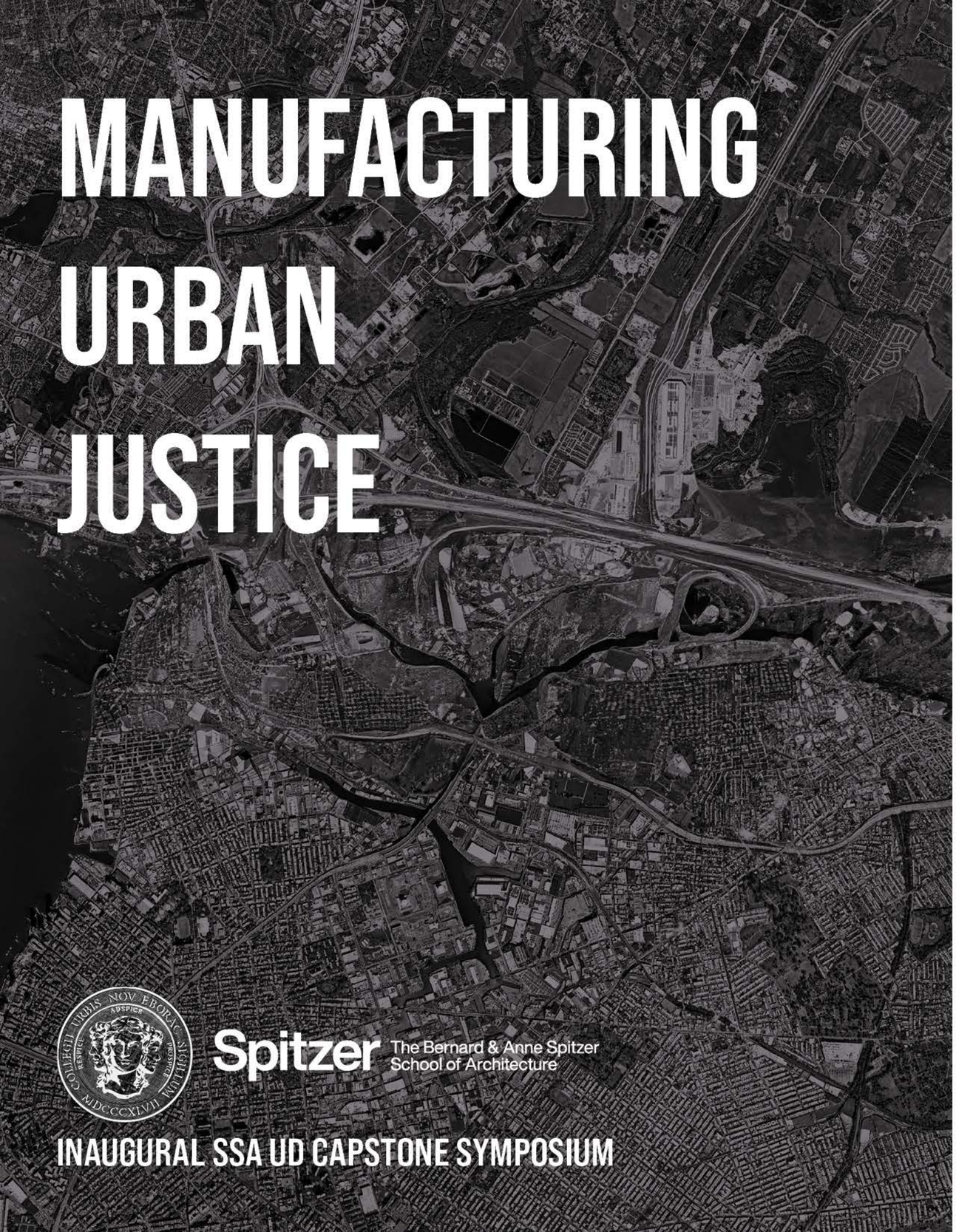


MANUFACTURING URBAN JUSTICE

Spitzer The Bernard & Anne Spitzer School of Architecture

INAUGURAL SSA UD CAPSTONE SYMPOSIUM

ABSTRACT

Students: Aakanksha Maharjan, Amy Ho, Gaston Fernandez, Sara Abousaid, Xavier Raymore and Zhenhao Huang.
Advisors: Julio Salcedo and Marina Correia
Fall 2024

This magazine showcases the Final Capstone Projects, the third and final design research lab of the Urban Design, Master of Urban Planning Program. It serves as an opportunity for students to investigate with depth the agendas, competencies, strategies, and methods developed during the first year of the program, addressing a wide range of concerns including social and environmental justice, technology, and infrastructure.

The Urban Design Labs are dedicated to cultivating responsive urban visions that re-imagine the fundamental essence of cities. By adopting a multifaceted approach that prioritizes contestedness, we are resolute in confronting the prevailing paralysis caused by restrictive modes of design, planning, and governance, which perpetuate social and environmental injustices. Our overarching objective is to replace these constraints with strategic interventions that initiate radical transformations in existing systems, fostering adaptive and just frameworks.

Students were invited to produce a comprehensive neighborhood-scale design that demonstrated the integration of social and environmental justice principles into urban design, with special focus on contemporary urban manufacturing and housing on two distinct locations: Dog's Head in Austin, Texas, and East Williamsburg in Brooklyn, New York. We challenged existing trends in legacy industrial cities, recognizing contemporary urban manufacturing as a transformative force with the potential to drive both social and environmental justice while advancing circular green economies. This transformative potential requires a critical reevaluation of the historical interface between manufacturing and urban environments.

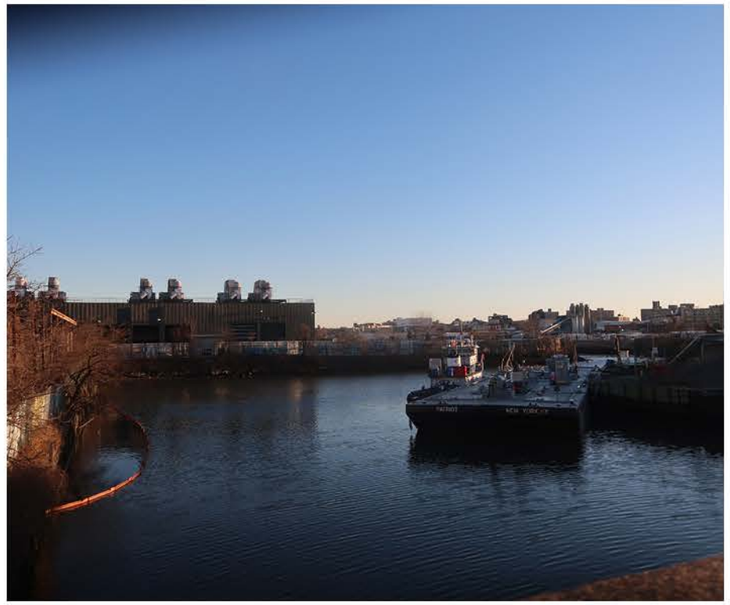
The studio operated at the intersection of theoretical exploration and practical application. Each student selected a unique topic, exploring a wide range of themes. This individualized approach highlights the variety of perspectives within the program and the complexity of urban challenges. The investigation process included research documentation, design proposals, analysis tools and community engagement.

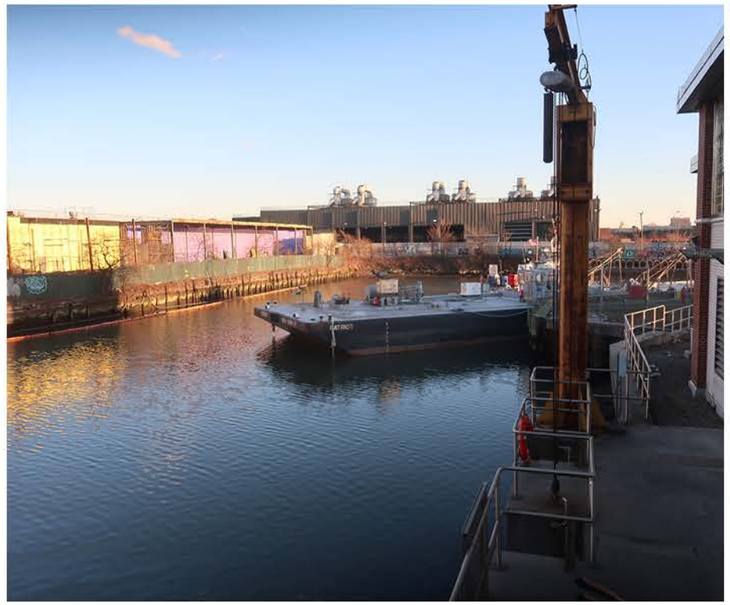
Key aspects included delineated territories, environmental responsibility, urban density, and community involvement within urban manufacturing districts. By reimagining waste as a valuable resource, embracing circular economies, and optimizing local resource utilization, we envision a future where urban manufacturing contributes to the economic growth of underserved communities, social equity, and environmental sustainability.

CONTENT

STUDIO

BROOKLYN, NY SITE VISIT





AUSTIN, TX SITE VISIT

SYMPOSIUM


Regulating Plan
Phytoremediation
Market/Affordable Housing
Missing Middle/Remediation/Agriculture/Affordable Housing

DAY 1

1. Introduction
Moderator: Julio Salcedo
2:15 PM - 2:30 PM

2. Interactive Showcase
2:30 PM - 3:00 PM

3. Brooklyn
Last Semester Recap
3:00 PM - 3:10 PM

Panel 1: Xavier Raymore
3:10 PM - 3:25 PM

Panel 2: Stanley Huang
3:25 PM - 3:40 PM

Break
3:40 PM - 3:55 PM

4. Texas
Last semester recap
3:55 PM - 4:05 PM

Panel 1: Amy Ho
4:05 PM - 4:20 PM

Panel 2: Sara Abousaid
4:20 PM - 4:35 PM

Panel 3: Gaston Fernandez
4:35 PM - 4:50 PM

Break
4:50 PM - 5:05 PM

Panel 4: Aakanksha Maharjan
5:05 PM - 5:25PM

5. Closing remarks
5:25 PM - 5:45 PM

DAY 2

1. Introduction & recap
11:00 AM - 11:30 AM

2. Panel 1:
Marc Coudert
Climate Resilience & Adaptation Manager, City of Austin

> Marc Coudert serves as the Climate Resilience and Adaptation Manager for the City of Austin Office of Resilience, where he integrates climate adaptation strategies into long-term planning and supports community organizers in the Eastern Crescent. He holds a Certificate in Climate Change and Health from the Yale School of Public Health, a Master of Science in Sustainable Design from the University of Texas at Austin, and a Bachelor of Science in Urban Planning from Arizona State University. With a strong background in planning and sustainability, Marc is passionate about sustainable practices and collaborates with interdisciplinary teams on innovative projects. He is also actively involved in community initiatives, advocating for climate resiliency and enhancing urban environments.

11:30 am - 12:00 pm

Break
12:00 pm - 12:20 pm

3. Panel 2:
Terri Matthews
Director, Town+Gown, NYC Department of Design and Construction

> Terri Matthews is the Director of Town+Gown:NYC, a citywide university-community applied research program housed in the NYC Department of Design and Construction (DDC). She founded the program to foster partnerships between academia and city agencies to improve the built environment through collaborative research.
> Terri holds a BA and JD from Boston College and an MPA from NYU Wagner. She is currently a PhD candidate at NYU Tandon School of Engineering. Her career spans public and private sectors, including roles in public finance law and various positions within NYC government. She is admitted to practice law in New York and Massachusetts. In 2022, she was named one of City & State's Above & Beyond Innovators for her work with Town+Gown:NYC.

12:20 pm - 12:50 pm

4. Panel 3:
Sagi Golan
Deputy Director, Urban Design Office, NYC Department of City Planning

> Sagi Golan is the Deputy Director of Urban Design at the NYC Department of City Planning. He leads work on housing, public space, waterfronts, streets, and mixed-use developments, focusing on collaboration to make New York more sustainable, resilient, and equitable. Sagi teaches the summer Urban Design Studio at Columbia GSAPP and has taught at The New School, with critic roles at Syracuse, Cornell, NYIT, and Pratt. He holds a B.Arch from Tel Aviv University and an M.S. in Architecture and Urban Design from Columbia, where he received several design awards.

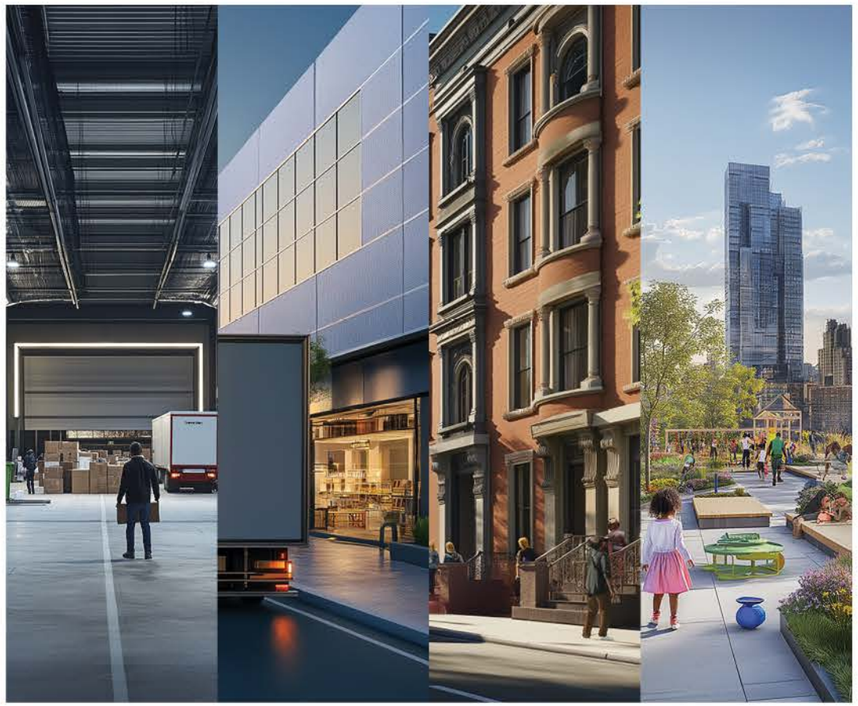
12:50 pm - 1:20 pm

5. Roundtable
1:20 pm - 1:50 pm

6. Closing
1:50 pm - 2:00 pm

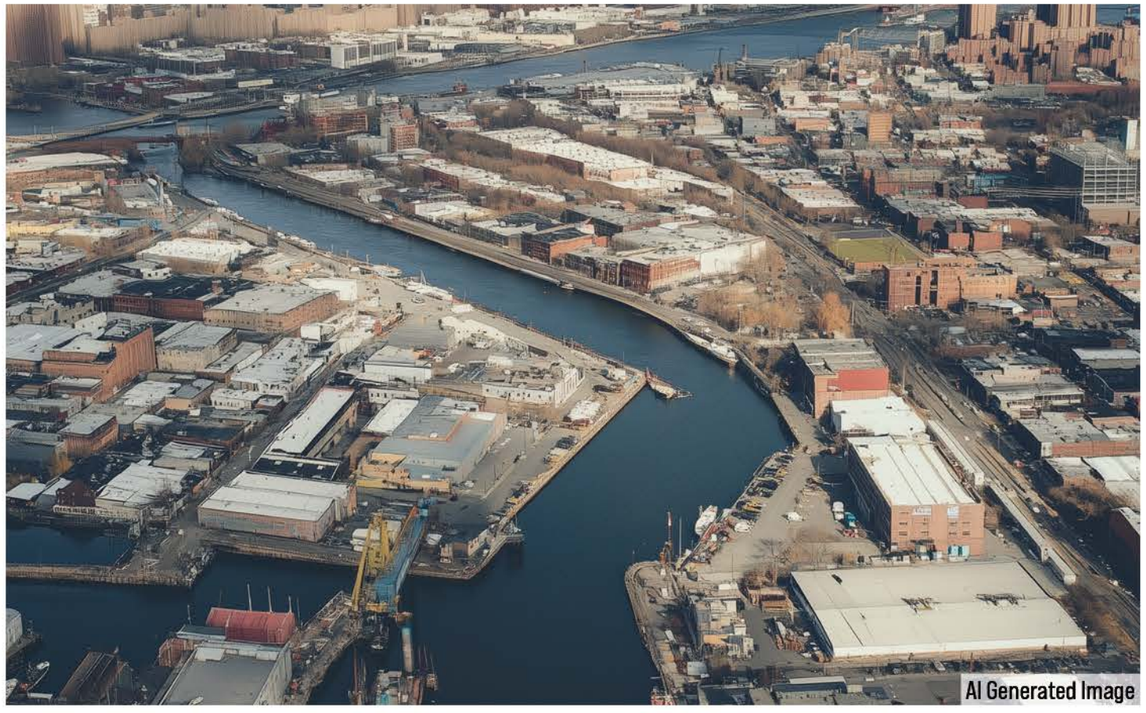
SITE 01: Brooklyn, New York

Building on our collaboration with the NYC DDC Cap and Gown Program as part of the Urban Resource Recovery group, we researched, tested, and hypothesized models of Urban Manufacturing in Northern Brooklyn. These models explored increased densities and synergies between urban and regional needs and programs, evaluating their environmental and social justice capabilities. Additionally, we scrutinized current practices and regulatory contexts to propose alternative approaches.

