

VASANTH MAYILVAHANAN

2020 Graduation Portfolio

Master of Science in Architecture and Urban Design (MSAUD)

Columbia University GSAPP 2019-2020

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Spring 2020

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Gardens Of Hope

Hatikva-Ezra, Tel Aviv, Israel

Type: Academic Project (Group of 4)

Studio: Urban Design Studio III (A6851-1)

Year & Term: Spring 2020

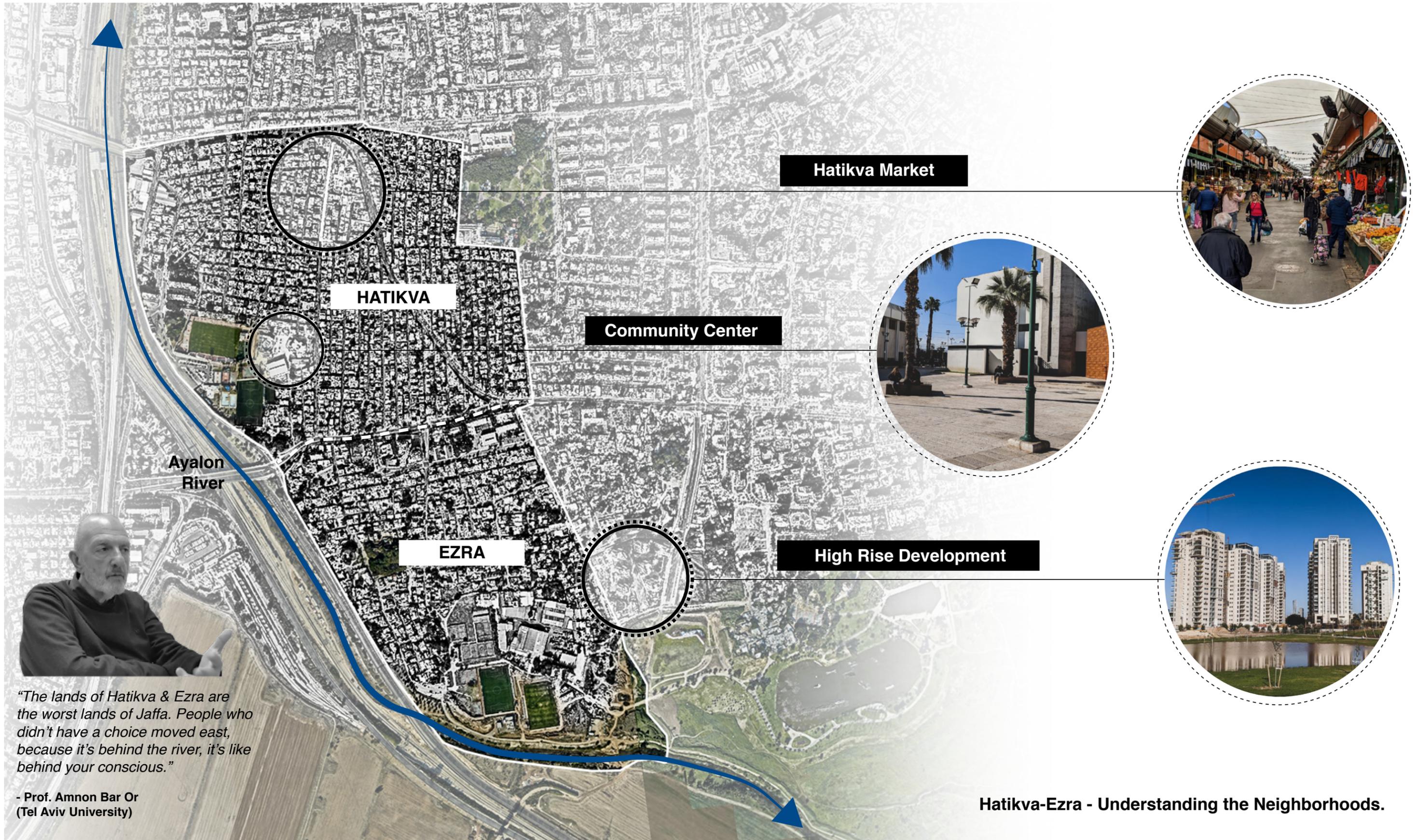
Instructors: Prof. Kate Orff, Geeta Mehta, Thad Pawlowski, Julia Watson, Adriana Chavez, Dilip Da Cunha, Lee Altman, Fitsum Gelaye

Hatikva and Ezra are both working-class neighborhoods located in the south-east of Tel Aviv-Yafo next to the Ayalon River. The neighborhoods are rich in diversity and culture with historically underinvested and marginalized communities. They have a unique land parcelization called the Muşah, where people share large parcels of land without a defined individual allotment. Subsequently, development pressures are threatening the uniqueness of these neighborhoods.

The project proposes to establish a development trust that creates an opportunity to build consensus, collaborate, design, and implement projects that enable local stewardship for a new way of life for the residents. The sharing mechanisms of the Muşah concept are used to integrate Water-Sensitive Urban Design (WSUD) interventions and new housing typologies that would allow local communities to connect and thrive. The project proposes an urban design strategy to densify the neighborhood and provide much-needed housing, improve social cohesion, connect residents through water-driven design, and interpret the historic Muşah.



Proposed Dry and Wet Conditions in a Typical Hatikva Street.



Hatikva Market

HATIKVA

Community Center

Ayalon River

EZRA

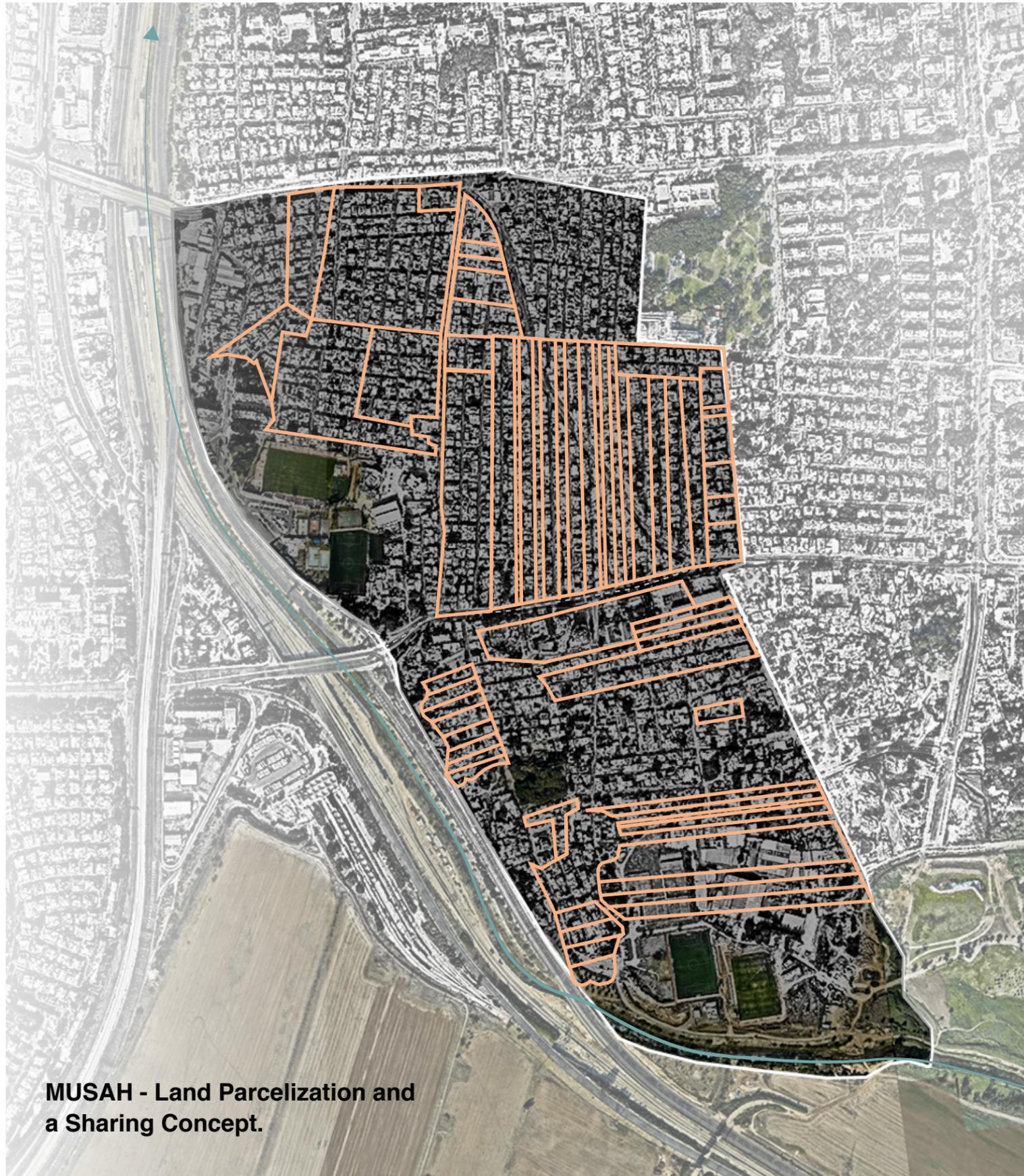
High Rise Development



"The lands of Hatikva & Ezra are the worst lands of Jaffa. People who didn't have a choice moved east, because it's behind the river, it's like behind your conscious."

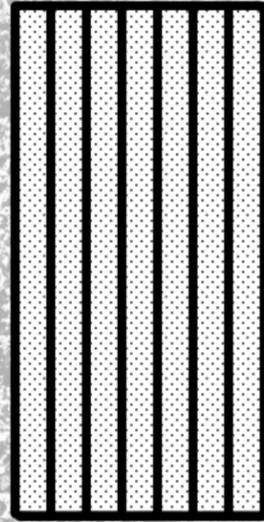
- Prof. Amnon Bar Or
(Tel Aviv University)

Hatikva-Ezra - Understanding the Neighborhoods.



MUSAH - Land Parcelization and a Sharing Concept.

Ottoman Land Law
1858 Part of Majela



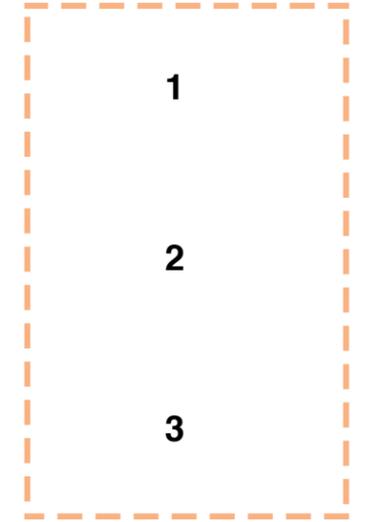
Cultivate Land
No defined Ownership for swapping the land in different seasons.

The British Mandate
20th Century



Redistributed
Partnership Lands were redistributed during the Agrarian Reform.

The Land Law of Israel
1969



Musah in Hatikva & Ezra
Joint Ownership exists to date.

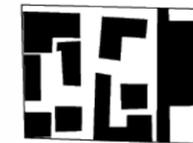
Musah Geometry



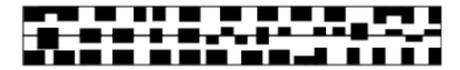
Linear/Vertical



L Shaped



Square



Horizontal

A Systematic Approach to Regulate Water for Local Benefit



- Divert Stormwater**
- Block Flood Water
 - Divert

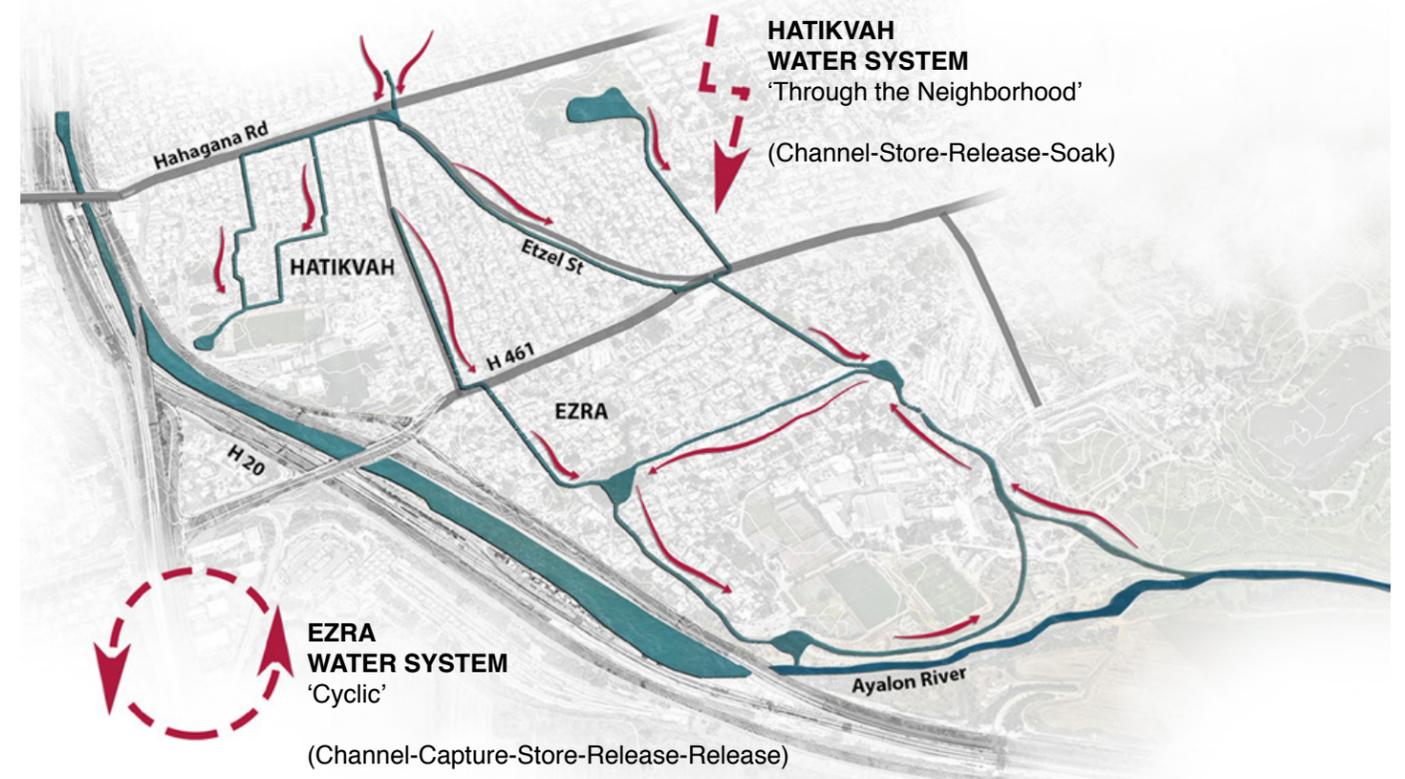
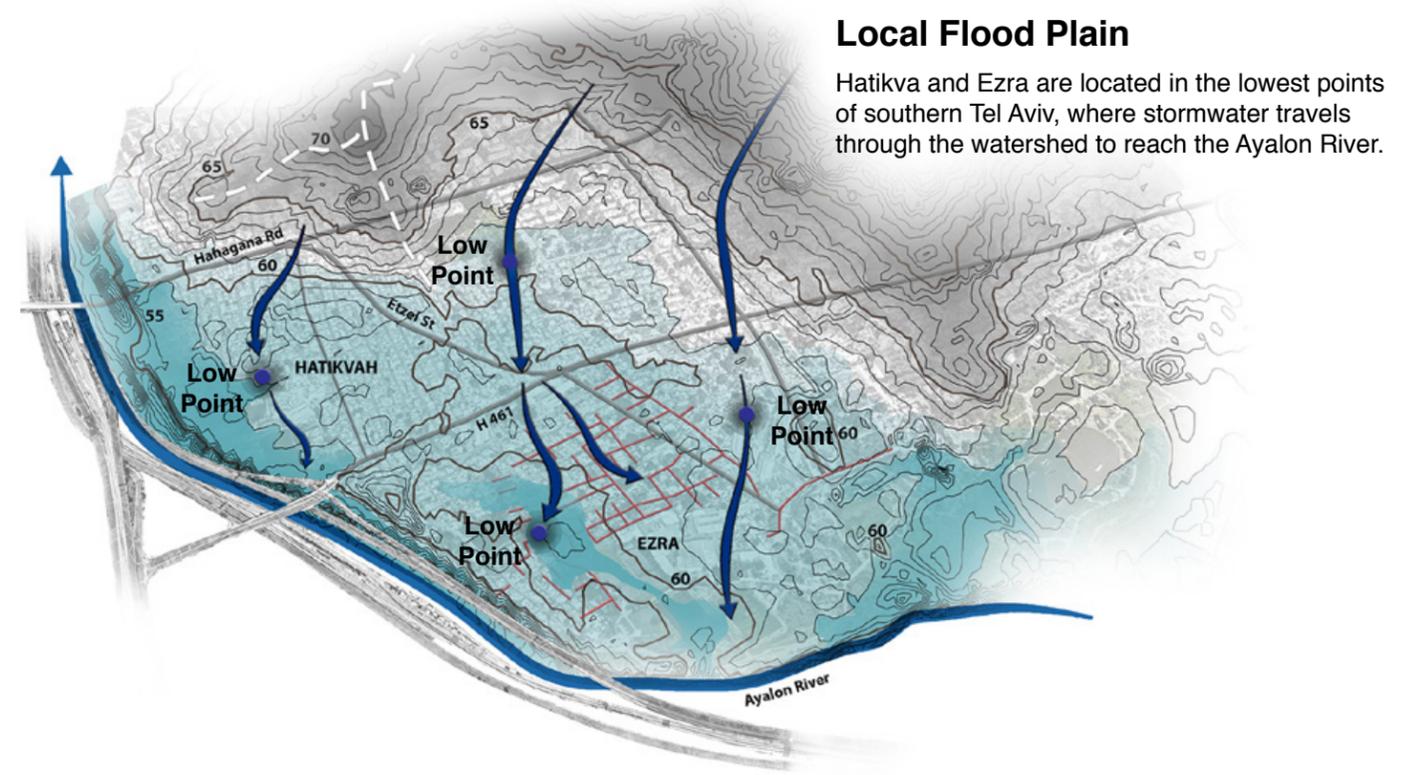
- Alter the Landform**
- Fill
 - Cut

