

Yi Zhang

Portfolio 2019 - 2020

**M.S. Architecture &
Urban Design**

Introduction

1. Sharing Green Economy

Port & Industries / Ecology / Resiliency /
Post-disaster Recovery

2. Drive Less Life

Transportation / Decarbonization /
Urban Systems / Climate Change

3. Manufacturing Public Spaces

Civic Space / Industrial Recovery

CONTENTS

Spring 2020

Sharing Green Economy

Fall 2019

Drive-Less Life

Summer 2019

Manufacturing Public Spaces

SHARING GREEN ECONOMY

Private Sector-Led Diversified Local Industries Recovery

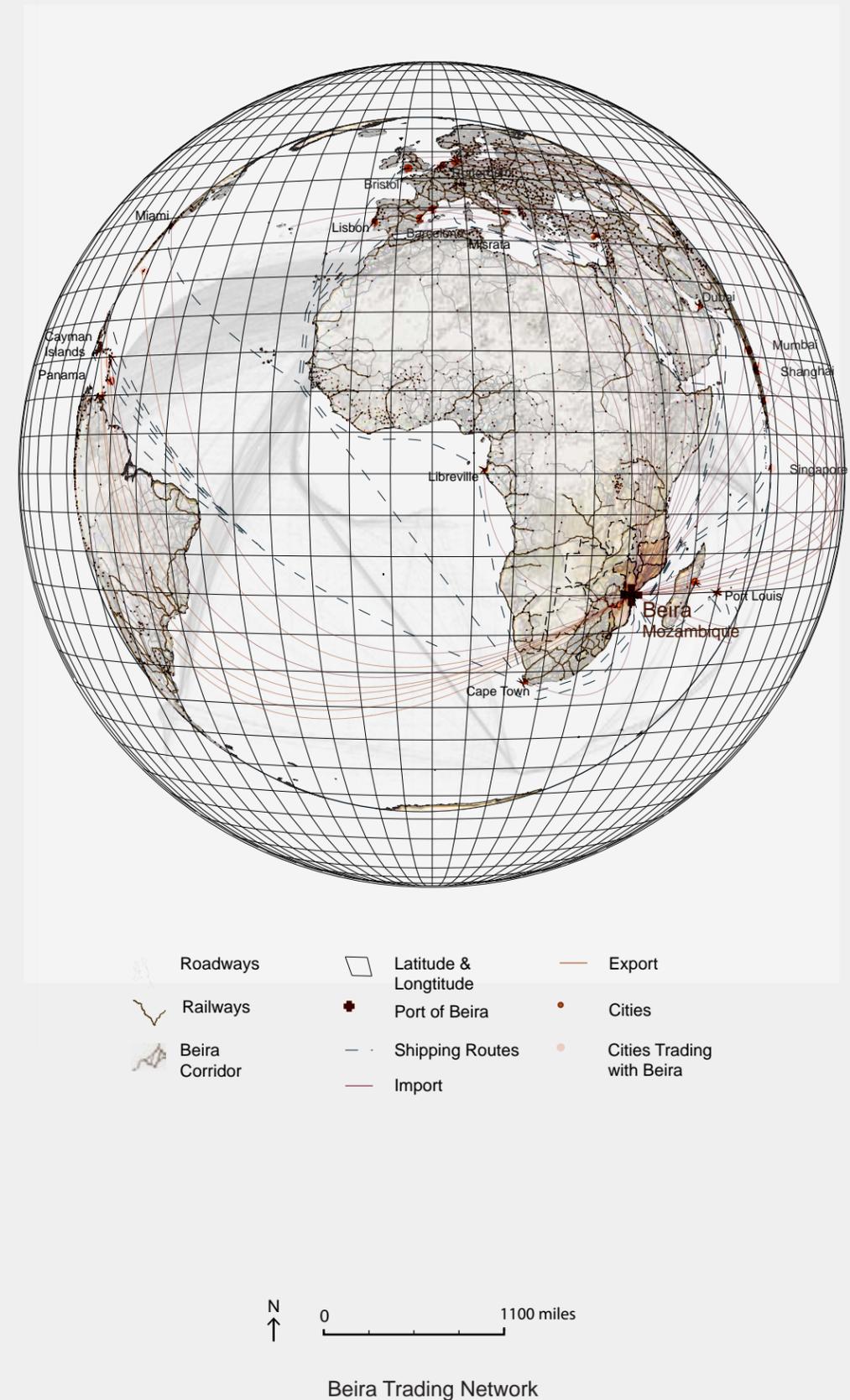
The port of Beira is a major economic asset for Mozambique. As a link between the global shipping and the interior of Sub-Saharan Africa, while the port benefits from Beira's strategic location. This project is imagining how the port could do more to benefit the people of Beira, empowering the local economy, ecology, and community!

What if the port could be redesigned to build long-term economic resilience for future generations by:

- Promoting diversified and regenerative local industries.
- Providing better jobs and training opportunities for Beirans.
- Balancing port infrastructure with thriving, adaptive ecosystems.

Design Team

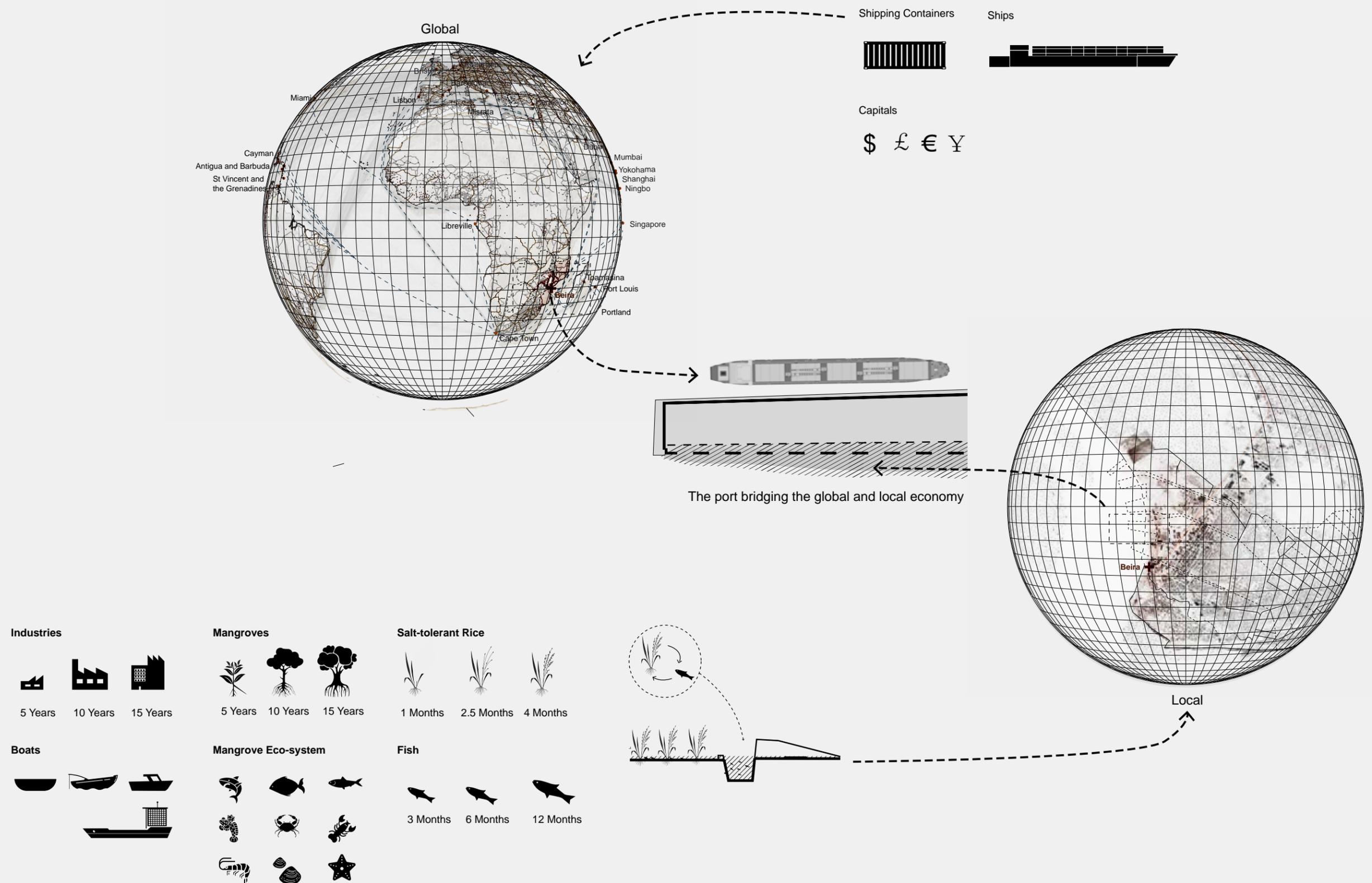
Annie Wu ,Chris Zheng, Yi (Isabelle) Zhang, Mansoo Han,Ritchie Ju



