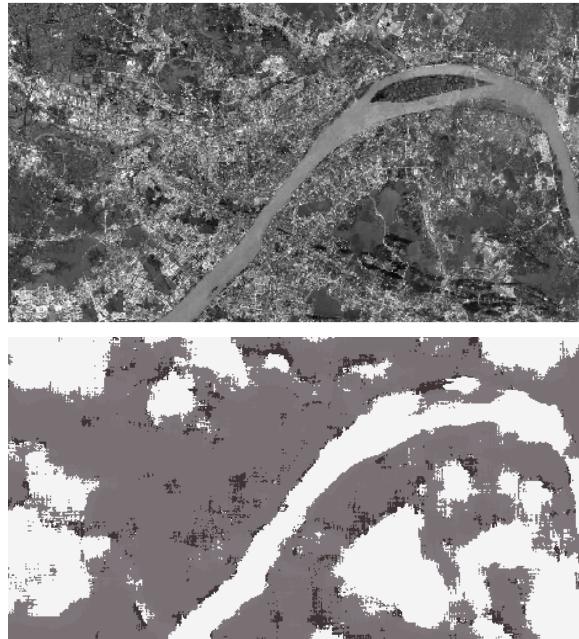
The walking distance from Citi Bike stations to subway stations varied by location. Walking distances increased towards the western and eastern parts of Manhattan and Brooklyn. This pattern was reflected in the distribution of subway stations, and a strong collocation was evident. The areas with the least walking distance from Citi Bike stations to their nearest subway stations generally had the most subway stations. The maximum walking distance was about 1.4 miles, almost a mile further than the comfortable walking distance previously decided upon. The minimum walking distance, on the other hand, was 15 feet. The average was about 0.3 miles, which was less than the comfortable walking distance. The large range of walking distances from Citi Bike stations to subway stations indicates that the level of access from Citi Bike stations is not uniform across New York City, and the fact that some Citi Bike stations had no subway stations close to them in the service area supports this notion.

When the subway was factored in, however, accessibility to the Citi Bike network increased. The service area of Citi Bike stations contained part or all of each subway line. 39% of subway stations were within the Citi Bike service area, while a much increased 89% of New York City's subway stations were accessible from those subway stations.

### THE CITI BIKE NETWORK

615 Citi Bike stations are located in Manhattan, Brooklyn and Queens. The service area of Citi Bike stations was made using a half-mile distance along pedestrian streets.





# *predicting urban sprawl*

## **Can we create a model to predict the expansion of cities?**

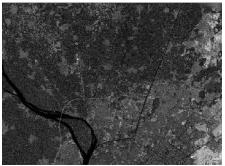
In this machine learning project, a model that could predict urban sprawl was trained by being fed historical images of cities using Python. The model learnt to recognize built and unbuilt areas and identify them with different colors, and thus was able to predict future sprawl.

[View Project.](#)

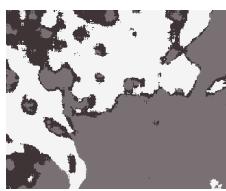
*Fall 2016. Data Mining the City - taught by Danil Nagy. In collaboration with Marwah Garib, Vrinda Sharma and Kun Qian.*