- New Water Bodies**
- Retention Ponds
 - New Streams

- Green Infrastructure**
- Existing Green Spaces
 - Proposed Green Spaces

Local Flood Plain

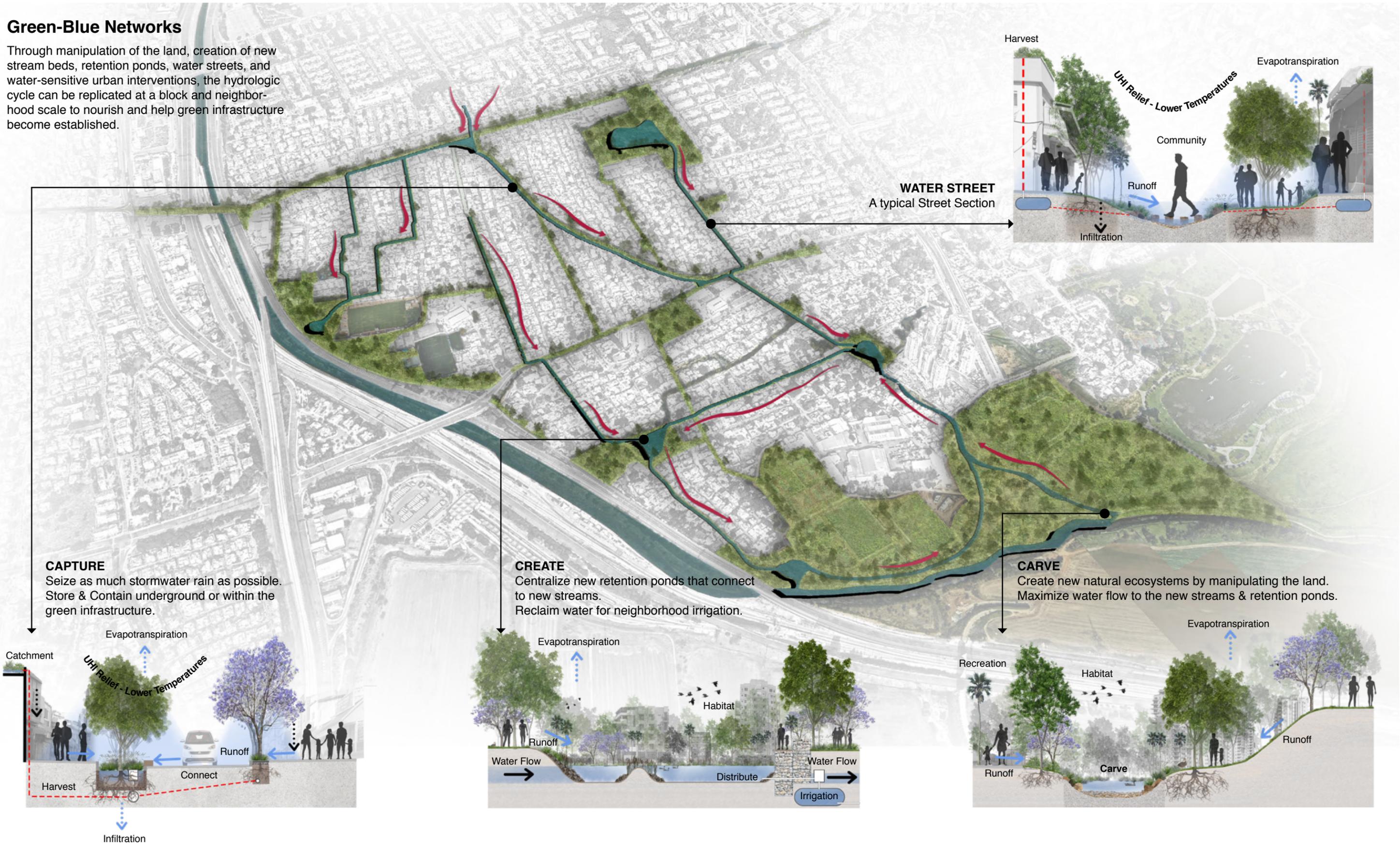
Hatikva and Ezra are located in the lowest points of southern Tel Aviv, where stormwater travels through the watershed to reach the Ayalon River.



Maximizing Water Capacity

Green-Blue Networks

Through manipulation of the land, creation of new stream beds, retention ponds, water streets, and water-sensitive urban interventions, the hydrologic cycle can be replicated at a block and neighborhood scale to nourish and help green infrastructure become established.





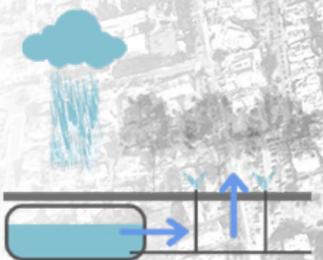
Rainwater Harvesting



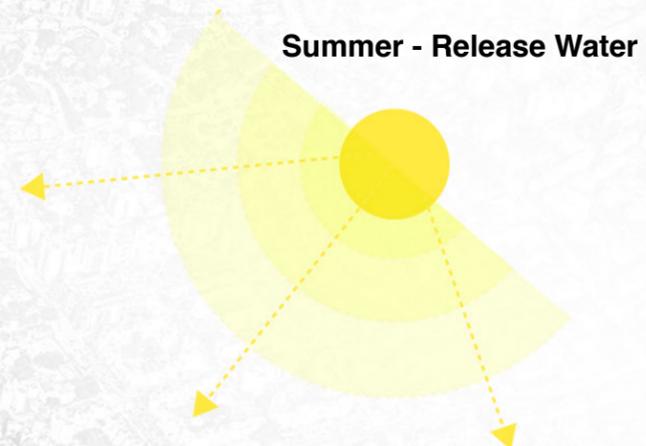
New Natural Water Bodies



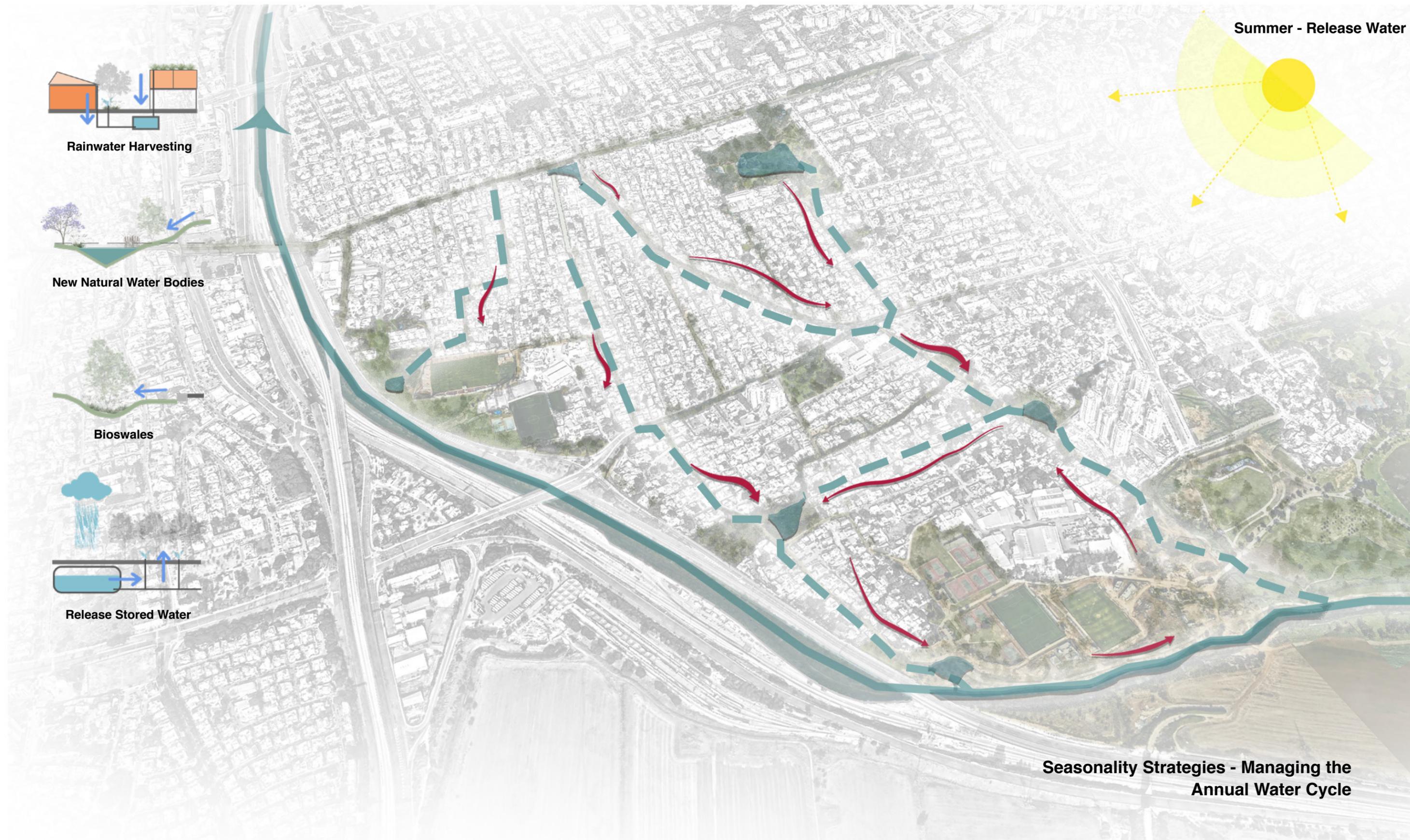
Bioswales



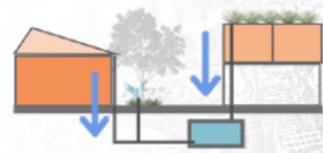
Release Stored Water



Summer - Release Water



Seasonality Strategies - Managing the Annual Water Cycle



Rainwater Harvesting



New Natural Water Bodies



Bioswales



Retention Ponds & Wetlands



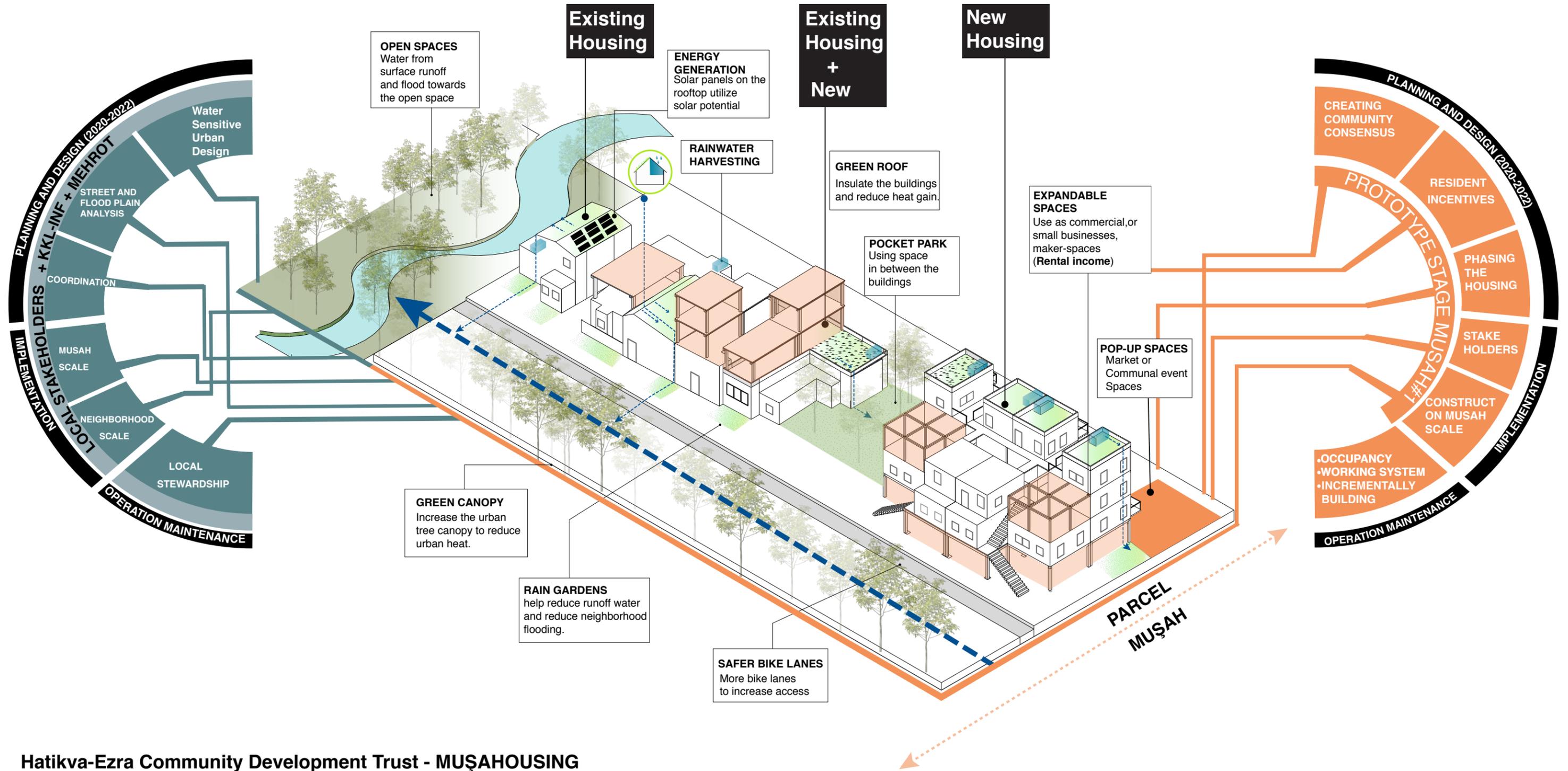
Water Streets



Seasonality Strategies - Managing the Annual Water Cycle

WATER

HOUSING



Hatikva-Ezra Community Development Trust - MUŞAHOUSING

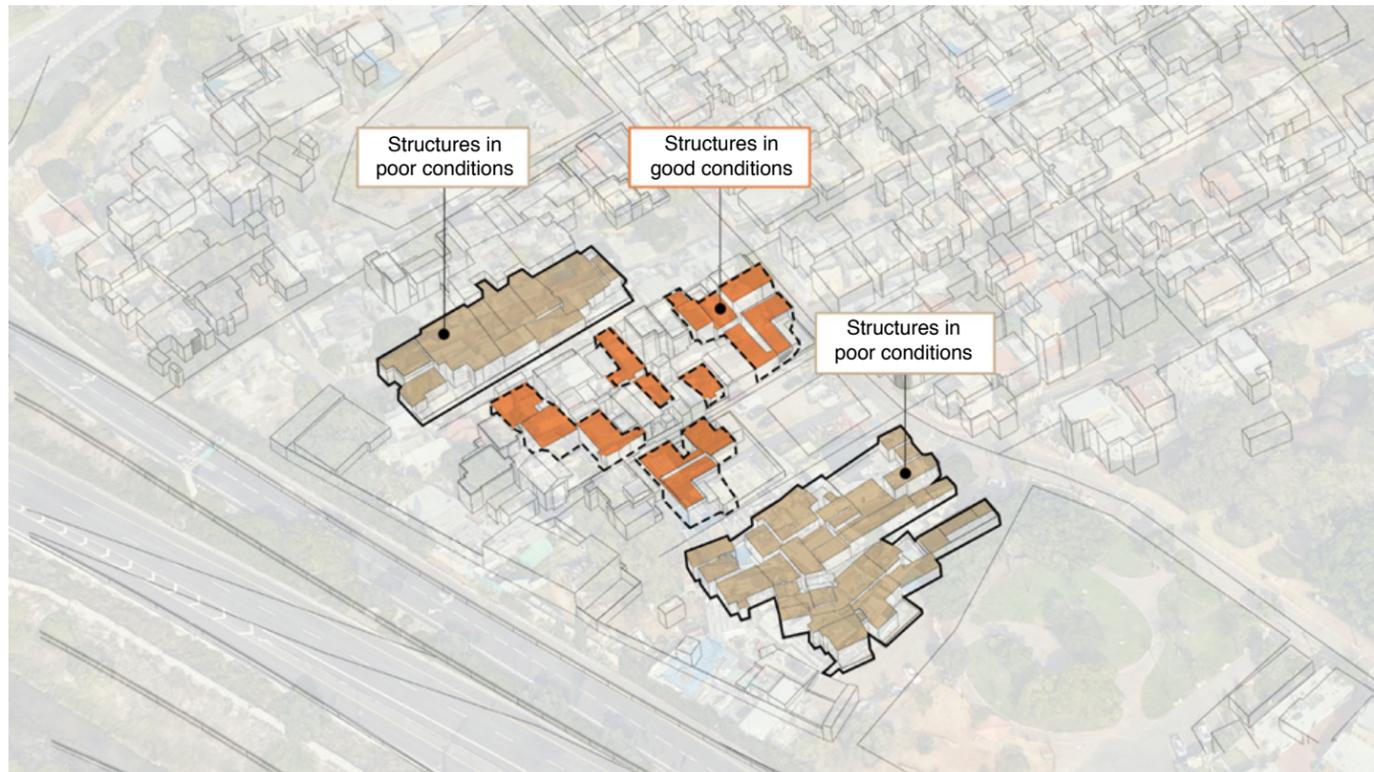
Consensus Building Through a Bottom-Up Approach.