BEIRA AS AN UNIQUE PORT CITY

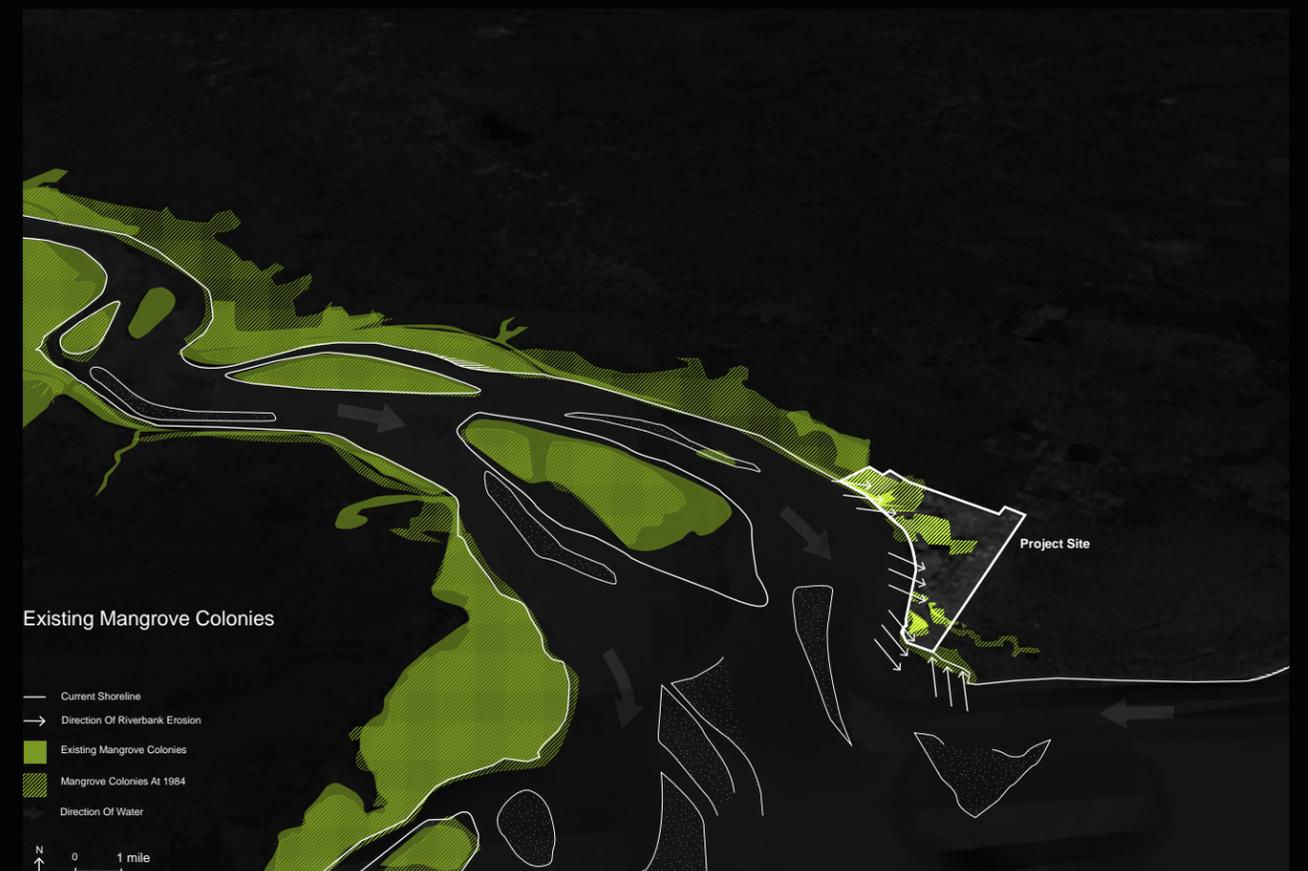
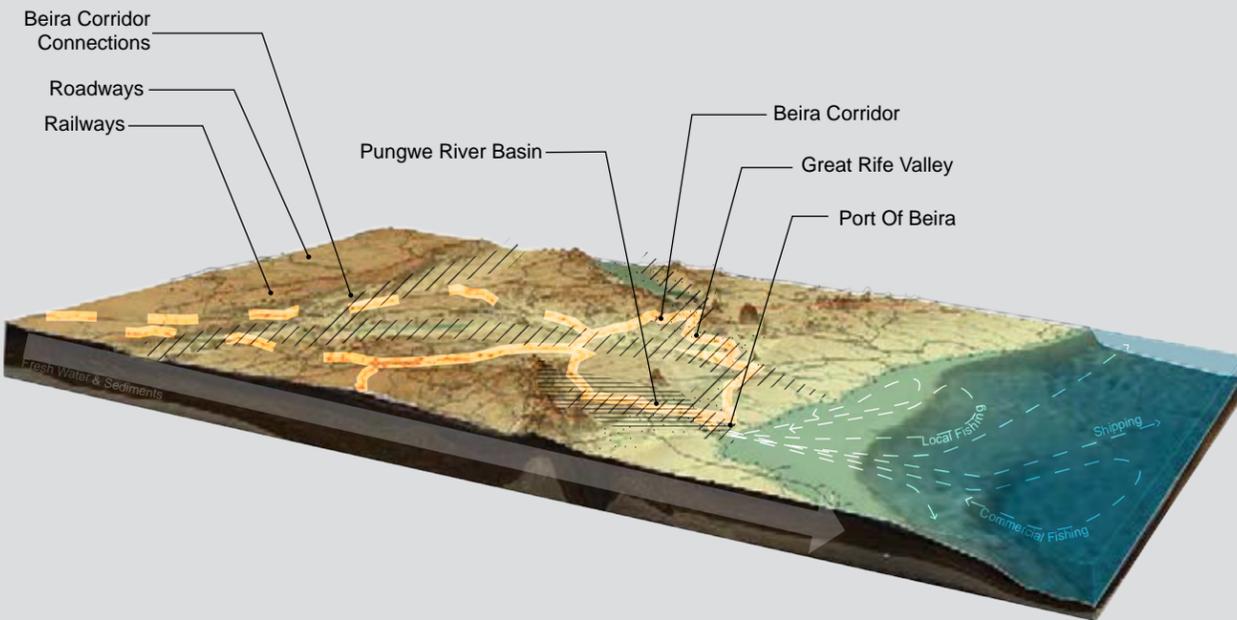
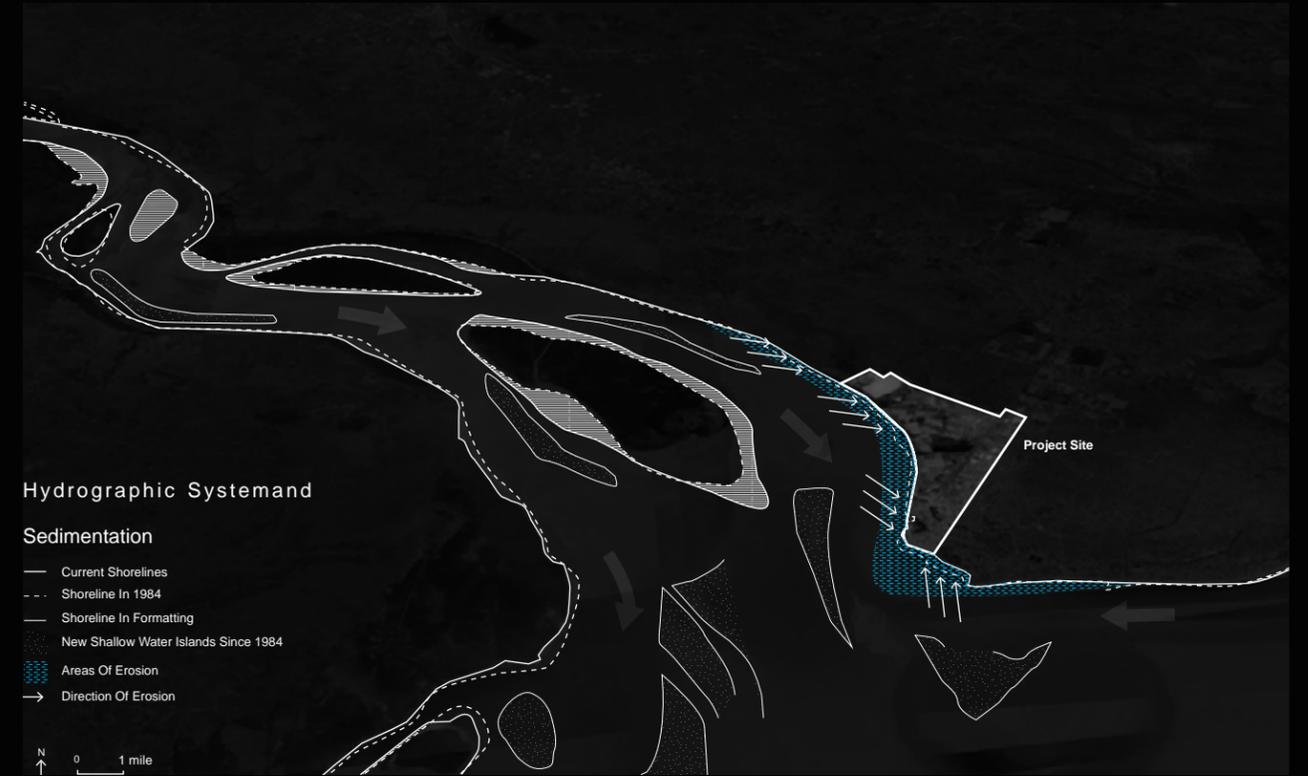
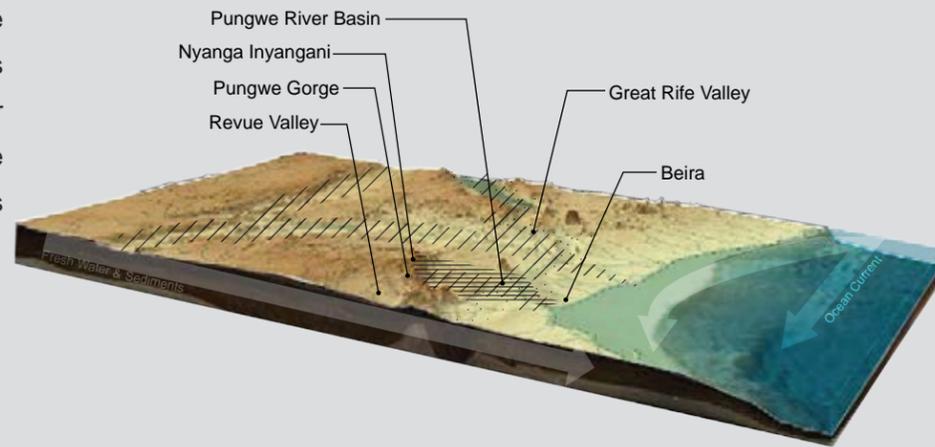
Bridging the Local and Global Economy

The future Port of Beira will harness global connectivity for local benefit. The water that connects Beira to the world will bring prosperity to local communities and ecosystems. As the port reaches out to the world, canals (corridors of blue-green infrastructure and industry) will stretch into the city. Industries along these corridors will provide food, energy, and job security to Beirans.



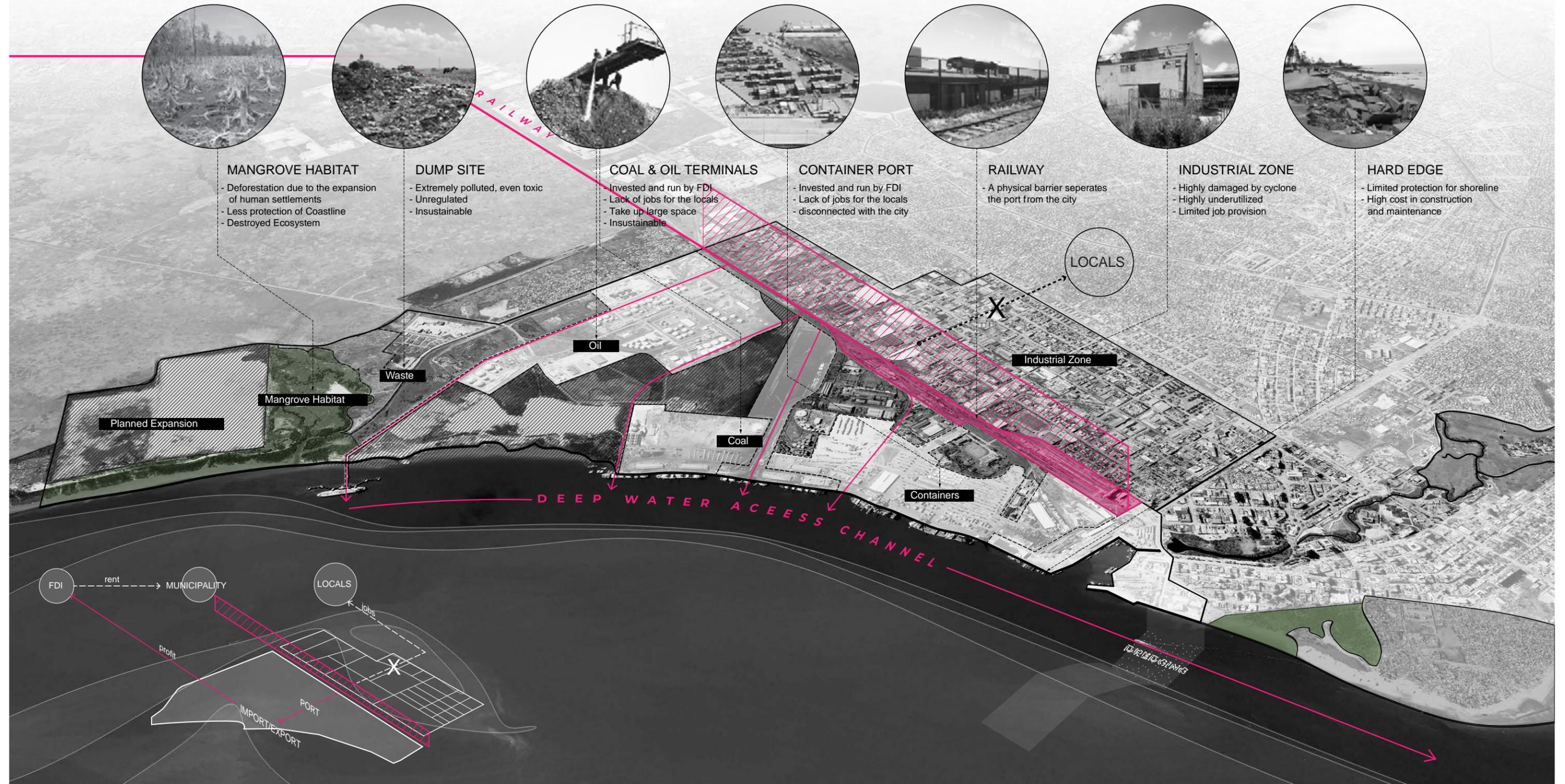
FORMATION OF THE CITY

Beira forms from the water of the river and sea. The accumulation of sediments from the Pungwe River supports the thriving of the city and mangrove colonies surrounding the city.