Cairo, Egypt  
*Existing*

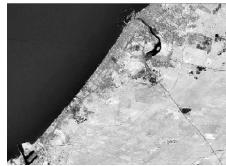
2000  
2005  
2010  
2015  
2020



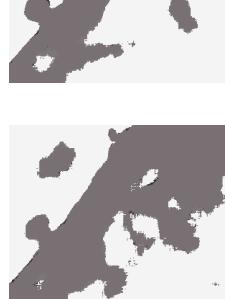
*Prediction*



Dubai, UAE  
*Existing*



*Prediction*



**Wuhan, China**  
*Existing*

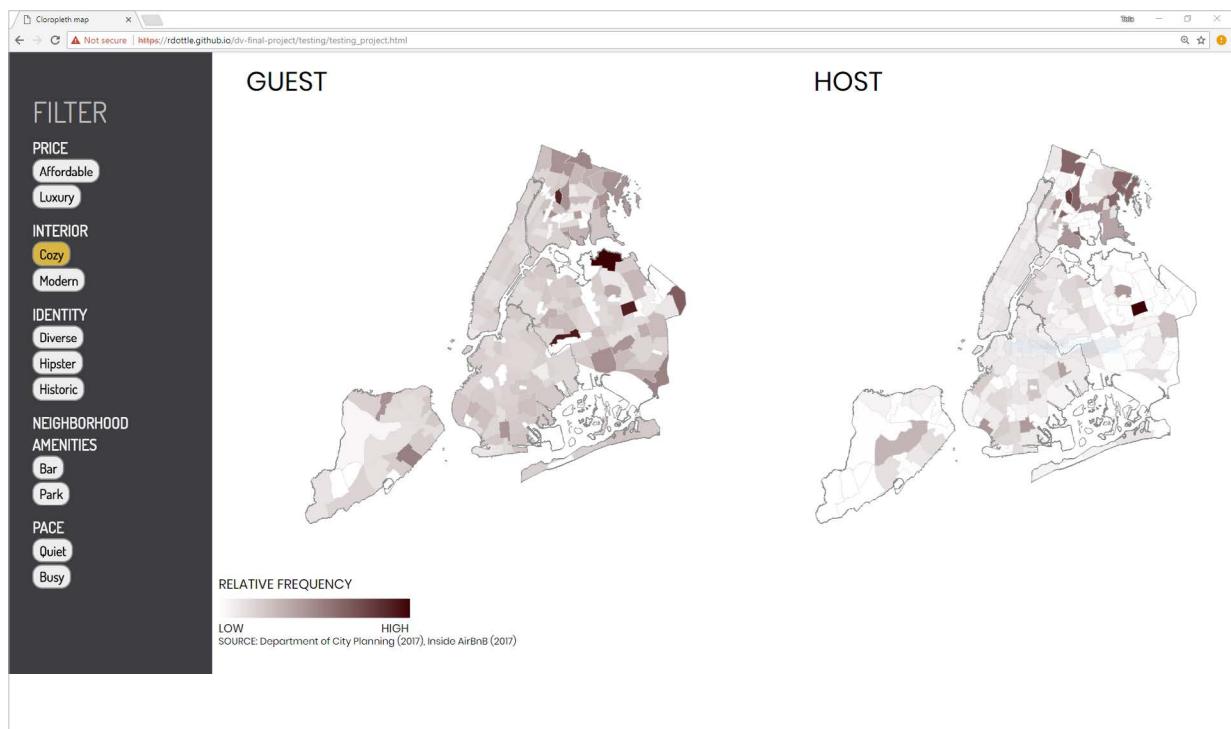


*Predicted Urbanization*

*Predicted Ruralization*

*Prediction*





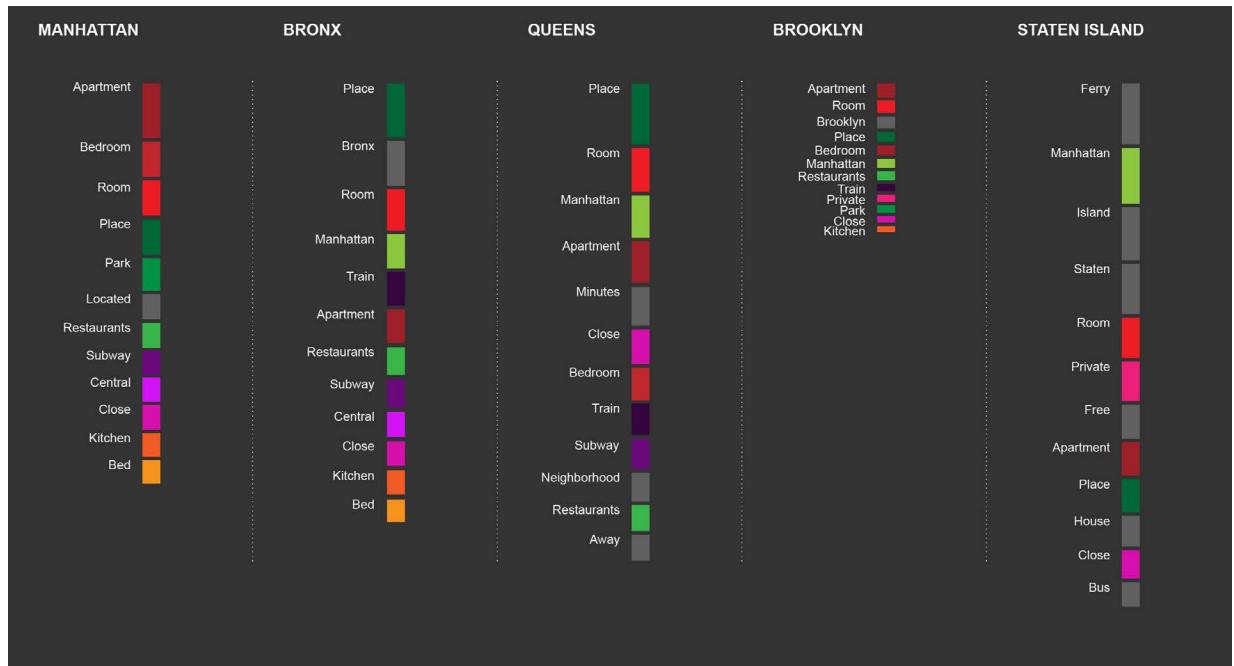
# *airbnb analysis*

## **How do Airbnb's active users, i.e. those who write listings and leave reviews, conceive of New York City's neighborhoods?**

This project visualizes Airbnb text data and looks at New York City neighborhood identity through the lens of Airbnb guest reviews and host listings.

[View Project.](#)

*Spring 2017. Data Visualization for Architecture, Urbanism and the Humanities. Taught by Juan Saldarriaga. In collaboration with Rachael Dottle, Eric Wong, Clara Dykstra, and Andreea Seusan.*



# AirBnB Analysis

## Neighborhood Identity in New York City

This project visualizes text data from Airbnb to create a narrative about neighbourhood identity and how this identity differs across neighbourhoods and between Airbnb hosts and guests. The themes being explored are:

- Price (Affordable, Luxury)
- Interior (Cozy, Modern)
- Exterior (Charming, Hipster, Historic)
- Neighborhood amenities (Bars, Parks)
- Pace (Quiet, Busy)

We are using these clusters of words to see how hosts in different neighbourhoods market themselves, whether their guests agree with their descriptions and to identify patterns that support or defy neighbourhood stereotypes.



