Architecture For Crisis: Designing a Space Between Public Realms and Healthcare Facilities

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ARCHITECURE FOR CRISIS

DESIGNING SPACE BETWEEN PUBLIC REALM & HEALTH FACILITIES

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I would like to express my sincere gratitude and appreciation to everyone who supported and assisted me during my Thesis Project.

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I would like to express my sincere appreciation to everyone who assisted me in completing this thesis.

- Zerin

ABSTRACT

In 2020, when COVID-19 hit worldwide, many nations ran out of capacity for hospitals, treatments, and facilities, forcing hospitals to expand their facilities beyond their traditional physical boundaries. Even with advanced technologies, supply chains, and economic resources, the question remains for US healthcare and its communities: are people prepared for the next pandemic? Historically, pandemics created similar conditions where overflow facilities and field hospitals were set up in iconic sites such as New York's Central Park during the tuberculosis epidemic. This thesis explores this connection between public space, healthcare, and architecture's role in crisis events.

When the pandemic hit, people built numerous permanent health facilities and temporary field hospitals, transforming public places into alternative care sites. The temporary structures built into the public domain were so abundant that most were dismantled and unused, foreclosing any possible long-lasting connection between the public realm and healthcare. On the other hand, permanent healthcare facilities, such as hospitals, operate on their own spatial and technological logic, often creating no broader connection to the surrounding context or community, creating a sense of barrier to the public. Typically, hospitals were designed so that only the served and service providers could access them, even though they had a large occupancy in the community sphere, opening questions related to broader notions of "care work" that often happens in the public domain.

This thesis will explore the coexistence, revitalization, and regeneration of health facilities and public spaces. It studies the health and social risk factors based on the overlapping vulnerabilities of the high mortality rate, low community resilience, flood, rising sea levels, poverty, and the possibility of another pandemic.

The thesis will research and apply the idea in Miami, Florida. Specifically, the thesis aims to study the current situation of existing healthcare facilities, how they responded to the last pandemic and natural disasters, the flexibility of these facilities, and community resilience. Based on these prompts, I propose redesigning the existing facilities to expand their capacity to serve more patients and accommodate additional staff by extending it into a community facility and turning it into a satellite hospital in the case of the following health crisis. It is also essential for the facility to remain engaged with the community and continue to be involved in public activities, which is a primary concern of this thesis.ning the existing facilities to expand their capacity to serve more patients and accommodate additional staff by extending it into a community facility and turning it into a satellite hospital in the case of the following health crisis. It is also essential for the facility to remain engaged with the community and continue to be involved in public activities, which is a primary concern of this thesis.







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INTRODUCTION



Figure 1 : Scenerios in healthfacilities during Covid 19.

Pandemics, disasters, and wars have existed since the beginning of human existence, and these occurrences have tended to create severe crises in human physical existence. All these crises led people to one institution to rely on, the Healthcare facilities. Healthcare facilities care for human health in severe scenarios and everyday life. Though the technological advancement of these facilities is far beyond imagination, there is still a barrier that makes this facility work to its full extent during an acute health crisis. The question has arisen over the years and is mainly based on the recent events of the pandemic: Why are these facilities failing to provide services in the crisis scenario? Why they still don't have enough services to offer? Can the way these facilities and systems were designed change their fate of failure? Covid-19 was a recent event in which we could see the extreme situation in the USA and worldwide; hospitals and healthcare facilities failed to provide enough capacity for the sudden surge of patients. Healthcare Design approaches were questioned, and architects were most to blame because those facilities were insufficient to handle the overwhelming number of patients. The facilities had to extend to public realms like parks, garages, stadiums, and airports to use these spaces as extensions of these services. Though this practice is not new during COVID-19, history shows that health facilities tend to use public realms as additional facilities during the case of a health crisis. If that is a general practice, this thesis explores the connection of health facilities to public realms during a health Crisis in a more systematic approach. My thesis started with the question of when all the crises and disasters lead people to healthcare facilities and how these facilities can successfully accommodate people who need care when the severity of this crisis rises. Based on capacity building, the question remains creating more hospitals would be a solution?

more hospitals ?

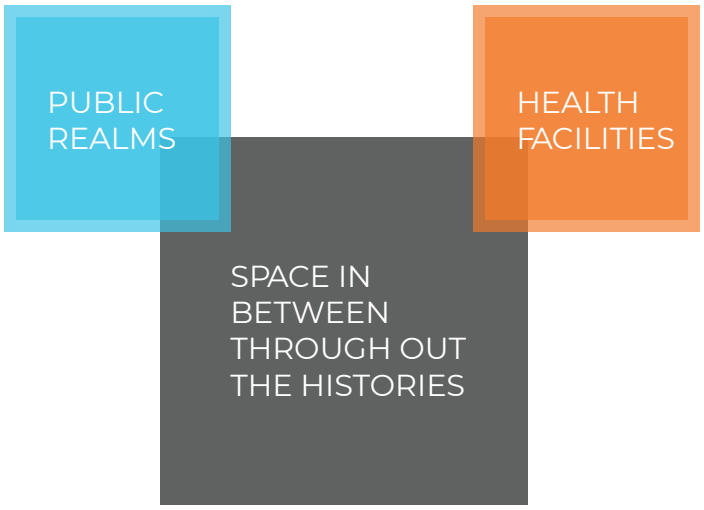


Figure 2 : The domain of the proposed research

Addressing Health Crisis and Possible Solutions

In this kind of extreme crisis, the main facilities that serve people are healthcare facilities, which may become out of capacity when the situation becomes more acute. In this scenario, the immediate solution could be building more permanent and temporary structures to accommodate the expanding need. However, when the crisis is minimized, these structures remain in question. The recent examples of temporary modular hospitals during covid 19, which were dismantled in a few cases, were transformed into convertible public spaces, and the permanent hospital that was built may not need patient beds and stuff as much as necessary during the pandemic.

As the coronavirus spread, the hospitals started to overflow. Different organizations immediately began to build a large number of temporary field hospitals. However, the lack of trained staff and the betterment of the situation led these hospitals to shut down. Moreover, building these temporary structures without a vision for the future, as when the pandemic is over, the reason they were built will be invalid. For example, the Billie Jean King National Tennis Center in Queens, New York, was transformed into a hospital for $52 million and served only 79 patients before it closed.

The city spent at least $52 million to transform the tennis center into a field hospital. Still, the facility ultimately treated only 79 patients. Credit...Hilary Swift for The New York Times

Even from the past cases, during the tuberculosis pandemic in the early 1900s, the was transformed into a tuberculosis hospital from a private residential property in Louisville, Kentucky, which eventually became a ghost building after the pandemic, and literal ghost tours are arranged on that building after getting abandoned.

On the other hand, the other solution was to build more permanent hospitals, for which, based on the present hospital design, the service span of these hospitals is getting shorter. Modern hospitals, designed in a typical rigid manner, tend to look like vertical fortresses with shorter life spans than the older healthcare facilities.

A thorough study by OMA to figure out what the future of these health facilities should look like when they needed to be expanded during crises and pandemics started way back into the history of designing healthcare facilities. In their research, OMA figured out that when mass-scale healthcare was needed, they used temples and monasteries to treat those patients; from there, humankind shifted these services to dedicated healthcare facilities over time. Their research studied the survival timeline for these healthcare structures and found that modern hospitals have the shortest life span and get abandoned within the shortest period.

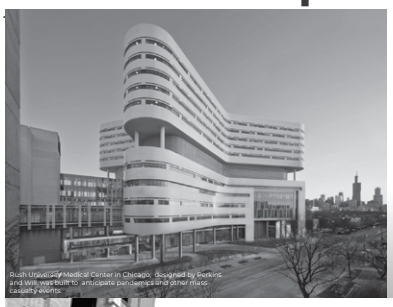
Abandoned Hospitals when pandemic is over ??

Pandemic is over, purpose is served, hospital got abandoned

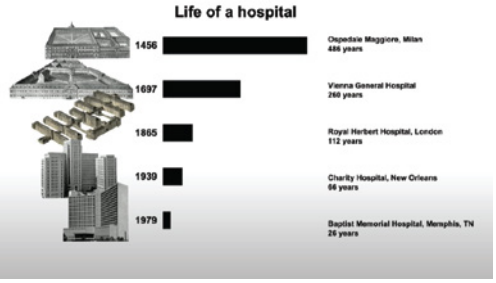


Waverly Hill Sanatorium

Modern Hospitals with shorter life span ??



Rush University Medical Center in Chicago, designed by Perkins and Will, was built to anticipate pandemics and other mass casualty events.





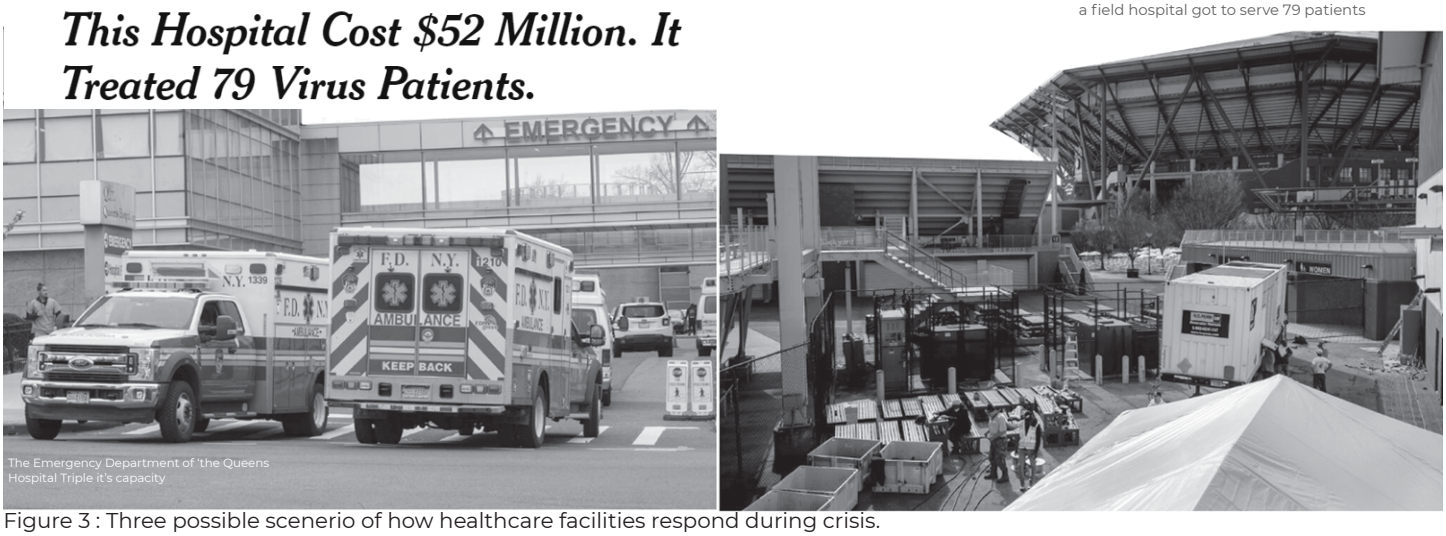
Hospital St. Luc, Montreal

St. John General Hospital

Millard Fillmore Gates Circle Hospital, buffalo

Field Hospitals without future purpose ??

The Tennis Court at Queens that turned into a field hospital got to serve 79 patients



The Emergency Department of 'the Queens Hospital Triple it's capacity

Figure 3 : Three possible scenerio of how healthcare facilities respond during crisis.

Health Crisis and Relation to the Public Realm

The given scenario is familiar as the research focused on how the health facilities and the public domain collided during the crisis. Looking into the public spaces in the urban US, the healthcare facilities were shaped by the problems they were dealing with from that era. In the 1800s, when the US was dealing with the tuberculosis pandemic, the city planner was focused on designing more parks and open spaces to make the cities greener and pollution-free. As a result of such thinking, the USA got Central Park, NY. However, the health improvement initiative to build the central park and the adjacent hospital around the park began to evolve.

The hospitals around the park started to add balconies to their floor plans for the tuberculosis patient and keep their bed in that outdoor space facing the garden to have the fresh air filtered by the surrounding greeneries. Not only did this significant role play a part during the health crisis, but the Central Park of Ny was also used as a pop-up hospital for injured soldiers during the World Wars. The same idea and specific site were used for pop-up hospitals when the COVID-19hit. However, it's an example of how a public space can evolve to provide service during the health crisis within the USA. However, it is pretty well accepted worldwide; though the pandemic and the pandemic are undoubtedly a curse for human beings, they have led to pretty big medical innovations over the years, and the innovative addition always required spaces that the public domain could always provide.

OMA mentioned in their research that the rigidity of the design of these permanent modern healthcare and hospitals and the verticality make these structures look like fortresses, less interactive, and more isolated. Their research raised a few interesting points about the design of modern permanent healthcare. How should it expand over time, even when considering designing a hospital during a pandemic? To answer the question, they figured out how to create a hospital where the people and the facility coexist.

OMA raised all of the questions about how the future of healthcare should look. They challenged the verticality of the hospital's design and expanded it horizontally. They suggested that the hospitals of the future should be built so that they can develop themselves horizontally in an automated way.

The research of OMA Questioned a few conventional design techniques for healthcare and brought them into more public realms. These studies worked as a guideline to shape the following questions to deal with future health crises during a pandemic, war, or disaster. The questions raised for the research are?

- Does creating more healthcare facilities solve the capacity problem for US hospitals during a crisis?
- Which will be more efficient, creating temporary structures as hospitals, converting public facilities to hospitals, or constructing more hospitals? Temporary premises consume more resources than permanent premises.
- What will happen if we blur the domain between public realms and healthcare?



Figure 4 : Healthcare facilities and design approach .**Image Source : OMA**





Figure 5 : The adaptive use of central park over the centuries

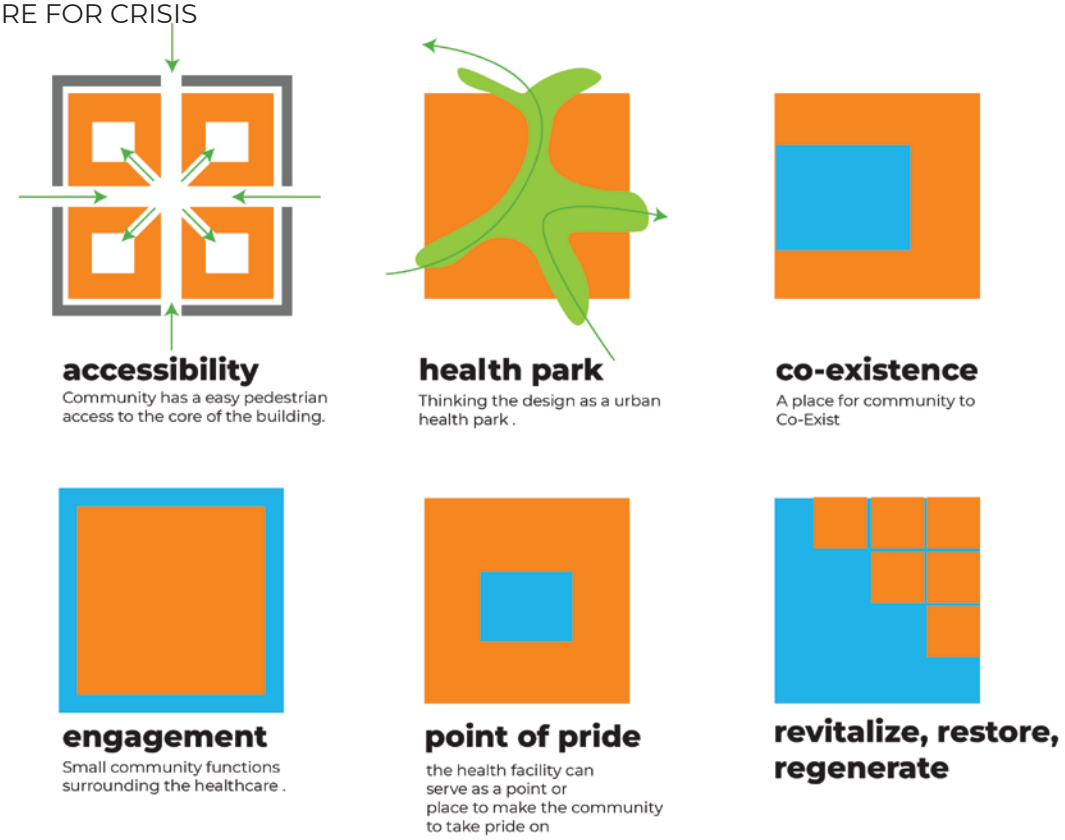


Figure 6 : New Design approaches of Healthcare Facilities explored by leading design firms.

Thesis Question and Proposition

The experts in healthcare have put forth a crucial question regarding the design approach for healthcare facilities. They're pondering whether the public should have a say in shaping these facilities to some extent. Furthermore, they believe that the community being served by a healthcare facility should have an active role in its maintenance during times of crisis. The design approaches for healthcare facilities are undergoing significant changes, and below are some examples of how these changes are taking shape.

Upon thorough discussion of the topic, it is abundantly clear that during a crisis, healthcare facilities must go beyond their standard services and extend their reach to the community. Hence, this thesis emphasizes the potential of creating a two-way systematic process that would transform healthcare facilities into approachable community facilities. Such a transformation would have the power to restore and revitalize the community, and thus demand urgent attention..

Based on this, my thesis examined whether this invasion of hospitals into the public realm during a crisis is the regular scenario, so why not make this process a systematic and regenerative approach between healthcare facilities and public realms and create a more inclusive approach to design for both facilities?

PUBLIC REALM TO HEALTH FACILITY

HEALTH FACILITY TO PUBLIC REALM

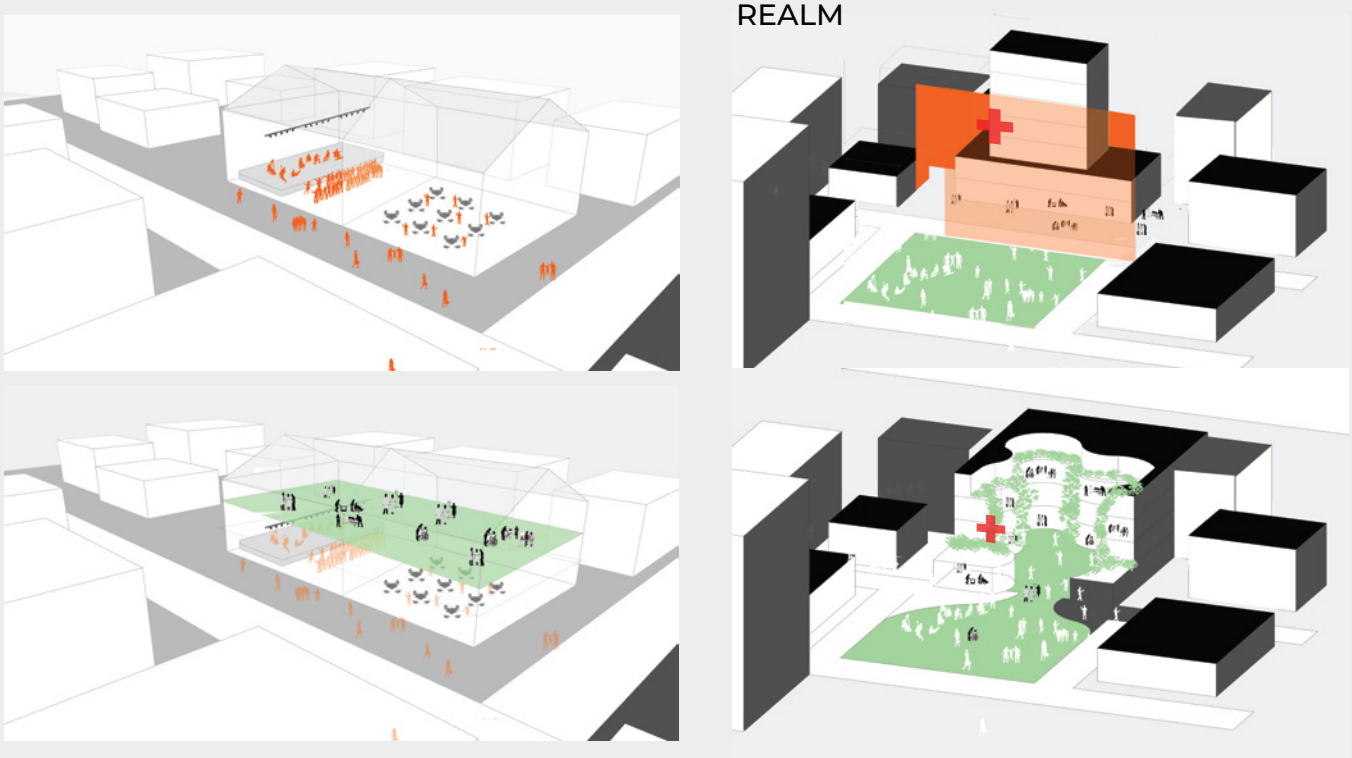


Figure 7 : Systematic transition between Healthcare Facilities and Public Realm



Create an invigorating park-like ambiance for Caregivers and the general public.