**BEIRA PORT IS
SEGREGATED FROM THE
CITY**

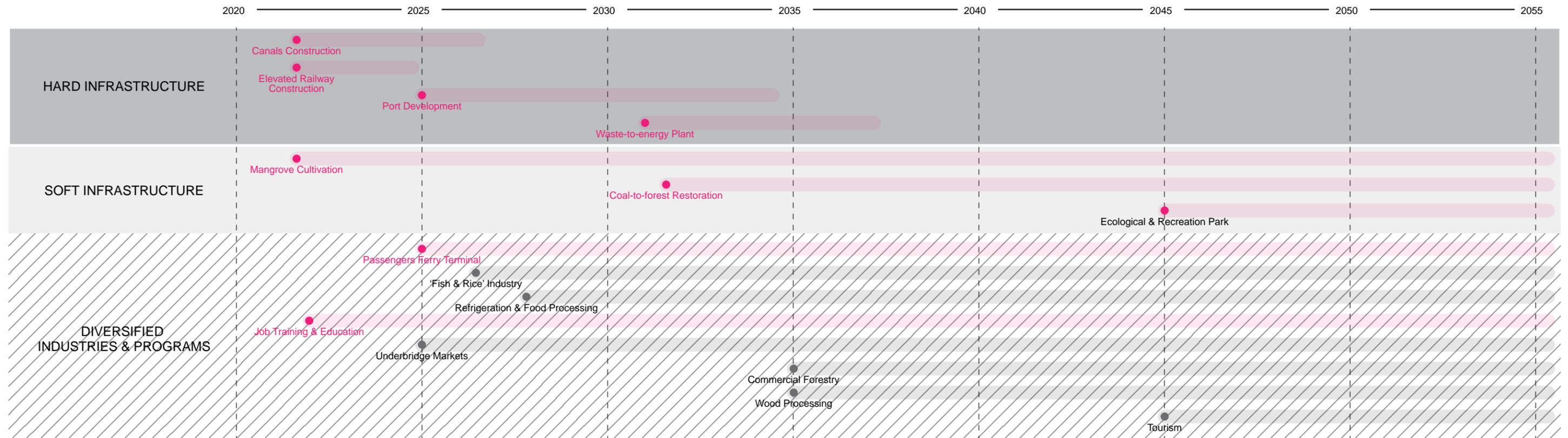
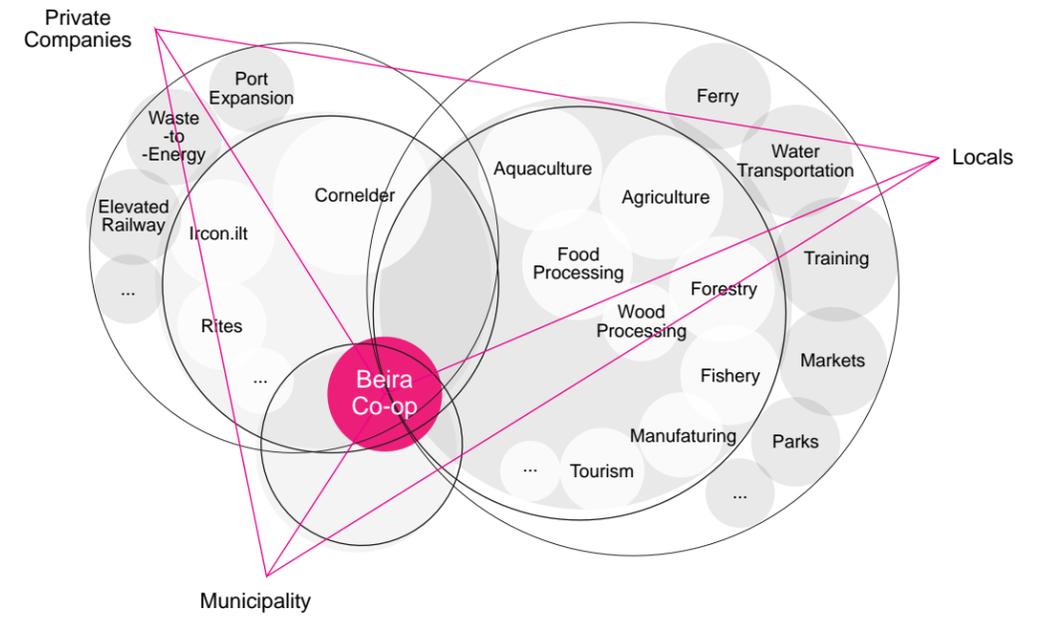
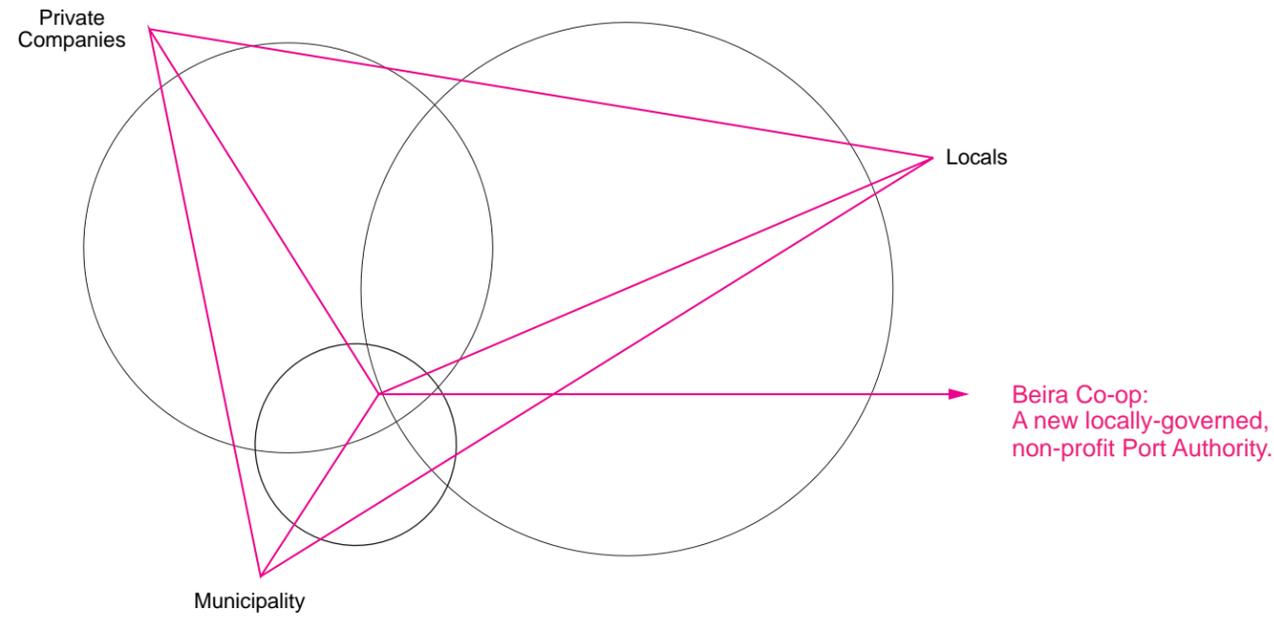
Physically, Socially and
Economically



BEIRA CO-OP

A New Locally-governed,
Non-profit Port Authority

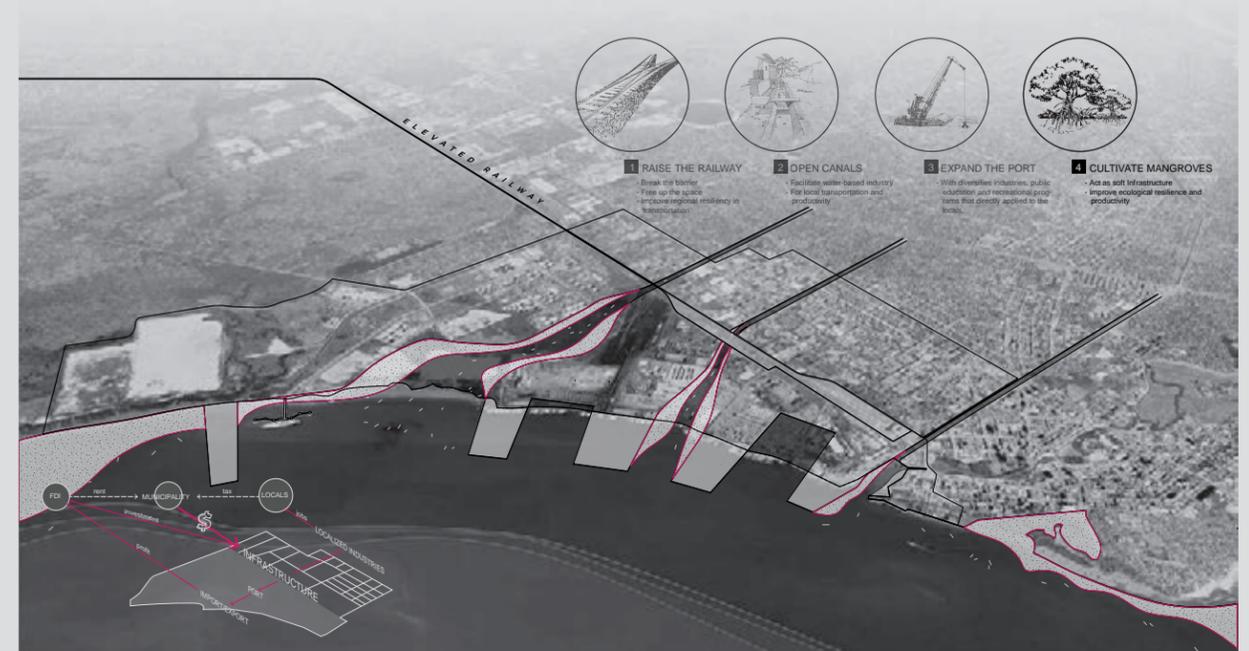
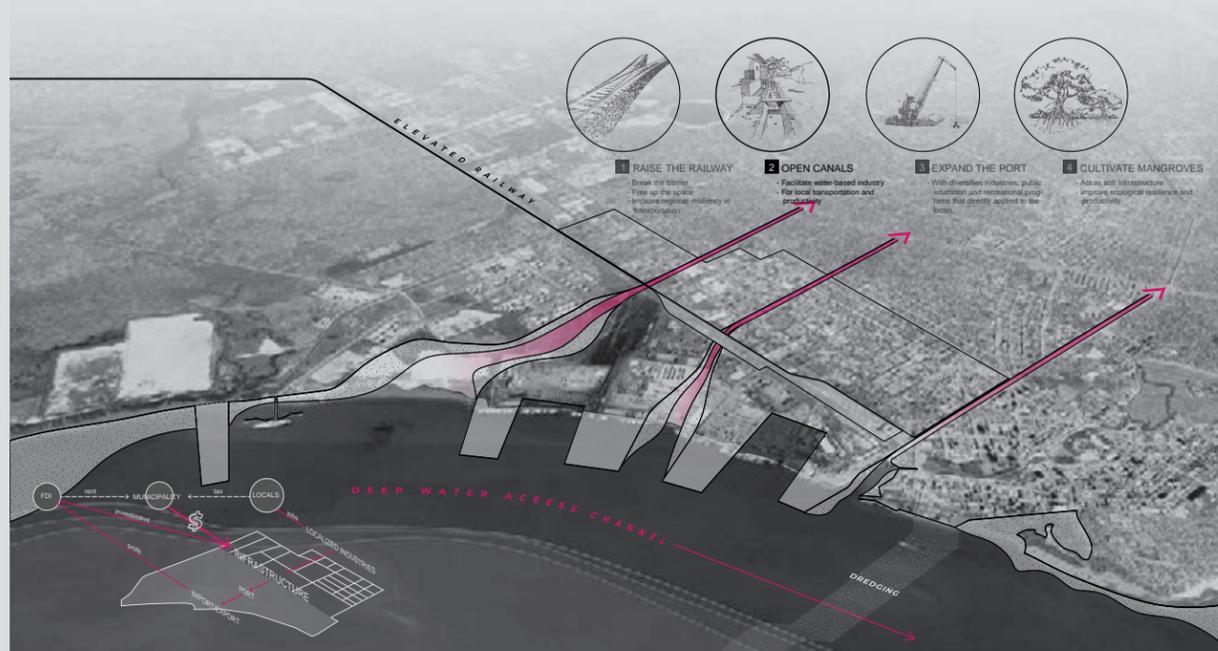
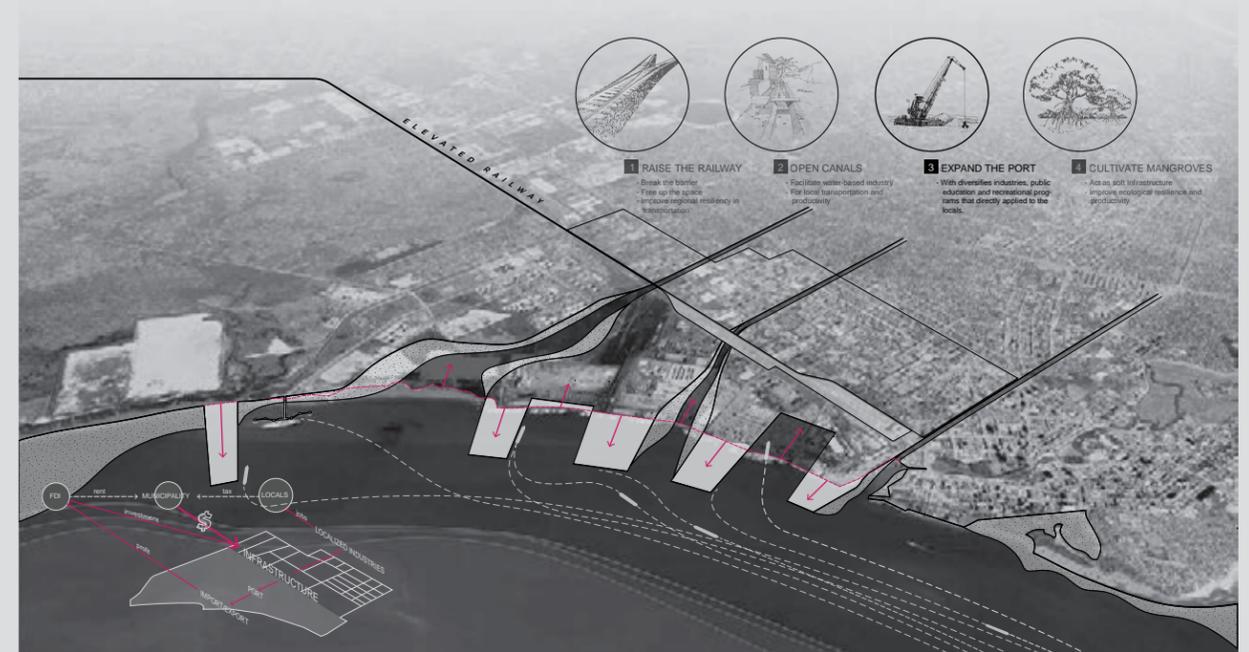
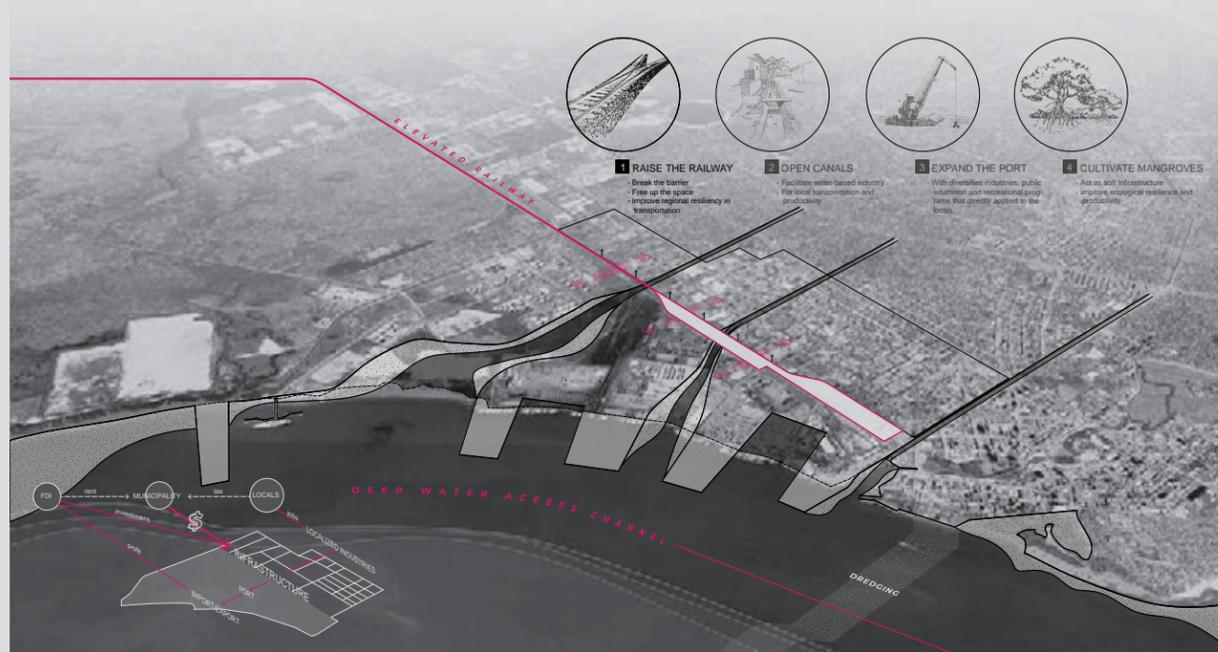
We imagine the Port can be expanded and improved by a new locally governed, non-profit Port Authority, which would seek to balance corporate interests with a clear public mission to improve ecological health and provide local jobs. This entity would raise funds for infrastructure improvements, job training and grants to local businesses.



