

[PORTFOLIO]

**YONGZHUO XU**

# 01

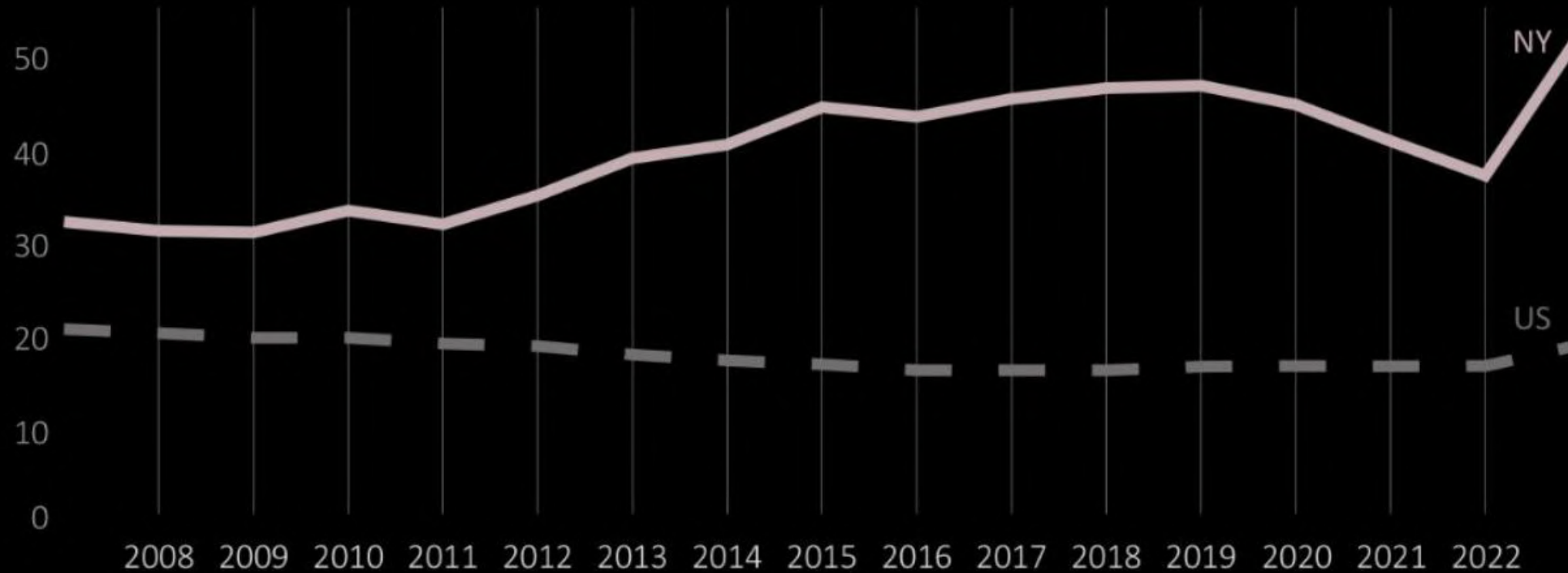
Independence in Assemblies

**TIDAL COMMUNITY**

## Rates of Homelessness State Compared with United States



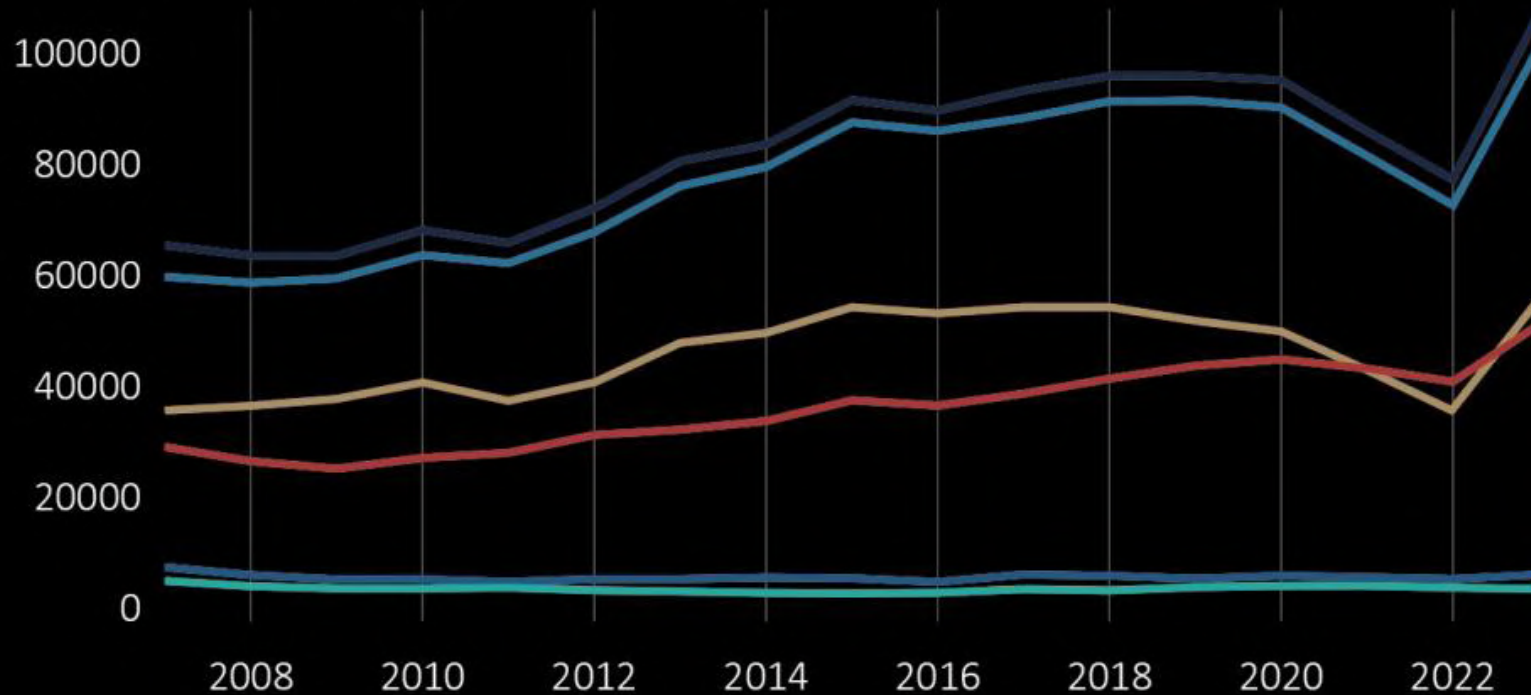
<https://endhomelessness.org/>



**Number of People  
Currently Sleeping In NYC Shelters Each Night**

**120513**

***State Homelessness by Population***



**Including  
41615  
Children  
in Jan. 2025**

Total	↑ 65%
Unsheltered	↓ 6%
Sheltered	↑ 74%
Individual	↑ 76%
Family	↑ 55%
Chronic	↓ 12%



# Shelter Bed Capacity and Utilization

## Families

### CAPACITY

**107%**

of People that  
Have a Bed  
Available to  
Them

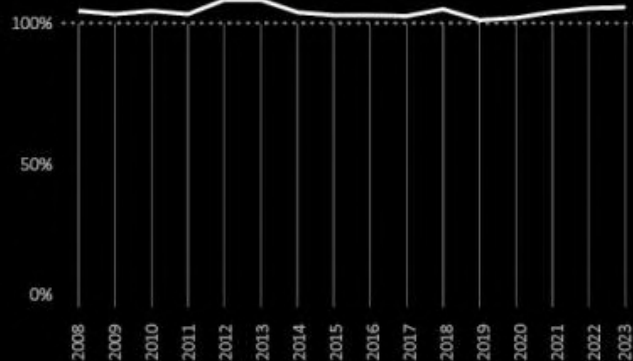
### UTILIZATION

**4956**

Beds  
Empty

**32**

Slept Outside  
(Unsheltered)



## Individuals

### CAPACITY

**94%**

of People that  
Have a Bed  
Available to  
Them

### UTILIZATION

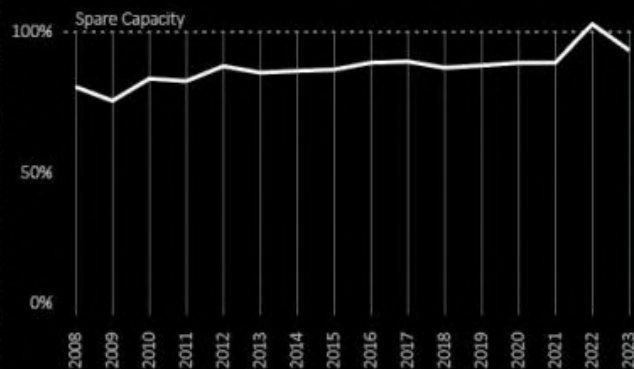
**3660**

Beds  
Empty

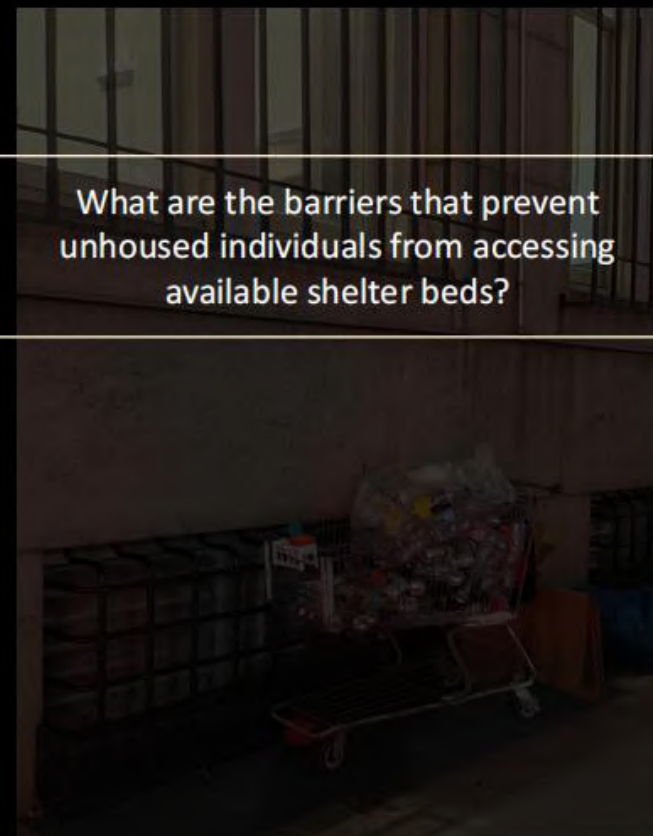
**4975**

Slept Outside  
(Unsheltered)

### Spare Capacity



What are the barriers that prevent unhoused individuals from accessing available shelter beds?