Courtesy of Khoo Teck Puat Hospital

Literature Review

As the research is not a new idea, but with the recent events, the idea got new dimensions of thinking: to question the rigidity and conventionality of the present healthcare facilities. Under this section, the resources reviewed were mainly based on the past pandemic, how the design dealt with them, how covid 19 revolved the public spaces into hospitals, and similar aspects of the invention. Under the literature review, the aim was also to examine how the areas and the structures are adaptive and flexible in different situations.

The other Idea generated is to provide healthcare to people in emergencies by making the facility modular and portable. The idea was to use the available resources on the site, more likely prefabricated containers, and make them mobile, transformable, and adaptive based on the number of patients and caregivers and the facility's capacity. The modules were done in a way that was fully equipped with the health equipment based on the treatment and was assembled in a brief period. This idea is an innovation of the architects and a vast collaboration with urban planners and engineers. The open public spaces in the dense infected area could turn into well-equipped temporary healthcare facilities without hampering any existing activity on that site. Another idea emerged during the covid situation, where the emergency was so severe that it was impossible to transport those modules to the site or bring people to the facilities.

As the initial idea of the research popped by the concept of how to deal with the next pandemic similar to covid 19, the initial literature resources are the solutions towards coping with the pandemic. The book, '**RETHINK DESIGN GUIDE Architecture for a post-pandemic World, By RIBA Publishing',** works as a design guide for how the major architecture sectors can be rethought based on the needs and necessities of the post-pandemic world. The book contains guidance for designing significant buildings and spaces like housing, healthcare, hospitalities, and urban areas to cope with the aftermath of Covid 19.



Figure 8 : Books for Literature Review .

The reason to look in the book was to look at the guidelines for healthcare and public spaces. In addition to the book, **'Space, Structures and Design in a Post-Pandemic World '**By, Thomas Fisher looked into the different domains of the spaces and drew a guideline on how those spaces should adapt after the pandemic. This book talks about how the daily design aspects of architecture have changed after the pandemic. Moreover, this book also works as a guide for the questions on how we should behave and act on a personal, professional, and social level to deal with the aftermath of the pandemic from the architectural point of view.

Another worthwhile read to find the solution to how the public domain should evolve with the pandemic from a multi-disciplinary point of view. 'The Pandemic Effect: Ninety Experts on Immunizing the Built Environment ' by Blaine Brownell, this book is a thoughtful compilation of responses to the Covid 19 situation, not only for the present but also the precautions different professionals are working on for the future crisis in cities and building environments by the architect and scholar Blaine Brownell. In this book, Brownell looked into the history of different pandemics and pointed out the innovative outcomes through it. His book contains 99 case studies that work as a great source of strategies to guide future scholars and architects to different solutions to similar situations and help them with an introduction for further research. Brownell looked into the innovative outcomes of the pandemic. Among the ninety-nine responses, some cases focus on the adaptive use of spaces during a pandemic, which aligns with this research's interest.

While the research is to determine whether the designed space helps the healthcare facilities enhance its adaptability and flexibility, it is essential to be familiar with the term and how the 'Flexibility' of a structure will serve the purpose of the research. 'Flexible: Architecture that Responds to Change' Book by David Kronenburg and Robert Kronenburg This book is one of the pioneers of the modern idea of making architecture flexible and responsive to the changing needs of society and the community. Though the concept of loose structure and adaptability is not new, the authors looked into history, mentioning the tens and huts and how they were made with flexible materials and this excellent responsive quality to their surroundings. Based on the design quality, those tents were lightweight and even practical. Mentioning the history, the question of the authors was, why are we failing to design our buildings and spaces in a way that they are adaptable to the changing needs? The author mentioned four qualities of architecture that a building should achieve to have flexibility; Adapt, Transform, Move, and Interact.

Though the buildings from modern architecture, which are brick and concrete, could have adapted to the needs of the century and even interacted at some point, when the question is about transforming and moving, the author talked about getting over the rigid nature of the buildings and getting into more adaptive and sustainable materials—structural and Constructional innovations, which the authors thought were the main to achieve flexibility.

Case Study

1. AL DAAYAN HEALTH DISTRICT MASTERPLAN, QATAR, BY OMA

Based on their research for future hospitals, OMA designed Qatar's Al Daayan Health District Masterplan. Oma designed the hospital more like a hospital and health village, and the main idea was to expand the hospital horizontally in an automated process when needed.

They designed the hospital in modular units of corridors, inpatient units, nursing stations, and courtyards and made all departments arranged in various combinations. They created and alleged the whole thing to add and subtract any module from the main design.

All units are prefabricated except the corridors, which are 3D printed on the site with various combinations of motifs.

The courtyards are used for social interaction space and for patients to access nature. These grounds are also used as agricultural space for medicinal herds to make medicine by the hospital.

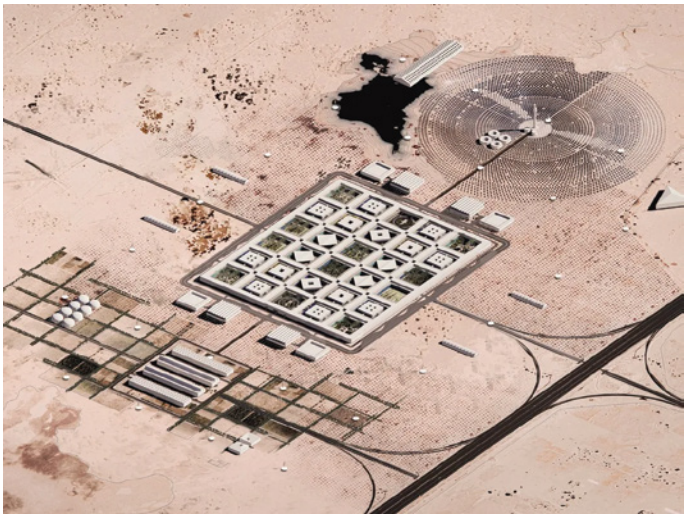


Figure 9 : Areal View of the Hospital (Source : OMA)

Function-wise, the hospital has more generic functions as a hospital. The peripheral building is the administrative quarters, and the inner modulable parts are the main hospital area.

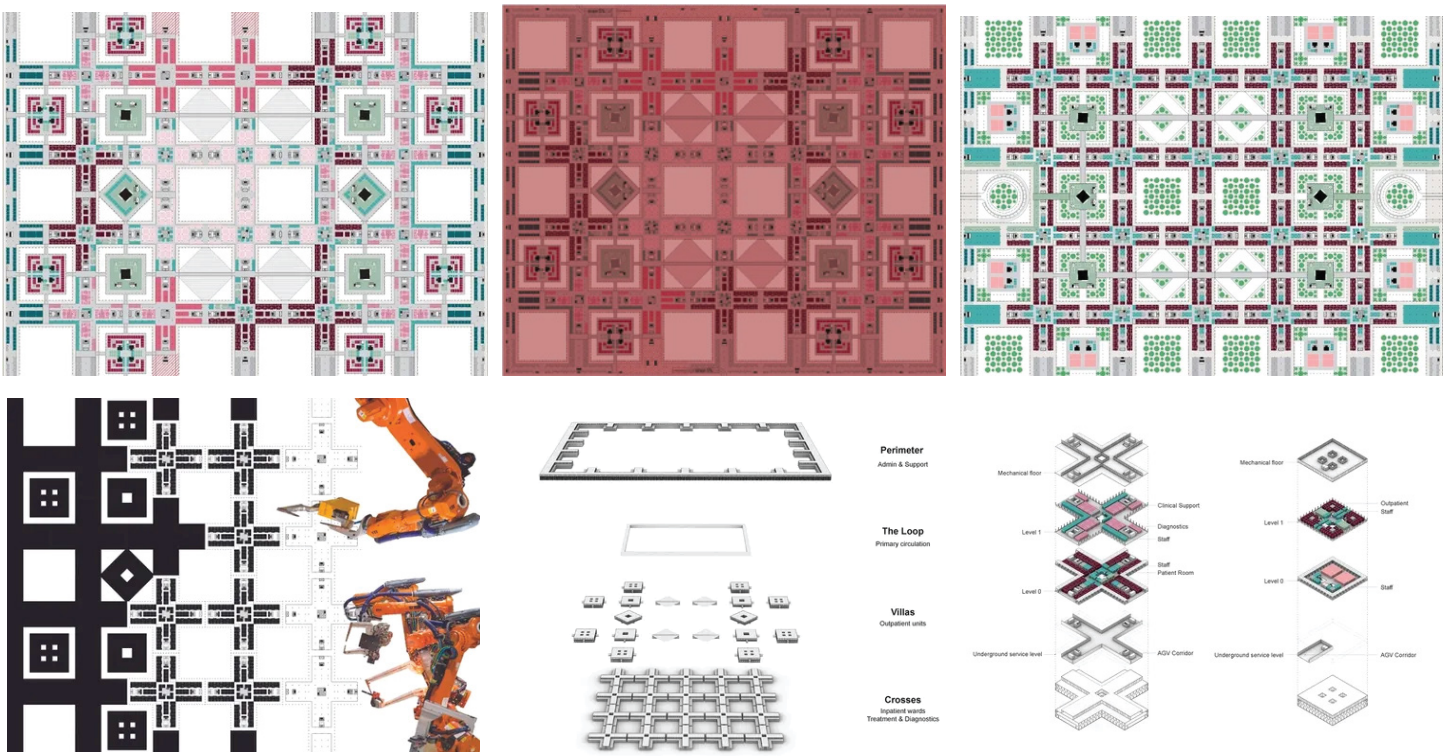


Figure 10 : Plan and Layout Development of the Hospital (Source : OMA)

"A hospital is the house of man. The key is the man, his height, his step, his eye, his hand. That's why the starting point will be his accommodation, the hospital room."

-Le Corbusier,

2 : Counterfactual Venice II - At that time, Le Corbusier was about to transform the city.

Venice Hospital, Designed by Le Corbusier, was a non-built project of the architect to challenge the traditional hospital design strategies of the time. The architect visualized the building as a part of the urban fabric of the city and designed it in a way that feels more open to the community.

The Mat design technique is one of the unique features of the functional organization of the building. It allows the building to create these open outdoor spaces that allow the user to connect to nature. It also opposes the typical hospital layout and functional organizations as the patient rooms and nurse stations are designed in clusters rather than simply arranged against linear corridors.

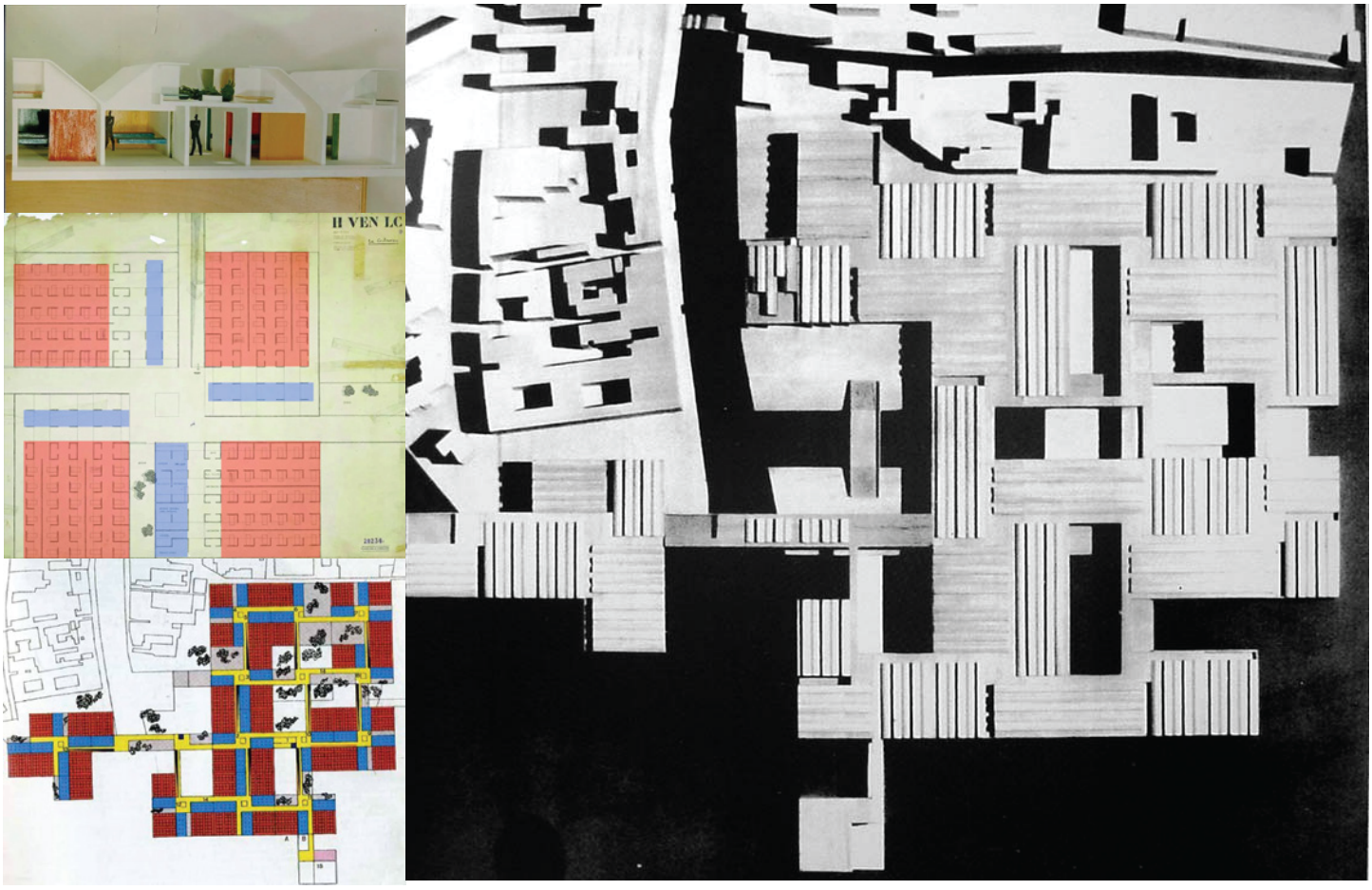


Figure 11 : Plan and Diagrams for Venice Hospital (Source : Archdaily)

3 : Plug-In City - by Archigram

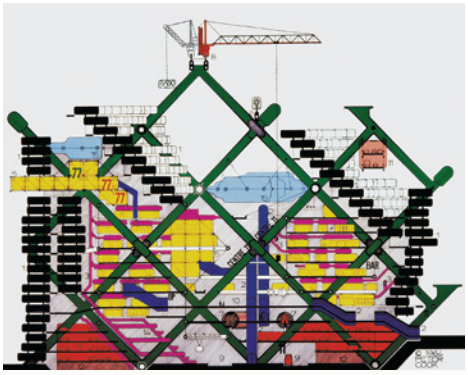
The visionary project of Plug-In City by Archigram inspired the thesis to contemplate a significant institution or plan on an urban scale that can be viewed as a dynamic system. The concept drew inspiration from emerging technologies, such as prefabrication, mass production, and transportation systems, to create a city that could grow and expand naturally over time.

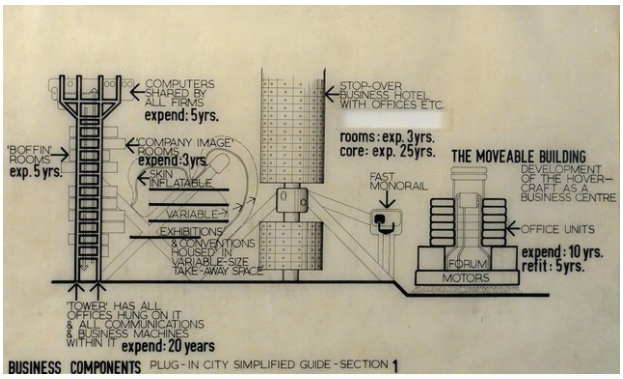
The main objective of Plug-In City is to achieve mobility and transformability of the urban context, enabling the city to adapt to changing demographics, economic conditions, and social dynamics.

"So it lifts the city off the ground and it enjoys space in a different way, because there are certain pieces of enclosed space that then become public areas,"

"The mega-structure that you hold the dwellings on can start to sprout up and become relatively high-rise and contain more public open spaces inside it."

-Peter Cook





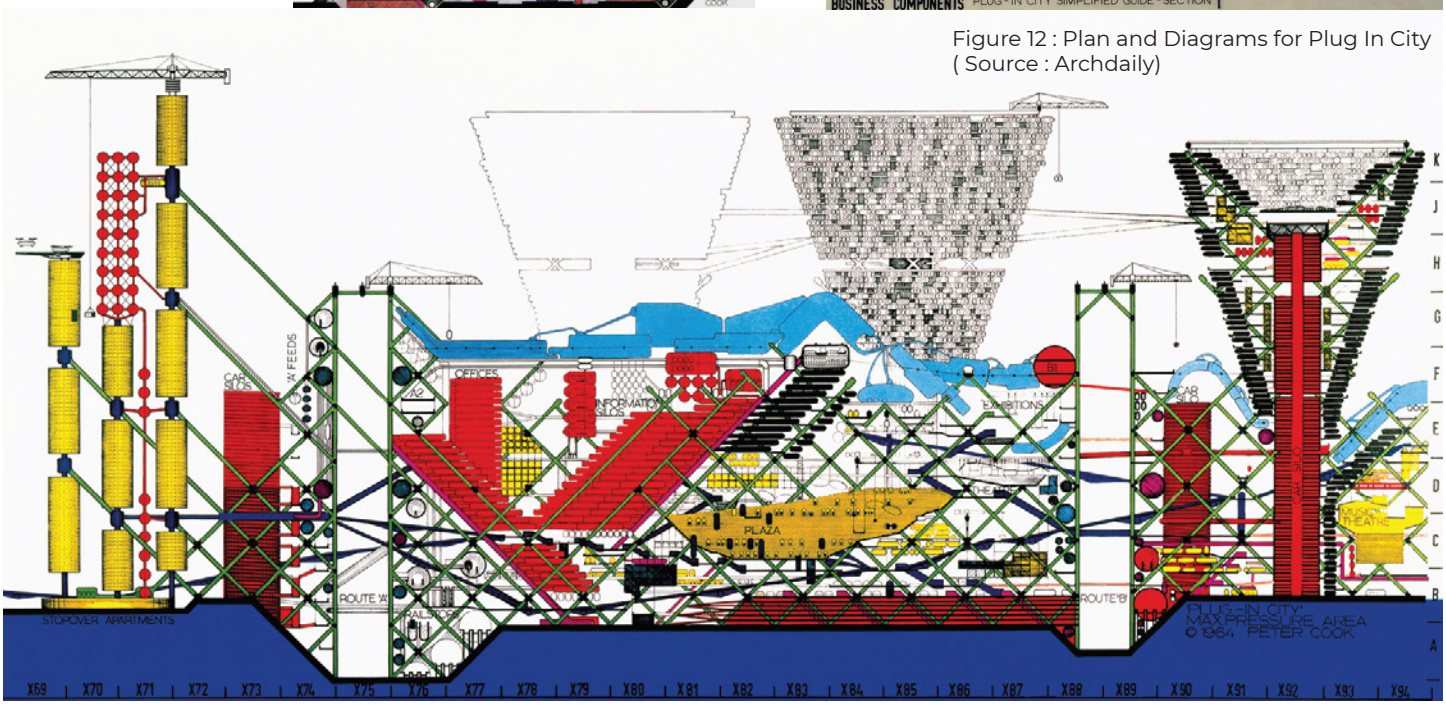


Figure 12 : Plan and Diagrams for Plug In City
(Source : Archdaily)



4 : Think Belt by Cedric Price

Thinkbelt is one of Cedric Price's most innovative projects that challenges the typical concept of institutional designs. Originally conceptualized in the 1960s, Thinkbelt aimed to revolutionize transportation, education, and urban infrastructure by transforming Britain's obsolete railway network into a dynamic educational network.

