

Architecture Portfolio | **XUEYIN LU**

MS.AAD 2021-2022, GSAPP

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House For Everyone

Frick Collection Renovation

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Under the Viaduct: Community Well-being

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01 *House For Everyone*

Frick Collection Renovation

Spring 2022 | Academic project | New York
Instructor: Juan Herreros
Collaborator: Chuqi Huang, U Kei Long

The Frick Collection is a house for everyone.

As the Frick Collection museum transformed from a luxurious 20th century residence, the exclusiveness of the Frick Collection has isolated itself from the public which it is supposed to serve.

During the days when Henry Frick used it as a residence, the art collections were no more than a background of the family's daily life. To reconnect the Frick Collection to the public, the project aims to highlight the domesticity of its original function as residence.

Taking different possibilities into consideration to occupy this house, the project evolves by stitching all prototypical spaces with existing decorated domestic context. Rather than a destination for exhibitions, the museum is to be transformed into a context where multiple domestic activities could happen along with the appreciation of Frick's Art Collection. Without dramatically changing the existing layout, the Frick Collection is livened up with its own identity, making it no longer an island in New York City. This Frick Collection welcomes everyone to attend, and provides all domestic possibilities for everyone to install their daily life there.

With the idea that "to destroy the part is to destroy the future," this is the way that we redefine the meaning of domesticity to this home-like museum, by proposing the juxtaposition of different domestic possibilities for everyone to find their home there. Weaving the publicness into this island, where we can now manifest: Frick Collection is the House for Everyone.



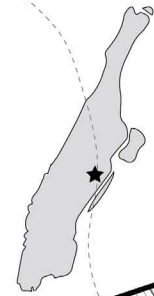
By U Kei

HENRY CLAY FRICK'S RESIDENCE

FRICK COLLECTION

With an endowment of nearly \$40-million and an annual income in excess of \$1- million
Trustee members who each give a minimum of \$25,000 a year to the Frick Collection
Hosting 270,000-300,000 visitors per year

← Residence
CLOSED
→ Museum
OPEN



Henry Clay Frick - an American industrialist, financier, and art patron, Founder of Frick Collection

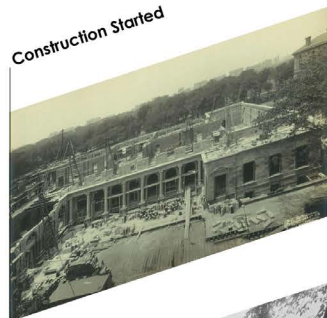
Moved to NYC Before Pittsburgh

Frick bought the land and design

Frick's death due to sudden heart attack



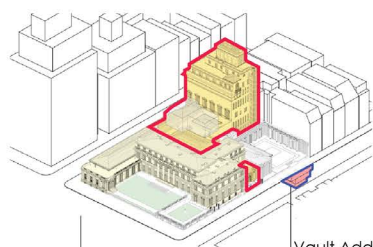
Adelaide and Helen Frick lived until the death of Adelaide Frick. Helen Frick inherited most of wealth, became the trustee of Frick Collection



Construction finished and moved in

Helen Frick established Frick Art Library

1ST Expansion Started



Vault Addition at 1941

1ST Expansion Finished

Helen Frick moved most of the archive to Midwest in the worries of WWII

Helen Frick and Rockefeller Joined As the Chairman Board of Trustee

ROCKEFELLER GIFT OF ART IS REFUSED

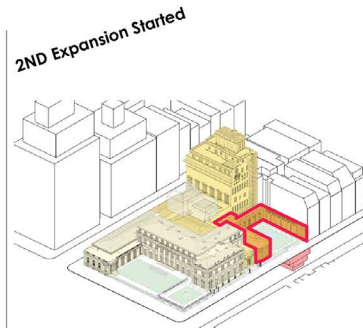
Trustees of Frick Collection File Suit Against Daughter of Steel Maker Over Ban ...
7 LEGAL POINTS AT ISSUE
Counsel for Defendant in Case Challenges Legality of Any Donations Besides Founder's

Helen Frick In Conflict with Rockefeller

Harry Grier Is Appointed Frick Collection's Director

Harry D. M. Grier, assistant director of the Frick Collection, 1 East 70th Street, was appointed director yesterday by the board of trustees. He succeeds Franklin M. Biebel, who had held the post since 1951. Mr. Grier, who is chairman of the Museums Council of New York, had been assistant director of the Minneapolis Institute of Arts and assistant dean of education at the Metropolitan Museum of Art.

over 300,000 books and exhibition catalogues, extensive auction and provenance records, and 1.2 million images of art from the 4th to the 20th centuries
From 1922 to 1967 Commissioned by Helen Frick



Reception Hall & Garden Baylay Addition

ARCHIVES
The Frick Changes Plan for Vacant Plot, Proposing 2d Wing
MAY 17, 1974

PRINT EDITION
May 17, 1974

Helen Frick resigned after years in the gender politics matter and conflicts with Rockefeller in the Trustee

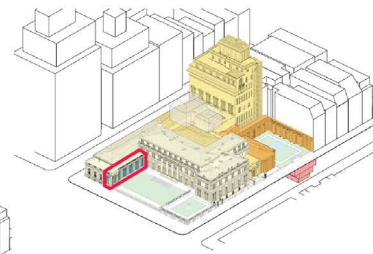
Henry D.M Grier appointed as the director of Trustee

Helen Frick served as Director of the Library from its inception until shortly before her death at 1984.

The Frick Collection had an operating budget of \$10 million and an endowment of \$170 million.

The Frick hired Rika Burnham as head of their education department. Burnham introduced several changes to the museum, including the introduction of monthly free entrance to the museum, called First Fridays.

3RD Expansion Started



Portico Gallery Addition

Anne L. Poulet as former director retired

Current Director Ian Wardchopper on board

Save the Frick Collection

The new expansion plan isn't right for the small museum in a mansion.
By David Masello

ART & DESIGN

Preservationists Protest New Frick Collection Expansion Plan

Critics say the plan would still destroy the mansion's gated garden as well as its music room, a chamber concert venue.
By Robin Pogrebin

ART & DESIGN

Frick Collection, With Fourth Expansion Plan, Crosses Its Fingers Again

The new design by Annabelle Selldorf highlights its controversial garden, and brings visitors up into former living quarters for an intimate experience with art.
By Robin Pogrebin

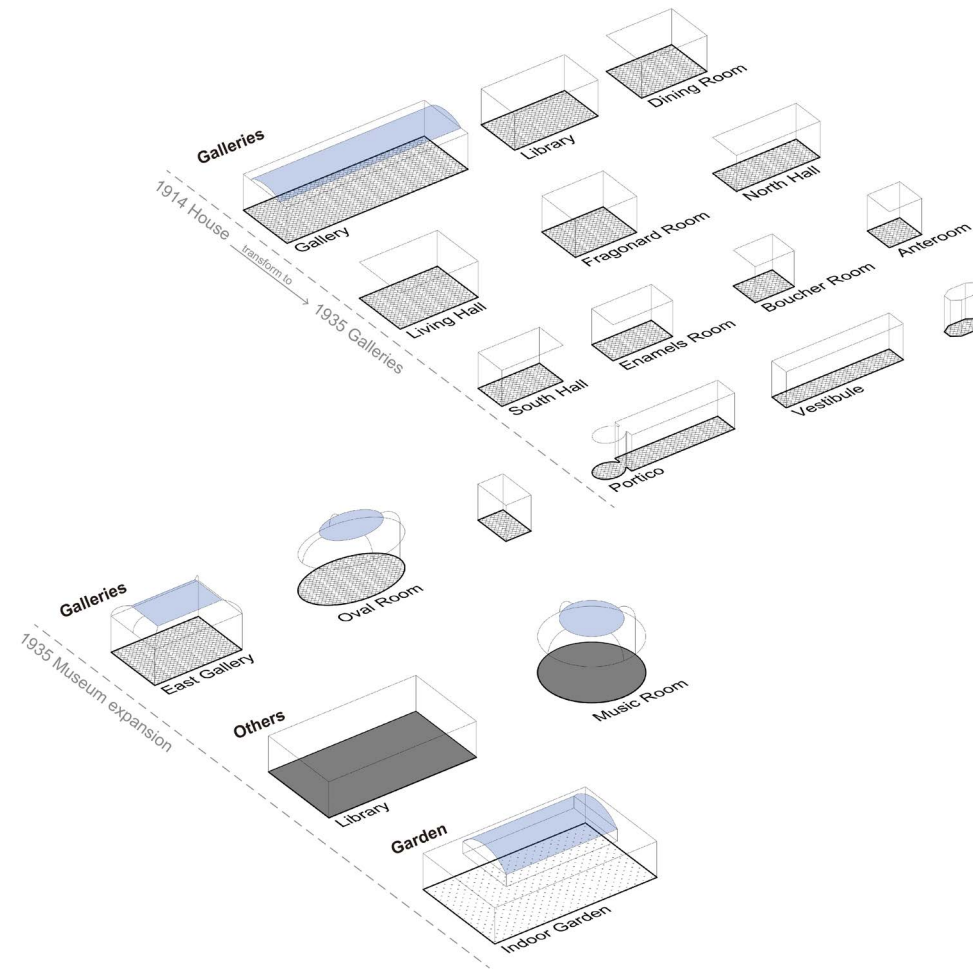


Frick Madison-

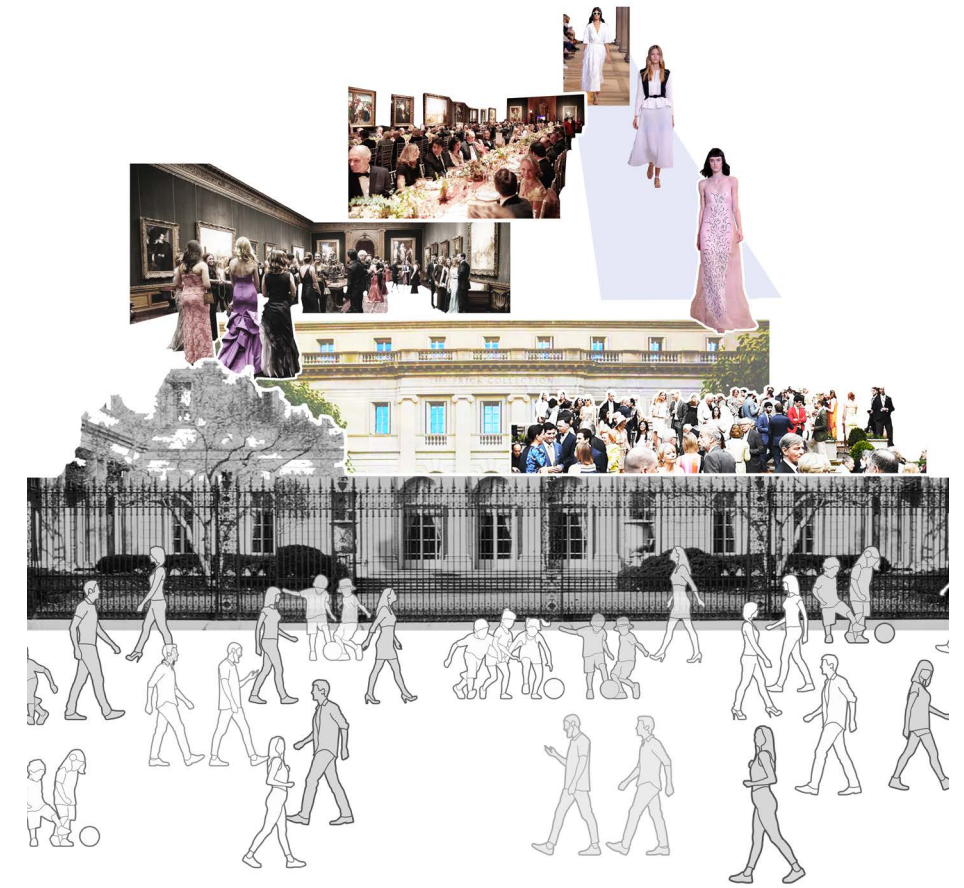
The temporary home of The Frick Collection while the start of 4TH expansion



Comparing the same art piece in the Frick Collection with the temporary setting right now in Met Breuer, the transplanted space impairs the understanding of the institutional origin of the collection which was rooted in a domestic context.

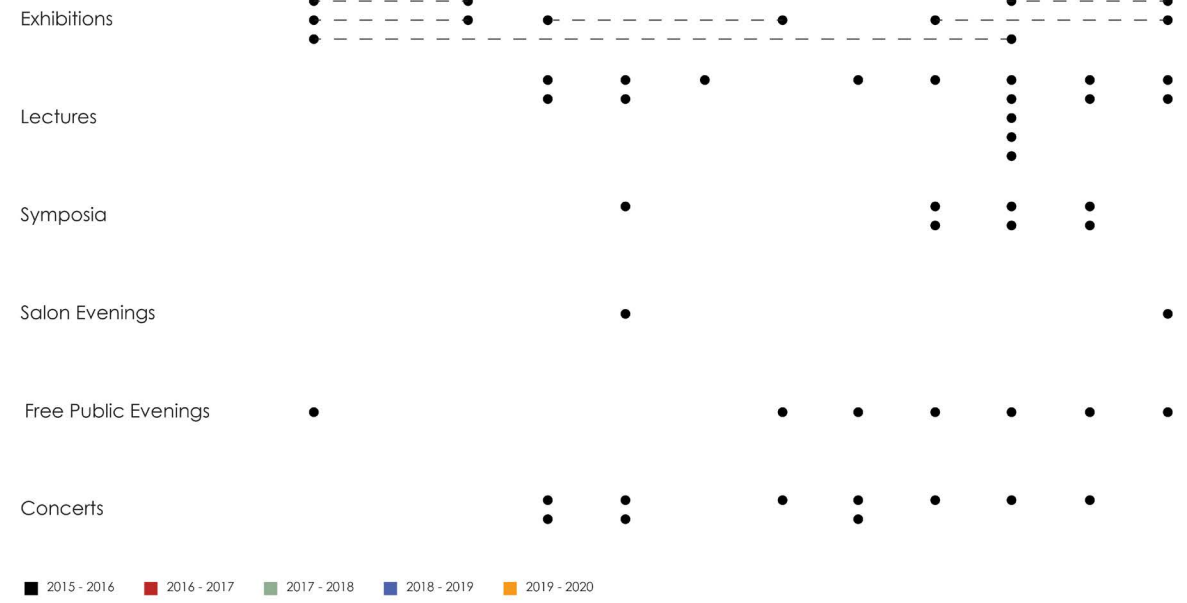


As for the existing layout of Frick Collection, the overall arrangement of space is room after room. However, the uniformity of the spatial sequence and the specific arrangement of exhibitions diminish the unique domesticity of Frick's residence as a collection.