## Why Available Beds Go Unused ?



**Lack of  
Safety and Privacy**



**Restrictive Entry  
Rules**



**Systemic Mistrust  
and Trauma**



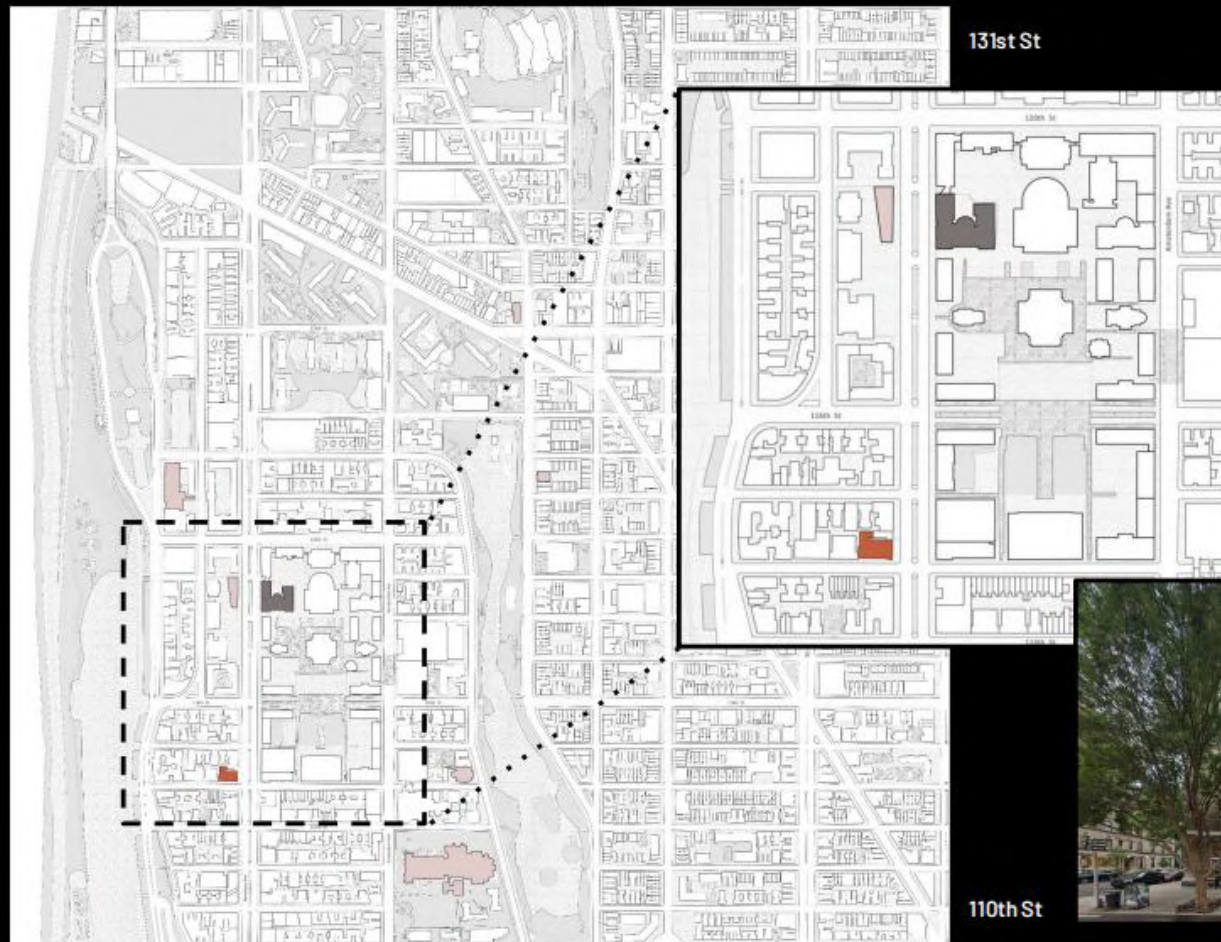
**Inconvenient  
Location**



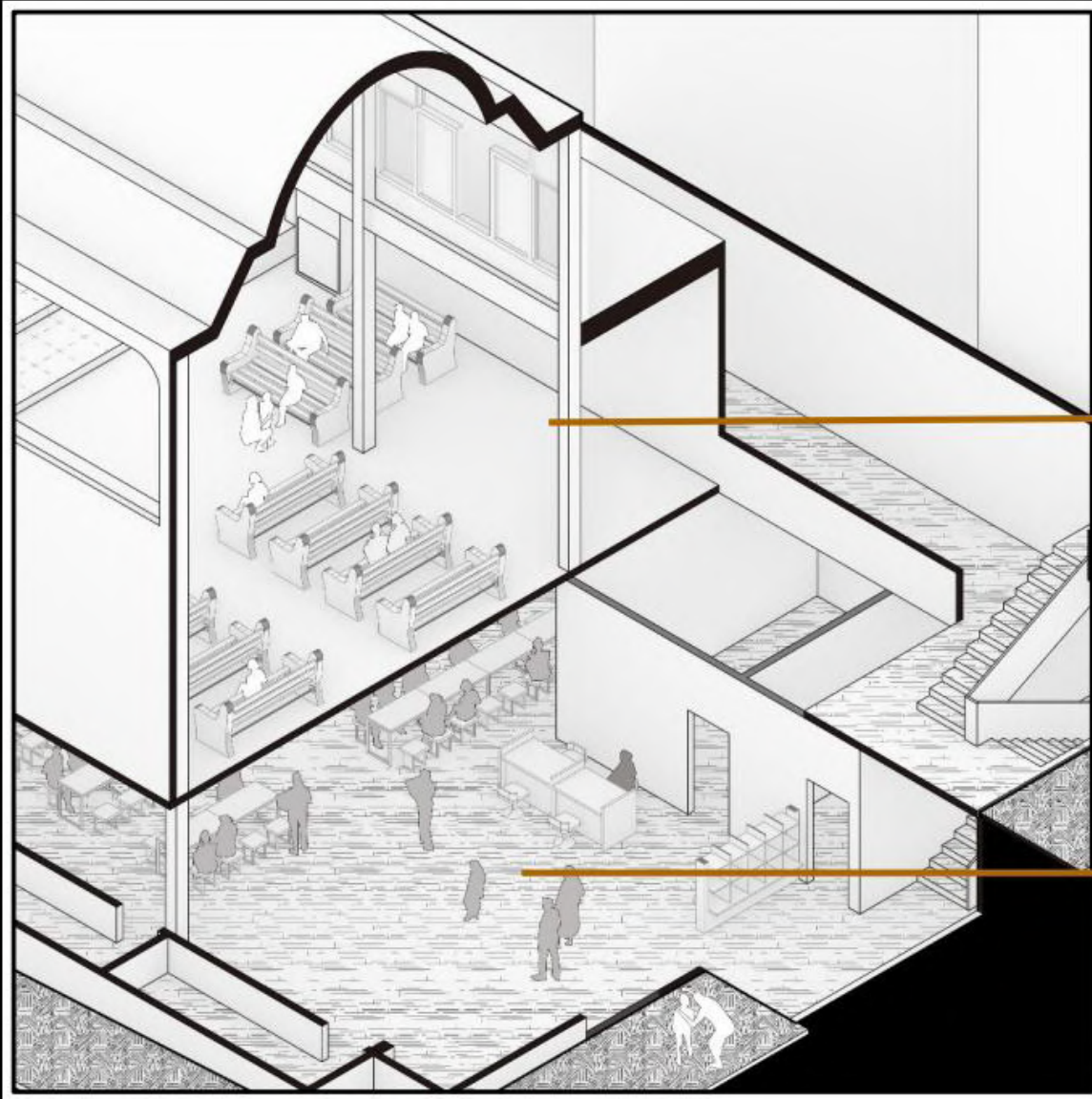
**Mental Health and  
Addiction Barriers**