The core concept of Thinkbelt involved repurposing underutilized railway lines and stations to create a network of mobile and modular educational units. These units could be effortlessly moved and reconfigured as per the students' requirements. A fleet of adaptable trains would connect the units, enabling students to move freely between different locations and access a wide range of learning environments. This flexible approach to education challenged the conventional notion of static campuses, emphasizing the need for flexibility, experimentation, and interaction with the surrounding environment.

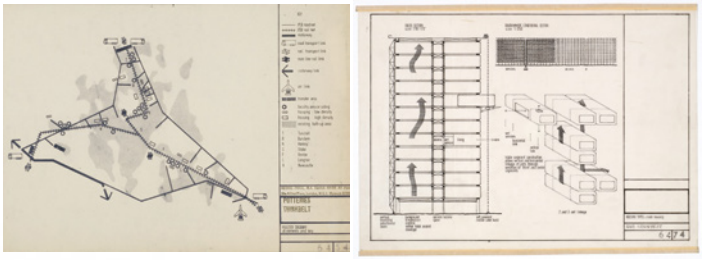
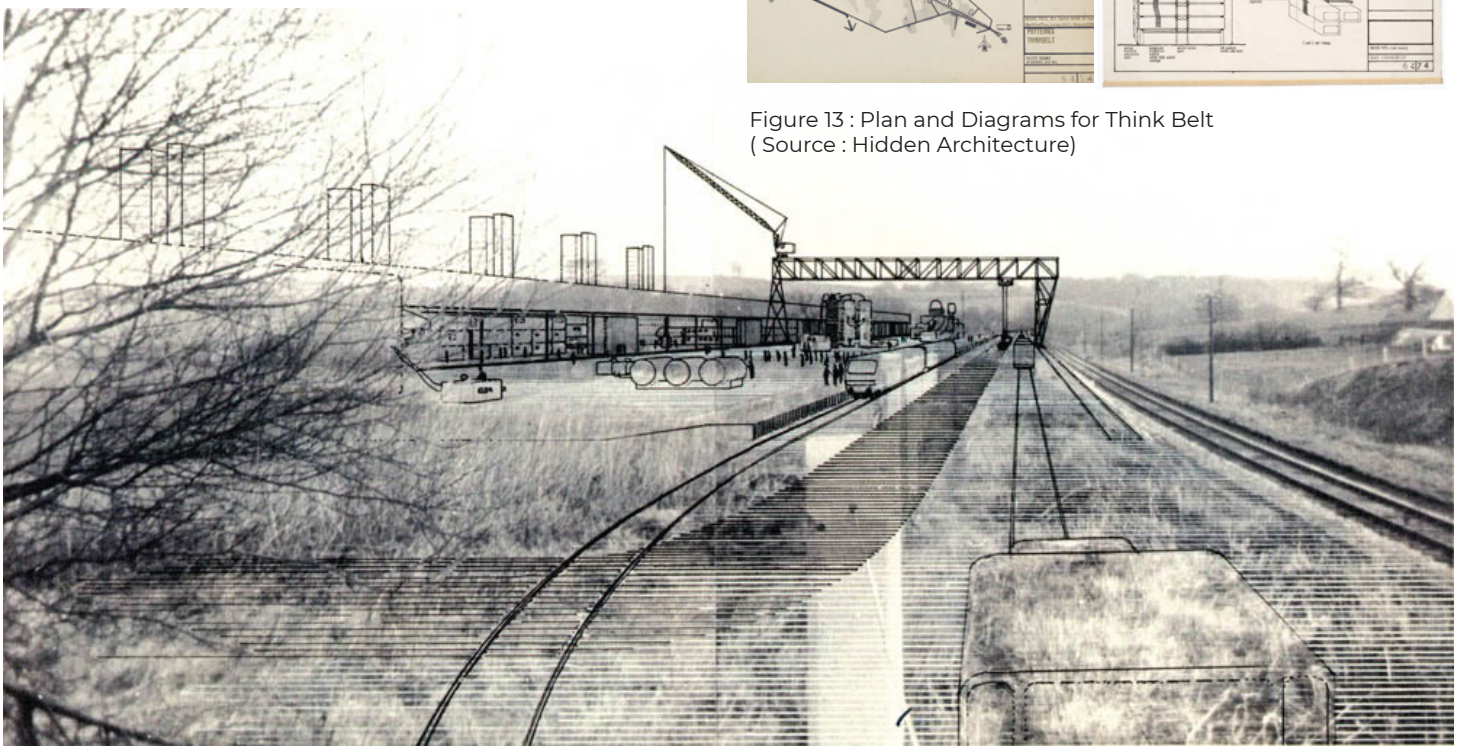


Figure 13 : Plan and Diagrams for Think Belt
(Source : Hidden Architecture)



Methodology

Hypothesis and Information Gathering:
In the initial stage of the research, It is essential to identify the type of crisis to deal with in the general study and how to manage the situation based on the architectural solutions. As the current research is more aligned with the scenario based on the recent pandemic, reimagining the health service-providing system and capability can respond to crisis management through architecture. As a part of the process, it is vital to know the exact scenario of how the USA has managed to survive the past health crisis. It will also look into the pandemics and their architectural responses worldwide over the past few decades.

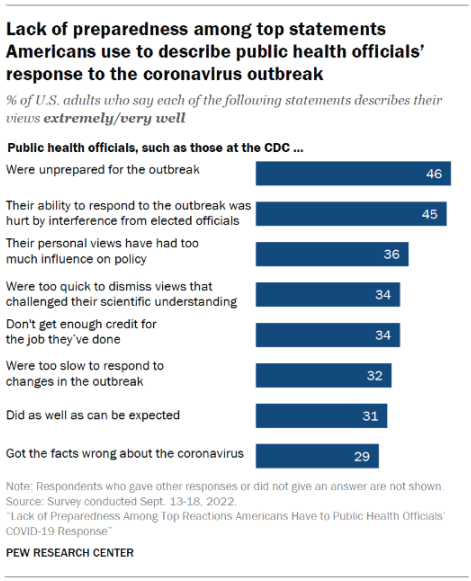


Figure 14 : Data Anlysis for the capacity failure in hospitals
Source : PEW Research Center

Literature Analysis:
The idea of health crisis management by the capacity building to the healthcare and similar research materials and literature should be collected, and the possible design techniques and solutions can be studied under this section.

Comparison:
The different case studies to respond to and solve the current crisis should be considered. For the particular thesis, the idea is to look at different architectural responses to hospitals worldwide during the covid situation. After sorting the design responses of the other case studies under variables like it's flexibility, modularity, context, Crisis response time, and capacity, the goal is to identify the typology of the responses.

Sorting:
In this part of the research, it is essential to sort out the case studies and pick the Case studies that align with the healthcare solution needs a specific site and specific response to the health services and health crisis. Based on the comparison analysis, as the different context has different answers, it is crucial to determine the context of the health crisis and pick studies more similar to the chosen context.

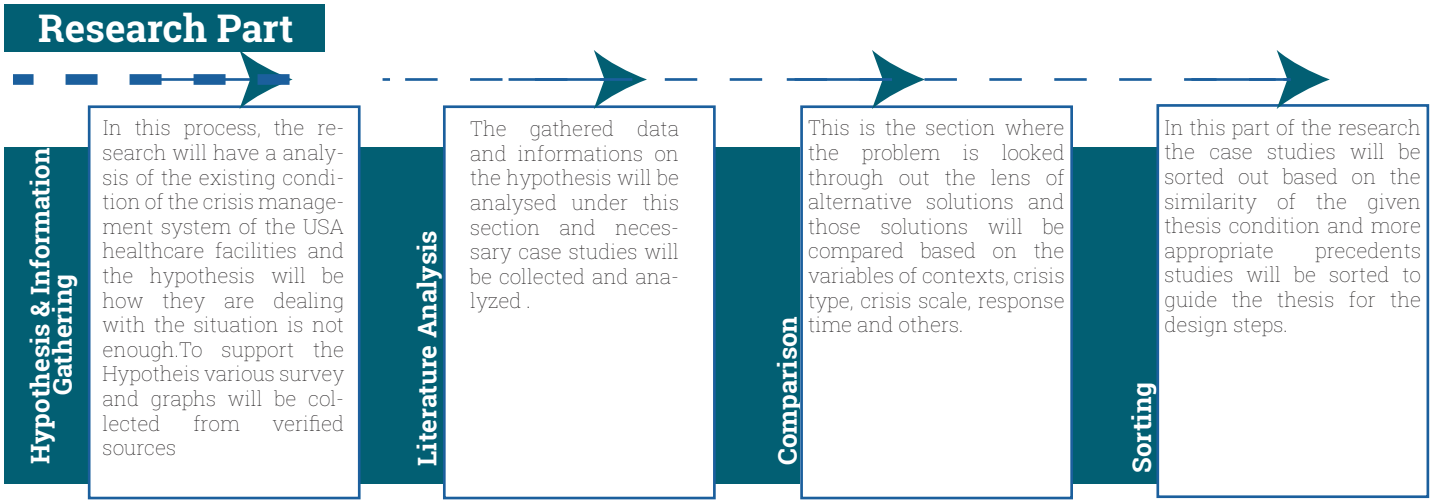


Figure 15 : Research Methodology

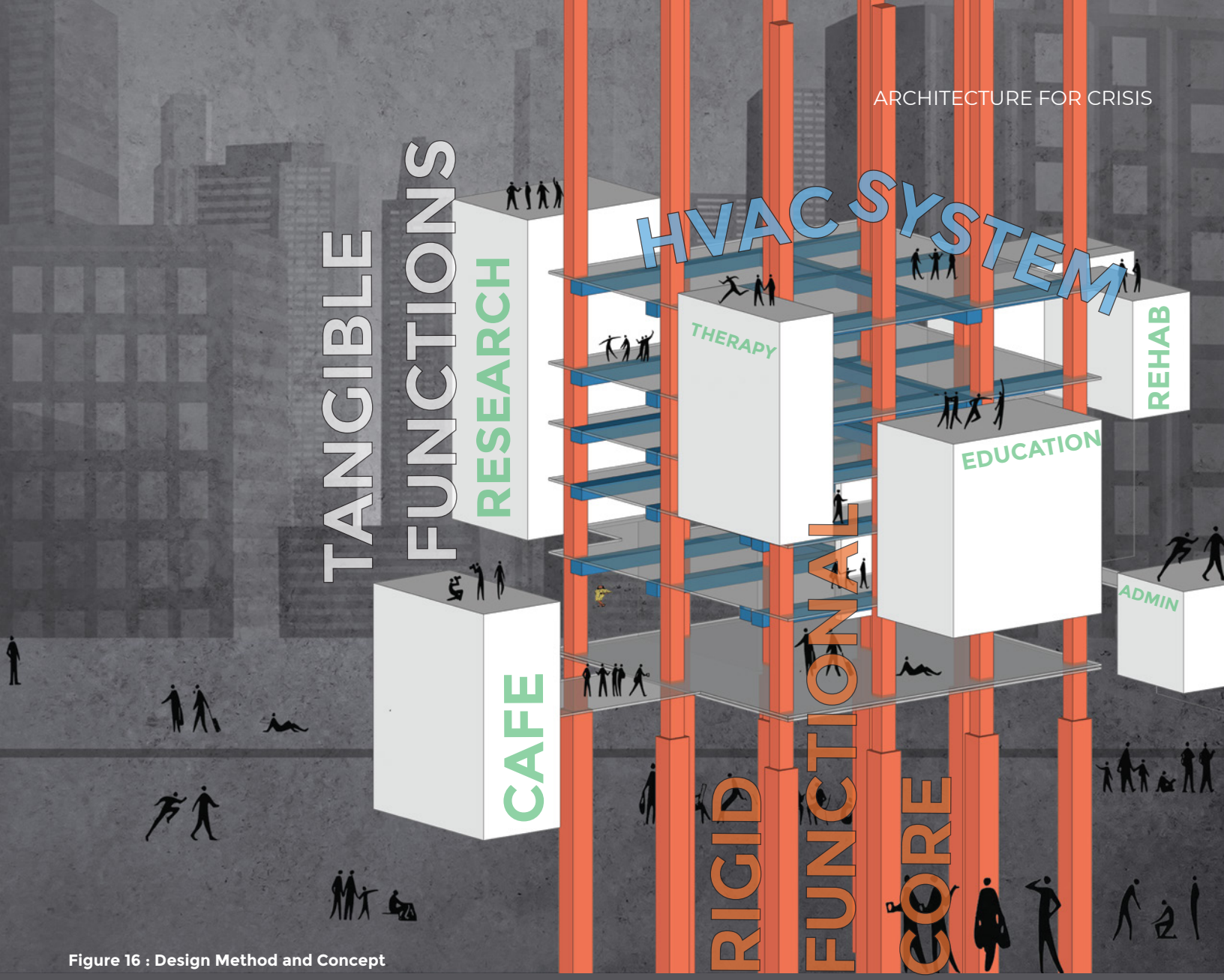


Figure 16 : Design Method and Concept

Design Methods

As a part of the design strategy, it is essential to visualize the whole situation and look into the possible scenarios and outcomes based on the precedent studies. For this research, the likely outcome can be, designing a healthcare system with all the flexible characteristics, creating mobile and portable healthcare units, or designing an intermediatory space between public and healthcare facilities that can be used during the health crisis.

Another critical step for the research design methods is to locate the site. This design aims to choose one of the most affected sites in the USA during the covid and intervene in creating that particular site and predict the possible outcome.

Addition to the site selection, the design will consider the tangible function of the healthcare facilities to explore in public realm and create a connection betwwen these two institution using a common connecting factor.

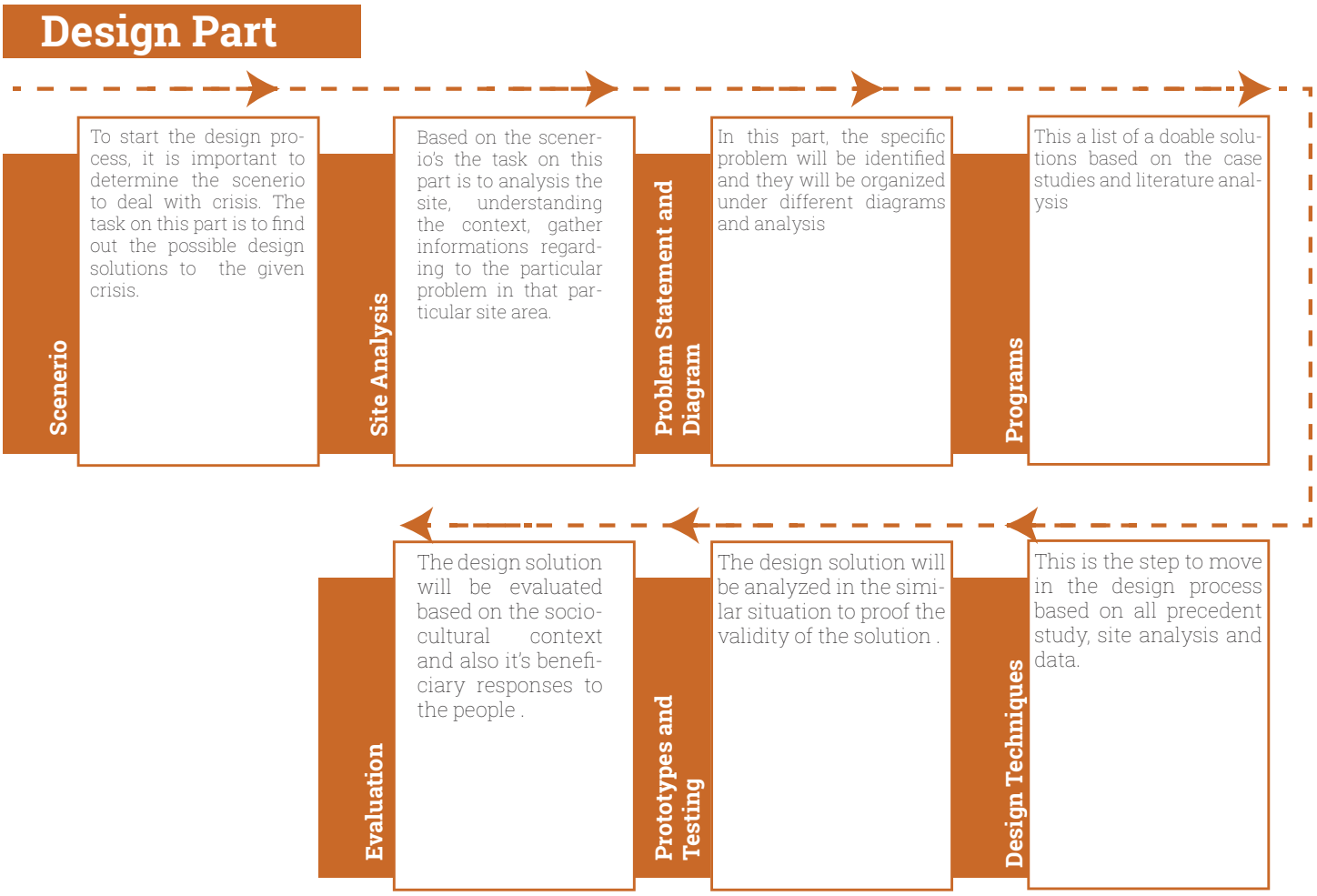


Figure 17 : Design Methodology Development

Site Selection and Study

The main driving question of the design is how healthcare facilities can expand their capacity most efficiently during the next health crisis. To test the solution, the study analyzed the most vulnerable cities for the next pandemic or health crisis and figured out the possible scopes of the design.

According to the study on the future pandemic vulnerability index for US cities, the following cities are more vulnerable to future pandemics and health crises based on the measure criteria of population, density, availability of health facilities, and demographic factors.

Though this strategy of open healthcare should be versatile and adaptable to the whole world , i wanted to explore my idea in the US and consider a city highly vulnerable to the next crisis, based on the risk factor analysis on these all criteria , i figured out Miami , Florida might be a suitable site for the exploration .