STRATEGIES

Connecting Port of Beira and the Industrial Zone

The Port Authority would raise the railway to break the barrier and improve Beira's regional resiliency in transportation; open canals for local transportation and productivity; expand and populate the port with diversified industries, public education and recreational programs that applied directly to the locals; cultivate mangroves as a soft infrastructure to form hard and soft edges to improve ecological resilience and productivities.



GREEN AND BLUE INFRASTRUCTURES

CANALS

- Main Water Amatory
- Water Enter
- Canal Exit - Existing
- Canal Exit - Proposed
- Canal - Existing
- - - Canal - Proposed
- Hard Edge - Existing
- Hard Edge - Proposed
- - - Soft Edge - Existing
- - - Soft Edge - Proposed
- Shoals



Mangroves

- Hard Edge - Existing
- Hard Edge - Proposed
- - - Soft Edge - Existing
- - - Soft Edge - Proposed
- Mangrove Growth Through Time
- Mangroves - Proposed
- ▨ Mangroves - Existing



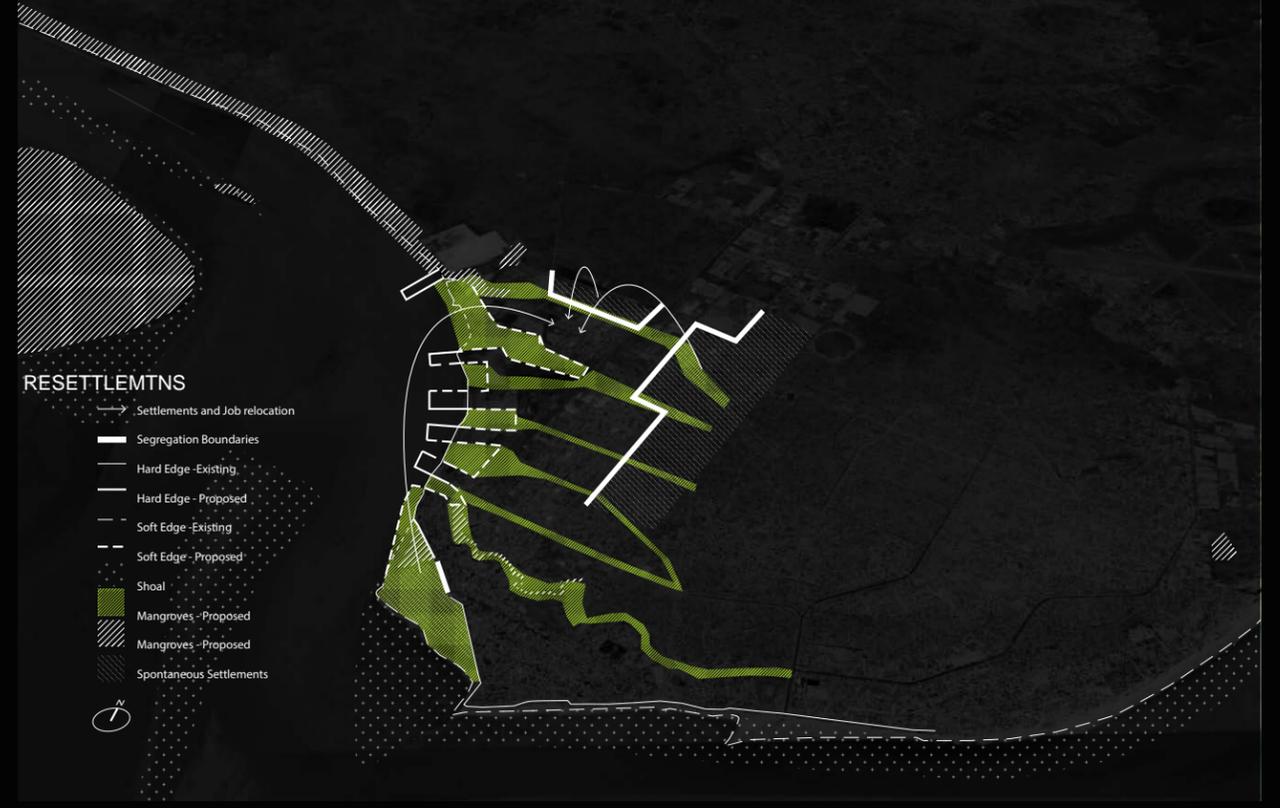
SEDIMENTATIONS

- Directions of Sedimentation
- Hard Edge - Existing
- Hard Edge - Proposed
- - - Soft Edge - Existing
- - - Soft Edge - Proposed
- Mangrove Growth Through Time
- Mangroves - Proposed
- ▨ Mangroves - Existing



RESETTLEMENTS

- Settlements and Job relocation
- Segregation Boundaries
- Hard Edge - Existing
- Hard Edge - Proposed
- - - Soft Edge - Existing
- - - Soft Edge - Proposed
- Shoal
- Mangroves - Proposed
- ▨ Mangroves - Proposed
- Spontaneous Settlements



DESIGN VISION

Bridging the Local and
Global Economy

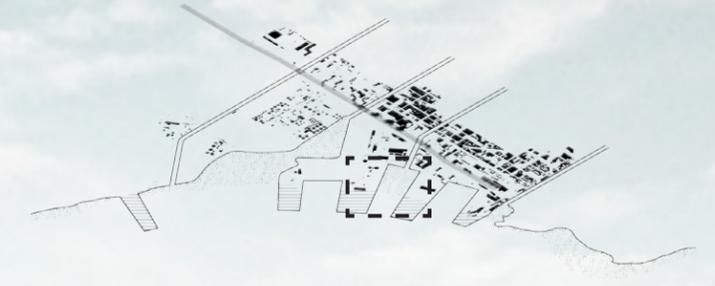
In the long term, Beira's
waterfront would transform
from a single hard edge
into a fluctuating, growing
and hard-and-soft edge that
interweaves the land and the
sea.



**BEIRA'S PORT
CONNECTS TO THE
WORLD**

With Multi-functional Port
Infrastructures

Soft ecological edge protects the coastline, while keeping the hard edge for daily port function. Coexistence of containers ships, passenger ferries and local fishing boats. Public realm integrates port activity with the rest of the city.



**A ECOLOGICAL LIGHT
INDUSTRIAL PARK**

With A Rebuilt Rail Line
Connects to The Region
A Rebuilt Rail line connects
to the Region!

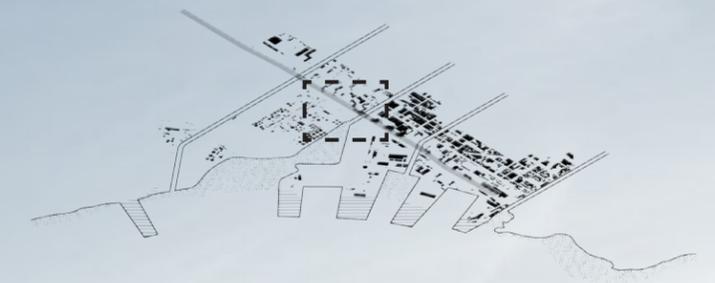
The elevated rail line will connect Zimbabwe and Malawi to the international high-speed passenger ferry, and the container port. As coal and gas terminals are phased out, they will be replaced by a multi-functional ecological industrial park and a renewable energy research and development campus.



CANALS CONNECT TO THE CITY

With A Thriving Public Realm

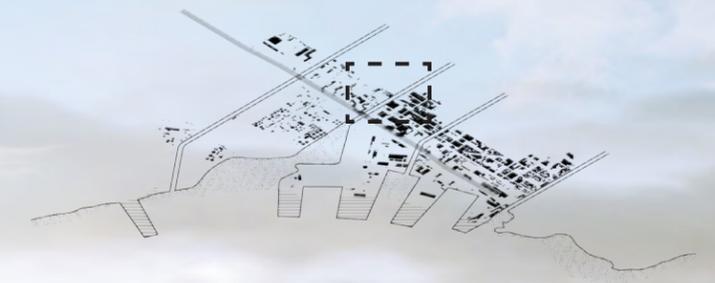
Canals connect to the City! With a mix of hard and soft edges, these canals create a thriving public realm along which markets, and factories can thrive. • Shipping containers from the Port can be upcycled into housing and public structures.



**BRINGING DIVERSE
JOBS INTO THE
NEIGHBOURHOODS**

With Diversified Industries
for More Job Opportunities

An industrial zone along the canals will promote a diversity of local industries including ship-building, manufactured housing, aquaculture and agriculture processing. The Beira CO-OP will provide training centers so locals can access these high skill jobs.

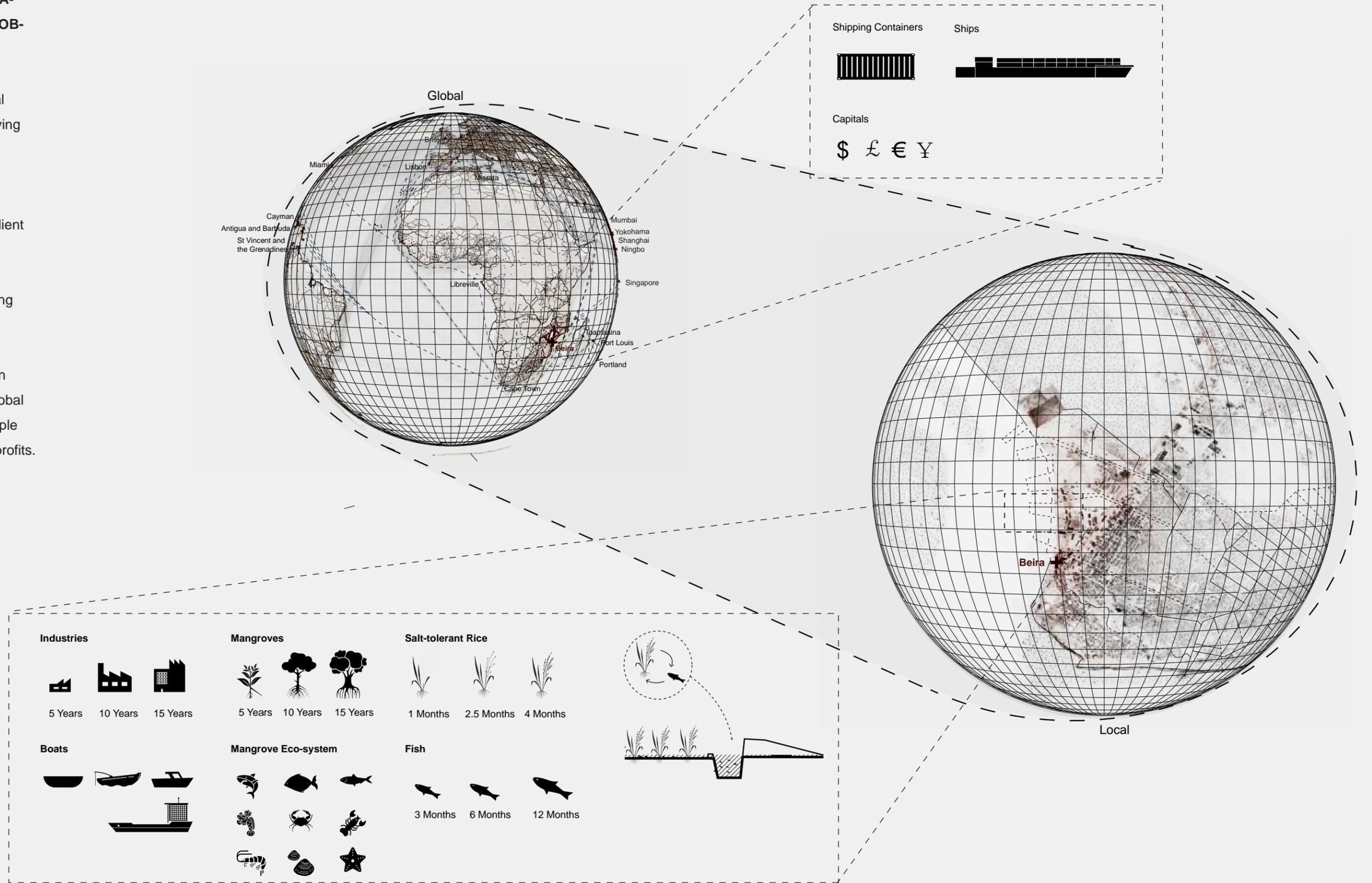


BEIRA AS AN INSPIRATION FOR A NEW GLOBAL ECONOMY

That Harness Its Global Connections for A Thriving Local Economy

By protecting its rich natural capital and resilient communities, Beira can harness its global connections for a thriving local economy.