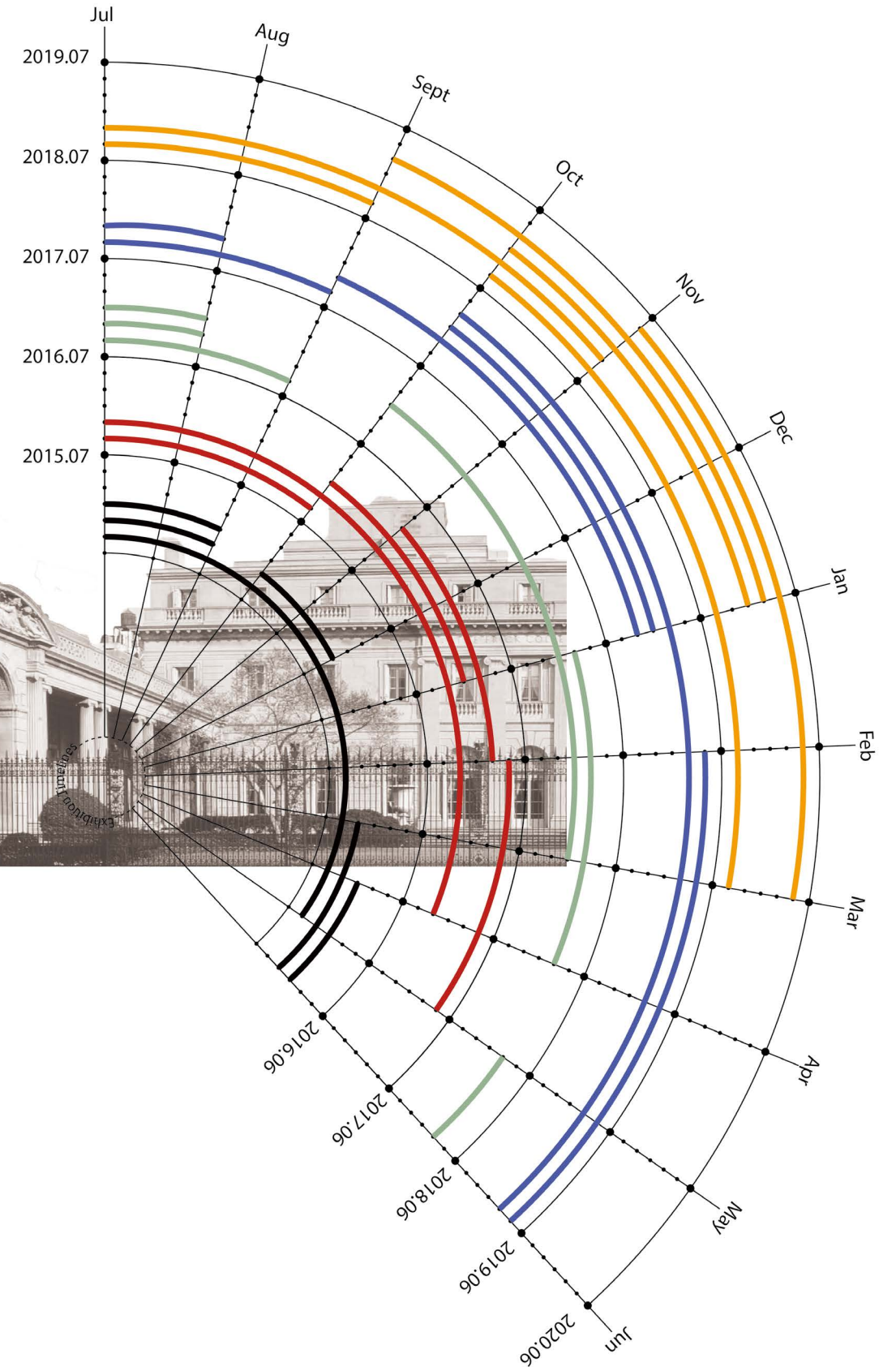
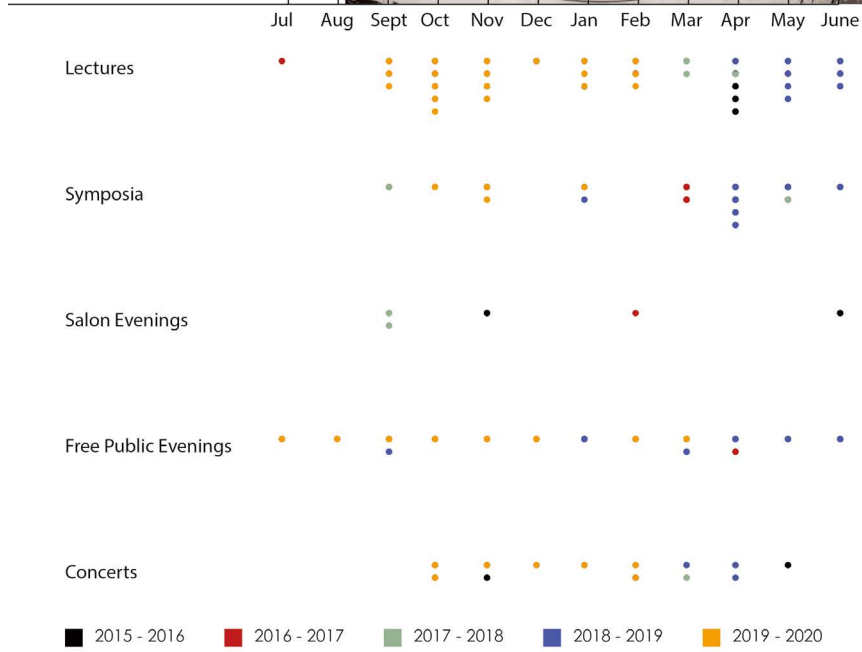


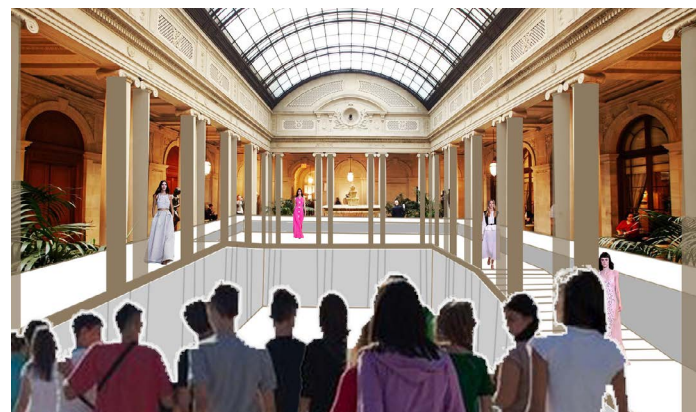
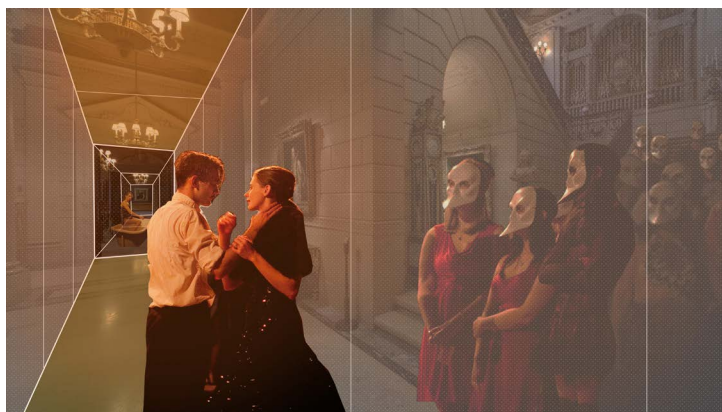
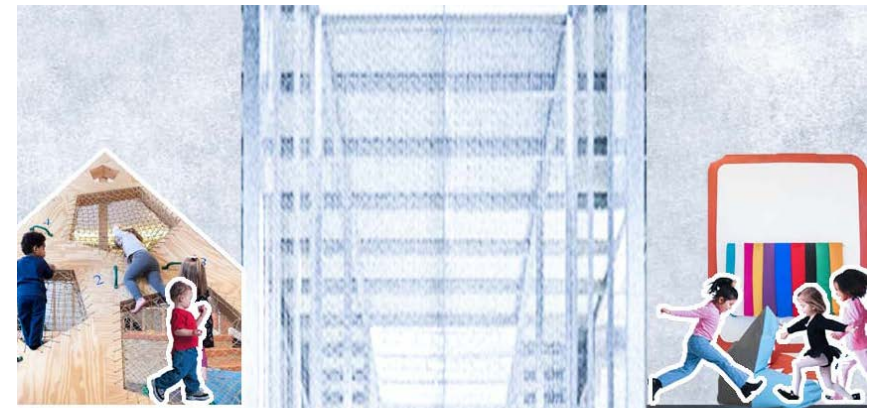
The lack of inclusiveness and accessibility of the Frick Collection is also reflected in the activities it holds annually. Special activities are held in Frick for specific groups of people. Sometimes, the Frick is more like a social place for the upper class. Even children under ten are restricted to visit the museum to protect Frick's art collection from vandalism, further alienating art from the general public.

Public Program | Timeline Jul Aug Sept Oct Nov Dec Jan Feb Mar Apr May Jun



Even though the Frick Collection provides public programs such as art lectures, seminars, and concerts that intend to connect with the local community. Its primary focus has been the display of art catering to an ever dwindling, if not irrelevant, taste of the so called upper class, setting a bar for public accessibility.





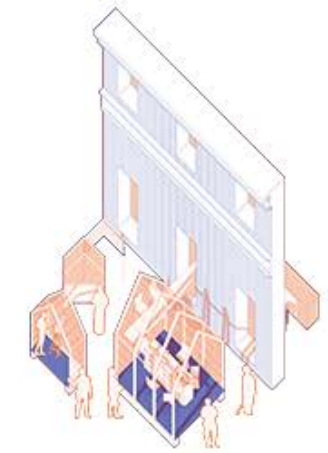
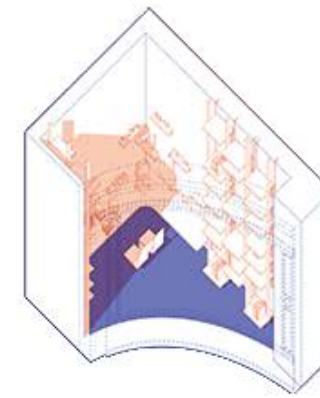
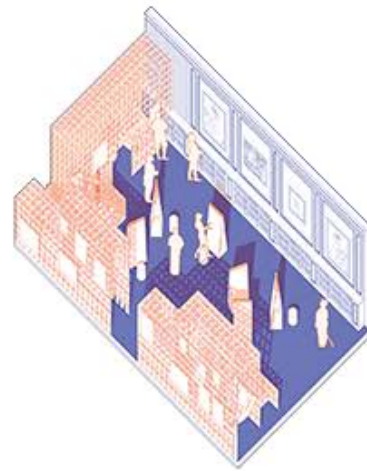
Furniture

Partition Wall

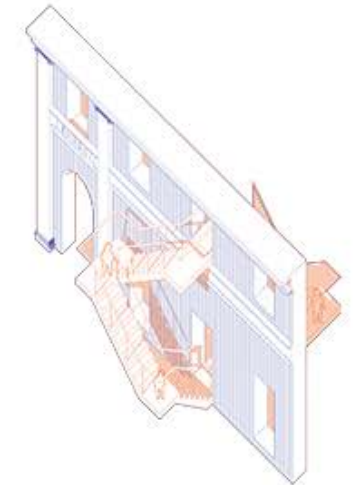
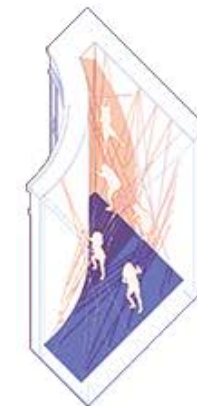
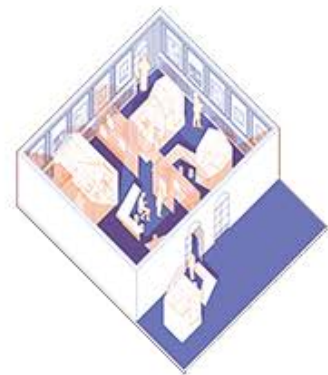
Poché

Transition

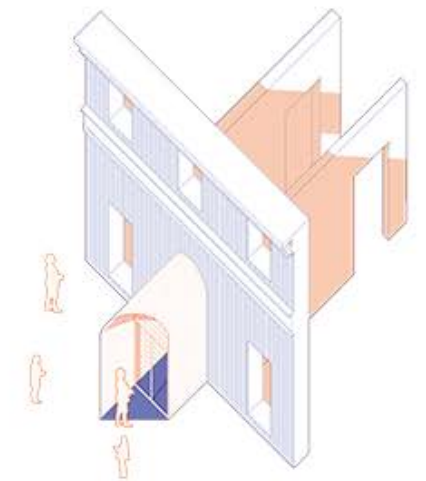
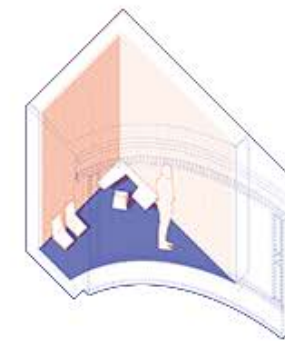
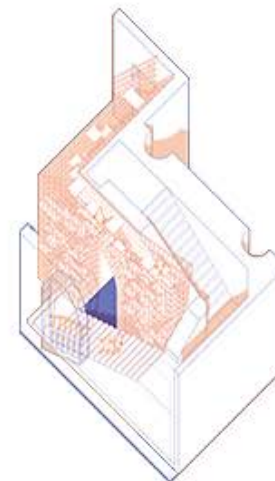
Art-related Group

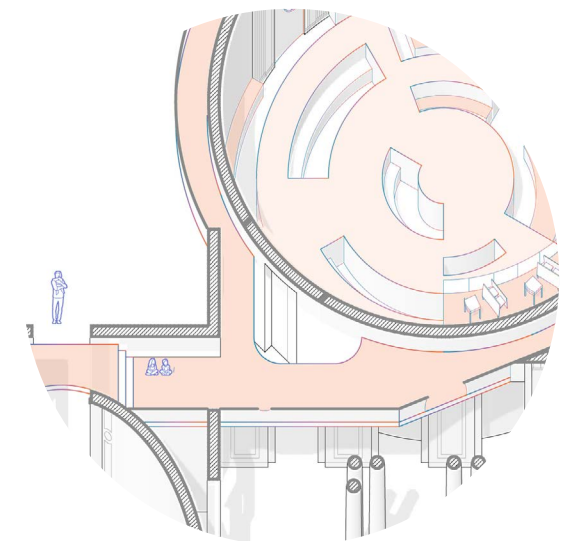
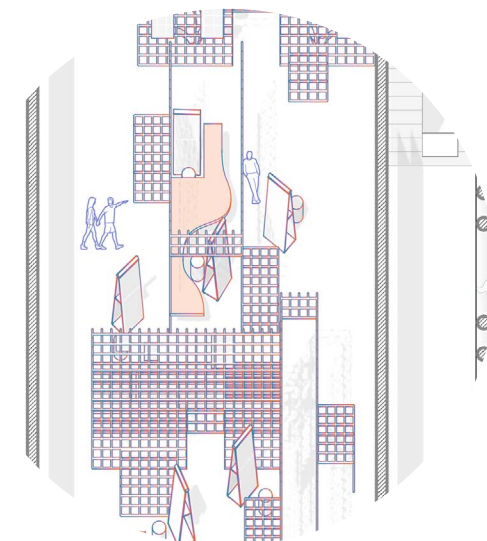
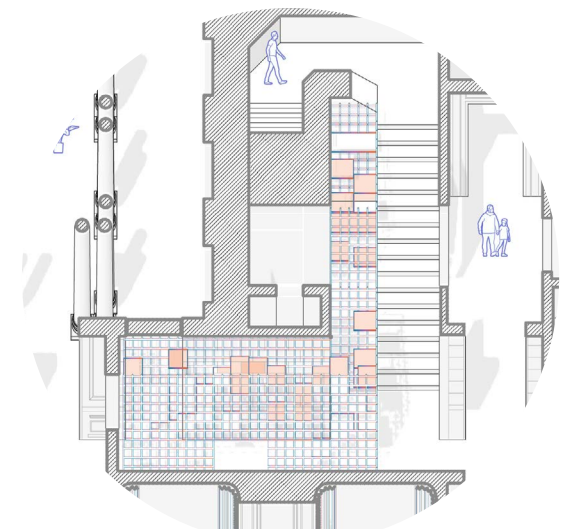
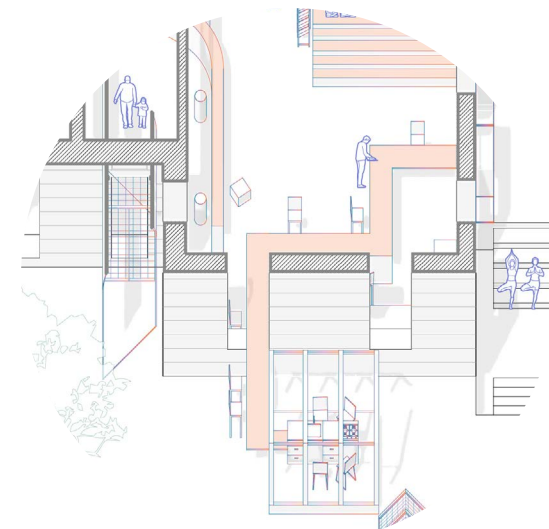
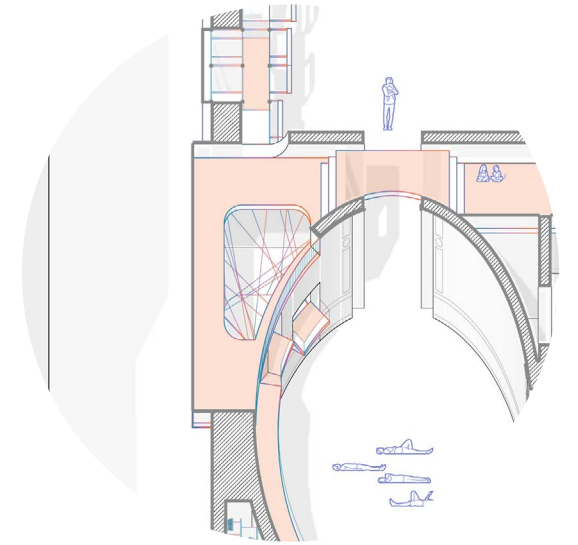
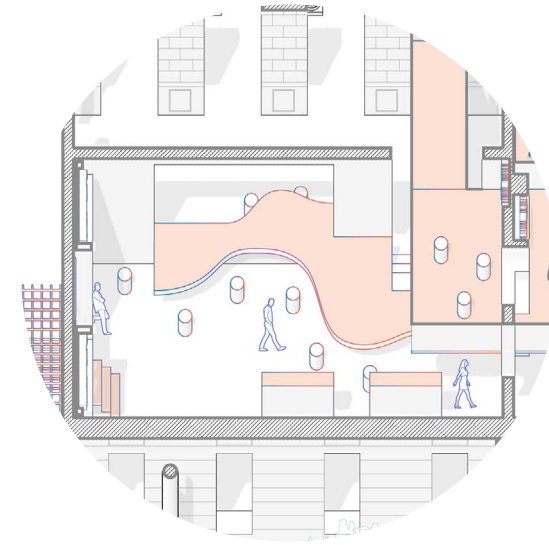