Miami is located in a coastal region, making it susceptible to natural disasters. Despite this, it is a popular retirement destination, and the number of people over 65 years old is increasing. Unfortunately, many health hazards occur in Miami every year. To better understand the health crisis situation, it is important to understand Miami's crisis management process and its existing strategy.

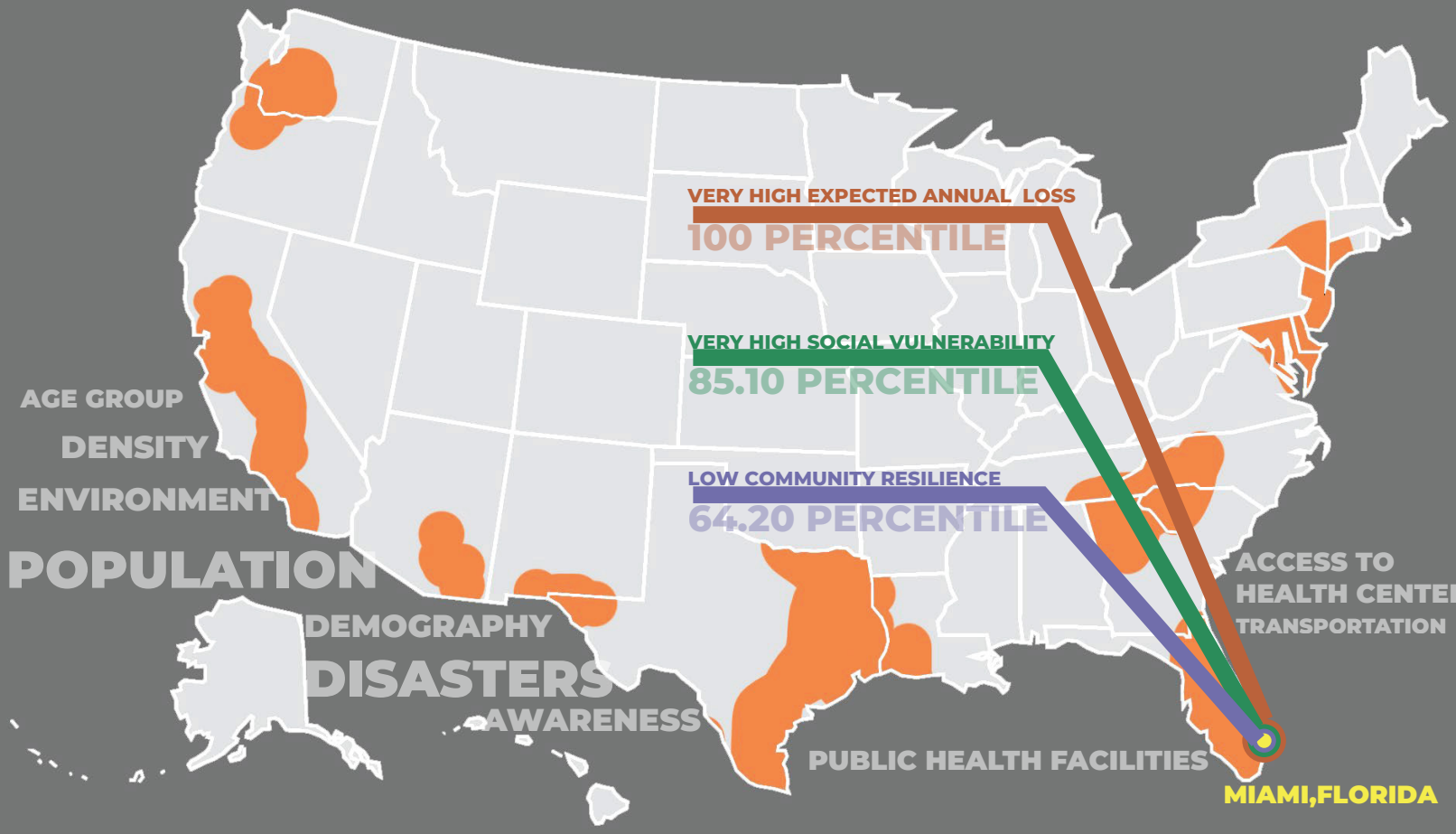


Figure 18 : Site Selection Parameters

Figure 19 : Considering Miami Florida as a potential site

Hey, Alexa — Will Florida Be Completely Doomed by 2025?

What will happen to Florida in 2025? A TikTok creator recorded himself asking Alexa about the future, and she's implied Florida may be in trouble.

**"On Sept. 4, 2025, at 3:08 pm, Florida will be hit by a Category 5 hurricane with winds as high as 205 miles per hour.
Miami will be completely destroyed."**

Source : GREENMATTER (https://www.greenmatters.com/p/what-will-happen-to-florida-in-2025)

Predictions Put Some Of South Florida Under Water by 2025

‘Miami is one of those’

CBS NEWS MIAMI



Health Crisis Scenario Analysis, Problem Statement, and Diagram

My research focused on vulnerabilities related to sea level rise, climate change, and the pandemic scenario, using the 5x5 matrix developed by the Department of Defense Occupational Safety and Health Program to analyze crises from the perspectives of health, disasters, transportation, capacity in health facilities, and evacuation centers.

I studied two parallel scenarios that consider Miami's significant elderly population. During a flood or hurricane, how would they reach evacuation centers? If there is a severe disease outbreak, and health service providers who live in distant locations are needed in their workplace more than ever, how would they make their way to the hospitals? These are the challenges that Miami faces, and it is important to understand them to prepare for the future.

As a potential site to establish a connection between healthcare facilities and the public realms addressing the crisis scene, the health district in Miami , Florida has many opportunities for connection across the city.It is the second-largest health research zone and home to a huge number of healthcare professionals and services.



Figure 20 : Analysis of Miami's Flood Scenerio

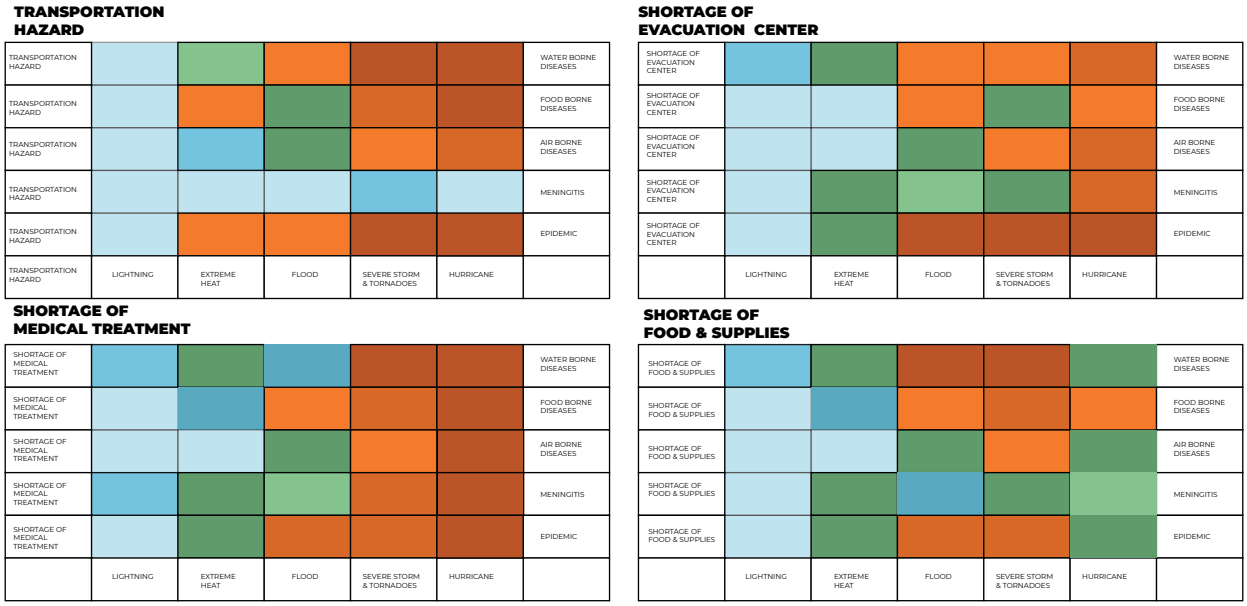


Figure 21 : 5X5 Risk Analysis Matrix for Miami Florida

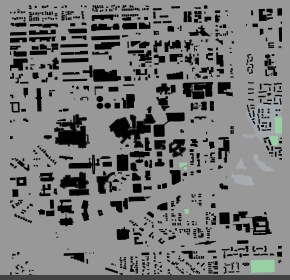
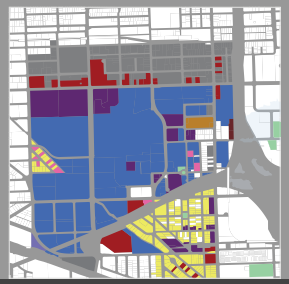


FIGURE GROUND MAP



LAND USE

- INSTITUTIONAL
- COMMERCIAL, SHOPPING CENTERS, STADIUMS
- OFFICE
- COMMUNICATIONS, UTILITIES, TERMINAL
- INDUSTRIAL
- SINGLE-FAMILY
- HIGH-DENSITY MULTI-FAMILY
- RESIDENTIAL-GOVERNMENT OWNED HOUSING



HEALTHCARE AND EDUCATIONAL FACILITIES



FLOOD MAP



SITE CONNECTIVITY

- PRIMARY CONNECTION
- SECONDARY CONNECTION
- TERTIARY CONNECTION
- POTENTIAL CONNECTION
- METRO LINE
- METRO STATION

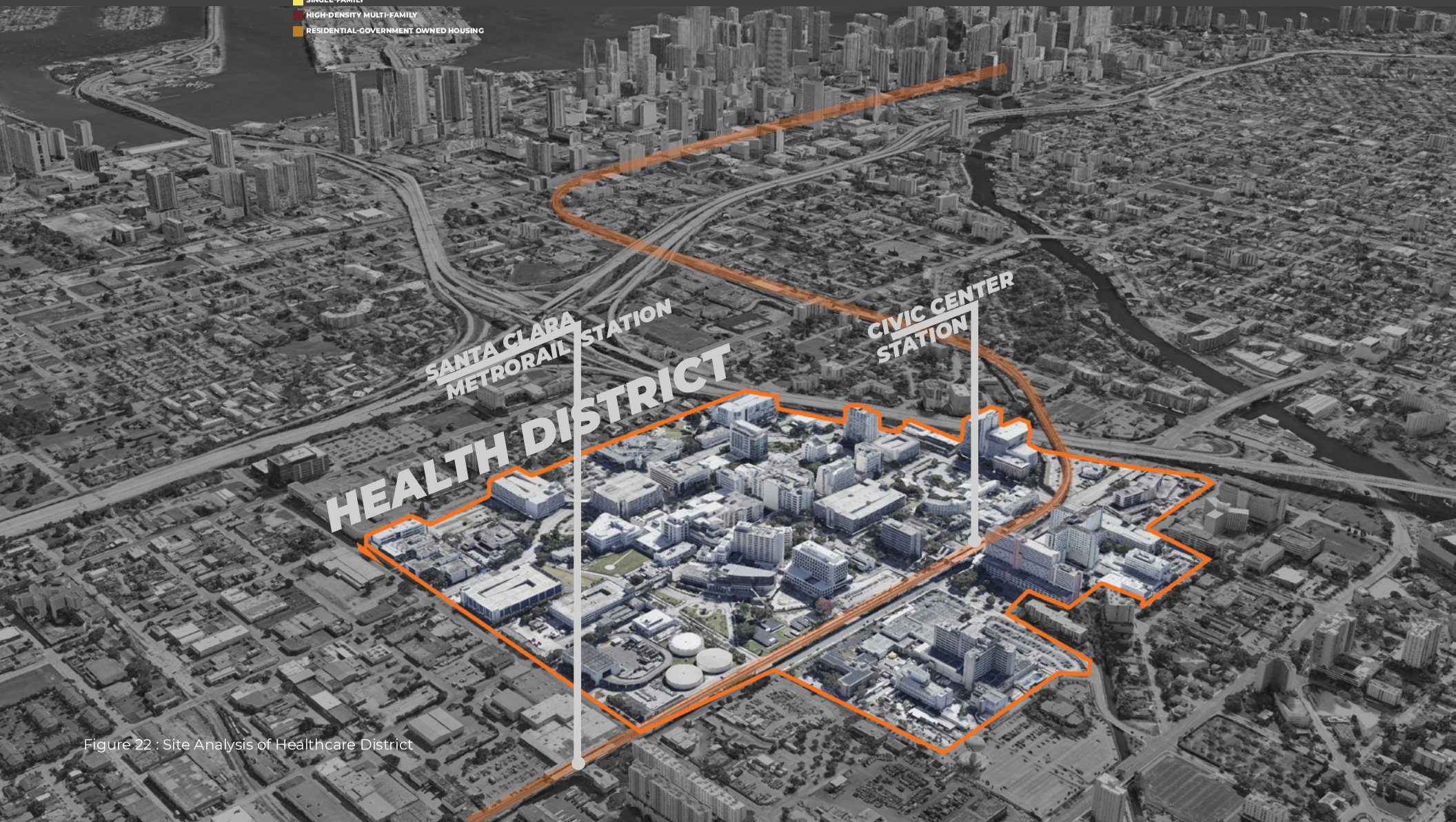
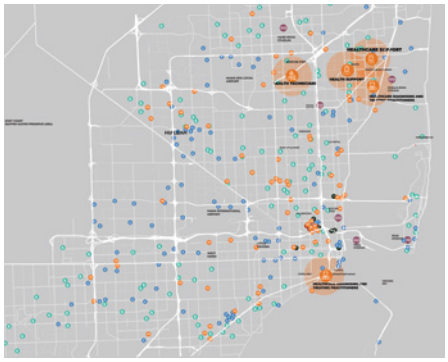
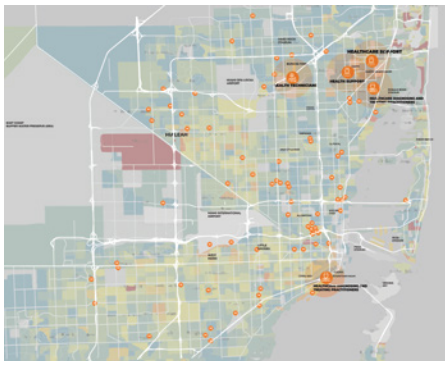


Figure 22 : Site Analysis of Healthcare District

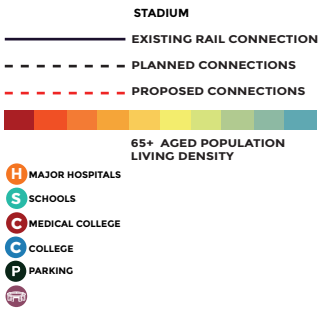


MAP SHOWING LOCATION OF EVACUATION CENTERS DURING DISASTER



MAP SHOWING LOCATION FOR HEALTHCARE FACILITIES AND CARE PROVIDER WITH DEMOGRAPHIC DATA

I studied the locations for all the health facilities with the overlay map of the existing and proposed mrt transit lines and where vulnerable populations are most prevalent. My intention is to connect those facilities to the mrt stations nearby and address the Civic Center Station as a mobile and flexible building that will be connected to other station providing emergency services and also can bring people from remote places during a flood and other crises .



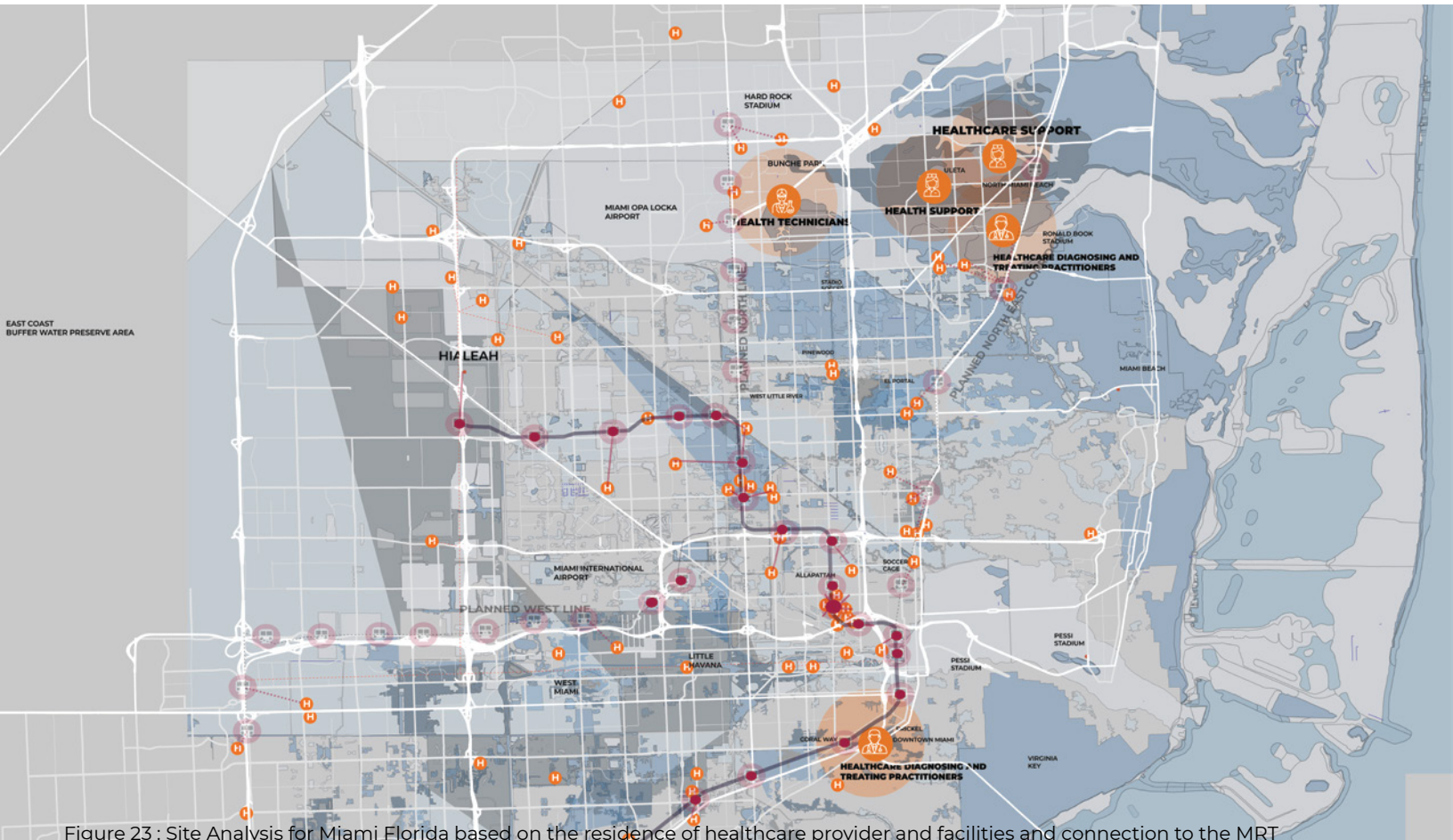


Figure 23 : Site Analysis for Miami Florida based on the residence of healthcare provider and facilities and connection to the MRT

MIAMI , FLORIDA

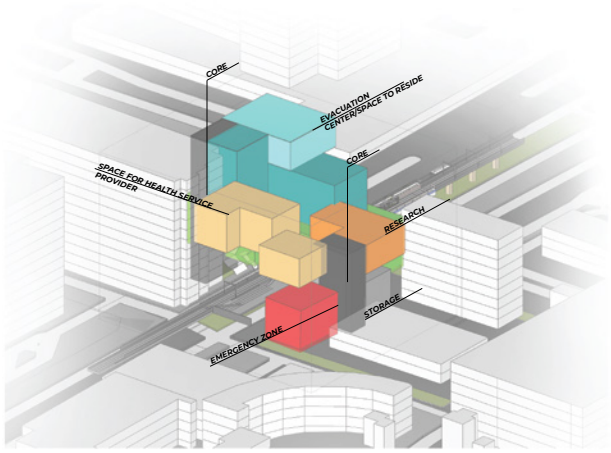
Program

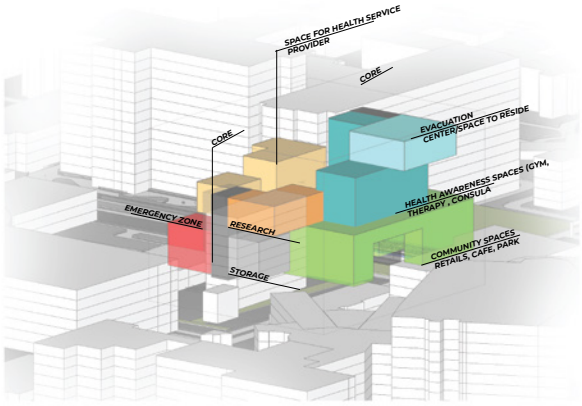
The research will be focused on designing three interchangeable programs for the crisis management wing of the Healthcare facility. The nature of the design will be an intermediatory space between public realms and healthcare facilities. The area can be initially used as a publicly engaged and interactive space to promote public health; then, due to the transformability nature of the design, the program can be changed into a crisis management facility for a particular healthcare center. The design program will have the following three functions based on the concept.