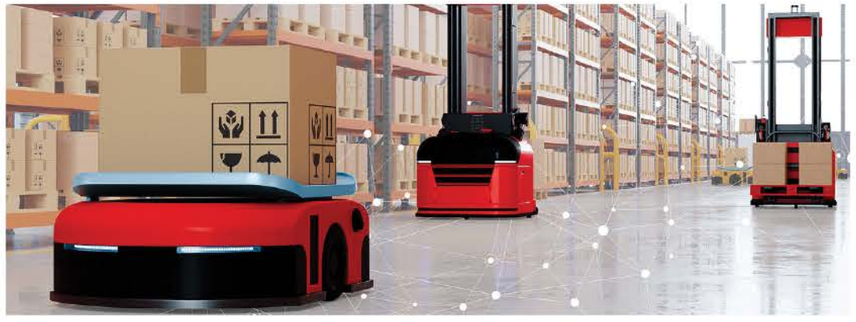


XAVIER

EAST WILLIAMSBURG - BROOKLYN- NEW YORK



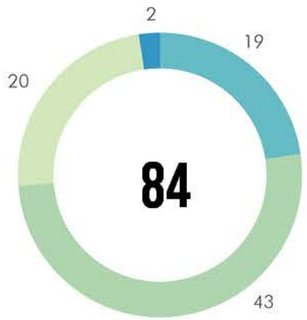
AI Generated Image



ZHENHAO

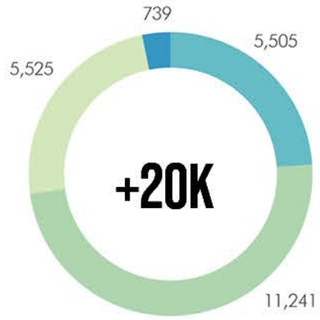
Economics

This study explores the economic feasibility of implementing private **cross-subsidy** models in mixed-use developments that feature light manufacturing. Using East Williamsburg in Brooklyn as a laboratory, the research identifies the neighborhood's potential as a template for **balancing** industrial and residential uses. Building on this framework, the study expands to identify **over 80** sites across New York City with similar characteristics and zoning opportunities. These sites collectively have the capacity to facilitate over **20,000** manufacturing jobs while creating more than **80,000** housing units. This approach offers a transformative solution to address the city's housing shortage and job creation needs, enriching communities and fostering inclusive economic growth.



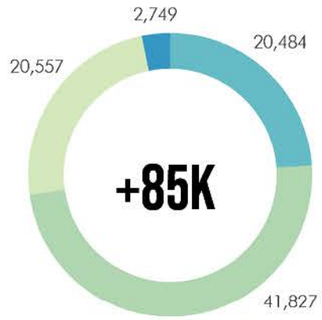
Total: 84

Number of Sites



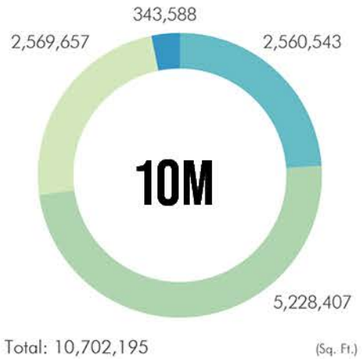
Total: 23,009

Manufacturing Jobs



Total: 85,618

Housing Units

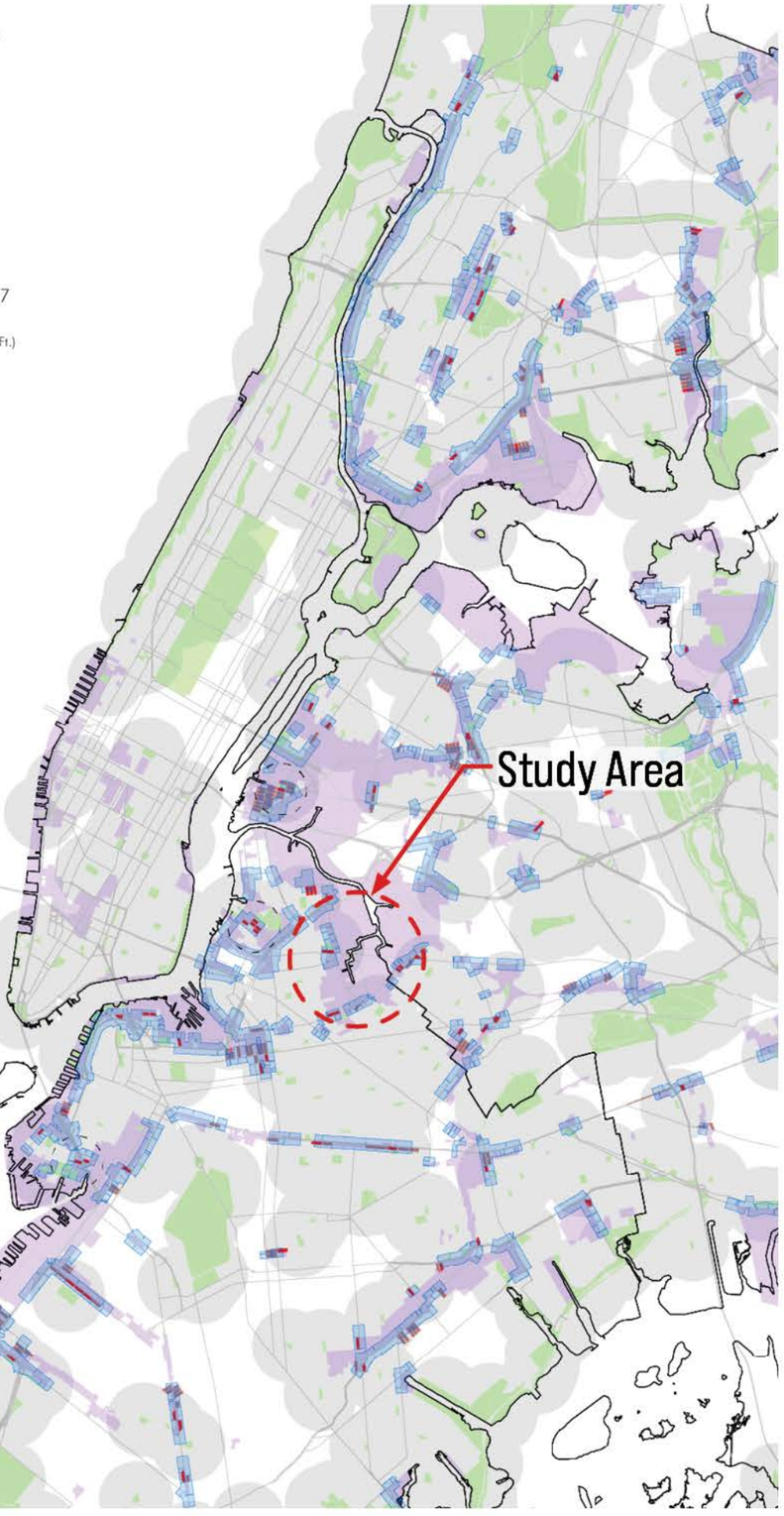


Total: 10,702,195 (Sq. Ft.)

Total Site Capacity

- Bronx
- Brooklyn
- Queens
- Staten Island

- Qualified Sites
- Unqualified Sites
- Parks
- Manufacturing Mixed-Use Disctricts
- Manufacturing Zones
- 1/2 Mile from Parks Buffer Zones
- Truck Routes



Vacant Housing Units (2020) - by census block

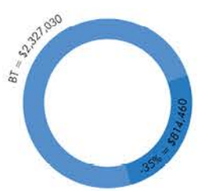
Percentage of Units with Rent +50% of Income - by census block

Design Economics

Current

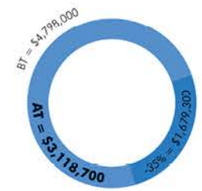
Developer

AT = $1,512,569



Manufacturer

AT = $3,118,700



Residential Tenant

AR = $28,000

BT = Before Taxes
AT = After Taxes
BR = Before Rent
AR = After Rent

Assumptions

(i)	Unit Size Average (Res.)	750 SF (128 units)
(ii)	Rent per SF (Res.)	$3
(iii)	Rent per SF (Manuf.)	$25
(iv)	Profit per SF (Manuf.)	$125
(v)	Rent per SF (Comm.)	$45
(vi)	Profit per SF (Comm.)	$135
(vii)	Manuf. & Comm. Overheads	30%
(viii)	Tax Deductions	35%
(ix)	Rent Subsidy Contributions	12% (max)

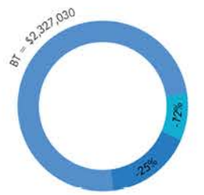
Incentives

(i) For every 2.4% of pre-tax dollars paid into subsidy fund = 2% tax break, up to 10% (Developer and Manufacturer)
(ii) For every 5 employees with home of record within 1 mile radius= 1% tax break, up to 10% (Manufacturer)

Proposed

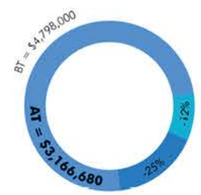
Developer

AT = $1,535,839 **(+$23,270)**



Manufacturer

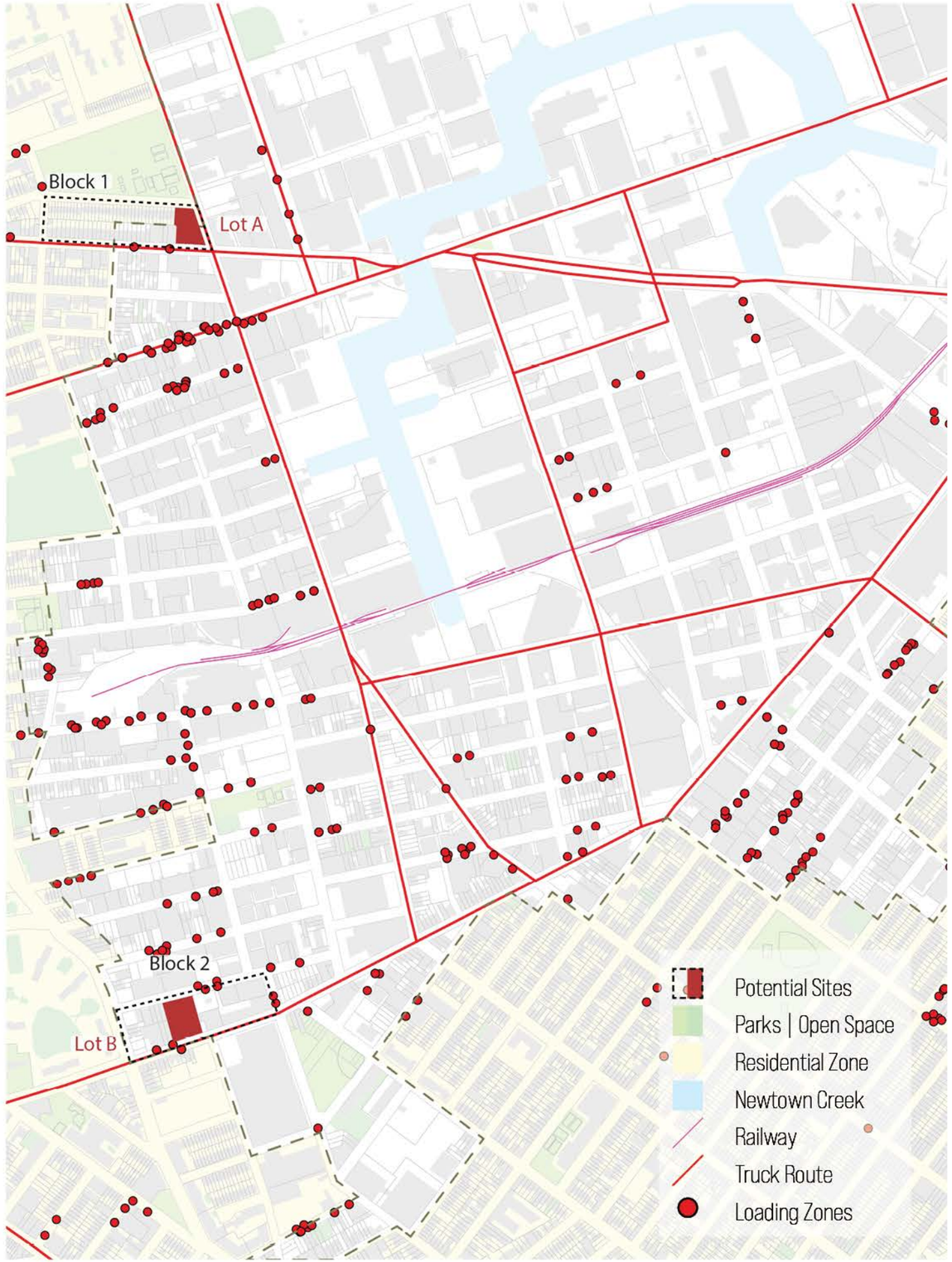
AT = $3,166,680 **(+$47,980)**



Residential Tenant

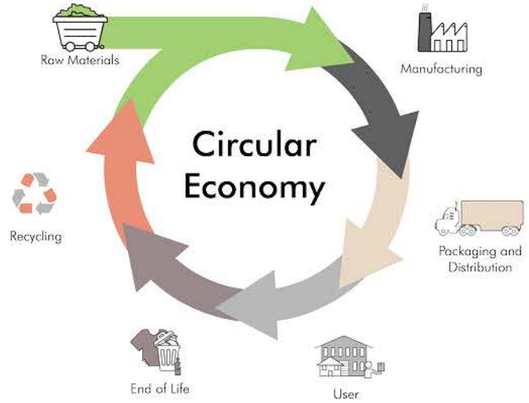
AR = $34,682 **(+$6,682)**

Subsidy funds to be distributed evenly between all residential tenants in development

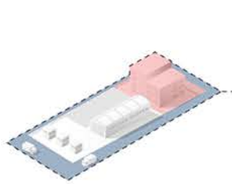


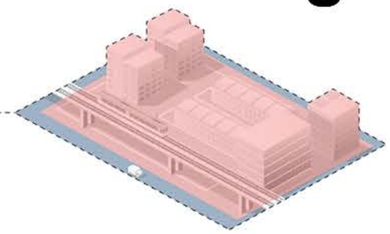
These light manufacturing mixed-use developments can be implemented at either the lot or block scale, each offering distinct advantages and challenges. **Lot-scale** developments are highly responsive to site-specific qualities, making them adaptable to unique conditions. In contrast, **block-scale** developments are more integrated with surrounding infrastructure and the broader neighborhood fabric. Regardless of scale, a critical component of these developments is providing adequate **loading facilities** for manufacturers - as street loading significantly contributes to traffic congestion. To address this, a design that relocates loading zones on-site to reduce traffic disruptions is required.

Nevertheless, the overarching goal is to foster **circular economies** by creating **synergies** within the development, where residential, commercial, and industrial uses mutually support each other, driving sustainability, economic growth, and community cohesion.