Beira's Port could be an inspiration for a new global economy that puts people and ecology ahead of profits.



DRIVE-LESS LIFE

The transportation sector alone contributes to 36% greenhouse gas (GHG) emission in New York State, and approximately 70% of which comes from private vehicles. Extensive highway networks, deficient infrastructures for mass transits, suburban lifestyle all facilitate a culture of car dependency and contribute to the amount of GHG emission.

To decarbonizing the transportation system in the region and meeting the goal of net-zero, we propose a hybrid system with three target design solutions while taking Poughkeepsie as a pilot site.

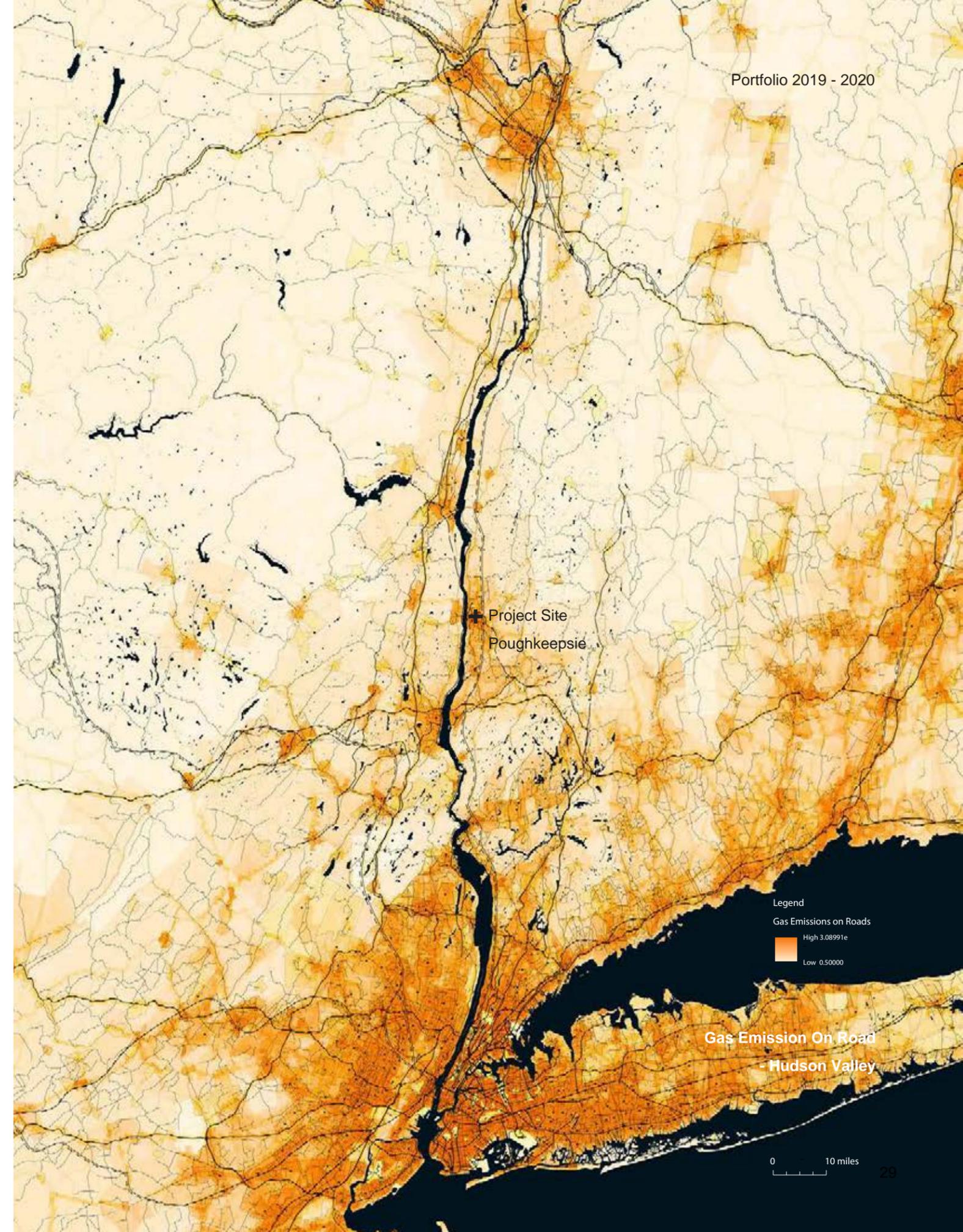
1. An Emission-Free Shared Vehicle system combines a network of smaller shuttles and a fleet of shared autonomous electric vehicles to replace the existing bus network with more flexible and frequent services.

2. Improve public transportation infrastructure by building new bus stops integrated with public space and urban life.

3. Remove the elevated Route 9 Highway in front of the Poughkeepsie train station to redesign the route as a street with a mix-use development to meet the needs of residents while serving as an engine to high density and low carbon emission lifestyle.

Design Team

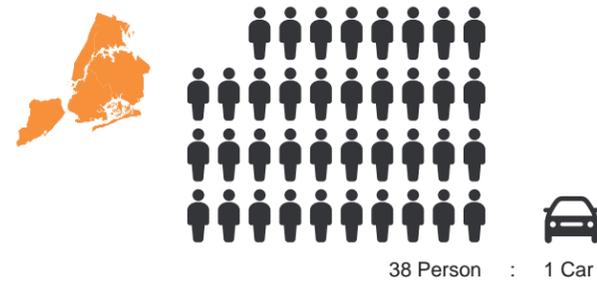
Yao Yao, Shuo Han, Yi (Isabelle) Zhang,



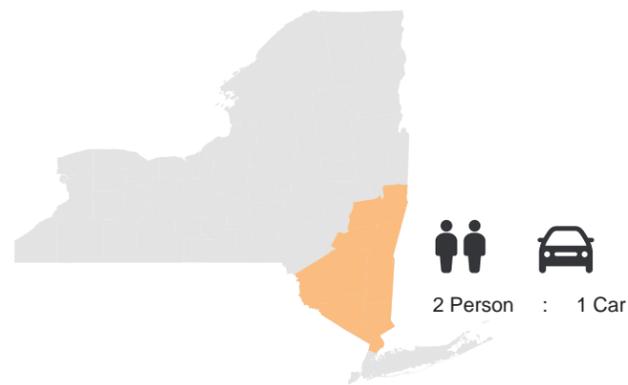
**TRANSPORTATION
AND CAR OWNERSHIP
ANALYSIS**

Ratio of Car Ownership

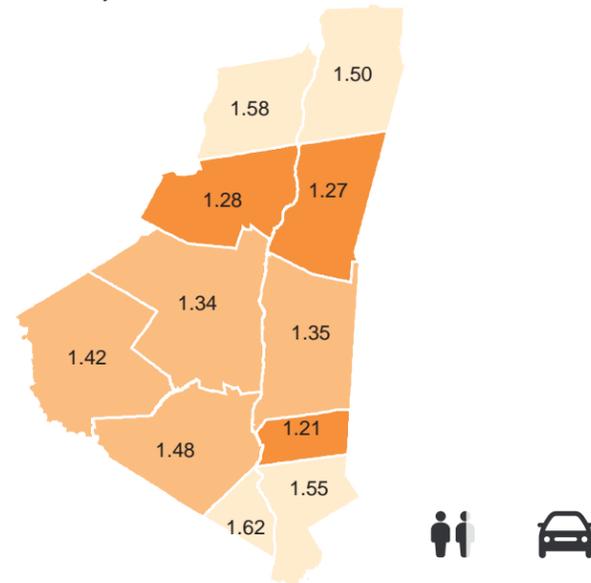
New York City



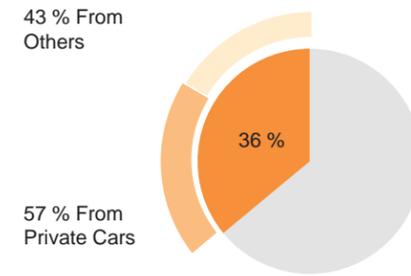
New York State



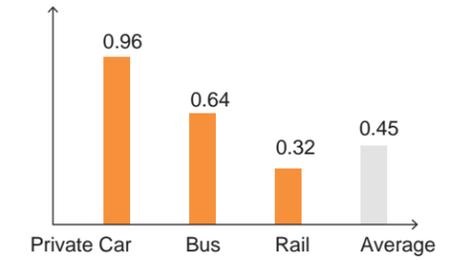
Hudson Valley



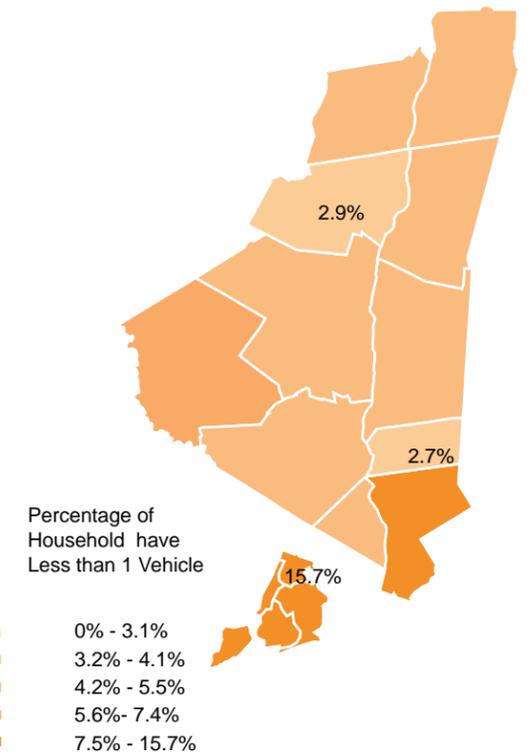
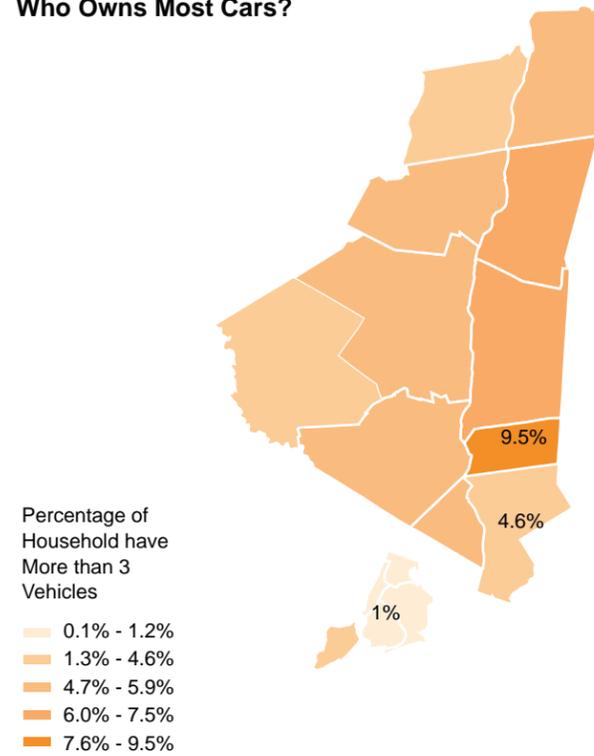
**GHG from Transportation
in New York State**



**GHG per Passenger Mile for
Transit and Private Cars**



Who Owns Most Cars?