## DATA

We are using NYC Airbnb data from [Inside Airbnb](#), "an independent, non-commercial set of tools and data that allows you to explore how Airbnb is really being used in cities around the world" ([Inside Airbnb](#)).

Disclaimers about the data from [http://insideairbnb.com/about.html](#)

- The data utilizes public information compiled from the Airbnb web-site including the availability calendar for 365 days in the future, and the reviews for each listing. Data is verified, cleansed, analyzed and aggregated.
- Some reviews may be "spam" allowed by Airbnb. Analysis suggests that spam reviews are small and do not affect the statistics.
- Neighborhood names for each listing are compiled by comparing the listing's geographic coordinates with a city's definition of neighbourhoods. Airbnb neighbourhood names are not used because of their inaccuracies.

We will use a compressed csv of host descriptions and guest reviews. A list of explanatory variables are listed below.

## PROCESS & CODING

We used text analysis of the airbnb host listing descriptions and guest reviews. Specifically, we used topic modeling to create clusters of similar words (i.e. entertainment = bars, restaurants, clubs; nature = green, space, open) and analyzed these topics in accordance with their prominence across neighbourhoods.

In order to provide the user of this website with a narrative instead of just an exploration of a data set, we analyzed the data first to find the topics that are frequently used in some areas but not in others, and the topics that differ between host and guest within a same neighbourhood. The particular topics and the words from which they are composed will depend on the results of this exploratory analysis. We were particularly interested in seeing whether host and guest perceptions of a neighbourhood differ and how.

The website aims to build a narrative and guide the user through the data story. The interactive piece will allow users to explore the neighbourhoods and topics that most interest them.

In addition, we also used R to do the text analysis of the data.

We were interested in comparing the differences in the perceived character of neighborhoods in New York, by comparing the way neighborhoods are described and presented in listings and reviews. We have developed a basic text mining program, to extract features from our listing and review datasets. Some features we are focusing on are word frequencies, correlations, which can be compared spatially and between listings and reviews. We've also applied basic topic modeling methods to develop and compare topics across the two texts regarding how neighborhoods are described, experienced and perceived.

## CODING

```
library(tidyverse)
library(wordcloud)
library(qdap)
library(topicmodels)
library(dplyr)
library(igraphviz)
library(ggplot2)
library(cluster)
library(fpc)
library(tidytext)

x <- revlist_by_nb %>% group_by(neighbourhood)
x_1 <- split(x, x$neighbourhood)

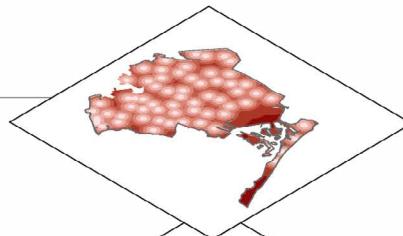
list2env(x_1, envir=.GlobalEnv)

doc_sum <- Corpus(VectorSource(listings$summary)) %>%
  tm_map(removePunctuation) %>% tm_map(removeNumbers) %>% tm_map(tolower) %>%
  tm_map(removeWords, stopwords("english")) %>% tm_mapPlainTextDocument

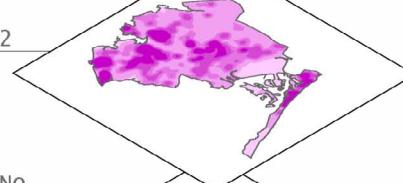
listtest <- lapply(x_1, dropLevels.data.frame)
wordAll <- lapply(listtest, "[", "summary")
corpus <- Corpus(VectorSource(wordAll), readerControl = list(language = "en"))
```

## CRITERIA

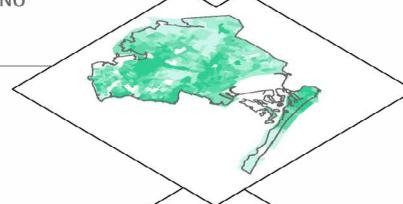
Library Distance \* 3



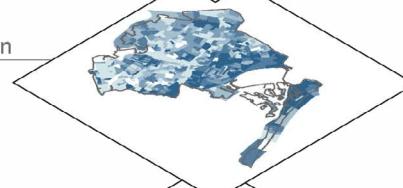
Residential Density \* 2



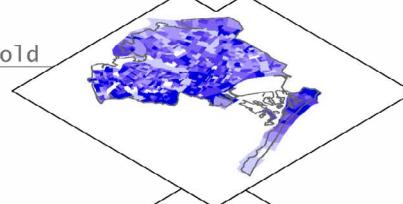
Adult population with No High School Diploma or Equivalent