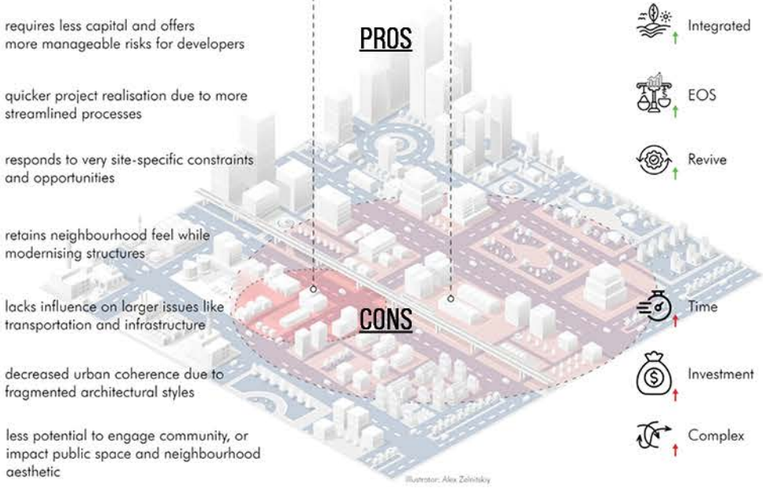
Industry + Housing





PROS

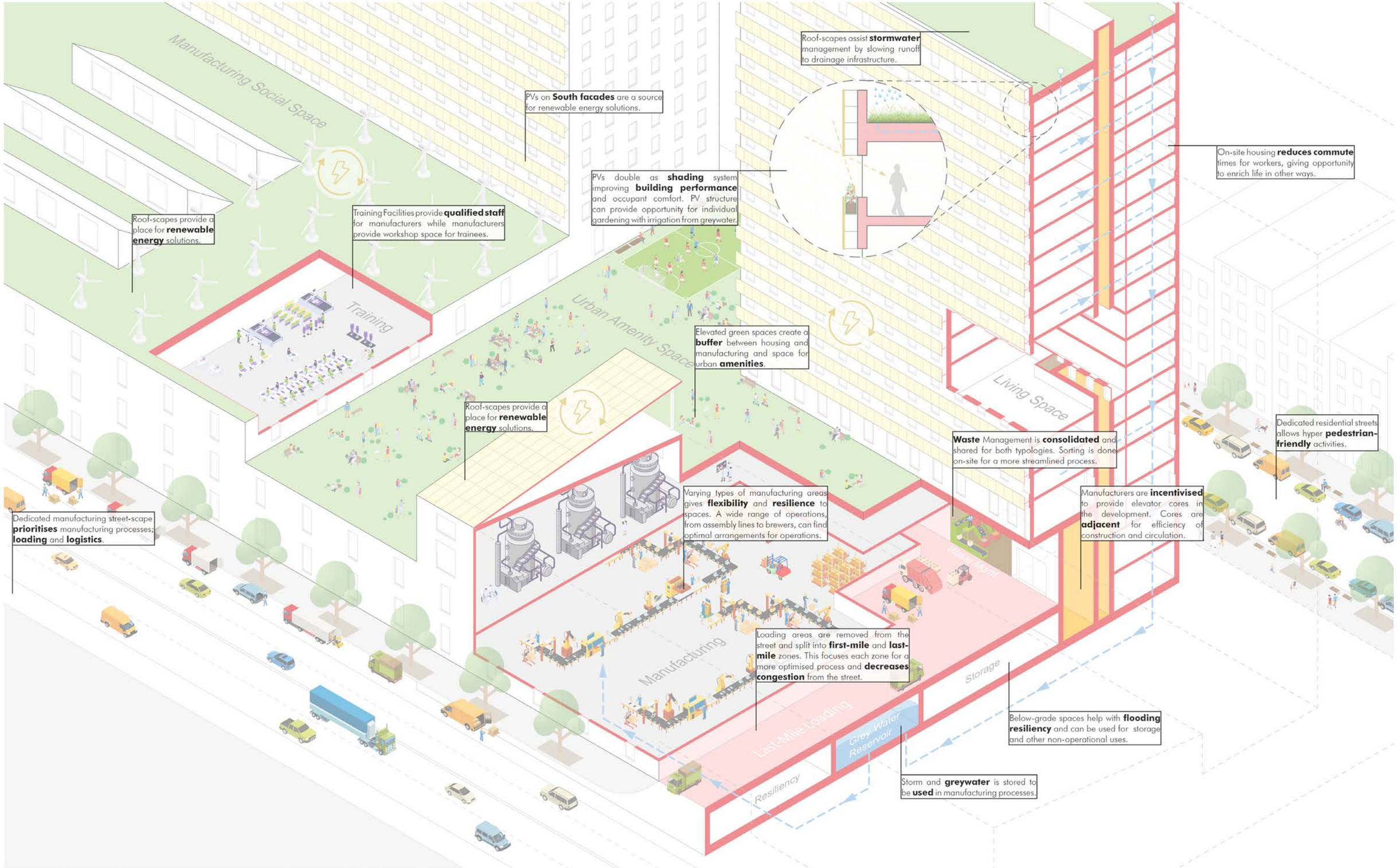
Investment	requires less capital and offers more manageable risks for developers
Speed	quicker project realisation due to more streamlined processes
Bespoke	responds to very site-specific constraints and opportunities
Character	retains neighbourhood feel while modernising structures
Scope	lacks influence on larger issues like transportation and infrastructure
Inconsistent	decreased urban coherence due to fragmented architectural styles
Impact	less potential to engage community, or impact public space and neighbourhood aesthetic



CONS

Integrated	creates cohesive relationship between buildings, infrastructure, green spaces, etc.
EOS	utilise Economies of Scale and distribute costs creating efficiencies across project
Revive	updates utility infrastructure improving sustainability and efficiency
Time	scope and regulatory requirements cause projects to take years
Investment	requires substantial capital with a great deal of financial risk
Complex	involves multiple stakeholders and regulatory bodies making project management harder

Illustrator: Alex Zelinsky


Manufacturing Social Space
Roof-scapes provide a place for **renewable energy** solutions.
Training Facilities provide **qualified staff** for manufacturers while manufacturers provide workshop space for trainees.
Training
PVs on **South facades** are a source for renewable energy solutions.
PVs double as **shading** system improving **building performance** and occupant comfort. PV structure can provide opportunity for individual gardening with irrigation from greywater.
Urban Amenity Space
Roof-scapes provide a place for **renewable energy** solutions.
Roof-scapes assist **stormwater** management by slowing runoff to drainage infrastructure.
Elevated green spaces create a **buffer** between housing and manufacturing and space for urban **amenities**.
On-site housing **reduces commute** times for workers, giving opportunity to enrich life in other ways.
Living Space
Waste Management is **consolidated** and shared for both typologies. Sorting is done on-site for a more streamlined process.
Dedicated residential streets allows hyper **pedestrian-friendly** activities.
Manufacturers are **incentivised** to provide elevator cores in the development. Cores are **adjacent** for efficiency of construction and circulation.
Dedicated manufacturing street-scape **prioritises** manufacturing processes; **loading** and **logistics**.
Varying types of manufacturing areas gives **flexibility** and **resilience** to spaces. A wide range of operations, from assembly lines to brewers, can find optimal arrangements for operations.
Manufacturing
Loading areas are removed from the street and split into **first-mile** and **last-mile** zones. This focuses each zone for a more optimised process and **decreases congestion** from the street.
Last-Mile Loading
Grey-Water Reservoir
Storage
Below-grade spaces help with **flooding resiliency** and can be used for storage and other non-operational uses.
Resiliency
Storm and **greywater** is stored to be **used** in manufacturing processes.

RENEWING INDUSTRIAL BUSINESS ZONES

RESEARCH QUESTION

Can we reduce the increasing environmental pollution by optimizing routes of logistic transportation and promoting better renewable industrial business zones to enhance manufacturing environment for both the working environment and surrounding communities?

HYPOTHESIS

Implementing localized urban resource recovery systems within the North Brooklyn Industrial Bussiness Zone - IBZ can significantly reduce pollution by minimizing local logistic transportation emissions and enhancing better manufacturing environment for material and waste circularity, thereby decreasing the overall carbon footprint of recycling processes.

AREA OF CONCERN

Today's waste recycling has become an important component of the urban industrial zone and circular economy. Nonetheless, urban resource recovery can be highly polluting. Pollution comes in different ways, atmospheric, and in terms of transportation and from the site of different materials randomly stacked. The project aims to look at ways to increase circularity, but most importantly to reduce pollution. " Therefore, implementing renovated new urban resource recovery systems within the North Brooklyn Industrial Bussiness Zone - IBZ can significantly reduce air pollution by minimizing local logistic transportation emissions and enhancing a better manufacturing environment for material and waste circularity, thereby decreasing the overall carbon footprint of recycling processes."

- Pollution caused by transportation & material random stacked
- Traffic routes are scattered
- The parking lot is too far from the factory
- The parking spaces cannot meet the transportation needs of local factories.

ABSTRACT

The increasing environmental pollution caused by industrial activities and logistic transportation has posed significant challenges to both surrounding communities and working environments. Introducing renewable industrial zones offers a promising solution to address these issues by incorporating sustainable designs, especially within recycling enterprises. This research investigates whether optimizing logistic transportation routes and promoting well-designed renewable industrial business zones can effectively reduce pollution and improve the overall manufacturing environment. By exploring innovative strategies for industrial zone development and transportation logistics, the study aims to enhance environmental quality, ensure greener recovery for industrial areas, and create healthier conditions for workers and neighboring communities. This research will also highlight the importance of integrated approaches in industrial productivity and environmental sustainability. Additionally, the study explores how green recovery can be facilitated by integrating new pedestrian paths and innovative platforms for public spaces that support upcycling activities. This will engage local communities in sustainable practices, fostering a circular economy. The exploration emphasizes the significance of holistic approaches in balancing industrial productivity, environmental sustainability, and community well-being.

IN TERMS OF DESIGN

1. Connect the waste stacking area to the parking lot with the factory through a conveyor belt can alleviate some of the traffic roblems.
2. Apply the Supporting facilities to connect with the conveyor belt including AGC, ARS,
3. Adding elevated parking spaces to accommodate more trucks can alleviate transportation pressure.
4. Alleviate dust and water pollution problems by adding closed factories or the most basic dust and water covers or closed actories can also achieve carbon neutrality goals
5. Adding green rooftops or solar panels and other measures.

CURRENT CONDITIONS

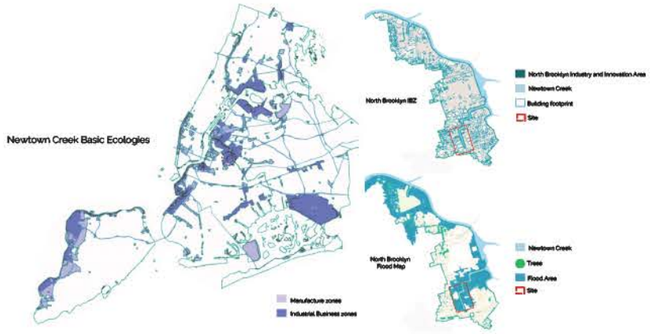
1

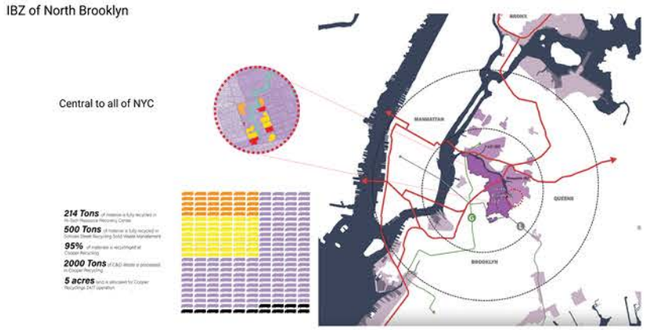
2

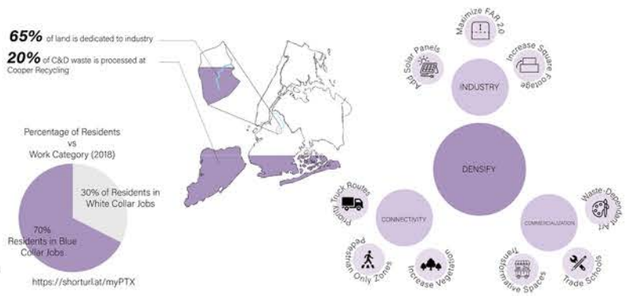
3

4

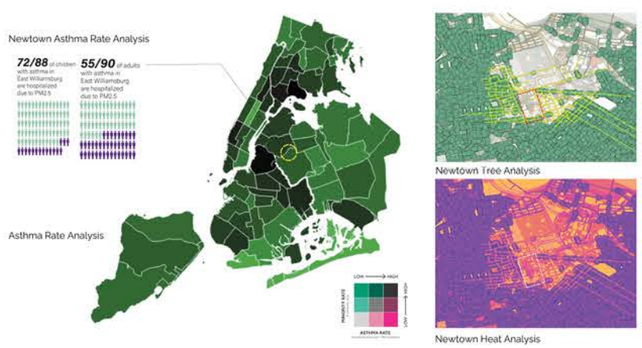
CURRENT CONDITIONS



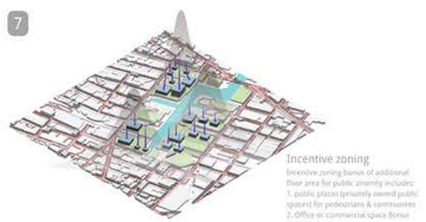




Current Conditions



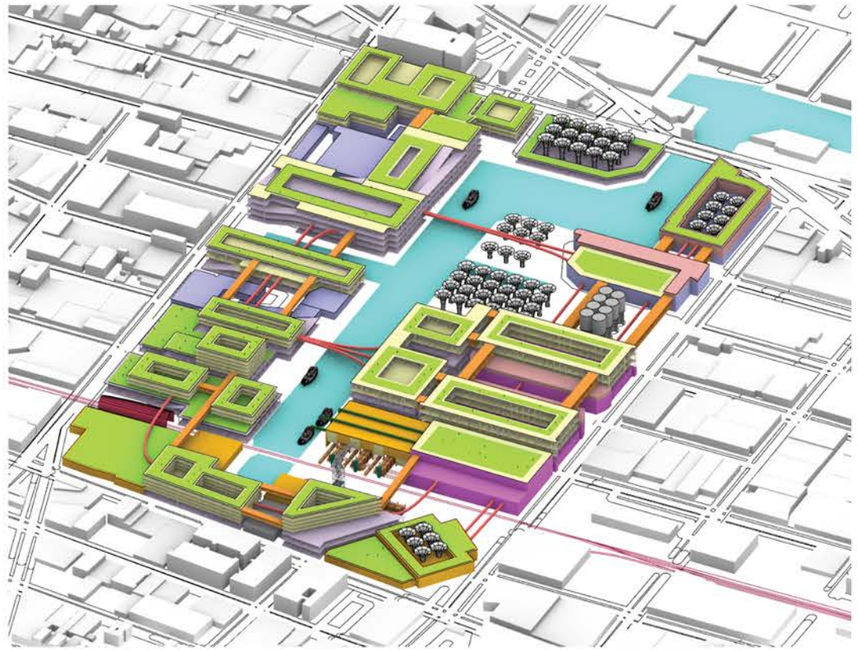
PHASES



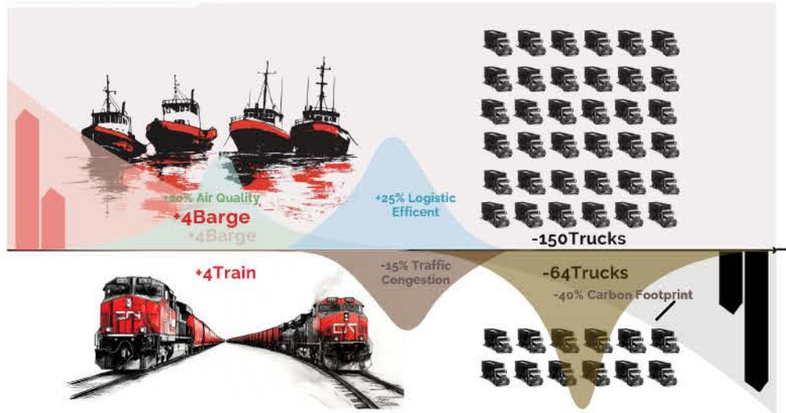
PERSPECTIVE

Master Plan

- Conveyor Belt
- Greenery & Pedestrian Path
- Connection for Pedestrian Path
- Elevated Parking
- Public/community buildings, local businesses
- Energy Recovery & Upcycling
- Cooper Recycling
- Salt Storage
- NewTown Creek