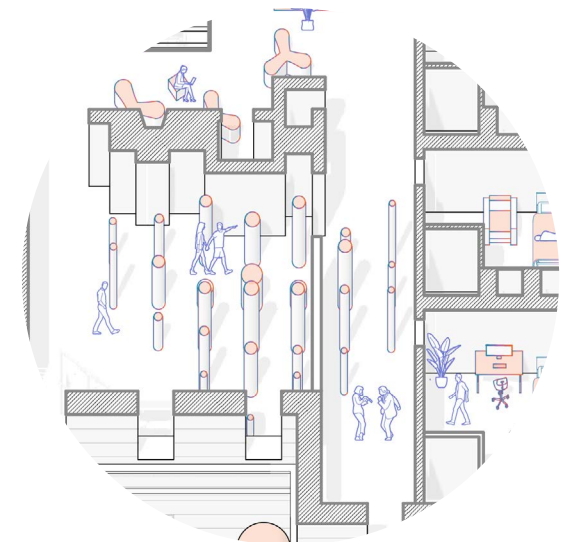
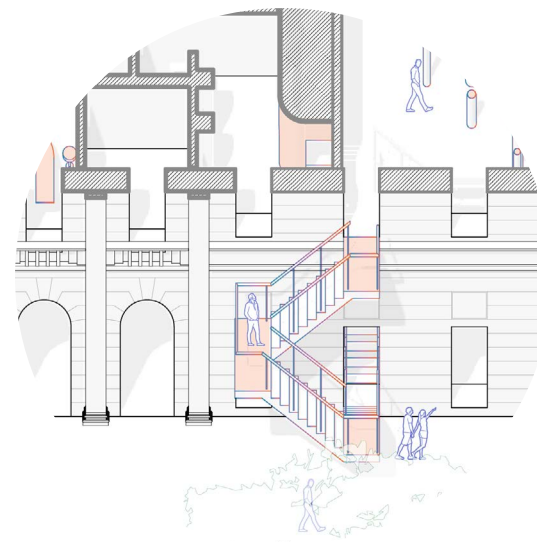
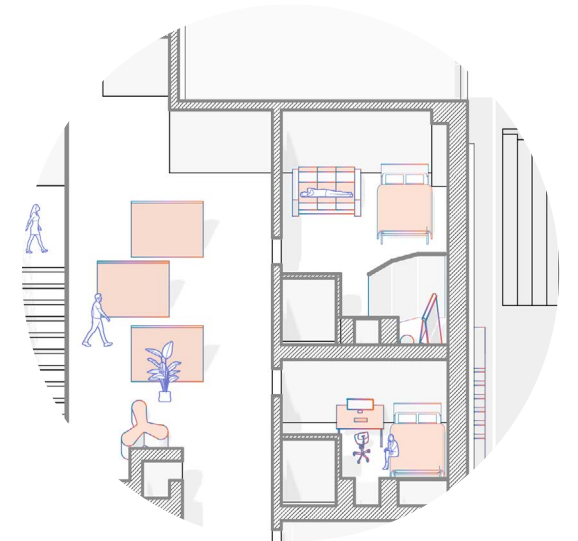
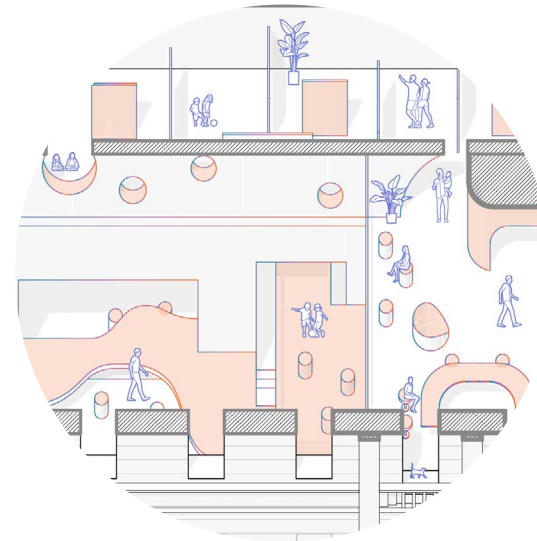
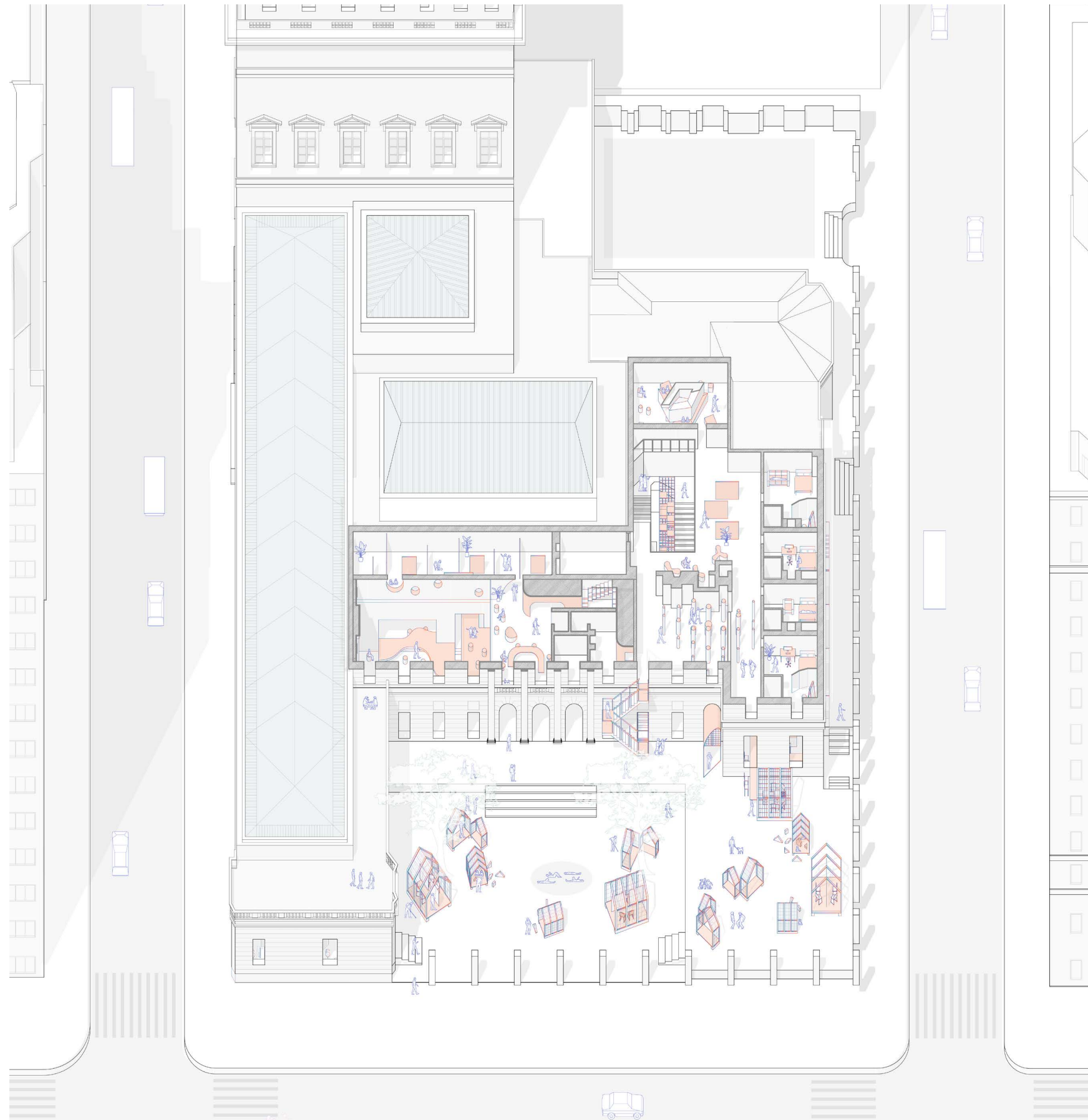
Visitors/ Local



Kids







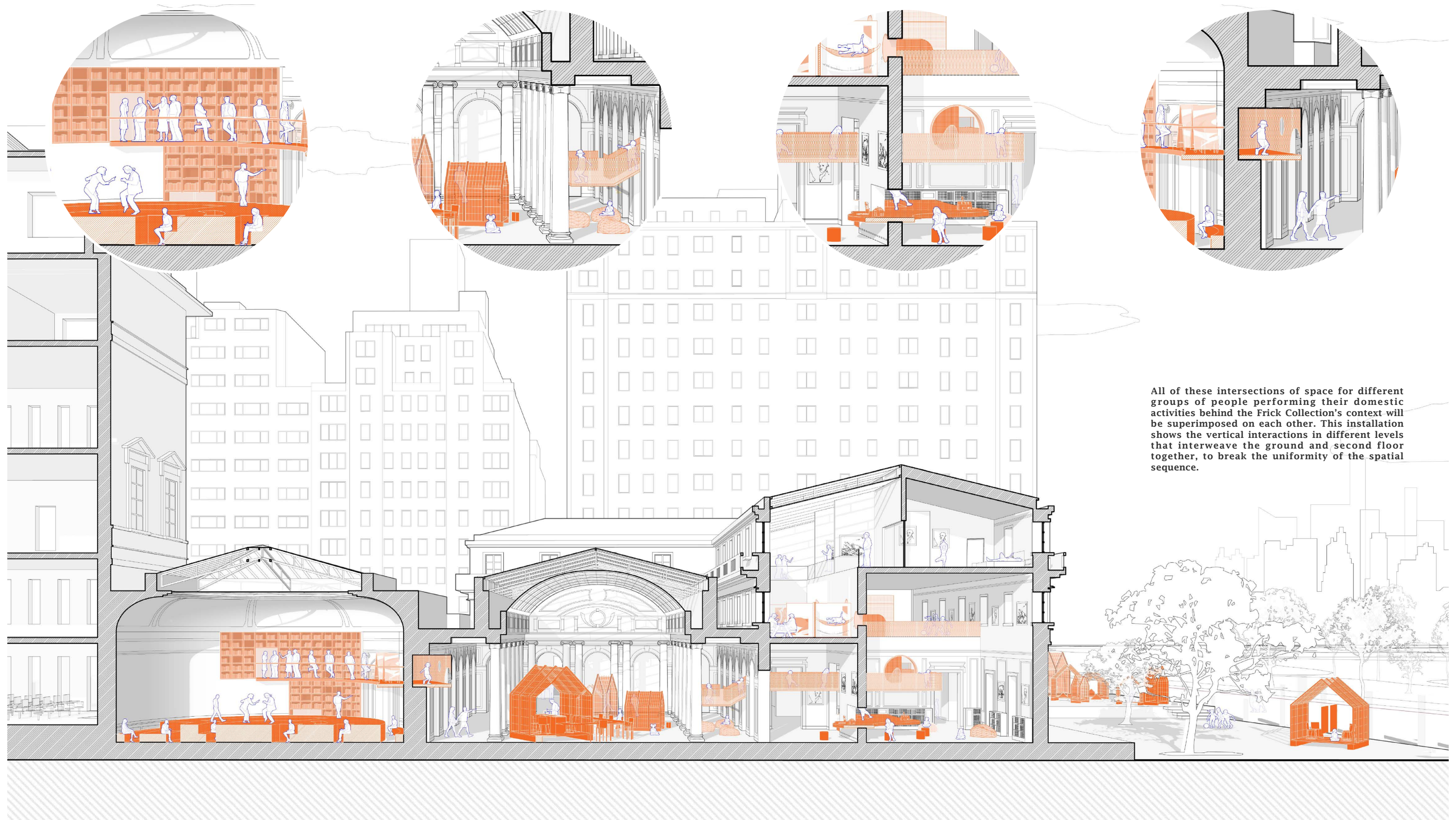
With its art collection as the background of context to demonstrate the value of superimposition, through the rearrangement of Furniture, Partition walls, poché and Transitional installations.

This movement is intended to sustain the form of domestic activities with different groups of people, including visitors and locals, kids and artists related groups.

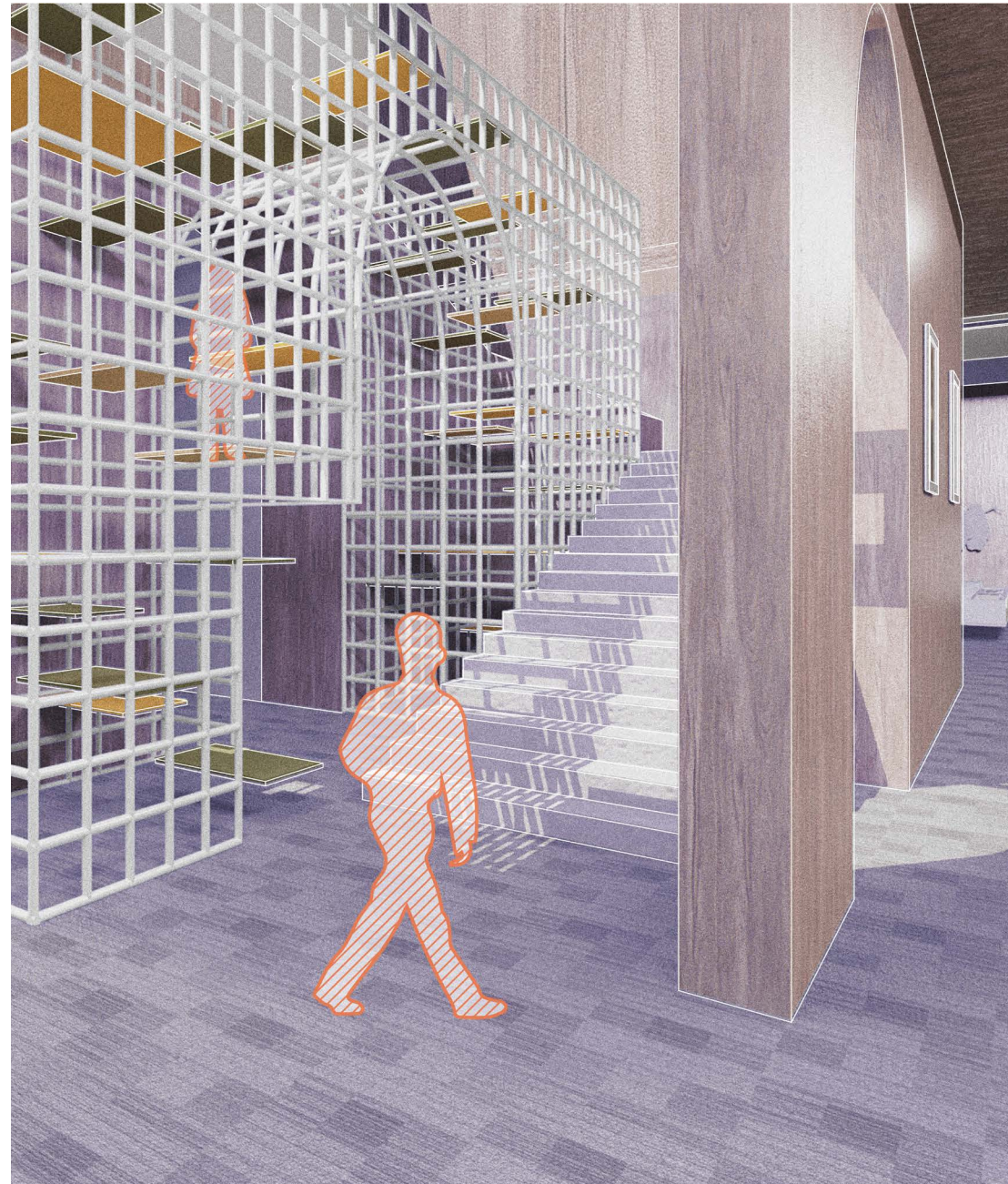
By taking all these possibilities that we imagine, into consideration to occupy this house, the project evolves by stitching all prototypical spaces with existing decorated domestic context.