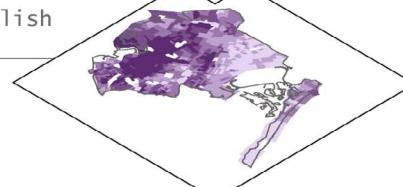
Foreign born Population



People under 18 years old



Population for who English is a Second Language



Vacant Lots

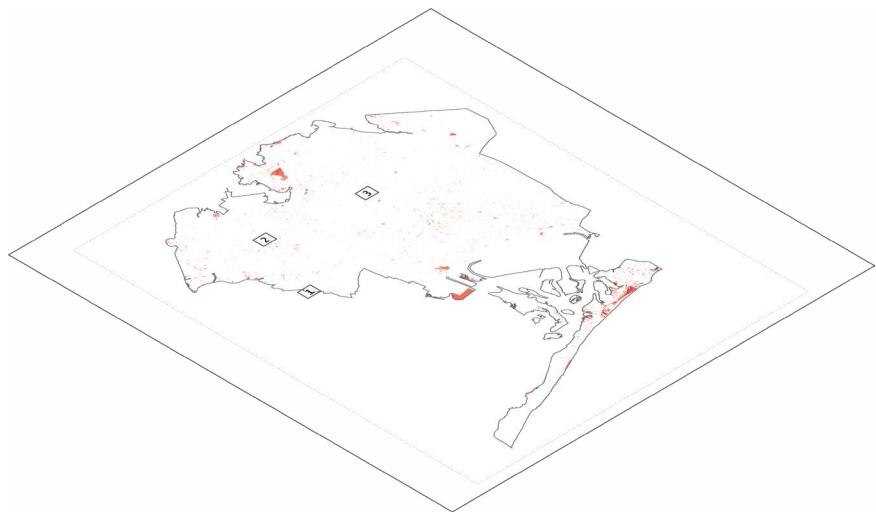


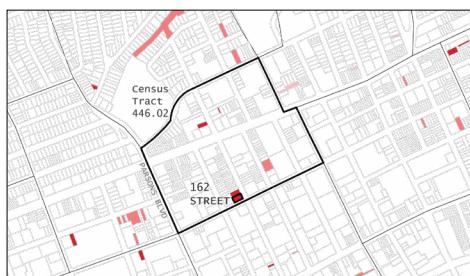
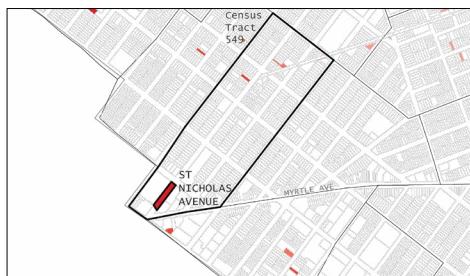
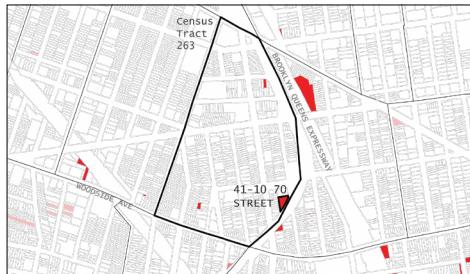
# *siting libraries*

## **Can the Queens Library System decide where to locate the next library based on demographic and locational factors?**

A multi-criteria decision analysis was done to find possible locations for new libraries in the Queens Public Library system using several weighted factors. These included distance from other libraries, English proficiency, age, origin and level of education. The factors were combined with the vacant lots in Queens to generate possible lots for new library sites. From this, three possible locations which were highly suitable for a Queens Public Library were generated.

*Spring 2017. Introduction to Geographic Information Systems.  
Taught by Leah Meisterlin.*