A Space for Engaging People
This space can be an existing public realm: a gym, a park, or a center for general activities and cultural gatherings. The area's nature will be more adaptive and flexible based on the users and how they want to use it during the noncrisis time. As a part of modern healthcare facilities, some spaces are not related to extensive care units but have more social values. Post-treatment Rehab and Counselling room; these facilities can be part of this space for the design.

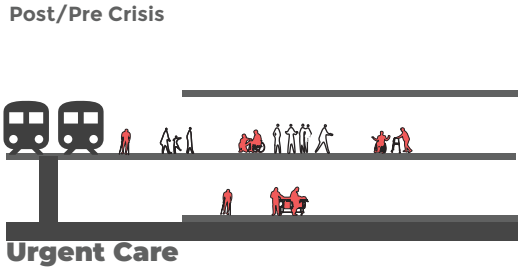
A Space for Crisis Preparation
As the main program of the design is to create a support system for the healthcare facility during the crisis to increase the capacity, based on the situation, the initial goal is to transform the intermediatory space into an extension of the existing healthcare facility. The extension can be a patient care unit, a quarantine center, accommodation for the additional staff, an equipment storage area, and support facilities to deal with the crisis.

A Space for Crisis Management
In the extreme senior, the design intends to transfer into a care unit for the healthcare facility. This program depends on the context, the health crisis type, the occupancy, and the emergence of the crisis. A possible outcome of this program is transforming the space with complete healthcare emergency service when necessary.









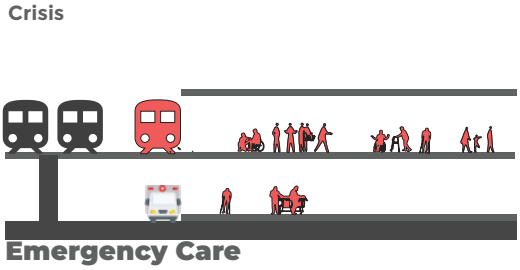
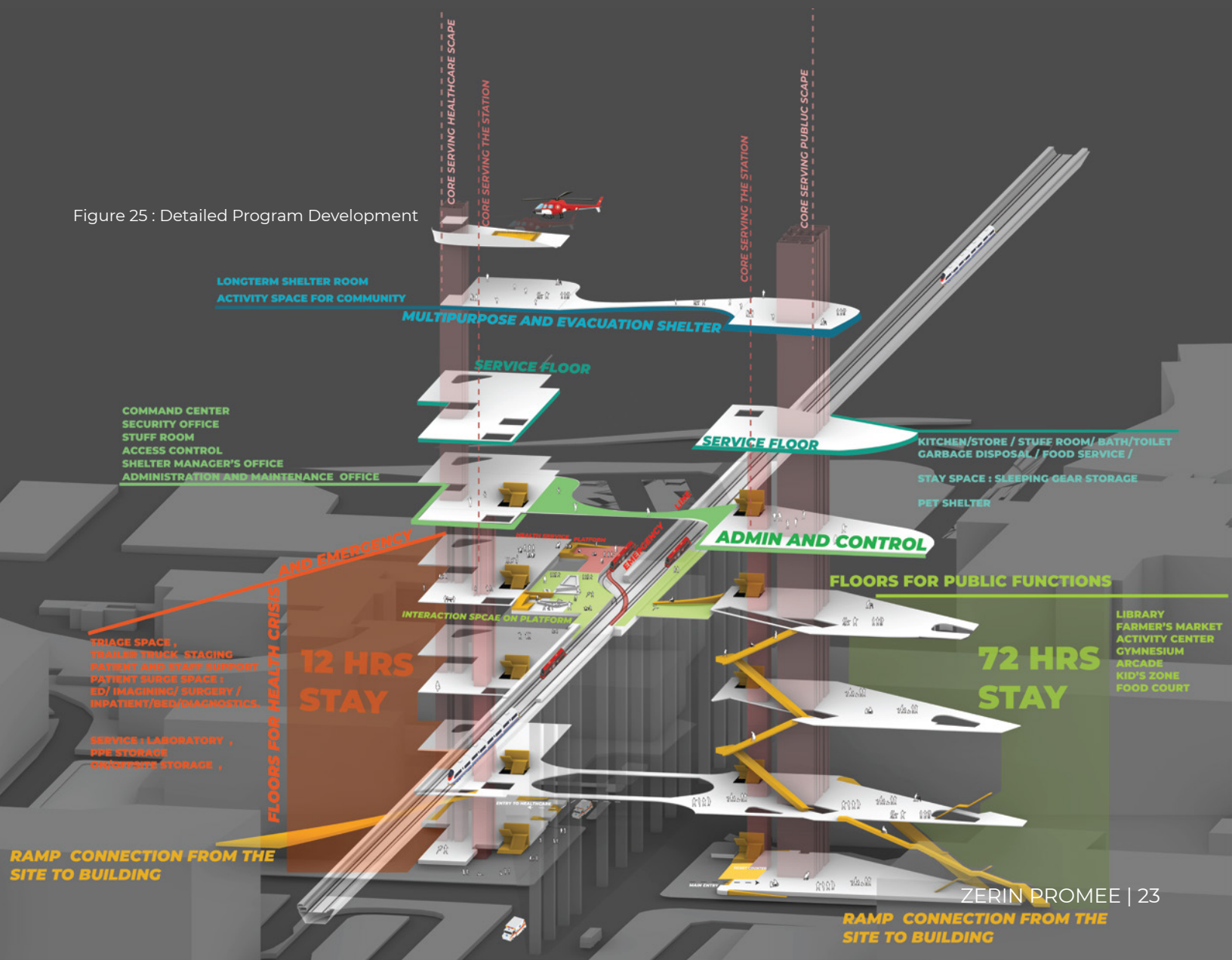


Figure 24 : Initial Program Development for the design

The following is a description of a program created during a health crisis. The program consists of three primary spaces: the healthcare facility, the station, and the public realm. In a crisis scenario, the healthcare facility can function as an emergency response unit, supported by the train, and designed for a 12-hour stay. The other side of the site can be used as a regular shelter for service providers and, in extreme cases, as an alternative care unit and an extension for the adjacent healthcare facility. These spaces have been designed to be flexible, with the administration having the ability to monitor both sides of the facility, as well as the service and community multi-purpose spaces.

Figure 25 : Detailed Program Development



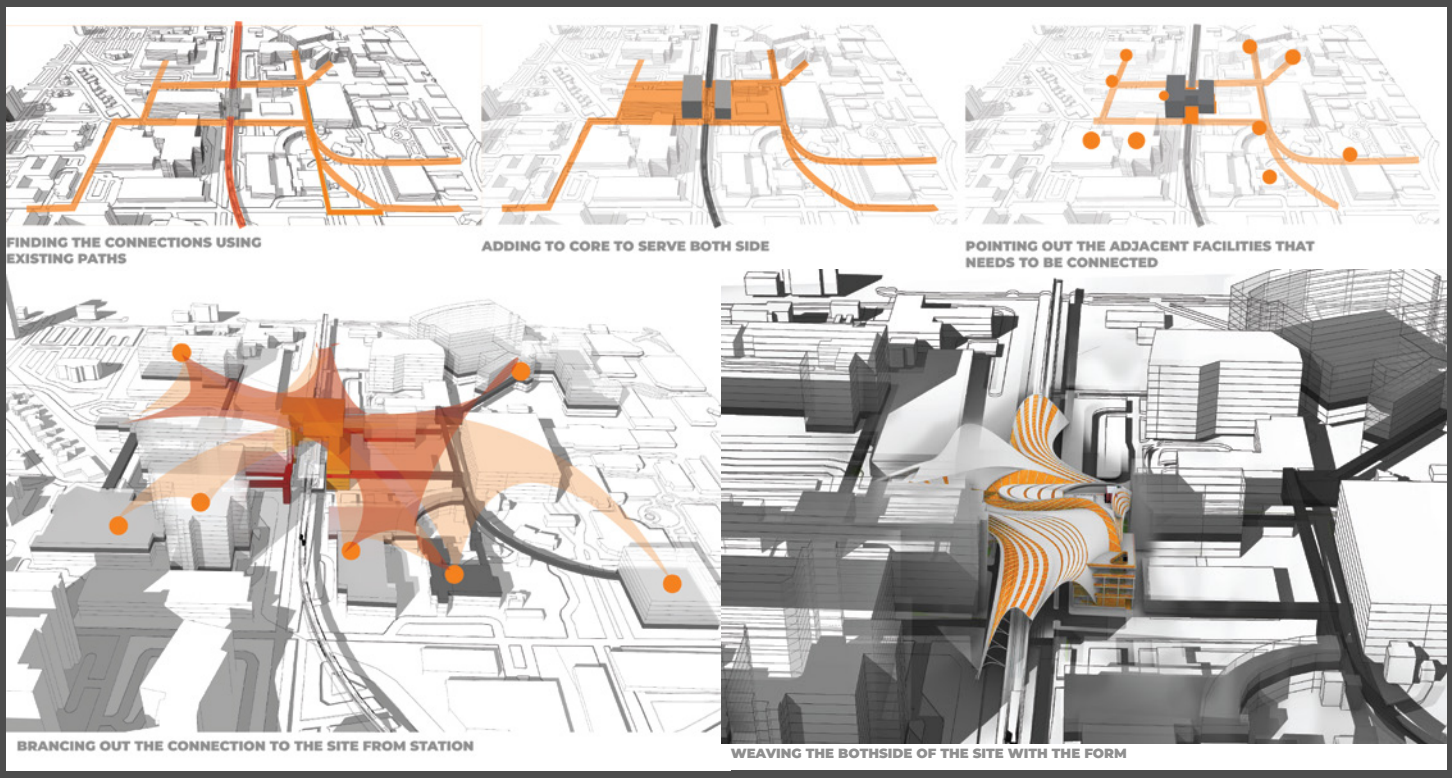


Figure 26 : Form Generation

Design Approaches

Massing Development

The design of the Civic Center Station draws inspiration from the healthcare district it serves. This station can serve as a hub for various healthcare services and public facilities. The building's design is meant to connect these institutions and public spaces, branching out from the station. The goal was to create a structure that is accessible to people, not like a fortress as healthcare facilities can often seem. The canopy design was inspired by the need for shelter during a disaster, a primary human emotion.

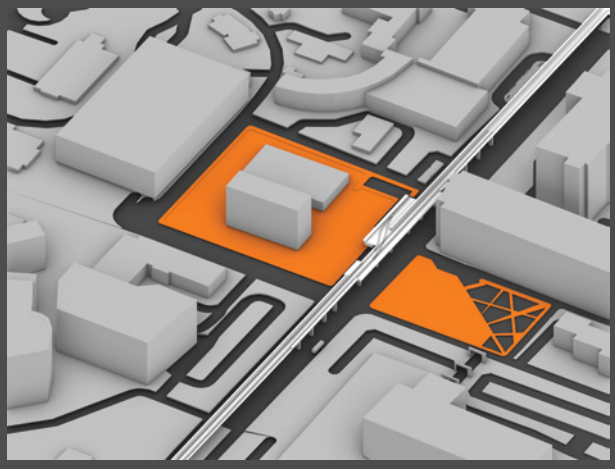


Figure 27 : Site Area Selection

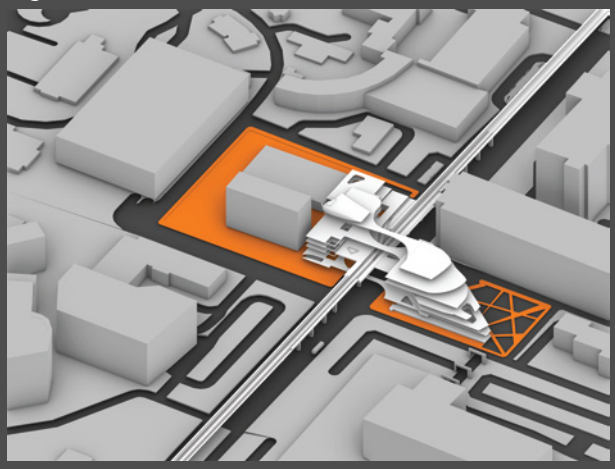
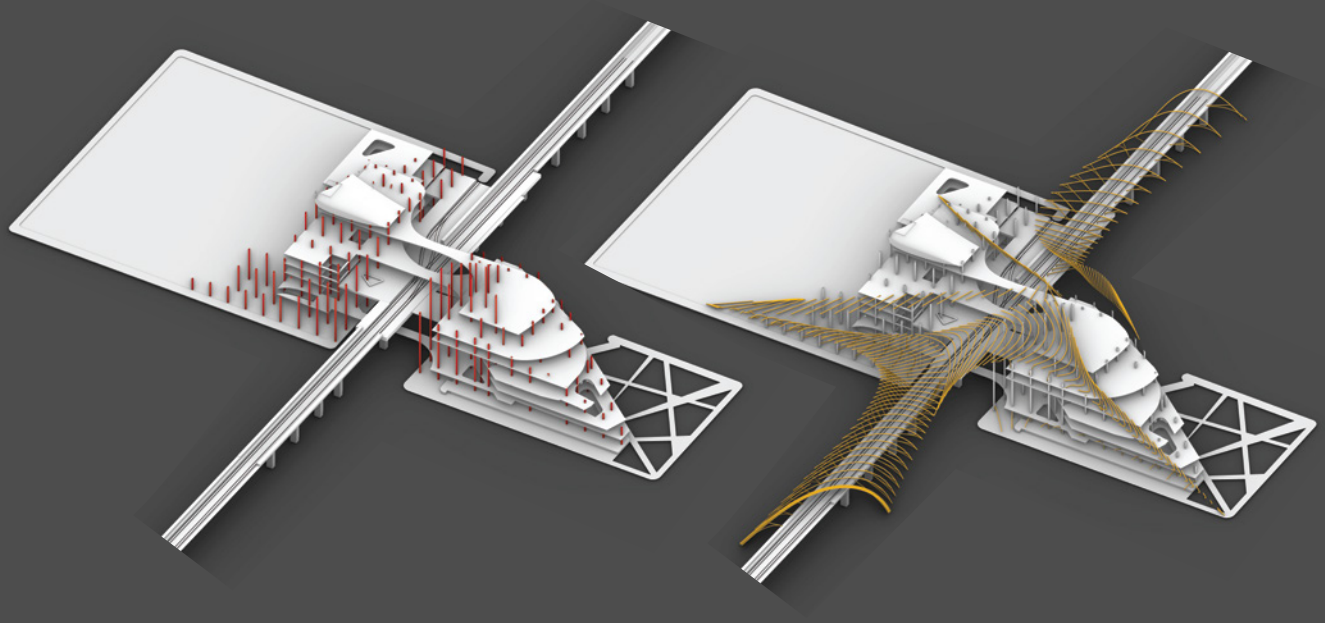


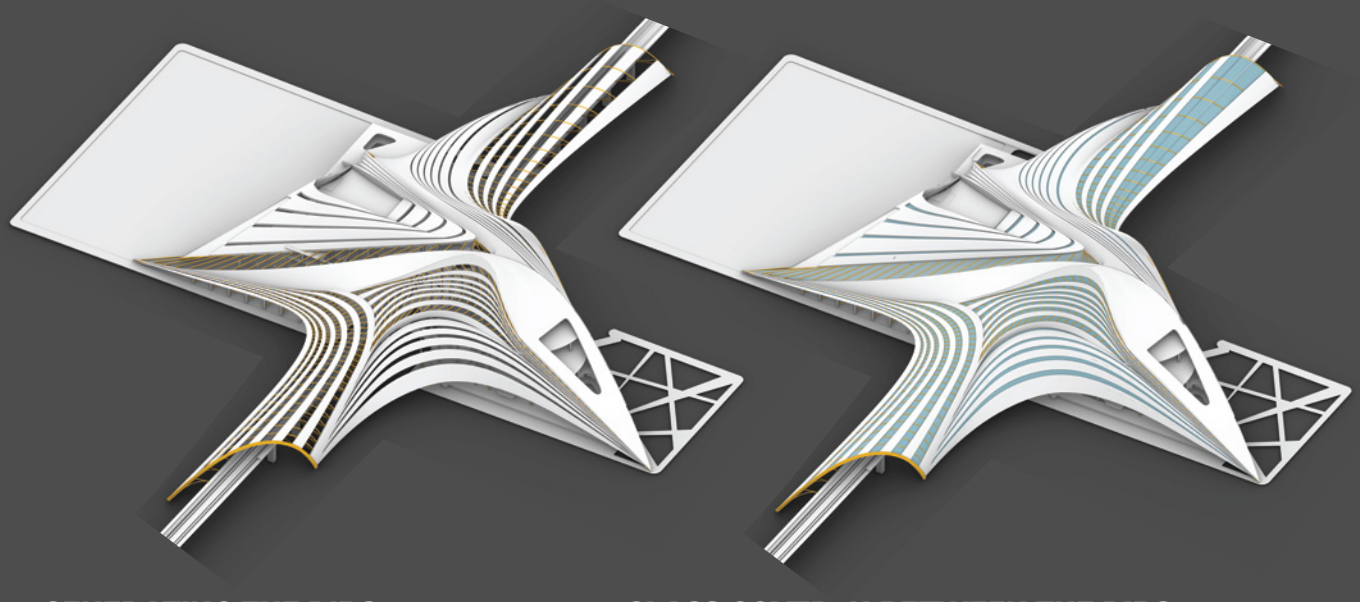
Figure 28 : Floor Slab Generation

ROOF GENERATION



COLUMN SET UP

PANELINGS FOR ROOF SUPPORT



GENERATING THE RIBS

GLASS COVER IN BETWEEN THE RIBS

Figure 29 : Roof Generation

Phasing and Implementation

Civic Center Site

The design of the site has been carefully crafted to address two parallel scenarios - the ongoing health crisis of the pandemic and the possibility of flooding in the area. The central feature of the design is the station which has been planned to connect the adjacent building seamlessly. The station serves three distinct functions - facilitating commuting by train, offering public activities, and providing healthcare services.