2 - Musah



4 - Incremental Housing



3 - Existing Housing Conditions



5 - Local Green-Blue Network



Proposed Green Infrastructure

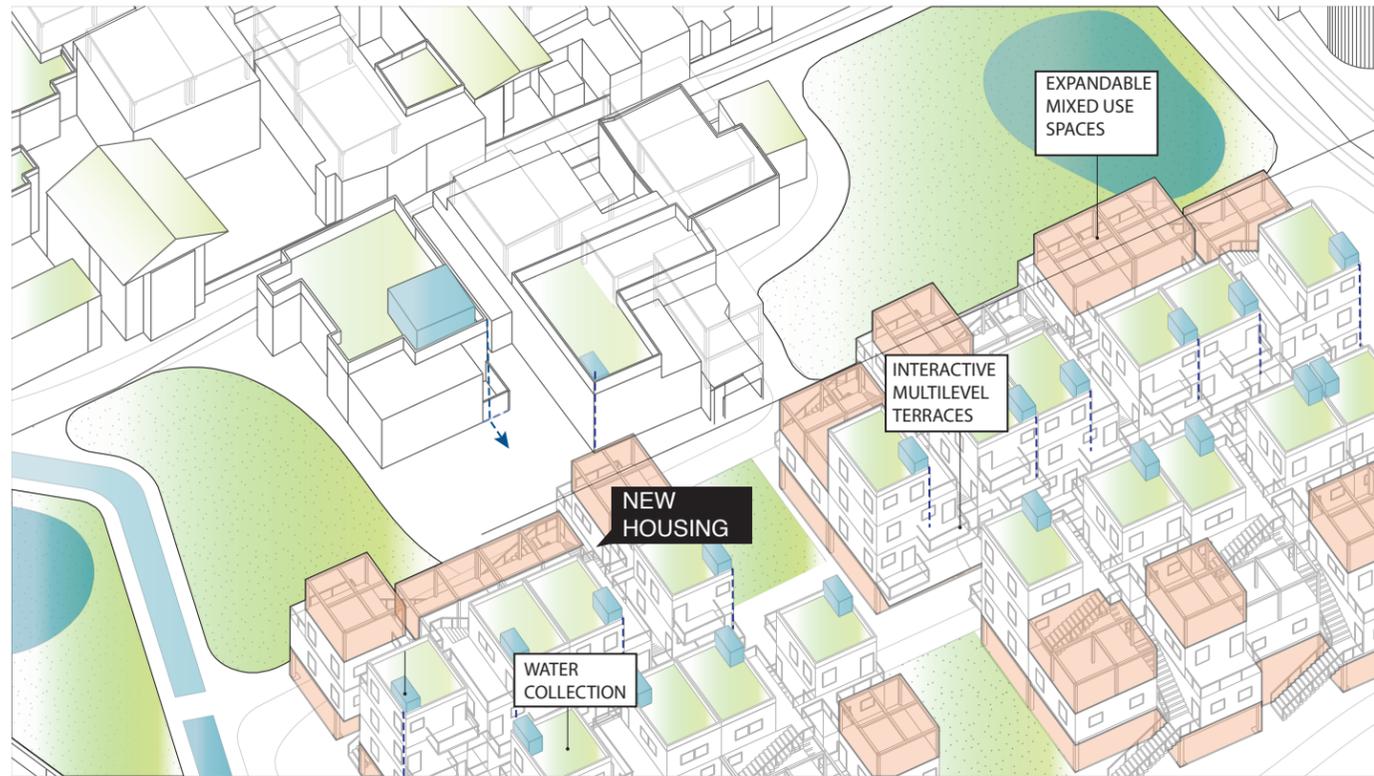
Expandable Units

Proposed Modular Housing System

New Urban Landscape

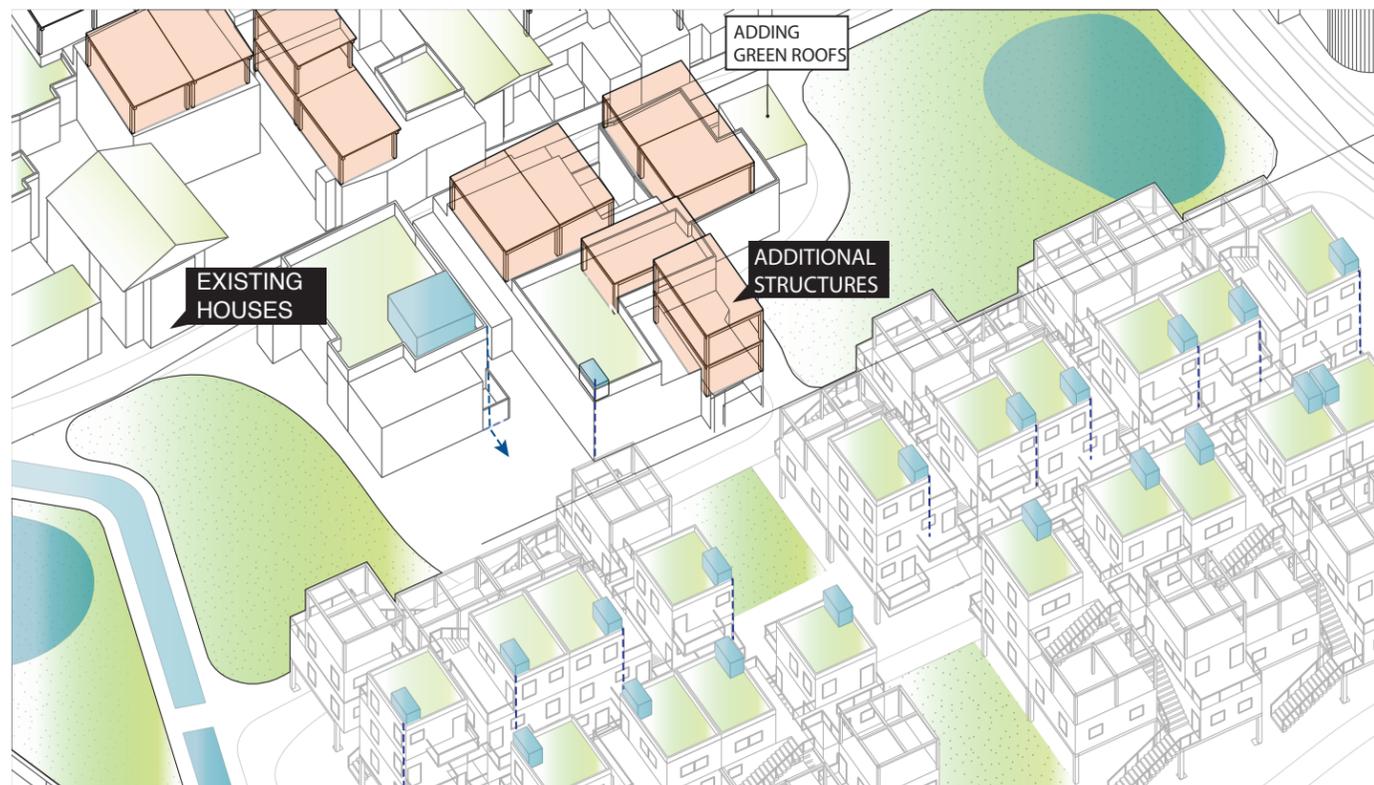
Integrating Housing with the Green-Blue Infrastructure as a Pilot Project.

Modularity - An Incremental Housing System



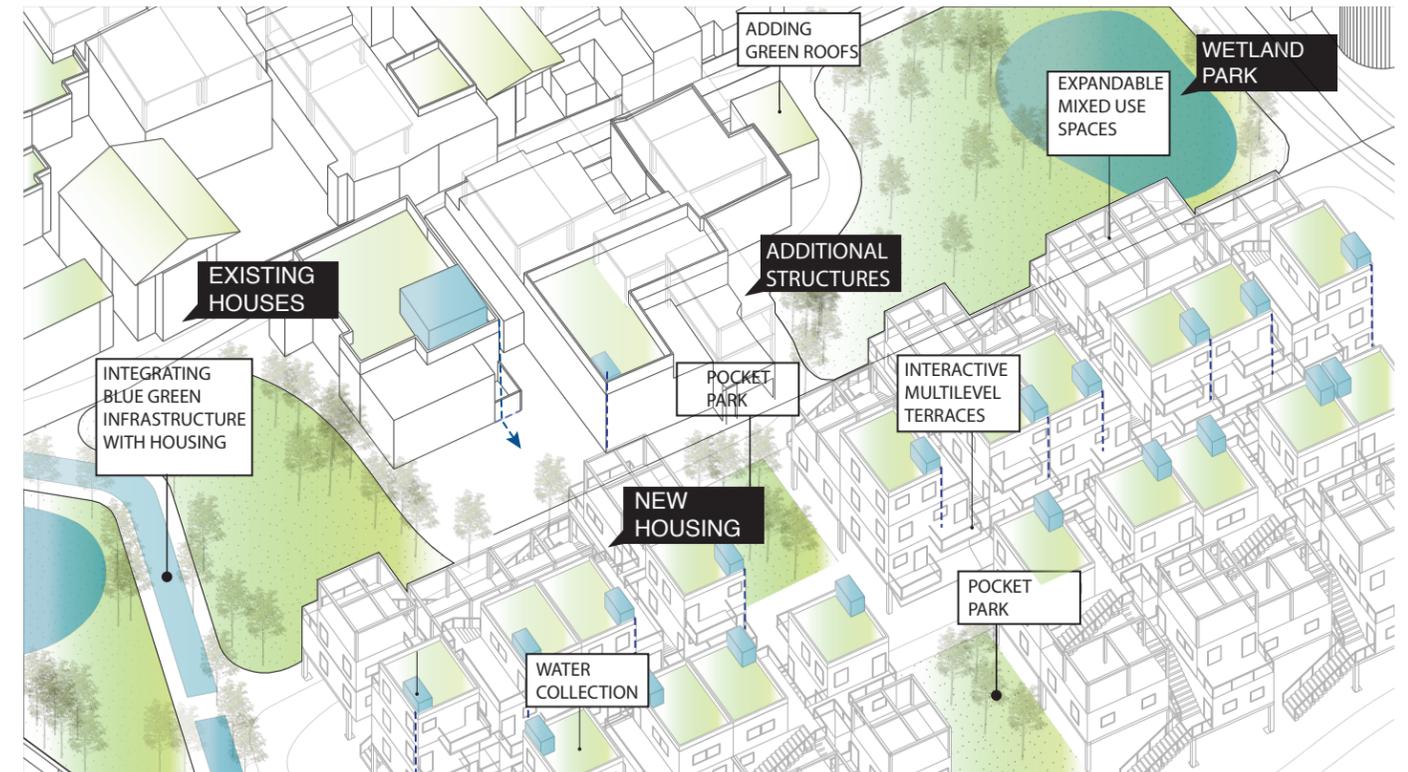
Addition

Integrate additional development on existing housing structures in good conditions.



New Construction

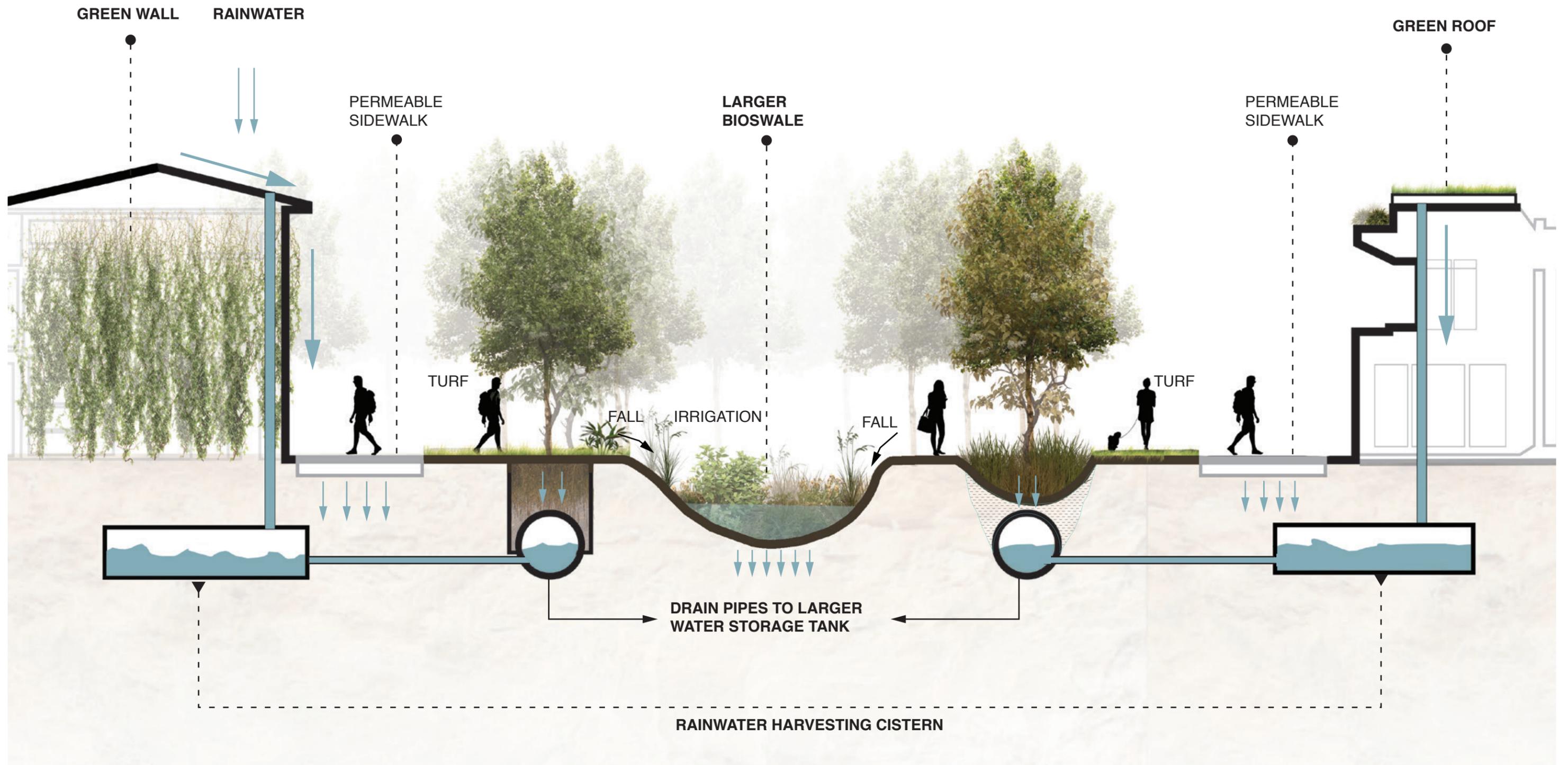
Identify vacant or underutilized areas to build new housing.



Integration

Connects new and existing housing systems with the green-blue infrastructure network.

Water Sensitive Urban Design (WSUD) - Typical Street Section



Placemaking - Muşah as a Cooperative System of Living

The Muşah be not only a tool for parcelization, but also a system to foster local trust and collaboration. The interconnected green-blue infrastructure creates flexible maker spaces, roof gardens, interactive multi-level terraces, and markets.





Dry Seasons



Wet Seasons

“Densify Dont Destroy”



Living with Water

Using the Concept of Musah to Connect People.

What's on Your Plate?

Hudson Valley, New York, USA

Type: Academic Project (Group of 4)

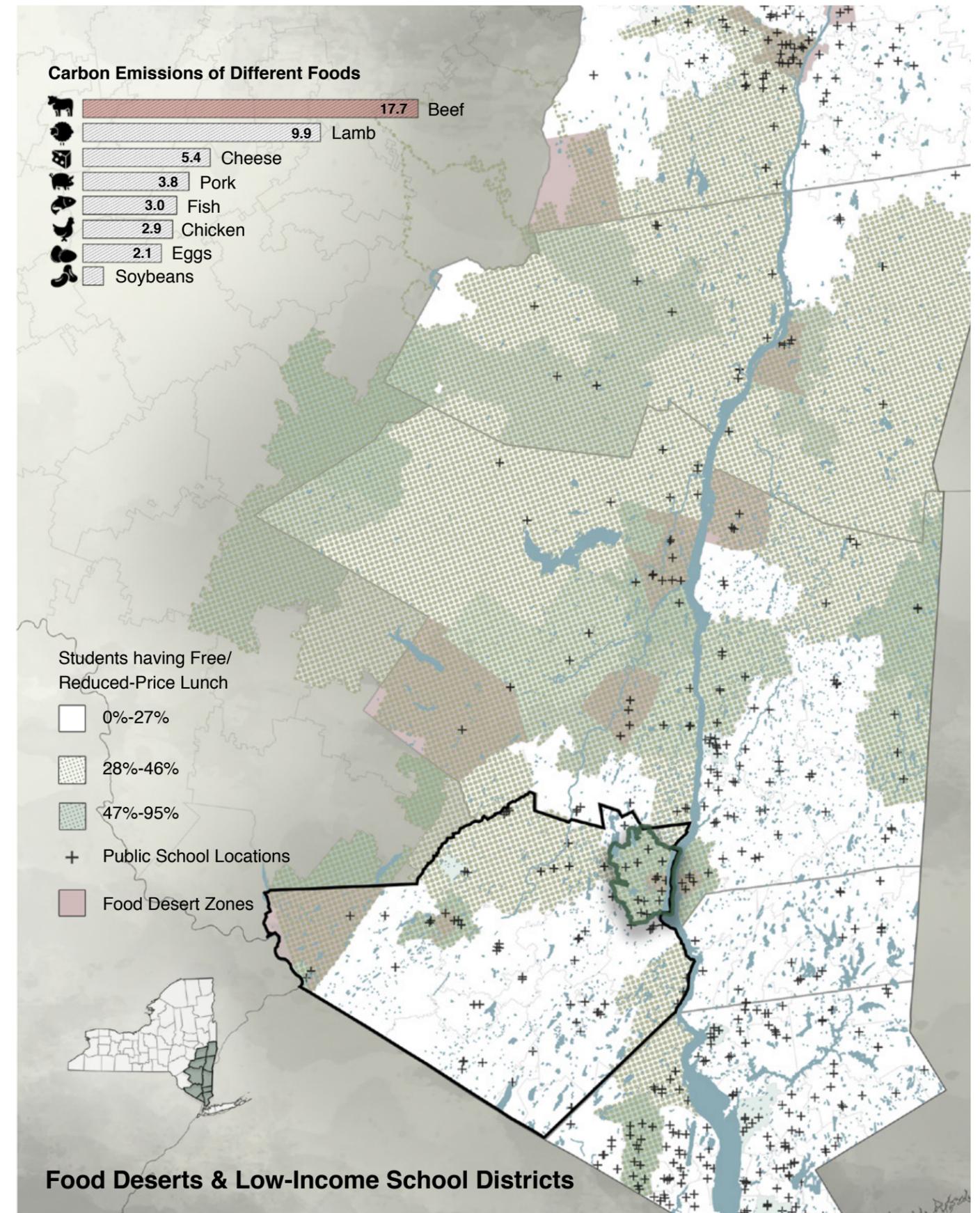
Studio: Urban Design Studio II (A6850-1)

Year & Term: Fall 2019

Instructors: Prof. Kaja Kuhl, David Smiley, Anna Dietzsch, Jerome Haferd,
Liz McEnaney, Justin Moore, Shachi Pandey, Raafi Rivero,
Dragana Zoric

The food system is responsible for over one-quarter of global carbon emissions. Lack of access to quality food creates food insecurity leading to a higher meat consumption over our primary area of focus - Hudson Valley. These issues magnify in areas like Newburgh that have a diverse young population with school children making up for a third of the population.