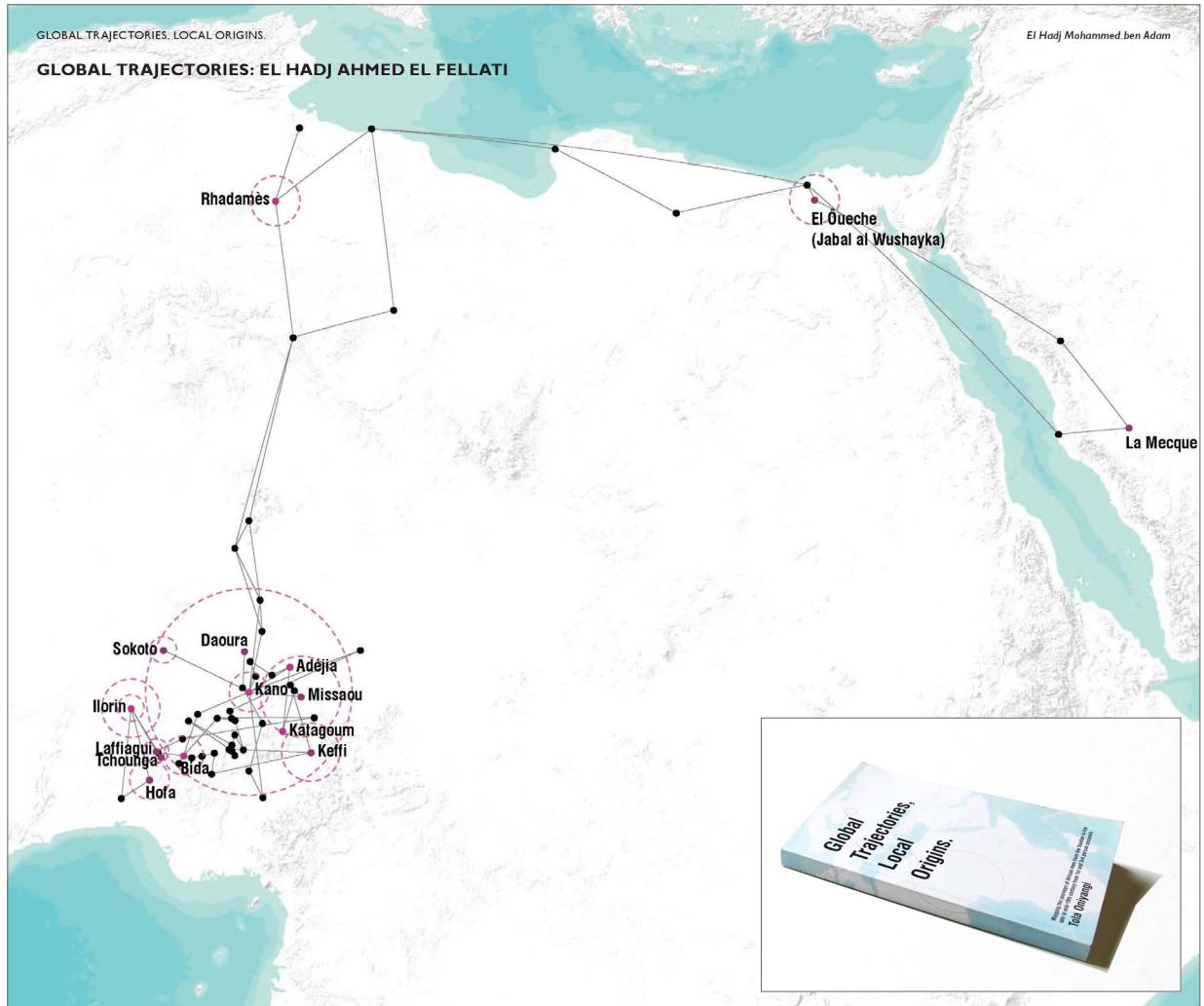


**(data) visualization**

GLOBAL TRAJECTORIES, LOCAL ORIGINS.

El Hadj Mohammed ben Adam

### GLOBAL TRAJECTORIES: EL HADJ AHMED EL FELLATI



# *global trajectories: local origins*

## **How can we study the relationship between precolonial Africa and the world through the people themselves?**

This mapping and aggregation project explores how (West) Africans interacted with the world from an African perspective using data gleaned from autobiographical and biographical accounts. Numbering 154 pages, the book presents the journeys undertaken by four men from what is now northern Nigeria on three scales. It presents an overall view of travel, zooms into specific journeys and trajectories, and finally, zooms into principal points along this journey. The final layer incorporates the personal experiences of the subjects by including direct quotes describing their journeys and destinations.

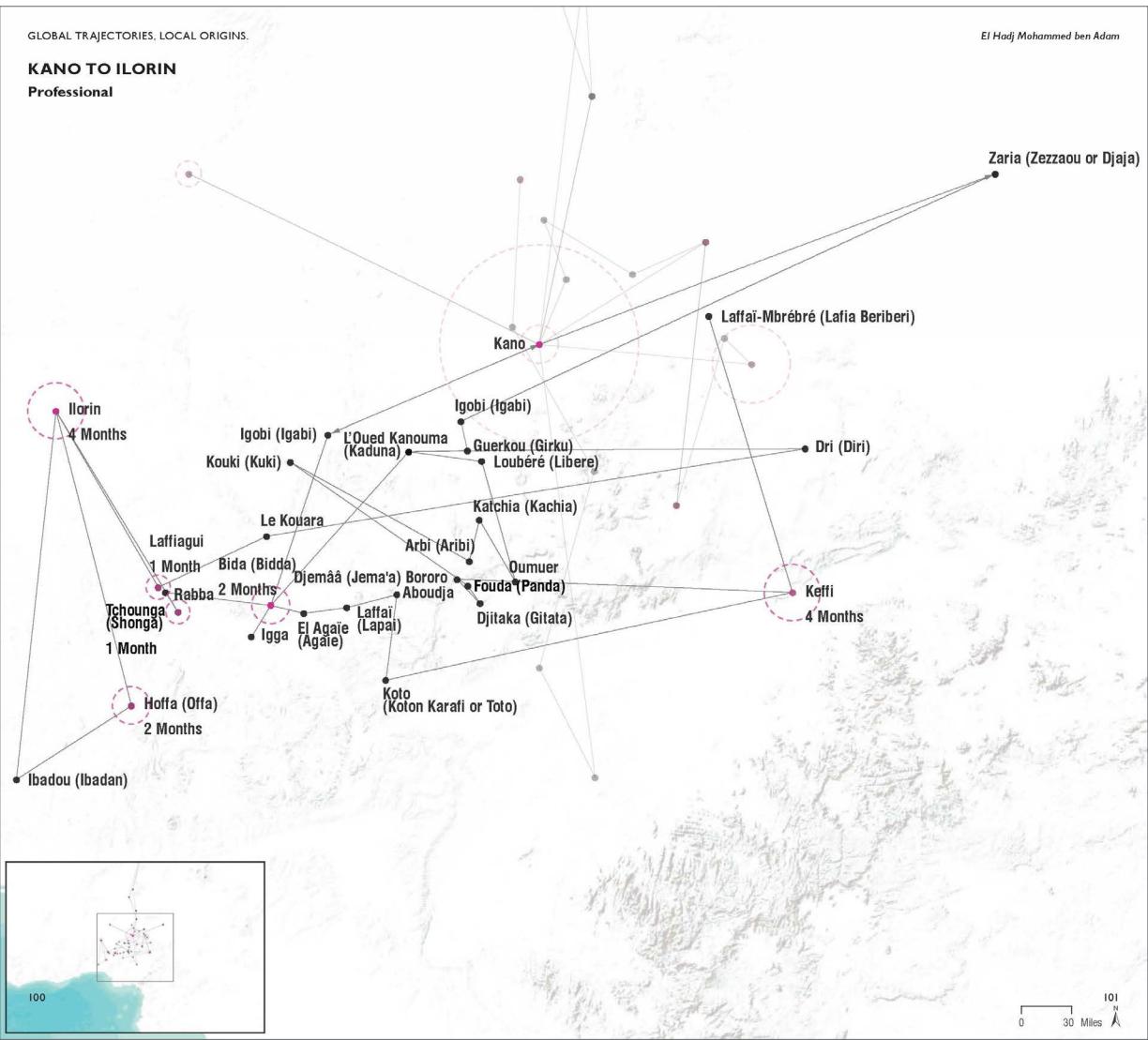
*Fall 2015. Supervised by Ralph Ghoche.*