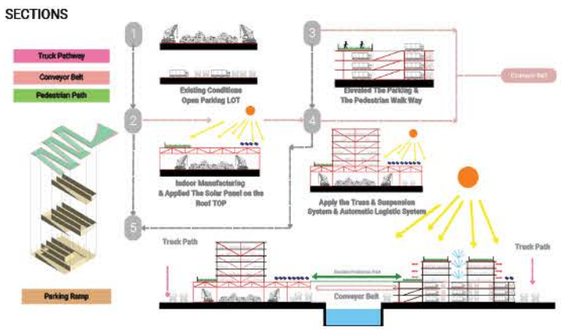


IMPROVE TRANSPORTATION

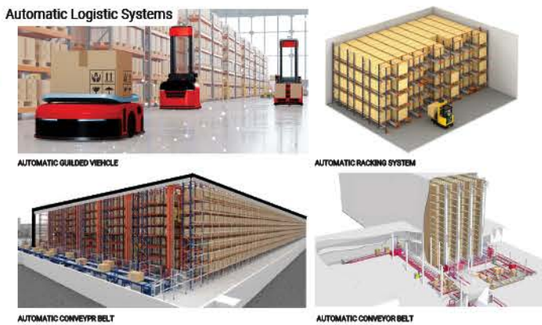


ENHANCED LOGISTICS SYSTEM

SECTIONS

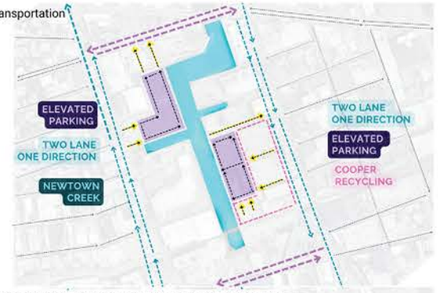


Automatic Logistic Systems



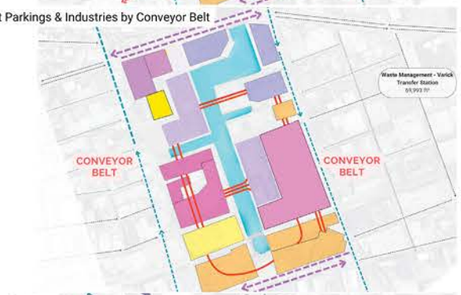
EVALUATION

Enhanced Transportation

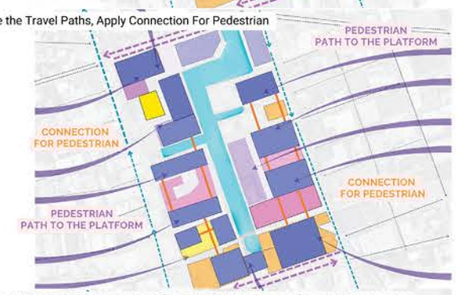


Add the Barges Increase Transporation Efficiency & Sustainbility

Connect Parkings & Industries by Conveyor Belt



Separate the Travel Paths, Apply Connection For Pedestrian

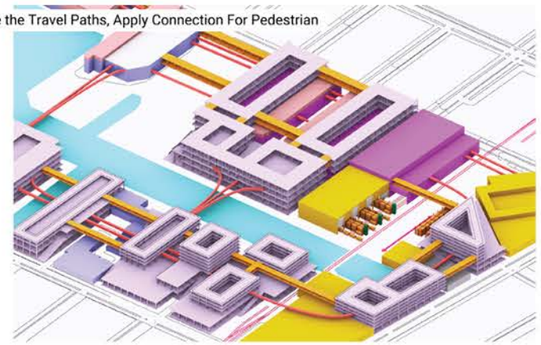


Incentive zoning Provides more space for the public community, local businesses, and promote business development & upcycling

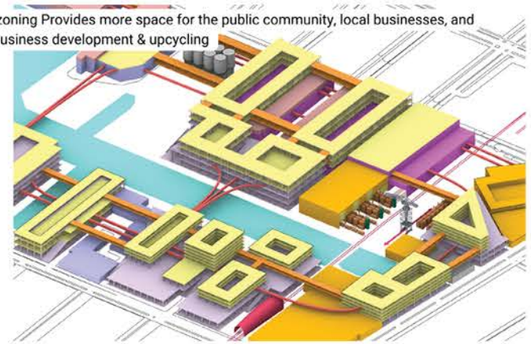
COOPER RECYCLING

Enhanced Transportation

Separate the Travel Paths, Apply Connection For Pedestrian



Incentive zoning Provides more space for the public community, local businesses, and promote business development & upcycling

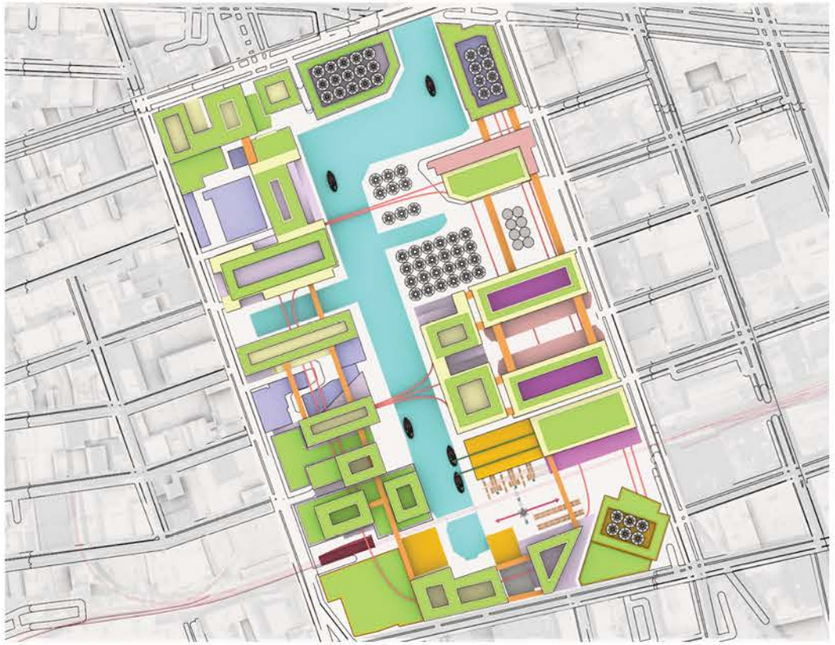


Add the Barges Increase Transporation Efficiency & Sustainbility

PLAN

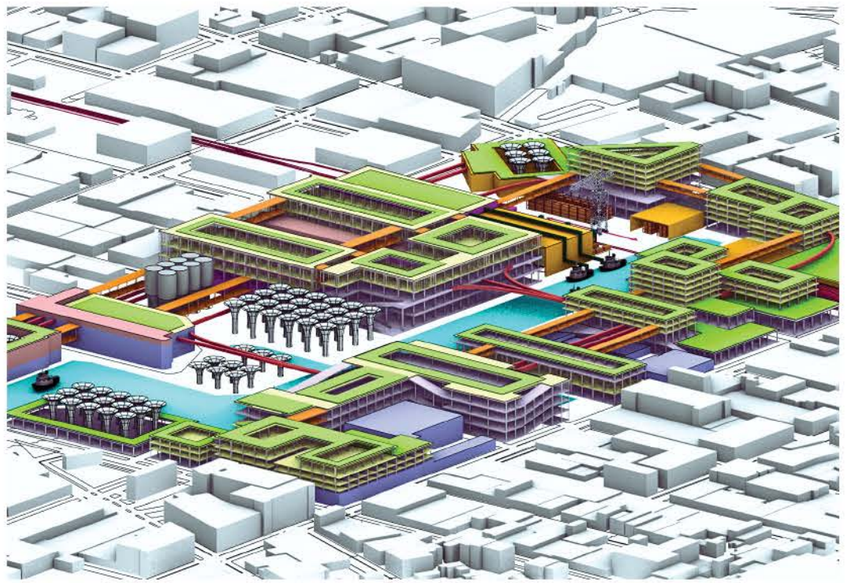
Master Plan

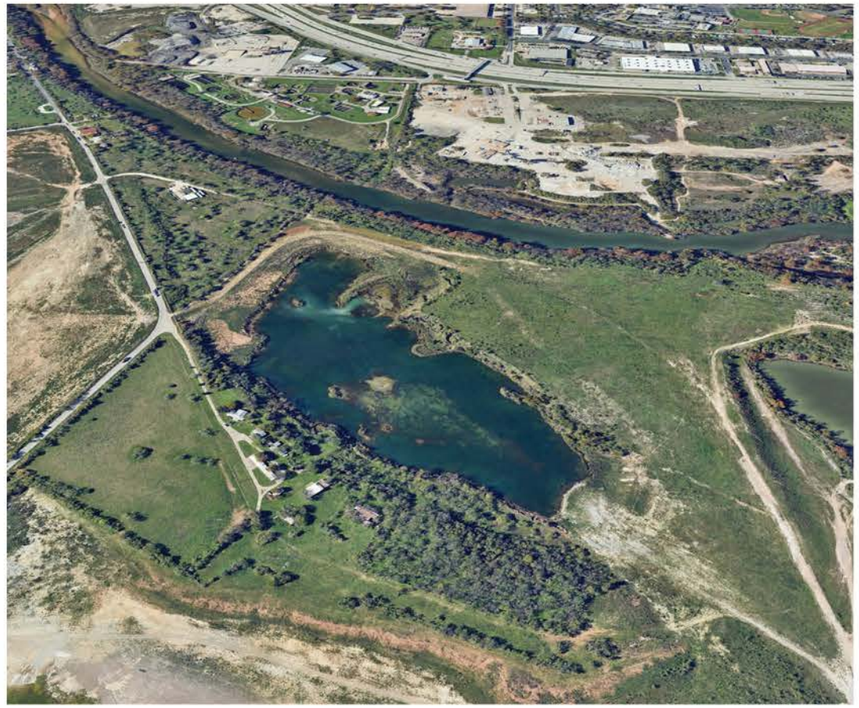
- Conveyor Belt
- Greenery & Pedestrian Path
- Connection for Pedestrian Path
- Elevated Parking
- Public/community buildings, local businesses
- Energy Recovery & Upcycling
- Cooper Recycling
- Salt Storage
- NewTown Creek



OVERVIEW OF REVITALIZED NORTH BROOKLYN IBZ

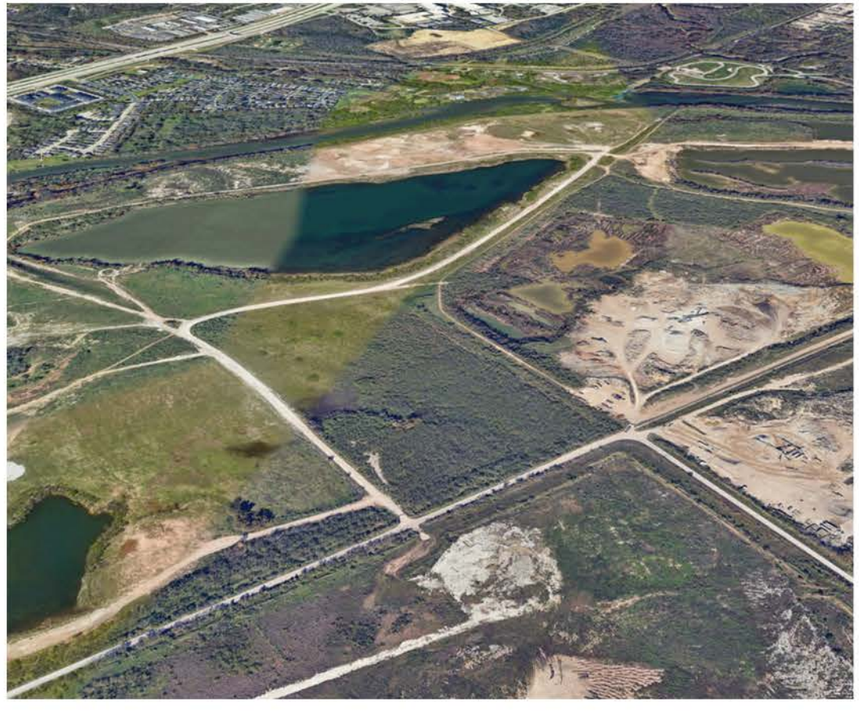
- Conveyor Belt
- Greenery & Pedestrian Path
- Connection for Pedestrian Path
- Elevated Parking
- Public/community buildings, local businesses
- Energy Recovery & Upcycling
- Cooper Recycling
- Salt Storage
- NewTown Creek





SARA
GASTON

DOG'S HEAD - AUSTIN, TEXAS



AMY
AAKANKSHA

SITE 02: Austin, Texas

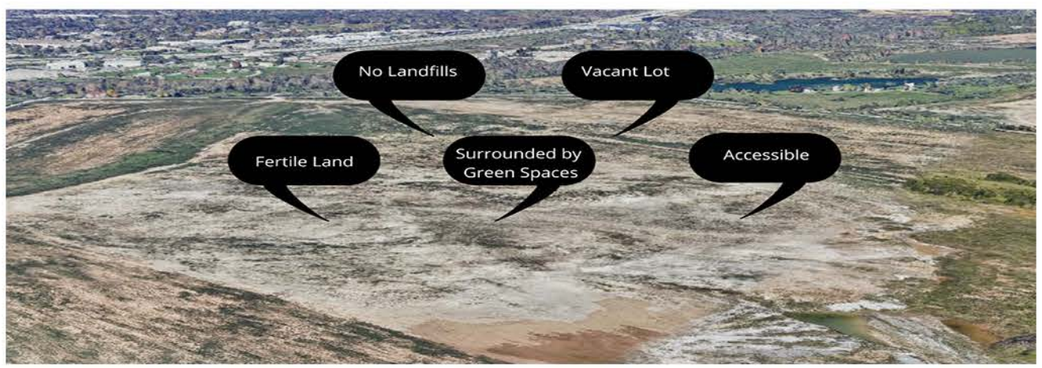
Austin's largely decentralized exurban growth has embraced and promoted an expanding 21st-century manufacturing territory adjacent to new and existing communities. Austin challenges social and environmental justice practices in ways distinct from its Brooklyn counterpart. Both cases challenge the capacity of normative urban design to interpret and channel new pervasive models and provide alternative solutions.

Dog's Head and East Williamsburg offer unique challenges due to their differing backgrounds, contexts, and urban realities. This diversity allowed students to approach their projects with an open view and adaptability, tailoring specific solutions to each location's needs.

Research Question: How can phytoremediation and other sustainable remediation techniques be effectively integrated into the redevelopment of contaminated urban sites to support affordable housing, while promoting environmental justice and community well-being?

Hypothesis: Integrating affordable housing development with innovative site remediation techniques (such as phytoremediation, bioremediation, and agricultural practices) can not only address the urgent need for low-income housing but also contribute to environmental justice by transforming brownfields into livable, sustainable spaces that support community well-being and ecological resilience.

To test the hypothesis, a site in Dog's Head was chosen based on specific criteria, primarily its proximity to the Colorado River and main access roads.