The project aims at restructuring the food system to reduce carbon emissions by providing access to quality food and creating awareness by educating the children for the future. The idea is to connect local farms directly to schools as central kitchens. The project uses two existing schools in Newburgh as a prototype for the system. These schools would act as a catalyst by hosting programs ranging from shared-use kitchen spaces, community dining halls, learning gardens, and market spaces to create awareness through a system of experiential learning.





JEN: Resident of Newburgh
"It is hard to get access to fresh produce nearby, and I have to take my car and go directly to the farm. That is time-consuming and expensive."



MARIA: Highschool Student in Newburgh
"We get pizzas for breakfast! We can be given more variety and healthy choices."



ALLEN: Resident of Newburgh
"It has got to do with awareness. If people are aware that they can eat healthy food which is affordable and also contribute to the local economy, that is when we start to create a sustainable environment."



VIRGINIA: Program Director at Newburgh Urban Farm and Food Initiative
"30% of the population of Newburgh is in poverty, with 45% of them being children. So, these are the folks who need the most healthy food so that they can continue to grow and do well in school."

LIANA: Program Director at Newburgh Urban Farm and Food Initiative
"Schools are opportunity spaces that can have direct relationships with the farms, which can create variable pricing in the produce."



DAVE: Resident of Newburgh
"It is not easy to buy groceries since I have to travel far. I'd rather eat at a local fast-food joint."



Population
28,444



Poverty Rate
31.2%



Average Age
27.9



Single Population
63%



Unemployment Rate
8%



K-12 Public School Students
28,444



ONLY 1 IN 10 CHILDREN IN THE US consume the recommended daily dose of fruits and vegetables.



1 IN 5 PUBLIC HIGH SCHOOLS offers meals from fast food places like Taco Bell and Pizza Hut.

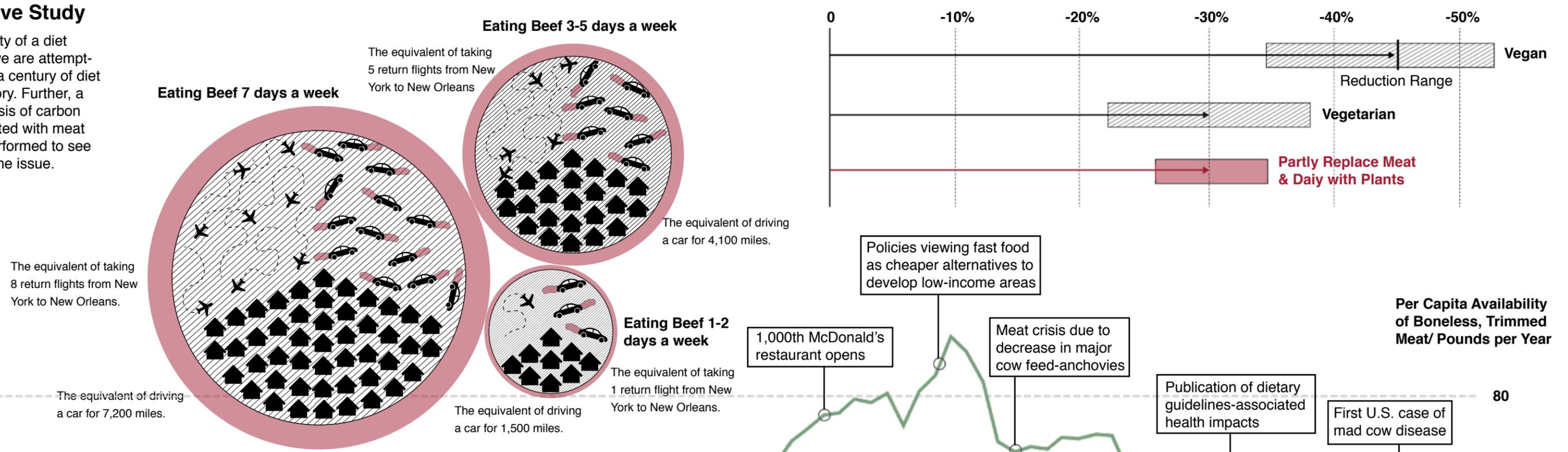


Students who regularly eat school lunch are **30% MORE LIKELY TO BE OBESSE** than other kids.

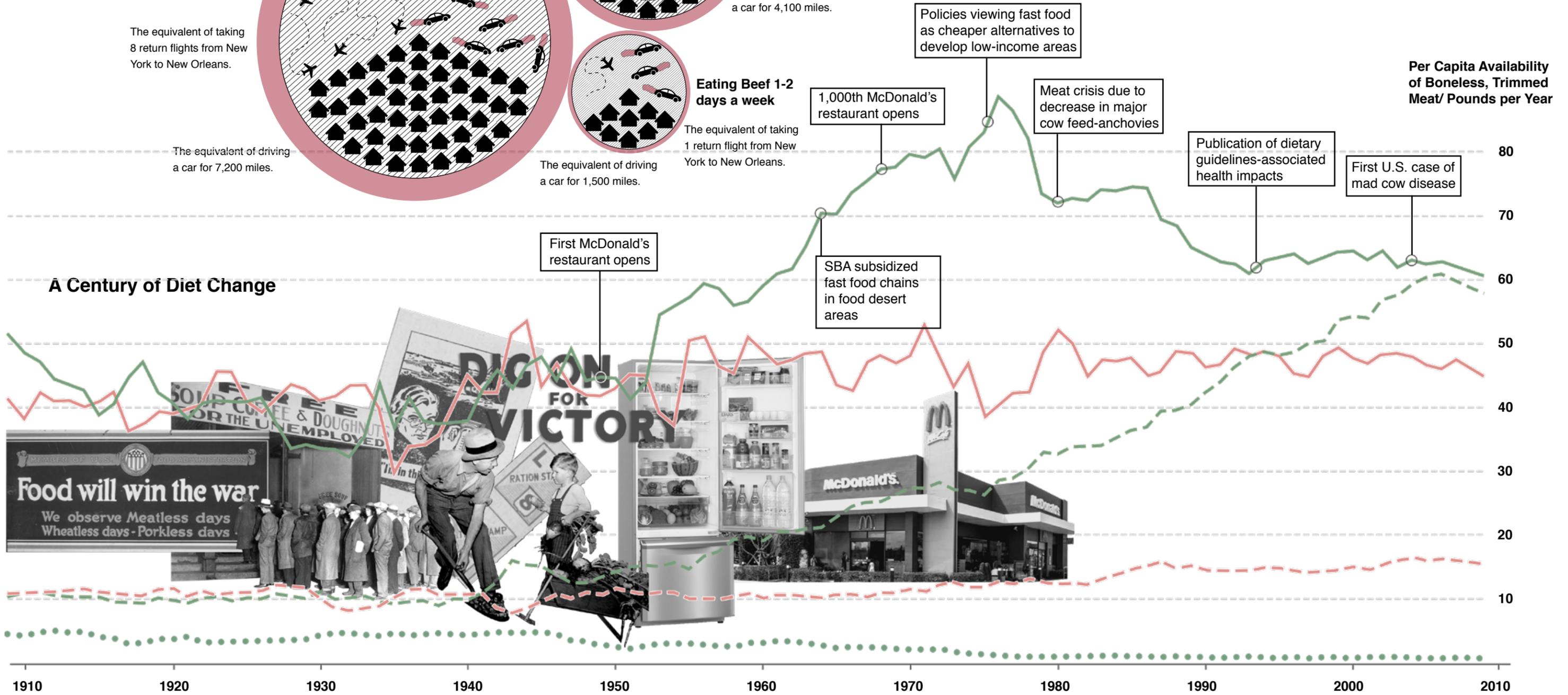


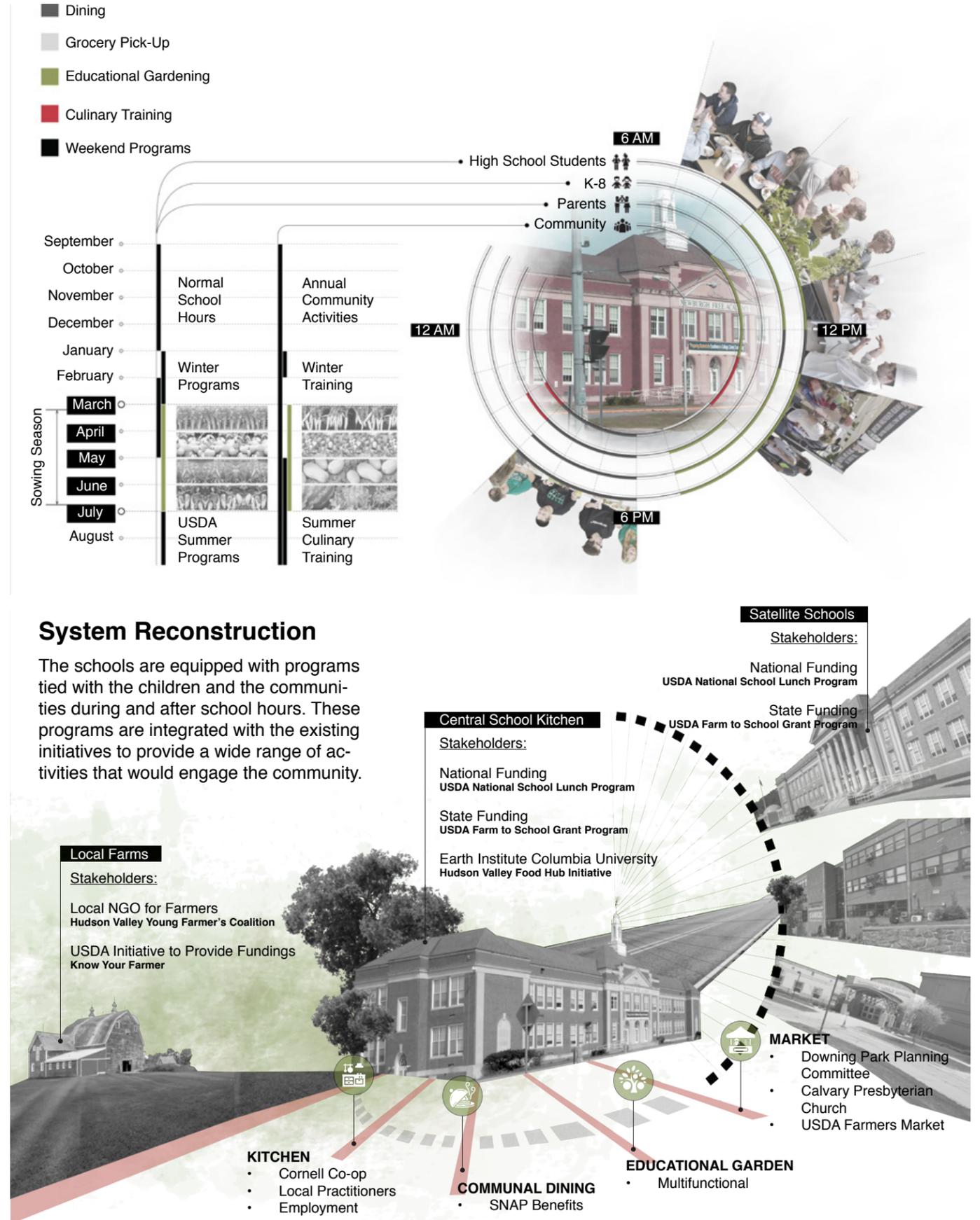
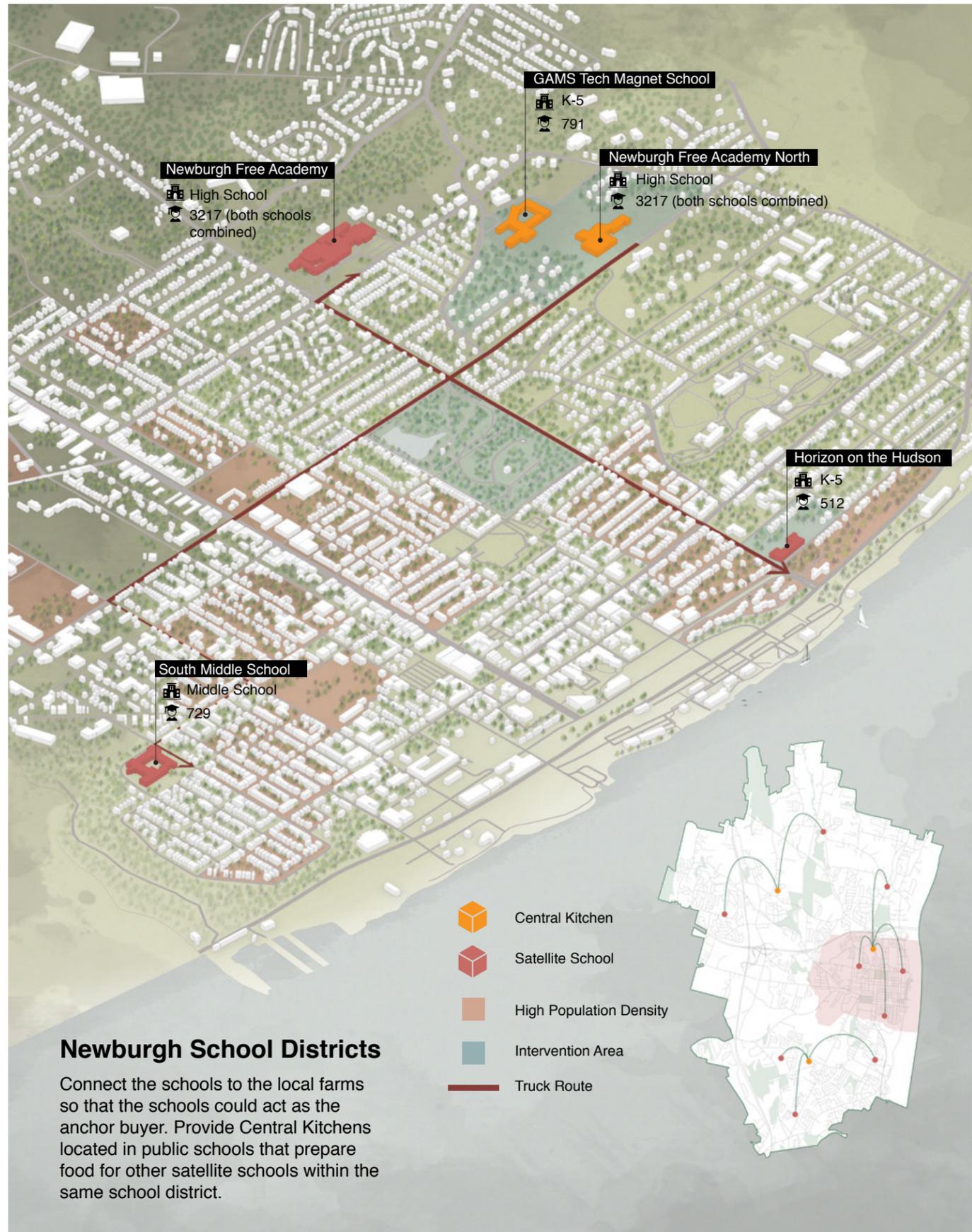
A Comparative Study

To test the feasibility of a diet change process, we are attempting to understand a century of diet change in US history. Further, a comparative analysis of carbon emissions associated with meat consumption is performed to see the magnitude of the issue.