GLOBAL TRAJECTORIES, LOCAL ORIGINS.

El Hadj Mohammed ben Adam

## KANO TO ILORIN

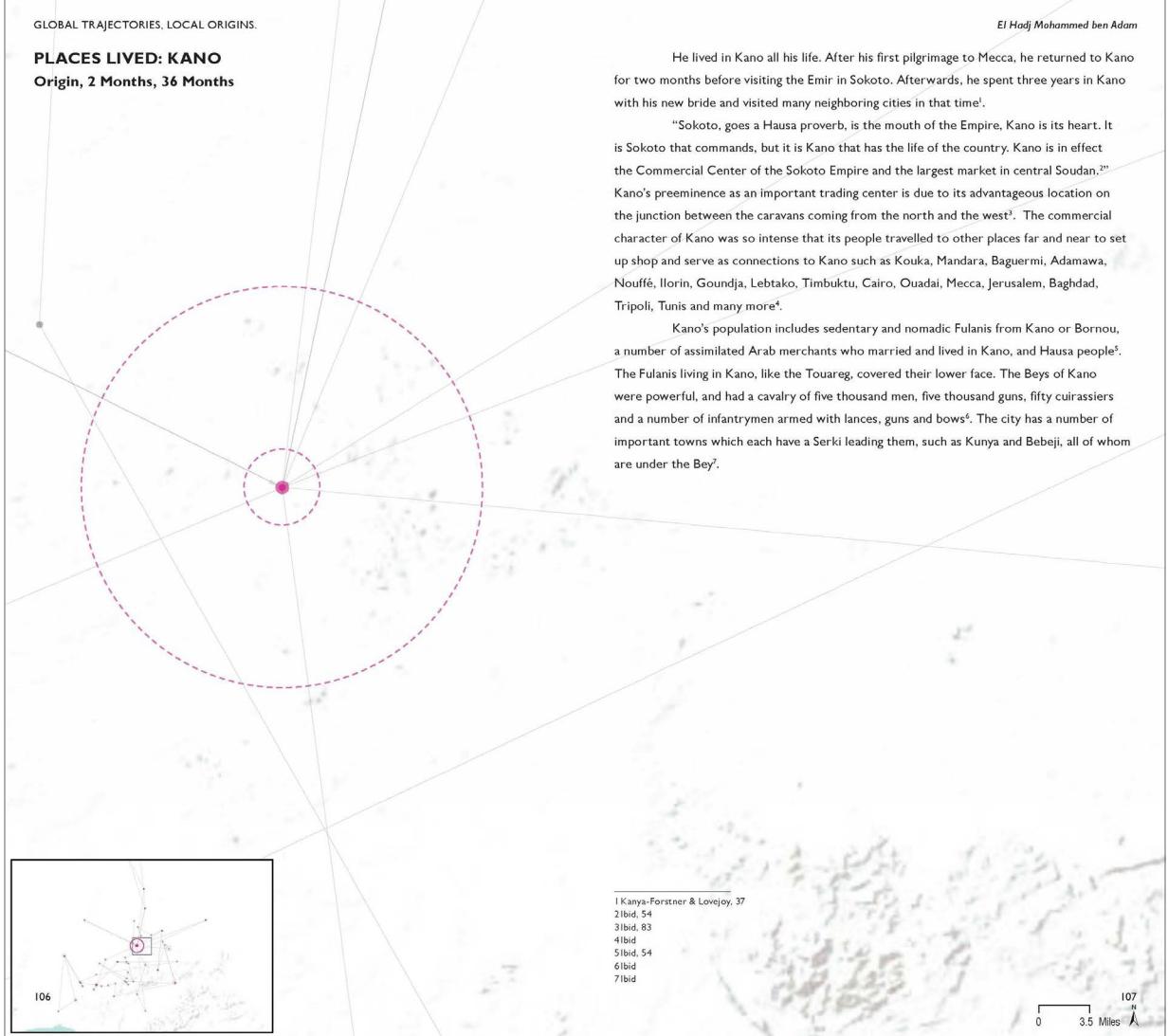
Professional



GLOBAL TRAJECTORIES, LOCAL ORIGINS.