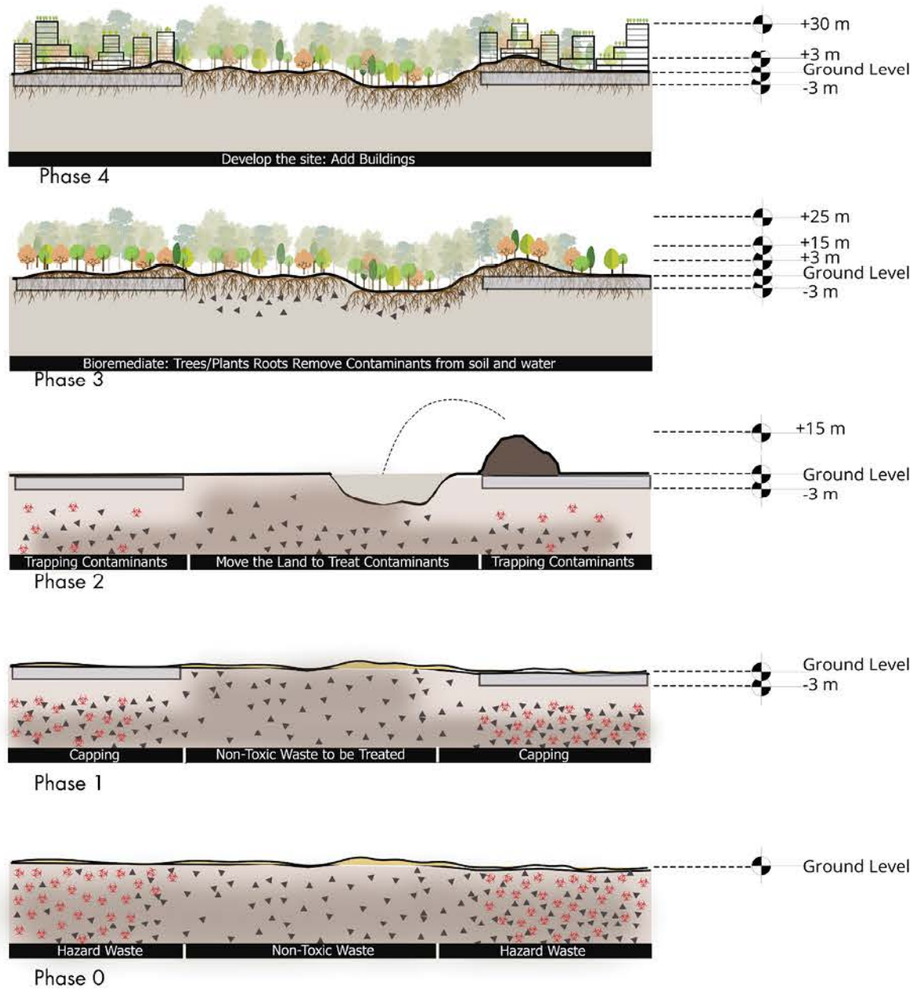
URBAN REVITALIZATION

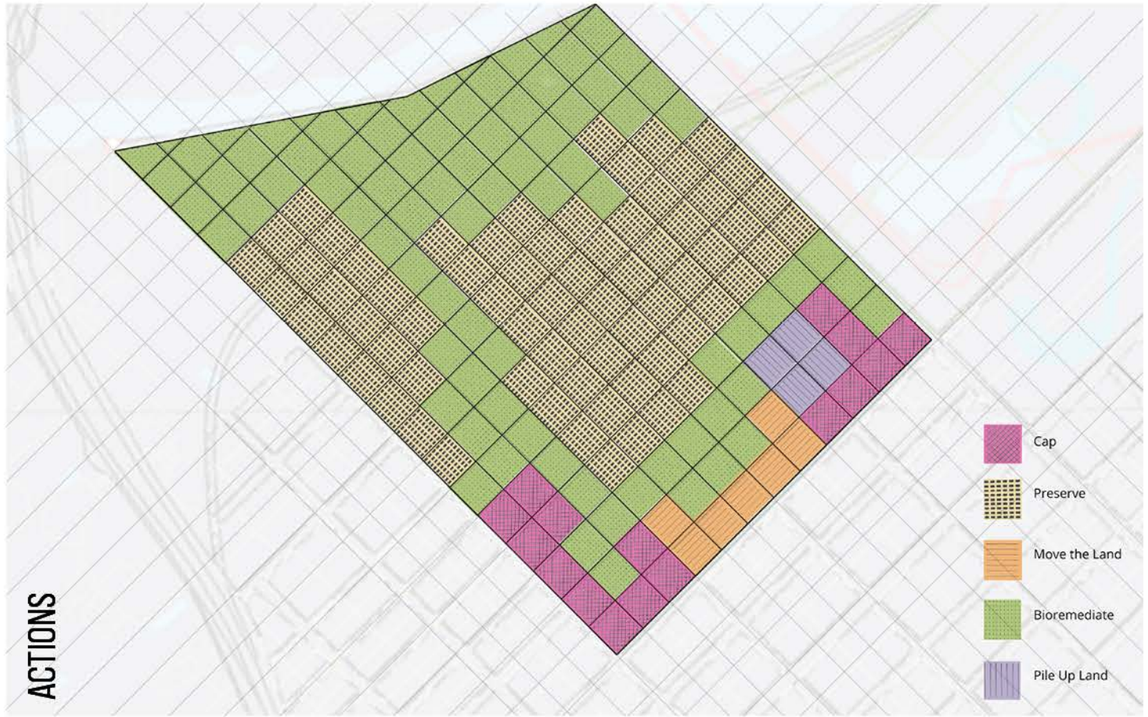
The history of site landfills, types of waste, land use, and soil types facilitated the categorization of the site (using a 100m x 100m grid) into open spaces, fertile land, and development zones, thereby guiding the specification of appropriate actions for each area.

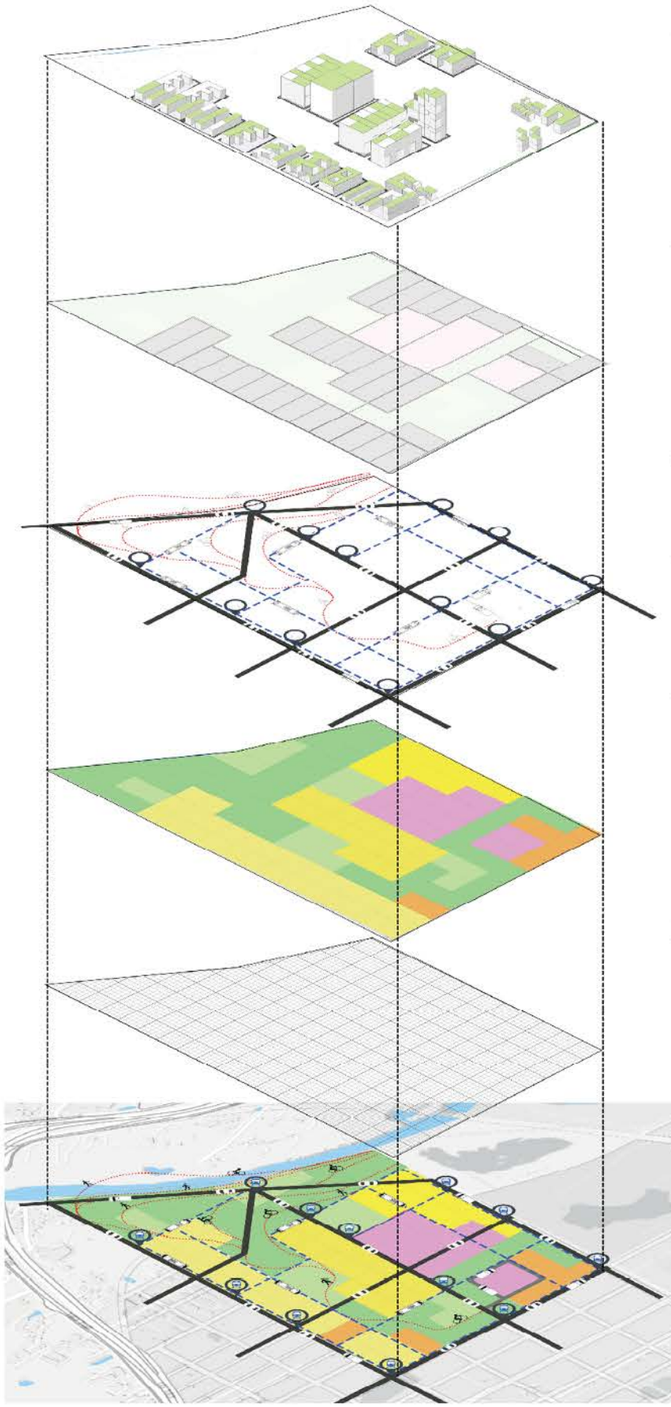
This allowed for determining areas where land is to be capped, moved, piled up, restored, or bioremediated. Ultimately, this led to a proposed land use plan that remediates the land while supporting affordable housing and promoting environmental justice and community well-being.

The diagram below illustrates topographic variations across different phases, as well as the gradual cleanup process, progressing from a heavily contaminated site to a clean site following remediation:

TOPOGRAPHY VARIATIONS







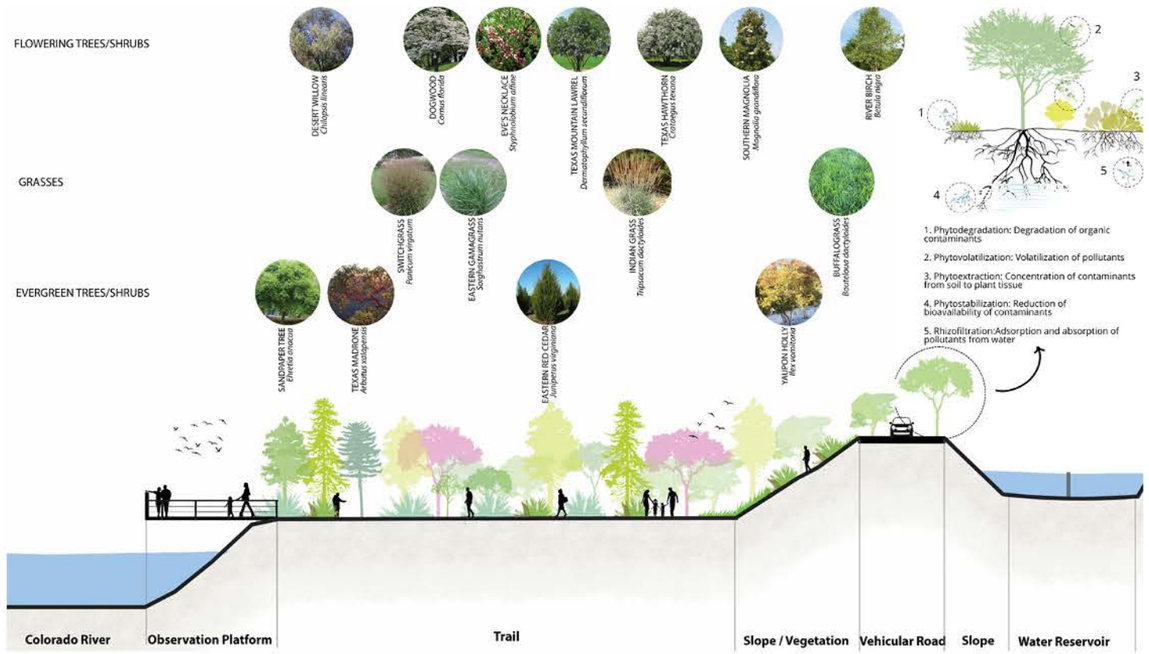
Buildings
Missing Middle
High Rise
Mixed Use

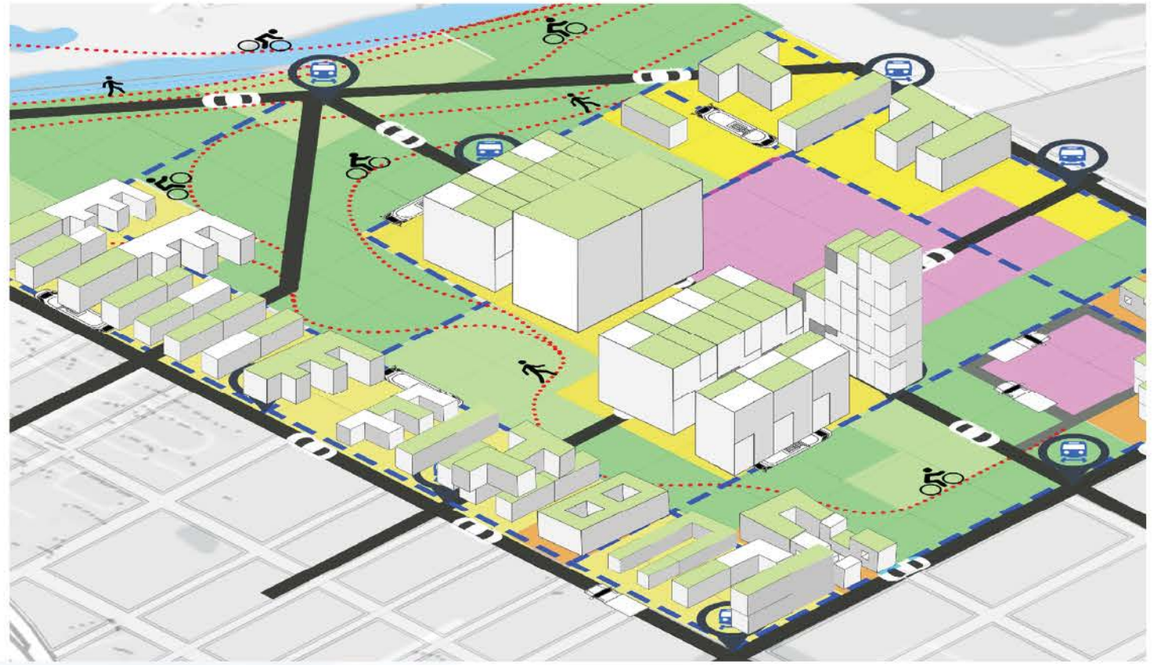
Blocks
Residential
Mixed Use
Commercial

Circulation
Cars/Trucks
Trucks Only
Electric Train
Pedestrian/Bike

Classification/Zoning
Residential
Commercial
Community/Open
Phytoremediation
Agriculture

100mx100m Grid
20mx20m grid to facilitate classification


FLOWERING TREES/SHRUBS
DESERT WILLOW
Chilopsis linearis
DOGWOOD
Cornus florida
EVE'S NECKLACE
Styphnolobium affine
TEXAS MOUNTAIN LAUREL
Dermatophyllum secundiflorum
TEXAS HAWTHORN
Crataegus texana
SOUTHERN MAGNOLIA
Magnolia grandiflora
RIVER BIRCH
Betula nigra
GRASSES
SWITCHGRASS
Panicum virgatum
EASTERN GAMAGRASS
Sorghastrum nutans
INDIAN GRASS
Trajectum dactyloides
BUFFALOGRASS
Bouteloua dactyloides
EVERGREEN TREES/SHRUBS
SANDPAPER TREE
Dirvilla sinensis
TEXAS MADRONE
Arbutus xalapensis
EASTERN RED CEDAR
Juniperus virginiana
YAUPON HOLLY
Ilex vomitoria
1. Phytodegradation: Degradation of organic contaminants
2. Phytovolatilization: Volatilization of pollutants
3. Phytoextraction: Concentration of contaminants from soil to plant tissue
4. Phytostabilization: Reduction of bioavailability of contaminants
5. Rhizofiltration:Adsorption and absorption of pollutants from water
Colorado River
Observation Platform
Trail
Slope / Vegetation
Vehicular Road
Slope
Water Reservoir




Affordable Housing
Missing Middle
RESTAURANT
SHOP
Vehicular Road
Pedestrian/Bike
Phytoremediation
Pedestrian
Agriculture
Pedestrian
Phyto-remediation
Pedestrian /Bike
Vehicular Road
Tram

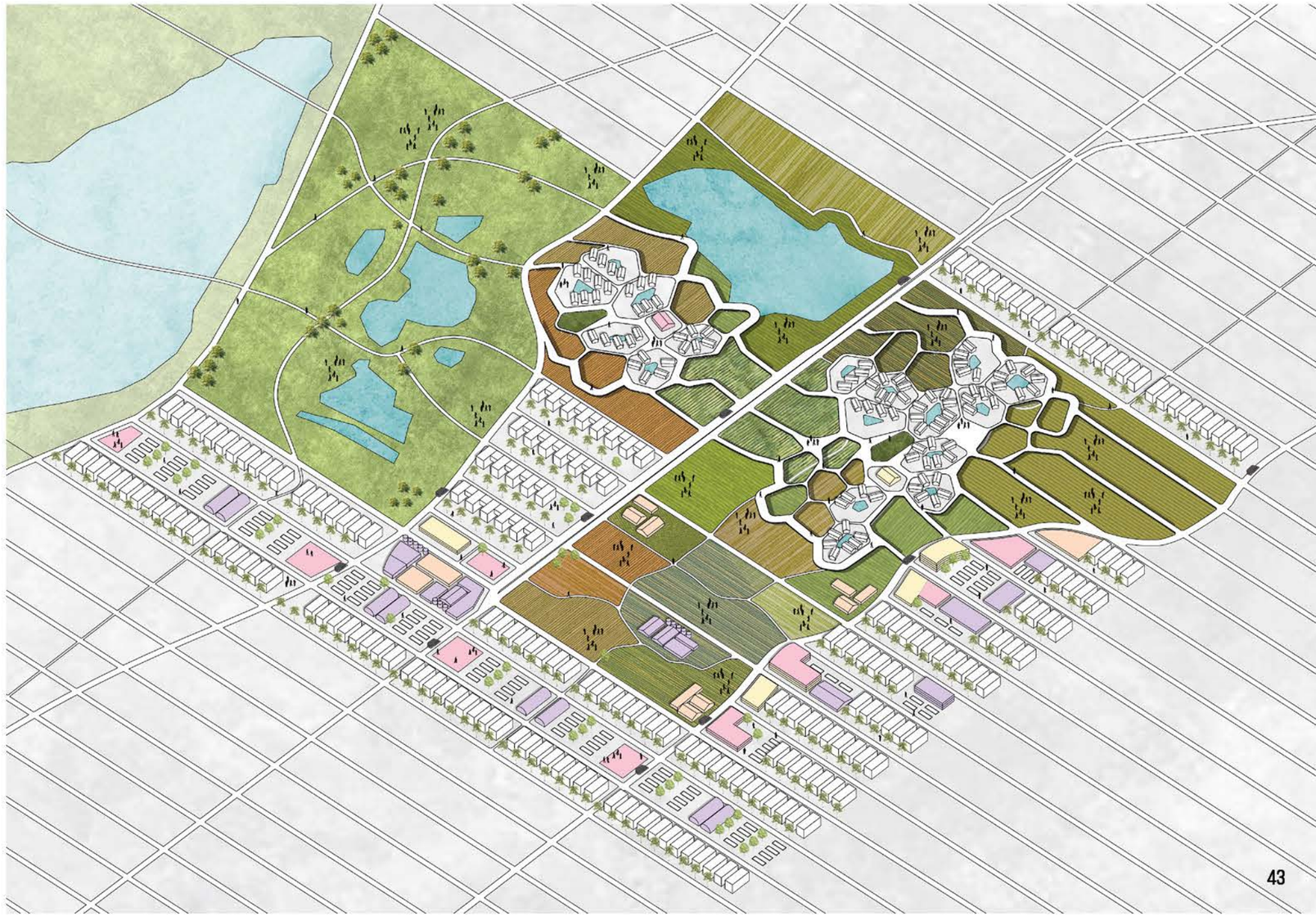
AAKANKSHA MAHARJAN

“Integration of agriculture contested under the pressure of urban development offers an opportunity to rethink the relationship between community housing and urban agriculture”

Research Question: How can urban planning in Austin, Texas, integrate urban agriculture techniques such as hydroponics and aquaponics with residential development to create sustainable community housing?