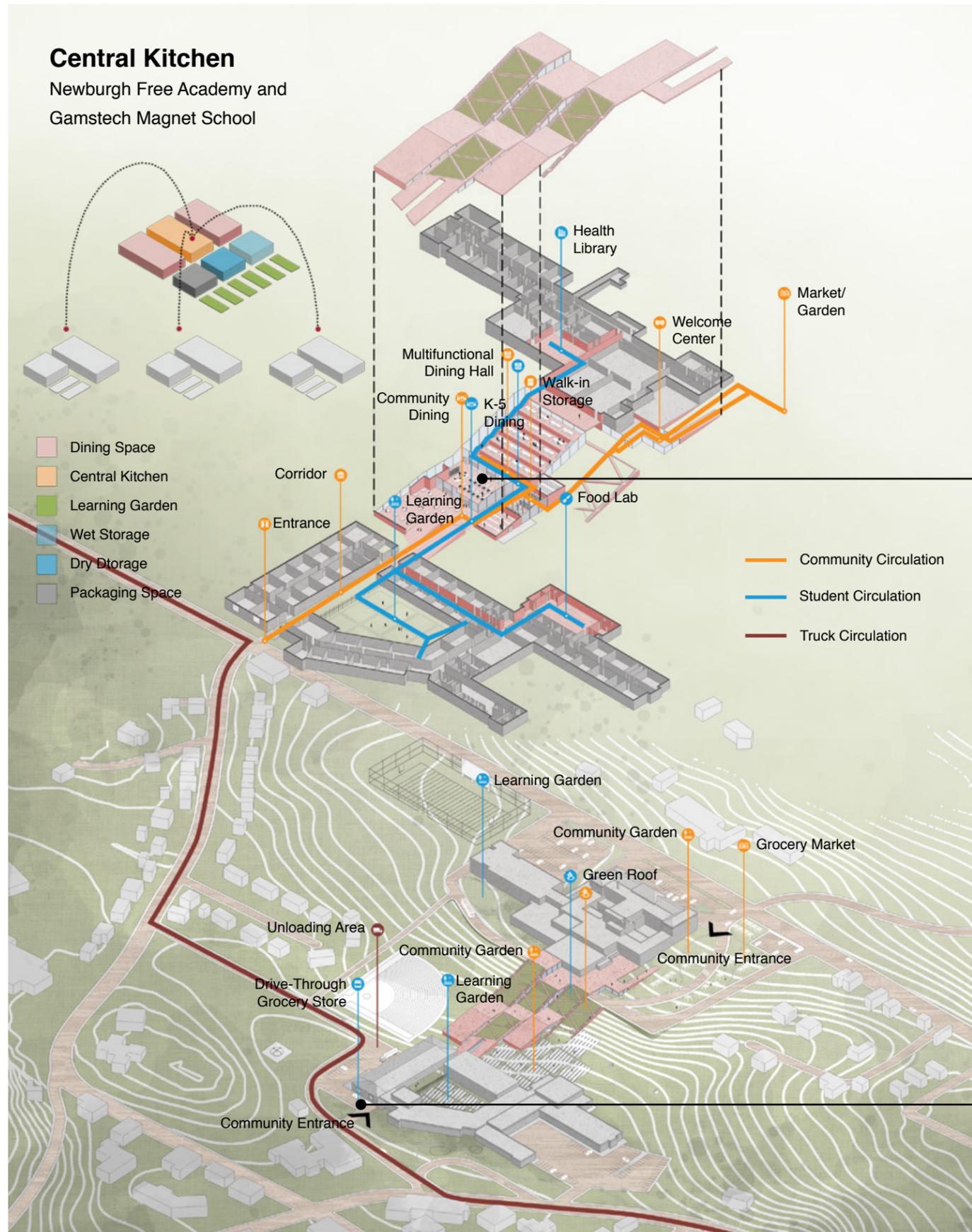
A Century of Diet Change





Central Kitchen

Newburgh Free Academy and Gamstech Magnet School



Multi-Functional Dining Hall

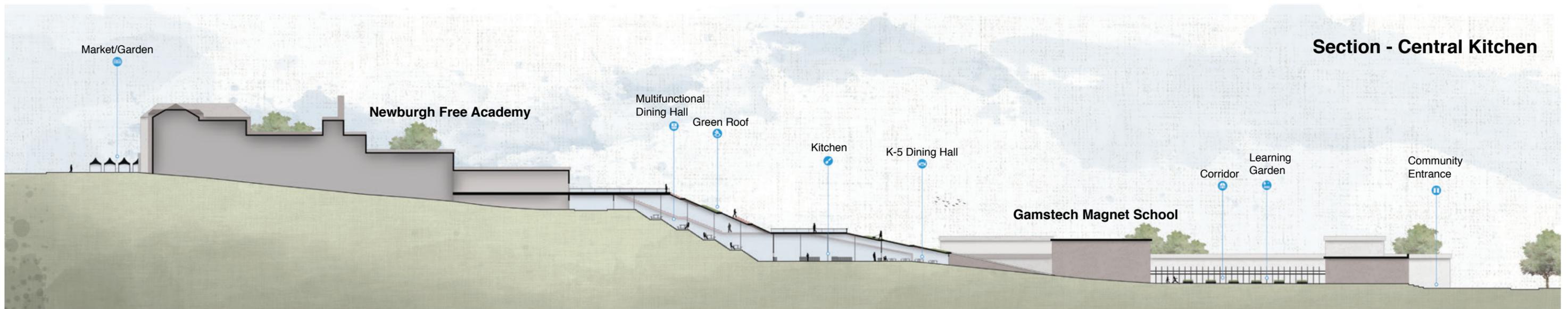


Drive-Through Market

Learning Garden

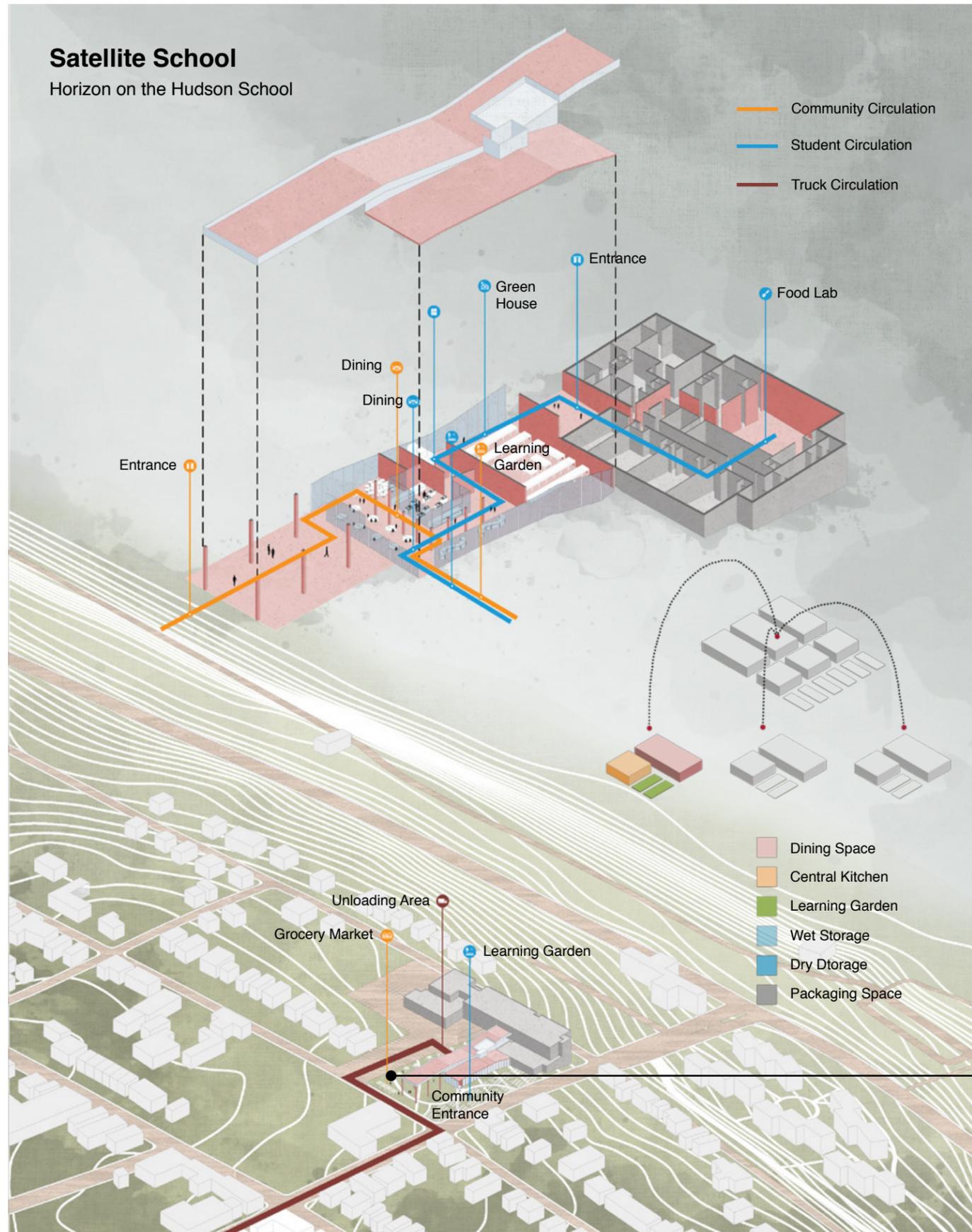


Section - Central Kitchen



Satellite School

Horizon on the Hudson School



Grocery Market



Day
Student Dining



Night
Community Dining

The Wastefront

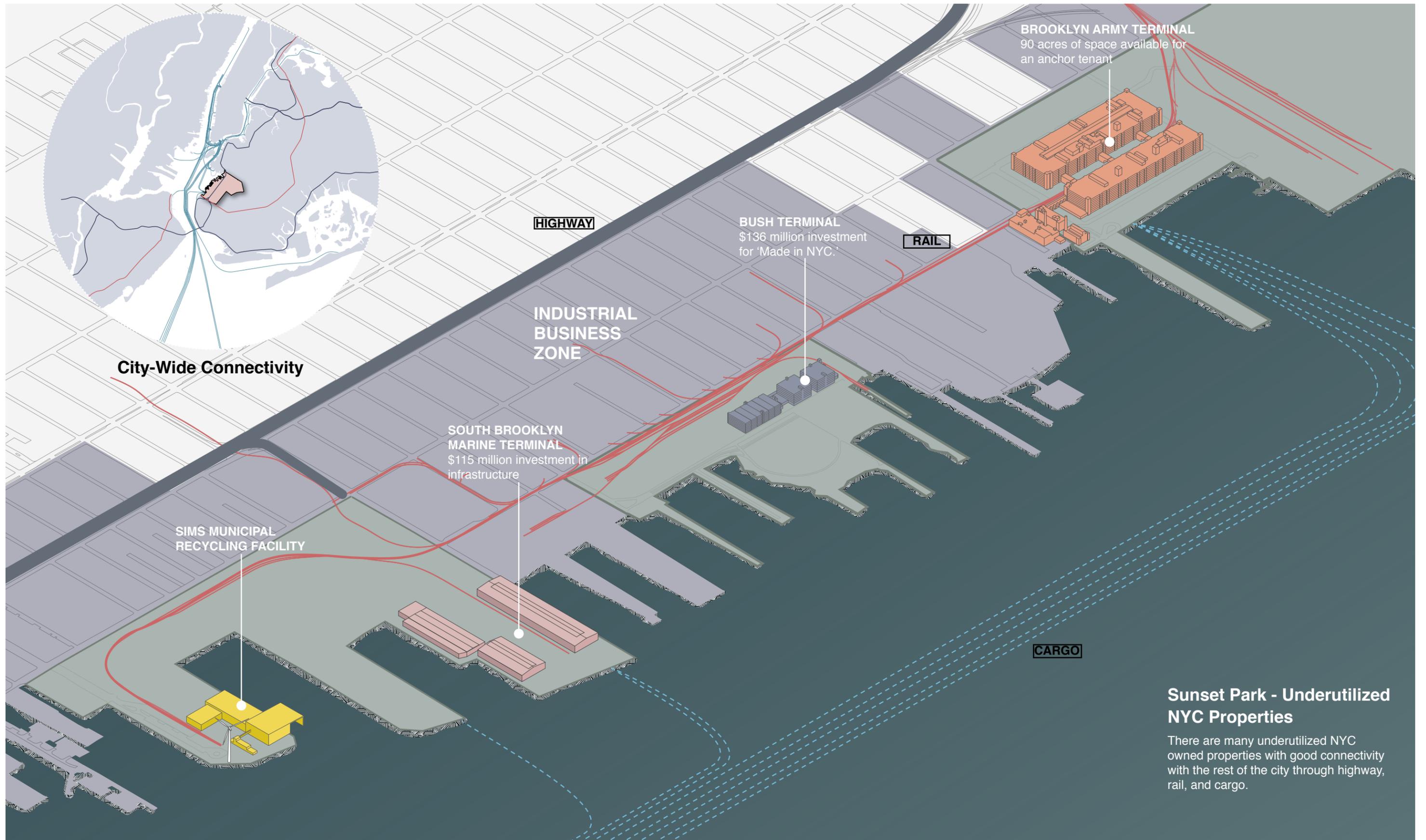
New York City, USA

- Type:** Academic Project (Group of 3)
Studio: Urban Design Studio I (A6849-1)
Year & Term: Summer 2019
Instructors: Prof. Tricia Martin, Nans Voron, Hayley Eber, Sagi Golan, Quilian Riano, Austin Sakong, Shin-pei Tsay

The project proposes a Green Waste System that will manage and recycle NYC's waste, creating an asset at Sunset Park that will give back to the community. Lack of necessary infrastructure and lack of awareness has led to over 75% of NYC's recyclable waste ending in landfills. As a part of the studio, we develop existing infrastructures to form a transformative system spanning multiple scales investigating complex, layered contexts with Sunset Park as the site.

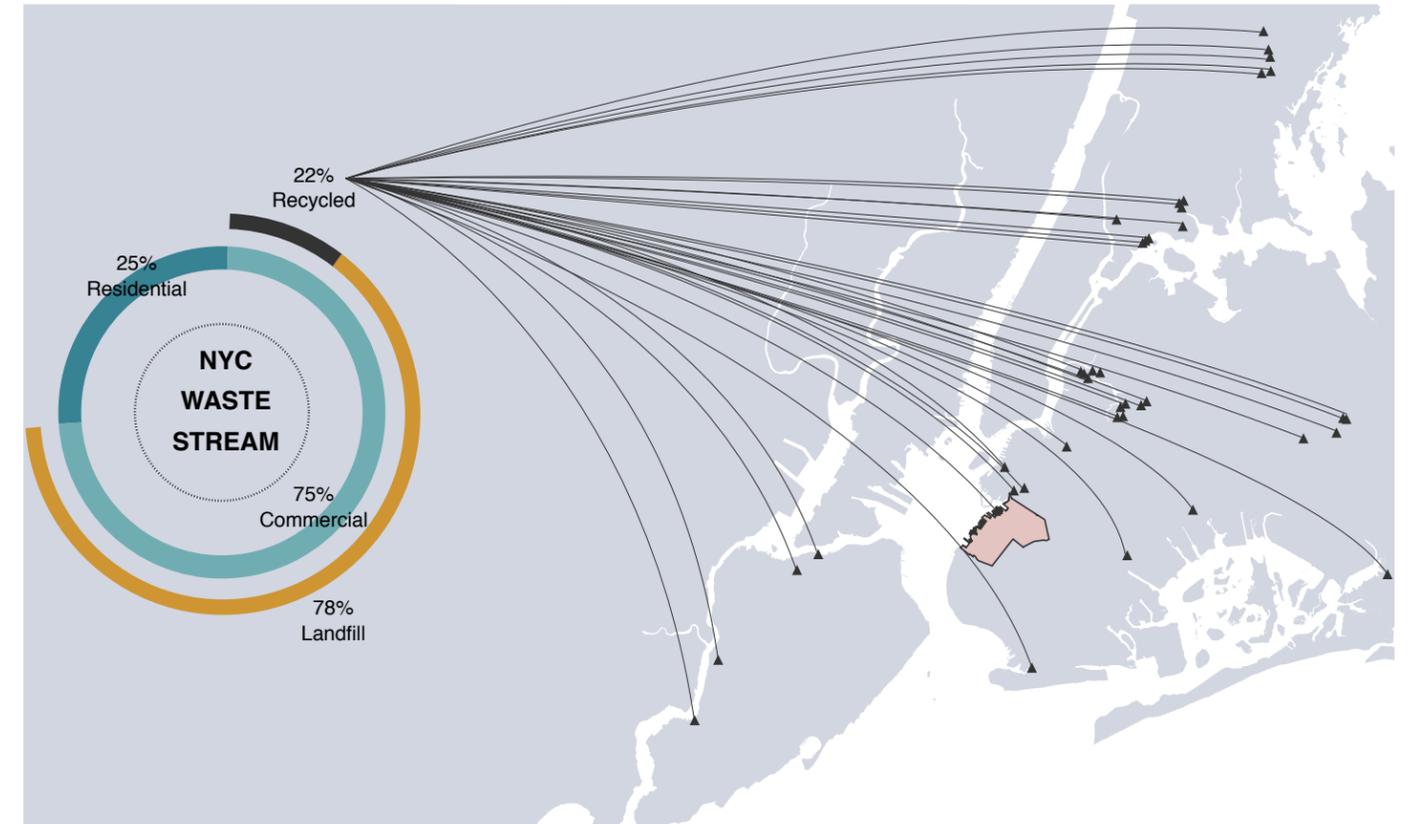
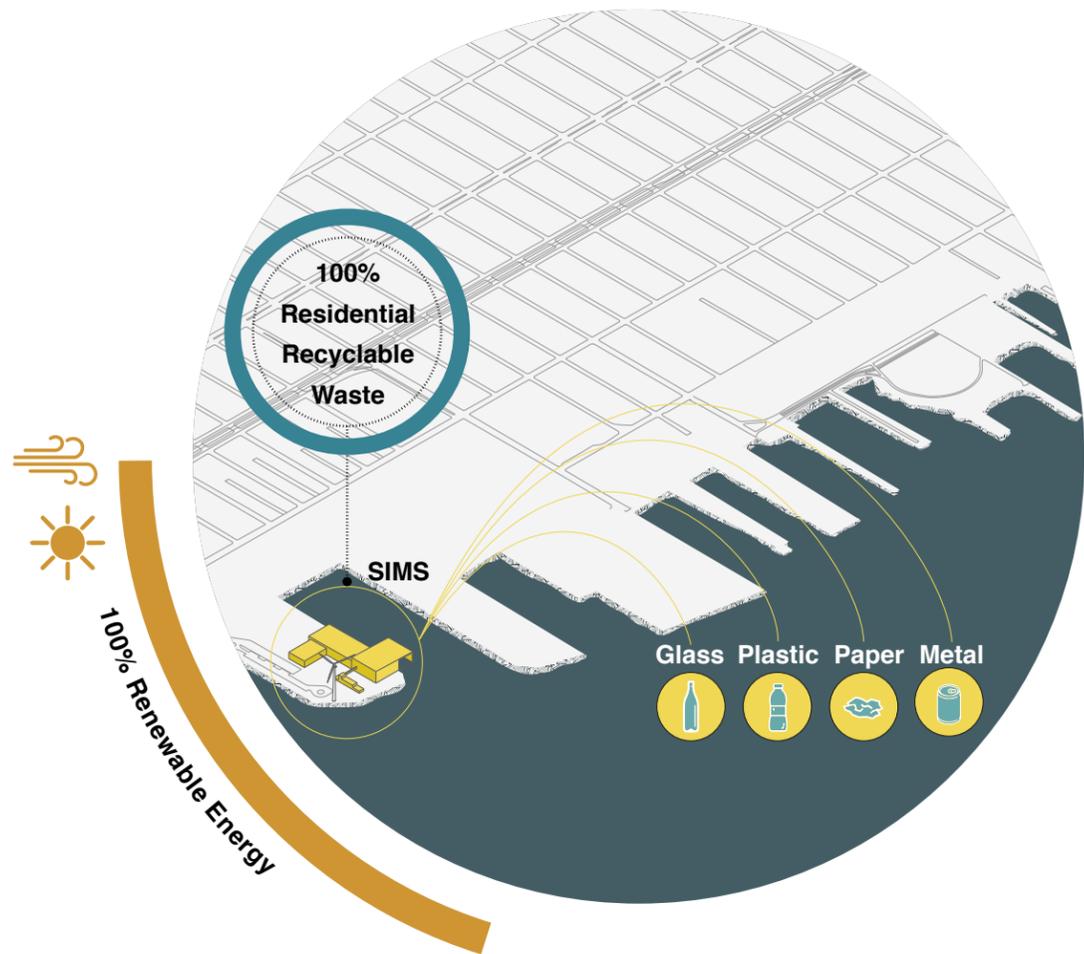
Sunset Park has an underutilized waterfront that has great potentials like being an Industrial area (IBZ) with several NYC properties that are being underutilized (SBMT, BT, BAT) with great connectivity. Finally, one of the main opportunities we identified was the SIMS recycling facility that is currently not utilized to its full capacity. Capitalizing on the existing infrastructures, our system aims at creating pneumatic tube systems that would connect waste to these recycling facilities in the Sunset Park waterfront. The waterfront would also host several programs that would change the people's understanding of waste as something without value, also giving back to the Sunset Park community.