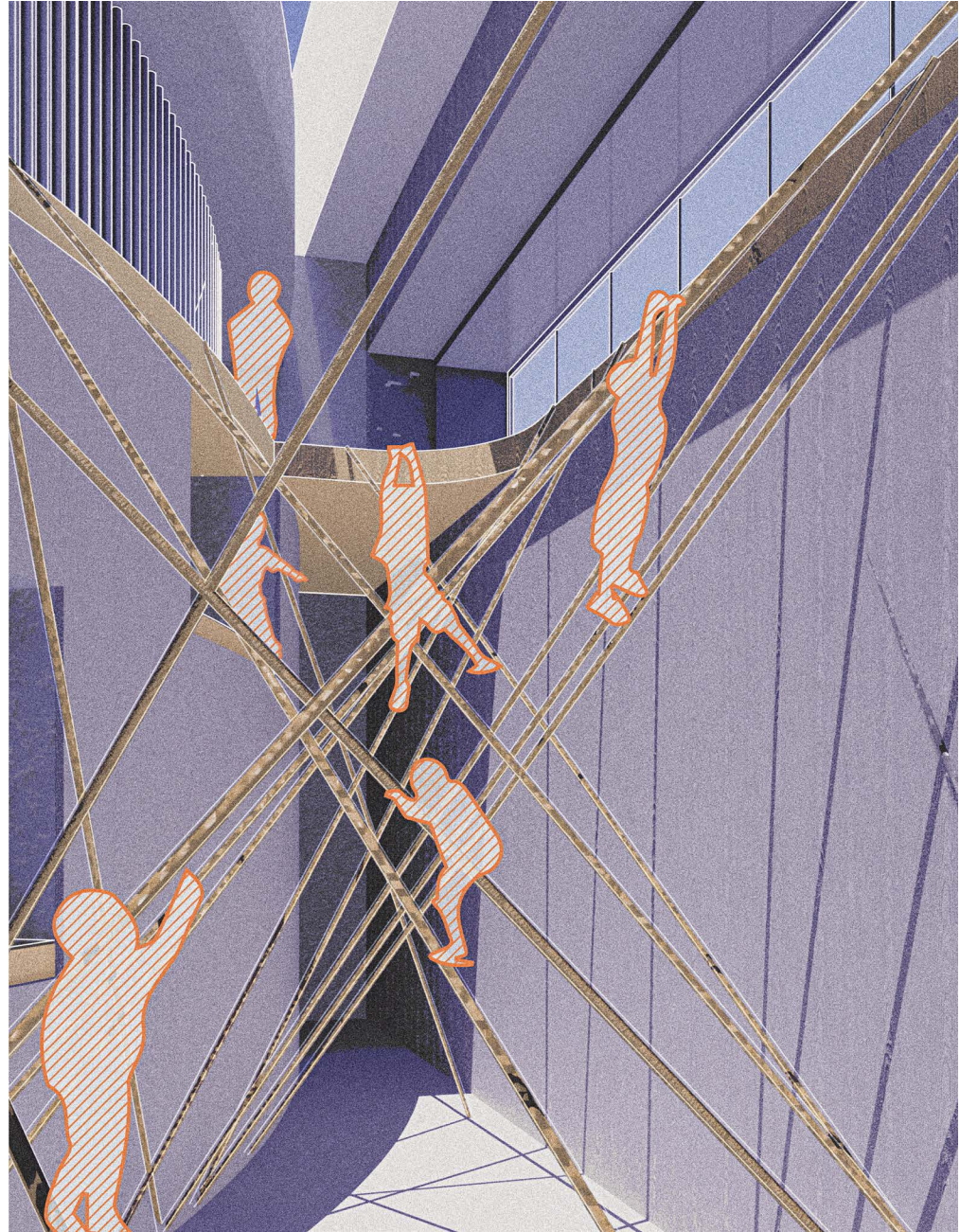
Rather than a destination for exhibitions, the museum is to be transformed into a context where multiple domestic activities could happen along with the appreciation of Frick's Art Collection.

Without dramatically changing the existing layout, the Frick Collection is livened up with its own identity, making it no longer an island in New York City. This Frick Collection welcomes everyone to attend, and provides all domestic possibilities for everyone to install their daily life there.



All of these intersections of space for different groups of people performing their domestic activities behind the Frick Collection's context will be superimposed on each other. This installation shows the vertical interactions in different levels that interweave the ground and second floor together, to break the uniformity of the spatial sequence.





The art related groups like scholars, students and designers will use these spaces for gathering, discussing, researching for art resources and books that belong to Frick Art Library. Artists, Musicians and dancers can also find their identity to install and perform in the Frick Collection, while providing residency for them to work there.

New York City Locals and visitors, the form of designated space can more privately like having their own domestic experience like home. They can sleep, cook, take phone calls, and work from home with the domestic background of Frick Collection, by arranging all the gallery rooms to function as Frick's residence before.

We know that kids are restricted from entering the Frick Collection. Yet, in this domestic manifest that we propose, kids can be actively involved in all kinds of spaces by occupying designated routes that only allow them to explore.

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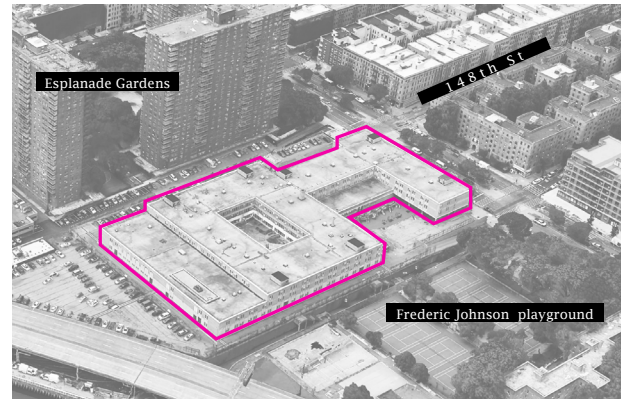


02 *Above the Station*

Under the Viaduct: Community Well-being in Bradhurst, Harlem

Fall 2021 | Academic project | New York | Individual Work
Instructor: Victor Body-Lawson, Richard Plunz

- MIX-USE** A mix use of subway station, school, housing and community facilities
- EDUCATION** Enhance the current educational condition of the school
- HOUSING** Provide as much housing as possible to meet the need of the growing population of the area
- COMMUNITY** Add community facilities, mainly after-school programs, childcare services



ISSUES:

Waterfront accessibility

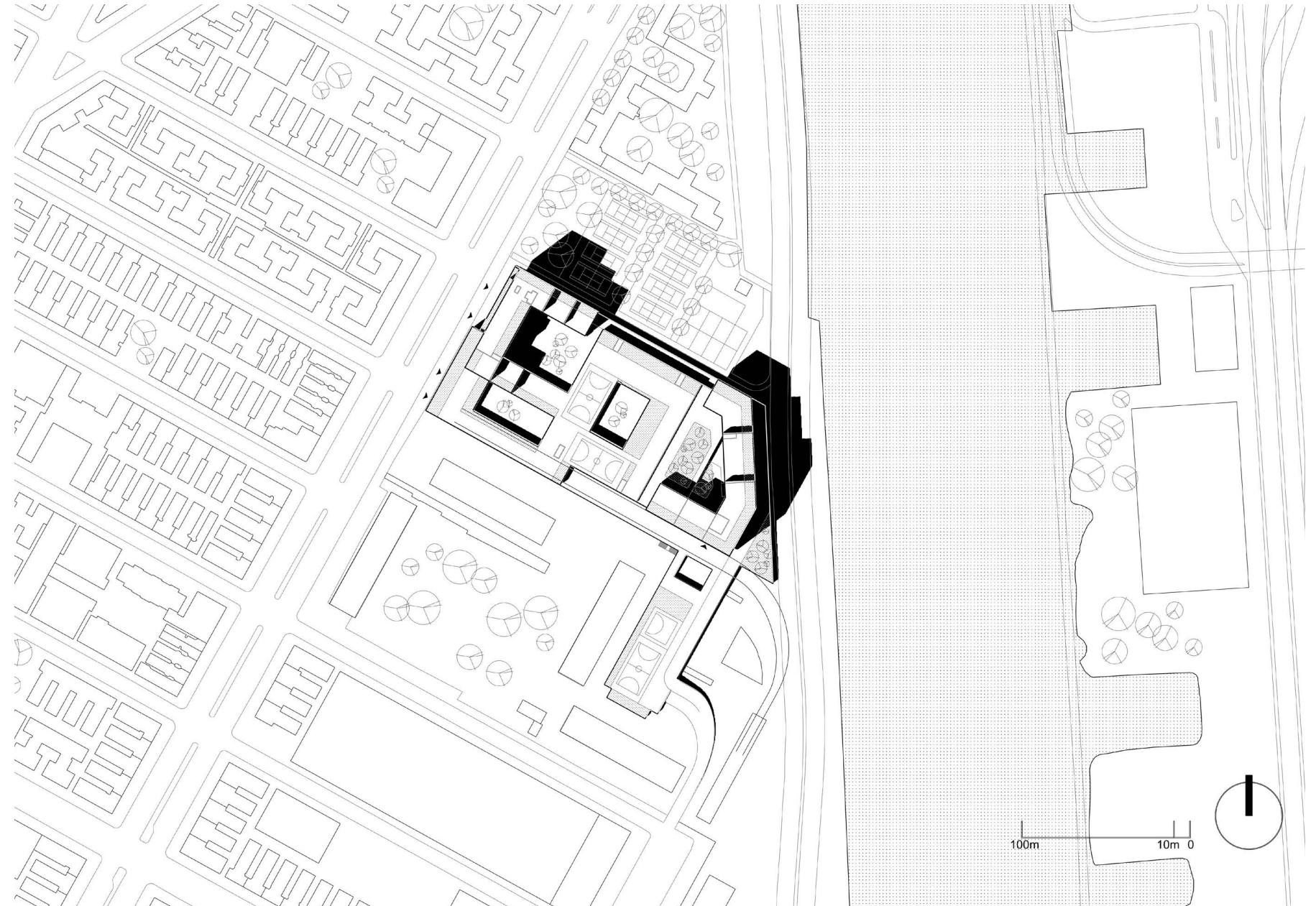
The station cut the waterfront from public entrance

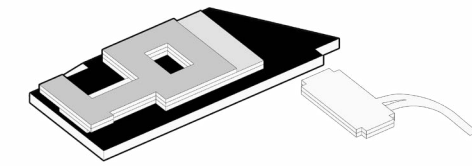
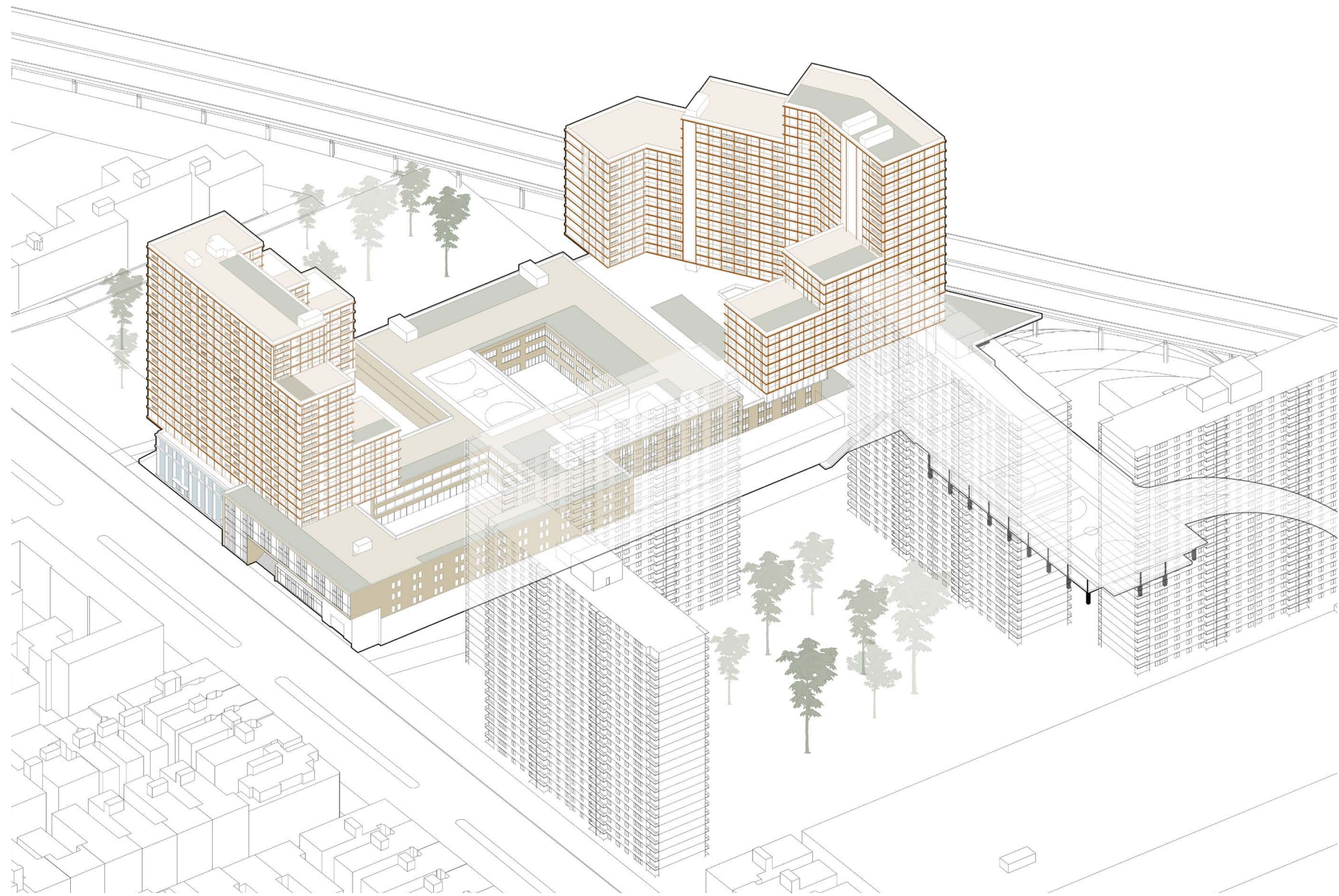
Underdevelop

covers a huge area but serve as only a little functions to the neighborhood.