The initial design idea includes various types of connections from the station to both sides of the site. The design also takes into account the possibility of flooding, and therefore, the upper levels of the site have been designed to remain operational even during floods. This has been made possible by the elevated train station which connects to the healthcare facilities, ensuring that essential services remain accessible even during times of crisis.

The authorities are considering connecting the stations of one area to their nearby healthcare facilities. The Civic Center Station will be the main hub, and the train will provide a two-way service to the Civic Center Station site. In times of crisis, the train will bring supplies and health services to remote areas, and healthcare providers can commute to their respective healthcare hubs using the train.

The health district is located in a sea level rise zone, so in the next phase, if the area goes underwater, the system can be moved to more inland areas and replicated in all areas that have an elevated rail connection and adjacent healthcare facilities.

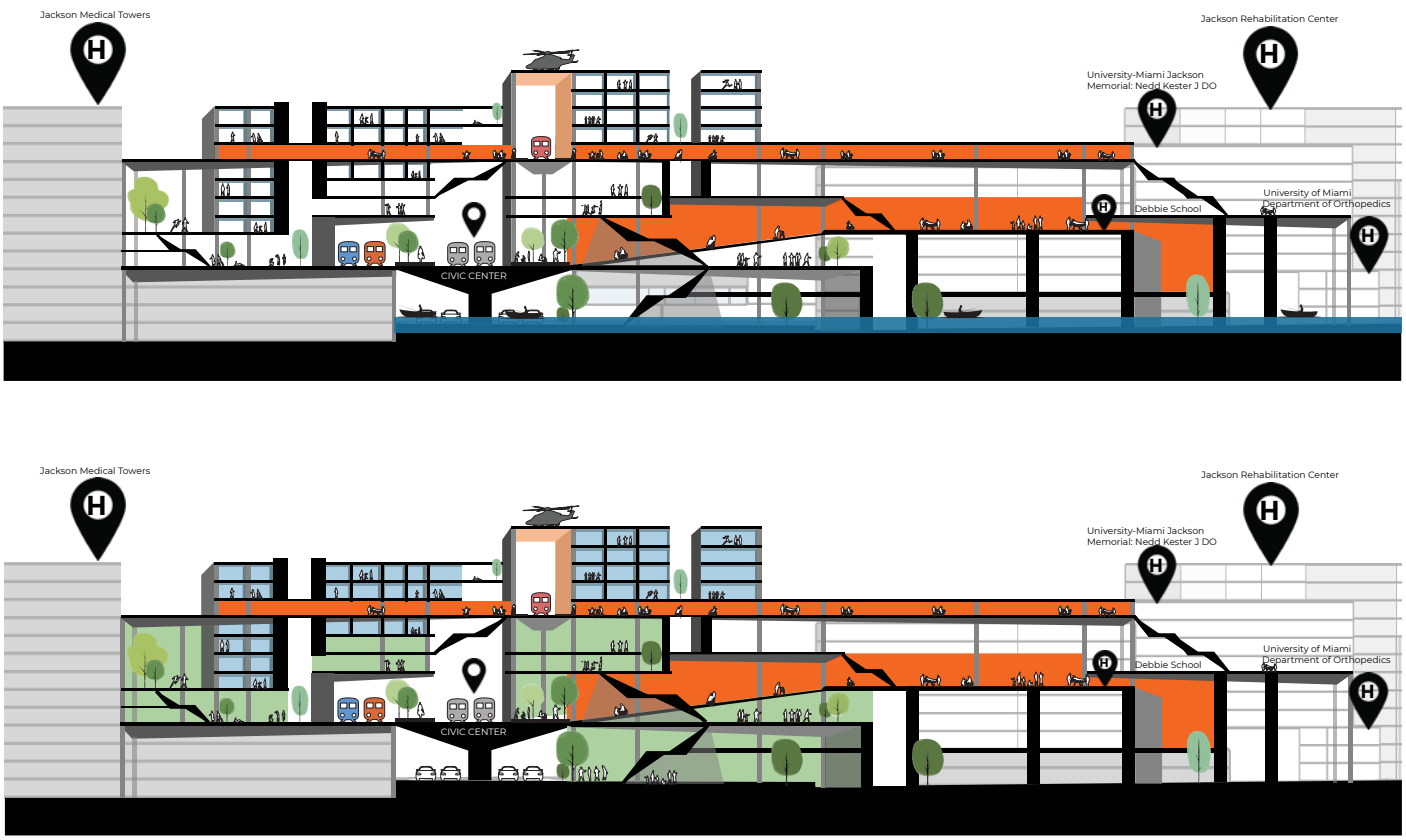


Figure 30 : Conceptual Diagramatic Section Addressing the normal scenerio and Flood scenerio

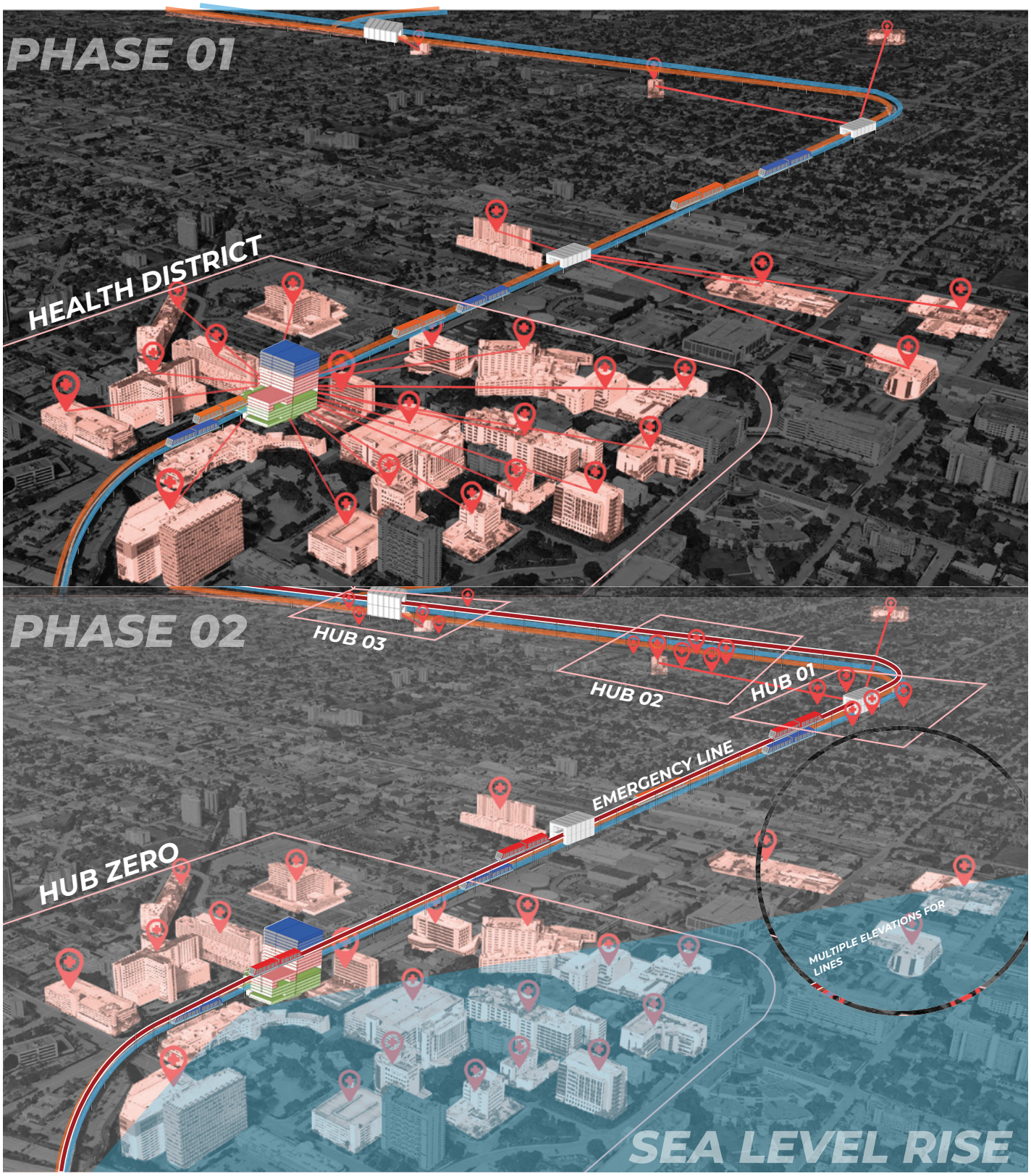


Figure 31 : Phasing Diagram Showing the connection between MRT stations and Healthcare Facilities

The facilities that have been designed are truly innovative and aim to address the needs of the public and healthcare services in a seamless manner. The two separate platforms, one for public use and the other for healthcare services, have been thoughtfully designed to ensure that there is smooth circulation for the healthcare zone.

Given that the structure will be dealing with natural disasters, the materials used have been chosen to be sustainable and extremely resilient to withstand such disasters. The facility has been built with the aim of being able to function even in the most challenging of conditions.

Furthermore, the building has been equipped with photovoltaic glasses, which serve as an alternative energy source. These glasses have been installed in such a way that they provide additional energy while also being aesthetically pleasing. The use of this alternative energy source ensures that the facility is eco-friendly and sustainable.

The front-facing side of the building has been equipped with all the necessary support services and mechanical equipment to function effectively as an additional care area during a health crisis. This means that in the event of a pandemic, such as the COVID-19 outbreak, the building can be used to accommodate the overflow of patients from hospitals. The support services include medical equipment, such as oxygen tanks, ventilators, and other necessary medical supplies.

Moreover, the floor plan of the building has been designed to be flexible and adaptable to various situations. In the event of a natural disaster, such as an flood, hurricane the building can be transformed into an evacuation center to provide shelter for those affected. The building's layout can be adjusted to accommodate large groups of people, with separate areas for sleeping, eating, and recreation. The building's location also makes it easily accessible to emergency responders, making it an ideal place for evacuees to seek refuge.

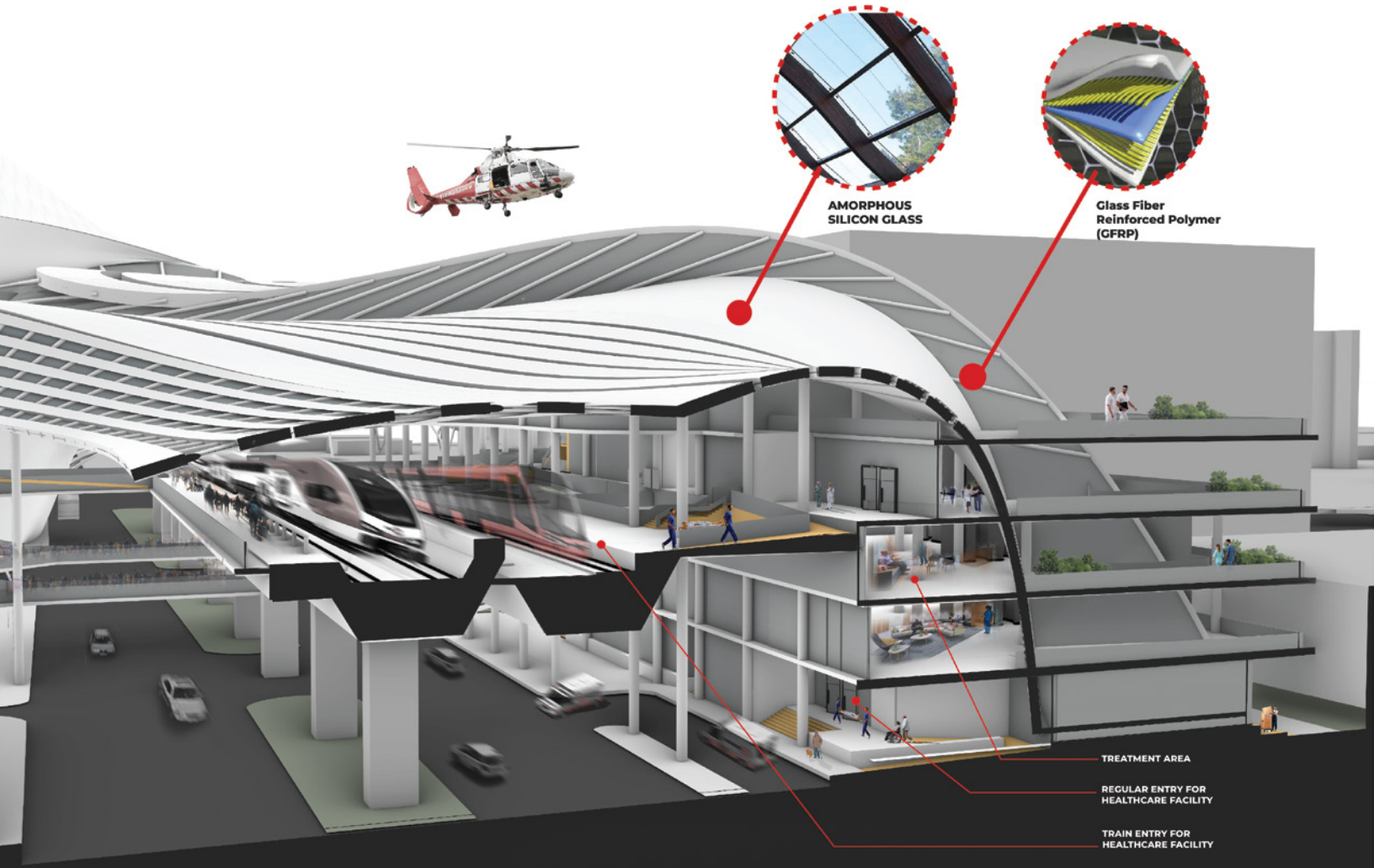


Figure 32 :
SECTIONAL PERSPECTIVE THROUGH HEALTHCARE PLATFORM

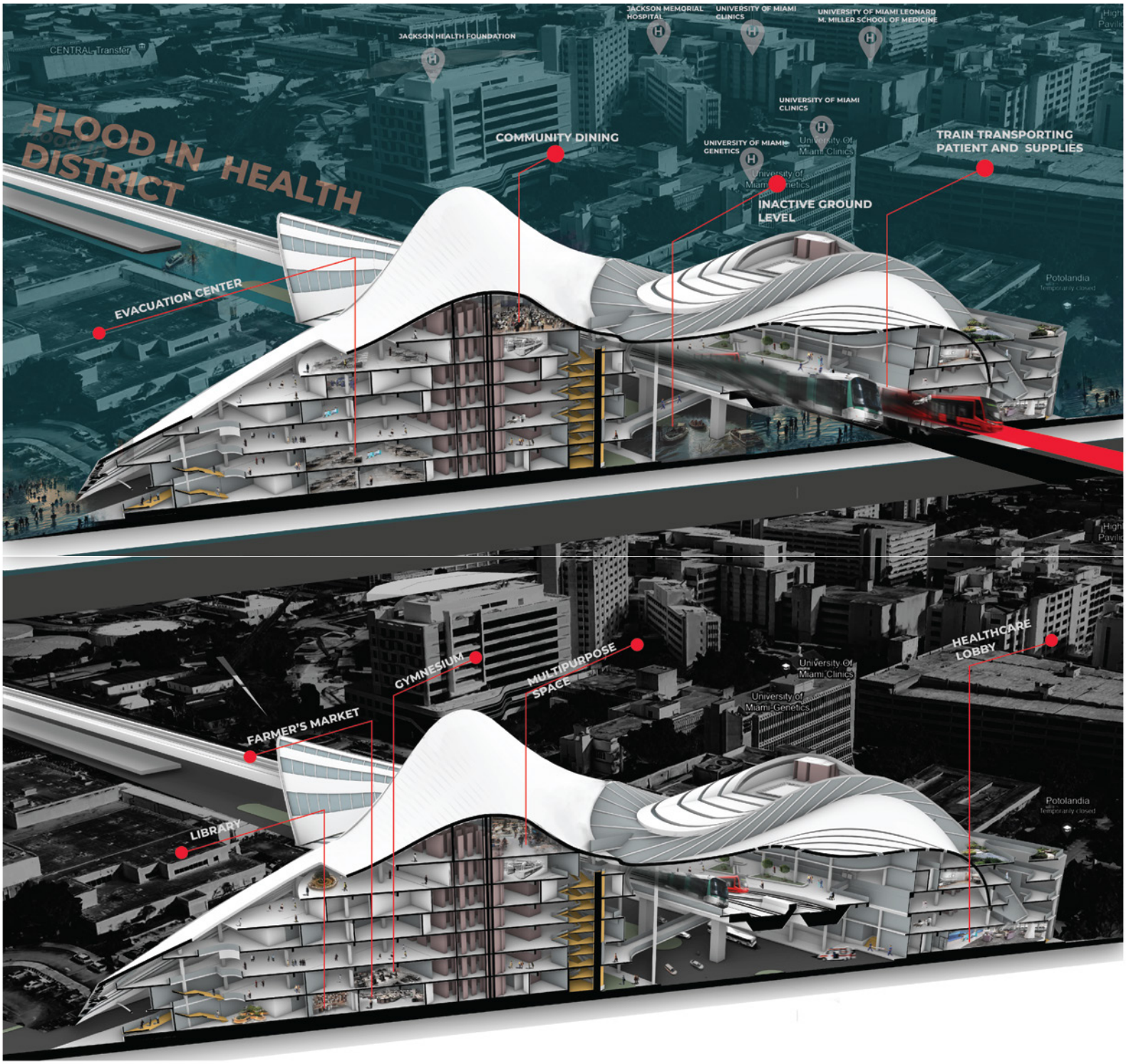


Figure 33 : Health District Flood Scenerio and Solution

Crisis Management and Resiliency

Hialeah Site

The thesis focuses on the civic center site for crisis preparation and response. It also delves into how the train connection will serve other stations during a crisis. Specifically, it will explore the Hialeah site in Miami Dade county, which is a demographically vulnerable area with many elderly residents and a history of severe flooding. The thesis proposes establishing another service station that connects the civic center and the Hialeah site. This station will be designed to receive aid and provide space to accommodate people in the time of crisis