Sunset Park - Underutilized NYC Properties

There are many underutilized NYC owned properties with good connectivity with the rest of the city through highway, rail, and cargo.



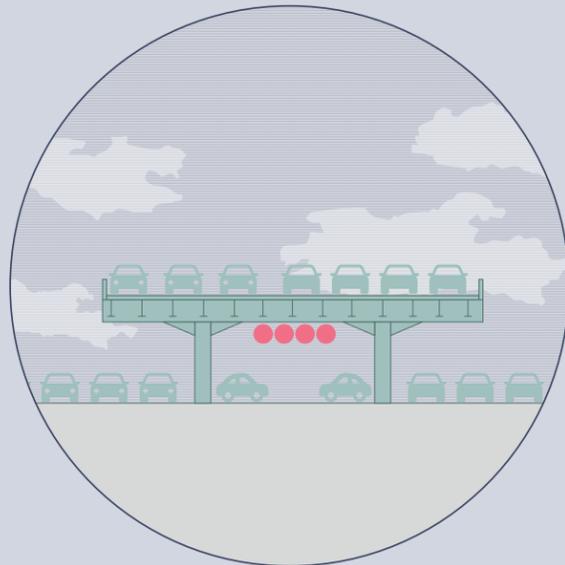
NYC Waste Stream

NYC's waste is distributed into different sites spread across the city. The goal is to centralize them to few locations to improve waste management efficiency.

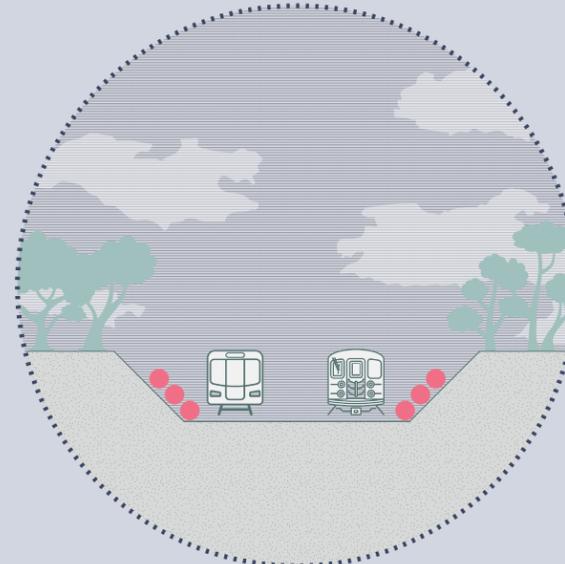


SIMS Municipal Recycling

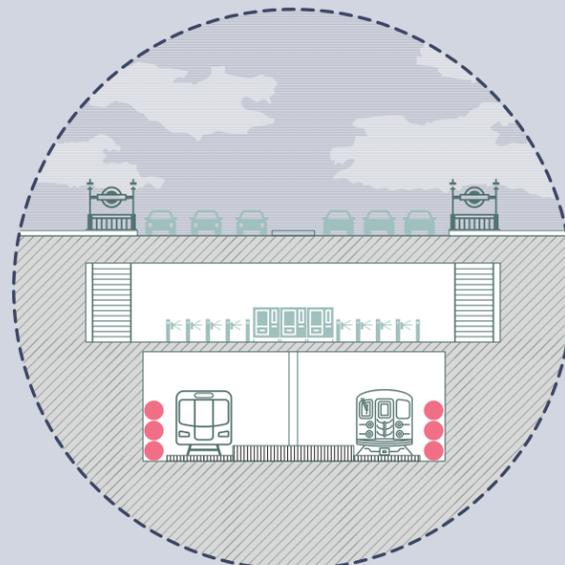
Leveraging the presence of the SIMS facility to create a system that would enable the city's waste to reach sunset park for sorting into various types. Further, SIMS has been organizing community events to spread awareness about waste management, which could be taken advantage of.



Elevated Expressways

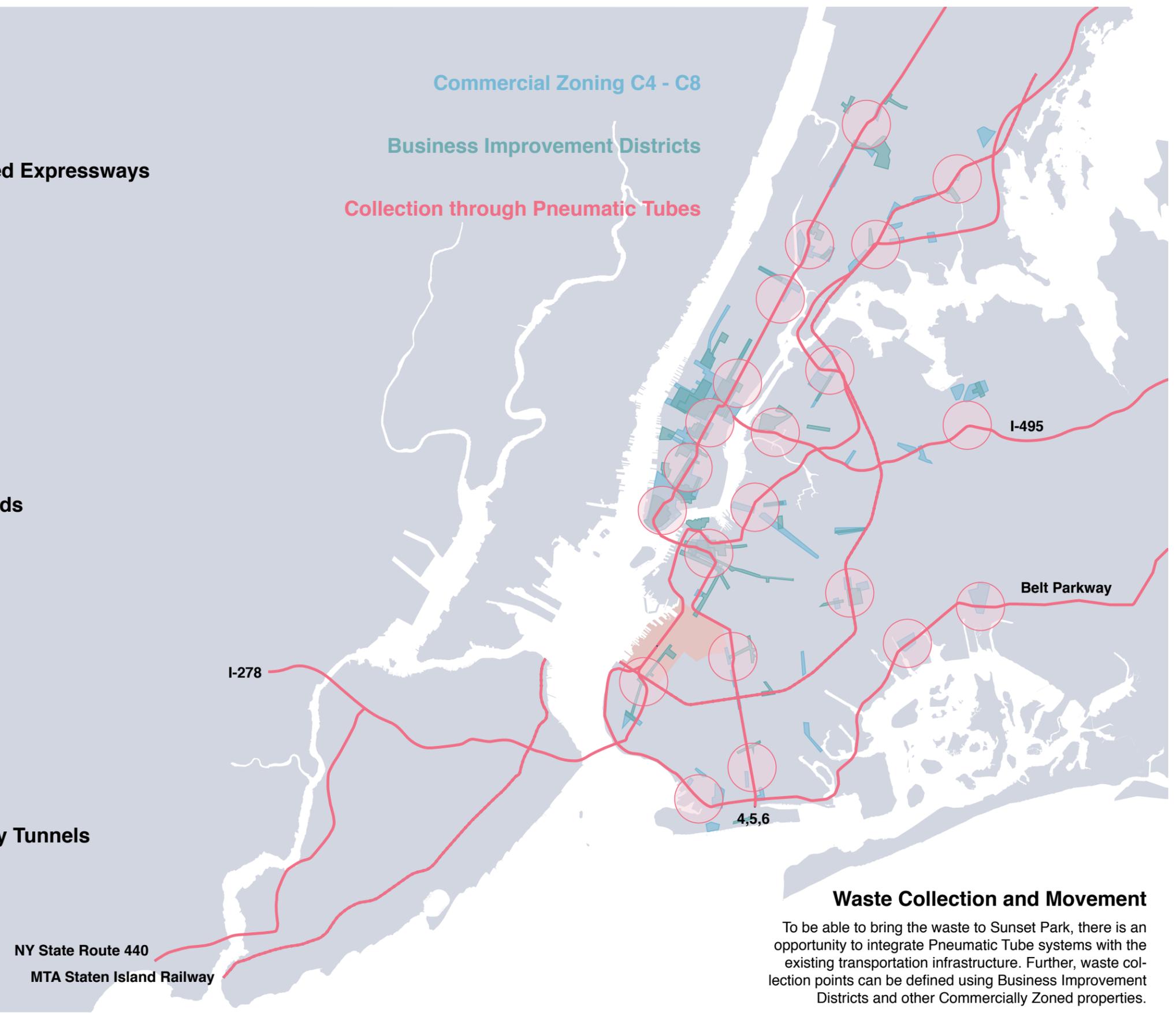


Railroads



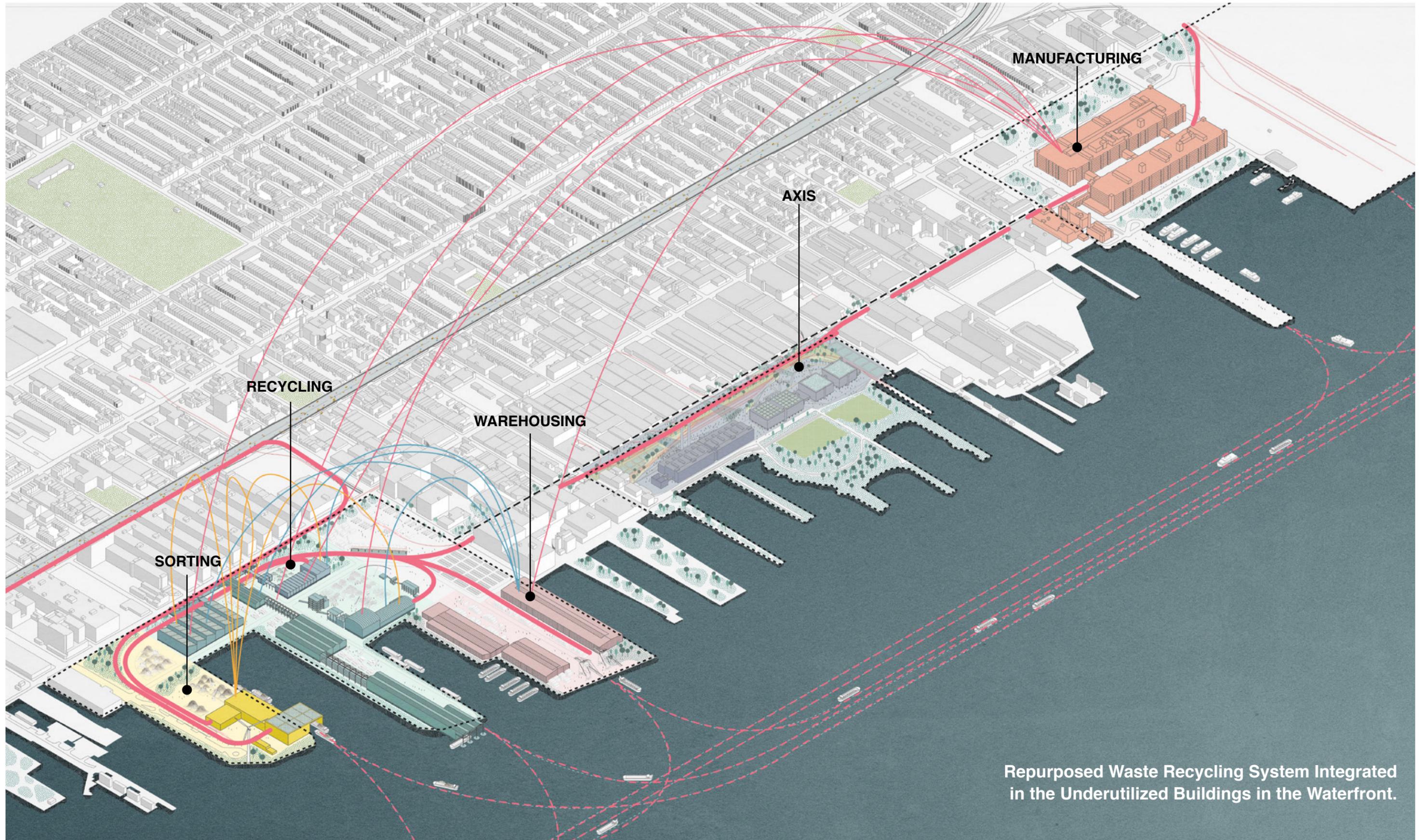
Subway Tunnels

Commercial Zoning C4 - C8
 Business Improvement Districts
 Collection through Pneumatic Tubes

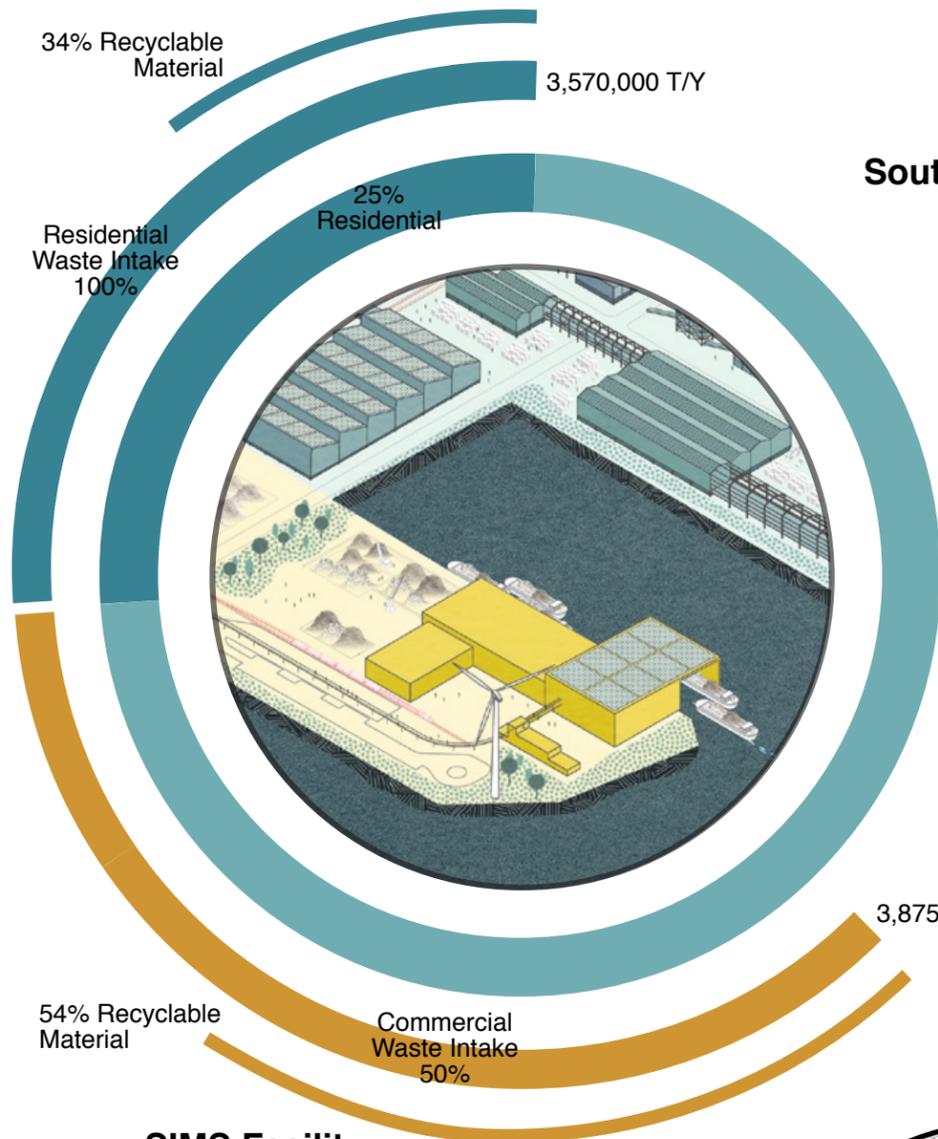


Waste Collection and Movement

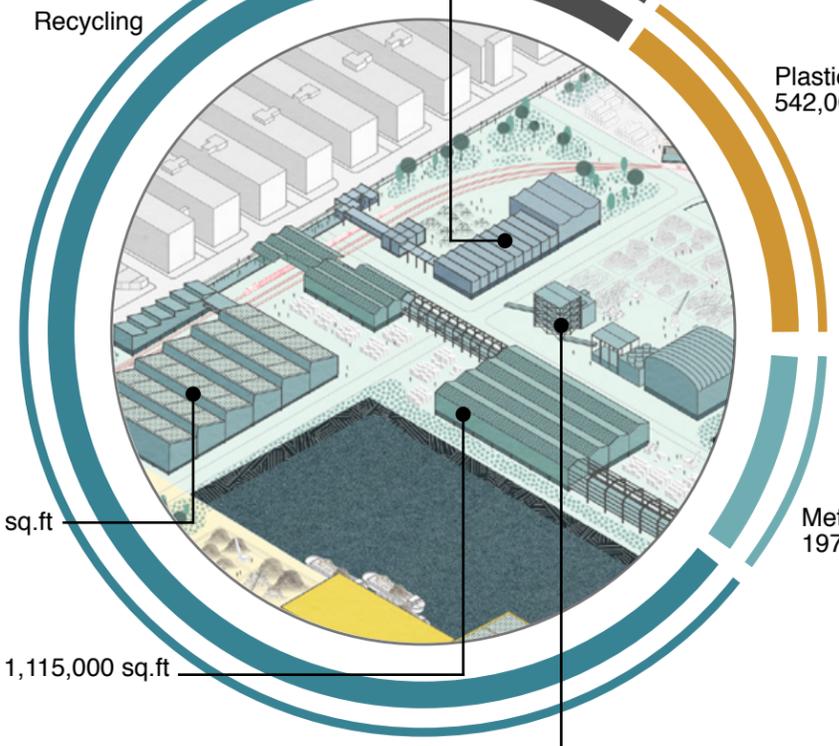
To be able to bring the waste to Sunset Park, there is an opportunity to integrate Pneumatic Tube systems with the existing transportation infrastructure. Further, waste collection points can be defined using Business Improvement Districts and other Commercially Zoned properties.