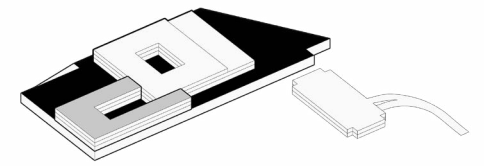
No direct entrance on the street (school)

There is no direct entrance of the school on the street, students have to go upstairs first. The school image is not apparent.

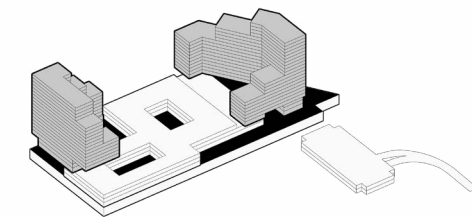




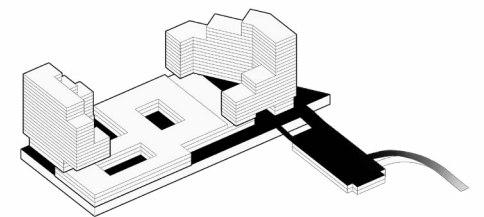
1. Original



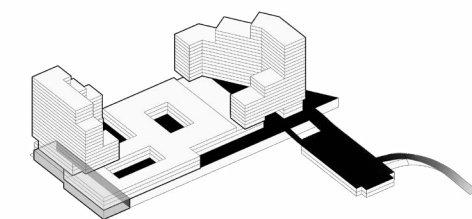
2. Rebuild part of the school



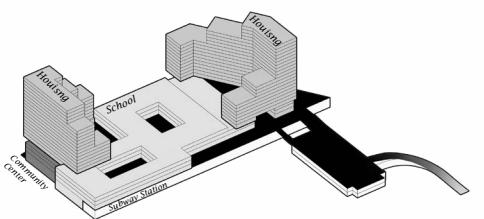
3. Housing



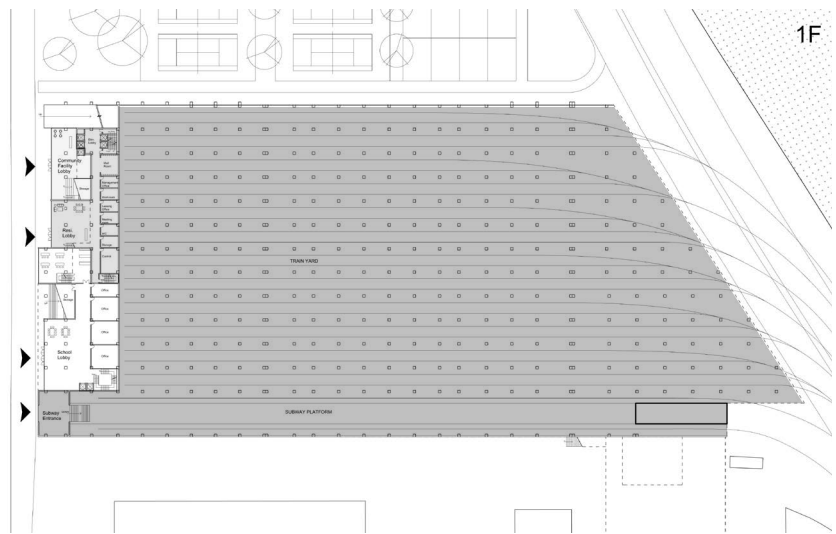
4. Vehicle entrance



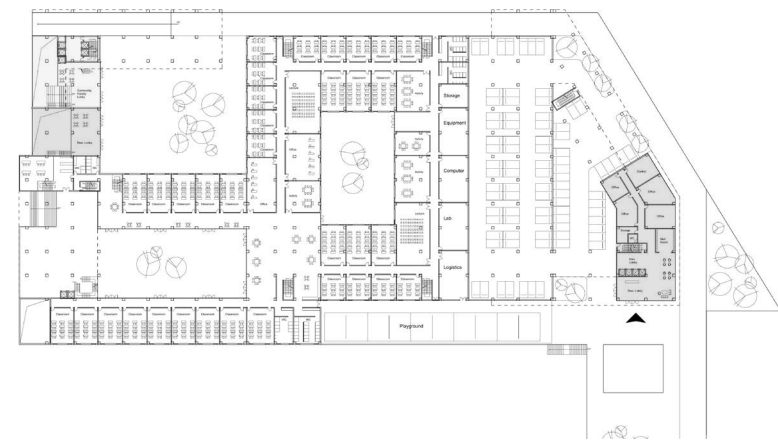
5. Cut back part of the tracks



6. Courtyards; space structure



1F



2F

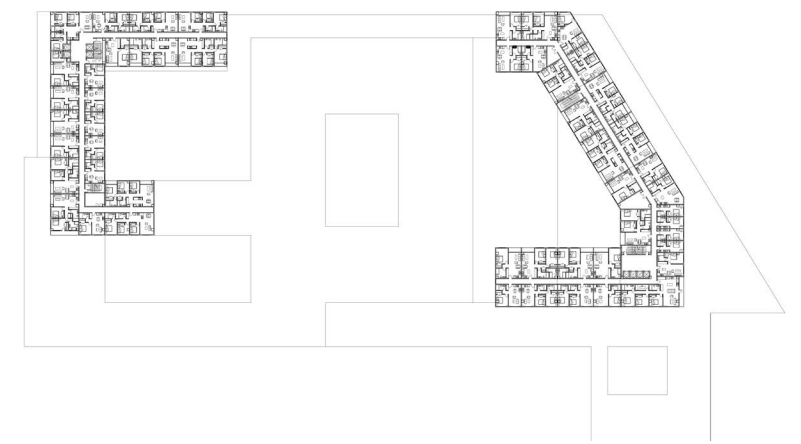


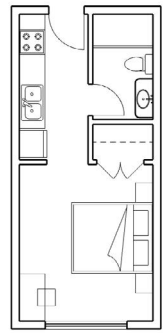


3F

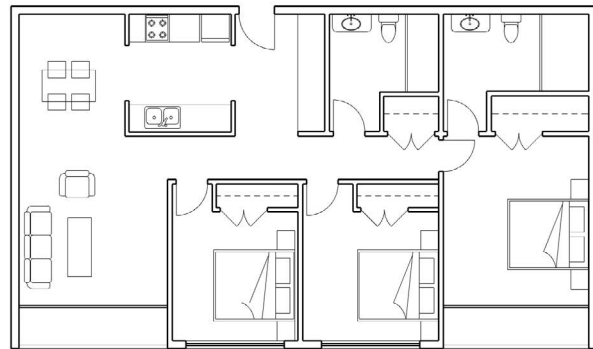


Typical

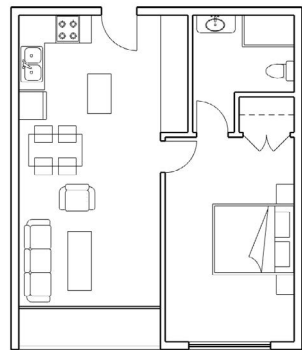




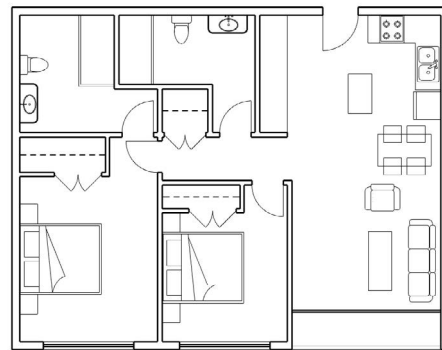
Studio
310 sqft



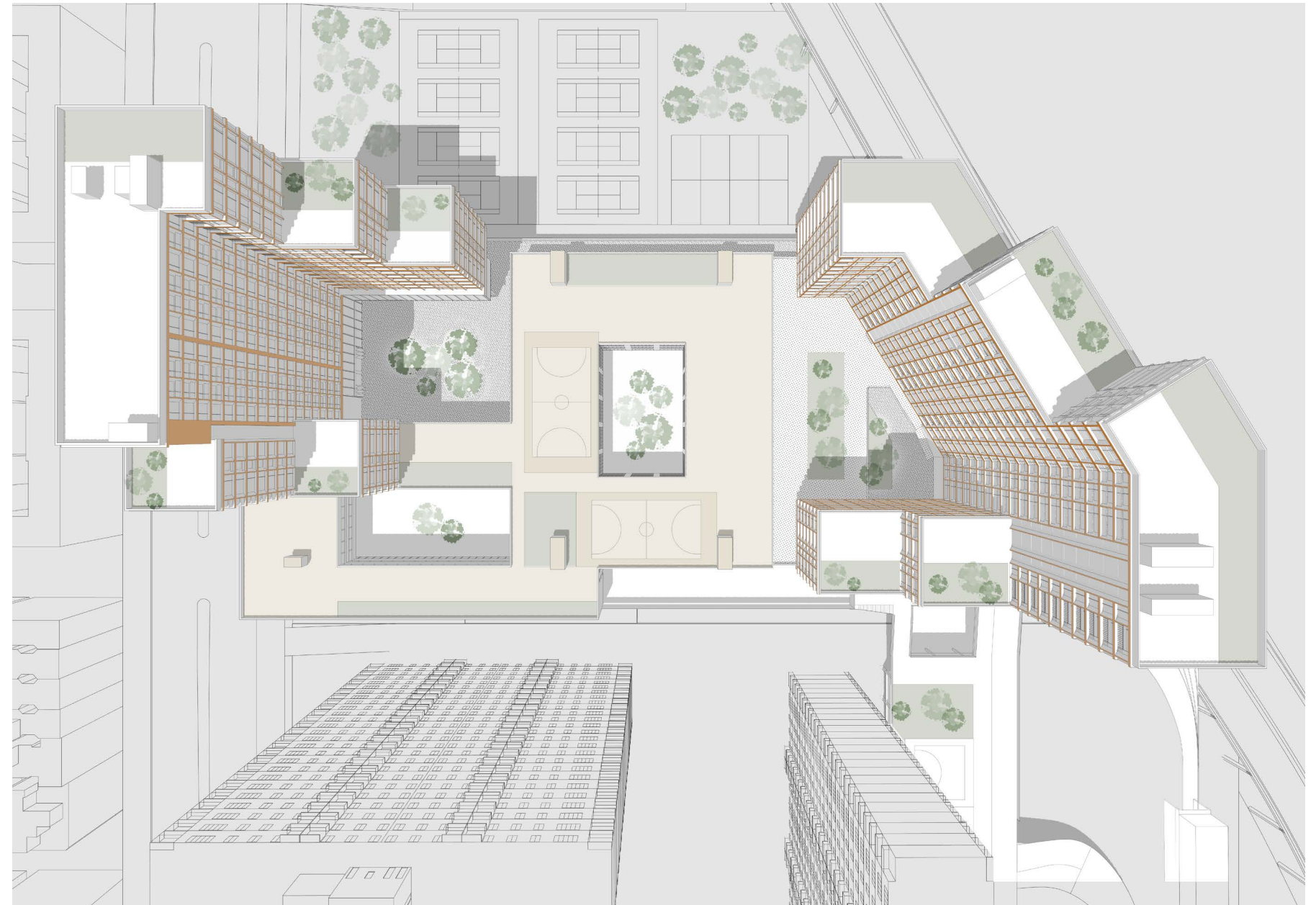
2-bedroom
997 sqft

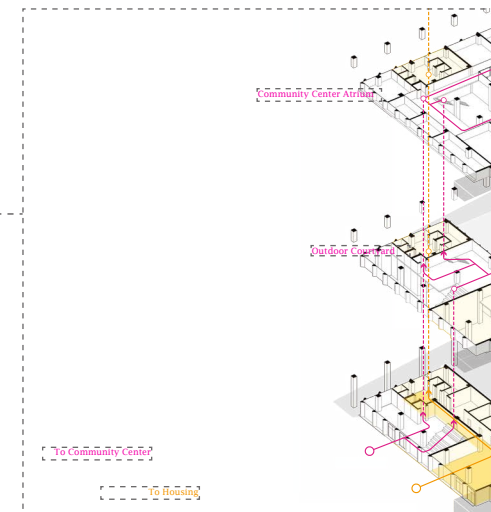
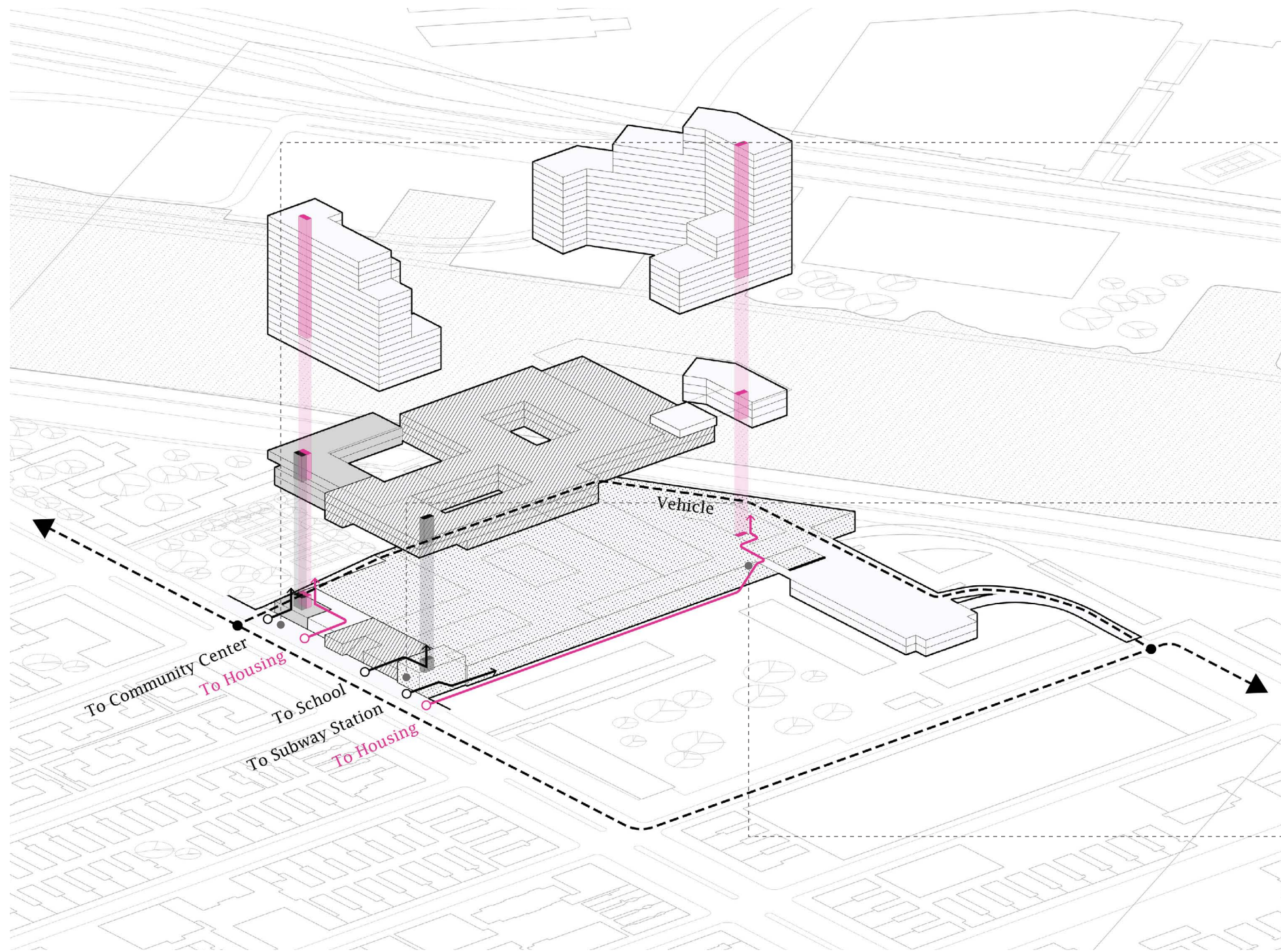