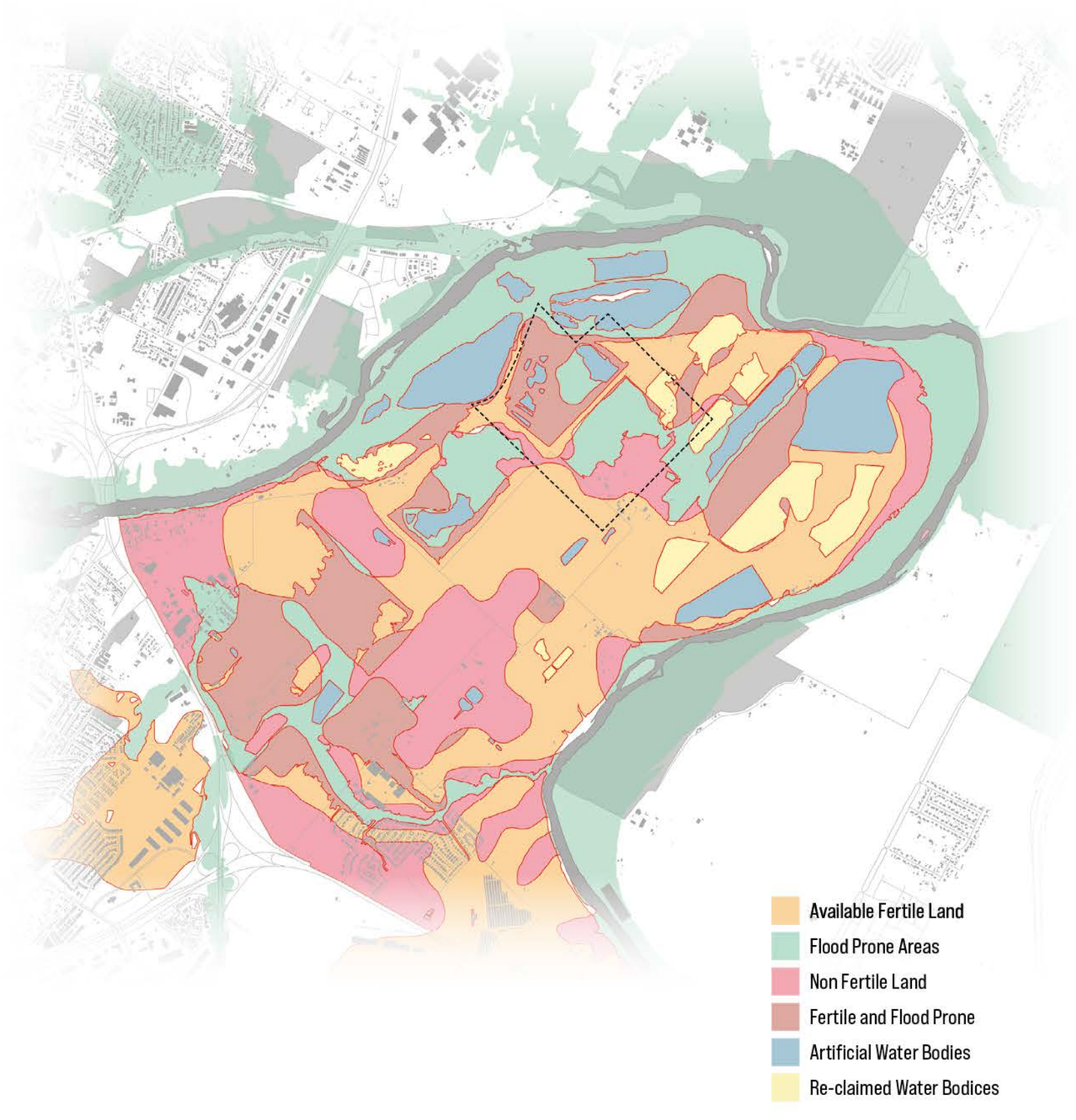
RETHINKING THE RELATION BETWEEN

URBAN HOUSING AND URBAN AGRICULTURE



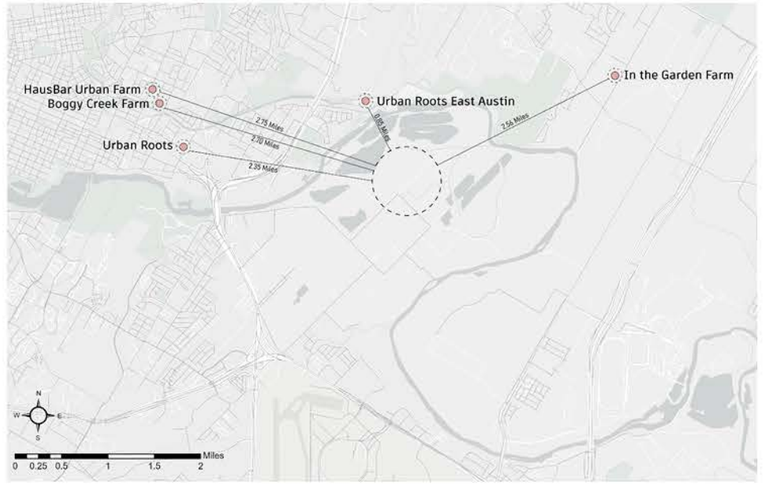
Geographic Data

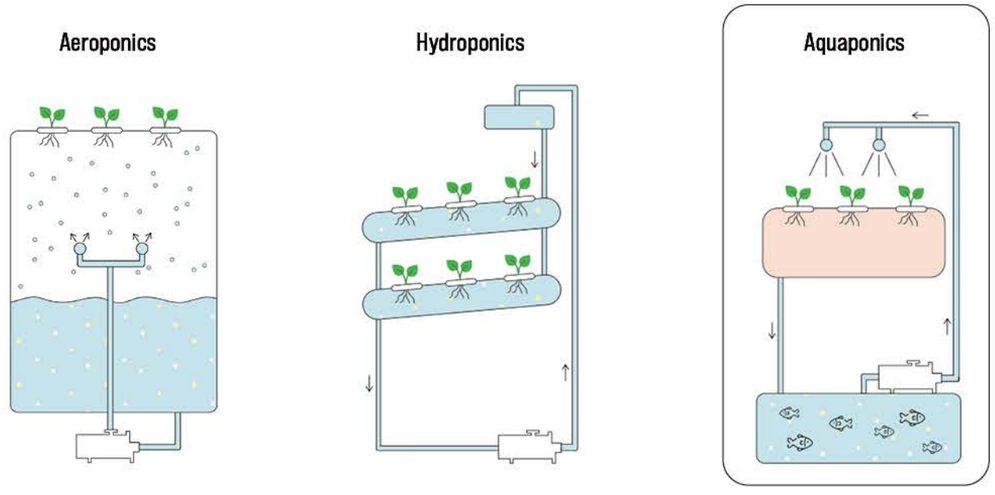
This map represents a compilation of existing soil conditions . Utilizing this data as a guide helps in strategically placing programs by offering valuable insights into the site's characteristics.



Existing Farms

This diagram highlights the farms situated near the Dog's Head area in Austin, offering a clear overview of their locations in relation to this landmark. It provides valuable insight into the distribution of agricultural activity in the surrounding region.





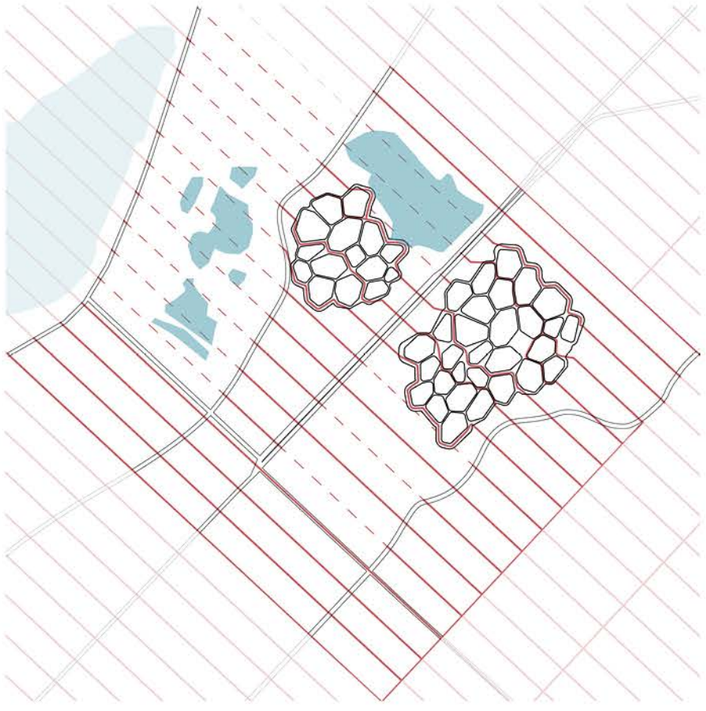
	Aeroponic	Hydroponic	Aquaponic
Pros	- Water-efficient - Fast growth due to high oxygen level - Space efficient (Vertical Farming) - Low disease risk	- Efficient water use - Fast growth with direct nutrients access - Less pesticide use - Scalable - Control over growing condition	- Sustainable closed-loop system - Produces both plant and fish - Water efficient - Organic and eco-friendly - Low waste
Cons	- High initial setup cost - Requires constant monitoring and expertise - Risk of failure if misting is disrupted - High energy use	- Initial setup cost -Needs regular monitoring - Potential for waterborne diseases - Energy consumption	- Complex system needing expertise - High Initial setup cost - Requires constant monitoring - Energy-intensive

Urban Design Strategy

Existing streets and new boulevards following the land condition

Linear Grid

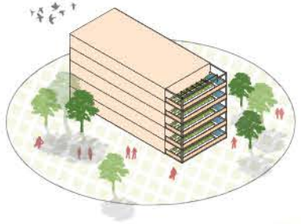
Elevated Platform



New Arterial Streets

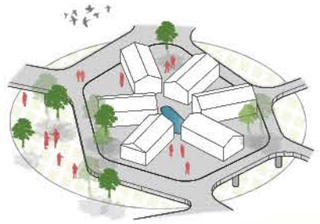
Street Layout

The Function

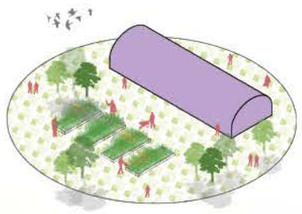


① Residential Typology 1

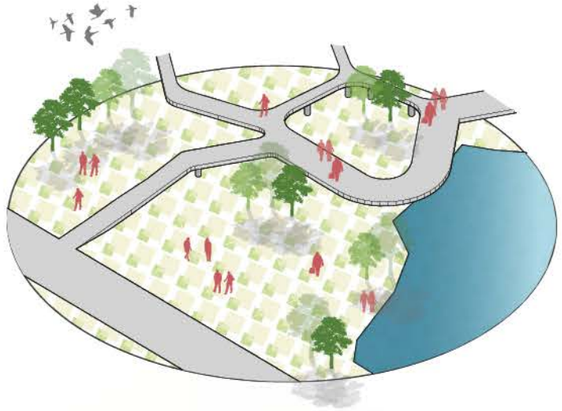
② Residential Typology 2



③ Residential Typology 3



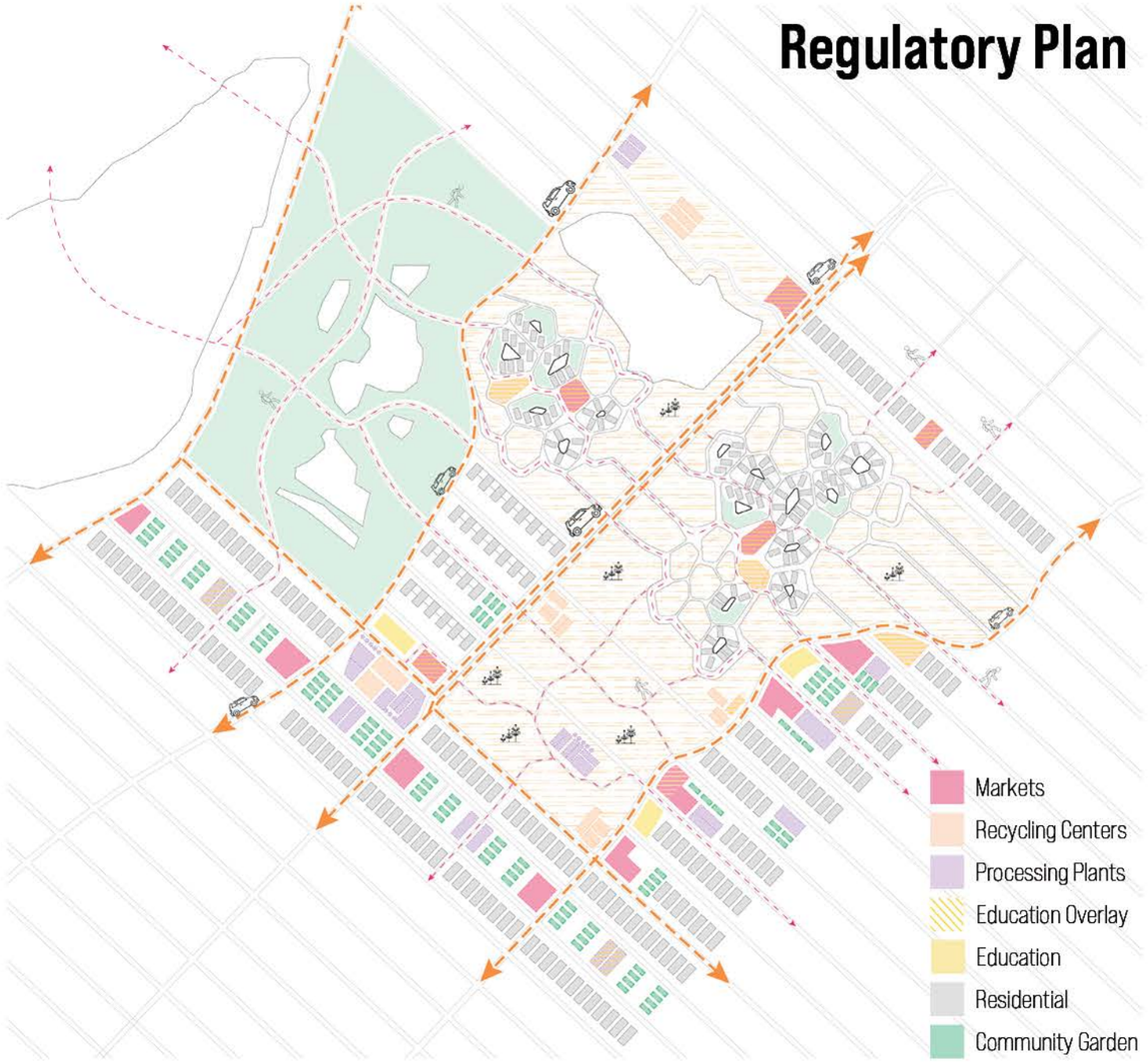
④ Community Garden



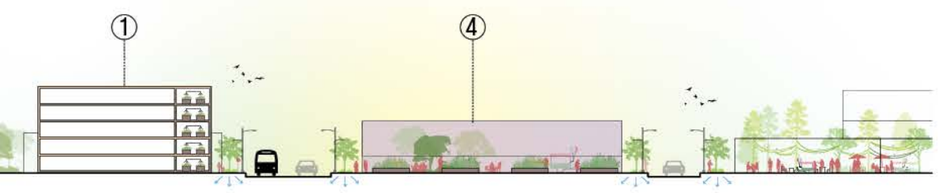
⑤ Relation between the elevated platform and the pond