Aspects that might be improved through spatial interventions





## **Broadway Community:** **A Well-Established and Effective Shelter Model**

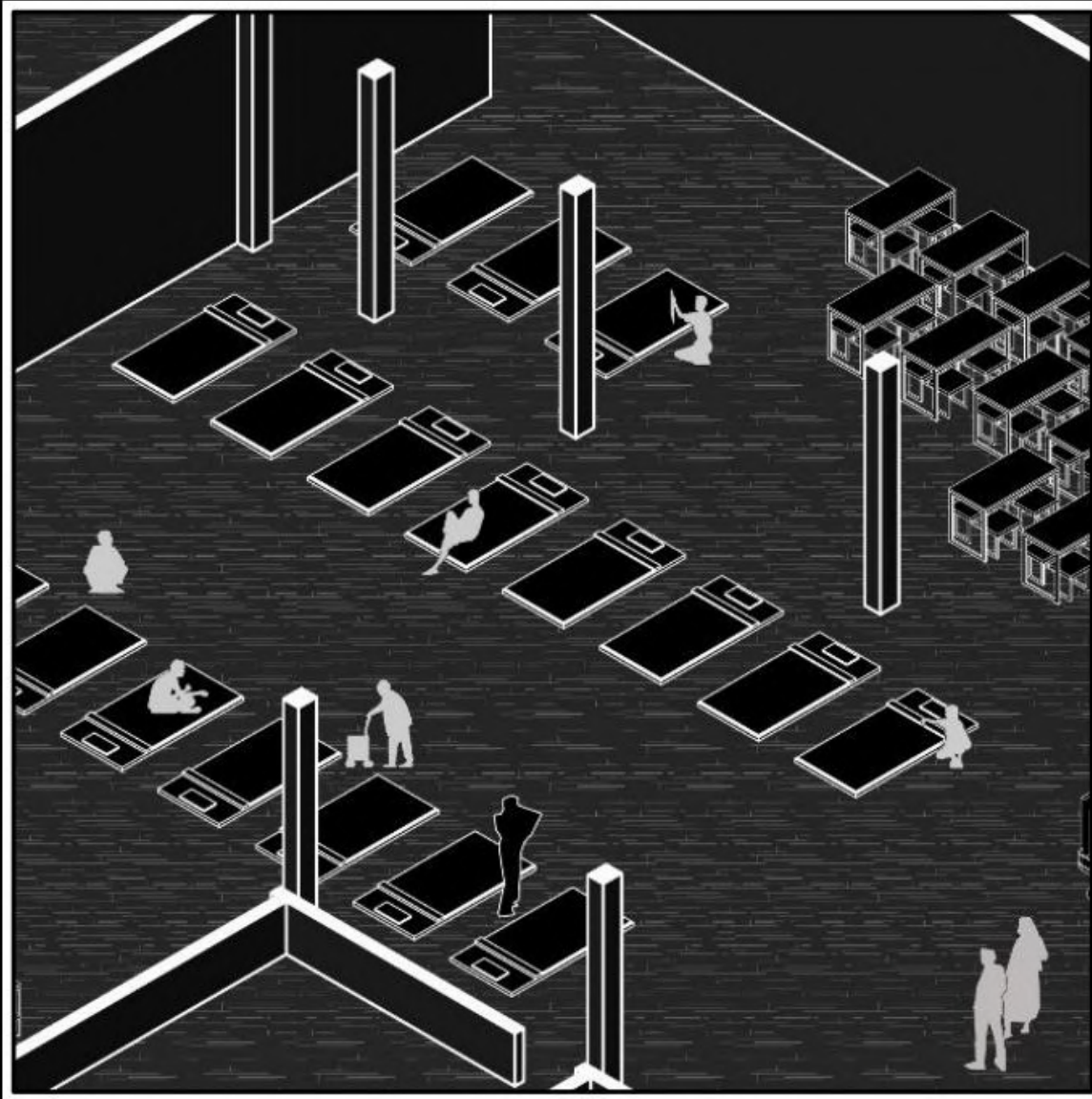


## LOCATION

In the Basement of Church

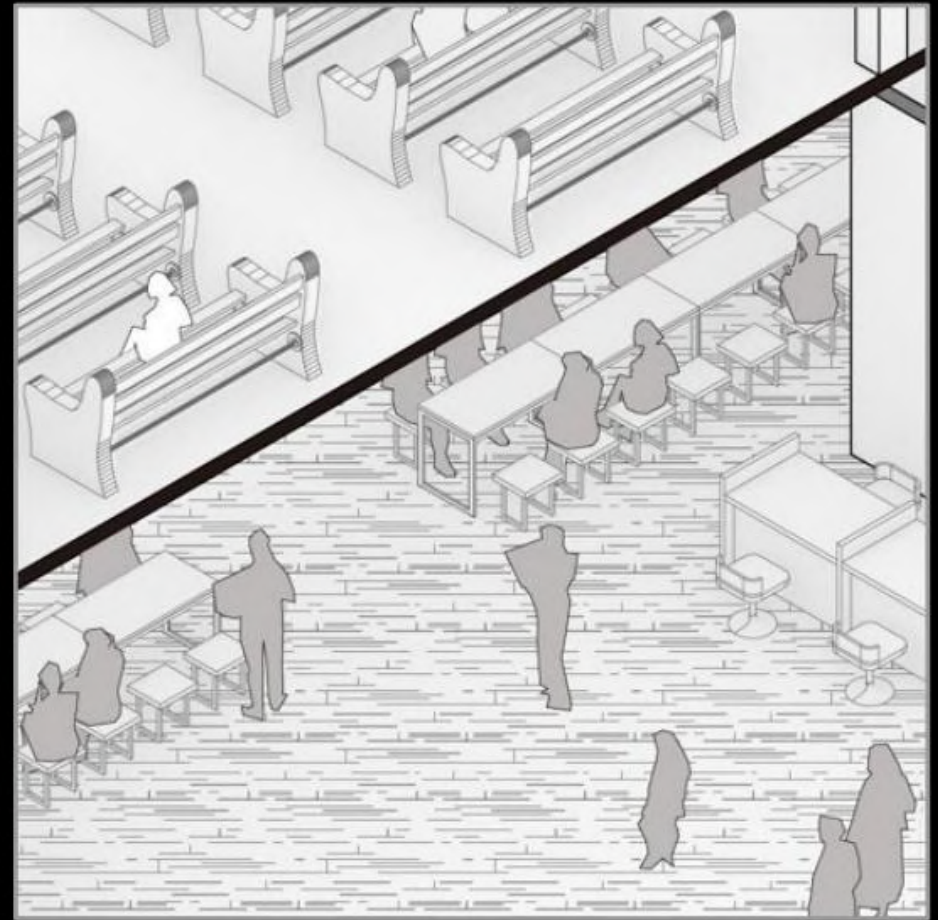






## ARRANGEMENT

Tables are set up in the lobby during meal times and removed at night to be replaced with beds

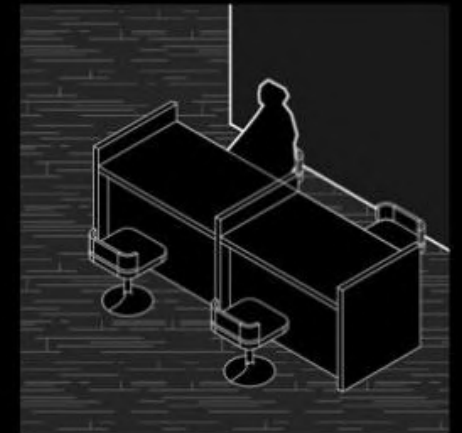




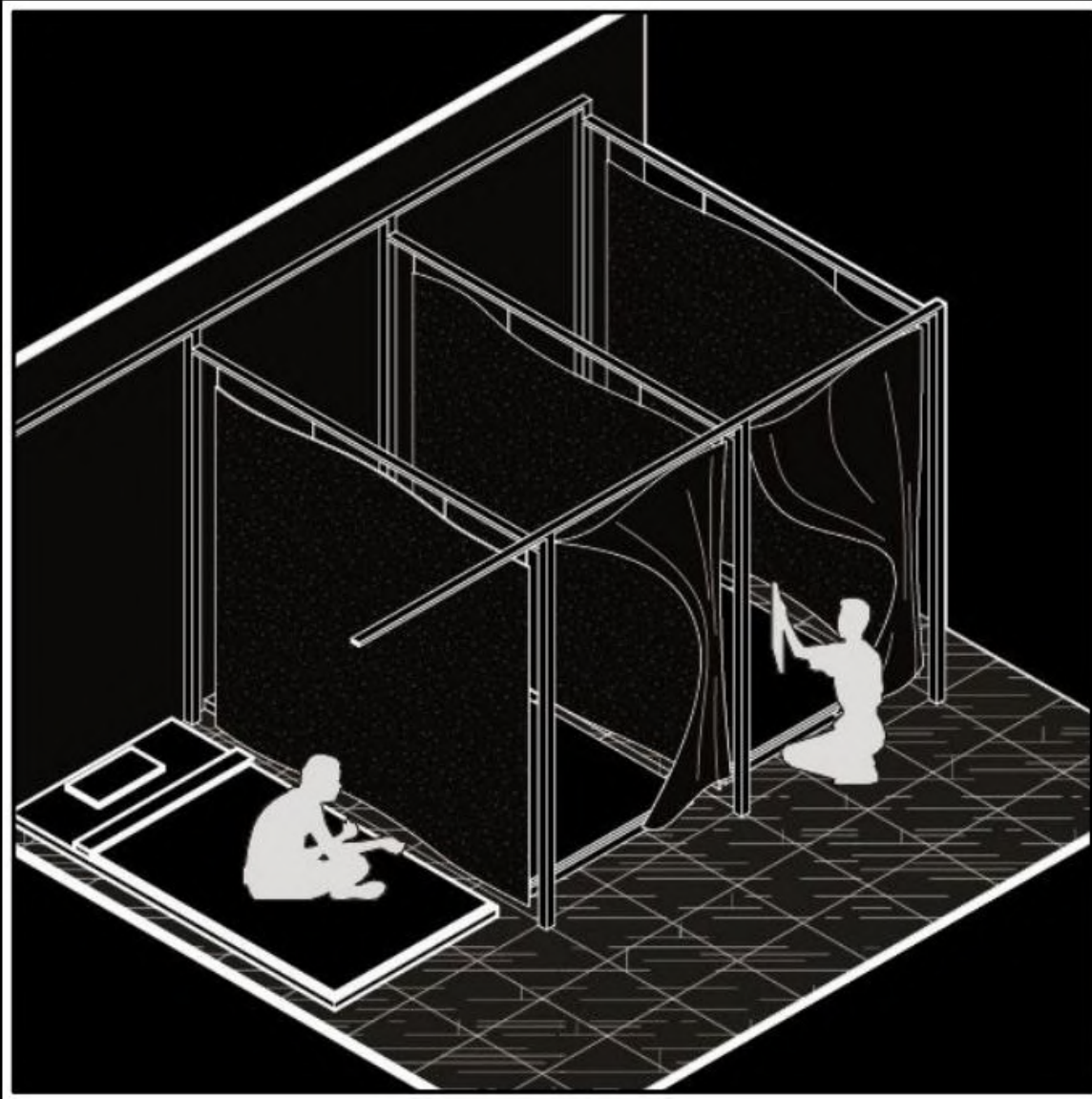
## STAFF & GUARD

Daytime jobs include counseling, meal preparation, cleaning, and teaching survival skills, etc.  
Most of these are volunteer positions.

There are two guards in the shelter at night.  
They are paid and will stay awake the whole night.