1-bedroom
658 sqft

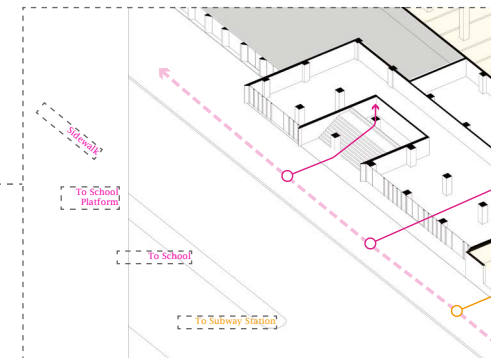


3-bedroom
1344 sqft

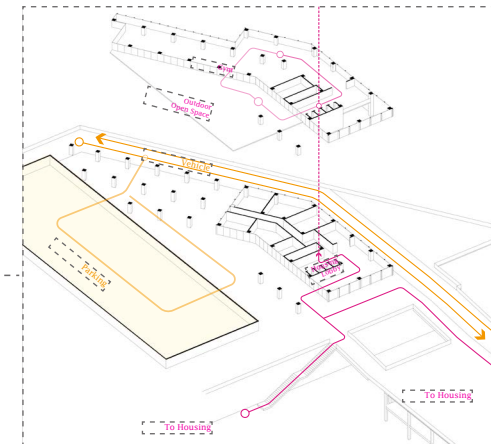




Housing + Community center

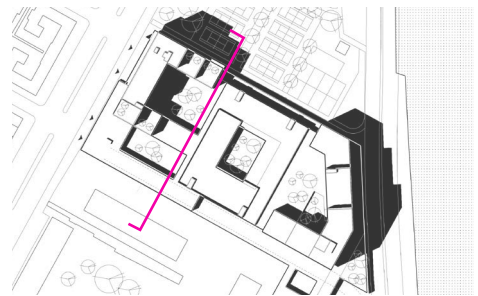


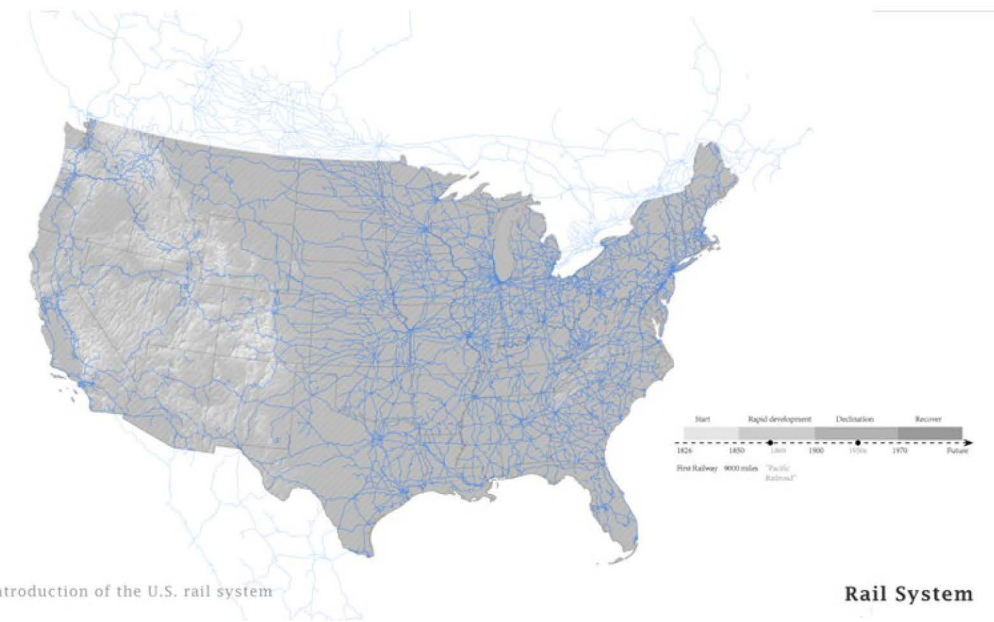
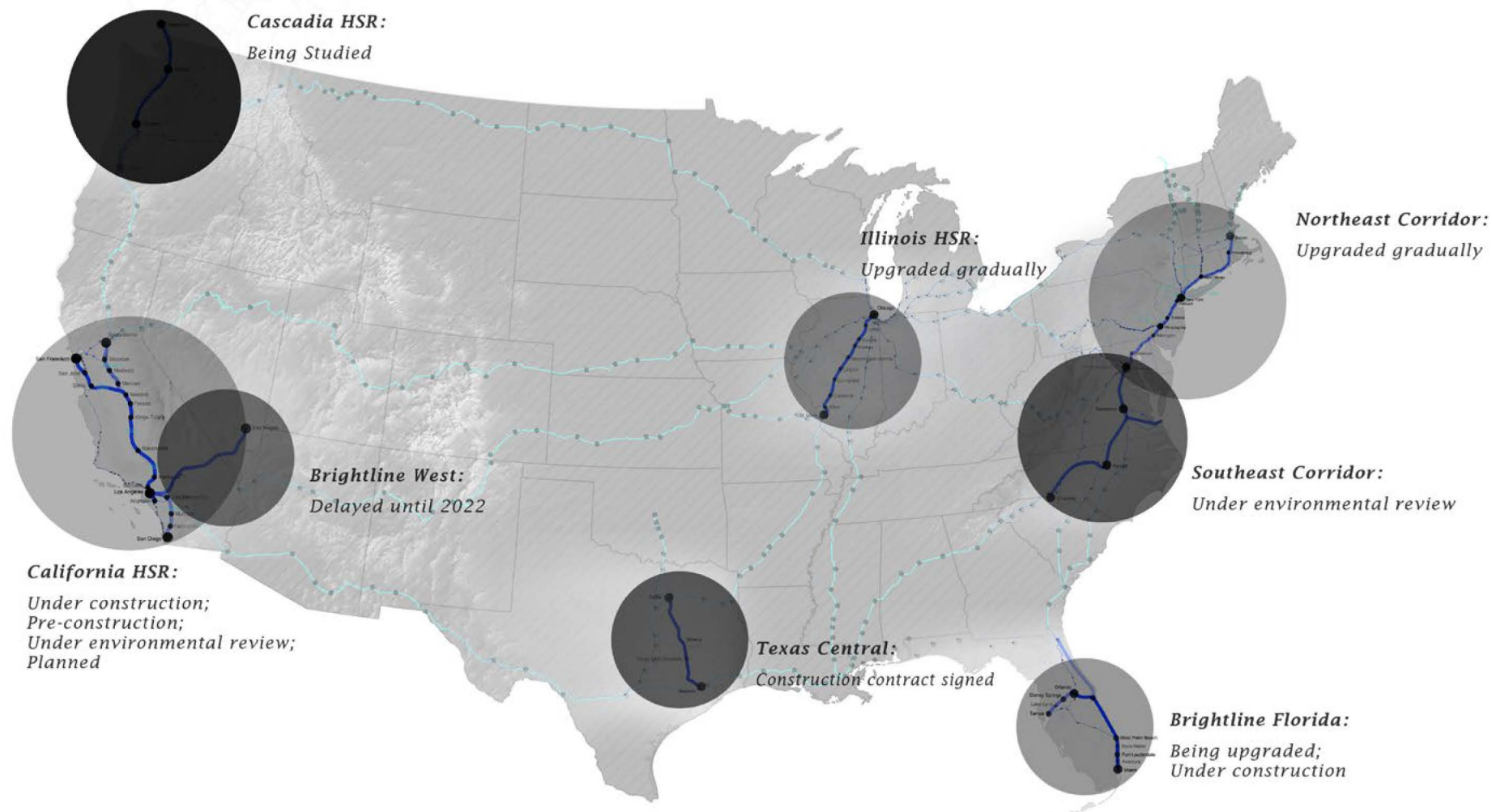
School



Housing

Circulation





03 Better connected (or not) High-speed Rail Infrastructure

Summer 2021 | Academic project | US | Individual Work
Instructor: Marco Ferrari

HSR Definition

Existing Lines
≥ 120 mph

New Lines
≥ 160 mph

U.S. HSR Definition (Speed)

Emerging HSR
80 – 110 mph

Regional HSR
110 – 150 mph

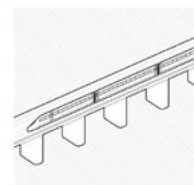
HSR - Express
≥ 150 mph

* 110 mph: Maximum speed without the necessity of providing special protection at highway grade crossings

U.S. HSR Definition (System)

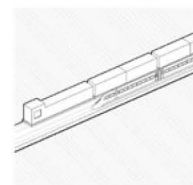
True High-speed Systems

Built specifically for high-speed trains and limited to operation by such trains



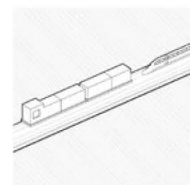
Hybrid Systems

Build a high-speed train system onto an existing rail system



Blended Systems

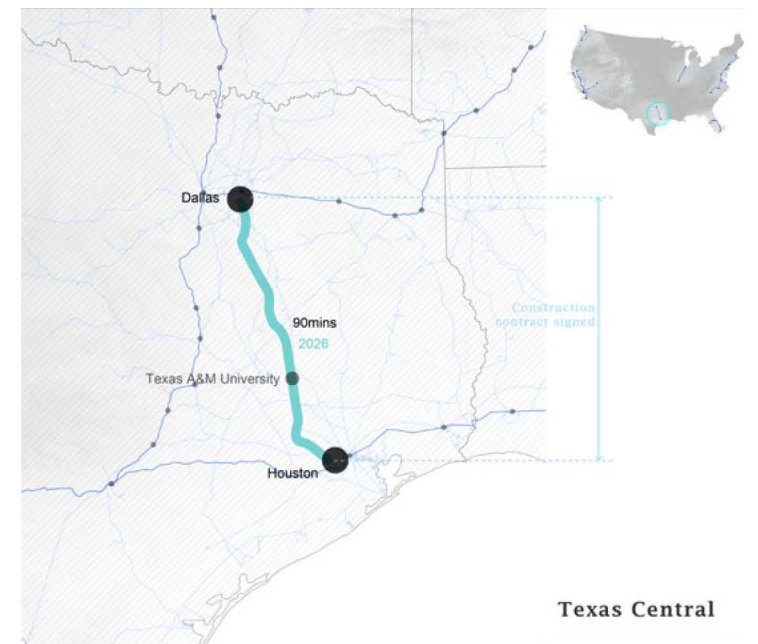
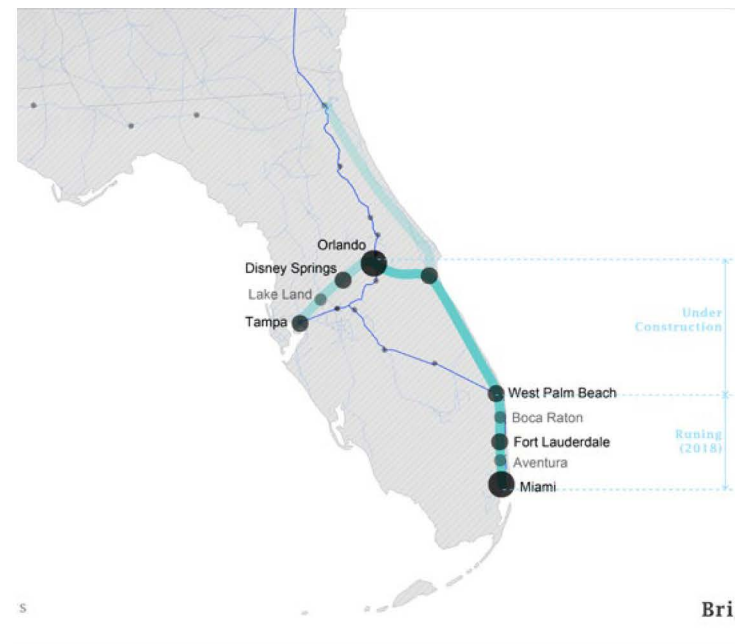
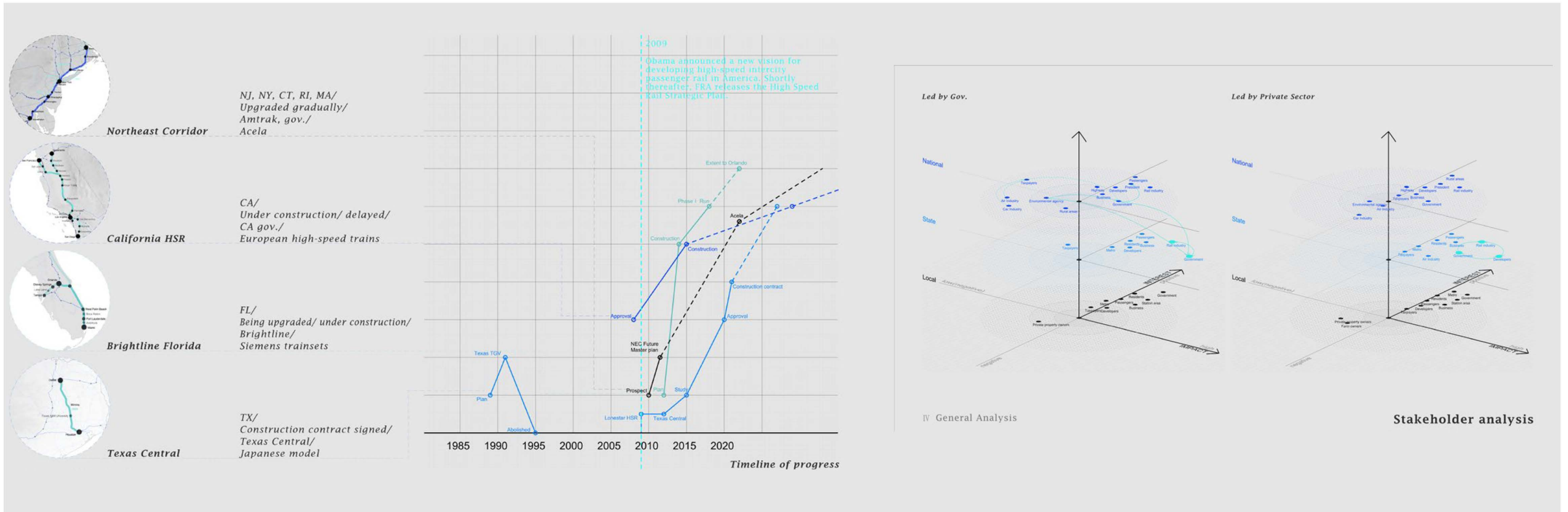
Shared use, by high-speed trains, local or commuter trains, and freight trains, of track



The slogans of HSR projects are always similar: the promise of high-speed connections, economic boom, more employment, and environmental benefits. These same long-term benefits have pushed European and Asian countries to invest heavily on HSR, but they seem not to be attractive enough to the US government. Is this because the United States are reluctant to pay for a future of uncertain profits?

The atlas outlines the history of all the HSR initiatives that have been announced so far, in order to expose the reasons why they have been halted or postponed; it presents specific projects in order to show how the US weighs between the upgrade of the existing network and newly-built HSR lines. Finally, an atlas of hypotheses shows a comprehensive overview of potential HSR projects that encompasses the environmental, economical, social, and political aspects of their development, along with the stakeholders involved in the decision-making process.





Barriers in U.S.