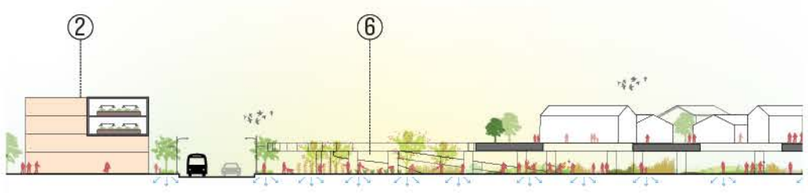
⑥ Agriculture below the platform

Regulatory Plan



Section Through Different Zones



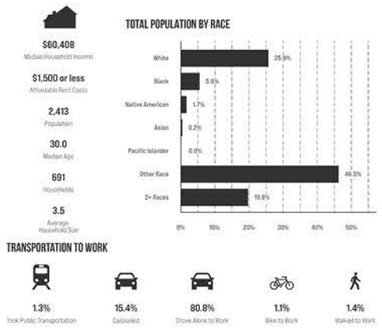


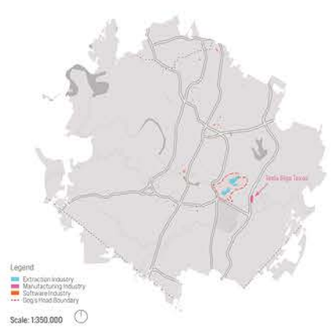
INDUSTRIAL-LED HOUSING FOR RESILIENT COMMUNITIES

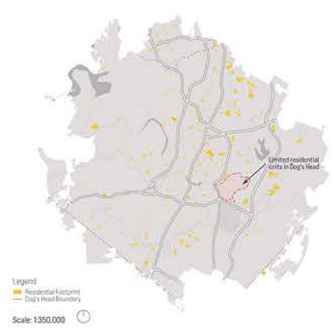
A MODERN COMPANY TOWN MODEL

Research Question: What role can the extraction and manufacturing industries play in mitigating gentrification driven by the growing technology sector and ensuring equitable urban development in Dog's Head, Texas?

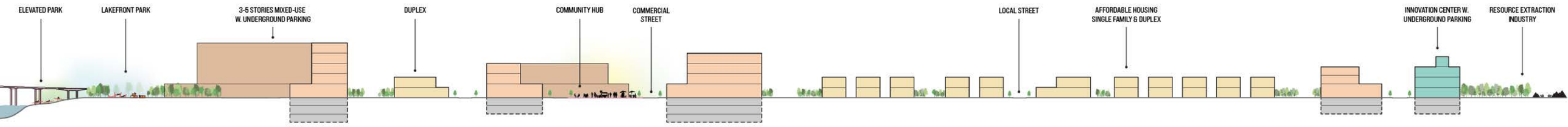
Research Hypothesis: The integration of industrial-led housing developments in Dog's Head, Texas, can enhance urban resilience and community cohesion by providing affordable housing for the labor force in the extraction and manufacturing industries, promoting equitable urban development and mitigating the impacts of gentrification caused by the technology sector.



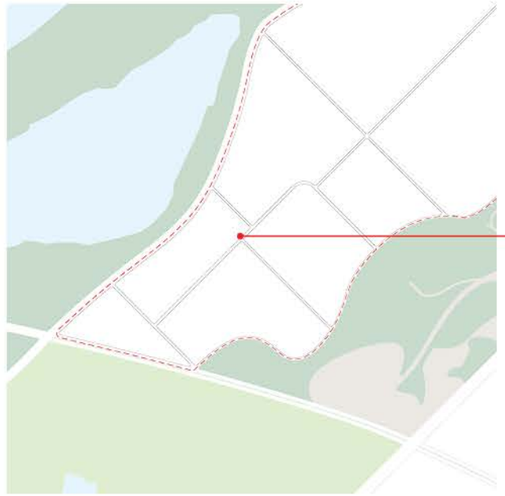




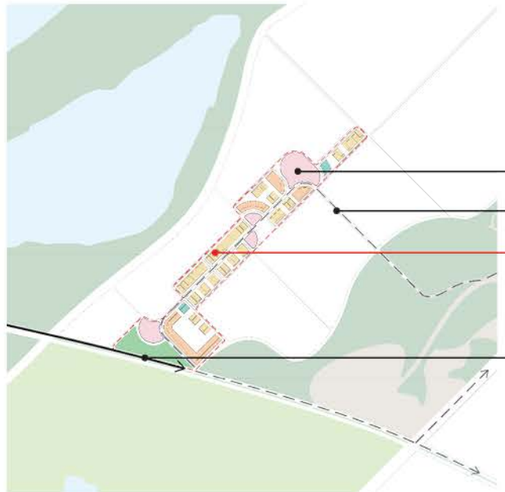
SECTION A



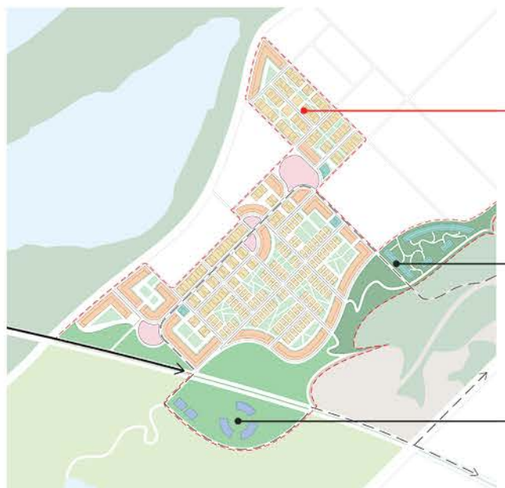
PHASE 1 - MAJOR STREETS



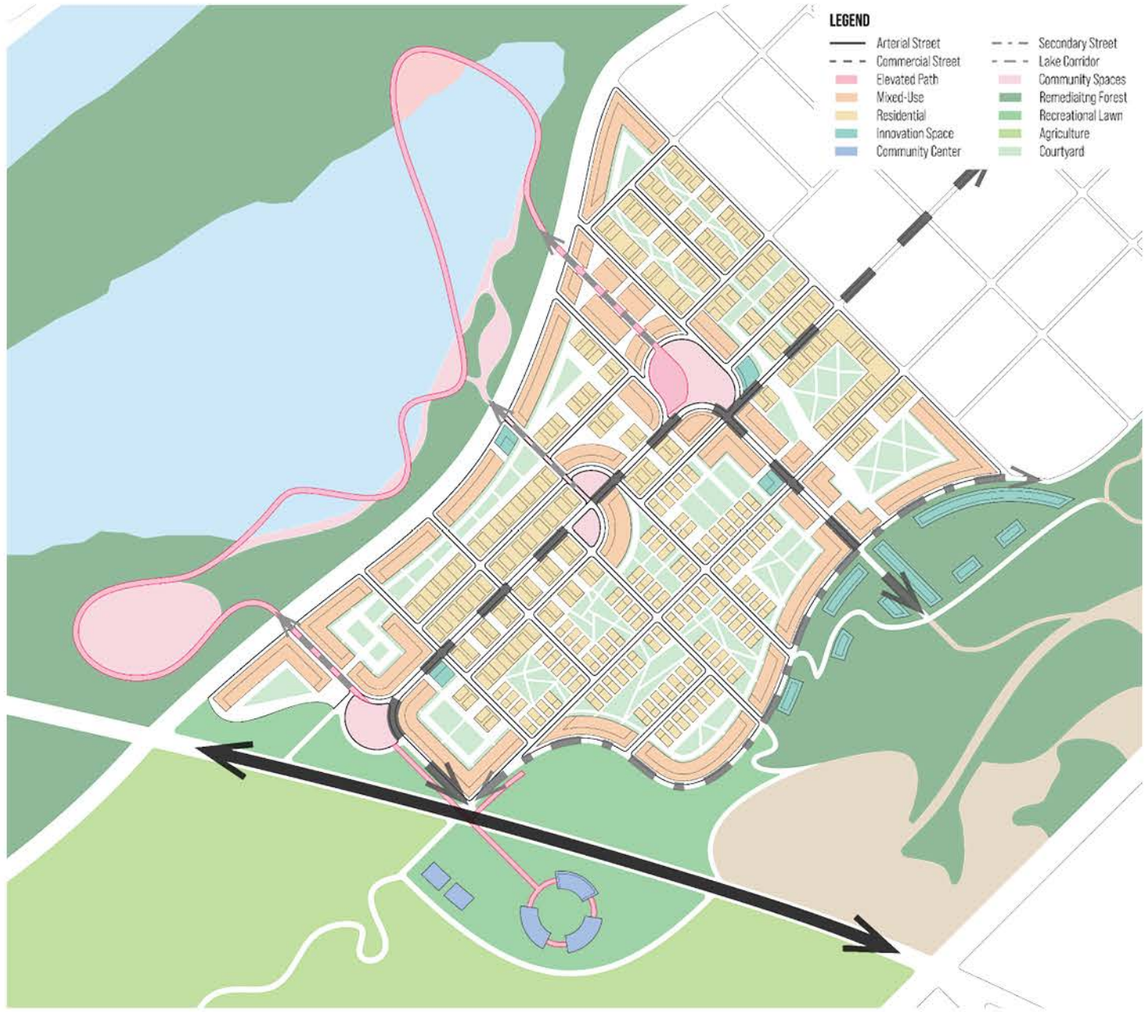
PHASE 2 - CITY INITIATIVE



PHASE 3 - PRIVATE AND PUBLIC PARTNERSHIP

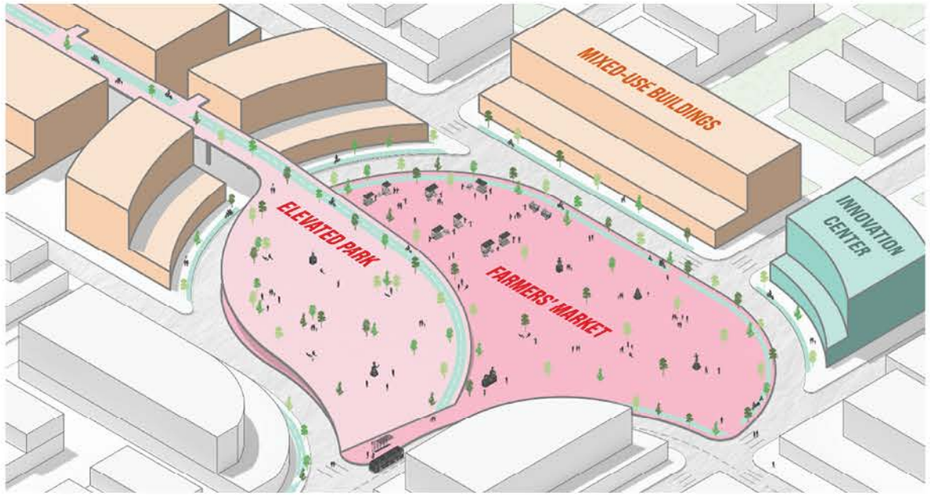


PHASE 4 - COMPLETE DEVELOPMENT

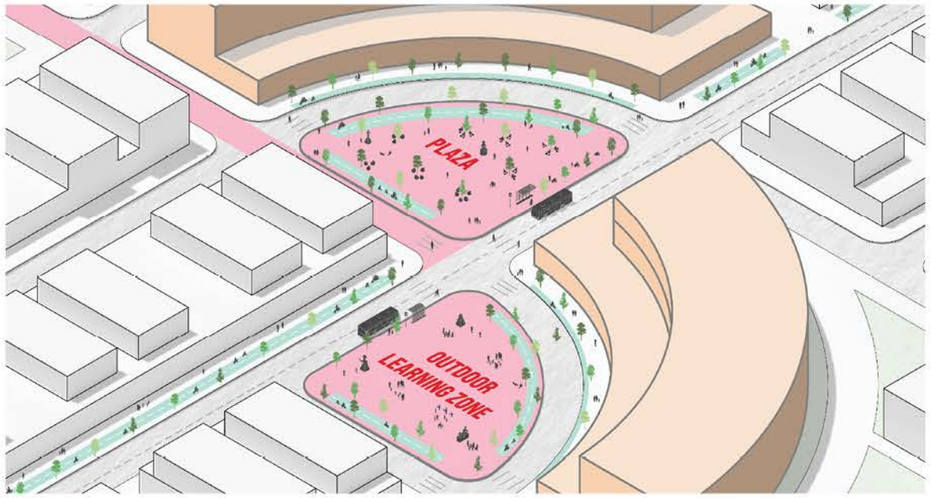


REGULATING PLAN

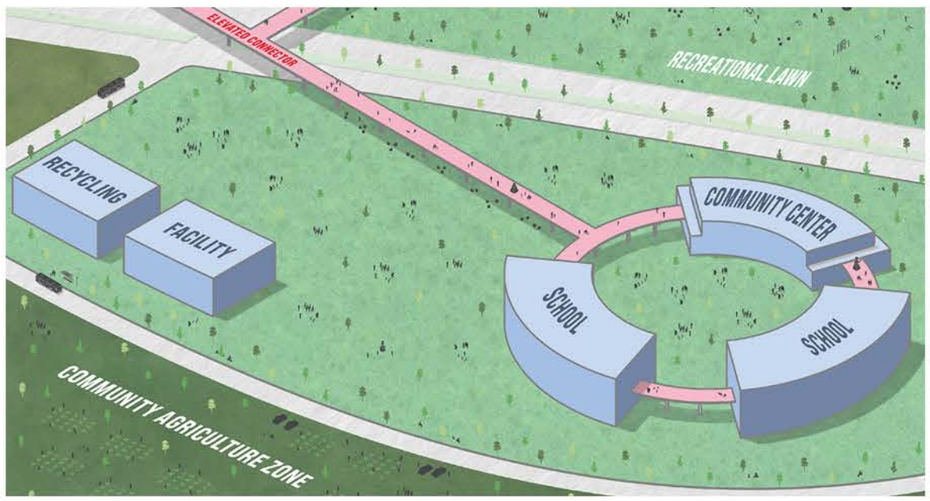
FARMERS' MARKET



PLAZA



COMMUNITY CENTER



GASTON FERNANDEZ

KEEP IT WEIRD AND EQUITABLE:

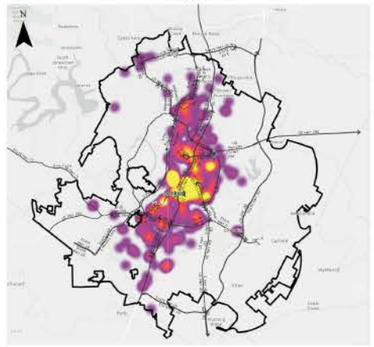
TRIGGERING URBAN DEVELOPMENT IN AUSTIN, TEXAS, THROUGH THE CREATION OF CULTURAL INFRASTRUCTURE.

Culture could be the key factor to enhance and trigger the expansion of the city, bringing investments and project developments in the context of equitability and contemplation of minorities. An equitable city could be created by cultural infrastructure that stimulates the future growth of Austin, giving a special focus on the production of affordable housing and a circular economy.

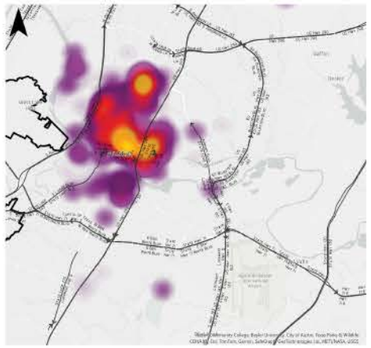
CULTURAL INFRASTRUCTURE

Austin is a well-known city rich for its multicultural identity and growing innovative tech hub. The city faces rapid widening challenges, including a housing crisis and economic disparities disproportionately affecting vulnerable communities. This research aims to inquire into the potential of cultural infrastructure as a catalyst for equitable urban expansion, focusing on the impact that this cultural infrastructure could have if it is placed on Dog's Head area, a largely undeveloped site near Austin's city center.