## **BARRIER**

The curtain is controlled by two people separately, so the curtain can only provide a certain degree of privacy but not a sense of security





Privacy & Control

Limited Reintegration

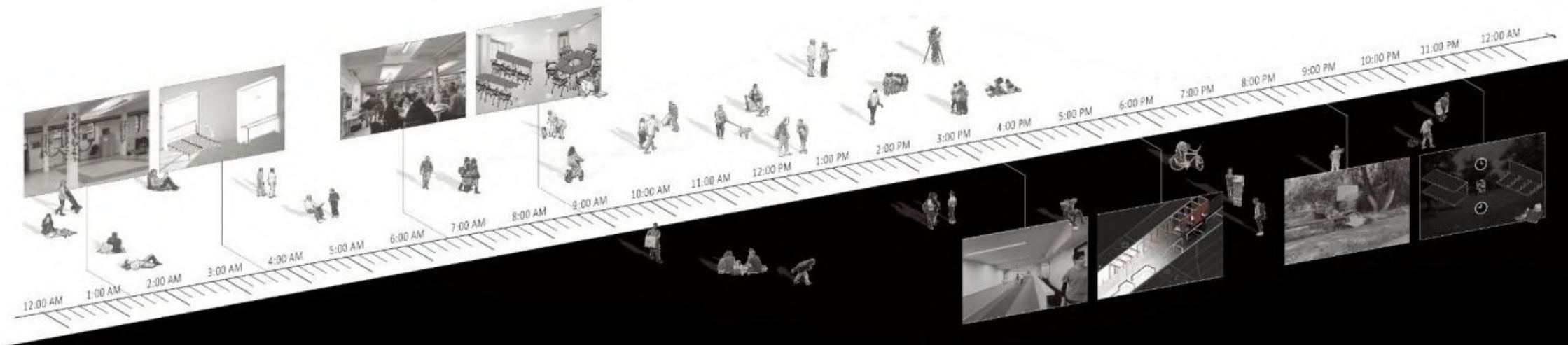
Environmental Quality

Temporal Disruption

**LIMITATION**

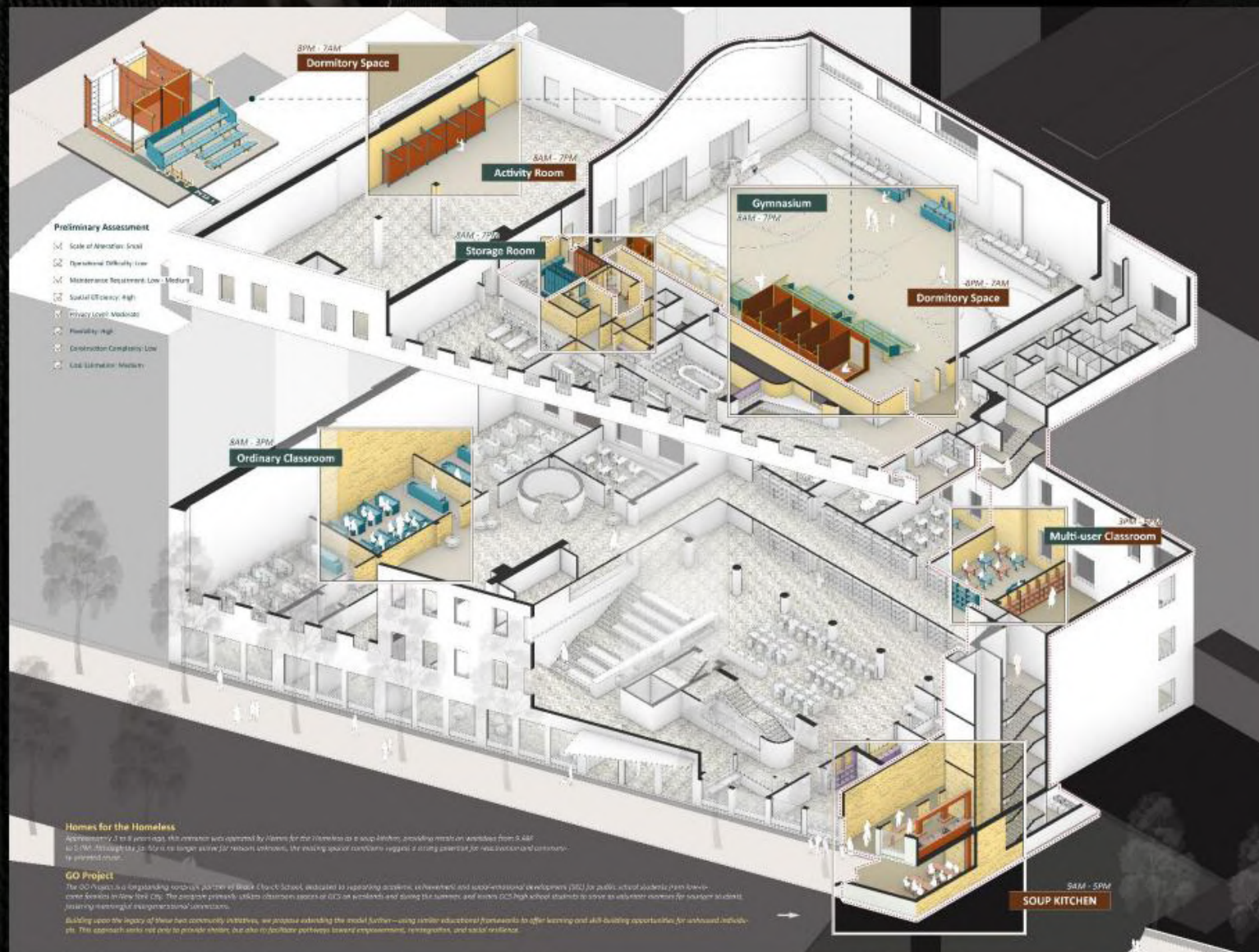


# TIMELINE

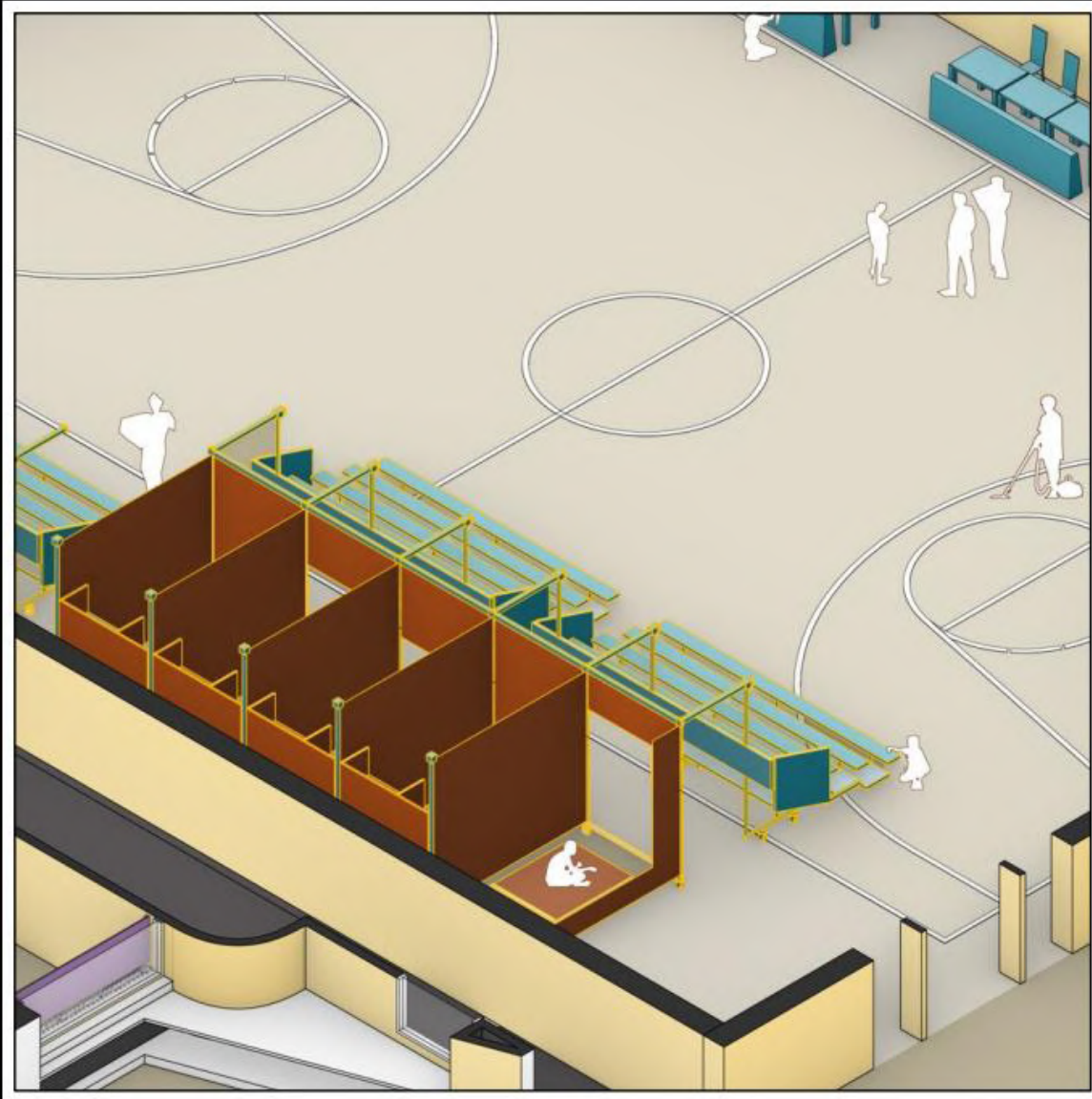










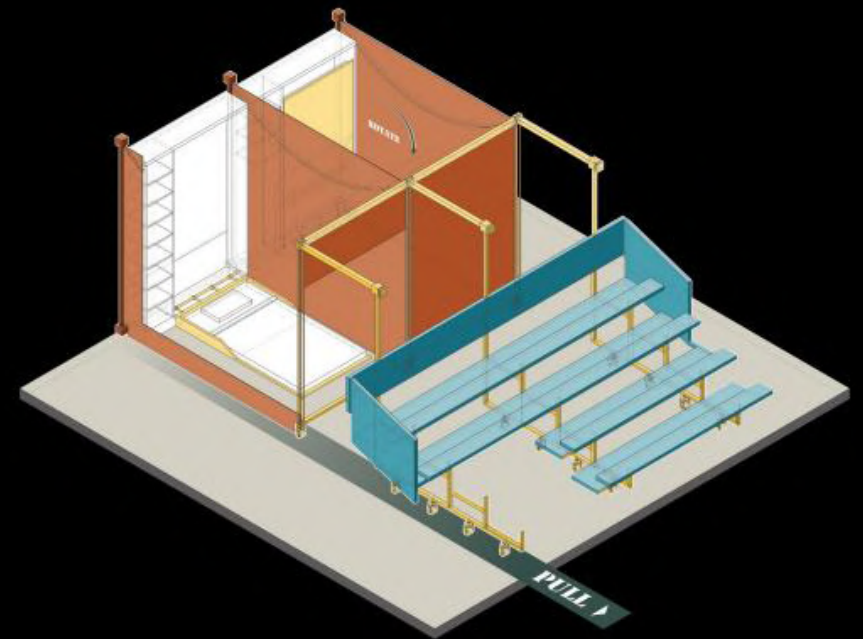


## GYMNASIUM / DORMITORY

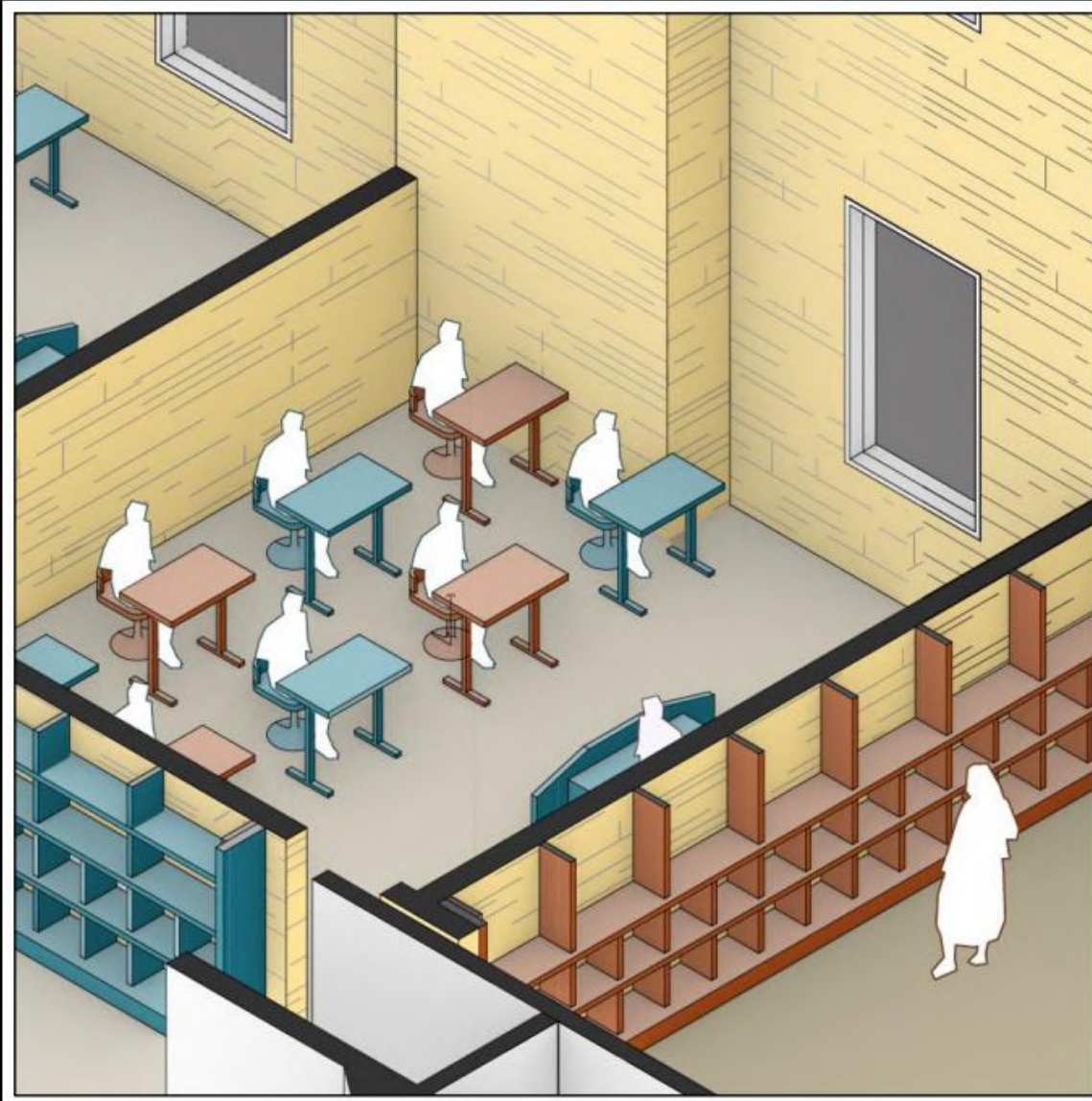
8:00AM

8:00PM

8:00AM







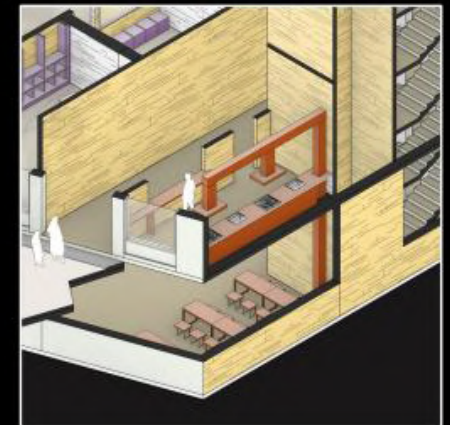