Economical

- High cost
- Uncertainty of profitable operation
- Who take the responsibility
- Difficulty in paying operating expenses (Current Situation)

Political

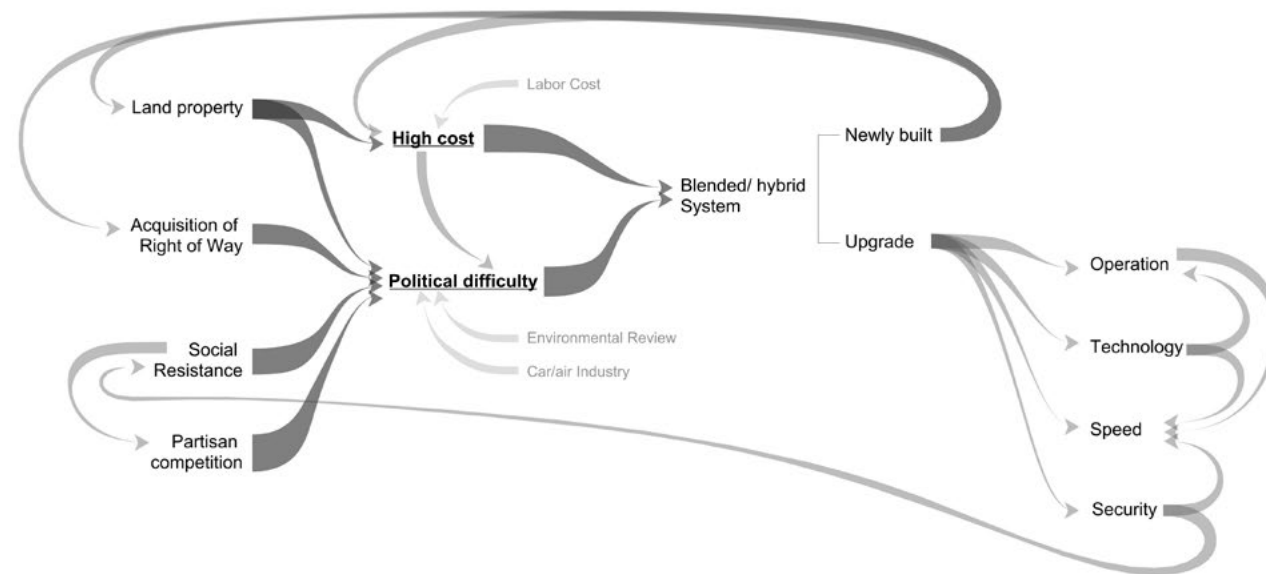
- Red-state-versus- blue-state issue
- Funding at the federal level is nil
- Long-term political process
- Difficult to be interstate

Social

- Car-loving Culture
- Security
- Private Property

Technical

- Structure
- Steep Grades
- Curves
- Maintainence



-Improved airport connections;
-Faster trip times;
-More frequent trains

-Rightline is using modern equipment for passenger comfort and smooth operation.

-More job accessible

-Improve rail service;
-Expand rail capacity;
-Modernize NEC infrastructure

-Environmental benefits (Greenhouse gas emission reduces)

California HSR Project

Another empty promise made to voters in 2008. \$33 billion in 2008 to \$100 billion in 2021

We want that money back now. Whole project is a "green" disaster! (Donald J. Trump)

The real purpose of the California High-Speed Rail project is political. It gives elected officials a continual opportunity to reward construction-related companies and labor unions for their consistent campaign support.

Texas Central

Detours cost time during the 'golden hour' for getting to injured people and fires. High-speed rail makes our job harder (Fire fighters)

A high-speed rail line would cut through parts of the rural county. It would bisect land that's been in our families for generations. (Property owners)

As people dump large tracts of land, developers would move in, building large swaths of tract homes on pristine prairie land. The private company would abuse eminent domain to develop the route.

Brightline Florida

The recent deaths on Brightline tracks have increased opposition to the expansion to Orlando. The interaction with traffic has given the train company a ghastly record with regards to fatalities.

A high-speed passenger train will disrupt their tranquil community.

NEC

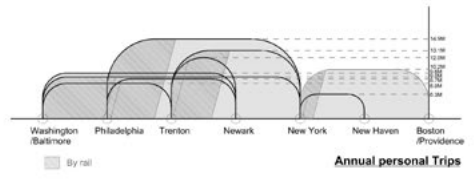
The project would lead to a poor use of valuable urban land in a time where real estate in Boston is booming.

Upgrading them could cost as much or more as building from the ground up.

The system envisioned would never come close to repaying its costs.



NEC improvements



NEC-wide priorities
aim to rebuild assets most at risk of failure to prevent a loss of service

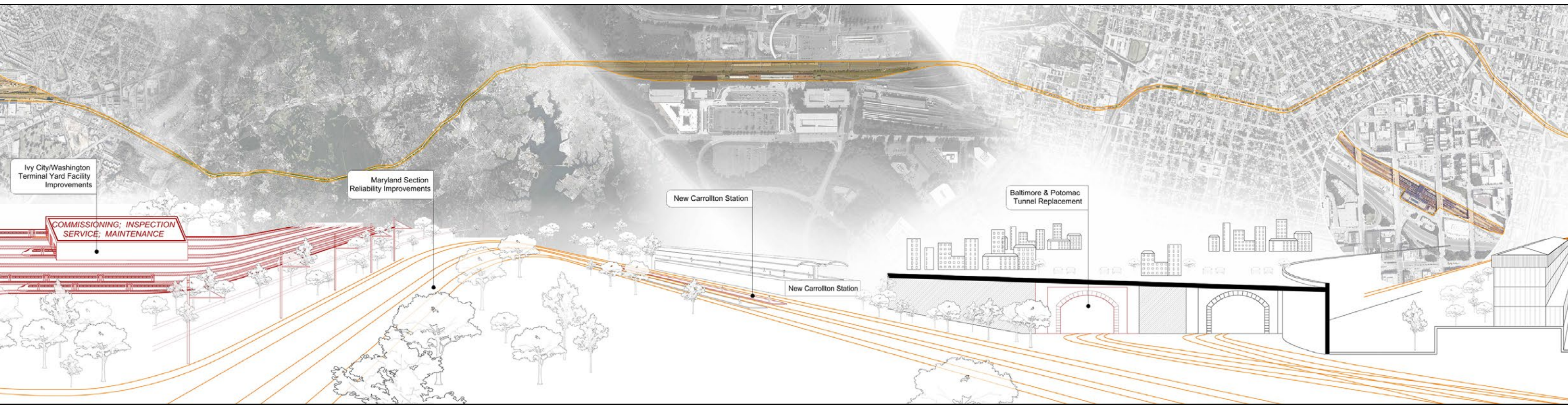
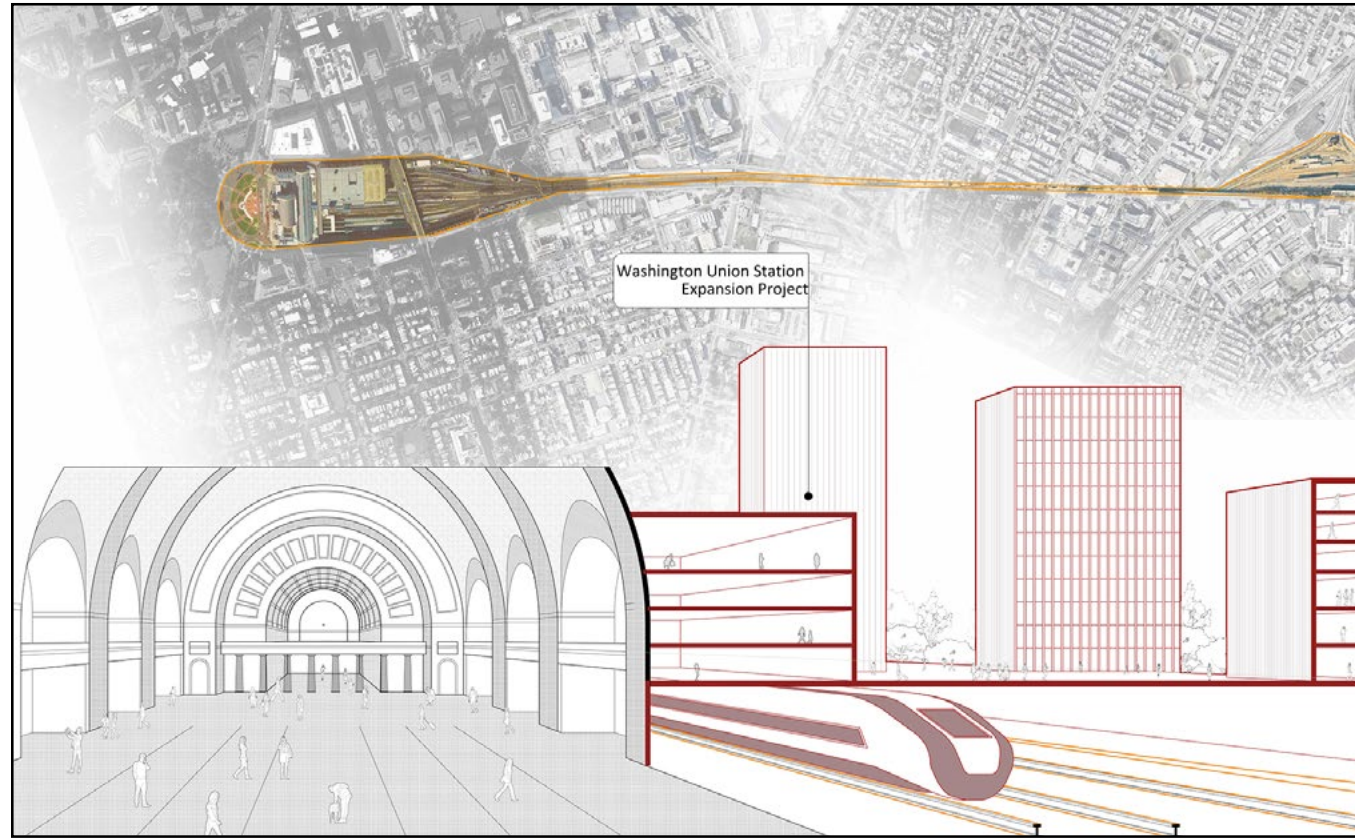
- Portal North Bridge
- Hudson Tunnel Project
- Walk Bridge Program
- Devon Bridge Replacement
- Baltimore & Potomac Tunnel Replacement
- Susquehanna River Bridge Replacement

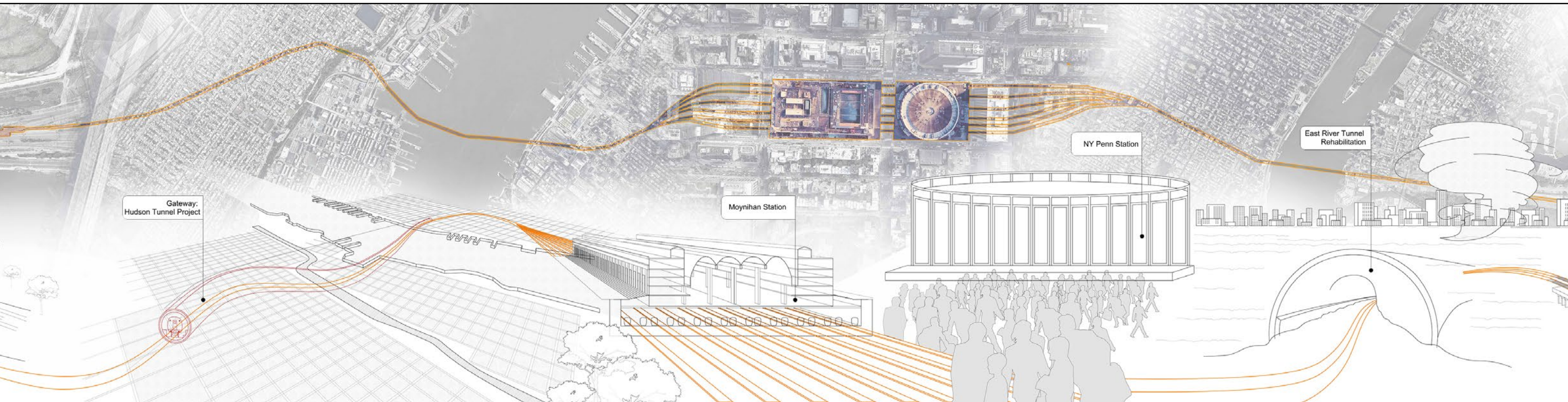
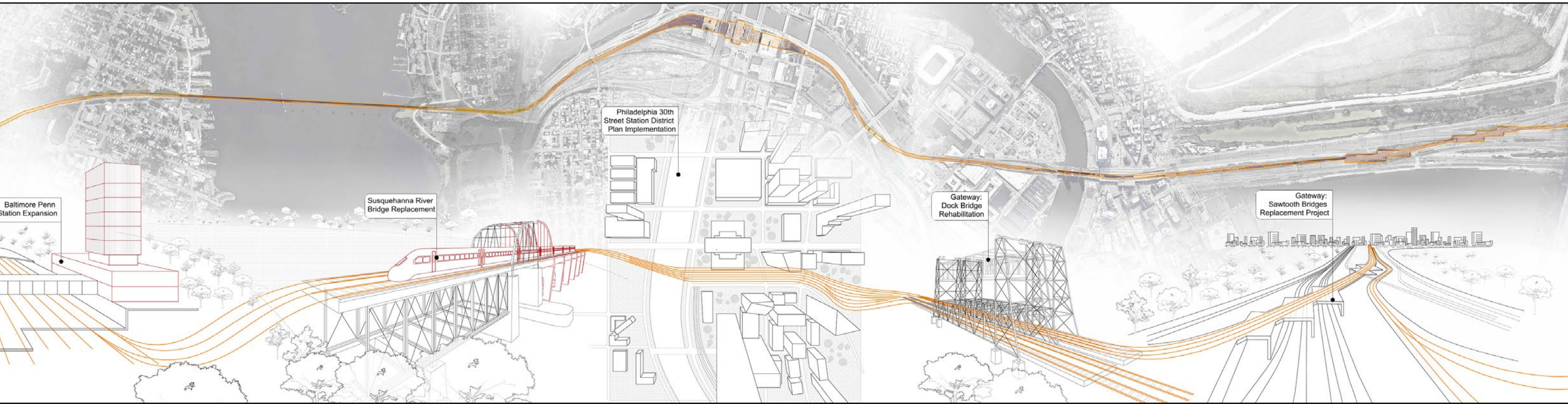
Regional priorities
aim to increase train capacity and improve access to rail

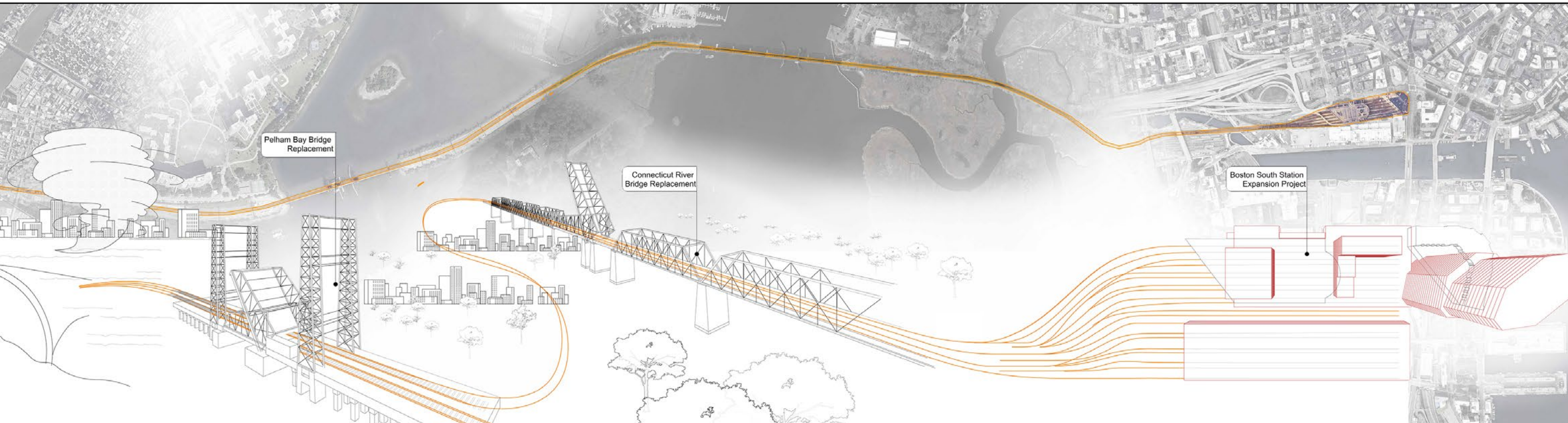
- Boston South Station and Tower 1 Interlocking
- Providence Station
- Mid-Line Loop
- Harrisburg Line Interlocking Improvements
- Washington Union Station Long Term Station Expansion

Near-term investments

Long-term investments

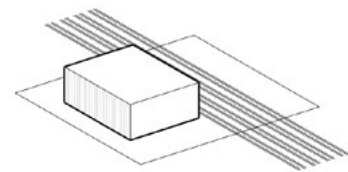




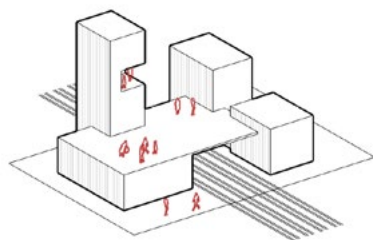


Manifesto

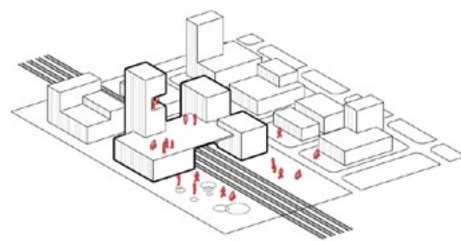
Not only an efficient transportation facilities,
but also public place involving people's everyday life.