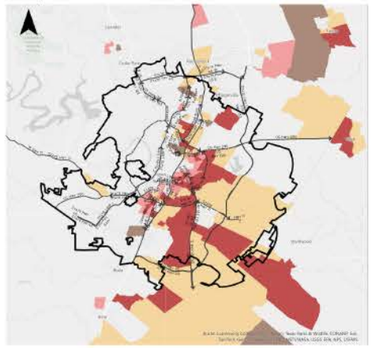
Affordable Housing In Austin



Cultural Spots in Austin



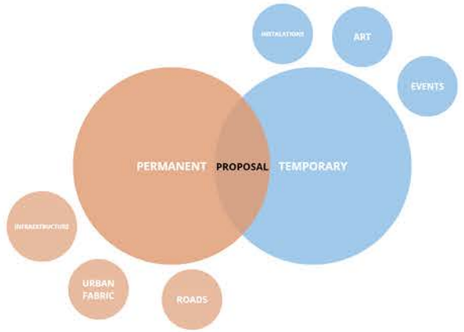
Displacement Risk in Austin



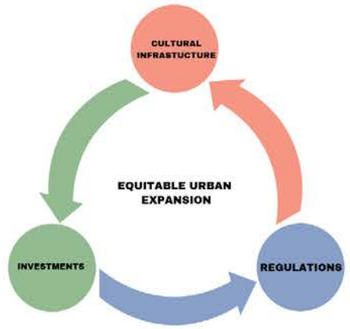
PROPOSAL LOCATION

CONCEPT & CULTURAL HUBS

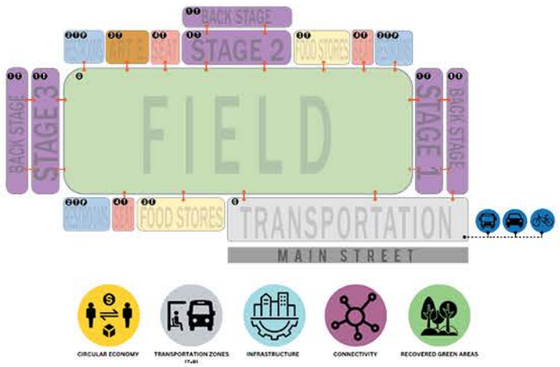
Proposal Concept Base



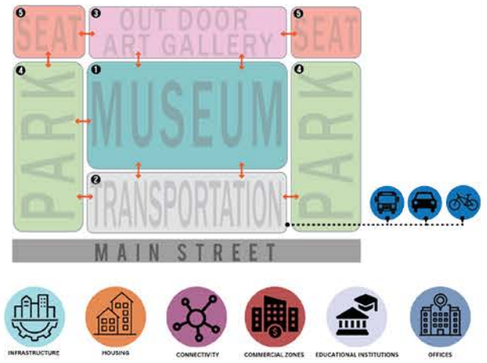
Loop Process



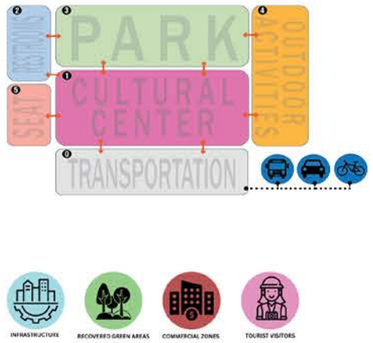
Stage



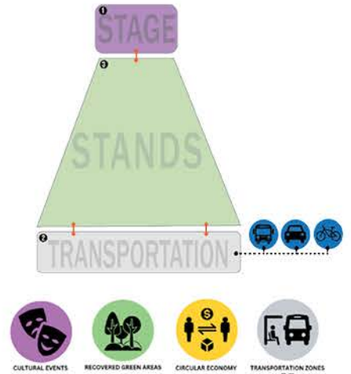
Museum



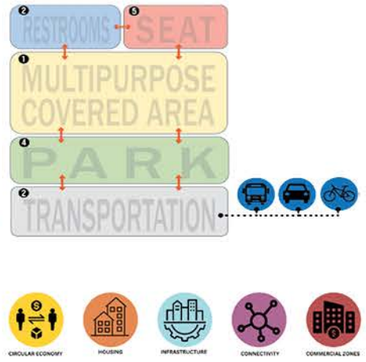
Cultural Center



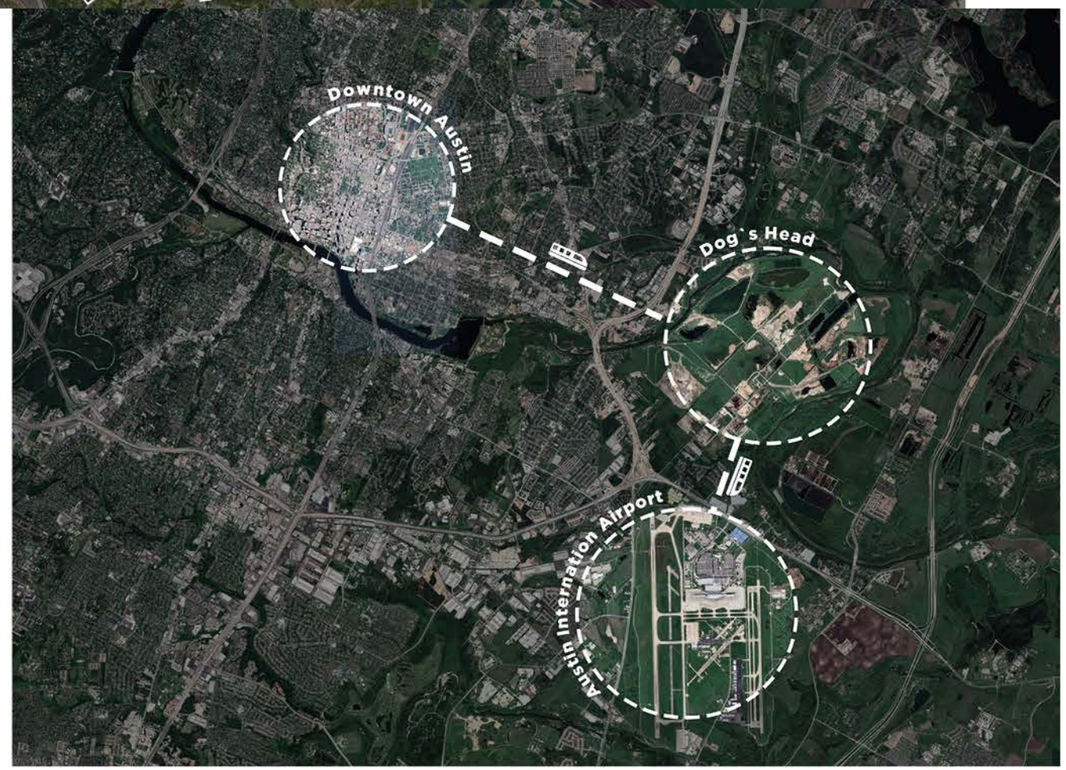
Amphitheater



Multipurpose Area



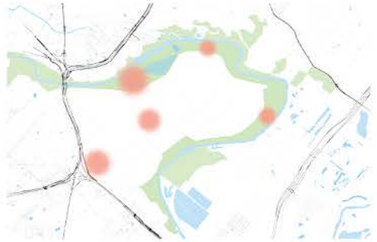
CULTURE AS A TRIGGER



TRAIN CONNECTION

PROJECT PHASING

PROJECT PHASING - A



PROJECT PHASING - B

PROJECT PHASING - C

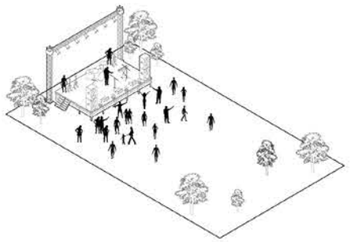
PROJECT PHASING - D

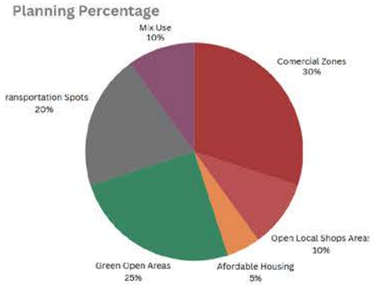
PROJECT PHASING - E

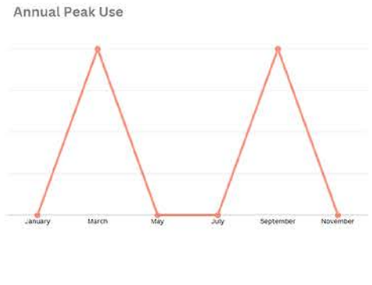
PROJECT PHASING - F

FINAL PROJECT PHASING

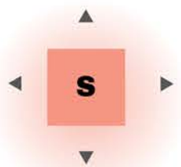
STAGE TRIGGERS CITY

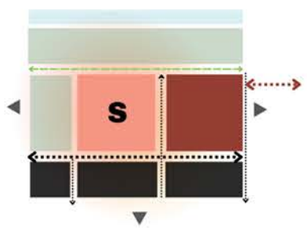


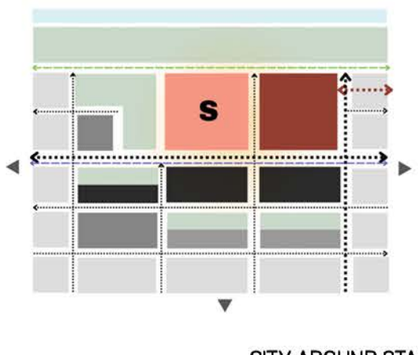




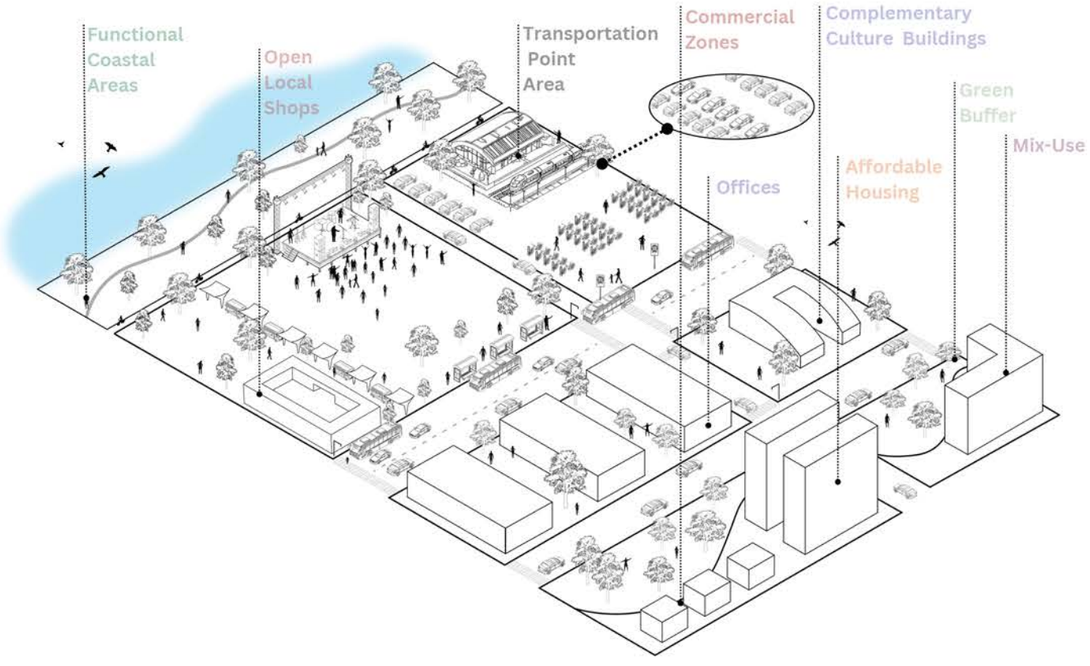
URBAN EXPANSION



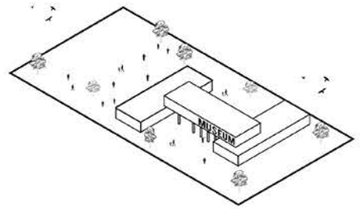


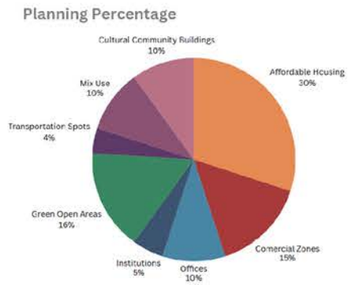


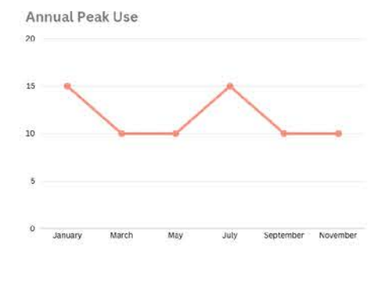
CITY AROUND STAGE



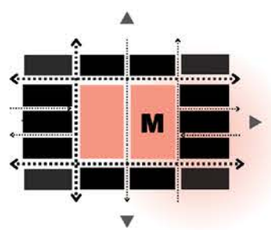
MUSEUM TRIGGERS CITY

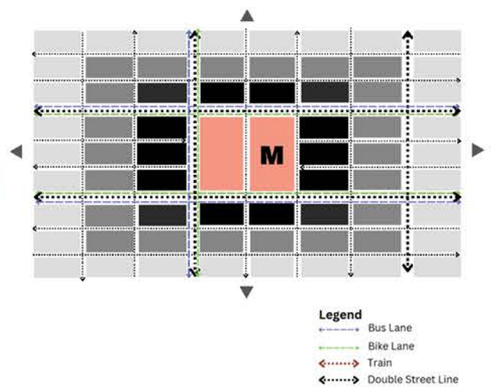




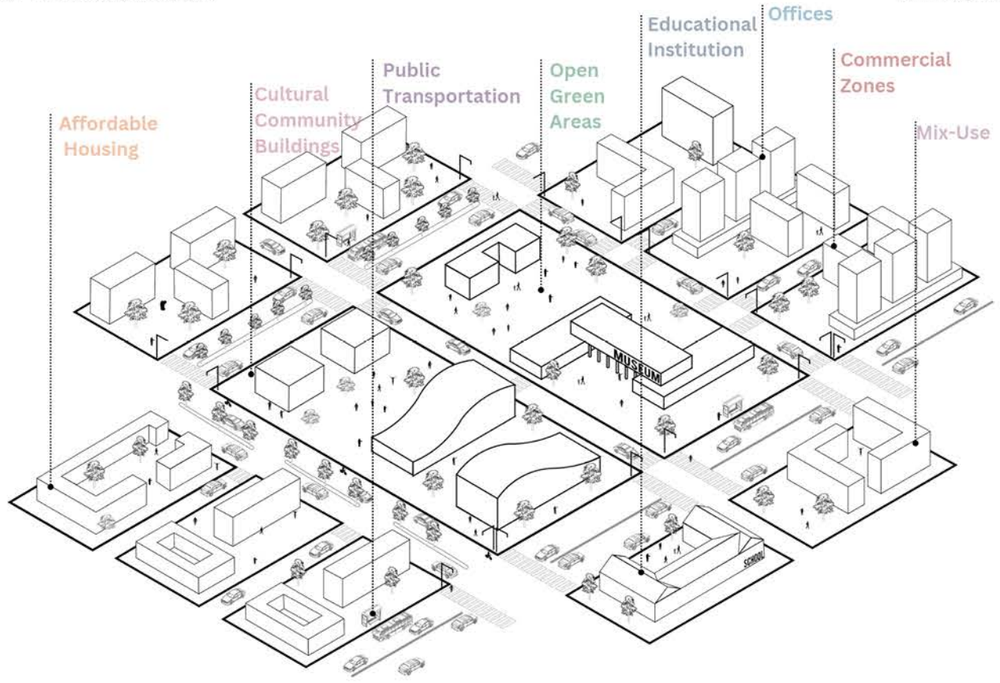


URBAN EXPANSION





CITY AROUND MUSEUM



THANK YOU!

Spitzer The Bernard & Anne Spitzer School of Architecture

INAUGURAL SSA UD CAPSTONE SYMPOSIUM

Jurors/ Critics: Marc Coudert, Terri Matthews, Sagi Golan, Carlos Brillembourg, Cassim Shepard, Felipe Correa, Kaja Kuehl, and Landon Brown.

Special Thanks To The City Of Austin,
And NYC DDC - Town + Gown