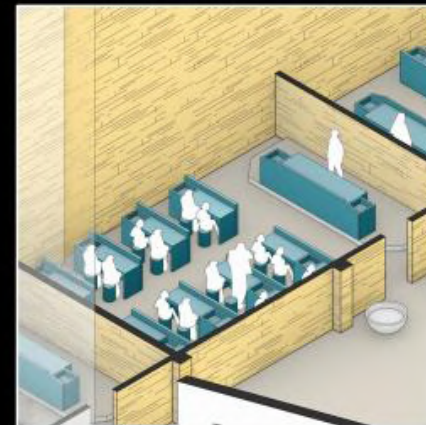
## MULTI-USER CLASSROOM

3:00PM

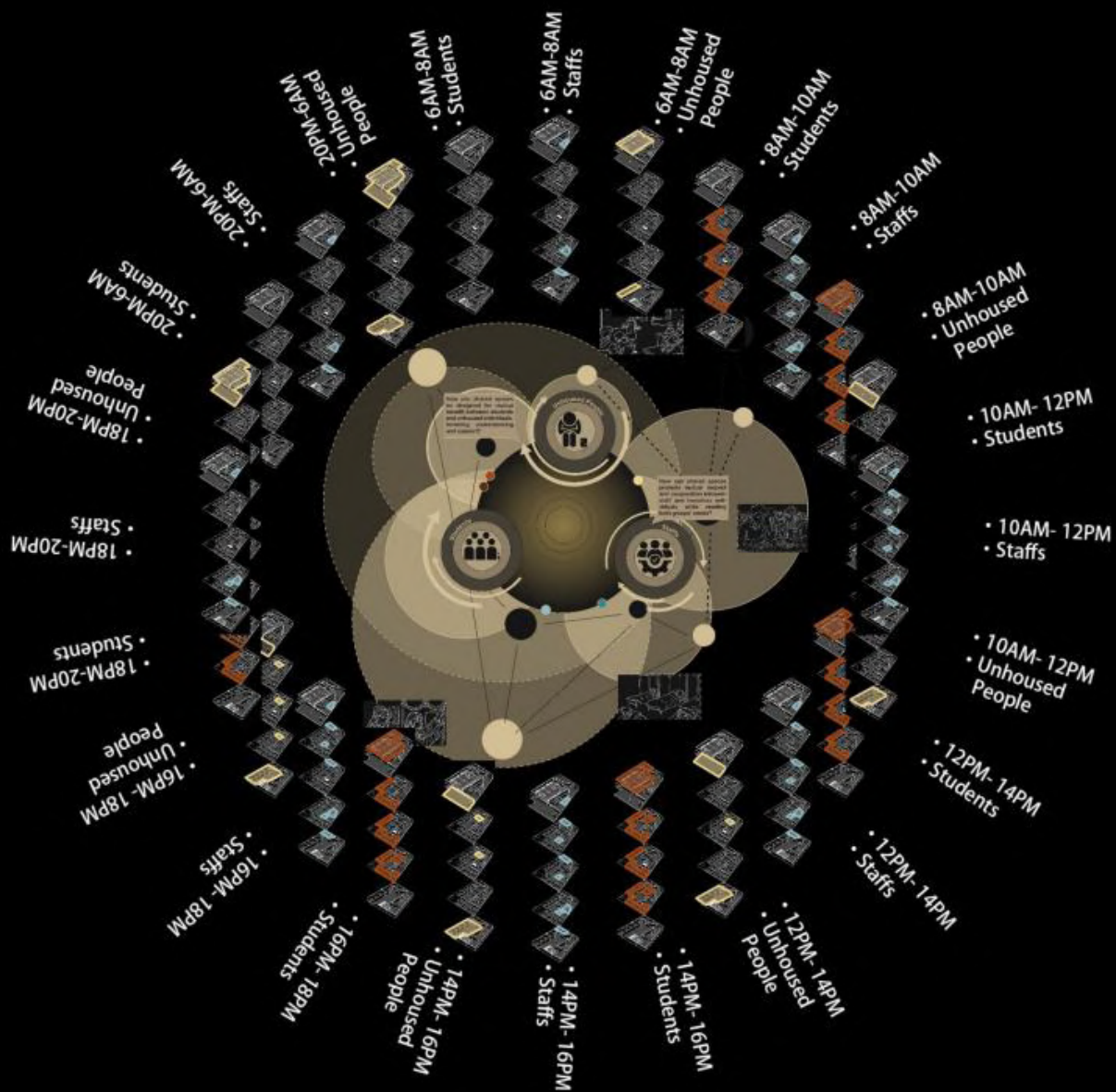
5:00PM

7:00PM

In our design, classrooms are used exclusively by students and faculty during regular school hours to ensure a focused learning environment. However, between 3:30 and 6:00 PM, selected classrooms become hybrid spaces where unhoused individuals and students can participate in shared programs.



Similarly, unhoused individuals also have their own dedicated spaces—such as soup kitchens and dining areas—where they can gather without intrusion.