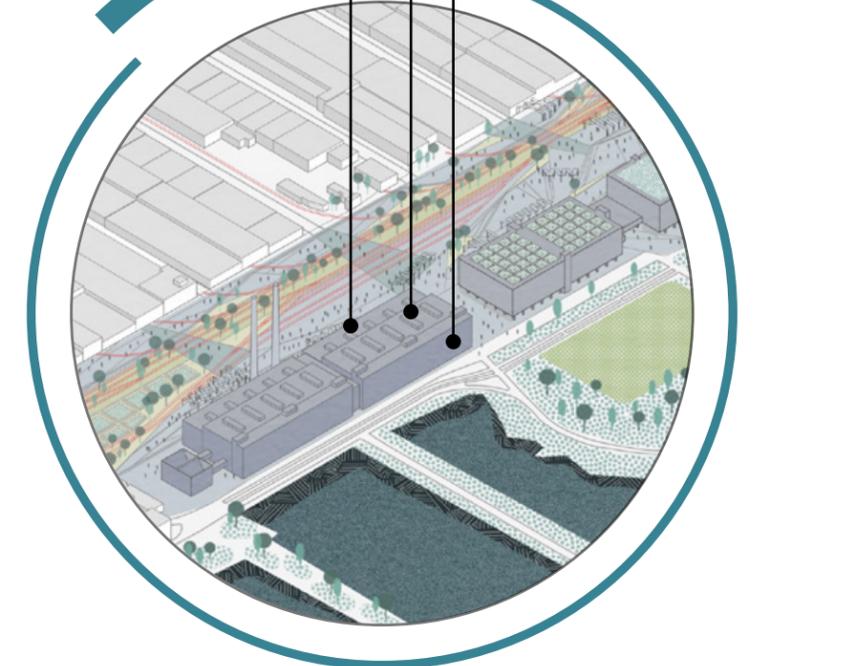
Repurposed Waste Recycling System Integrated in the Underutilized Buildings in the Waterfront.



South Brooklyn Marine Terminal (SBMT)



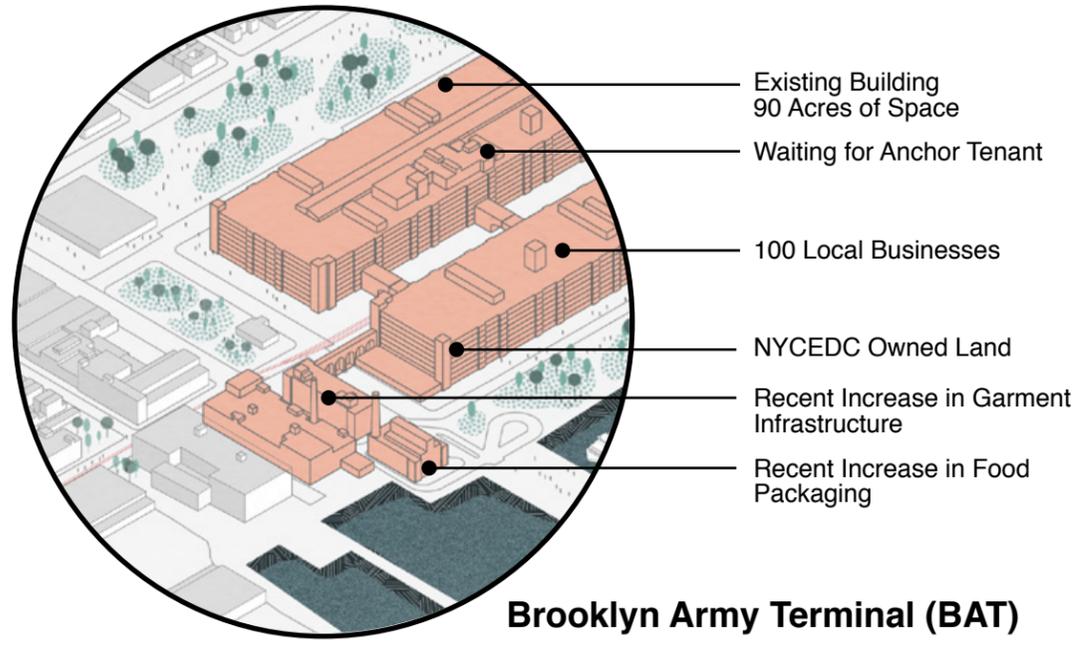
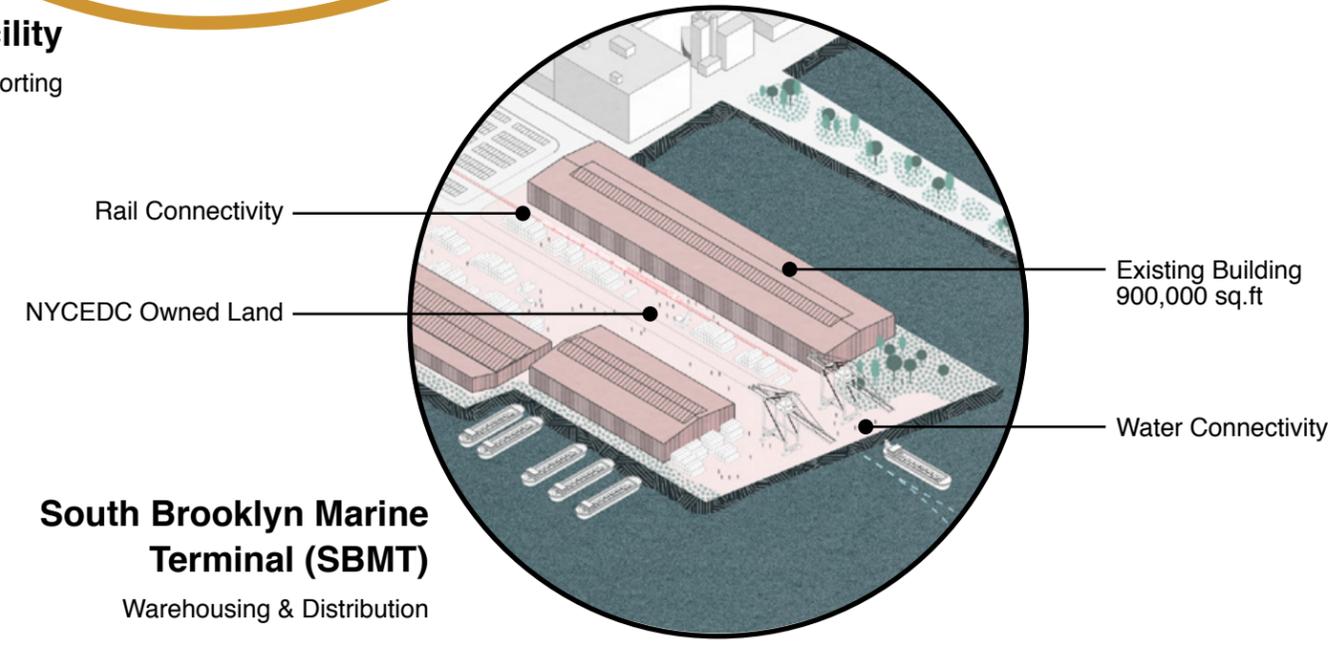
Bush Terminal