### PLACES LIVED: KANO

Origin, 2 Months, 36 Months



*El Hadj Mohammed ben Adam*

He lived in Kano all his life. After his first pilgrimage to Mecca, he returned to Kano for two months before visiting the Emir in Sokoto. Afterwards, he spent three years in Kano with his new bride and visited many neighboring cities in that time<sup>1</sup>.

"Sokoto, goes a Hausa proverb, is the mouth of the Empire, Kano is its heart. It is Sokoto that commands, but it is Kano that has the life of the country. Kano is in effect the Commercial Center of the Sokoto Empire and the largest market in central Soudan."<sup>2</sup> Kano's preeminence as an important trading center is due to its advantageous location on the junction between the caravans coming from the north and the west<sup>3</sup>. The commercial character of Kano was so intense that its people travelled to other places far and near to set up shop and serve as connections to Kano such as Kouka, Mandara, Baguermi, Adamawa, Noufè, Ilorin, Goundja, Lebtako, Timbuktu, Cairo, Ouadai, Mecca, Jerusalem, Baghdad, Tripoli, Tunis and many more<sup>4</sup>.

Kano's population includes sedentary and nomadic Fulanis from Kano or Bornou, a number of assimilated Arab merchants who married and lived in Kano, and Hausa people<sup>5</sup>. The Fulanis living in Kano, like the Touareg, covered their lower face. The Beys of Kano were powerful, and had a cavalry of five thousand men, five thousand guns, fifty cuirassiers and a number of infantrymen armed with lances, guns and bows<sup>6</sup>. The city has a number of important towns which each have a Serki leading them, such as Kunya and Bebeji, all of whom are under the Bey<sup>7</sup>.