02

**SEEING WITH ALGORITHM**





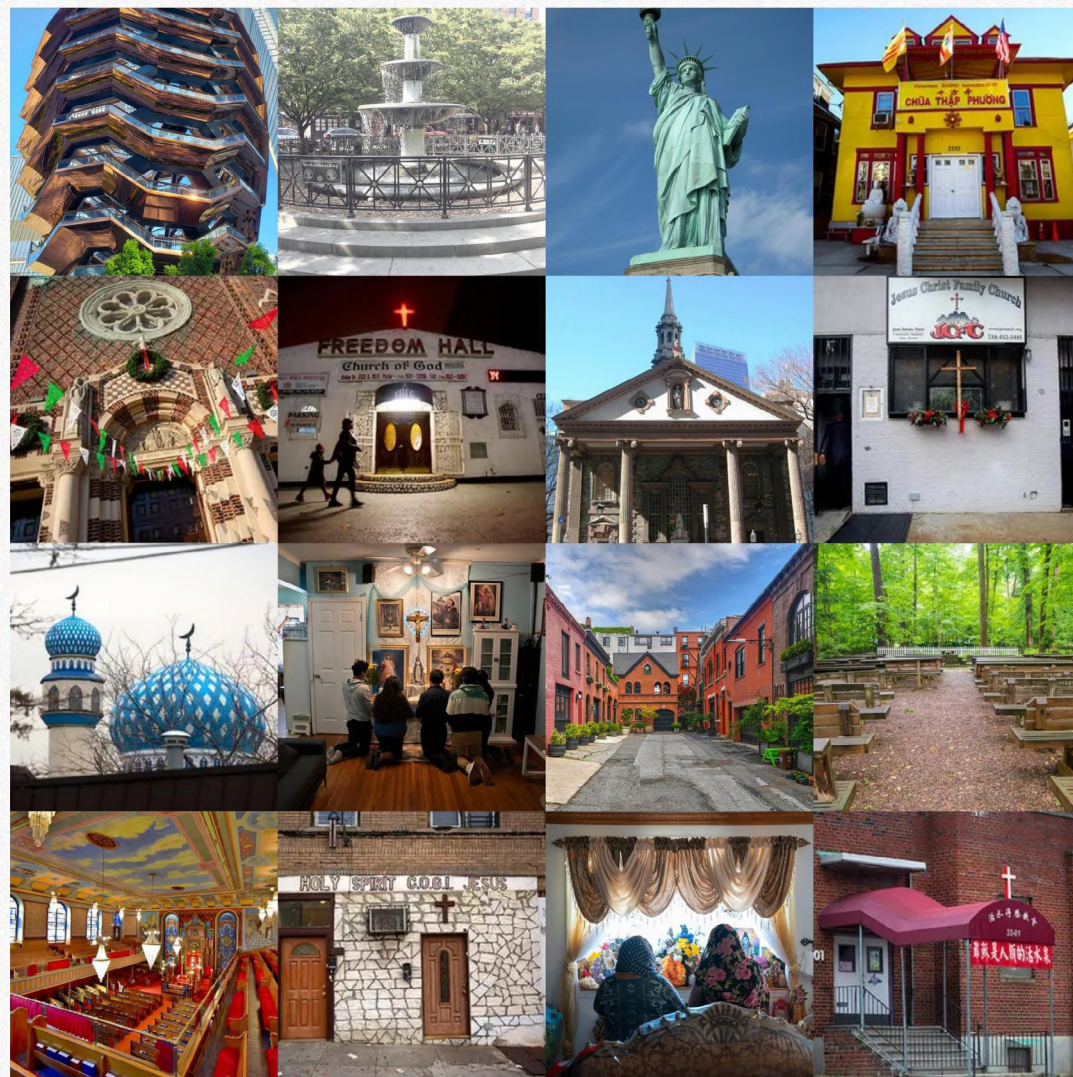


# Critical Image Dataset





# Critical Image Dataset



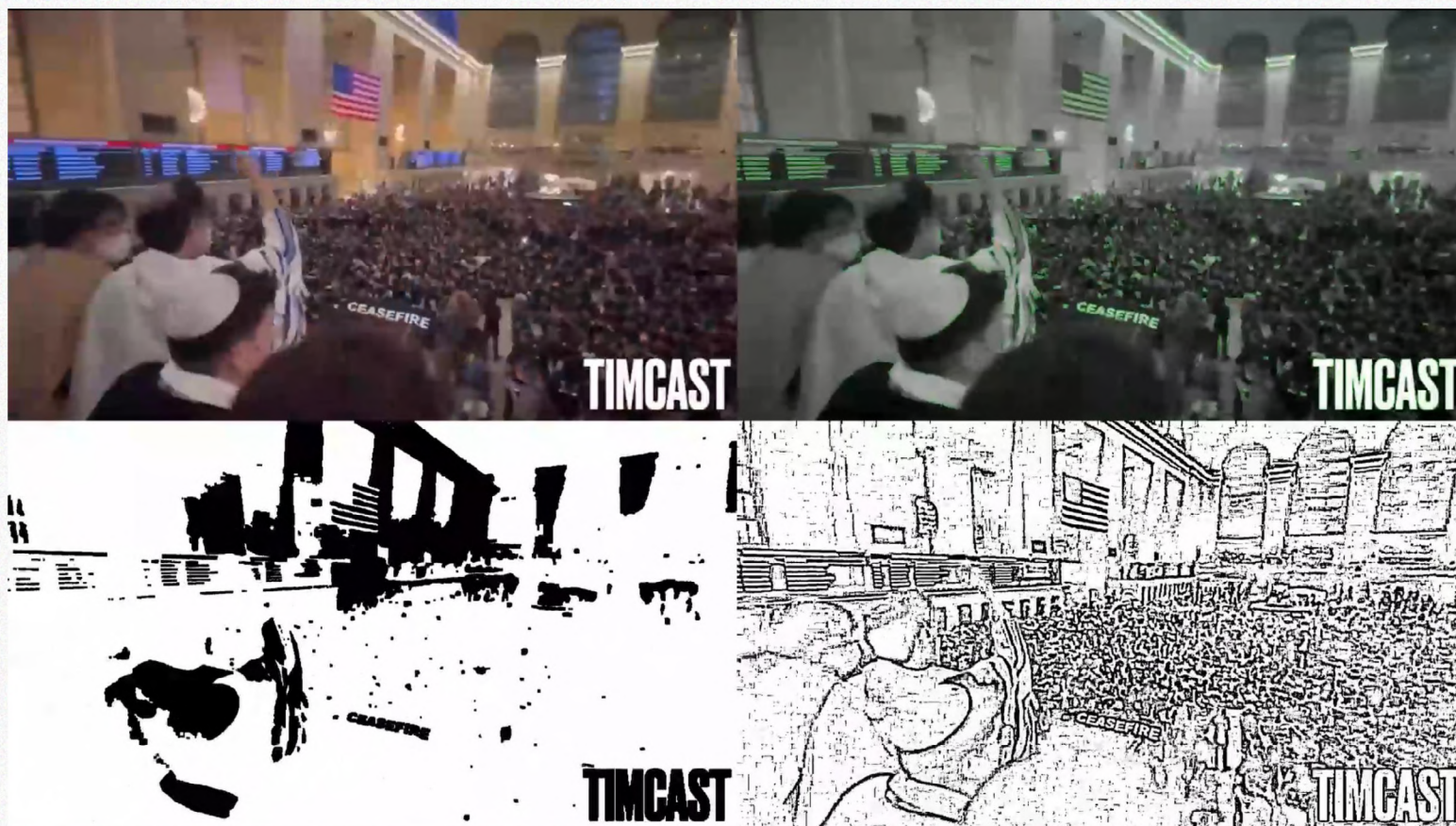


# Critical Computer Vision





# Critical Computer Vision



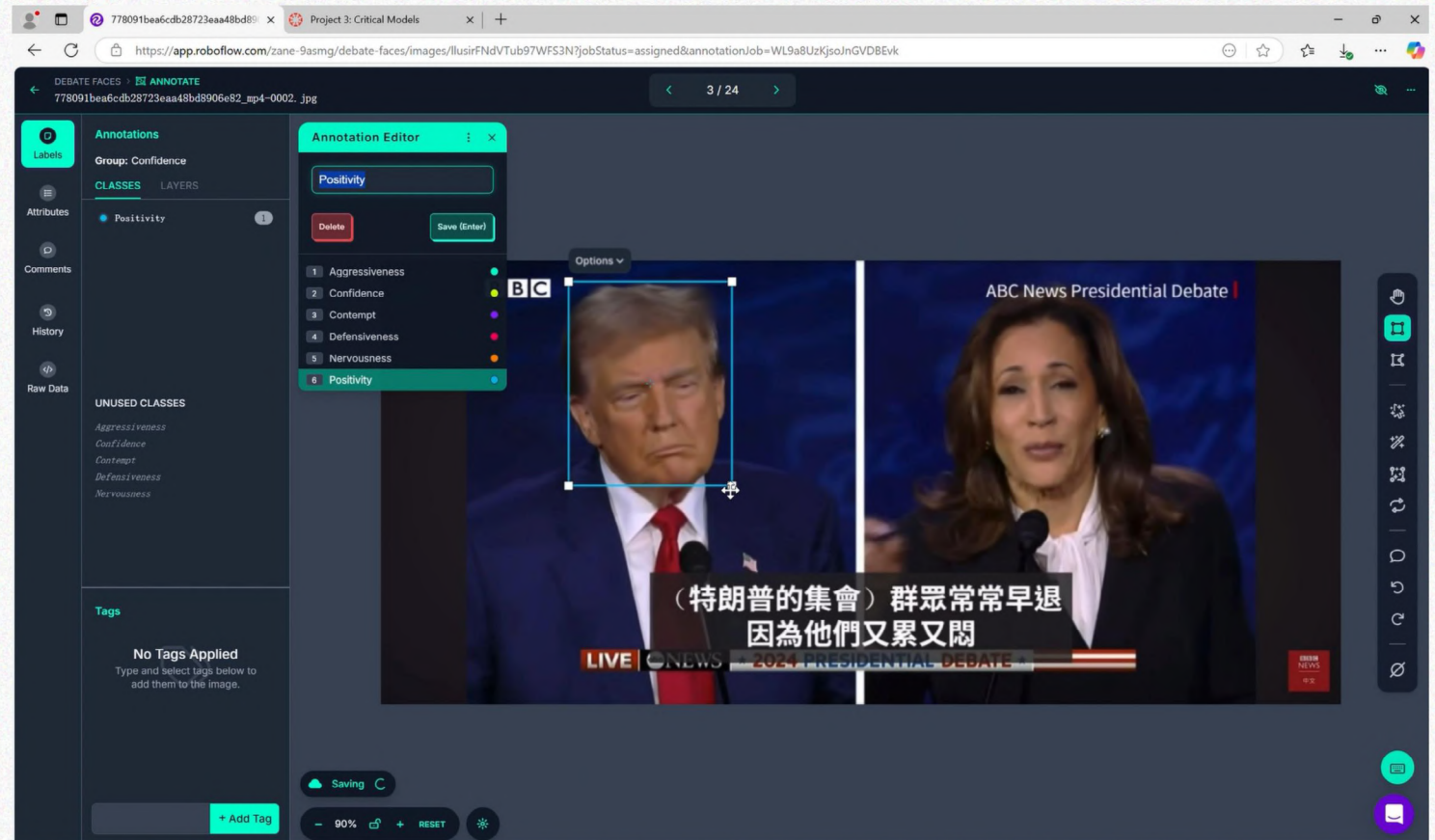


# Critical Computer Vision





# Critical Model





# Critical Model

debate-faces/2

Model Type: Roboflow 3.0 Object Detection (Fast)