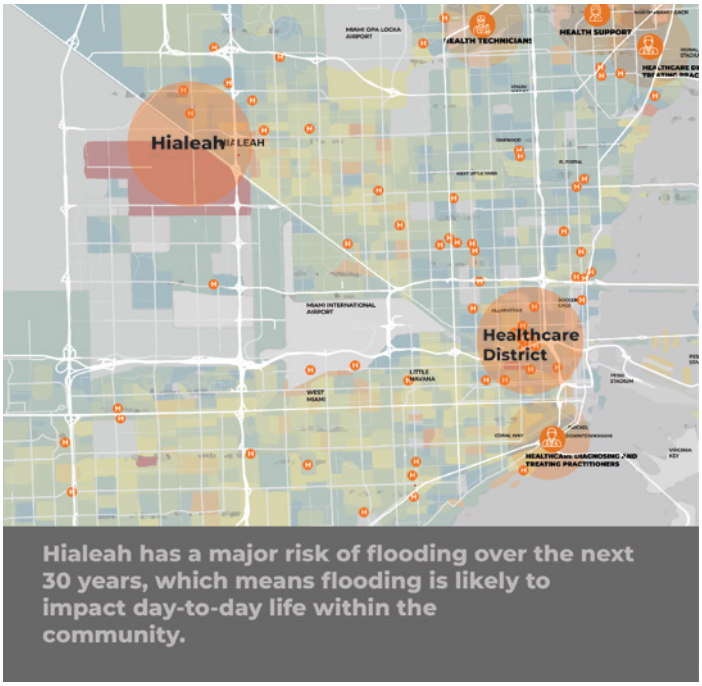


Figure 34 : Hialeah and Health District position in Map



Figure 35 : Hialeah Flood Scenerio

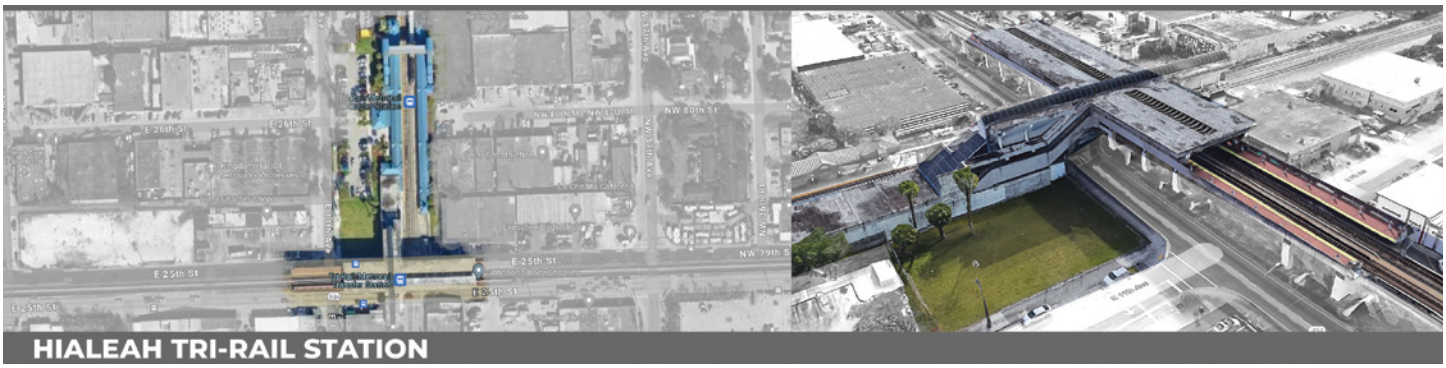


Figure 36 : Potential Station Site for exploration

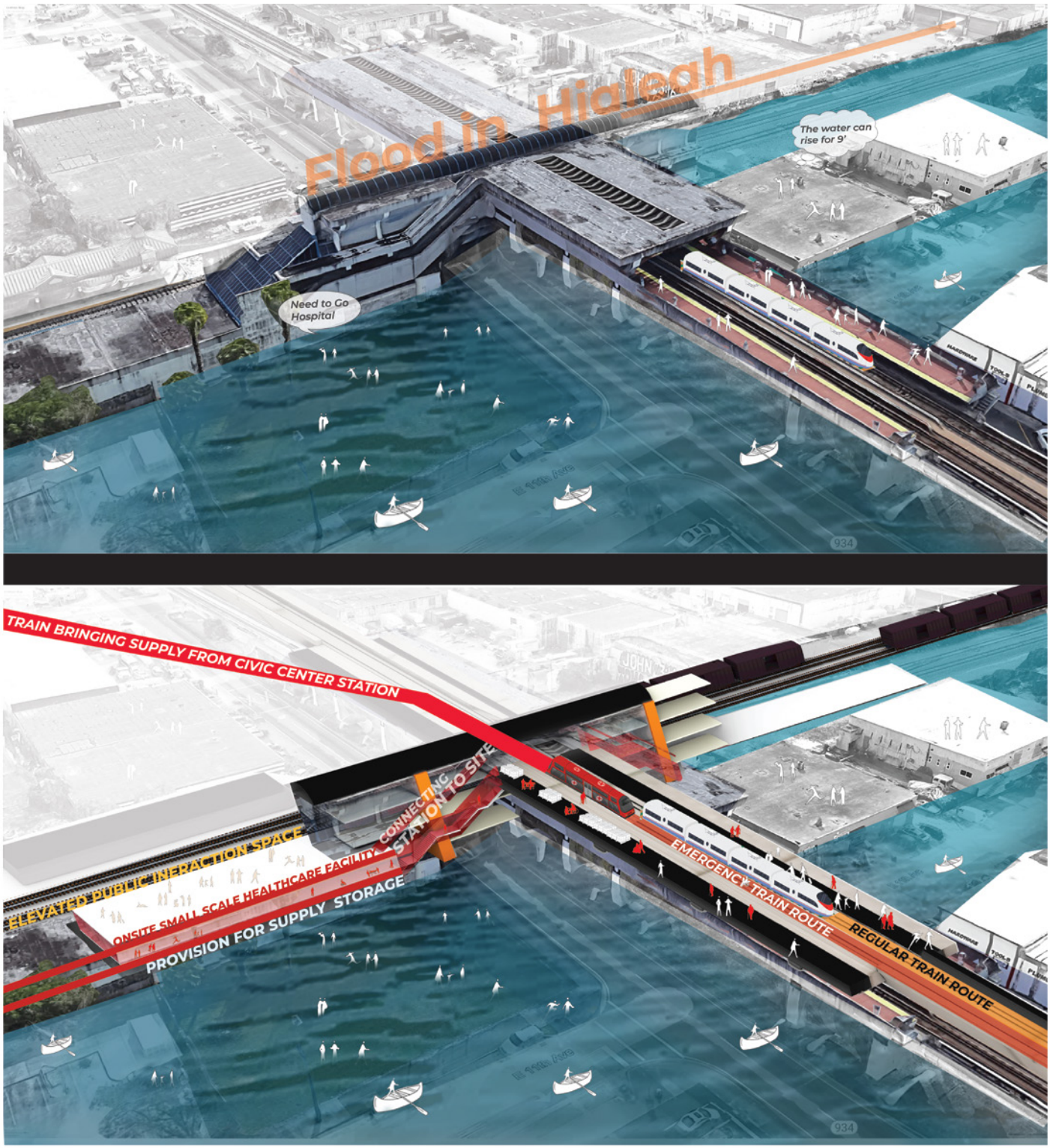
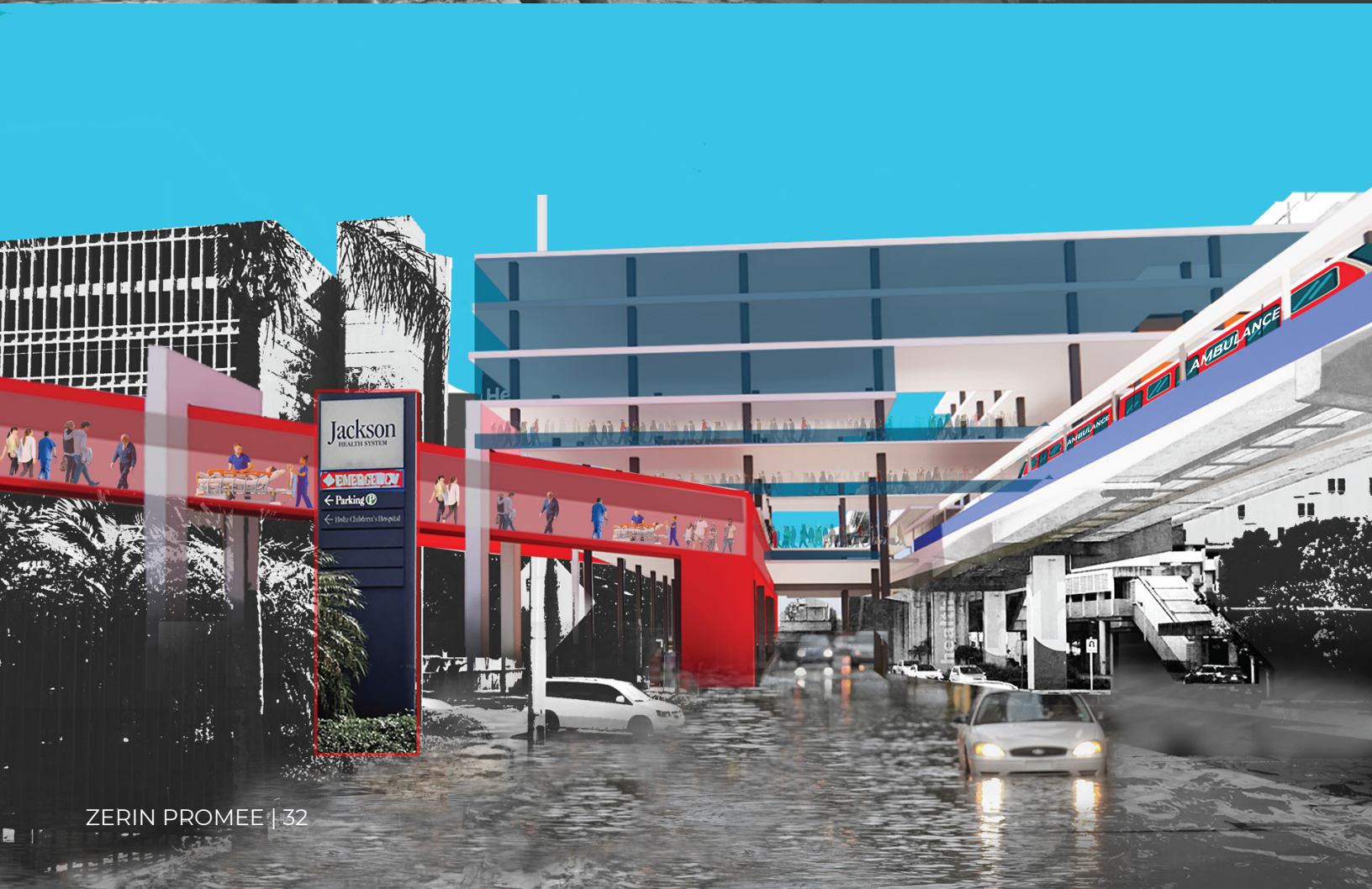


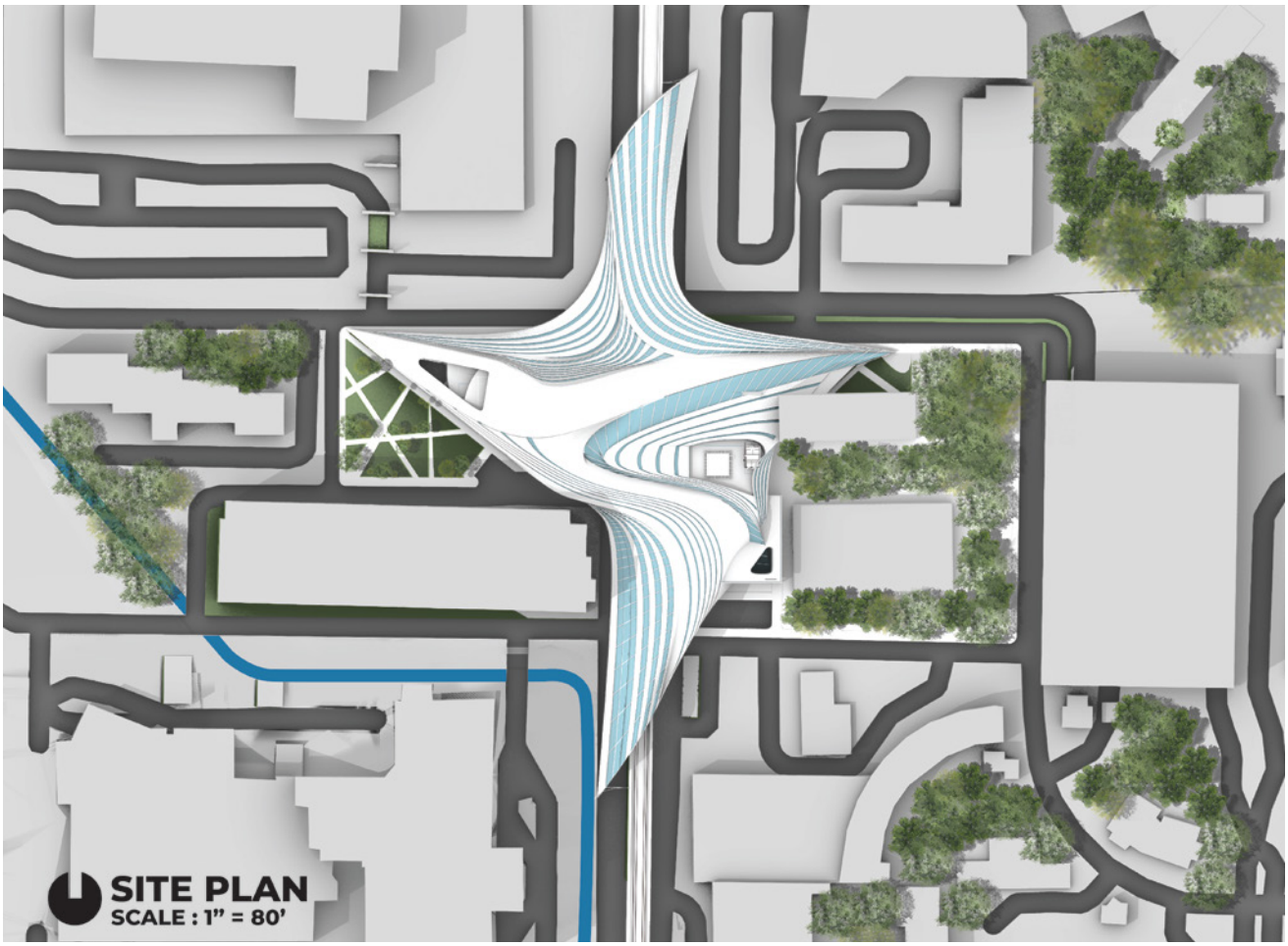
Figure 37 : Hialeah Flood Scenerio and Solution

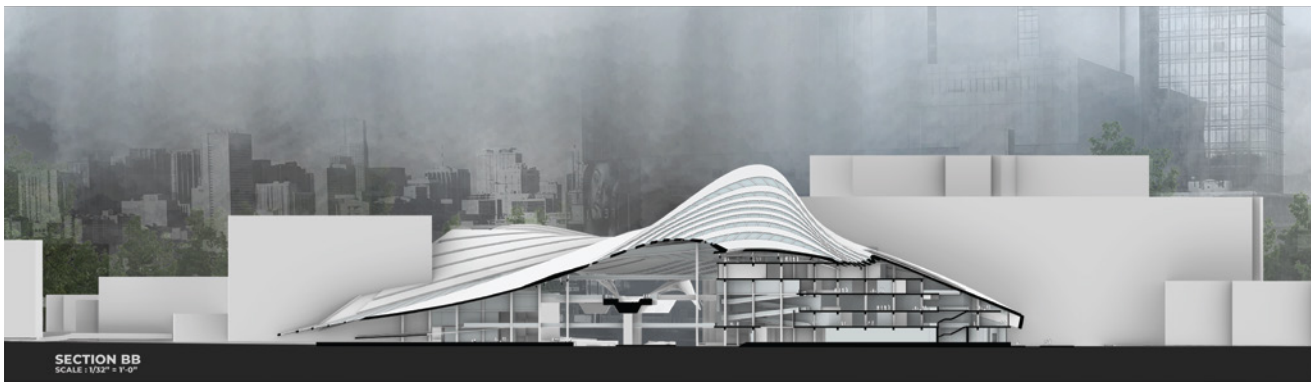

How am I gonna go back home ?
Jackson
EMERGENCY
Parking
Here for you.
The Ambulance is stuck
How are we gonna make it to the hospital ?
AMBULANCE
AMBULANCE