<sup>1</sup> Kanya-Forstner & Lovejoy, 37

<sup>2</sup>ibid, 54

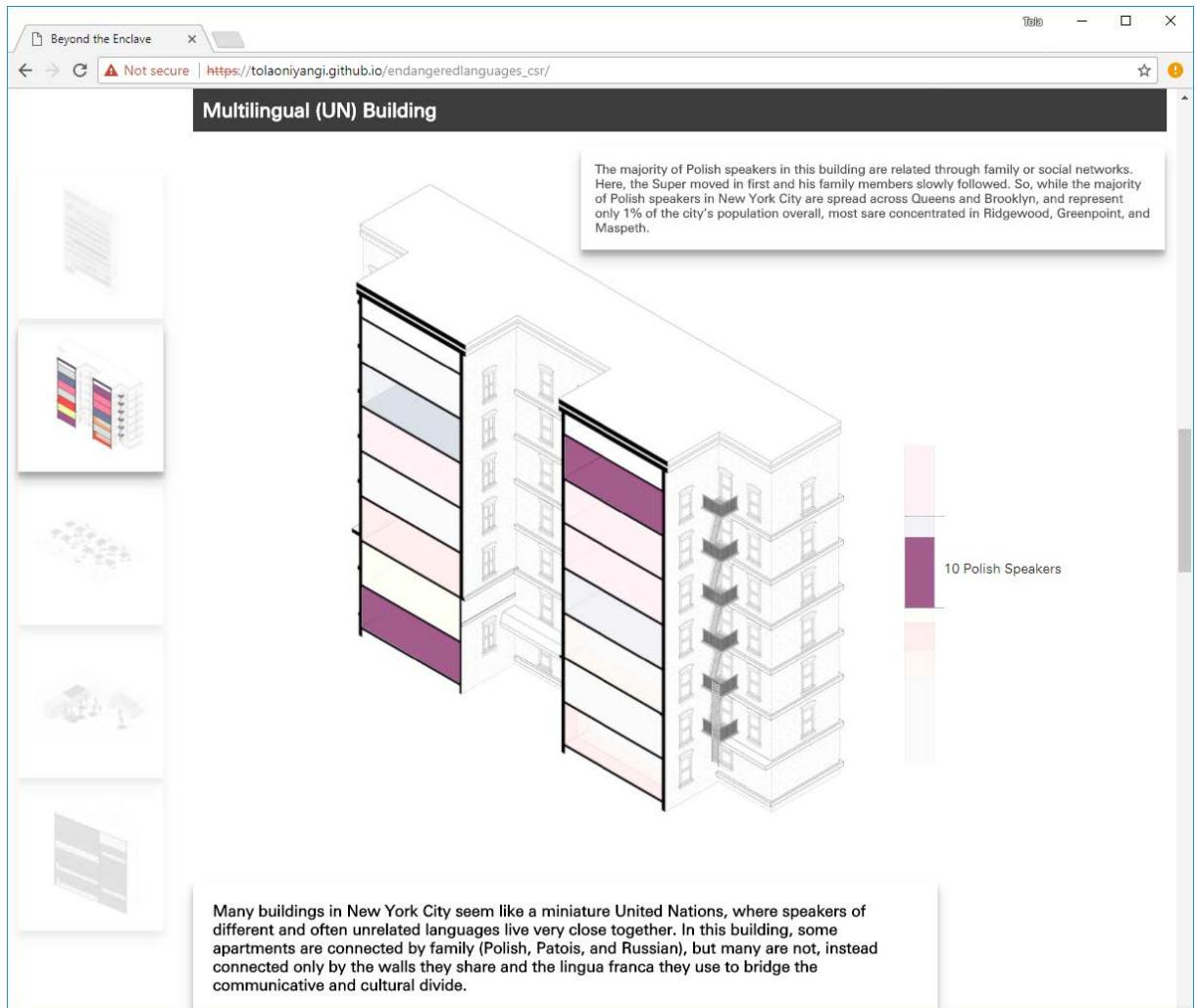
<sup>3</sup>ibid, 83

<sup>4</sup>ibid

<sup>5</sup>ibid, 54

<sup>6</sup>ibid

<sup>7</sup>ibid



# *beyond the enclave: language diversity in Queens*

**Can an intimate look into the performance of language in everyday scenarios subvert the ubiquity of ethnic enclaves in public imagination?**

By taking an in-depth look at the ways that people perform their languages both in public and in private, this project presents a taxonomy of language arrangements in New York City. Drawing on ethnographic field work exploring language practices in apartment complexes, street festivals, and food trucks as well as quantitative datasets, the project presents intimate look at the textured landscape of language in an urban context.

[Visit project.](#)

*Summer 2017. Supervised by Michelle McSweeney, Dare Brawley and Laura Kurgan. In collaboration with Carsten Rodin for the Center for Spatial Research.*

# Should I go here for college?

An exploration of the characteristics of a high college density area on Flatbush Ave



# *mapping the “vibe”: the Flatbush story*

## **How can we measure a neighborhood's “vibe” and communicate it to a certain demographic?**

This video mapping project is tailored to prospective college students through a fun graphic sensibility, light-hearted questions and a peppy musical score. We mapped how suitable the study area was for an ideal college neighborhood using a checklist of important qualities prospective students look for in their future neighborhoods. We used field work and information from various city and national agencies.

[View Project.](#)

*Fall 2015. Datascapes and the Informal City. Taught by Leah Meisterlin. In collaboration with Joud Al Shdaifat and Kamay Jin.*

But where can I grab a cheap bite?



WINING & DINING OPTIONS PRICED UNDER \$10  
● Cafe ● Bar ● Restaurant ● Deli ● Food Truck

**64** CHEAP OPTIONS

What about wining & dining options?



TYPES OF WINING & DINING ESTABLISHMENTS IN THE NEIGHBORHOOD  
● Cafe ● Bar ● Restaurant ● Deli ● Food Truck

**145** WINING & DINING ESTABLISHMENTS

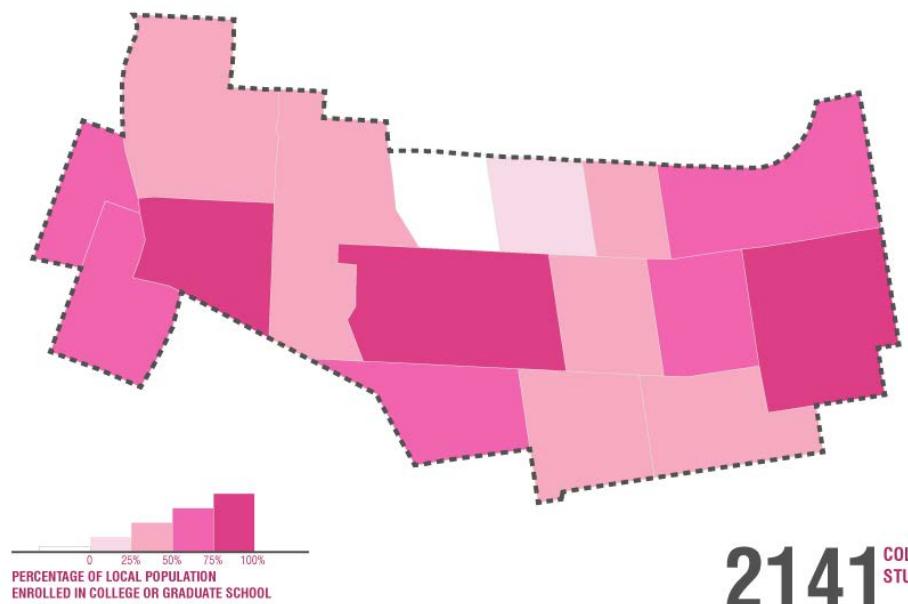
And what if I'm a **night owl**?



WINING & DINING ESTABLISHMENTS OPEN BETWEEN MIDNIGHT AND 5 AM  
● Cafe ● Bar ● Restaurant ● Deli ● Food Truck

**67** ARE OPEN LATE AT NIGHT

## Who will I live with?



**2141** COLLEGE  
STUDENTS



### MUST HAVES

- CONNECTIVITY**  
TRANSPORT  
WI-FI HOTSPOTS
- ENERGETIC NEIGHBORHOOD**  
AGE  
DIVERSITY
- WINNING AND DINING**  
OPTIONS  
PRICE  
TIMING  
DELIVERY

An area with 7 colleges