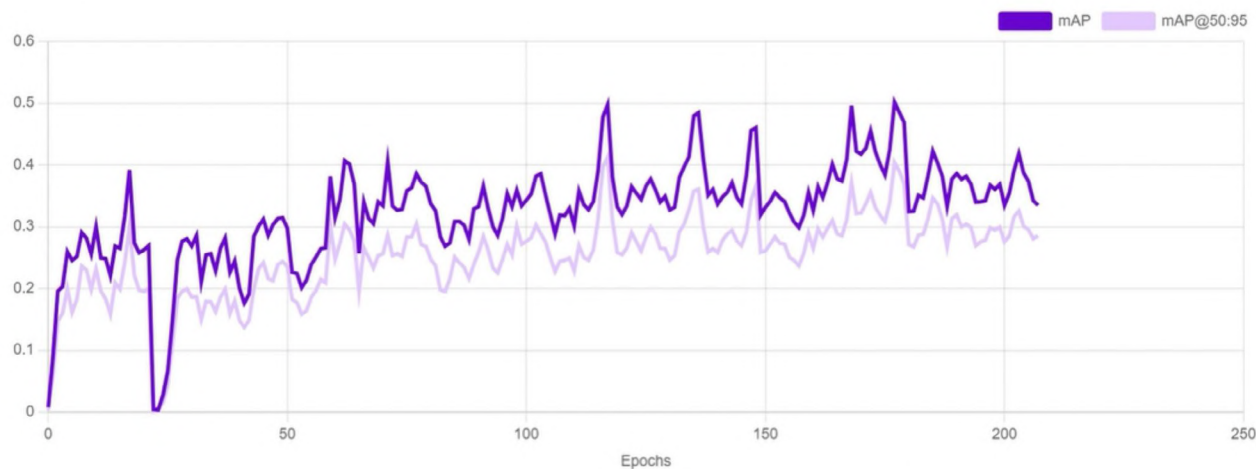
Checkpoint: COCOv

About 17 minutes remaining...

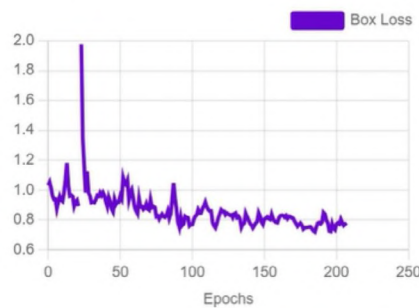
Training...

mAP 49.77% Precision 44.97% Recall 57.42%

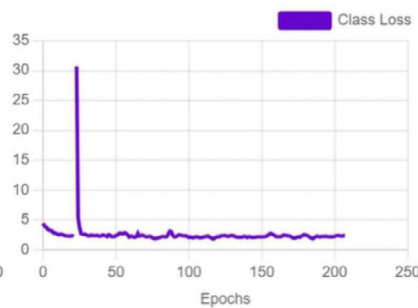
mAP



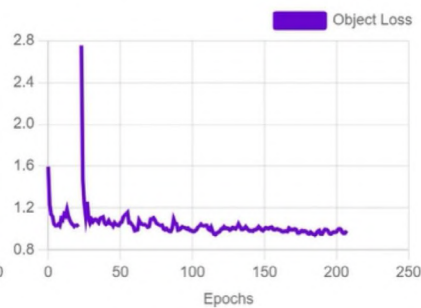
Box Loss



Class Loss

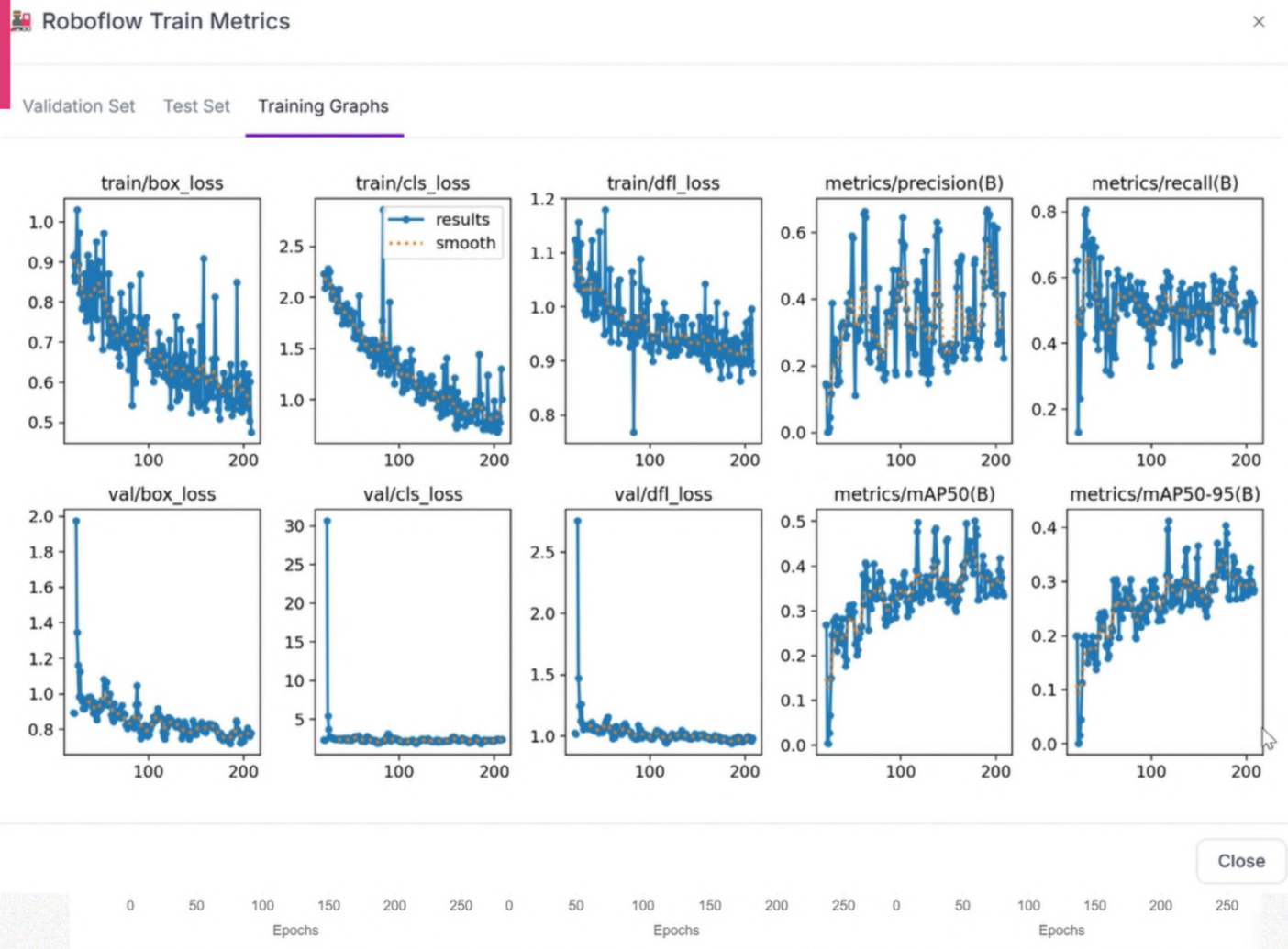


Object Loss





# Critical Model





# Critical Model

01



Confidence Threshold: 50%

0%  100%

Overlap Threshold: 50%

0%  100%

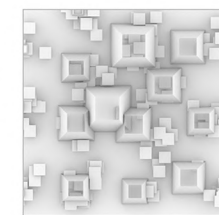
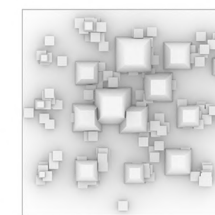
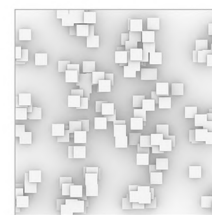
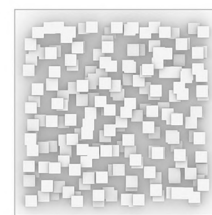
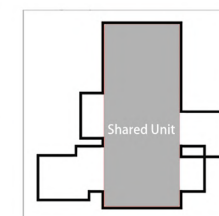
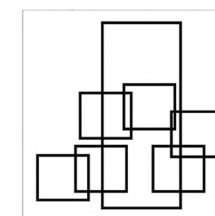
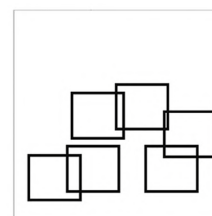
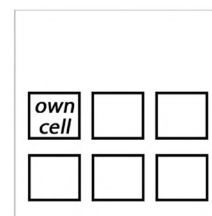
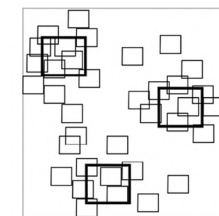
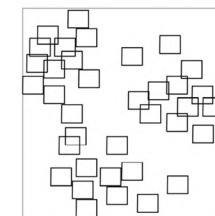
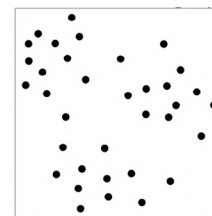
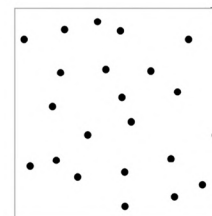
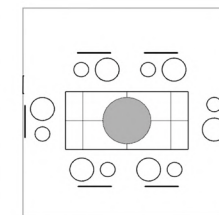
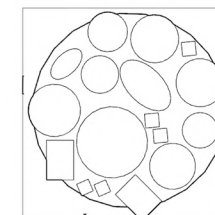
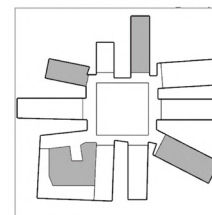
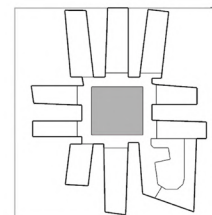
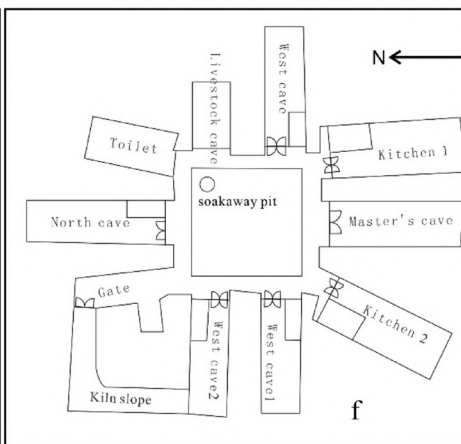
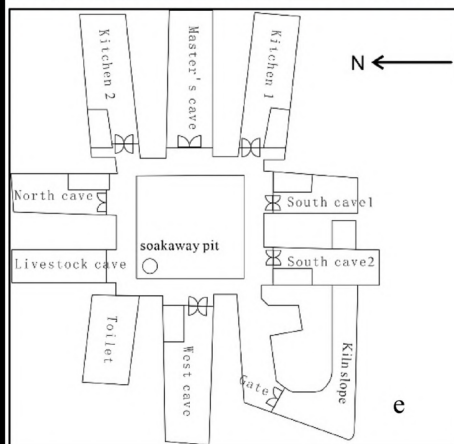
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      },
      "color": "#F4004E"
    }
  ]
}
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03