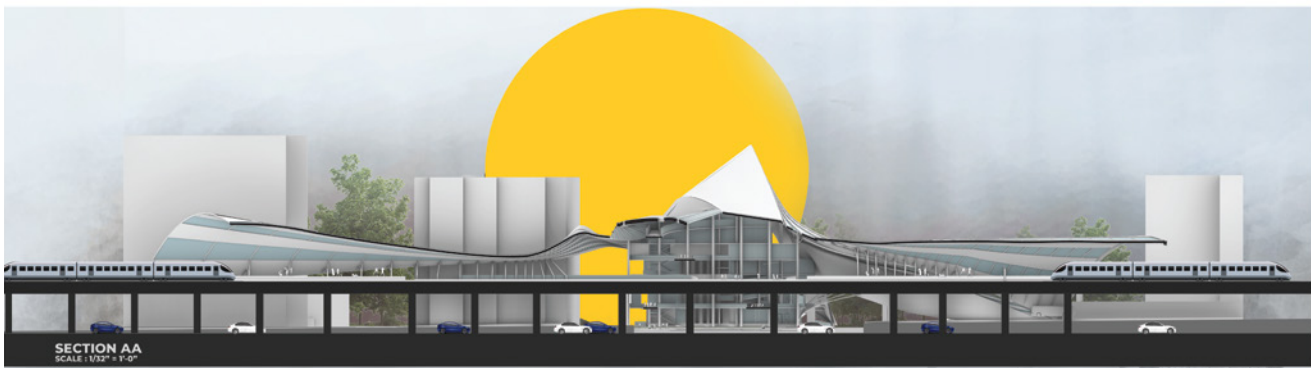

Jackson
HEALTH SYSTEM
EMERGENCY
Parking
AMBULANCE

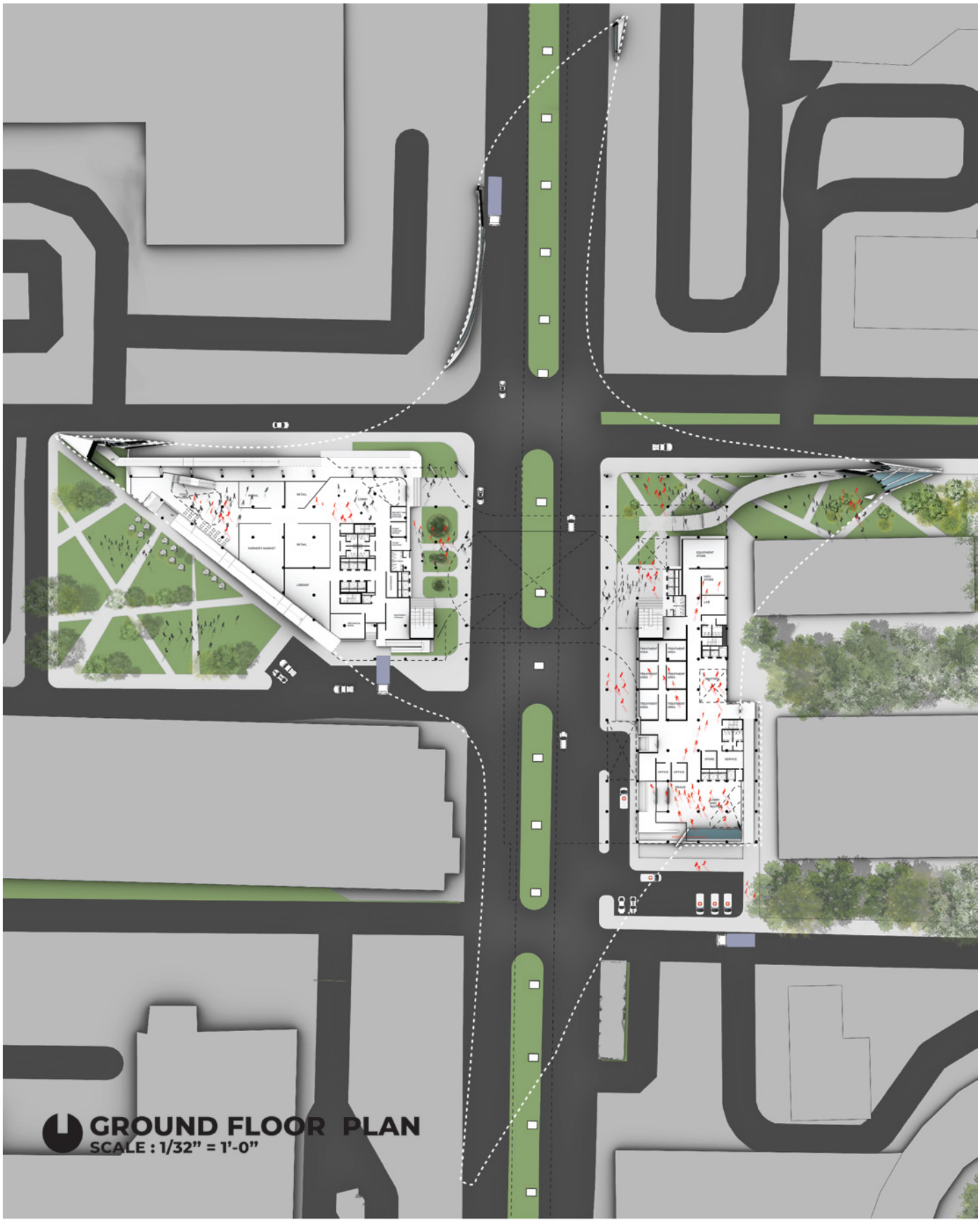
Conclusion

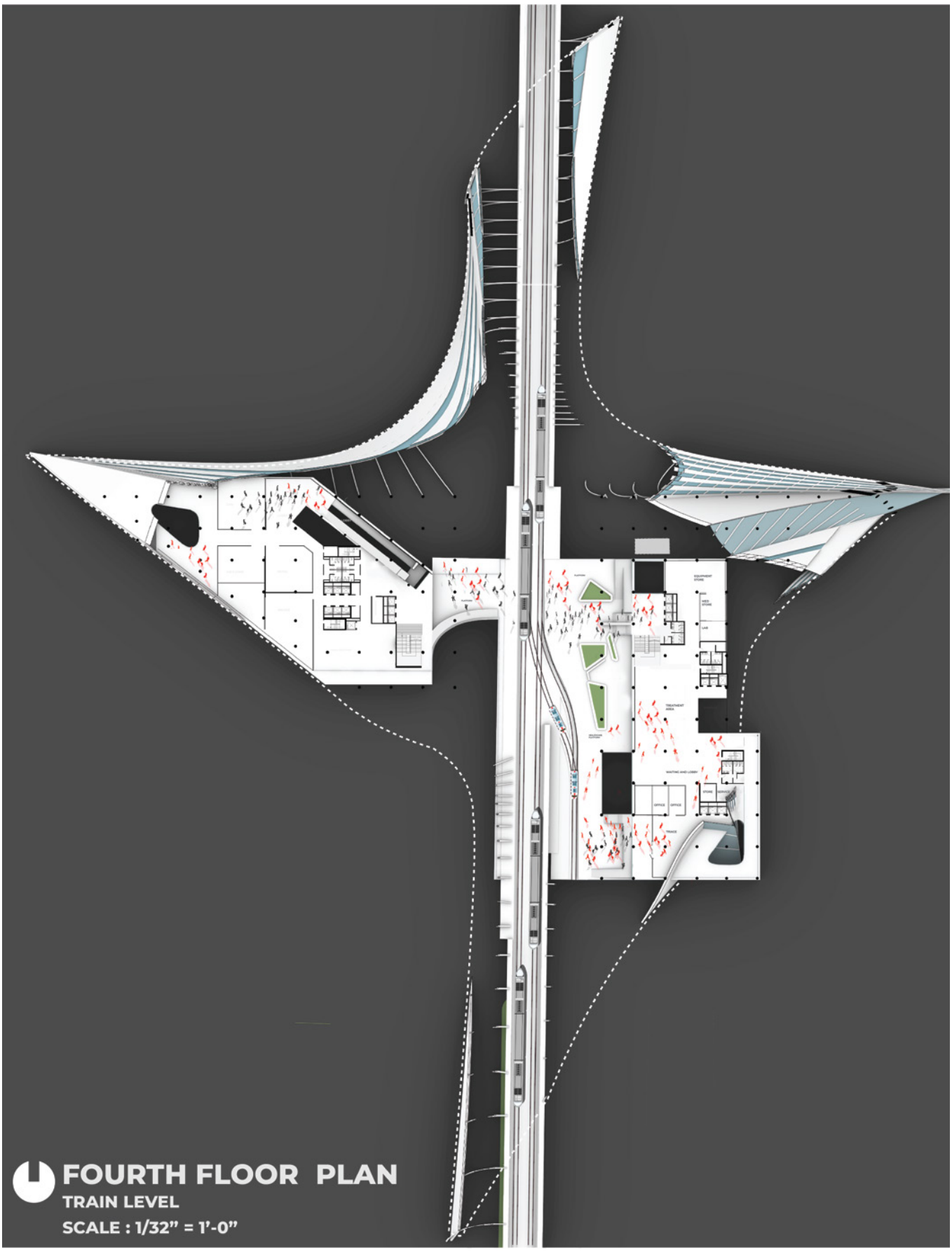
The main focus of the thesis was to make healthcare facilities more mobile and blur the boundary between them and the community. The idea is challenging to achieve due to technicalities, but it is a small effort towards establishing healthcare facilities that are not isolated and insular. In case of a huge health crisis, the thesis proposes scenarios on how health facilities should expand into the public realm in a pre-established and systematic manner. The design is also made to be prototypical and replicable so that in any city or place in the world that needs additional space during a health crisis, the system can be used to develop an expanded network of healthcare facilities.


SITE PLAN
SCALE : 1" = 80'

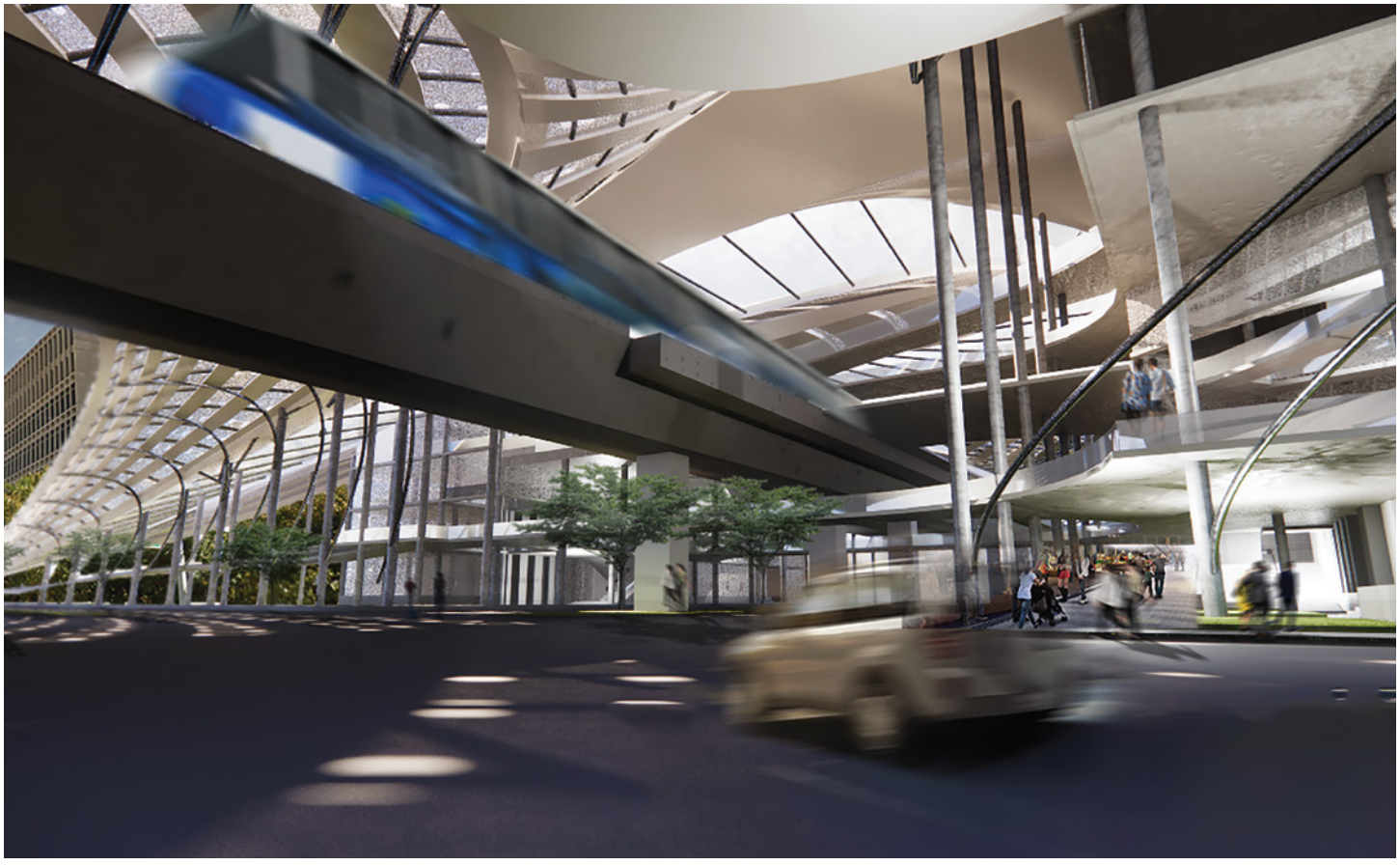

SECTION BB


SECTION AA

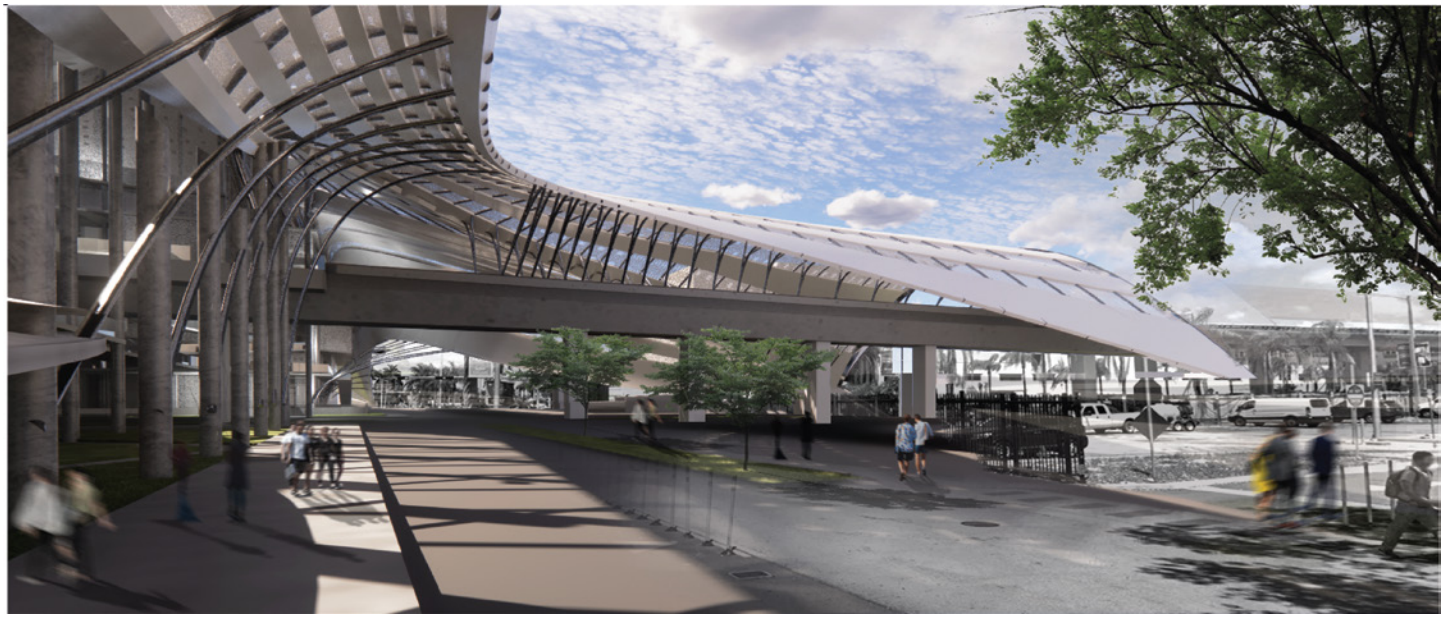

GROUND FLOOR PLAN
SCALE : 1/32" = 1'-0"

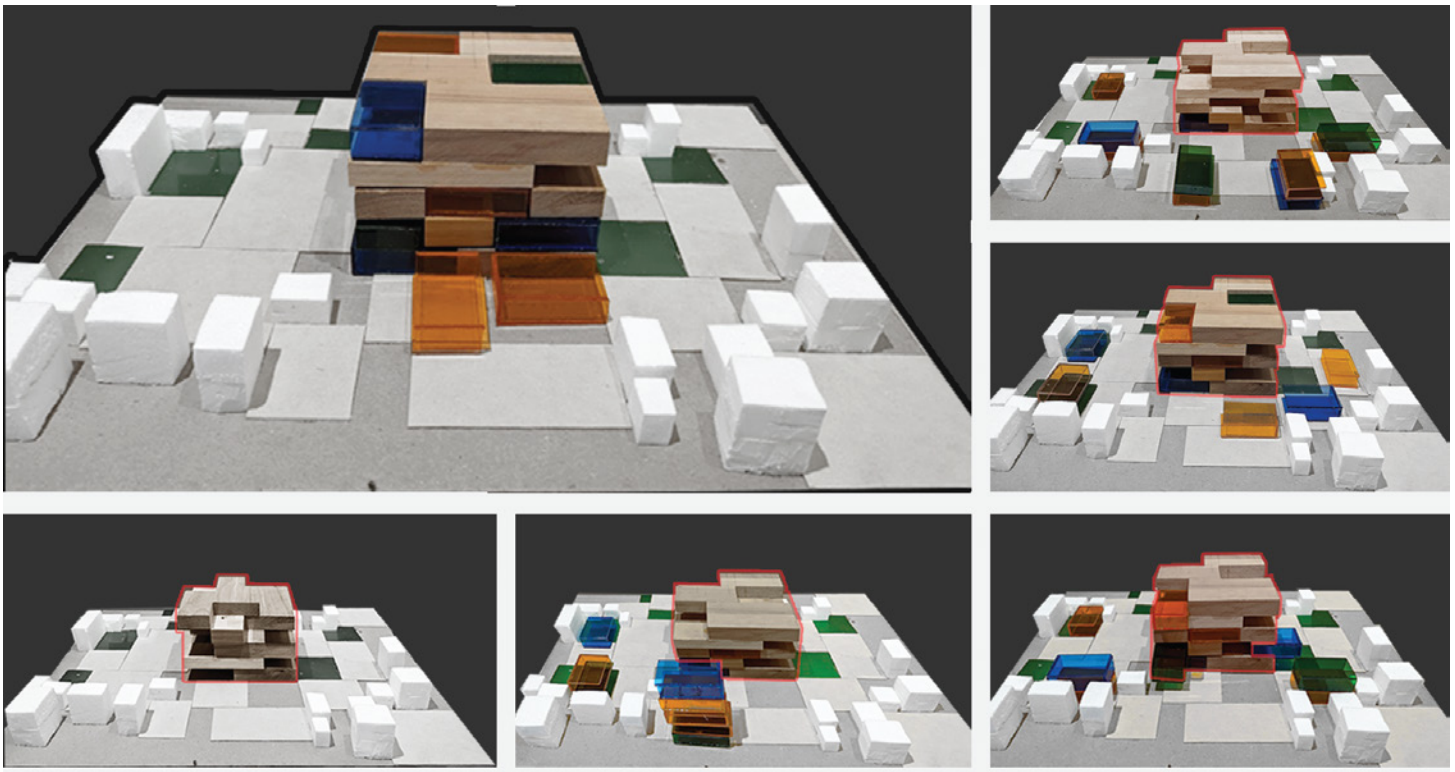

FOURTH FLOOR PLAN
TRAIN LEVEL
SCALE : 1/32" = 1'-0"


08

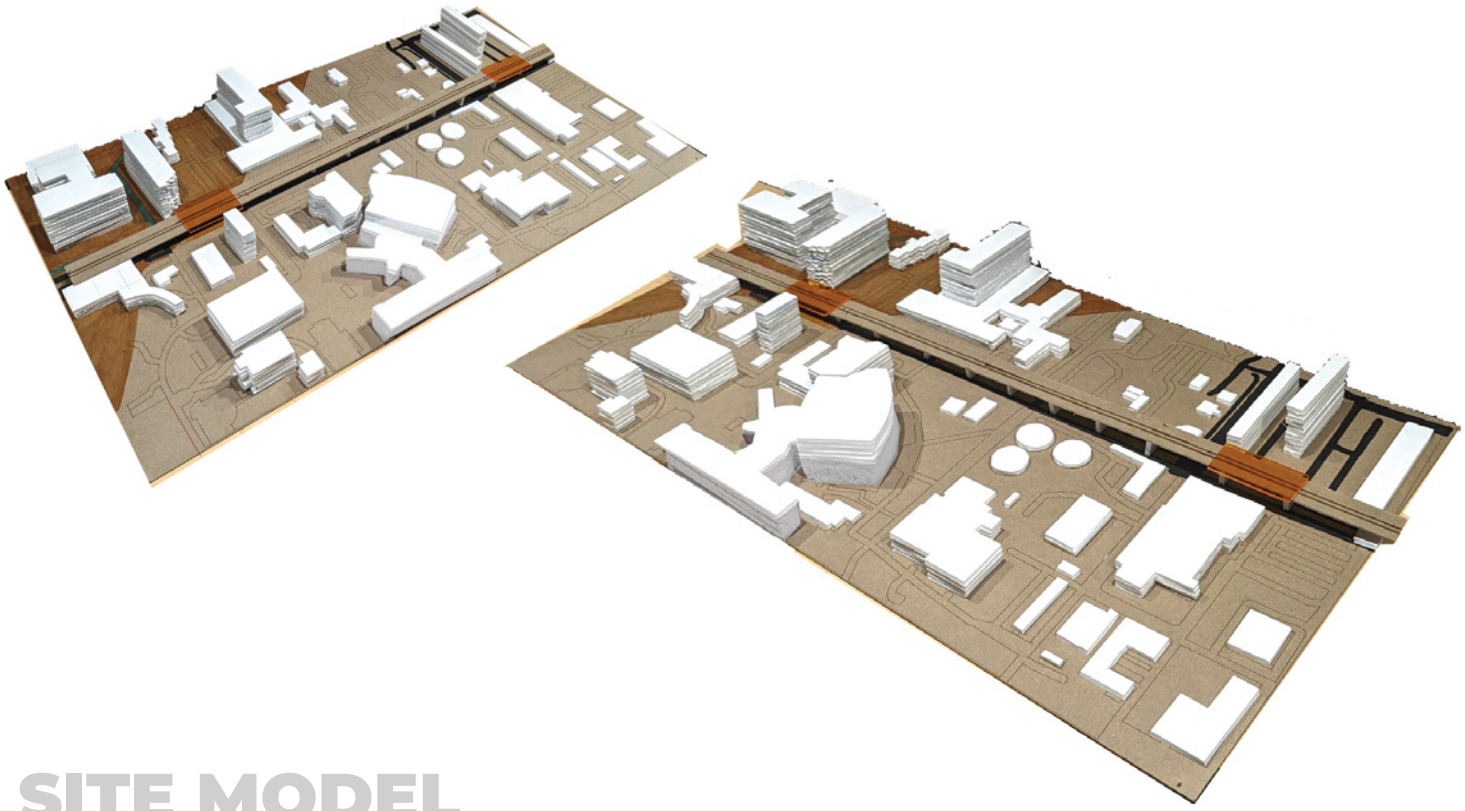








WUNDERKAMMER



SITE MODEL

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Figure 37 : Hialeah Flood Scenerio and Solution

Bibliography

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