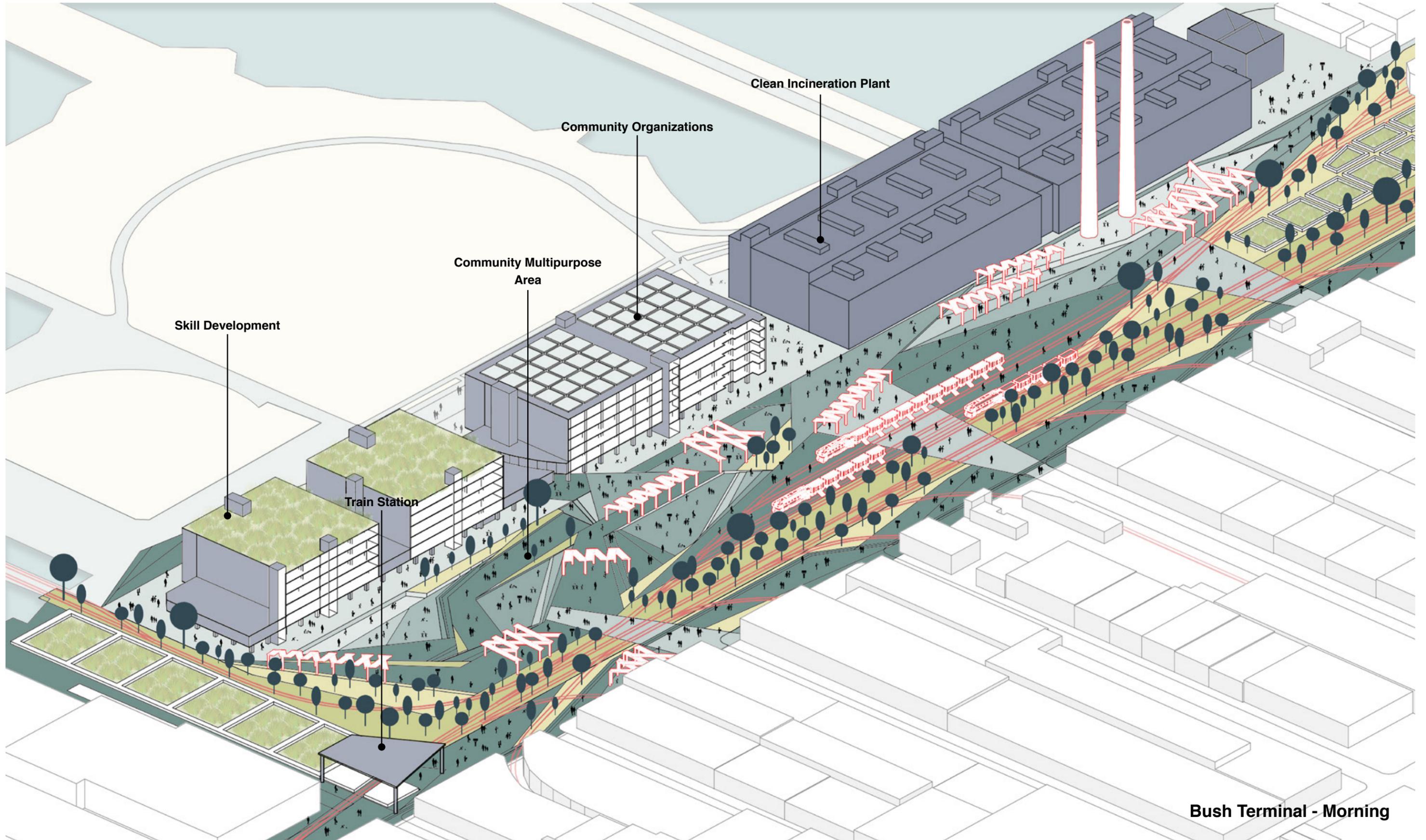


Bush Terminal
Clean Energy - Sustainable Incineration Plant

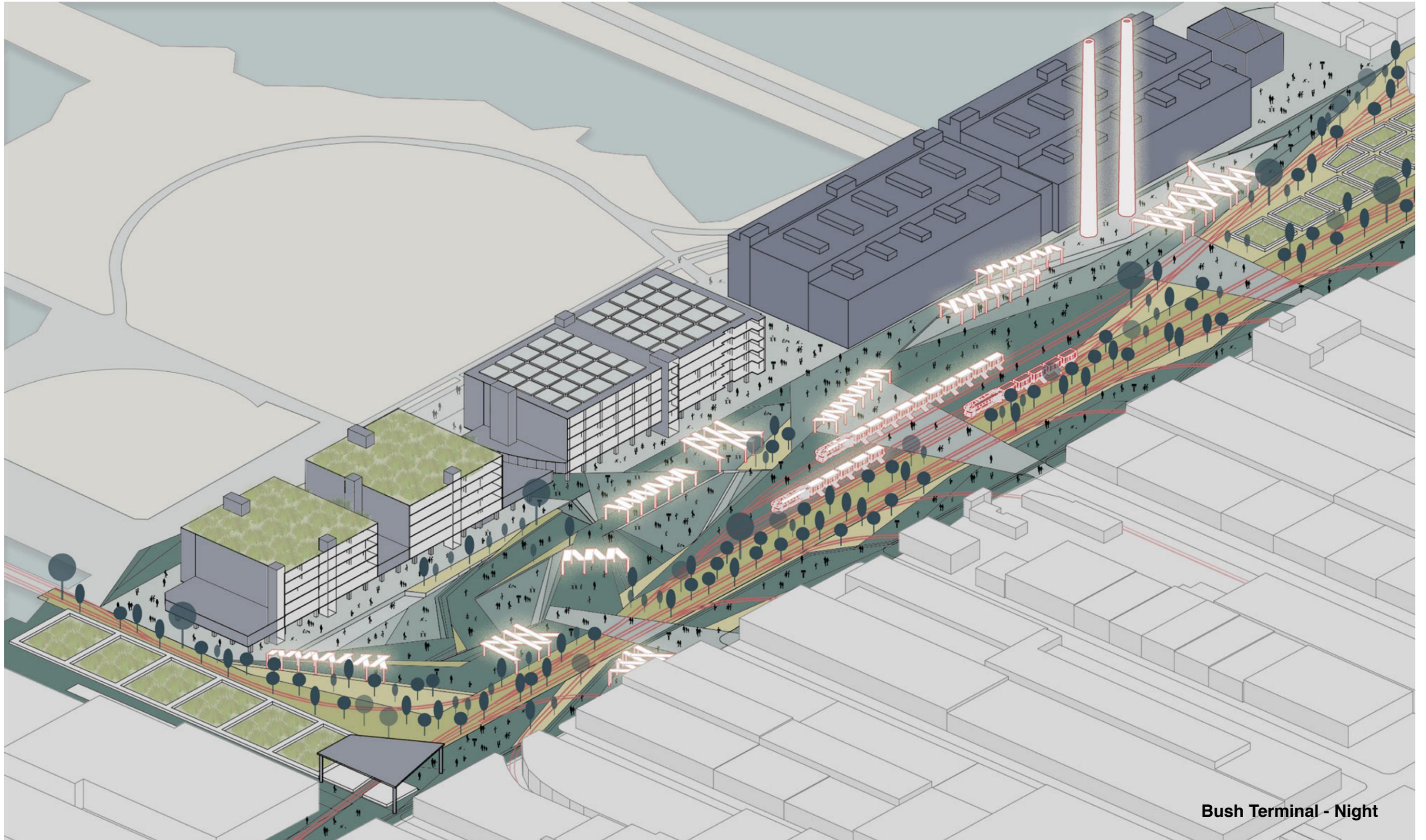
SIMS Facility

Sorting

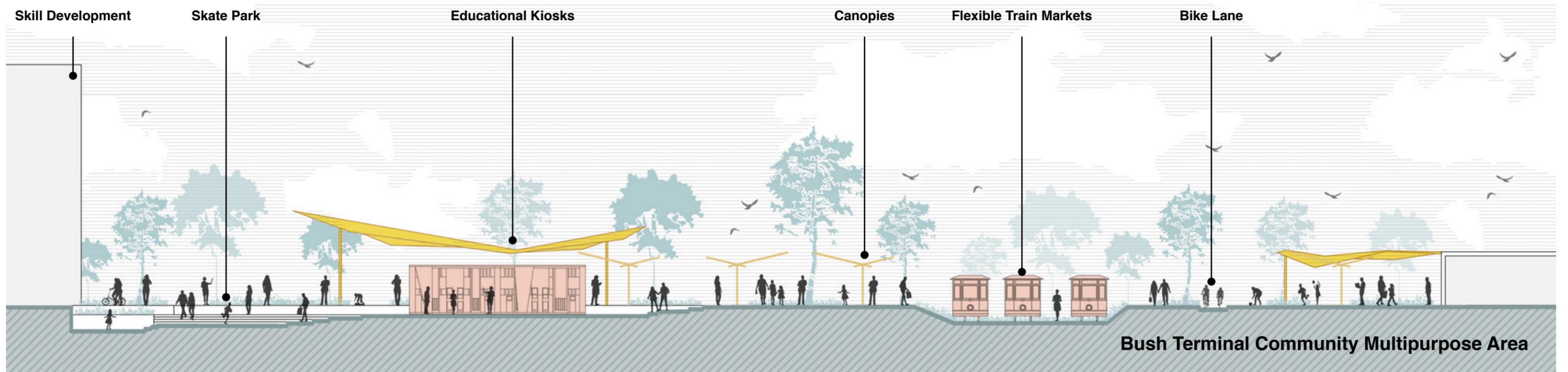
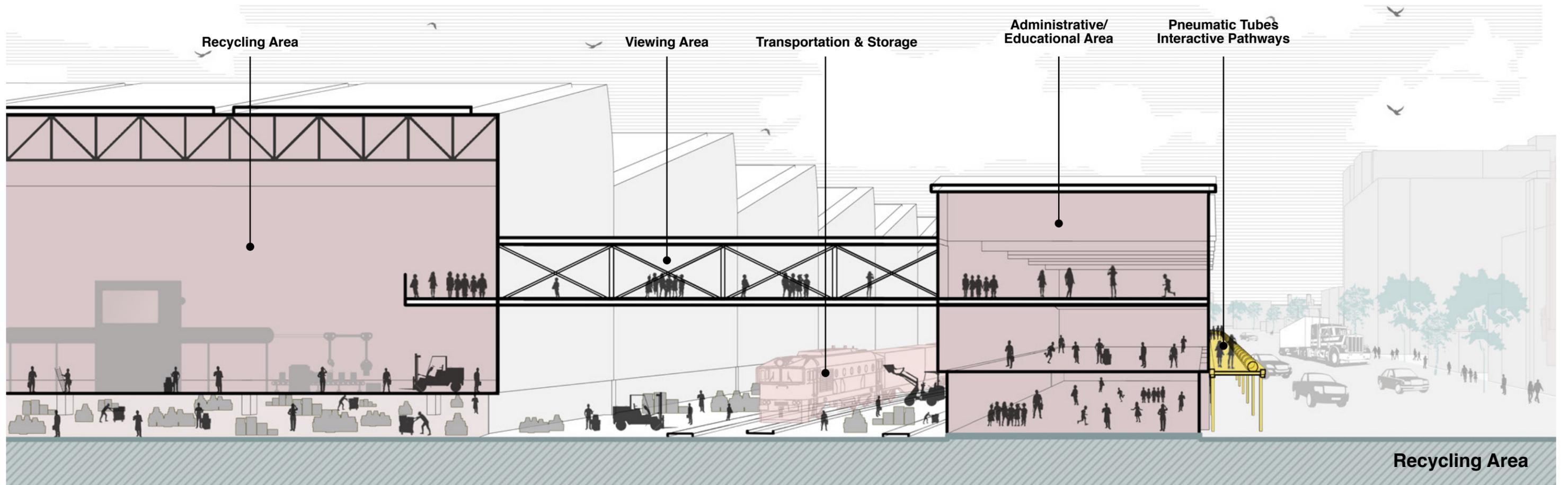


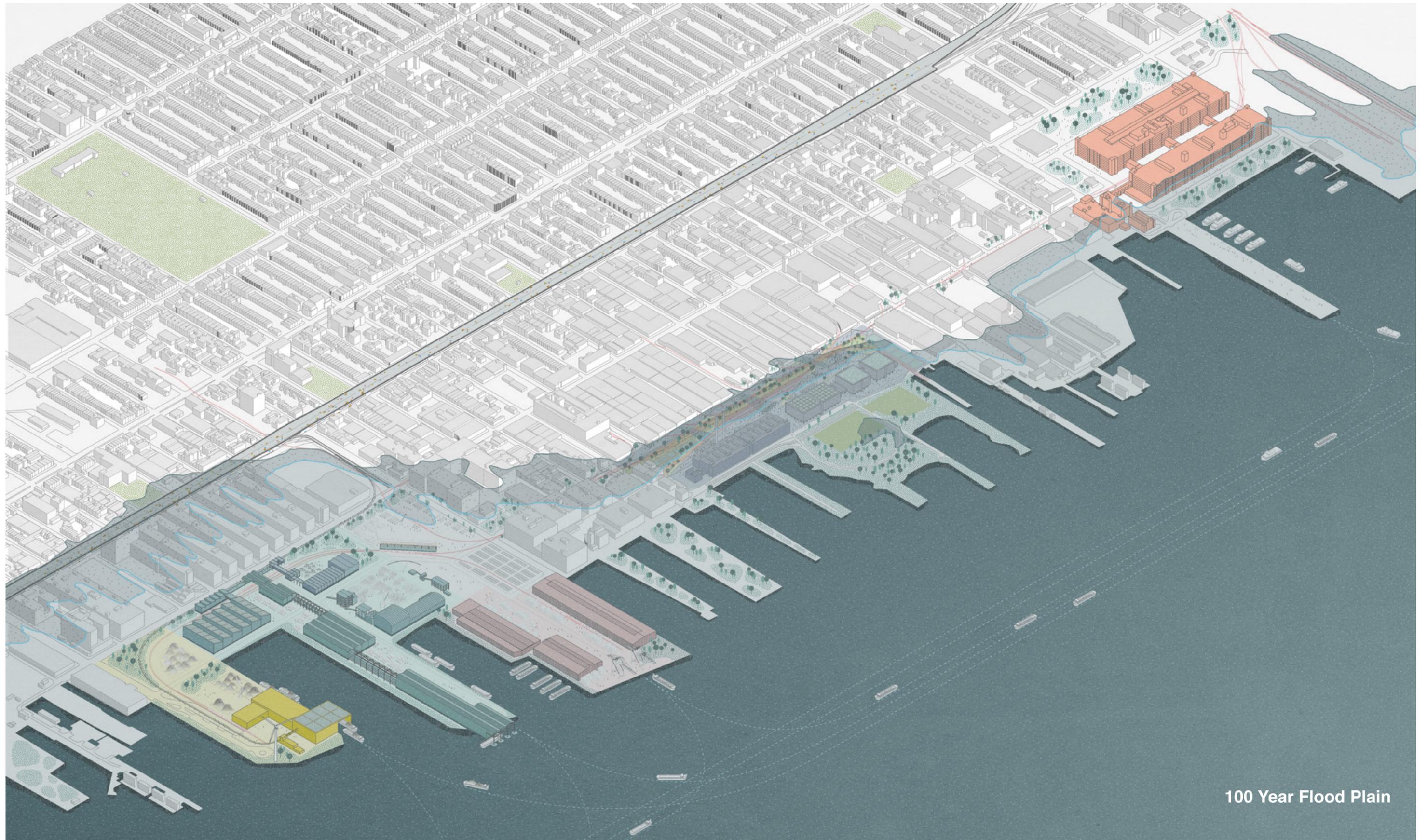


Bush Terminal - Morning



Bush Terminal - Night

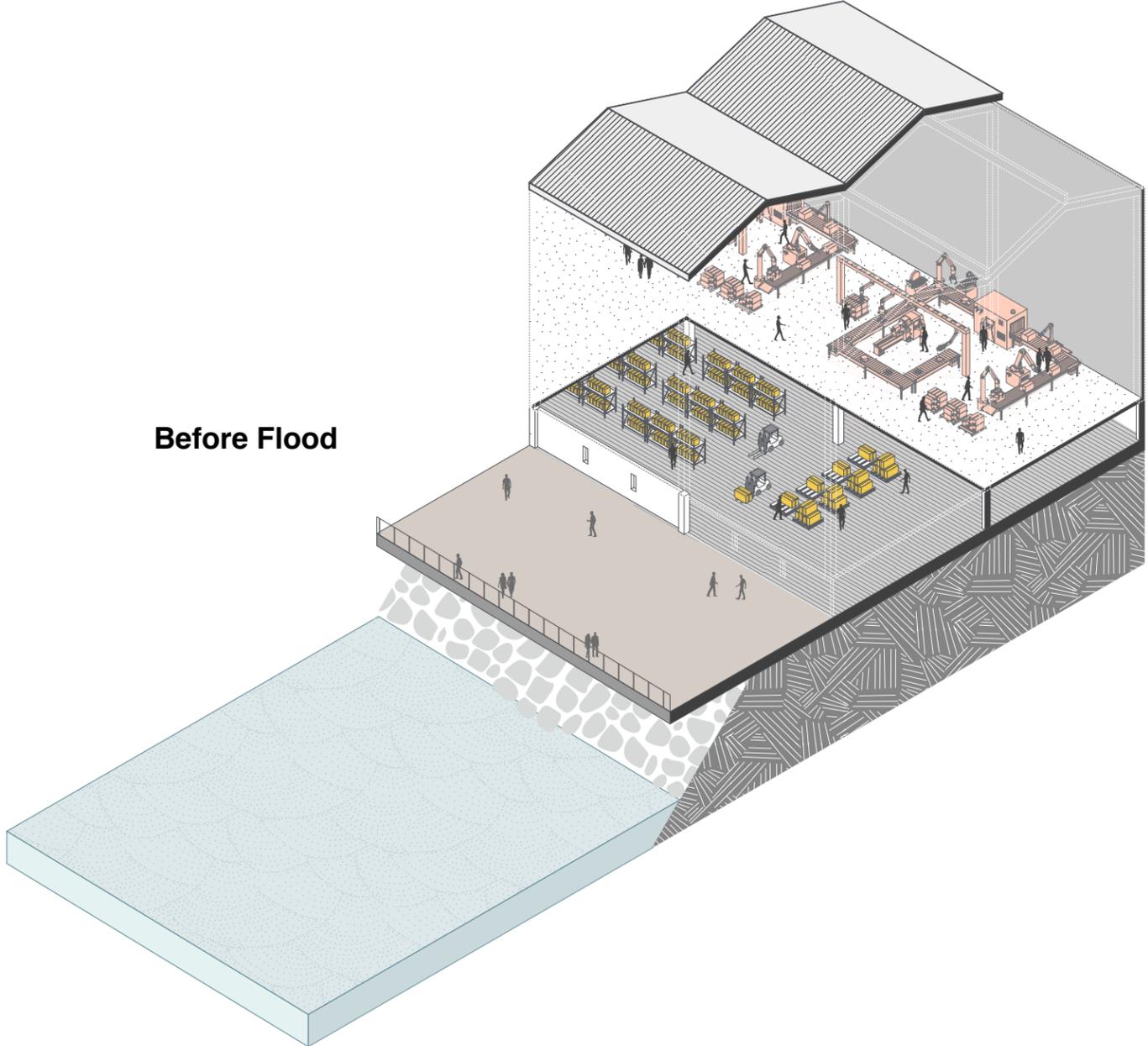




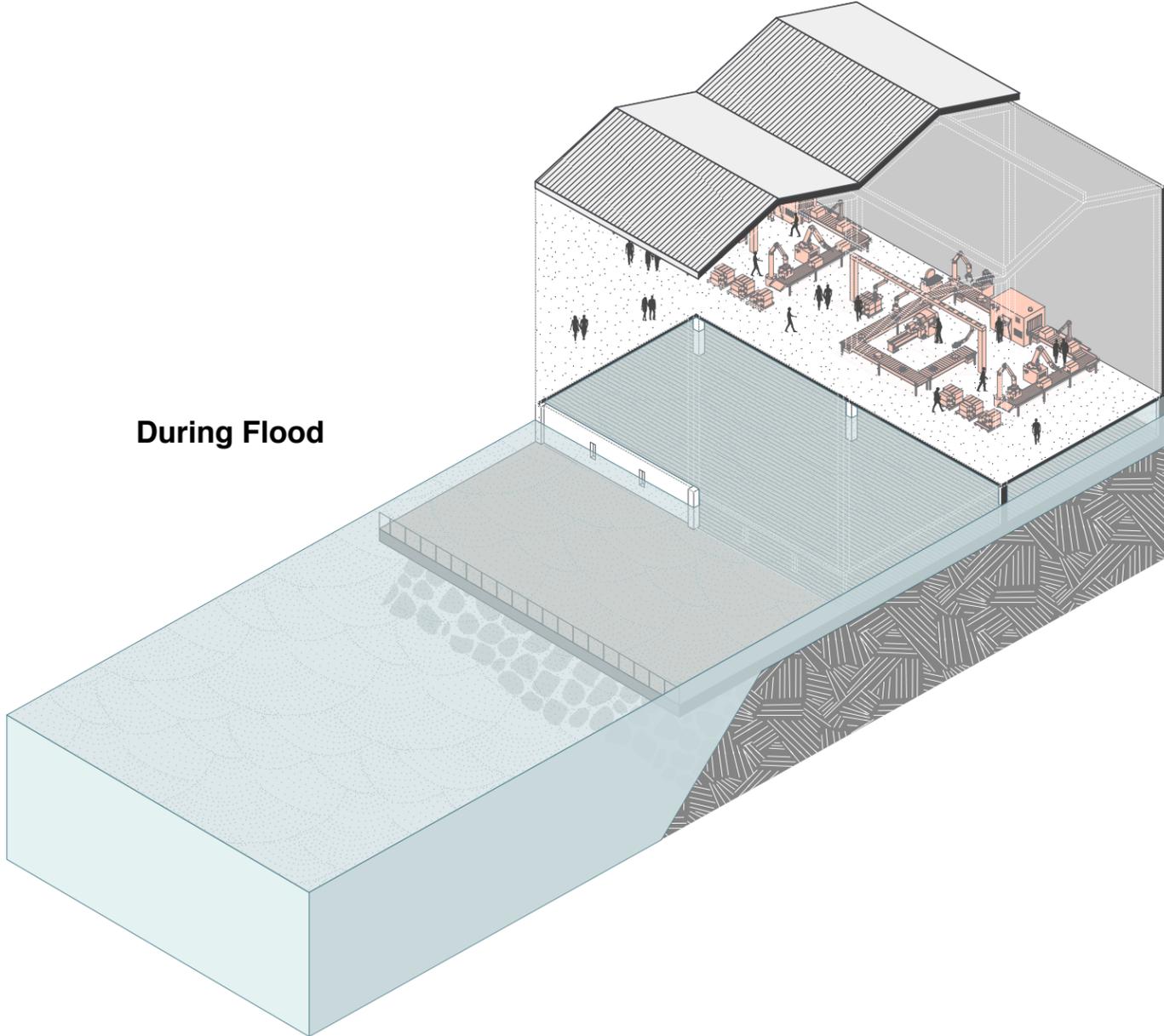
100 Year Flood Plain

**Flood Management Resiliency Strategies in
the New Infrastructure**

Before Flood

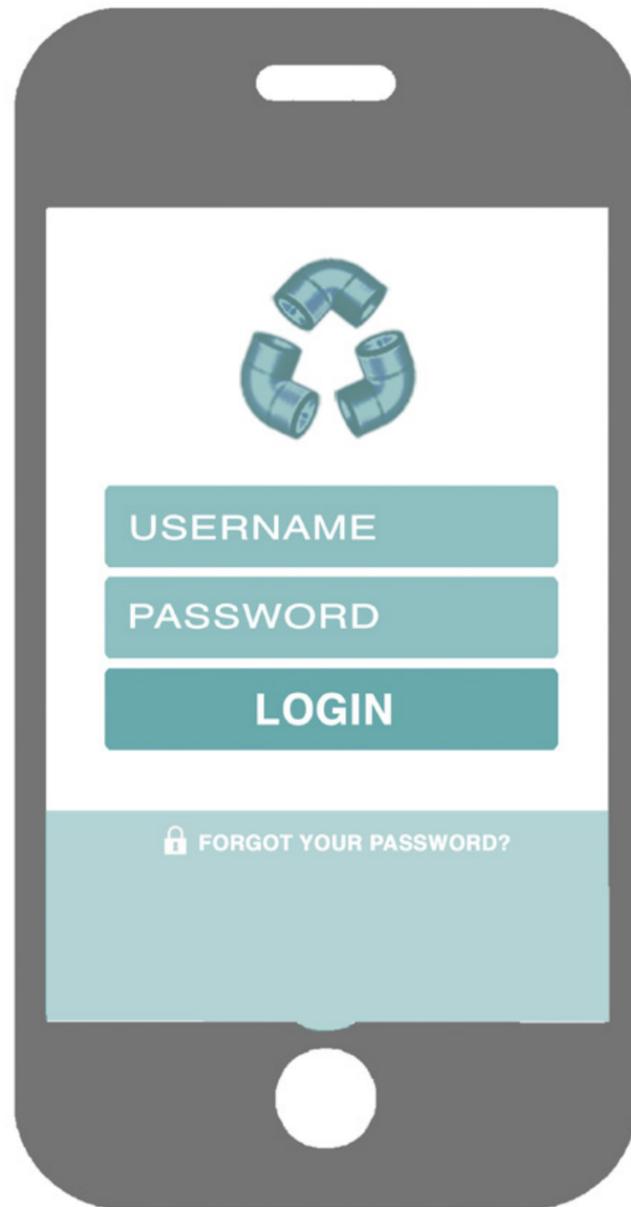


During Flood



Digital Engagement Platform

Mobile Application for updates about waste management and the events in the Sunset Park Waterfront.



Sunset Park Festival

An Ephemeral Space that acts as an exhibition space for festivals and awareness programs about waste management during the weekends.