**SHARED DIMSUM IN HARLEM**





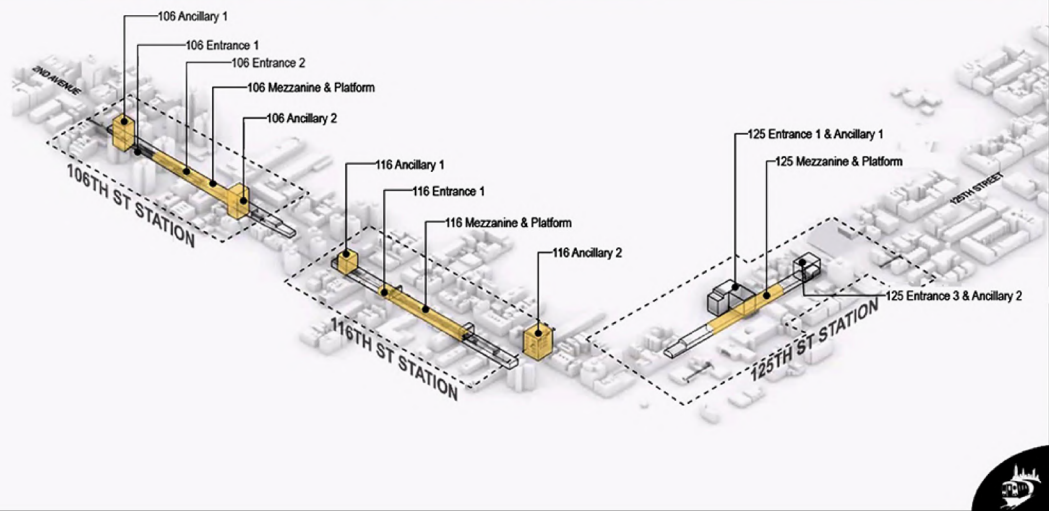








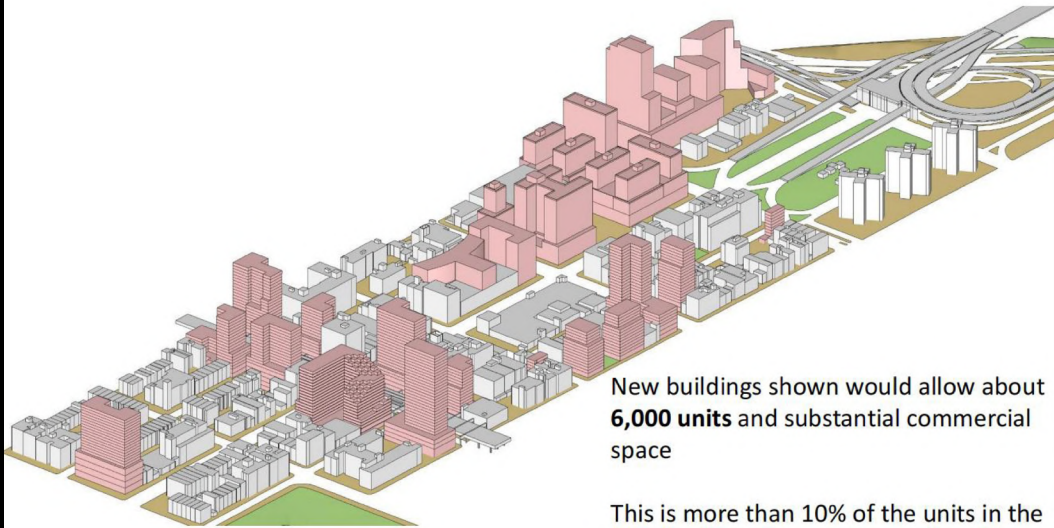
# Stations Spacing and Arrangement







## Under current regulations, the corridor will be transformed



New buildings shown would allow about **6,000 units** and substantial commercial space

This is more than 10% of the units in the entire community district

A substantial percentage (~35-40%) would be rent regulated





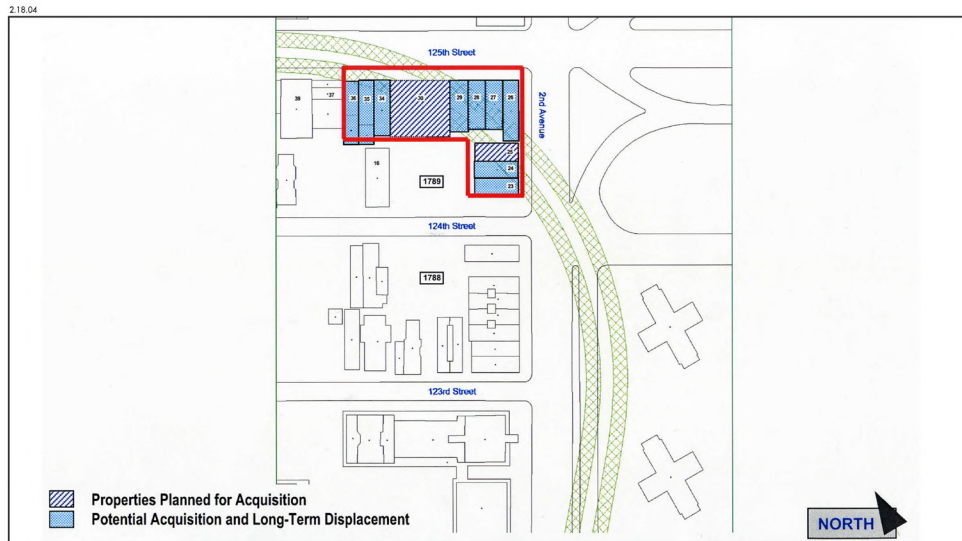
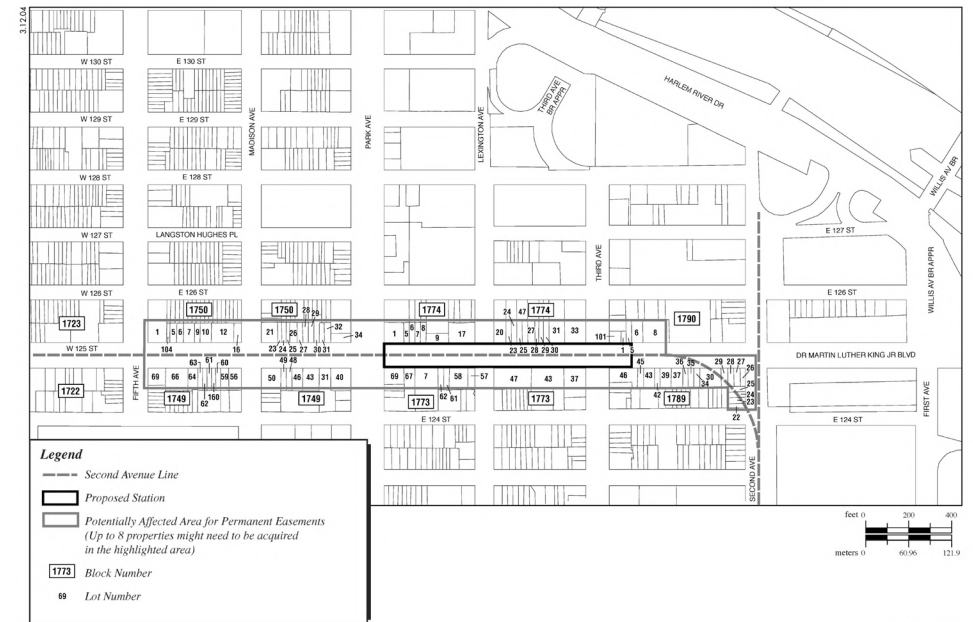


Figure 8-1  
Properties Where Long Term Displacement Would Be Required  
125th Street and Second Avenue

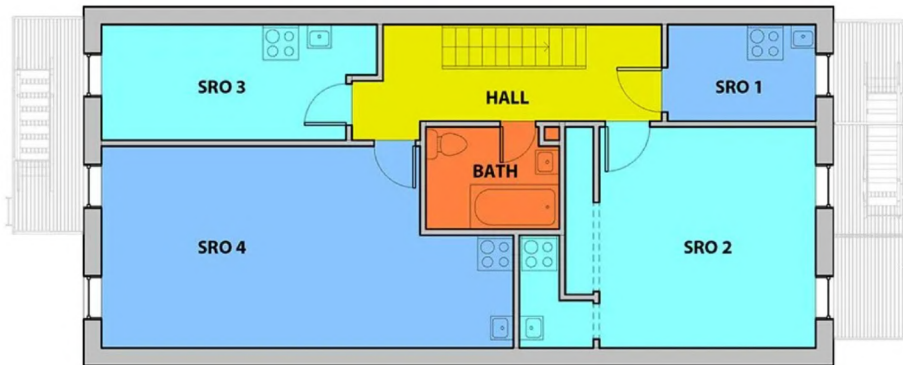
Second Avenue Subway







### SINGLE ROOM OCCUPANCY: SRO



### CONVERTING SRO TO SINGLE - FAMILY