Station Only



Transportation Complex



Integrated City Design

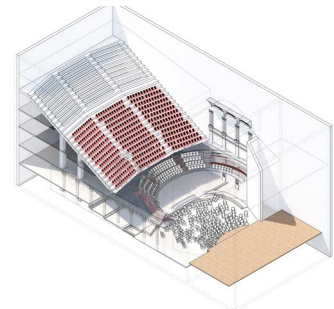
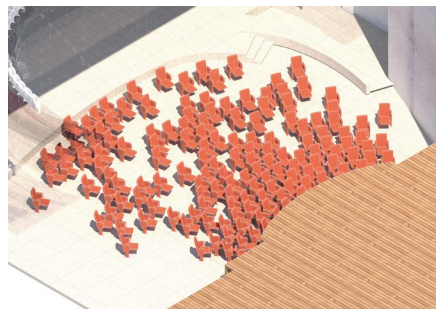
04 Palace Theater View Optimization

Generative Design

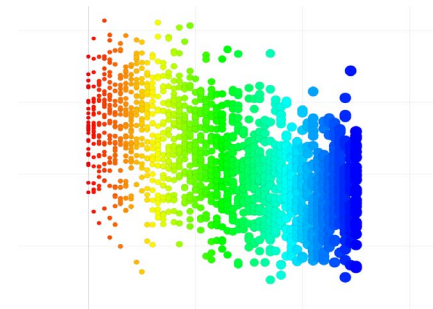
Fall 2021 | Academic project | New York
 Instructor: Danil Nagy
 Collaborator: Shulong Ren, Yunlong Fan, Yukun Tian, Juno Lee

To ensure a good viewing experience is the focus of theater design(Palace Theater as an example). An evaluation system is established for the viewing experience. We tried to minimize sight occlusion area (due to space limitation and unreasonable seat arrangement)by optimizing seat position through Genetic Algorithm in the existing theatres without changing the original building structure. The result of proposal 2 is closer to expectation, which proved the reasonability of the algorithm. Proposal 1 is a brand new attempt to arrange the auditorium. Although the limitation is that the seating arrangement is too chaotic and the space utilization efficiency is low, it has the potential for further development. For example, more complex collision algorithms can be used to make seats less left to right and more forward to ensure audience accessibility.

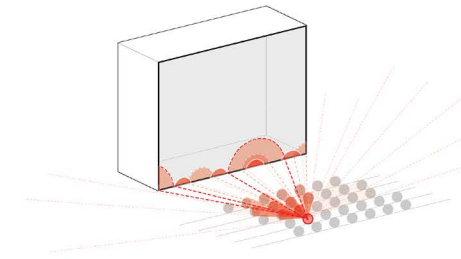
<https://medium.com/generative-design-course/theater-view-optimization-fdd3a732035f>



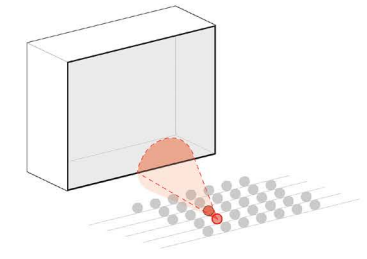
Renderings
by Juno



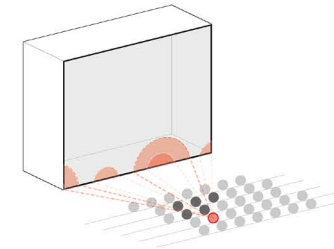
Discover Results
by Xueyin



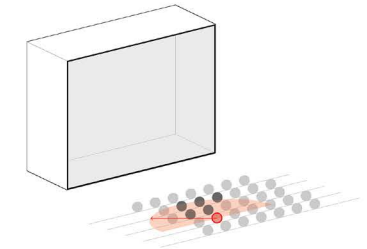
Calculate all the seats in front of the selected one



Use the intersecting area of a cone and the stage as the sight occlusion



Only the seats near the selected one have efficient influence on sight occlusion



Simplify the Calculation:
Draw a semicircle of a certain radius to choose the seats that need calculating

Algorithm:

A cone is drawn with the eyes of a random viewer as vertex and the head of all other audiences as base. After extending the length of the generatrices, we selected the cones that have intersected area with the screening. Those who are far from this audience have little influence, we only calculate cones in a small range to simplify the calculation. We also used collision detection to prevent any two seats from being too close or out of bounds.

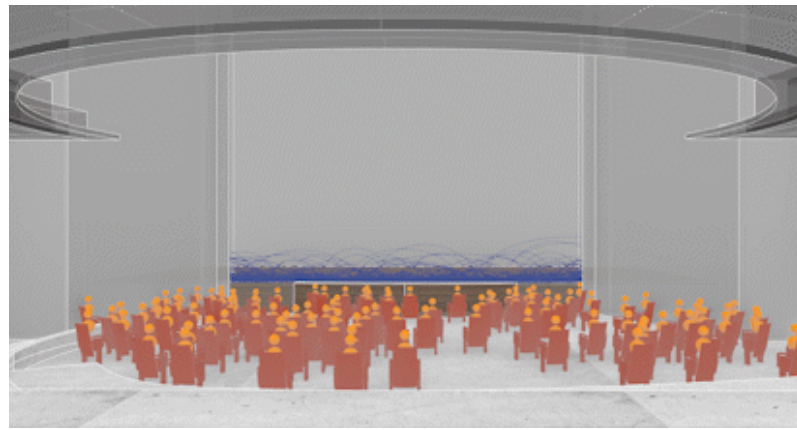
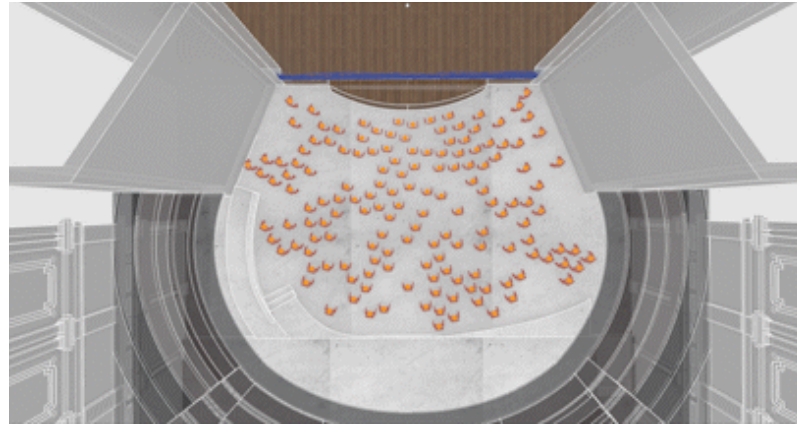
Algorithm diagram
by Xueyin

| Angle of turning head in vertical direction | Proportion of area obscured by stage frame proportion = (a/A) | Proportion of area obscured by front people's head |
|---|--|--|
| | | |
| | | |

| The distance between seat and best veiwing line | Angle at which the seat is positioned away from the center line | Angle of turning head in horizontal direction |
|---|---|---|
| | | |
| | | |

Evaluation system for the viewing experience
by Juno

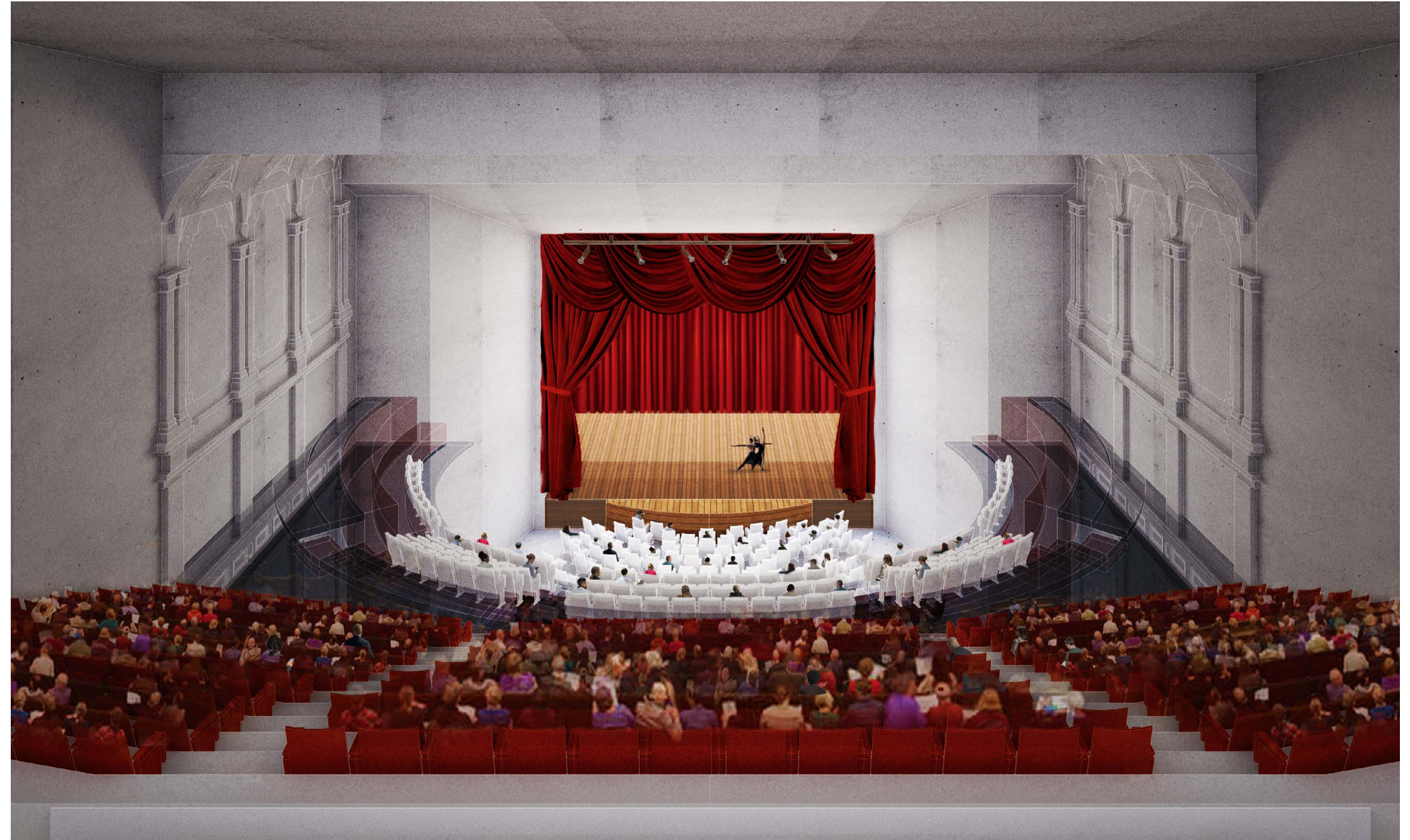
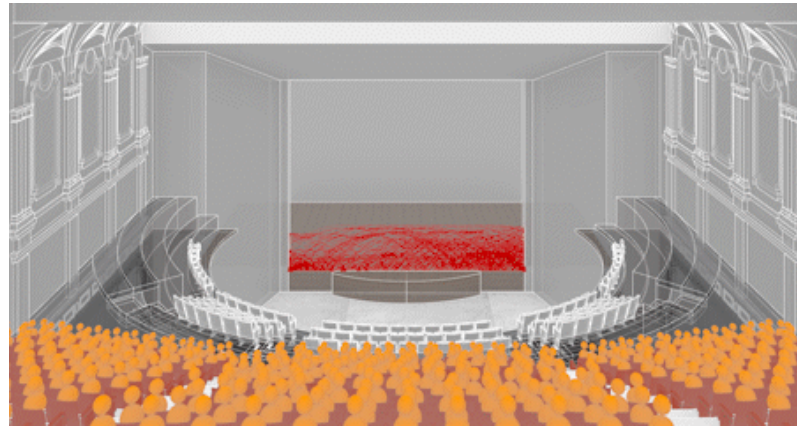
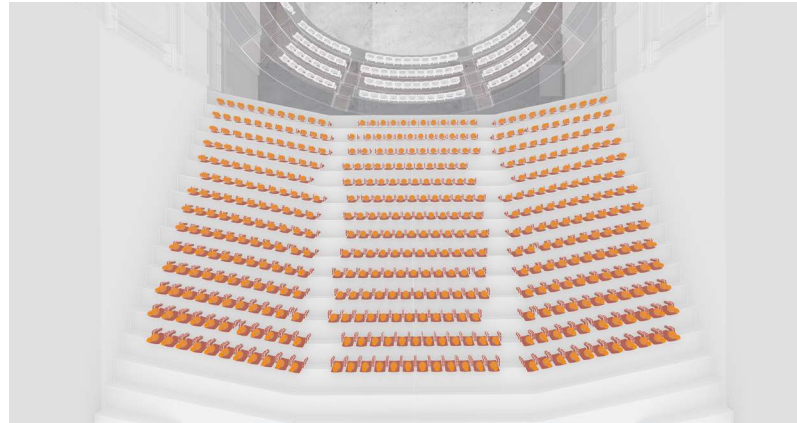
The drawings produced by other members are labeled.



Proposal 1:
For the first floor, we put forward a more radical design strategy. Seats are randomly generated in this area. We then calculate the average sight occlusion area of each choice, and optimize the whole area by Genetic Algorithm. Flexible arrangement can fit different types of performance.

Algorithm by Shulong, Rendering by Juno & Yukun

The drawings produced by other members are labeled.



Proposal 2:
For the upper floor, we kept the traditional arrangement of the auditorium — arranged in rows — and the number of seats. We used the original structure of the auditorium, and only adjusted the left and right spacing of each seat to reduce the shielding area of the audience.

Algorithm by Xueyin, Rendering by Juno & Yukun

The drawings produced by other members are labeled.

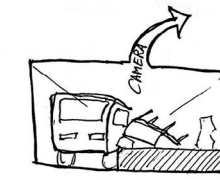
05 The Leap

Model Fictions

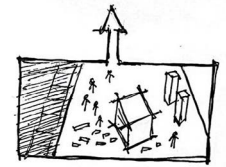
Spring 2022 | Academic project | New York
Instructor: Joshua C. Jordan
Collaborator: Haoran Xu, Haoge Gan

"As climate politics get increasingly polarized and precarious, a massive cultural divide has emerged over whether sunlight is deadly. As awareness of the dangers of the sun become more mainstream, institutions and the public realm comes under more pressure by the sun-risk-avoidant to accommodate health risks by making more things sunless. The conspiratorial sun-seekers flaunt the sun more and more. Florida becomes a sort of social capital for the latter, and Seattle for the former. Between the two, the rest of society must navigate this increasing social, geographical, and environmental division."

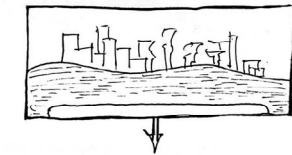
script, provided by Josh



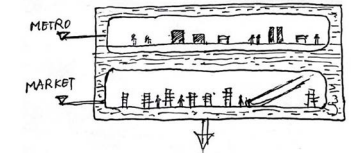
01. The scene starts from a close look to the metro level, to show the mass and the sense of a disutopia. And then camera swish higher, over the station.



02. The scene shows a rolling forward image of the platform. By using some stop motions, where frames people fight for supplements.



03. Then the scene montaged to the big model, and first to show the abandoned world on the ground, then the camera rolls down to show the beneath.



04. After the on-ground image, the camera goes down to show the first two levels, which are Metro platform and Market. By using stop motion to show the moving items and people.