MASTERPLAN



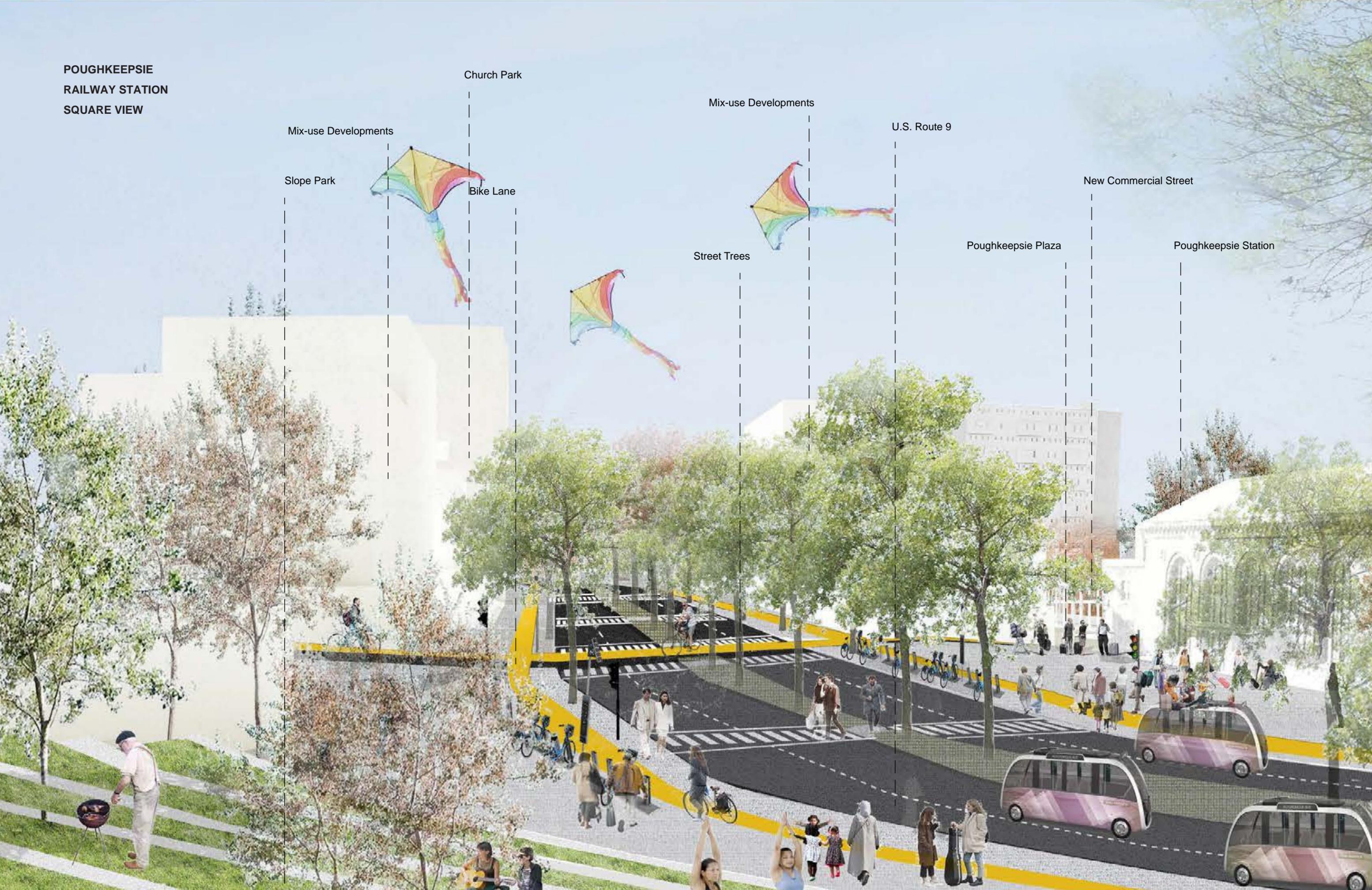
Existing Conditions

- 1. Poughkeepsie Station
- 2. Poughkeepsie Plaza
- 3. U.S Route 9
- 4. Slope Park
- 5. Footpath to Fall Kill
- 6. Bike Station
- 7. Bike Lane
- 8. Mix-use development
- 9. Church Park
- 10. Street Front
- 11. Street Tree
- 12. Highway Park
- 13. New Commercial Street.



0 1.2 miles

**POUGHKEEPSIE
RAILWAY STATION
SQUARE VIEW**



Church Park

Mix-use Developments

U.S. Route 9

Mix-use Developments

Slope Park

Bike Lane

New Commercial Street

Street Trees

Poughkeepsie Plaza

Poughkeepsie Station

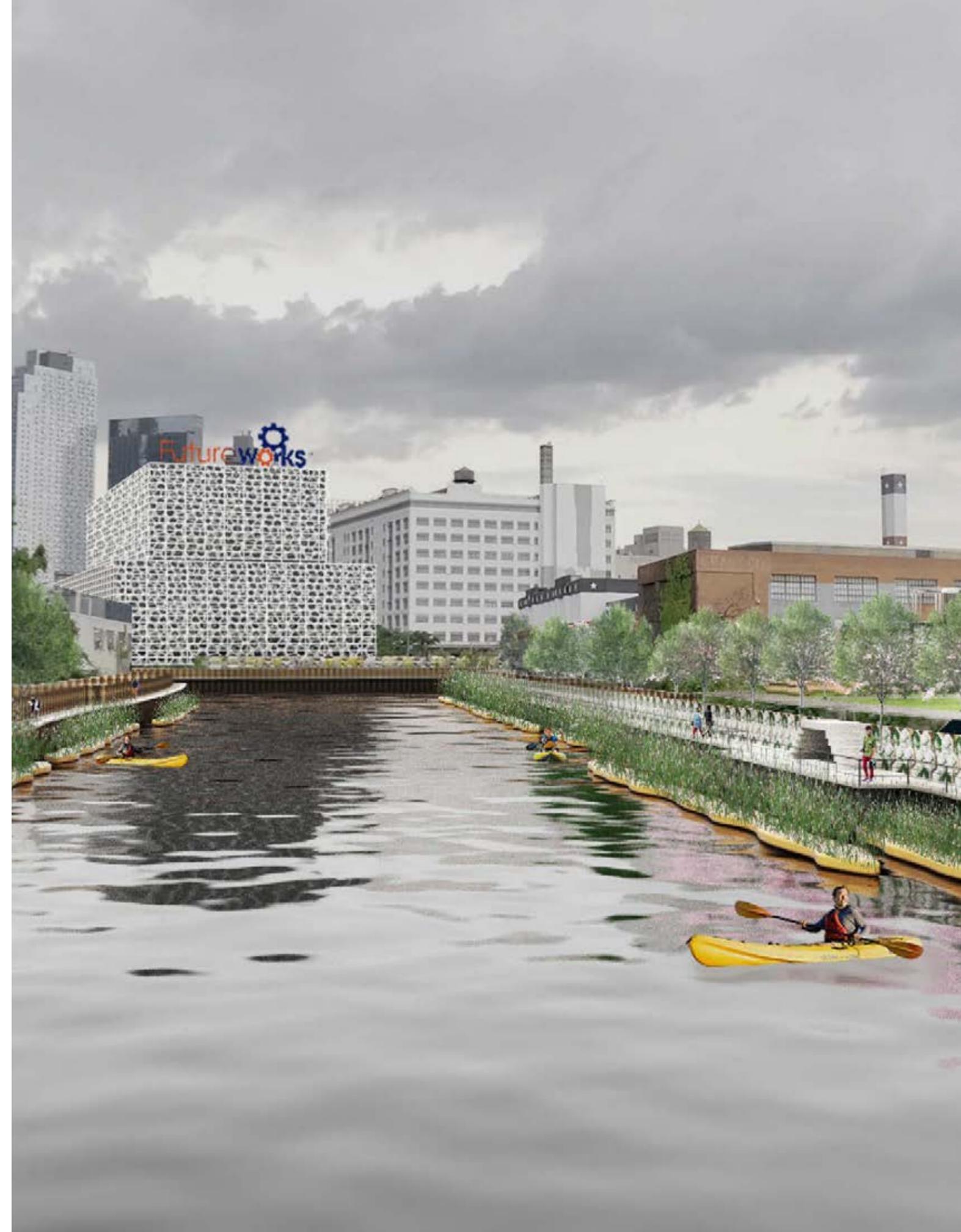
MANUFACTURING PUBLIC SPACES

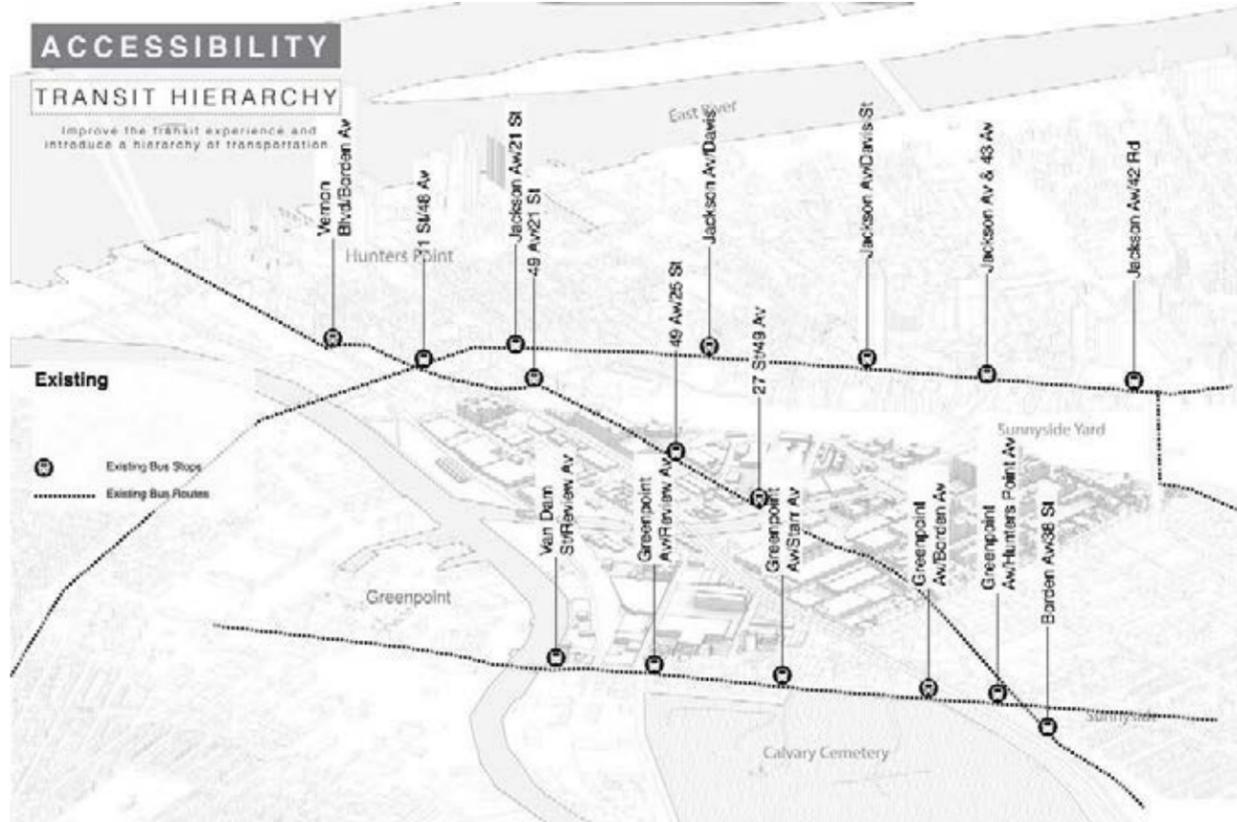
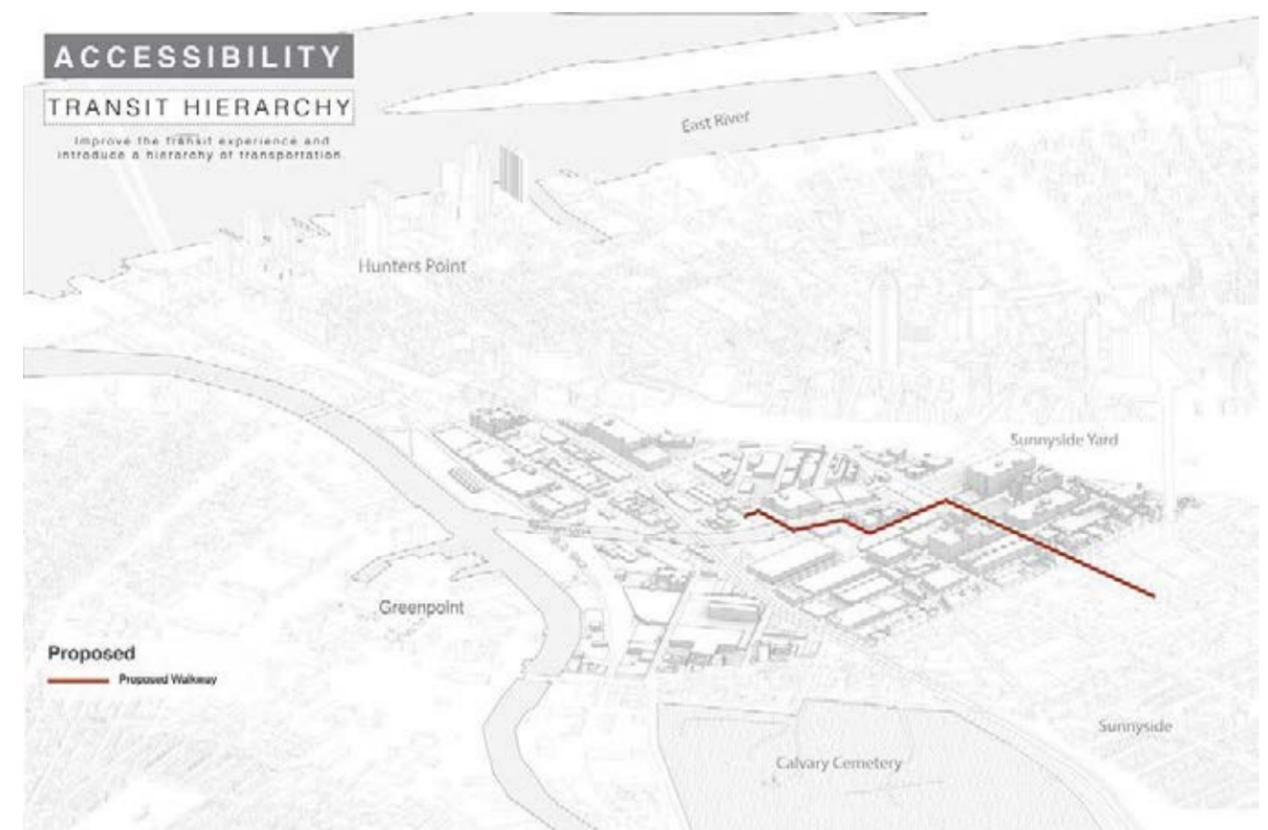
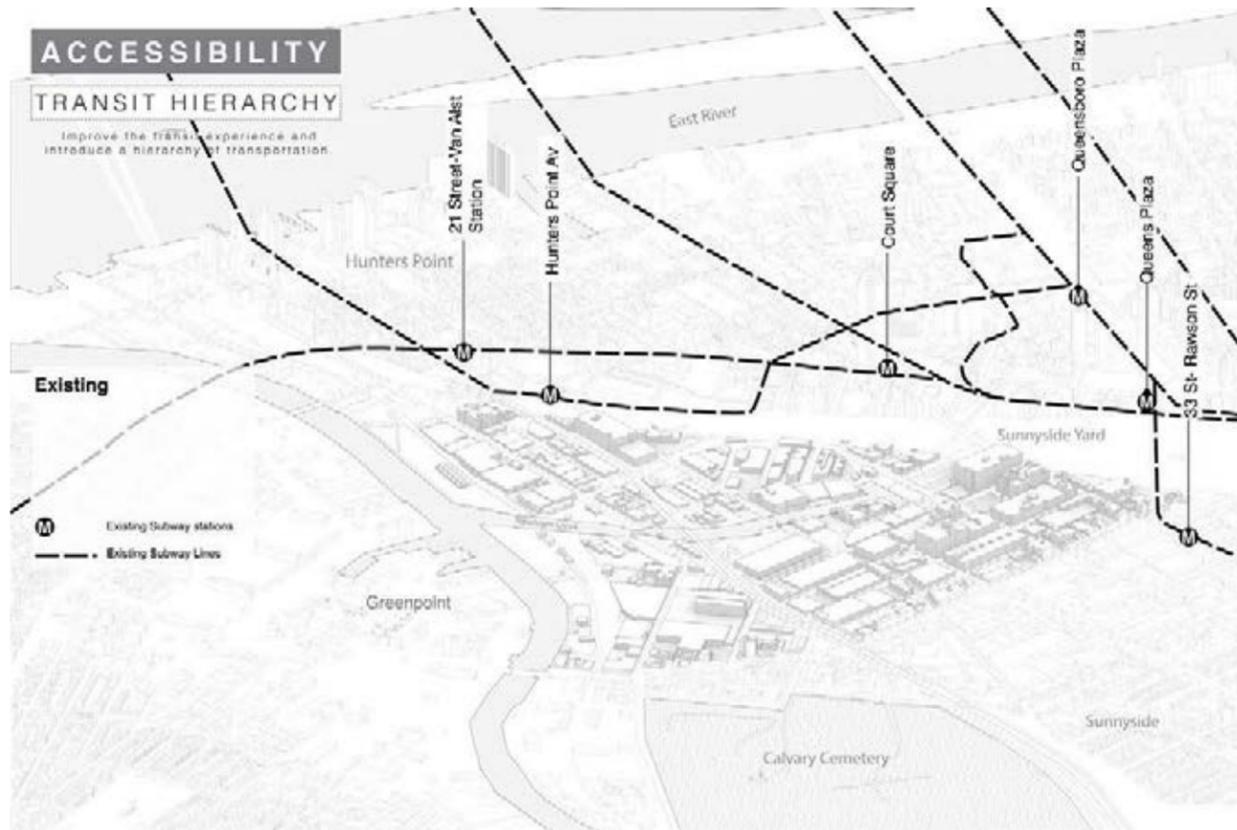
The Industrial Business Zone in Long Island City is located in the heart of New York City. However, because the area is severely disconnected to the city's mass transportation systems, including subways, and buses, the IBZ has also been disconnected from the local communities.

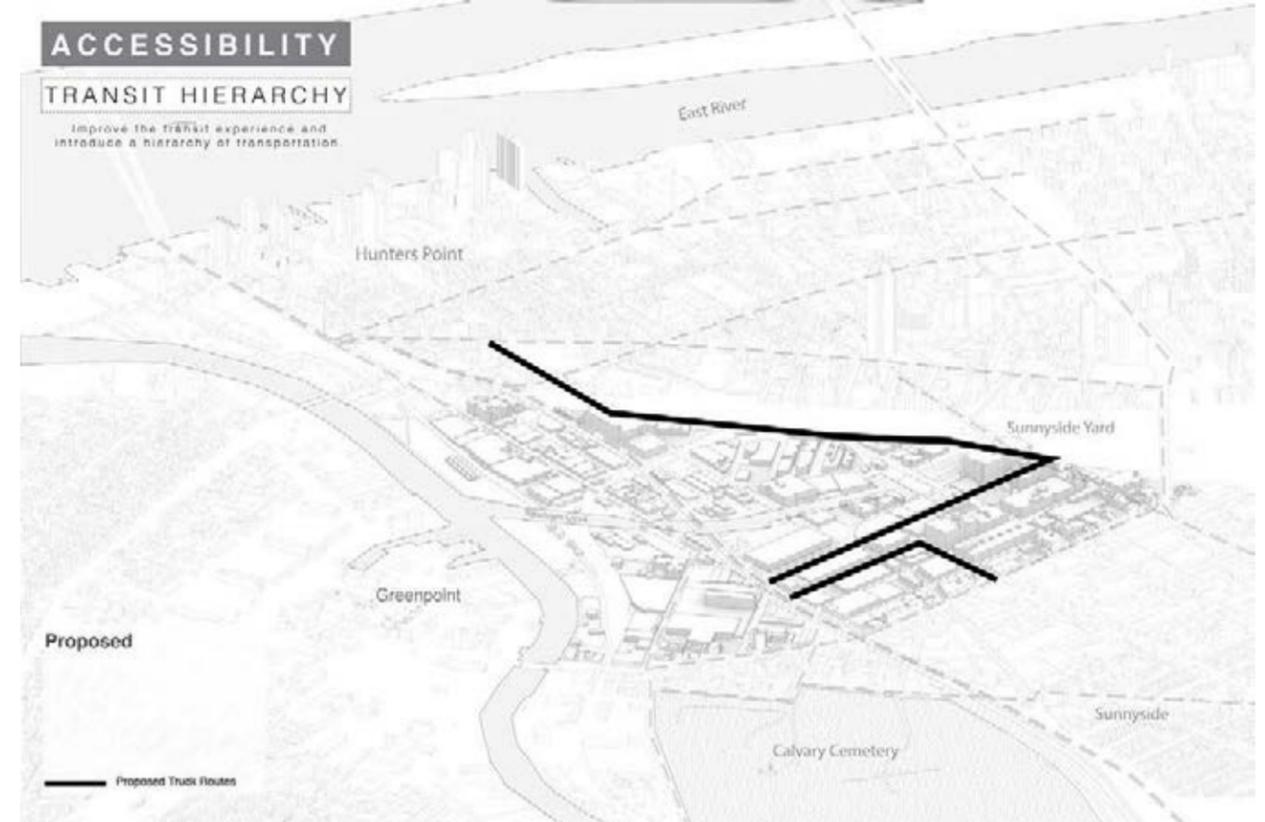
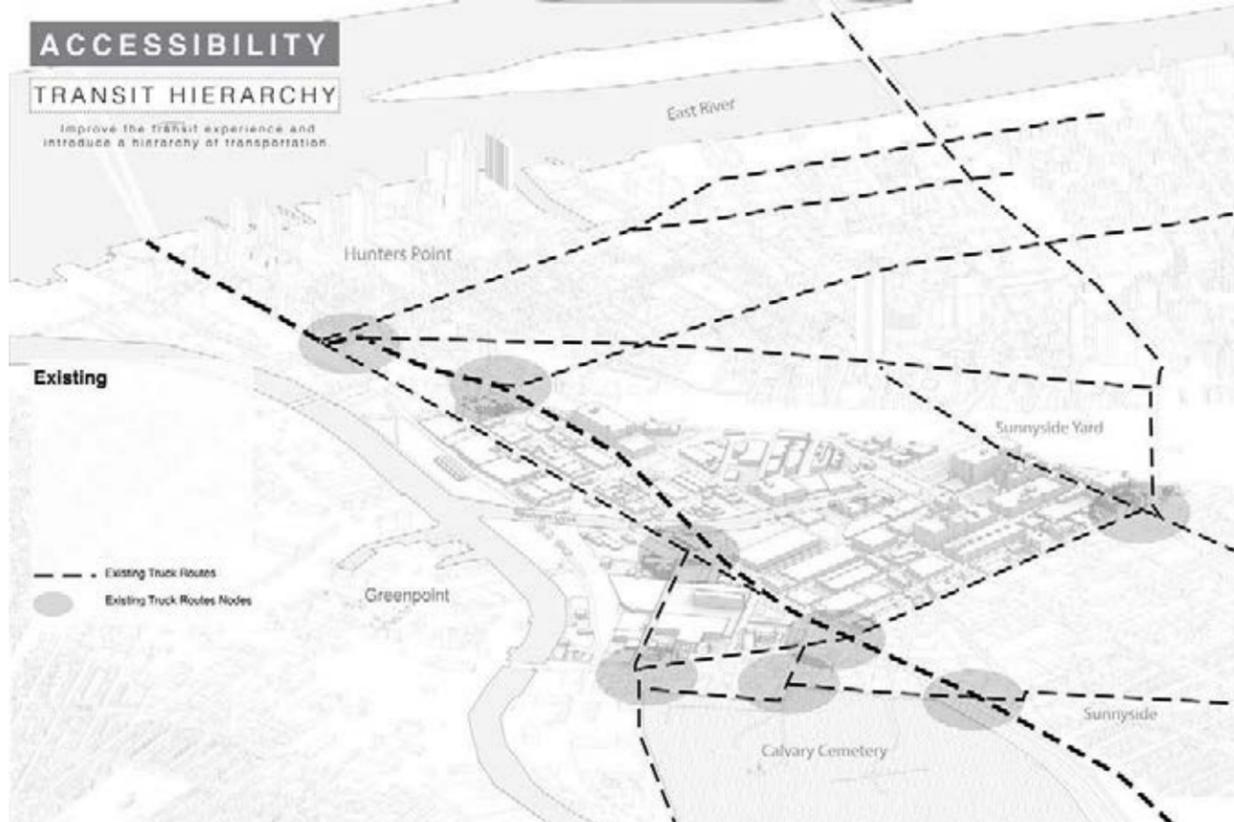
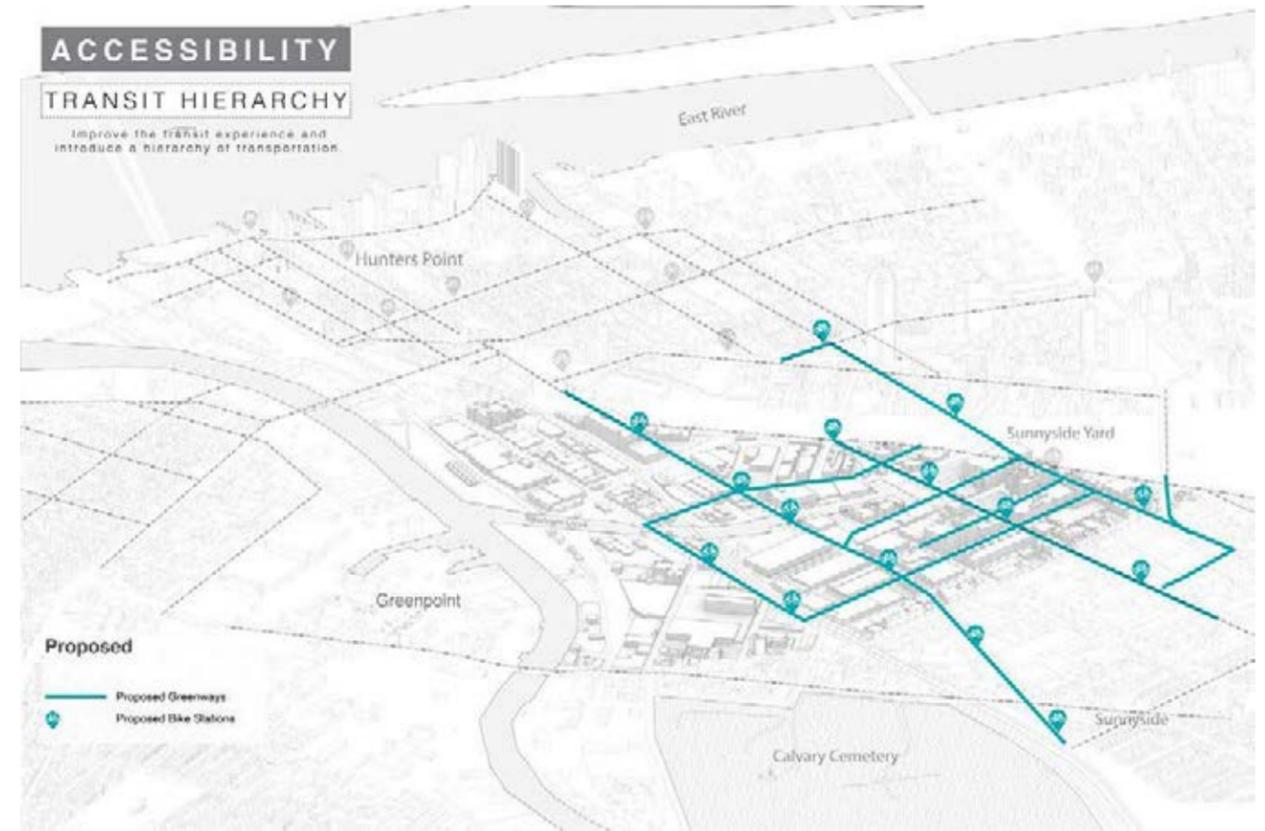
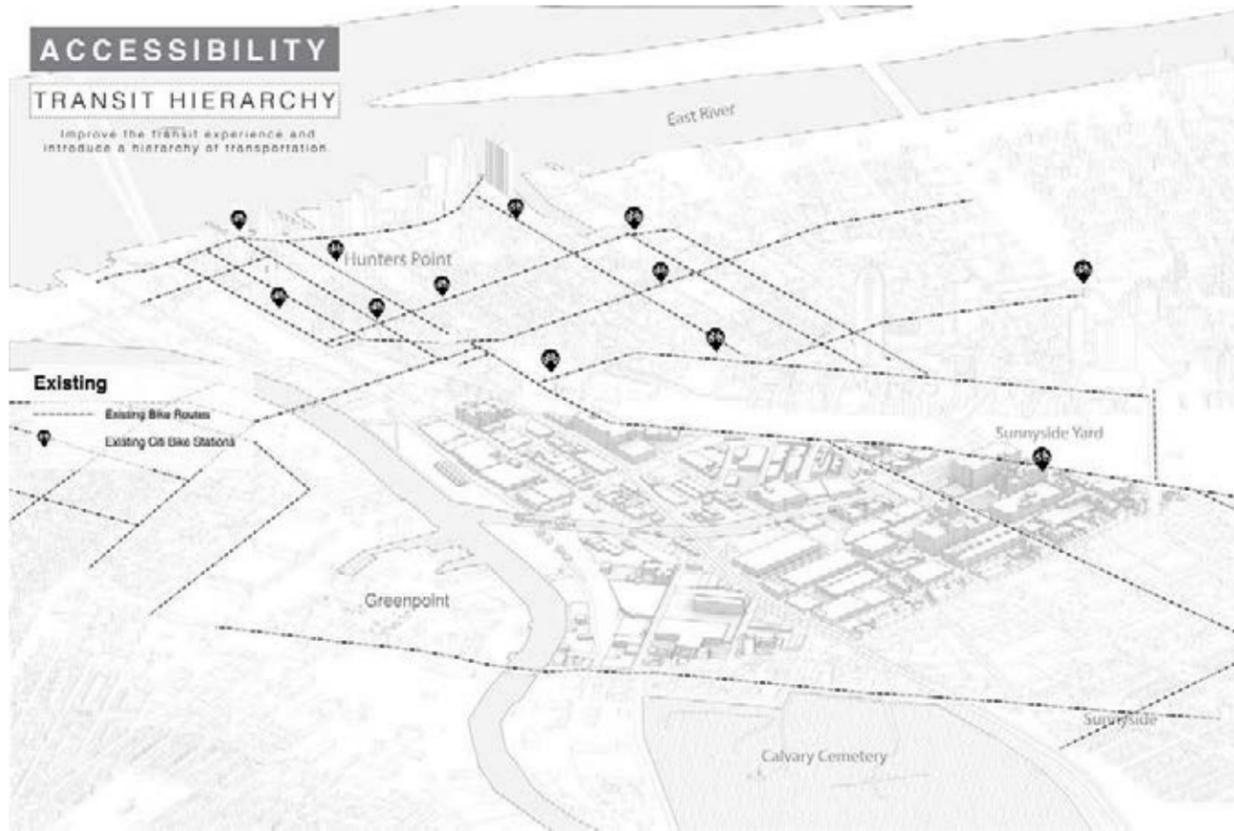
Manufacturing Public Space is an urban design proposal that attempts to use streetscapes to revitalize the IBZ for mutual benefits of the industries and local communities. The design strategies include protecting the industries and businesses in the IBZ; then, reconnecting the IBZ to the local communities, while improving the built environments of IBZ. Through designing integrated public spaces, the project attempts to reconnect the IBZ with local communities, and improve the quality of living and working for both the local residences as well as workers.

Design Team

Scott Guo, Laszlo Botond Kovacs, Nina Lish, Yi (Isabella) Zhang







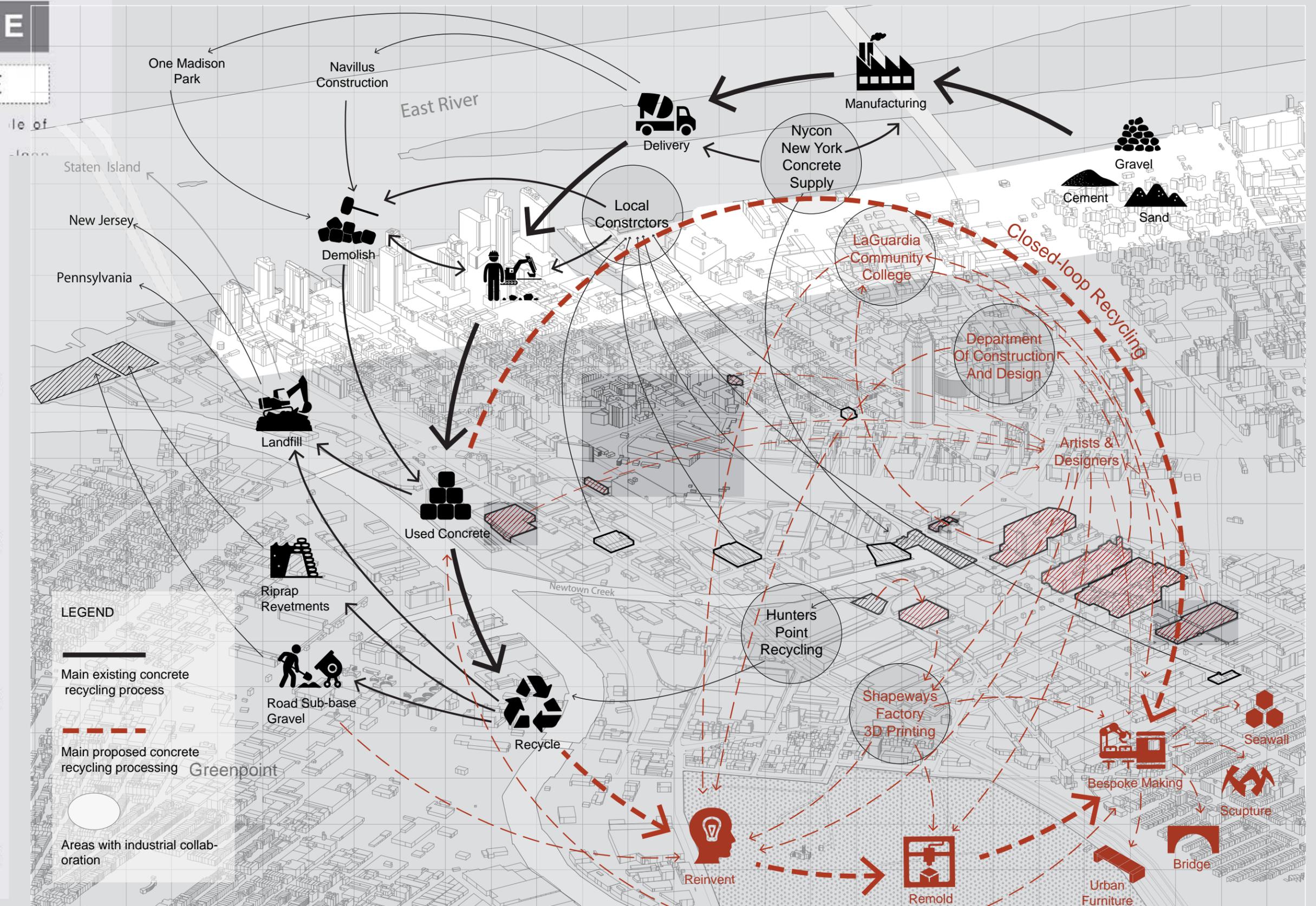
ACCESSIBILITY

TRANSIT HIERARCHY

Improve the transit experience and introduce a hierarchy of transportation.



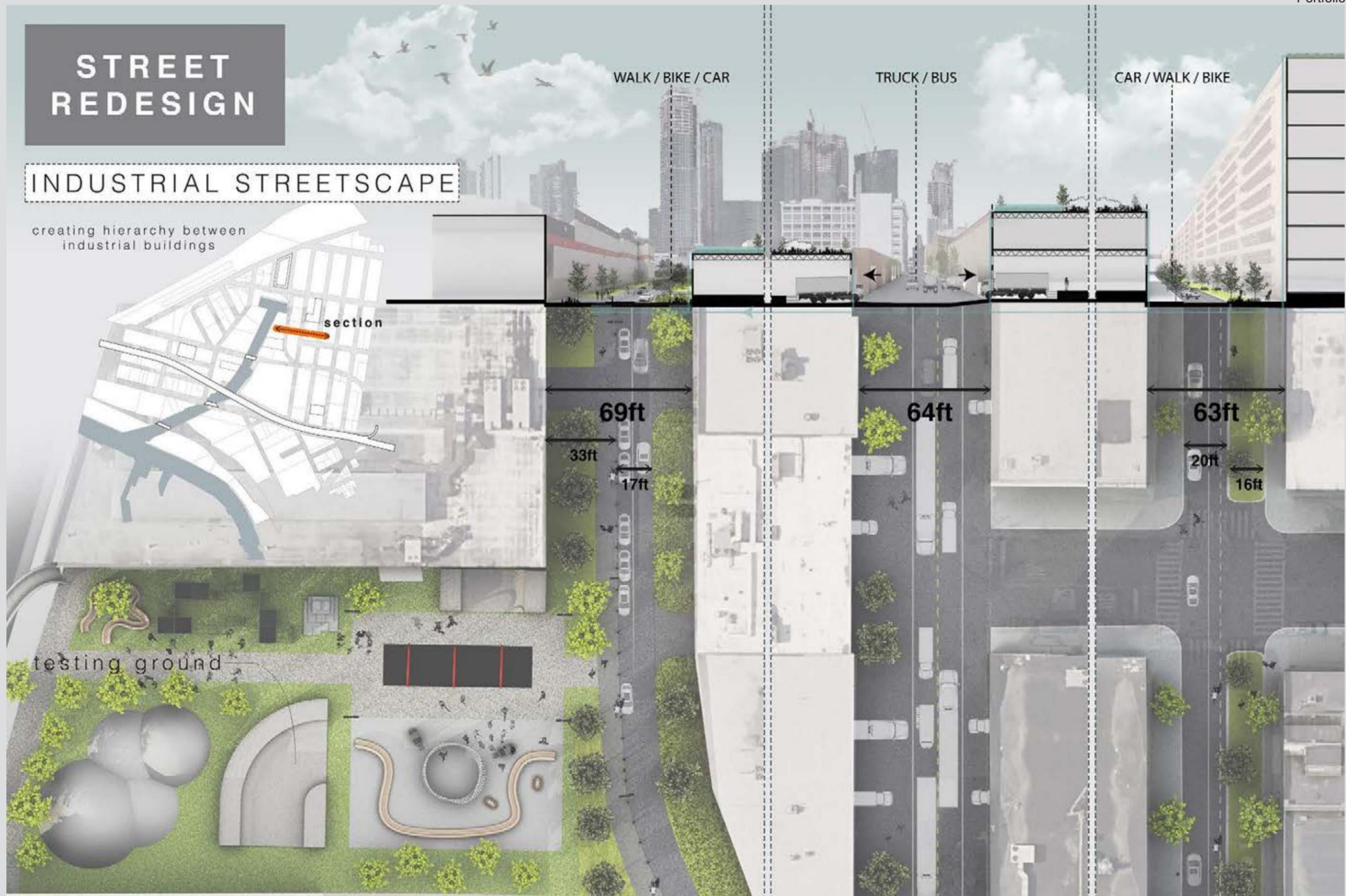
CONCRETE LIFECYCLE



STREET REDESIGN

INDUSTRIAL STREETSCAPE

creating hierarchy between industrial buildings



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